Federal Court  Cour fédérale

Date: 20120130

Docket: T-737-08

Citation: 2012 FC 113

Montréal, Quebec, January 30, 2012

PRESENT: The Honourable Mr. Justice Martineau

BETWEEN:

EUROCOPTER
(SOCIÉTÉ PAR ACTIONS SIMPLIFIÉE)

Plaintiff / Defendant by Counterclaim

and

BELL HELICOPTER TEXTRON CANADA LIMITÉE

Defendant / Plaintiff by Counterclaim

REASONS FOR JUDGMENT AND JUDGMENT

[1] This case is a classic patent infringement/invalidity scenario. Eurocopter alleges that its competitor, Bell Helicopter Textron Canada Limitée (Bell), has infringed Canadian Patent No. 2,207,787 (the '787 Patent) which relates to a skid-type landing gear for helicopter. Bell denies that it has infringed the '787 Patent, and, in counterclaim, seeks its invalidity.

[2] The Court will begin by referring to the parties (paras 3-4), to the patent at issue (paras 5-14), and to the litigation (paras 15-38). This will be followed by an examination of the legal framework (paras 39-80). After reviewing both the factual and expert evidence (paras 81-153) the Court will also expose the chronology of relevant events (paras 154-184). The Court will then construe the patent at issue (paras 185-249). This will be followed by the Court's findings with respect to infringement (paras 250-292) and validity (paras 293-376). Finally, declarations and remedies shall be dealt with at the end of the present reasons (paras 377-464).

I. **THE PARTIES**

[3] Eurocopter, the owner of the '787 Patent, has its headquarters at the Aéroport International Marseille/Provence, France. It conducts its business in Canada through Eurocopter Canada Limited; the latter is not a party to these proceedings. Eurocopter is a major player in the civilian and parapublic helicopter market and owns 850 patents that have generated almost 2,500 titles worldwide.

[4] Bell is incorporated under Canadian law, with its principal place of business in Mirabel, Quebec. Its parent company, Bell Helicopter Textron Incorporated (Textron), operates in Fort Worth, Texas; it is wholly owned by Textron Incorporated headquartered in Providence, Rhode Island. Bell encompasses the full spectrum of helicopter research and manufacturing in the civilian and parapublic helicopter market.

II. **PATENT AT ISSUE**

[5] The ‘787 Patent, entitled “Train d’atterrissage à patins pour hélicoptère” (skid-type landing gear for helicopter) was issued on December 31, 2002 to Eurocopter from an application filed on June 5, 1997, claiming priority based on French patent application No. 96 07158, filed in France on June 10, 1996. The ‘787 Patent will expire on June 5, 2017.

[6] The ‘787 Patent is written in French. That said, a translation of same in English was prepared for the litigation by ALL LANGUAGES LTD. Any difference or ambiguity with respect to the choice of particular words used in the English translation will be touched upon subsequently by the Court, if material to the issues raised by the parties.

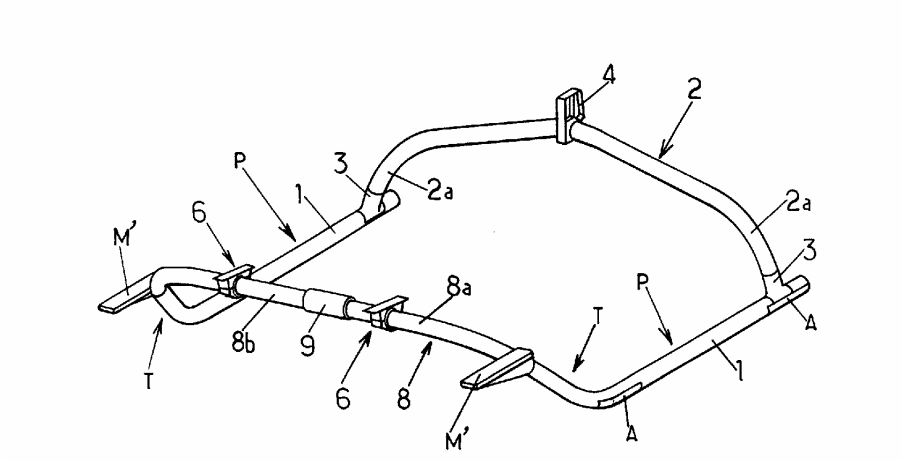
[7] Mr. Henri Fernand Louis Barquet, Mr. Pierre Prud’homme Lacroix and Mr. Joseph François Robert Mairou are the named inventors of the landing gear described and claimed in the ‘787 Patent. The disclosed invention is presented as a major innovation in the field of skid-type landing gears for light helicopters. Although not referred to as such in the ‘787 Patent, it has been known colloquially in French as the “train à moustache” and it is designated in English as the “Moustache landing gear”.

[8] The invention disclosed in the ‘787 Patent relates to helicopter landing gear, more particularly intended for light helicopters, comprised of two skids each having a longitudinal ground support surface and connected to a front cross piece and a rear cross piece which are themselves

attached to the structure of the aircraft by connecting devices, the rear cross piece being attached by the ends of its descending branches to the rear part of said longitudinal support surfaces.

[9] The landing gear according to the invention disclosed in the ‘787 Patent, of the type described above, is characterized by the fact that each of said skids has, at the front, an inclined transition zone with double curvature orienting itself transversely in relation to said longitudinal ground support surface, above the plane of the latter. In this way, the two transition zones together constitute an integrated front cross piece, offset either forwards or backwards in relation to the front delimitation of the plane of contact of said longitudinal support surfaces of the skids on the ground.

[10] Figure 1 of the ‘787 Patent is an isometric view of an embodiment of the disclosed invention:



[11] As can be seen, in this embodiment, the disclosed invention has a sleigh type of shape and its front cross piece is inclined and offset forward in relation to the front delimitation of plane of contact of the longitudinal support surfaces of the two skids.

[12] The ‘787 Patent is comprised of 16 claims. Claim 1 is the sole independent claim; claims 2 to 16 are dependent claims. In French, they read as follows:

1. Train d’atterrissage pour hélicoptère, comprenant deux patins présentant chacun une plage longitudinale d’appui au sol et reliés à une traverse avant et à une traverse arrière elles-mêmes assujetties à la structure de l’hélicoptère par des organes de liaison, la traverse arrière étant fixée par les extrémités de ses branches descendantes à la partie arrière desdites plages longitudinale d’appui, caractérisé en ce que chacun desdits patins présente à l’avant une zone de transition inclinée à double courbure s’orientant transversalement auxdites plages longitudinales d’appui au sol, au-dessus du plan de ces dernières, les deux zones de transition constituant ensemble, de la sorte, une traverse avant intégrée, décalée par rapport à la délimitation avant du plan de contact des plages longitudinales d’appui des patins sur le sol.

2. Train d’atterrissage selon la revendication 1, caractérisé en ce que l’ensemble des patins et traverses est constitué de tubes d’aluminium.

3. Train d’atterrissage selon la revendication 2, dans lequel l’aluminium desdits tubes se caractérise par une limite égale à environ 75% de la résistance à la rupture, et par un allongement relatif à la rupture au moins égal à 12%.

4. Train d’atterrissage selon la revendication 2 ou 3, caractérisé en ce que l’épaisseur de paroi des tubes constituant lesdites traverses avant et arrière est dégressive entre la partie centrale de la traverse et sa jonction au patin correspondant.

5. Train d’atterrissage selon l’une quelconque des revendications 1 à 4, caractérisé en ce que les extrémités des branches descendantes de la traverse arrière sont fixées auxdites plages longitudinales d’appui des patins par l’intermédiaire de manchons en aluminium.

6. Train d’atterrissage selon l’une quelconque des revendications 1 à 5, caractérisé en ce que ladite traverse avant est constituée de deux demi-branches reliées l’une à l’autre vers le milieu de ladite traverse avant par un moyen de jonction démontable et établissant la continuité de ladite traverse avant en flexion.

7. Train d’atterrissage selon l’une quelconque des revendications 1 à 5, caractérisé en ce que ladite traverse avant est constituée d’une seule branche dont les extrémités sont chacune reliées par un moyen de jonction démontable à la partie avant du patin correspondant, ce moyen de jonction étant disposé entre les deux courbures de la zone de transition concernée.

8. Train d’atterrissage selon la revendication 6 ou 7, caractérisé en ce que lesdits moyens de jonction sont constitués par un système de manchon vissé en aluminium ou par un collier de fixation.

9. Train d’atterrissage selon l’une quelconque des revendications 1 à 8, caractérisé en ce que lesdits organes de liaison entre lesdites traverses avant et arrière et la structure de l’hélicoptère sont du type à frottement contrôlé en rotation, comportant à cet effet deux demi-colliers ou analogues enserrant le tube de la traverse, avec interposition d’un palier de matériau élastique du genre élastomère.

10. Train d’atterrissage selon l’une quelconque des revendications 1 à 9, caractérisé en ce qu’il comporte au moins trois organes de liaison à la structure de l’hélicoptère, dont un assujetti centralement sur l’une desdites traverses et les deux autres assujettis, en étant mutuellement écartés de part et d’autre de l’axe longitudinal du train, sur l’autre traverse.

11. Train d’atterrissage selon l’une quelconque des revendications 1 à 9, caractérisé en ce qu’il comporte quatre organes de liaison à la structure de l’hélicoptère, assujettis deux par deux sur l’une et l’autre traverse, en étant mutuellement écartés de part et d’autre de l’axe longitudinal du train.

12. Train d’atterrissage selon la revendication 11, caractérisé en ce que la traverse avant ou arrière présente, entre deux tronçons de traverse, une interruption dans sa partie centrale, et en ce que lesdits organes de liaison à la structure de l’hélicoptère sont assujettis en tant qu’articulations à rappel élastique aux extrémités desdits tronçons.

13. Train d’atterrissage selon l’une quelconque des revendications 1 à 12, caractérisé en ce que ladite traverse arrière est constituée, pour sa partie avant, d’un tube à profil aérodynamique cintré formant bord d’attaque, ce tube étant prolongé vers l’arrière par un carénage rapporté formant bord de fuite.

14. Train d’atterrissage selon l’une quelconque des revendications 1 à 13, caractérisé en ce que des marchepieds sont fixés sur les lesdites zones de transition inclinées à l’avant des patins, au-dessous des portes d’accès à la cabine, ces marchepieds s’étendant, à partir desdites zones de transition, uniquement vers l’arrière.

15. Train d’atterrissage selon l’une quelconque des revendications 1 à 14, caractérisé en ce que ladite traverse avant intégrée est décalée vers l’avant par rapport à la délimitation avant du plan de contact des plages longitudinales d’appui des patins sur le sol.

16. Train d’atterrissage selon l’une quelconque des revendications 1 à 14, caractérisé en ce que ladite traverse avant intégrée est décalée vers l’arrière par rapport à la délimitation avant du plan de contact des plages longitudinales d’appui des patins sur le sol.

[13] For ease of reference, the translation of claims 1 to 16 prepared by ALL LANGUAGES LTD is reproduced below:

1. Helicopter landing gear, comprising two skids each having a longitudinal ground support surface and connected to a front cross piece and a rear cross piece which are themselves attached to the structure of the helicopter by connecting devices, the rear cross piece being attached by the ends of its descending branches to the rear part of said longitudinal support surfaces, characterized in that each of said skids has at the front an inclined transition zone with double curvature orienting itself transversely in relation to said longitudinal ground support surfaces, above the plane of the latter, the two transition zones together constituting, in this way, an integrated front cross piece, offset in relation to the front delimitation of the plane of contact of the longitudinal support surfaces of the skids on the ground.

2. Landing gear according to claim 1, characterized in that the assembly of skids and cross pieces is made of aluminium tubes.

3. Landing gear according to claim 2, wherein the aluminium of said tubes is characterized by a limit equal to approximately 75% of the fracture strength, and by a relative elongation at fracture at least equal to 12%.

4. Landing gear according to claim 2 or 3, characterized in that the wall thickness of the tubes making up said front and rear cross pieces is degressive between the central part of the cross piece and its junction with the corresponding skid.

5. Landing gear according to any of claims 1 to 4, characterized in that the ends of the descending branches of the rear cross piece are attached to said longitudinal support surfaces of the skids by means of aluminium couplings.

6. Landing gear according to any claims 1 to 5, characterized in that the said front cross piece consists of two half-branches interconnected towards the middle of said front cross piece by a removable junction means and establishing continuity of said front cross piece in bending.

7. Landing gear according to any of claims 1 to 5, characterized in that said front cross piece consists of a single branch whose ends are each connected by a removable junction means to the front part of the corresponding skid, said junction means being arranged between the two curves of the transition zone in question.

8. Landing gear according to claim 6 or 7, characterized in that said junction means consist of a screwed coupling system made of aluminium, or of an attachment collar.

9. Landing gear according to any claims 1 to 8, characterized in that said connecting devices between said front and rear cross pieces and the structure of the helicopter are of the type with controlled friction in rotation, comprising for this purpose two half-collars or similar devices surrounding the tube of the cross piece, with the interposition of a bearing made of elastic metal of the elastomer type.

10. Landing gear according to any of claims 1 to 9, characterized in that it includes at least three devices for connection to the structure of the helicopter, one of them being attached centrally to one of said cross pieces and the other two being attached, while being mutually spaced on either side of the longitudinal axis of the gear, to the other cross piece.

11. Landing gear according to any of claims 1 to 9, characterized in that it includes four devices for connection to the structure of the helicopter, two of them being attached to one and two to the other of the cross pieces, and being mutually spaced on either side of the longitudinal axis of the gear.

12. Landing gear according to claim 11, characterized in that the front or rear cross piece had, between two sections of cross piece, a gap in its central part, and wherein said devices for connection to the structure of the helicopter are attached as articulations with elastic return to the ends of said sections.

13. Landing gear according to any of claims 1 to 12, characterized in that said rear cross piece consists, for its front part, of a bent tube having an aerodynamic profile forming a leading edge, this tube being extended towards the rear by an added fairing forming a trailing edge.

14. Landing gear according to any claims 1 to 13, characterized in that steps are attached to said inclined transition zones at the front of the skids, below the access doors to the cabin, three steps starting from said transition zones and extending only towards the rear.

15. Landing gear according to any claims 1 to 14, characterized in that said integrated front cross piece is offset forwards in relation to the front delimitation of the plane of contact of the longitudinal support surfaces of the skids on the ground.

16. Landing gear according to any of claims 1 to 14, characterized in that said integrated front cross piece is offset backwards in relation to the front delimitation of the plane of contact of the longitudinal support surfaces of the skids on the ground.

[14] As further explained below, Eurocopter alleges that claims 1, 2, 3, 4, 5, 7, 9, 10 and 15 are infringed while Bell alleges that claims 1 to 16 are invalid on a number of grounds.

III. **THE LITIGATION**

[15] Eurocopter claims infringement of the ‘787 Patent by two distinct models of landing gear associated with the Bell 429 helicopter: the Legacy gear and the Production gear (the gears at issue).

Basic facts are not seriously challenged or have otherwise been the object of an agreed statement of facts and admissions.

[16] The 18-volume joint book of exhibits (JB) includes the trial record (vol. 1) and some 540 exhibits which have all been considered by the Court (although not specifically mentioned or discussed in these reasons for judgment). The authenticity and the content of the majority of these exhibits were admitted by the parties, but not for all.

[17] In coming to the findings of fact and law below, the Court has also considered the *viva voce* testimonies of a number of fact and expert witnesses heard, as well as the additional exhibits (P-1 to P-93 and D-1 to D-76), including the read-ins and experts reports, filed respectively by Eurocopter and Bell during this six week trial in January and February 2011.

[18] Unless otherwise indicated in these reasons for judgment, all objections taken under reserve at trial to questions or documents made by counsel are hereby dismissed, and the Court endorses the arguments made by the opposing counsel without repeating same in these reasons (see transcripts, written argumentation and table of objections with respect to same).

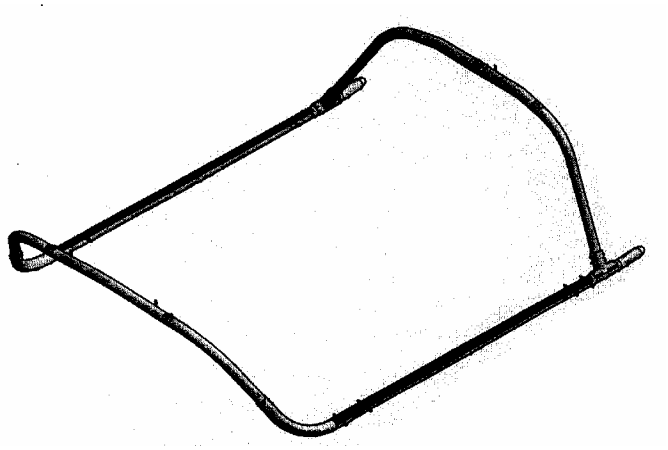
[19] In its action, Eurocopter alleges that the gears at issue infringe claims 1, 2, 3, 4, 5, 7, 9, 10 and 15 of the ‘787 Patent (the claims at issue). Incidentally, Eurocopter also alleges that Bell has made false and misleading statements to the public and its potential purchasers by representing that it had designed, for the first time, a landing gear that has the shape of a sleigh (the Legacy gear) and which is one of the embodiments of the claimed invention.

[20] The gears at issue are large and heavy material objects which could not be physically produced. Exhibits JB-216 and JB-271 faithfully represent the Legacy gear and its components, and JB-243 and drawings found in JB-405, JB-477 and JB-485 faithfully represent the Production gear and its components.

[21] Incidentally, on February 14, 2011, the Court examined the gears at issue in person, as well as the Bell 429 helicopter and other models at the Mirabel facility. The Court was guided in the course of its examination by the oral observations made by the parties' experts. The whole proceeding was video taped (exhibit C-1) and a transcript was prepared accordingly.

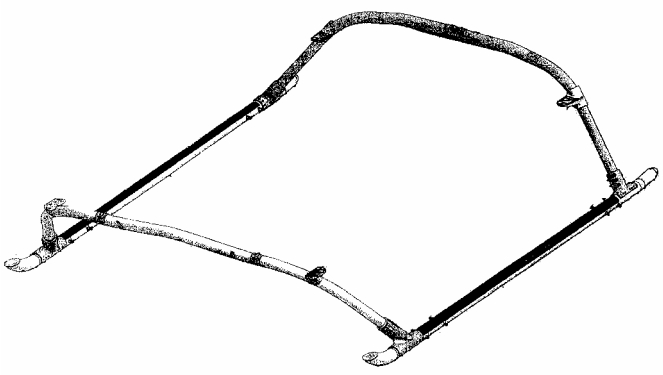
[22] Sometimes identified in the documentation as the "original gear", the Legacy gear was developed by Bell between 2004 and 2007. It is made of aluminium alloy. Twenty-one Legacy gears were manufactured by Aeronautical Accessories Inc., a related Bell company. The first flight of the Bell 429 equipped with the Legacy gear took place on February 27, 2007. All twenty-one gears have been quarantined since the commencement of the present action on May 9, 2008.

[23] An isometric view of the Legacy gear is reproduced below:



[24] The present action in infringement was commenced in May 2008. Eurocopter did not send a cease and desist letter to Bell. The present action initially included only the Legacy gear. Upon learning of Eurocopter's lawsuit, Bell rapidly made changes to the Legacy gear, resulting in the development of the Production gear.

[25] An isometric view of the Production gear, which is also made of aluminium, is reproduced below:



[26] On June 9, 2008, Eurocopter amended their statement of claim to include the Production gear.

[27] For Eurocopter, the Legacy gear is nothing more than a simple copy of the patented Moustache landing gear, an embodiment of which is shown at Figure 1 of the ‘787 Patent. As such, all the essential elements mentioned in claims 1, 2, 3, 4, 5, 9, 10 and 15 of the ‘787 Patent are found in the Legacy gear. Eurocopter also claims that the changes made to the Legacy gear, resulting in the Production gear, are merely cosmetic, and that both gears are functionally equivalent. Thus, all claims at issue are also infringed in the case of the Production gear.

[28] Besides seeking the usual declaration of infringement and the issuance of a permanent injunction, Eurocopter also requests that Bell be ordered to remit or destroy any infringing gear, that Eurocopter be permitted by the Court to elect between payment of their damages or an accounting of the profits of Bell, and further seeks punitive damages in the amount of $25,000,000, with pre- and post-judgment interests and costs.

[29] In the case at bar, Bell’s defence to the allegations of infringement of the ‘787 Patent varies, depending on the landing gear at issue.

[30] With respect to the Production gear, while denying any functional equivalence, Bell submits that the changes made after the institution of this action (saddle joint and a small protruding ski in the front of the gear), suffice to dispose of the allegations of infringement of claims 1, 2, 3, 4, 5, 7, 9, 10 and 15 of the ‘787 Patent.

[31] With respect to the Legacy gear, while not challenging that the essential elements of claims 1, 2, 3, 4, 5, 7, 9, 10 and 15 of the ‘787 Patent are present, Bell still denies infringement: (1) Bell was practicing prior art and thus, relies on the Gillette defence; (2) Bell used the Legacy gear for the purposes of obtaining regulatory approval and thus can benefit from section 55.2 of the *Patent Act*, RSC 1985, c P-4, as amended (the Act).

[32] Bell also denies Eurocopter’s entitlement to equitable remedies and questions the Court’s jurisdiction to decide whether false or misleading representations have been made. Furthermore, Bell counter-attacks by claiming that the ‘787 Patent and claims 1 to 16 thereof are invalid on the basis of anticipation, obviousness, lack of utility or of sound prediction, insufficient specification and lack of best mode, and/or overbreadth.

[33] With respect to utility, Bell makes the following allegations:

(a) The promised utility of the claimed invention across all embodiments was not demonstrated by the inventor at the Canadian filing date;

(b) The inventor could not rely upon a sound prediction of the promised utility across all claimed embodiments;

(c) At the trial, according to the evidence, one or more embodiments included in the claims do not meet the promised utility.

[34] Bell also claims that disclosure is insufficient, namely that the best mode is not indicated: paragraphs 27(3)(b) and (c) of the Act. Moreover, Bell alleges that the claims at issue are overbroad in relation to the disclosed invention.

[35] In defence, Eurocopter relies on the presumption of validity of the issued patent and submits that Bell has not met its burden to prove the lack of utility of the disclosed invention or of one or more embodiments included in the claims. Moreover, Eurocopter submits that as of the Canadian filing date, the evidence clearly establishes that the promised utility has been met and that this is not a case where the inventors are relying on a sound prediction.

[36] Bell's argument that the Moustache landing gear was anticipated is based on two groups of documents: the NASA documents (JB-201 and JB-202) and the Obstacle strike documents (JB-204, JB-493 and JB-497). It is submitted by Bell that each set of documents discloses all of the elements of claim 1 of the '787 Patent, which is denied by Eurocopter who further questions the alleged public character of the NASA documents.

[37] Subsidiarily, Bell submits that there are no differences between the inventive concept of claims 1 and 15 of the '787 Patent in light of the Obstacle strike documents, the NASA documents, and other prior art, including the XV-1 (JB-541 page 8235) and the XV-3 (JB-208), as well as several patents and design patents (JB-539, JB-528, JB-529 and JB-532). While denying that same were part of the common general knowledge, Eurocopter sustains that the test for obviousness is not met.

[38] On October 2, 2009, a bifurcation order was rendered to cover the calculation of damages, including punitive damages, and/or profits, suffered by Eurocopter or made by Bell, as a result of the infringement of the ‘787 Patent.

IV. **LEGAL FRAMEWORK**

[39] Since there is no serious disagreement between the parties with respect to the applicable law in this case, it is more convenient to deal first with legal principles governing the issues of construction, infringement and validity.

[40] The Court’s first step before making any finding with respect to infringement or invalidity is to construe the claims of the patent at issue, so as to properly ascertain the invention and the scope of the monopoly thereby granted. The basic principles laid out by the Supreme Court of Canada in *Free World Trust v Électro Santé Inc*, [2000] 2 SCR 1024, 2000 SCC 66 (*Free World Trust*) and *Whirlpool Corp v Camco Inc*, [2000] 2 SCR 1067, 2000 SCC 67 (*Whirlpool*), constitute the starting point for any patent construction.

[41] Adherence to the language of the claims in turn promotes both fairness and predictability. The claim language must be read in an informed and purposive way. However, there is no recourse to such vague notions as the "spirit of the invention" to expand it further (*Free World*, above, at para 31).

[42] While extrinsic evidence as to the inventor’s intention is not admissible when construing patent claims (*Free World Trust*, above, at para 66), recourse to the specification of the patent is

permissible to assist in understanding the terms in the claims. However, this is unnecessary where the words of the claim are plain and unambiguous (*Procter & Gamble Co v Beecham Canada Ltd*, 61 CPR (2d) 1 at para 24, [1982] FCJ 10).

[43] The claims language will, on a purposive construction, show that some elements of the claimed invention are essential while others are non-essential. An unnecessary or troublesome limitation in the claims is a self-inflicted wound, and the claims cannot be broadened to remove said limitation (*Free World Trust*, above, at para 51). Nor can claims be read down so as to exclude a construction that would invalidate the patent (*ICN Pharmaceuticals Inc v Canada (Patented Medicine Prices Review Board)*, [1997] 1 FC 32 at 64, [1996] FCJ 1065).

[44] Once the claims of the patent have been construed, the Court's next task is to determine whether there has, in fact, been infringement of the patent. Very simply, there is infringement if all of the essential elements of a claim are present in the product, but there is no infringement if an essential element is different or omitted; there may still be infringement, however, if non-essential elements are substituted or omitted (*Free World Trust*, above, at paras 31 and 68). That said, a patent is not infringed merely because a defendant's product achieves the same result as the patented invention.

[45] The substitutability of non-essential elements derives from an informed interpretation of the language of the claims at the time of publication of the patent. Both the element specified in the claim and the variant not making use of this element must be presented to the POSITA. The patentee bears the burden to establish known and obvious substitutability (*Free World Trust*, above,

at para 55). If the patentee fails to discharge that onus, the descriptive word or expression in the claim is to be considered essential unless the context of the claims language otherwise dictates (*Free World Trust*, above, at para 57).

[46] The identification of elements as essential or non-essential is made on the basis of the common knowledge of the POSITA to which the patent relates and as of the date the patent is published (*Free World Trust*, above, at para 31). If the POSITA would have understood from the language of the claim that the patentee intended that strict compliance with the primary meaning was an essential requirement of the invention, then the variant is outside the claim (*Free World Trust*, above, at paras 31, 58-60).

[47] It is important to distinguish between "public knowledge" and "common general knowledge" which has a narrower meaning. A piece of public knowledge becomes common general knowledge when it is generally regarded as a good basis for further action by the bulk of those who are engaged in the particular art (*Eli Lilly & Co v Apotex Inc*, [2009] FCJ 1229 at para 97, 2009 FC 991, aff'd 2010 FCA 240 (*Eli Lilly & Co*), quoting from *General Tire & Rubber Co v Firestone Tyre & Rubber Co Ltd*, [1972] RPC 457 at 482 and 483 (CA)).

[48] In order to establish whether a piece of information is part of the common general knowledge, the first and most significant step is to verify the source of that information (*Eli Lilly & Co*, above, at para 100). With the existence of powerful search engines, the distinction between public knowledge and common general knowledge may seem less important in recent times; still,

documents that are only available internally may not constitute part of the common general knowledge.

[49] The second step in determining whether a piece of information is part of the common general knowledge is to determine what field this information comes from, and whether this field is relevant to the patent in question. It cannot be assumed that the unimaginative, non-inventive technician skilled in the art would consider art in other fields (*Almecon Industries Ltd v Nutron Manufacturing Ltd*, [1996] FCJ 240 at para 67 (TD) (QL), 108 FTR 161, aff'd (1997), 72 CPR (3d) 397, leave to appeal to SCC refused, [1997] SCCA 374). There must be some reason, supported by evidence, which would justify a person skilled in the art to look beyond the field at issue (*Laboratoires Servier v Apotex Inc*, 67 CPR (4th) 241 at para 236, 2008 FC 825, aff'd 75 CPR (4th) 443 (FCA), leave to appeal to the SCC denied (33357) (*Laboratoires Servier*)).

Gillette defence

[50] Raising a Gillette defence, Bell has alleged that it was practicing prior art in making the Legacy and/or the Production gears. Thus, the Gillette defence is the counterpart to Bell's counterclaim that the '787 Patent is invalid because it is anticipated.

[51] In essence, a patent cannot be infringed if what a defendant is doing has already been disclosed in the prior art: *Gillette Safety Razor Co v Anglo-American Trading Co* (1913), 30 RPC (2d) 465 (HL); *Pfizer Canada Inc v Apotex* (2005), 43 CPR (4th) 81 at paras 159-161, 2005 FC 1421; *Eli Lilly Canada Inc v Apotex Inc* (2009), 75 CPR (4th) 165 at paras 60-64, 2009 FC 320.

[52] Accordingly, whether the Gillette defence is a valid defence in this case will depend on the Court's analysis and conclusions with respect to anticipation, an issue which is thoroughly examined in the section dealing with anticipation.

Regulatory or experimental defence

[53] In the case at bar, Bell submits that none of the twenty-one Legacy gears made were actually sold to customers. Bell invokes subsection 55.2(1) of the Act, which reads as follows:

55.2 (1) It is not an infringement of a patent for any person to make, construct, use or sell the patented invention solely for uses reasonably related to the development and submission of information required under any law of Canada, a province or a country other than Canada that regulates the manufacture, construction, use or sale of any product.	55.2 (1) Il n'y a pas contrefaçon de brevet lorsque l'utilisation, la fabrication, la construction ou la vente d'une invention brevetée se justifie dans la seule mesure nécessaire à la préparation et à la production du dossier d'information qu'oblige à fournir une loi fédérale, provinciale ou étrangère réglementant la fabrication, la construction, l'utilisation ou la vente d'un produit.

[54] Subsection 55.2(1) of the Act invites the Court to determine whether the patented invention is made, constructed or used "solely for uses reasonably related to the development and subdivision of information required under any law". There exists a similar jurisprudential exception to infringement, which is that of experimentation; the idea is that producing a patented product is not infringement if it is done for the purposes of experimentation and testing: *Micro Chemicals Ltd v Smith Kline & French Inter-American Corp*, [1972] SCR 506 and *Merck & Co v Apotex Inc*, [2006] FCJ 671, 2006 FC 524 (*Merck*).

[55] While the Legacy gear was used during the certification process of the Bell 429, Eurocopter alleges that it was concurrently used to promote sales of the Bell 429. Thus, Eurocopter submits that the regulatory or experimental exception does not apply in this case.

Utility

[56] For an invention to be patentable, it must be useful (section 2 of the Act), among other statutory requirements. At its most basic, the overarching concept is that, as of the relevant date, there must have been a demonstration of the utility of the invention, or, failing that, a sound prediction of utility based on the information and science available at the time of the prediction. A simple spark of utility is sufficient. In the case at bar, the relevant date for the evaluation of the utility of the Moustache landing gear is the Canadian filing date, namely, June 5, 1997.

[57] At the same time, the patentee benefits from a presumption of validity (subsection 43(2) of the Act). Thus, while the patentee must establish utility or soundly predict the utility of all the embodiments claimed, a defendant alleging lack of utility of the invention and/or the invalidity of the patent on various grounds bears the burden of proof: *Laboratoires Servier*, above, at paras 268-269; *Eli Lilly & Co*, above, at para 583.

[58] In Canada, a low standard for utility has been established. It is sufficient that it be new, better, cheaper, or afford a choice; it can include an advantage or a disadvantage that is avoided (*Pfizer Canada Ltd v Canada (Minister of Health)* (2006), 52 CPR (4^{th}) 241 (FCA) at para 31, 2006 FCA 214). However, one must still ask, as the English Court of Appeal did in *Lane-Fox v Kensington* [1892], 9 RPC 413 at 417 “useful for what?”

[59] As stated by my colleague Justice Hughes, this is where the concept of "promise" of the patent comes into play: *Pfizer Canada Inc et al v Mylan Pharmaceuticals ULC et al*, [2011] FCJ 686 at para 211, 2011 FC 547 (*Mylan Pharmaceuticals ULC*). This is a question of law (*Eli Lilly Canada Inc v Novopharm Ltd* (2010), 85 CPR (4^{th}) 413 at para 80, 2010 FCA 197 (*Eli Lilly v Novopharm*). The Court is to look at the specification through the eyes of a POSITA, bearing in mind commercial realities and being neither benevolent nor harsh, in order to determine fairly the true intent (*Mylan Pharmaceuticals ULC*, above, at para 217).

[60] Ultimately, the question to be determined is whether the patentee had sufficient information upon which to base the promise, as of the date of filing (*Eli Lilly Canada v Novopharm*, above, at para 81). However, it must be noted that bare speculation, even if it turns out to be correct after the fact, is insufficient to justify a valid patent. This requirement is in keeping with the notion that the public is entitled to accurate and meaningful teaching in exchange for the monopoly created by the Act (*Apotex Inc v Wellcome Foundation Ltd*, 2002 SCC 77, [2002] 4 SCR 153 at paras 83 and 84, 219 DLR (4th) 660 (*Wellcome*).

[61] If the patent states that a useful result has in fact been achieved, then that statement is accepted for what it says, subject to challenge in litigation (*Pfizer v Novopharm Limited*, [2010] FCJ 1200 at paras 80, 82 and 87-88, 2010 FCA 242). Where the patent, however, provides certain information and then, on that basis, predicts a result, that prediction must be "sound" (*Mylan Pharmaceuticals ULC*, above, at paras 225-226).

[62] The test for sound prediction was set out by the Supreme Court in *Wellcome*, above, and it states as follows:

1. There must be a factual basis for the prediction;
2. The inventors must have at the date of the patent application in Canada an articulable and sound line of reasoning from which the desired result can be inferred from the factual basis; and
3. There must be proper disclosure.

[63] By its very nature, the doctrine of sound prediction presupposes that the patentee's work is not complete. Logically, therefore, the promise need not have been met at the date of filing, although it must ultimately be fulfilled (*Eli Lilly Canada v Novopharm*, above, at para 82).

[64] Even if the promised utility was demonstrated at the Canadian filing date or there was a sound prediction, a patent claim may still be held invalid if it is established at trial that the claim includes embodiments that do not meet the promised utility (*Monsanto Co v Canada (Commissioner of Patents)*, [1979] 2 SCR 1108 at 1122; *Lundbeck Canada Inc v Canada (Minister of Health)*, [2010] FCJ 1504 at para 106, 2010 FCA 320). This is accomplished either by showing that the invention will not work, or it will not do what the specification promises it will do (*Consolboard Inc v MacMillan Bloedel (Saskatchewan) Ltd* [1981] 1 SCR 504 at 525, (1981), 56 CPR (2d) 145 (*Consolboard*)).

[65] Finally, as noted by my colleague Justice Hughes in *Pfizer Canada Inc v Canada (Minister of Health)*, 2008 FC 500 at para 95, 326 FTR 88, 167 ACWS (3d) 984, who relied on an excerpt of

Professor Blanco White, the concept of utility may overlap with those of insufficiency and misleading representations under subsection 53(1) of the Act (also cited by my colleague Justice Gauthier in *Bauer Hockey Corp v Easton Sports Canada Inc*, [2010] FCJ 431 at para 288, 2010 FC 361; aff'd 2011 FCA 83 (*Bauer*)).

Sufficiency of disclosure, misrepresentations and overbreadth

[66] In addition to meeting the tests for patentability, an invention must also be sufficiently disclosed. The specification represents the bargain between the Crown on behalf of the public and the inventor (*Consolboard*, above, at 517). Accordingly, the patent must contain enough information to allow a POSITA to make the invention.

[67] The claims must be precisely laid out, without being overbroad. If the disclosure requirements are not met, the patent will be invalid even if it is new, useful and not obvious. These requirements for a patent specification are set out in subsections 27(3) and 27(4) of the Act. In the case of a machine, the specification must explain the principle of the machine and the best mode in which the inventor has contemplated the application of that principle (para 27(3)(c) of the Act).

[68] If the inventor omits information in order to retain an advantage, misleads the public, or does not communicate the full scope of his knowledge, the specification is insufficient. That said, in order to invalidate a patent pursuant to subsection 53(1) of the Act, an applicant must first establish that an allegation in the disclosure was untrue, and then, that such allegation was "material" and "wilfully made for the purpose of misleading" (*Wellcome*, above, at para 94; also cited in *Bauer*, above, at para 323).

[69] Invalidity of a patent for overbreadth is not mentioned specifically in the Act; it is merely a particular application of the arguments of utility or anticipation. Essentially, the claims are deemed to be overbroad when they include elements not disclosed by the inventor that are not useful or are already present in the prior art.

[70] In the case at bar, Bell claims that disclosure is insufficient and that the best mode is not indicated, and that the claims are otherwise overbroad on the ground of lack of demonstrated utility of some embodiments. Sufficient disclosure is evaluated in function of the date of publication of the patent, namely December 10, 1997. The best mode is evaluated in function of the priority date, namely June 10, 1996. That said, there are no allegation by Bell that the ‘787 Patent is void on the basis of misrepresentations (subsection 53(1) of the Act).

Anticipation and obviousness

[71] Although anticipation and obviousness are both related to the content of the prior art, these are two distinct concepts:

> … obviousness is an attack on a patent based on its lack of inventiveness. The attacker says, in effect, “Any fool could have done that.” Anticipation, or lack of novelty, on the other hand, in effect assumes that there has been an invention but asserts that it has been disclosed to the public prior to the application for the patent. The charge is: “Your invention, though clever, was already known” (*Beloit Canada Ltd v Valmet Oy* (1986), 8 CPR (3d) 289 at 293, [1986] FCJ 87 (FCA) (*Beloit*)).

[72] A subject matter may only be patented if it is new (section 2 of the Act). In this regard, subsection 28.2(1) of the Act sets out the relevant date for consideration of prior art known to the public, in this case June 10, 1996.

[73] Disclosure must have occurred in one single patent or other publication: "[o]ne must, in effect, be able to look at a prior, single publication and find in it all the information which, for practical purposes, is needed to produce the claimed invention without the exercise of any inventive skill" (*Beloit*, above, at 297).

[74] The anticipation test, as refined by the Supreme Court of Canada in *Apotex Inc v Sanofi-Synthelabo Canada Inc*, [2008] 3 SCR 265, 2008 SCC 61 (*Sanofi-Synthelabo*), is a two-step process. The single prior publication must both disclose and enable the subject matter in question:

(1) Disclosure – The prior publication must "disclose subject matter which, if performed, would necessarily result in infringement of that patent… At this stage, there is no room for trial and error or experimentation by the skilled person."

(2) Enablement – If the first step of disclosure is met, the second requirement to prove anticipation is enablement. At this stage, a certain amount of trial and error may be carried out.

[75] As outlined above, in its inquiry, the Court must first focus on whether or not the matter performed in the prior art would necessarily constitute infringement. Such inquiry is thus necessarily directed at the invention as claimed, and only to the essential elements of the claim, properly construed (*Ratiopharm Inc v Pfizer Ltd* (2009), 76 CPR (4^{th}) 241 at para 157, 2009 FC 711). Moreover, prior art need not disclose the advantages of the patented invention (*Eli Lilly & Co*, above, at paras 396-398).

[76] Enablement is necessary, which calls for the treatment of prior art references that were never put into practice (so called “paper patents” or “paper anticipations”). In 1990, the Federal Court of Appeal stated “[p]roof of anticipation based on documents considered to be “paper patents”… will not have the same weight as evidence based on patents whose concepts have been put into use.” (*Créations 2000 Inc v Canper Industrial Products Ltd* (1990), 34 CPR (3d) 178 at 181, [1990] FCJ 1029 (FCA)). However, in *Sanofi-Synthelabo*, above, the Supreme Court did not differentiate between patents put into use and paper patents. Thus, if both the disclosure and enablement requirements are met in the case of a paper patent, there is no reason in law not to invalidate the patent at issue on the basis of anticipation.

[77] The criterion of non-obviousness is set out at section 28.3 of the Act and the relevant date for obviousness in this case is the priority date (as per subsection 28.1(1) of the Act), namely, June 10, 1996.

[78] In assessing whether a patent claim is obvious or not, the Court must apply the four-step test set out by the Supreme Court in *Sanofi-Synthelabo*, above, at para 67:

(1) (a) Identify the notional “person skilled in the art”;

(b) Identify the relevant common general knowledge of that person;

(2) Identify the inventive concept of the claim in question or if that cannot readily be done, construe it;

(3) Identify what, if any, differences exist between the matter cited as forming part of the “state of the art” and the inventive concept of the claim or the claim as construed;

(4) Viewed without any knowledge of the alleged invention as claimed, do those differences constitute steps which would have been obvious to the person skilled in the art or do they require any degree of invention?

[79] The obviousness inquiry is directed to the inventive concept which is to be ascertained by reference to the claims, rather than the specification: *Sanofi-Aventis Canada Inc v Apotex Inc* (2009), 77 CPR (4th) 99 at para 267, 2009 FC 676; *Laboratoires Servier v Apotex Inc*. (2009), 75 CPR (4th) 443 at para 57, 2009 FCA 222, aff'g 2008 FC 825, leave to appeal to the SCC denied (33357).

[80] In determining whether a claim is obvious, the Court is entitled to "look at all the patents and other publications that a skilled technician would discover in a 'reasonable and diligent search' to determine whether the resulting 'mosaic' leads directly to the invention" (*Pfizer Canada Inc v Apotex Inc* (2007), 61 CPR (4th) 305 at para 108, 2007 FC 971). However, one must be wary of reaching a conclusion of obviousness from a mosaic of documents, as obviousness is one of the trickier concepts to grasp.

V. FACTUAL AND EXPERT EVIDENCE

[81] In this section, the Court will provide an overview of the testimonies of fact witnesses, including an assessment of their credibility. This will be followed by an assessment of the qualifications of the parties' experts and a review of their evidence on a number of key points.

Factual evidence

[82] As is customary in patent litigation, witnesses were called to set the proper factual background and explain documentary evidence included in the Joint Book (JB). Three fact witnesses were heard on behalf of Eurocopter: Mr. Pierre Prud'homme Lacroix, Mr. Bernard

Certain and Mr. Jean-Pascal Méo. Bell called five fact witnesses: Mr. Guy Lambert, Mr. Robert Gardner, Mr. Walter Faessler, Mr. Pierre Rioux and Mr. Barry Kohler.

[83] Most of the witnesses above are still employed by either party. Some answers they gave at trial are argumentative and naturally tend to accord with positions taken by their employer. It turns out to be a question of proper weight to be given to those portions of their testimonies, in relation to the totality of the evidence. Having reviewed their testimonies, including the read-ins (P-22, P-35, D-5, D-19 and D-20), the Court finds the fact witnesses to be generally credible. There are a few implausibilities and/or a lack of corroborative documentary evidence on some disputed issues.

[84] Mr. Certain and Mr. Prud'homme Lacroix provided the bulk of Eurocopter's evidence with respect to and the development of the Moustache landing gear (the disclosed invention) including the calculations and tests performed on various landing gears for the EC120 and EC130. Mr. Prud'homme Lacroix is one of the three named inventors in the '787 Patent and has worked at Eurocopter, or one of its predecessors, since 1982. Mr. Certain has worked as a flight test engineer with Eurocopter and its predecessors since the 1970s. The two witnesses provided a clear picture of the technical problems encountered and the practical solutions considered or chosen during the period preceding the filing of the French patent application in 1996. Their evidence corroborates the fact that the development of a helicopter landing gear is a highly complex design and engineering exercise that necessitates concerted team efforts.

[85] In 2010, calculations were made by Mr. Prud'homme Lacroix (JB-153, JB-155 and P-15) with the purported intention of providing a practical illustration of points made by Dr. Wood in his

first and third expert reports (P-40 and P-68). Bell objected to Mr. Prud'homme Lacroix testifying regarding same and the objection was taken under reserve; the witness was thoroughly cross-examined at trial on same. The proper weight to be given to this relevant evidence is a matter left to the Court.

[86] Exhibits JB-153, JB-155 and P-15 are based on Eurocopter technical data and calculations used by Dr. Wood in his reports (exhibits 6, 13 and 33). To the extent that Mr. Prud'homme Lacroix does not provide an opinion, his testimony is admissible to prove the confection and content of a document used by Dr. Wood. For example, exhibit JB-153, entitled "simplified spring-mass approach", provides a practical illustration in Dr. Wood's first report of August 31, 2010 of how Eurocopter could ensure in 1997 that the regressive in-plane mode frequency and the rigid body natural frequencies of the rotorcraft on its landing gear were kept separated.

[87] The third fact witness called by Eurocopter was Mr. Méo who joined Eurocopter in 1994; he is now the head of the "Corporate" department in Direction juridique, which is responsible for the present litigation. Mr. Méo provided an overlook on Eurocopter's patent portfolio, the role of their intellectual property section and steps that had been taken in France and elsewhere with respect to the prosecution of the matter.

[88] Mr. Méo's testimony is relevant to the extent that Bell has questioned the length of time and the absence of a default letter prior to the institution of this action in May 2008. Eurocopter submits that the explanations provided by Mr. Méo are entirely reasonable and that it should not be deprived of any equitable remedy.

[89] Eurocopter had reserved its right to call a factual witness for counter-proof, and it had earlier announced at the pre-trial conference and the beginning of the trial that this witness might be Mr. Prud'homme Lacroix. When the latter was recalled, Bell objected, and Mr. Prud'homme Lacroix testified under reserve. Having now dismissed Bell's objection, Mr. Prud'homme Lacroix's additional testimony on his calculations on the documents he made that were commented on during the trial by Bell's experts is found relevant insomuch as it helps the Court to determine whether Bell's experts' presumptions of fact or critiques of these calculations or documents are founded or not. Otherwise, Mr. Prud'homme Lacroix's additional evidence has been given no weight.

[90] Mr. Lambert and Mr. Gardner provided the bulk of Bell's evidence with respect to the Bell 429 program, the features and characteristics of the Bell 429, and Bell's reasons to adopt the Legacy and Production gears (the gears at issue). Mr. Lambert is currently with Bombardier Aerospace. He worked for Bell from 1984-2009 and was Chief Engineer for the Bell 429 from 2004 until the time it was certified in 2009. Around the same period, Mr. Gardner was Structures Lead Analyst for the Bell 429.

[91] Mr. Faessler and Mr. Rioux, who are employed by Bell and acted as Transport Canada delegates for structures certification (as it relates to vibration and stability as the case may be), focused on regulatory aspects and representations made by Bell, the testing of the gears at issue and use of finite element analysis (LS-DYNA) in addition or in lieu of actual drop tests in the process leading to the certification of the Bell 429.

[92] Mr. Rioux notably explained that the Bell 429 employs several of the same methods of dealing with ground resonance as prior Bell helicopters: lead-lag dampers and a pivoted aft cross piece, and that the Bell 429, with its pivoted aft cross piece, has a roll mode frequency similar to other Bell multi-bladed helicopters with a pivoted rocker beam. He also testified that Bell simulates failure of the pivoted aft cross piece by blocking half of the roll movement allowed by the pivot. The tests and simulations yielded very similar frequencies for the Legacy and the Production gears, whether the pivot was blocked or not.

[93] During discovery, Bell resisted questions and communication of the documents provided to Transport Canada and the internal documents related to the development and tests carried out on the Landing and the Production gears, on the basis that they were not relevant. In setting aside the Prothonotary's decision maintaining the objection, the Judge found that [TRANSLATION] "the test information and the correspondence between Bell and Transport Canada are relevant…to show that the new landing gear of the Bell 429 [the Production gear] 'would perform substantially the same function in substantially the same way to obtain substantially the same result' as that described by Patent '787". In this regard, according to the Judge, [TRANSLATION] "although it is necessary to establish the similarity would have been obvious on the date of the publication of the patent, the fact remains that the applicant must, before reaching that step, establish that this similarity does exist" ([2009] ACF 1408 at para 10, 2009 FC 1141).

[94] In confirming the decision of the Judge, the Federal Court of Appeal reiterated that [TRANSLATION] "the questions and documents would directly or indirectly enable [Eurocopter] to advance its own case or to damage the case of [Bell]". That said, the Federal Court of Appeal

specified that [TRANSLATION] “where all the exhibits, witnesses and relevant documents will have been considered and taken into account, it will be up to the trial Judge to establish the degree of relevance that should be applied to the documents that are the subject of this decision” ([2010] FCJ 740 at para 33, 2010 FCA 142).

[95] At some point, the nature of Mr. Rioux’s questioning at trial came closely to seeking expert opinion. The Court gives little weight to any suggestion made by Mr. Rioux or another fact witness heard at trial that it is the presence of the aft pivot on both the Legacy gear and the Production gear that would be primarily responsible for the roll mode characteristics of these gears (not an alleged similarity in geometry with the Moustache landing gear).

[96] The Court has now considered the voluminous documentation related to the certification and testing of the gears at issue, which is included in the Joint Book and has been produced at the hearing, taking into account the totality of the evidence on record and the arguments advanced by the parties. Most documents and questions are directly or indirectly relevant to the debated issue of infringement. Much of this documentation has been thoroughly examined and commented on by various experts heard at the trial. Their differing opinions are treated elsewhere.

[97] To conclude, the documentation related to the certification and testing of the gears at issue is helpful to some extent in determining whether, at the date of the publication of the ‘787 Patent, the POSITA would have understood that the variant subsequently introduced by Bell would perform substantially the same function in substantially the same way to obtain substantially the same result.

However, any final answer to such a debated issue can only come once the Court has construed the '787 Patent.

[98] Eurocopter has also objected to the production of exhibit D-17, a document introduced by Mr. Rioux and which purportedly summarizes the frequencies of Bell's helicopters. Bell withdrew exhibit D-17. Consequently, Mr. Rioux's testimony regarding D-17 and the frequencies of Bell's helicopters has not been given any weight by the Court despite the fact that those parts of Mr. Rioux's testimony have not been formally struck from the record.

[99] Mr. Kohler was not personally involved in the Bell 429 program; he is currently president of Bell. He provided general information related to the history of Bell, its product line, delays incurred in the production of the Bell 429 and marketing efforts to promote its sale during the years preceding its certification in 2009.

[100] That said, a great portion of Mr. Kohler's testimony and related documentary evidence is particularly relevant to the issue of remedies. For example, the parties' positions in the market and the number of orders made and sales of the Bell 429 (with or without the Legacy and Production gears) are matters closely related to the damages or profits issue. All related economical aspects are better addressed at the second stage of the proceeding, if necessary.

Expert evidence

[101] The Court has considered the written reports and testimonies at trial of six qualified experts: Mr. Andrew Logan, Dr. Edward Roberts Wood and Dr. François Malburet testified on behalf of

Eurocopter, while Dr. Dewey Hodges, Dr. Farhan Gandhi and Mr. Thomas J. Toner were called on behalf of Bell.

[102] Mr. Logan is an expert in helicopter design and certification. Besides already holding a Bachelor of Science in Mechanical Engineering (1964), he obtained a Master in Aerospace Engineering in 1966. He also has over 40 years of experience in the helicopter industry, including leading teams responsible for the design and the development of helicopter landing gear. He was successively employed by Hughes Helicopter, McDonnell Douglas, Boeing and MD Helicopters. He has been a member of the Patent Committee at both Hughes Helicopter and McDonnell Helicopter. He is notably the co-inventor of a number of patents in the field, including a U.S. patent relating to a skid-type landing gear. Mr. Logan provided three reports (P-36, P-67 and P-87).

[103] Dr. Wood is an expert in aeromechanics, dynamics and ground resonance with experience in the design and development of helicopters, and in testing helicopters for ground resonance. Dr. Wood's expertise relates to dynamics issues for rotorcraft. Besides already holding a Bachelor of Science in Civil Engineering (1951) and a Master in Engineering Mechanics (1955), he obtained a PhD in Engineering in 1967. He has worked for almost 50 years in the helicopter industry in various capacities (Sikorsky Aircraft, Lockhead California Company and at Hughes Helicopters/McDonnell Douglas-Boeing Helicopters). He is a professor in the Department of Mechanical and Aerospace Engineering, at the Naval Postgraduate School in Monterey, California. Dr. Wood provided three expert reports (P-40, P-68 and P-89).

[104] Dr. Malburet is an expert in acoustic, vibratory mechanic and mecatronic related to helicopters, with experience in ground resonance. Besides already holding a Bachelor of Science in Mechanical Engineering (1990) and a Master in Acoustic vibrations and dynamics (DEA) (1991), he obtained a PhD in Mechanical Engineering in 1997. Dr. Malburet's expertise notably relates to dynamics related to helicopters, drones and motorized ultralights. He is a professor-researcher at an engineering school, Arts & Métiers Paris Tech., in Aix-en-Provence, France. He is the only French speaking expert heard by the Court. He produced one report (P-81).

[105] Dr. Hodges is an expert in helicopter dynamics, including aeromechanical stability, structural dynamics, aeroelasticity and structural mechanics, including finite element methods. Besides already holding a Bachelor of Science in Aerospace Engineering (1969) and a Master in Aeronautical and Astronautical Engineering (1970), he obtained a PhD in Aeronautics and Astronautics in 1973. He has over 40 years of experience in rotorcraft dynamics, 16 of which were with a U.S. Army Laboratory and 24 of which were as a full time Professor. Most of his research was focused on modeling or rotorcraft for the purpose of determining their stability. He is currently a Professor in the School of Aerospace Engineering at the Georgia Institute of Technology. He presented two reports (D-31 and D-32).

[106] Dr. Gandhi is an expert in dynamics, aeroelasticity and aeromechanical stability of rotorcraft (helicopters). Besides already holding a Bachelor of Science in Aeronautical Engineering (1989) and a Master in Aerospace Engineering (1992), he obtained his PhD in Aerospace Engineering in 1995. His thesis was on the modeling of nonlinear elastomeric dampers and effects on bearingless rotor aerolasticity. He became an Associate Professor in 2001 and a full Professor in 2006. He is

currently a Professor of Aerospace Engineering at Pennsylvania State University (Penn State). He is also Deputy Director of Penn State's Vertical Lift Research Center of Excellence. Dr. Gandhi presented two reports (D-44 and D-45).

[107] Mr. Toner is an expert in helicopter design, development and certification, with experience in rotor systems, aircraft structure and landing gear. Besides already holding a Bachelor of Science in Mechanical Engineering (1979), he obtained a Master in Engineering and Management in 1999. He worked for Sikorsky Aircraft Corporation for over 20 years (1980-2001). He has held various functions from designer to manager and has a broad understanding of the overall design configuration of helicopters (notably the RAH-66 Comanche and the S-92 program at Sikorsky). He has not been in the helicopter industry for the last ten years (2001-2011). He presented two reports (D-54 and D-74).

[108] Unless otherwise indicated in these reasons, the Court has generally found the expert evidence admissible and relevant. Unless specifically noted elsewhere, there were no serious discrepancies between the experts' written reports and their testimonies at trial. The Court finds that it has no reason to discard the written reports or wholly ignore the oral testimonies of any of the six experts heard at trial; the challenge is to decide which opinion to favour in case of disagreement.

[109] On the issue of infringement, the Court has considered the opinions of Eurocopter's experts, Mr. Logan and Dr. Wood, in light of the diverging opinions of Bell's experts, Dr. Hodges, Dr. Gandhi and Mr. Toner, as the case may be. Mr. Logan and Dr. Hodges provided the most comprehensive analysis of patent construction to support their respective conclusions on the issue of

infringement. While not negligible, the involvement of the other experts is peripheral and more result oriented in the Court's opinion.

[110] Besides the issue of claim construction, Mr. Logan and Dr. Hodges' opinions on infringement differ with respect to whether it would have been obvious to a POSITA in 1997 that the variants would have no effect on the way the gear works. Expressed in a very simplistic manner, the differing opinions stem from conflict of perspective. Mr. Logan (who pairs with Dr. Wood) looks at the issue from the point of view of the overall dynamic response of the gear, while Dr. Hodges (who pairs with Dr. Gandhi) looks at it from the point of view of the local stress response of the gear.

[111] Having defined the POSITA and construed the '787 Patent, Mr. Logan concludes in his first report (P-36), that the Moustache landing gear constitutes a novel and major advancement in the art of helicopter landing gear design. In his opinion, the Legacy gear draws on and replicates in every aspect all of the essential elements of the alleged infringed claims, notably independent claim 1 of the '787 Patent. The changes made by Bell after the present lawsuit and which have resulted in the Production gear are purely cosmetic; it also draws on and replicates what is disclosed and claimed in the '787 Patent. Accordingly, the Production gear also infringes the alleged infringed claims.

[112] According to Dr. Wood, if the mode shape is the same for tests on the Bell 429 with the Legacy gear and the Production gear, then the two gears are "equivalent". This conclusion is somewhat disputed by Dr. Hodges and Dr. Gandhi, two of Bell's experts, who examine equivalency

not from the general dynamic response (frequencies) of the compared gears, but from their structural response to load factors (stress) at the local level (i.e. front cross piece).

[113] In his first report (P-40), Dr. Wood provides corroboration to Mr. Logan's assertion that the Production gear is dynamically equivalent to the Legacy gear. He notably determines what would have been the analysis and calculations that the POSITA would have carried out in 1997 to verify the effect of the modifications found in the Production gear as compared to a helicopter landing gear as disclosed and claimed in the '787 Patent.

[114] Dr. Wood concludes that the substitution of a bend by a saddle does not change the way in which the landing gear operates. In doing so, he notably discusses the relevance and application of the Saint-Venant principle, of finite element programs used by Eurocopter and Bell, and of various tests performed by Bell on the gears at issue with respect to ground resonance requirements in the process leading to the certification of the Bell 429 helicopter and landing gear.

[115] In his report in rebuttal (D-32), Dr. Hodges sets out his own interpretation of the claims and the essential elements. Besides advancing that all of the elements of the Production gear were known in the art in 1997, Dr. Hodges questions Mr. Logan's assertion that some elements mentioned in claim 1 are not essential, notably the double curvature of the inclined transition zone of the front cross piece. While it is true that a person in the art would understand that a curve can have a small radius of curvature, he would also understand that two straight sections coming together at an angle and manufactured with fillets to avoid stress concentration does not constitute a curved junction in the commonly understood sense of the term.

[116] Dr. Hodges also denies that there is functional equivalence between the landing gear of claim 1 of the ‘787 Patent and the Production gear both from a structural standpoint and a dynamic response. Just because both landing gear systems “work”, meaning they absorb energy and do not have ground resonance problems, does not mean that the mechanisms in both systems are the same. For example, the Production gear has an aft pivot about which the body is free to rotate in the roll direction, which greatly contributes to solving any ground resonance problems, in Dr. Hodges’s opinion.

[117] In his report in rebuttal (D-45), Dr. Gandhi responds to Mr. Logan on issues of state of the art, construction and infringement, comments on the analysis contained in Dr. Wood’s report and provides his own finite element analysis results. Dr. Gandhi notably criticizes Mr. Prud’homme Lacroix’s finite element analysis used in Dr. Wood’s report on the basis that the saddle on the front of the landing gear would not have been properly taken into account.

[118] In his report in rebuttal (D-54), Mr. Toner also responds to Mr. Logan and Dr. Wood on issues of state of the art, construction and certification. Essentially, he concludes that a POSITA would not be able to conclude that the differences between the patented landing gear design and Bell’s Production landing gear would have no material effect on the way the invention works.

[119] In his report in reply (P-67), Mr. Logan expands on aspects already touched on in his first report (P-36). Criticizing the approach taken by Bell’s experts, he reiterates that the Production gear is dynamically equivalent to the Legacy gear and that stress distribution is not relevant.

[120] In his report in reply (P-68), Dr. Wood concludes that Bell's experts did not provide satisfactory evidence that the Production gear does not work the same way as the Legacy gear. He reiterates that the POSITA would find the replacement of the lower curve in the Legacy gear by a saddle in the Production gear wholly obvious. Stress distribution (or strain energy density) and pitch frequency are irrelevant for the purpose of the invention. The shape of the landing gear and the fact that it can work both in flexion and tension (as disclosed in the '787 Patent), are responsible for the ground resonance properties of the Bell 429.

[121] In his rebuttal report (P-81), Dr. Malburet does not directly address the issue of infringement. That said, at trial, he was notably called to address the meaning of certain words or expressions used in the '787 Patent, which were said to have created confusion because they had been wrongly translated into English by ALL LANGUAGES LTD. Despite objections raised by Bell's counsel, the Court has decided to consider this part of his testimony for the purpose of construing claim 1 of the '787 Patent.

[122] Turning now to the issue of the validity of the '787 Patent, in their first reports (D-31 and D-44), Dr. Hodges and Dr. Gandhi both provide a definition of the POSITA, discuss the common general knowledge of the POSITA in 1996 and 1997, explain a number of technical terms, speak of the promised utility and sound prediction (sufficiency of the specification and best mode) of the '787 Patent in light of the disclosure and the contemporaneous documentation, and give their understanding of the NASA documents (JB-201 and JB-202) and Obstacle strike documents (JB-204, JB-493 and JB-497).

[123] With respect to utility, Dr. Hodges examines the detailed stress calculations for the geometry of the Moustache landing gear that ended up being the certified version of the gear featured on the EC120 (the high gear). It is not seriously disputed that the POSITA needs to take the weight of the rotorcraft into account when selecting the number of points of attachment of the Moustache landing gear. However, there are no documents dated from 1997 or before that examined four or more points of attachments. Remember that claim 1 of the '787 Patent does not specify the number of attachments and would be understood to include three or more points of attachments (claim 11 is specific to four attachments).

[124] In his critique on utility, Dr. Hodges also referred to a Eurocopter internal memo dated March 22, 1999 (JB-142, page 2387) from Mr. Prud'homme Lacroix (as translated to Dr. Hodges by Bell's counsel). This evidence would suggest to a POSITA that the stability domain of the Moustache landing gear on the EC130 is limited by the second roll mode, which comes dangerously close to the nominal rotor frequency when the weight of the rotorcraft is increased.

[125] Dr. Hodges further notes that there are no documents dated from 1997 or before that provide any results from ground resonance calculations or tests for the Moustache landing gear in any configuration, which is "very surprising" given the promise of the '787 Patent. It is not challenged by Eurocopter that ground resonance calculations and testing to determine natural frequencies and damping on various landing gear configurations during the EC120 program (which led to the filing of the '787 Patent application) were actually carried out by Ms. Véronique Cardin, a dynamicist who worked at Eurocopter in the department dealing with vibrations.

[126] The experts noted that Ms. Cardin authored a number of documents. These documents were formally introduced into evidence in this trial through Mr. Prud'homme Lacroix. This includes her calculations for the PT1 gear in 1992 and 1993 (JB-108 and JB-112), and for the Moustache landing gear in 1999 (JB-142 to JB-144), and finally, a published article she presented in May 2000 at the American Helicopter Society and entitled "Practical examples of new technology in dynamics as applied to Eurocopter products" (JB-25) (the Cardin article).

[127] Commenting on the Cardin article (JB-25) published in 2000, Dr. Hodges is critical of some statements made by Ms. Cardin with respect to ground resonance stability. In order for him to be satisfied that the Moustache landing gear eliminates ground resonance (while avoiding the need for any mechanical anti-ground resonance systems), Ms. Cardin would have had to provide numerical values for all the pertinent parameters for ground resonance analysis along with results obtained including modal frequencies and modal damping.

[128] Having now considered the totality of the evidence (including the rebuttal evidence of Eurocopter's experts mentioned below), the critiques made by Dr. Hodges against the Cardin article are unfounded. In the Court's opinion, Dr. Wood has provided the most logic and persuasive expressions of understanding of a POSITA. For instance, the reproach made by Dr. Hodges with respect to the inversion by Ms. Cardin of a factor in the well-known Coleman criteria in her article (JB-25 at page 304) is simply a clerical mistake that does not affect the rest of her reasoning, as explained at trial by Dr. Wood.

[129] The Court has considered the weight that should be given to the Cardin article in light of the fact that the actual calculations and technical parameters used by Ms. Cardin are not disclosed. Ms. Cardin is still employed by Eurocopter (although not in the dynamics group). She did not testify at trial. Mr. Prud'homme Lacroix explained that there were two binders of Ms. Cardin's work at Eurocopter, but they could find only one. It is worth mentioning that her calculations for the Moustache landing gear in 1996, 1997 and 1998 could not be found. Ms. Cardin would have been the best witness to explain the calculations and factual basis for the 2000 article, and to provide firsthand evidence on the missing results of her studies on the Moustache landing gear in terms of frequency control and ground resonance.

[130] In his first report on validity (D-44), Dr. Gandhi simply echoes that the low number of calculations performed prior to June 5, 1997 and that the lack of comparative calculations on a reference conventional landing gear does not allow him to conclude that the promised utility of the Moustache landing gear has been demonstrated notably with respect to ground resonance stability.

[131] Some of the views expressed by Dr. Gandhi contrast with earlier comments he made in 2001 (with Eric Hathaway) in an article entitled "Concurrently Optimized Aerolastic Couplings and Rotor Stiffness for Alleviation of Helicopter Aeromechanical Instability", (2001) 38 Journal of Aircraft 69, particularly at pages 77, 78 and 80, footnote 19 (P-70).

[132] Regarding the different means to avoid ground resonance and improve stability, the Court notes that in the 2001 article above, Dr. Gandhi opined that "it is possible…to design a landing gear that retains a larger amount of vertical stiffness to support the weight of the helicopter, while at the

same time allowing enough flexibility in roll to help alleviate ground resonance". In support of this statement, reference is explicitly made by to the Cardin article published in 2000 (JB-25).

[133] After having weighed Dr. Gandhi's evidence with the evidence of the other experts who testified at this trial, the Court has accepted that frequency placement, which was the solution chosen by Eurocopter in the case of the landing gears used on the EC120 and EC130, constitutes another alternative to the use of damping devices.

[134] That said, both Dr. Hodges and Dr. Gandhi who have also opined on anticipation and obviousness, conclude in their reports on validity (D-31 and D-44) that the NASA documents (JB-201 and JB-202) and the Obstacle strike documents (JB-204, JB-493 and JB-497) disclose and enable the subject matter of the claimed invention, or that same is otherwise obvious at the relevant date.

[135] In his report in response (P-87), Mr. Logan notes that many of the references cited by Bell's experts as prior art were not publicly available or pertain to an unrelated technical field. In any event, he concludes that the '787 Patent is not anticipated and/or obvious. That said, he does not address the issues of utility, sound prediction, insufficient specification or best mode also raised by Bell.

[136] With respect to the validity issue, in his report in rebuttal (P-89), Dr. Wood focuses on the comments made by Bell's experts concerning the lack of utility, sufficiency of disclosure and best mode of the invention described and claimed in the '787 Patent. He notes that the utility of the '787

Patent could simply be to provide a working landing gear and concludes that its utility had been demonstrated before June 5, 1997. Dr. Wood also notes that the issues raised by Bell's experts relate to the landing gear sizing and not utility and that the POSITA would know how to determine the best landing gear configuration from a given helicopter. Dr. Wood's opinion on promised utility has been seriously challenged at trial by the other experts.

[137] Dr. Malburet produced one report in rebuttal (P-81) on questions of anticipation, utility and sufficiency. It is apparent that Dr. Malburet did not consider Eurocopter documentation related to the development, calculations and testing of the Moustache landing gear, nor did he consider Bell documentation related to the certification of the Legacy and/or the Production gear. Accordingly, the Court did not allow questioning of Dr. Malburet on such documents. For the same reason, the Court did not give any weight to the criticism of Bell's experts' reports regarding the utility issue.

[138] That said, the Court finds no reason to discard or ignore Dr. Malburet's opinion and conclusions with respect to the sufficiency of the disclosure (including best mode) in the '787 Patent, and the issues of anticipation or obviousness, taking into account the rest of the evidence, including the concurring or differing opinions of the other experts on the subject.

[139] The fact that one of the named inventors, Mr. Prud'homme Lacroix, participated in some meetings arranged by Eurocopter's counsel with the experts is not sufficient to cast a doubt on the independence of Mr. Logan and Dr. Wood. Whether or not Mr. Prud'homme Lacroix has acted as some kind of a "shadow expert" in these proceedings is not material either. The latter has not testified as a qualified expert and all three of Eurocopter's qualified experts, Mr. Logan, Dr. Wood

and Dr. Malburet, were duly cross-examined at trial by opposing counsel on their opinions, and, as the case may be, any input from Mr. Prud'homme Lacroix.

[140] It is only normal for counsel to instruct their experts on legal notions (i.e. POSITA, essential element of a claim, anticipation, or obviousness, etc.). In this case, some parts of the experts reports (whether Eurocopter or Bell) are structured like memorandums but this is not enough to disqualify these experts. The fact that some prior art was searched for by counsel or a Bell employee, does not bar Dr. Hodges, Dr. Gandhi and Mr. Toner, from providing their opinion on same.

[141] In the final analysis, it is the exclusive role of the Court to construe the patent at issue and interpret prior art. Perhaps only one or two experts heard at this trial combine in their person all the specialized knowledge and practical experience expected of a POSITA. That said, the Court has been attentive and thoroughly reviewed all of the expert reports produced at trial, taking into account the particular field of engineering in which each expert was duly qualified at the hearing, the logic of their reasoning, the persuasiveness of the examples and explanations provided during examination and cross-examination, the existence of corroborative evidence and all other relevant factors submitted by counsel, notably the fact that an expert would be advocating a point of view which all other experts dismiss.

[142] That said, the Court has also taken into account that at times, expert witnesses on both sides were argumentative or evasive at the hearing, which may affect the weight given to their testimony. For example, it took the intervention of the Court for Mr. Logan to answer whether "at the front" was essential in claim 1 of the '787 Patent. On the other hand, Dr. Hodges's insistence on

maintaining that the term “integrated” means “continuous” shows a form of advocating and appears to be result driven. While Mr. Toner worked for Sikorsky Aircraft Corporation for over 20 years, his lack of continued involvement in the helicopter industry for the last 10 years poses a problem. Some comments volunteered at the hearing (such as “this is bad design”) are also subject to caution.

[143] During oral arguments, grounds of attack of Bell’s counsel towards Dr. Wood became more personal. Dr. Wood is not a young man. Evidently, he moves slowly and sometimes he appears to be hard of hearing. That said, the Court has found his testimony generally reliable and coherent; age does not appear to have affected his mental capacities. Errors were present in some of the data used by the witness in his first report but, overall, Dr. Wood’s testimony was not “confused, full of errors and contradictory” as asserted by Bell’s counsel. On the stand, Dr. Wood was prompt to correct any error made, provide rational explanations and illustrate his reasoning by numerous examples.

[144] Moreover, there was nothing objectionable about Dr. Wood using calculations prepared by Mr. Prud’homme Lacroix, with the risk naturally that this could undermine the weight to be given by the Court to his expert opinion (if it was demonstrated that Mr. Prud’homme Lacroix’s calculations were erroneous).

[145] For example, exhibit JB-155, entitled “Analysis of various landing configurations” is a comparative analysis prepared by Mr. Prud’homme Lacroix and approved by Dr. Wood, which provides a practical illustration in Dr. Wood’s first report of the finite element methodology used by a POSITA to calculate various landing gears configurations. It could have been performed in December 1997 by a POSITA. The model uses EC120 data as a guideline and compares other

forms of landing gear. Dr. Wood could have carried out the calculations himself or recruited someone to do so. The reliability of the information used by Dr. Wood was tested during the cross-examinations.

[146] One point of contention during the trial was the interpretation a POSITA would give to the results of tests performed by Bell on the alleged infringing gears during the certification process (2006-2009). Experts on both sides were provided with ample occasion to specify whether frequency placement derived from the special pivot fitting developed by Bell for the aft attachment (in lieu of a rocker beam), rather than from the sleigh shape of the gear or the inclination of the front cross piece.

[147] To some extent, litigious aspects of Dr. Hodges and Dr. Gandhi's testimonies are subject to the cautionary remark that they have no practical experience in the design of helicopter landing gears or ground resonance. Although their research or interests may involve aeromechanical stability, which includes issues of air and ground resonance, the evidence on record shows how important it is, from a POSITA's point of view, to be closely implicated in the conception and testing of aircrafts and landing gears.

[148] In the aeronautics field, American and European academics will from time to time receive grants from or participate in research projects in association with the private sector of the helicopter industry. This is apparently the case with respect to Dr. Malburet (45% of his total research funding comes from Eurocopter), Dr. Hodges (at the time of preparation of his reports, he apparently had a research contract from Textron for rotor trim and stability analyses in the rough amount of

$155,000), and Dr. Gandhi (two projects relevant to the case and identified in his August 31, 2010 report have been apparently funded by Textron).

[149] The Arts & Métiers Paris Tech., in Aix-en-Provence, France, where Dr. Malburet works and teaches, has an institutional association with the sole helicopter manufacturer in France, namely, Eurocopter. In the United States of America, both the Georgia Institute of Technology and the Penn State Vertical Lift Research Center of Excellence, where Dr. Hodges and Dr. Gandhi work and teach, are associated with the aircraft and aeronautical industry. All these institutions, including their professors and researchers, count on the support of the industry.

[150] The Court does not believe that the independence of an expert who is an academic should turn on the particular amount of money or ratio of financing coming from the industry, including a party to a patent litigation. Otherwise, there would be very few academics who could testify before the Court. There must be a particularized assessment in light of the totality of the evidence and the positions taken by the witness. In this respect, cross-examination is a particularly effective tool to demonstrate bias, lack of perspective and insufficient hindsight of the witness.

[151] The Court notes that Dr. Malburet was not called to give an opinion on whether or not the gears at issue infringe the ‘787 Patent. His qualifications are not seriously disputed and he is the sole qualified expert heard in this trial who is able to read French and clarify any confusion flowing from the French text of the ‘787 Patent. Moreover, the Court has weighed his rebuttal report (P-81) in light of the opinions of other expert witnesses.

[152] Despite having earlier refused to act in this case as Eurocopter's expert because this made him uncomfortable since Textron funds his research, Dr. Hodges has shown independence of thought. For instance, he did not hesitate at trial to state that the Legacy gear falls squarely within claim 1 of the '787 Patent despite the fact that such an admission was never made by Bell in this proceeding.

[153] The Court has been confronted with Dr. Gandhi's very clear-cut opinions. While two projects directly relevant to the case have been funded by Textron (at least in part), his involvement as a teacher and researcher in the field of aerodynamics has been much more recent than other qualified experts in this case. Noting that Dr. Gandhi endorsed, without any reserve, Bell's claim that the claimed invention lacks demonstrated utility, the Court has preferred much more nuanced opinions (Dr. Hodges or Dr. Wood, as the case may be).

VI. **CHRONOLOGY**

[154] In this section, the Court will first set out the background related to the development and testing of the Moustache landing gear (notably in the embodiment where the front cross piece is inclined and offset forward i.e. claim 15 of the '787 Patent). This will be followed by an examination of relevant facts related to the development of the Legacy and Production gears.

Moustache landing gear

[155] The Moustache landing gear attached to both the EC120 and the EC130 which were manufactured by Eurocopter is an embodiment of the claimed invention in the '787 Patent. It has a sleigh type of shape and is similar to the landing gear shown in Figure 1 of the '787 Patent. The

Moustache landing gear installed on the EC120 has three points of attachments and is made entirely of aluminium alloy. The EC130 is also equipped with the Moustache landing gear in two configurations: either with three or four points of attachments. The EC120 is certified for a maximum weight of 1,715 kg, while the EC130 is certified for a maximum weight of 2,370 kg.

[156] The EC120 program started in 1992. Eurocopter wanted to develop a light helicopter to compete against Bell's Jet Ranger (Bell 206). It took three years to develop a prototype landing gear (the PT1 gear) for the EC120. Their starting point was the orthogonal shape of the Écureuil (AS350) skid-type gear with cross tubes made of steel and skid-tubes made of aluminium alloy.

[157] The PT1 gear was a conventional landing gear. It had three points of attachment, steel cross pieces and aluminium skids (photographs are found at JB-15, JB-16 and JB-17). It was designed for an aircraft of a maximum weight of 1,550 kg. The first flight of the EC120 with the PT1 took place on June 9, 1995.

[158] The EC120 was supposed to be a four-bladed rotor helicopter, which would have made it susceptible to ground resonance. Mr. Prud'homme Lacroix and Mr. Certain were familiar with the means to avoid ground resonance. The use of damping devices was a solution; another was frequency placement. It is only logic to avoid, if possible, the use of dampers because such components will add significantly to the weight of the helicopter. Mr. Prud'homme Lacroix already knew that the geometry of the landing gear can affect the pitch and roll frequencies.

[159] Mr. Certain, the lead flight test engineer at Eurocopter, had been involved in the development of the AS350. By 1995, he had become the head of the EC120 program. He had some concerns with respect to ground resonance regarding the PT1 gear. An earlier helicopter model (the Gazelle) had had recurring ground resonance problems. In September 1995, Mr. Certain discussed the matter with Mr. Barquet, one of the three named inventors in the ‘787 Patent and who is now deceased.

[160] The next morning, Mr. Barquet came up with a scale model having a sleigh shape; the protruding ski in front of each skid had disappeared. The scale model was shown to Mr. Prud’homme Lacroix who was responsible for calculations relating to structure in the EC120 program; he first found the shape rather large and wondered whether he could easily size such a gear. Be that as it may, he and his team started to analyse the behaviour of the gear under various configurations and conditions (loads, stress, material, length of the skids, diameter of the tubes, etc.).

[161] Mr. Prud’homme Lacroix had no previous experience with a sleigh type of shape (like the Moustache landing gear). Up to now, sizing and calculations of the conventional landing gear (prototype PT1) had been made using a two-dimensional finite element analysis program (CALTRAIN). Mr. Prud’homme Lacroix spent two months at the end of 1995 modifying the former program, so that it could be used for calculating additional (e.g. lateral) movements in space caused by flexing and bending of different pieces (the Moustache landing gear). This resulted in the creation of a three dimensional finite element analysis program (CALMOUS). A similar but more

advanced type of program (LS-DYNA) was used by Bell many years later when they analysed the behavior of the Legacy and Production gears.

[162] While working on different scenarios, Mr. Prud'homme Lacroix noted that increasing the distance between the front and rear cross pieces decreased the roll frequency, but by the same token, increased the pitch frequency. That said, by inclining the front cross piece forward, Mr. Prud'homme Lacroix was able to decrease the pitch mode. This was a great new discovery for him. Nonetheless, further work and calculations remained to be performed in order to determine which degree of inclination of the front cross piece would produce the best results in terms of frequency control. Although a qualified engineer, Mr. Prud'homme Lacroix is not a dynamicist, nor the person in charge of preparing detailed drawings of the components attached to the helicopter. Thus, he worked in concert with Mr. Mairoux, a designer, and with Ms. Cardin, a dynamicist.

[163] In addition to ensuring a more efficient load distribution than a conventional landing gear, Mr. Prud'homme Lacroix felt that the results in terms of frequency control were also very encouraging on paper, although no actual test had been performed yet. It was decided to continue with the Moustache landing gear.

[164] Using the design made by Mr. Mairoux, the other named inventor of the '787 Patent, a Moustache landing gear was constructed. It now had to be tested on the EC120. Mr. Certain testified that in June 1996 he, himself, performed a handshake test on the EC120 equipped with this Moustache landing gear. He was able to measure with a chronometer the improved roll frequency (1.7Hz) by simply pushing or shaking the EC120 equipped with the Moustache landing gear.

[165] The first flight of the EC120 equipped with the Moustache landing gear took place on July 4, 1996. Mr. Certain was on this flight. The report prepared on this occasion corroborates his testimony of that there was no ground resonance problem for the moment ("Pas de problème de résonance sol pour le moment") (JB-179). According to Mr. Certain, there were no ground resonance issues after the July 4, 1996 either. Considering that French certification of the EC120 with the Moustache landing gear was obtained by Eurocopter at the end of 1997, the Court will make no negative inference resulting from the fact that subsequent tests reports were not produced by Eurocopter after having duly considered the parties' representations.

[166] Mr. Certain also touched on the commercial success of the Moustache landing gear and its general design and capabilities. During cross-examination, Bell's counsel pressed Mr. Certain to admit that Eurocopter had chosen the Moustache landing gear for aesthetic reasons, suggesting that its sleigh type shape looked more modern; this was promptly dismissed by Mr. Certain. Having considered the totality of the evidence, the Court finds that engineering advantages and cost reductions flowing from the elimination of the short ski type protrusion and saddle at the front were the main reasons why Eurocopter decided to incorporate a Moustache landing gear into the EC120 and EC130.

Legacy and Production gears

[167] Earlier helicopter models developed by Bell had a two-bladed rotor. In the late 1970s, Bell introduced a four-bladed rotor to its commercial fleet, with the model 412. The Bell commercial product line is currently comprised of four models: 206L4, 407 (designed from the 206 Jet Ranger),

and the 412 (that traces back to the UH-1 helicopter, known as the Huey). The newest aircraft and flagship is the 429 which is the first real clean sheet design; it is a four-bladed rotor helicopter.

[168] The Bell 429 has a maximum gross weight of 7,000 lb, and a redesigned cabin area with a flat floor, rear doors, and large side doors. The precise location of the attachment points of the Legacy and Production gears has not changed and was dictated by the placement of the cabin area and doors.

[169] In the early 2000s, Bell had two separate helicopter programs: the Bell 427i, and the Modular Affordable Program Line (MAPL) program. The 427i was the most recent helicopter in the line of Bell helicopters. Its predecessors were the Bell 407 and the Bell 206L4, among others. Mr. Lambert was the head of the 427i program. In contrast, the MAPL program was brand new. It first began in September 2002 under the direction of Mr. Malcolm Foster. The idea was to create a completely new product line that would share the same components, thus reducing cost.

[170] Elements of these two programs were combined in September 2004 to form the Bell 429 helicopter. The landing gear from the MAPL became what is known as the Legacy gear. Two very important actors did not testify, that is Mr. Foster who was in charge of the new program, and Mr. Minderhoud who was the landing gear expert at Bell and did the technical calculations and sizing of both the Legacy and Production gears.

[171] The Legacy gear made for the Bell 429 had a novel design in comparison to other gears previously used by Bell. The Legacy gear has a sleigh type of shape as shown on this side view (JB-271), made, assembled or designed on or around March 14, 2005:

[172] As Bell had never designed a helicopter with an articulated rotor and a sleigh type landing gear, they studied the performance of an EC120. Indeed, they leased and operated an EC120 helicopter from approximately March to June 2003, during which time Bell performed tests on the EC120 helicopter, including a handshake test. Moreover, Bell employees received training on an EC120 helicopter in March 2003. Mr. Lambert testified that "benchmarking" competitor's product is common practice in the aeronautics industry. In this case, the March 2003 internal document (JB-478) suggests that the tests conducted on the EC120 in Texas at Textron facilities were to acquire better knowledge in order "to reduce the risk in the MAPL program regarding the ground resonance issues". Indeed, "[t]he data obtained during the ground shake test could be used to design better landing gears for future Bell products".

[173] Frequency placement was thoroughly investigated by Bell as the documentary and *viva voce* evidence reveals. The tests performed on the EC120 had shown that all of the EC120 modes on its landing gear had considerable higher damping than those of the Bell 407 and 427. Indeed, according to a March 2003 internal document, "[t]he EC120 shake test data has shown that higher damped landing gear design is possible while still maintaining excellent frequency placements" (JB-478).

Starting in the summer of 2003, Bell engineers analysed sleigh type landing gears with the NASTRAN program to determine the actual stresses and spring stiffness of the tubes in view of load displacement factors and other variables (JB-309, JB-310, JB-311 and JB-312).

[174] The evidence also indicates that both the 427i and the MAPL programs ran into problems. For example, Bell had previously introduced the rocker beam and the split pivot to deal with ground resonance when it had moved to multi-bladed aircraft in the early 1980s, but it considered removing the rocker beam from the MAPL fuselage designs to save on weight. In light thereof, the decision was made to combine the aircraft and landing gear from the MAPL program, and the rotor system from the Bell 427i.

[175] It was not smooth “flying” for the Bell 429 program. Helicopter design is always concerned with eliminating excess weight, and the Bell 429 continued to be too heavy. In March 2005, Bell convened its team members and was able to slim the design down enough to reduce the weight problem (JB-479). Despite the best efforts of Bell’s engineers, there were delays and the first flight of the Bell 429 had to be delayed time and time again over the years. Concurrently, optimistic statements were publicly made by Bell who wanted to reassure the clientele and stimulate an interest and potential advance purchase orders of the new Bell 429.

[176] The certification process of the Bell 429 began in earnest in early 2006. The test plan was submitted in March 2006, and the collected results were submitted to Transport Canada in May 2007 (JB-391). However, Bell had never tried to certify a landing gear with an inclined front cross

piece before, which meant that Bell had to develop a new, three-dimensional finite analysis software tool (LS-DYNA). Drop tests had to be conducted on the Legacy gear.

[177] The Bell 429 equipped with the Legacy gear achieved its first flight on February 27, 2007 at Bell's facility in Mirabel. However, certification of the Bell 429 with the Legacy gear was never completed. The explanation is simple. In the meantime, Eurocopter started the present action in infringement on May 9, 2008. At this point Mr. Lambert was mandated to develop a modified landing gear for the Bell 429 which would not infringe the '787 Patent. He was unable to say who gave him this mandate. He spent a few days redesigning. He came up with the general design of a modified landing gear, which met the requirements, but resulted in a 16 pound weight penalty.

[178] Mr. Gardner and Mr. Minderhoud then spent a few weeks during the summer of 2008 performing calculations on the modified landing gear which came to be known as the Production gear. Mr. Minderhoud worked as a senior technical staff specialist. He took early retirement from Bell in December 2010. Concurrently, Mr. Lambert asked the legal department in Texas (Mr. Ross Holloway) to verify that the new design would not infringe the patent.

[179] The general idea was to modify the Legacy gear sufficiently to eliminate any alleged patent infringement, but not so much as to affect the load factors. By all means, in view of the advancement of the Bell 429 project, further costs and delays had to be avoided. Mr. Minderhoud did the analysis and Mr. Faessler made sure that the Production gear could be certified. Mr. Rioux was the certification delegate acting for Transport Canada.

[180] As explained in Court by various Bell witnesses and shown on this side view of the Production gear (JB-475), prepared on or around June 11, 2009 by Aeronautical Accessories Inc., the lower curve of the front cross tube present in the Legacy gear is now replaced by a saddle in front of which there is a ski protrusion; the angle of inclination is slightly modified as well:

[181] Mr. Gardner testified that the Production gear is functionally equivalent to the Legacy gear. However, Bell has since distanced itself from Mr. Gardner's testimony, on the basis that Mr. Gardner was not called as an expert witness. On the other hand, Mr. Rioux was examined by Bell's counsel on a number of technical questions, some of which suggested that there were slight differences in terms of the frequencies in certain modes. The dynamic behaviour (ground resonance) and response to stress and load factors are important elements in terms of performance and security of a helicopter landing gear.

[182] Bell notably had to prove to the certification authorities that the Production gear was not susceptible to ground resonance. However, conducting physical testing on helicopters is extremely expensive and time-consuming, and so, as much testing as possible is done using software. In June 2003, when Bell was in the process of developing tools for the analysis of the skid gear behaviour, it was noted that "[s]tructural analysis for the complete gear assembly can involve 2000 man-hours using existing tools" and that "[i]f a drop test is required, a further 500 man-hours is required (…) for reports and coordination with the witnessing authorities" (JB-372 at page 6105).

[183] As stated in issue paper S-04 dated November 2008 (JB-402), Bell submitted to Transport Canada that "[t]he change in design of the [Legacy] landing gear from sled to conventional type, affects only the attachment of the skid tube to the forward cross tube and introduces a skid tube forward extension". Through Mr. Rioux's representations, Transport Canada was satisfied that compliance could be achieved by analysis (LS-DYNA) since there was correlation between the drop tests performed and the virtual tests calculated (JB-402 and JB-403). Bell was also exempted from having to test the strength of the ski tip of the Production gear, despite the fact that the Legacy gear did not have a ski tip.

[184] In a Bell report dated February 6, 2009 submitted to Transport Canada, it is explained that the Legacy and the Production gears "are dynamically similar as far as the most critical fuselage mode (Roll Mode) is concerned" (JB-390 at page 6216). Certification of the Bell 429 with the Production gear was obtained from Transport Canada on June 20, 2009, from FAA on June 30, 2009 and from EASA on September 23, 2009.

VII. **PATENT CONSTRUCTION**

[185] The first step in an action in infringement, coupled here with a counterclaim in invalidity, is to construe the patent at issue. The invention disclosed in the '787 Patent relates to helicopter landing gear, more particularly intended for light helicopters, and before going further, it is necessary to determine to whom the '787 Patent is addressed and to expose the state of the common general knowledge at the relevant time.

Basic concepts

[186] The ‘787 Patent is primarily addressed to manufacturers of helicopters who are particularly interested in designing and making skid-type of landing gears.

[187] A most helpful and comprehensive definition of a person of skill in the art (POSITA) in the field was provided by Mr. Logan in his first report (P-36) and oral testimony, which the Court has read in conjunction with the enlightening comments made by Mr. Toner in his rebuttal report (D-54). This is not to say that the Court rejects or ignores what the other experts have to say on the matter, including the state of common general knowledge of a POSITA in 1996 and 1997.

[188] A major aircraft system such as a helicopter is designed by large, multitalented teams which are comprised largely of engineers specialized in a number of disciplines, including dynamics, materials behaviour, vibration analysis and testing. It is extremely rare for these skills to be found in a single individual. Such specialized teams are only found in a handful of helicopter manufacturers in the world such as Eurocopter, Bell, Agusta Westland, Sikorsky, MD helicopters and Robinson.

[189] The helicopter’s unique flight capabilities of hover and forward flight present particular engineering challenges which include weight, forward speed and vibration. The landing gear is one of the key components of a helicopter and designing a well functioning helicopter landing gear is a complex endeavour. The landing gear must support the helicopter through all variations of operational loadings and must do so on varying terrain including non-level surfaces. The landing gear must be both structurally sound and commercially viable. In this regard, weight is a very important consideration for the manufacturer of helicopters.

[190] There are no more than a few hundred engineers, either actively employed or retired, including academics, who would have the required sophisticated knowledge to know the art of designing helicopter landing gears and who thus constitute persons of skill in the art to whom the ‘787 Patent is addressed.

[191] The POSITA has at least a Bachelor’s degree in engineering, while some may have a Master’s or a PhD, typically in aerospace or mechanical engineering. He should be familiar with the design of landing gears and the overall aircraft system. In assessing the behaviour of various components, including its landing gear, he will be called to make a number of calculations, to use sophisticated computer programs, and to choose between various materials according to a number of variables that differ from one model to another.

[192] As explained by Dr. Wood, in 1996 or 1997, the POSITA would be familiar with the Saint-Venant’s principle, which allows the analysis of stresses at different key points of a structure without having to take into account the local reactions at regions of the structure with complex geometries. The POSITA would also have mastered the use of finite element methodology in order to compute the behaviour of different configurations both with respect to energy absorption and structural deformation, and natural frequencies and mode shapes.

[193] In the development of a working and safe landing gear, the POSITA has a number of design options which depend on a number of variables. Airworthiness requirements as to ground resonance necessitate that the helicopter not have any tendencies, when it is on the ground or partially airborne

with the rotor turning, to oscillate in a manner that might lead to ground resonance. Thus, the POSITA is also knowledgeable about ground resonance and the ways which are known in the art to control or prevent this dangerous phenomenon.

[194] At the time of publication of the ‘787 Patent, the POSITA would have already known that each natural frequency of the landing gear deforms in a specific shape (mode shape), as recognized notably by Mr. Rioux himself and further explained by the various experts heard at trial. Dr. Wood, a qualified expert in aeromechanics, dynamics and ground resonance, testified that the frequencies and mode shapes are unique to each landing gear, constituting a fingerprint, after a fashion.

[195] The POSITA would also be aware of the Deutsch criteria (1946) and the work of Coleman and Feingold (1958) on ground resonance. As explained by Dr. Hodges and Dr. Wood notably, whether or not a rotorcraft exhibits ground resonance depends on several parameters, including the dominant body frequencies (such as the pitch and roll frequencies), the rotor lead-lag frequency in the non-rotating system, the distance from the hub centre to a blade’s centre of mass, the blade lead-lag damping coefficient, the body pitch damping coefficient, the body roll damping coefficient, etc.

[196] With respect to Dr. Malburet’s reliance on the intuition of the POSITA, the Court prefers Mr. Toner’s opinion that there is simply no way to intuitively predict the behaviours of the various elements which constitute and influence helicopter landing gear with respect to complex phenomena like ground resonance.

[197] Thus, to predict ground resonance, the POSITA needs to know effective stiffness, mass and damping coefficients for each of the relevant body modes (usually pitch and roll). The product of the damping coefficients in the fixed and rotating systems must exceed a threshold value determined by other systems parameters in order to guarantee the absence of ground resonance instability. The stiffer the landing gear is, the safer it is as regards ground resonance stability.

[198] By way of illustration, on Eurocopter's side, Mr. Prud'homme Lacroix and Ms. Cardin, and on Bell's side, Mr. Gardner and Mr. Minderhoud (and perhaps Mr. Rioux), would have the education and experience to qualify as a POSITA. For instance, Mr. Prud'homme Lacroix routinely used his own finite element program in the development of the EC120 to evaluate the Moustache landing gear. This is also true of Mr. Minderhoud and other Bell engineers involved in the Bell 429 program (see the Bell 429 certification documents).

Common general knowledge

[199] The '787 Patent relates directly to the field of helicopter landing gears. Eurocopter's experts posit that the common general knowledge is limited to current commercial landing gears. They go so far as to limit the technical field to that of helicopters that experience ground resonance. However, there is no reason to do so in the Court's opinion since the claims of the '787 Patent cover any helicopter landing gear having the shape and made of the materials mentioned in same.

[200] On the other hand, Bell's experts posit that experimental aircraft, patent helicopter designs, journal publications and prior patents all form part of the common general knowledge. However, this is only true to the extent that same are generally regarded as a good basis for further action in

the design of helicopter landing gears, which is not necessarily the case with all pieces of prior art invoked by Bell in this case.

[201] In 1996, a POSITA would have known that most of the technical breakthroughs and concepts developed by competing helicopter manufacturers were kept secret. Thus, in designing a new landing gear, he would have to primarily rely on his own knowledge and experience. If a search in the company's archives did not produce anything, searches for technical documents publicly available would have been generally carried out using online abstract databases such as "Compendex" (available online since 1995 to universities and other organizations).

[202] In this regard, the understanding of ground resonance mitigation has been essentially unchanged since the 1980s. The technical literature on the subject available in 1997 or before was essentially the same as today, except that there were fewer complete articles available online. The POSITA would have had to rely on key words to identify the relevant documents.

[203] For instance, it is highly improbable that in designing a skid-type of landing gear for a commercial light helicopter, the POSITA would be looking at old U.S. Patents describing sleds used in winter play (JB-1 and JB-498), hot air balloons (JB-7) or remote-controlled drones (JB-499 to JB-501), whether to solve ground resonance problems or to address elevated acceleration factors upon landing (load factors).

[204] Both the claimed invention and the alleged infringing gears are generally known as "skid-type landing gears". Skid-type landing gears generally have four components: two cross pieces

connected to the inframe at the top and two skids for ground contact connected to the bottom part of the cross pieces. All those elements are included in claim 1 of the ‘787 Patent and were *per se* well known in prior art.

[205] The weight of the landing gear always poses a particular challenge, even to the experienced designer. It must be remembered that a helicopter includes a portion which must be reserved for what is referred to as the “useful load”, which includes passengers, fuel and cargo. The remaining gross weight is reserved for the helicopter weight itself, and is generally referred to as the “empty weight”. The percent of the gross weight used for empty weight is commonly called the “empty weight fraction” which is generally about 50%, as explained by Mr. Logan in his first report (P-36 para 37).

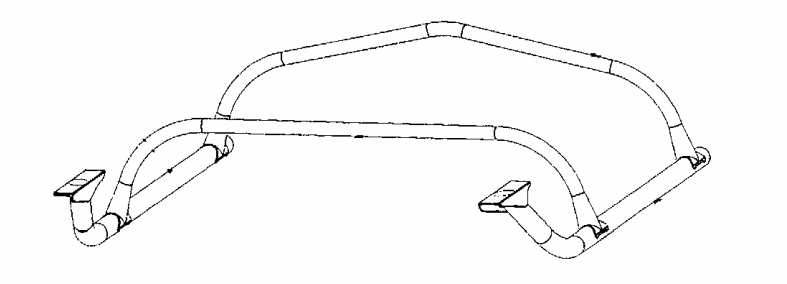
[206] In 1996 or 1997, landing gear design was based on stress and strain criteria related to load factors and rate of descent. A “light” helicopter would generally be understood to refer to a rotorcraft with a maximum take off weight up to about 7000 pounds. Skids were typically made of steel, though aluminium (e.g. JB-206) or composites (e.g. JB-3) are found in prior art. Such systems were known to be quite stiff, which resulted in high load factors.

[207] Although the term “load factor” is not defined in the specification, and is capable of different meanings in the art, the POSITA would infer in the context of the ‘787 Patent that it means as follows: as the aircraft descends at some specified rate of descent, and the skids touch the ground, the body of the aircraft is brought to a stop. How rapidly it is brought to a full stop is measured by

the acceleration (actually here deceleration) the body experiences as it is brought from whatever descent rate the rotorcraft has when it first touches the ground to a full stop.

[208] The experts agree that the stiffer the suspension, the higher the load factor. This means higher stress on the structure and more discomfort for the pilot and passengers. The higher stress means that the structure goes plastic at lower descent rates than desirable. Softening the suspension means the aircraft eases to a stop rather than suddenly stopping. Making the suspension softer makes it lighter, another benefit.

[209] In prior art, the common general knowledge in the field of skid-type landing gears was defined by an orthogonal design. The expression “conventional landing gear” would refer to a skid-type landing gear having long, straight, usually circular tubes oriented longitudinally, ending with a short ski type protrusion at the front end, similar to the general design shown on this isometric view (the ski tip may be shorter or longer and its inclination may vary):



[210] In such an orthogonal design, the front and rear cross pieces of the conventional landing gear are parallel and they are either perpendicular or substantially perpendicular to the ground skids. Typically, both cross pieces will be attached to the skids by way of a saddle (tee) attachment. The Gazelle 340 helicopter developed by Eurocopter in the 1960s has a similar orthogonal type of design (P-6). For the purpose of the case, having heard the various expert witnesses, the Court

accepts that “substantially perpendicular” would cover parallel cross pieces having an inclination of ten degrees or less; moreover, there would be no double curvature and no transition zone at the front.

The specification

[211] In the specification of the ‘787 Patent it is explained that typically, skid-type landing gears generally have four components: two cross pieces connected to the inframe at the top and two skids for ground contact connected to the bottom part of the cross pieces. As a general rule, the cross pieces are made of steel tubes and the skids are made of aluminium tubes. The inventors explain that the major drawback is the great rigidity of the system, which results in high acceleration factors during landings, difficult frequency adaptation in relation to the phenomenon known as “ground resonance,” and a rather high landing gear weight. These are drawbacks of prior art that the inventors assert can be significantly reduced in implementing the disclosed invention.

[212] Indeed, what distinguishes the Moustache landing gear from a conventional landing gear is that “each of said skids has at the front an inclined transition zone with double curvature orienting itself transversely in relation to said longitudinal ground support surfaces, above the plane of the latter, the two transition zones together constituting, in this way, an integrated front cross piece, offset in relation to the front delimitation of the plane of contact of the longitudinal support surfaces of the skids on the ground” (claim 1 of the ‘787 Patent).

[213] According to another important characteristic of the disclosed invention, the assembly of skids and cross pieces is made of aluminium tubes, with an elastic limit equal to approximately 75%

of the fracture strength, and a relative elongation at fracture equal to at least 12%. Also advantageously, the wall thickness of the tubes making up said front and rear cross pieces is degressive between the central part of the cross piece and its junction with the corresponding skid.

[214] The specification mentions a number of advantages which will be more thoroughly considered by the Court in analysis dealing with the demonstrated utility of the ‘787 Patent.

[215] That said, an explicit promise to reduce drawbacks of prior art “significantly” is made by the inventors in the specification, and more particularly:

(a) Elevated acceleration factors upon landing (load factors);

(b) Difficult frequency adaptation with respect to ground resonance; and

(c) High landing gear weight.

[216] This is the promised utility of the disclosed invention.

[217] The elimination of “mechanical anti-ground resonance systems” is an important promised advantage flowing from the particular design of the Moustache landing gear. Dampers in the rotating system of the helicopter are necessary to dissipate energy associated with blade lead-lag motion in the plane of rotation. To provide damping in the rotating system, however, is not sufficient. Thus, the POSITA would understand, in the context of the ‘787 Patent, that reference is made to dampers used in the landing gear. The specific mention of “mechanical anti-ground resonance systems” excludes, by implication, elastomeric bearings.

[218] As explained by a number of experts, notably Dr. Hodges, Dr. Wood and Dr. Gandhi, ground resonance instability results from an energy exchange between the main rotor and the helicopter structure on the ground, including the landing gear. Typically, the regressive in-plane mode of the rotor couples with the pitch, roll or lateral motion of the helicopter on its landing gear and ground resonance then occurs.

[219] Ground resonance is not an issue in the case of helicopters equipped with a two-bladed rotor. That said, the landing gear of a helicopter having a three or four-bladed rotor must be designed in a way to avoid ground resonance problems. If a helicopter experiences ground resonance, one solution is to add damping to it, and more particularly to both the rotor system and the landing gear system. The second solution consists of ensuring that the regressive in-plane mode frequency and the rigid body natural frequencies of the rotorcraft on its landing gear are kept well separated.

[220] As stated by Dr. Wayne Johnson in his seminal work *Helicopter Theory* (1980) at page 684, “instabilities can also be avoided by a proper placement of natural frequencies of the airframe to avoid resonances but usually there are too many constraints on the structural design for this to be a practical means of handling the ground resonance problem”. Yet, this feat is purposely achieved by the particular design of the Moustache landing gear, which in comparison to a conventional landing gear, is characterized by the fact “that each of said skids has at the front an inclined transition zone with double curvature orienting itself transversely in relation to said longitudinal ground support surface, above the plane of the latter, the two transition zones together constituting, in this way, an

integrated front cross piece, offset either forwards or backwards in relation to the front delimitation of the plane of contact of said longitudinal support surfaces of the skids on the ground".

[221] In prior art, a common solution for resolving ground resonance issues at the level of the landing gear had been to use oleo-type piston dampers mounted between the landing gear and the helicopter fuselage. Drawbacks associated with the use of dampers on a landing gear included weight addition and non-linearity. It was also known that oleo dampers are temperature sensitive; they require maintenance; they may be deformed as a result of hard landings, etc. That said, the disclosed invention in the '787 Patent proposes an architecture of skid landing gear that will avoid the need for dampers by way of frequency control.

[222] Where the functioning of the disclosed invention is examined, there is no mention in the specification that damping is provided by an independent device not disclosed by the inventors. While elastomeric connecting devices may add a very limited percentage of additional damping, this does not change the fact that according to the specification and the expert evidence of Eurocopter's witnesses, the absorption of the forces mainly flow from bendings of the tubes, in two different planes, on both sides of the gear (right and left).

[223] The POSITA would also understand that the comparative advantages mentioned in the specification are attainable on the condition that the landing gear has all the characteristics of the disclosed invention (best mode). To illustrate this point, the POSITA would understand that the promised reductions in mass and cost can be achieved by a combination of factors: the change of material (aluminium instead of steel) and the elimination of components rendered unnecessary by

the novel design of the Moustache landing gear (e.g. the saddles used to attach the skids to the front cross tube and the protruding skis at the front of the skids).

Claims 1 to 16 of the '787 Patent

[224] Claim 1, which is the sole independent claim, may be divided into its constituent elements, being:

- A helicopter landing gear;
- Each of the two skids have a longitudinal ground support surface;
- The skids are connected to a front cross piece and the rear cross piece;
- The cross pieces are themselves attached to the structure of the helicopter by connecting devices;
- The rear cross piece is being attached by the ends of its descending branches to the rear part of said longitudinal support surfaces;
- Each of said skids has at the front an inclined transition zone with double curvature orienting itself transversely in relation to said longitudinal ground support surfaces, above the plane of the latter;
- The two transition zones together constitute, in this way, an integrated front cross piece; and
- The integrated front cross piece is offset in relation to the front delimitation of the plane of contact of the longitudinal support surfaces of the skids on the ground.

[225] In a nutshell, Dr. Hodges opines that the elements above in claim 1 are all essential; whereas Mr. Logan considers that some are not essential and can be substituted without affecting the

functioning of the claimed invention. It emerged at trial that the experts also disagree on the interpretation to be given to “integrated front cross piece”, “transition zone”, “at the front”, “inclined” and “double curvature” which are used in claim 1 and elsewhere in the ‘787 Patent.

[226] Claim 1 is a Jepson type of claim meaning that after a recitation of elements found in prior art, what “characterizes” the claimed invention is what follows in the claim. After some prevarication, the experts agree that the words “at the front” and “an inclined transition zone” are essential. That said, Dr. Hodges interprets the words “at the front” to mean “at the very end of the skid, forward of the ground contact point”. In contrast, Mr. Logan holds that it means “in the front part”, thus allowing for the possibility of a protruding ski tip forward of the first curve of the transition zone. The Court finds that the general wording of the ‘787 Patent does not naturally allow for the latter interpretation. Mr. Logan’s view is purely oriented by the result Eurocopter seeks rather than by what a POSITA would understand in reading the ‘787 Patent.

[227] Another point of contention concerns the delimitation of the “inclined transition zone” which is certainly an essential element. The degree and direction of inclination are not specified and it follows that the POSITA would have to determine, through analysis, an acceptable range of angles to achieve the possible benefits of the landing gear. It is clear that the transition zone allows for two changes in direction: upwards (vertical) and towards the fuselage (horizontal). This zone is distinguishable from the last point at which the skid is in contact with the ground (notwithstanding Mr. Toner’s assertion to the contrary). However, the precise meaning of the word “inclined” is somewhat disputed. One point of contention is

the size or radius of the curve: Mr. Logan holds that there is no upper or lower limit on the radius of the curves, while Bell's experts claim that the radius must be large enough for the curve to be smooth.

[228] The Court does not agree with Mr. Logan's suggestion. Upon closer examination, the patent teaches that the transition zone is obtained by a first bend where the skid/cross piece bends upwards (C1), and then a second bend where the cross piece extends horizontally to meet the fuselage (C2). The figures in the patent disclose C1 and C2 as smooth curves. Mr. Toner considers that for the landing gear to accomplish its touted benefits of wire strike avoidance and preventing auguring, C1 must be fairly large. According to Dr. Hodges, a POSITA would not equate "two straight sections coming together at an angle" with a curvature. Even Dr. Wood contrasted "curvature" with an "abrupt change of direction", or a "saddle connection". The Court completely agrees with these experts' analysis, which represents the most plausible approach a POSITA would take.

[229] All of this leads to the question of whether or not the "double curvature" is essential, and on that point, there is major disagreement.

[230] Mr. Logan holds that the double curvature is in no way necessary to accomplish the benefits of the landing gear without giving any cogent reason therefor. He simply argues that the patent does not specifically exclude the possibility of replacing the curvature with a saddle. The fact that it is not listed as an example of different configurations in the patent should not be interpreted as excluding that possibility. However, the patent teaches that the

benefits of the landing gear (i.e. allowing for movement in torsion and flexion) can be realized by the replacement of the lower curvature by a saddle which will render it stiffer.

[231] The Court accepts the experts' evidence to the effect that a POSITA would understand that the front cross piece covers all that portion of the front cross piece that runs across the fuselage between the higher curve of the transition zone. That said, where the front cross piece extends all the way down to the skids which includes the two transition zones, most experts speak of an "integrated front cross piece". The Court notes that the parties' experts agree that an integrated front cross piece is essential; however, the word "integrated" ("intégrée" in French) leads to different interpretations.

[232] Mr. Logan speaks only of a functional integration of the front cross piece to the skids, with no regard to the resultant shape of the cross piece. In contrast, Dr. Hodges refers to both a functional and a design type of integration, meaning that you cannot tell where the cross piece begins or ends.

[233] Dr. Hodges's interpretation allows for joints in areas of low curvature, but not for a stiff saddle or other joint in area of high curvature. Mr. Logan's interpretation allows for a stiff saddle or other joint in an area of high curvature. From a POSITA's point of view, the '787 Patent simply does not allow for Mr. Logan's interpretation. The interpretation given to "integrated cross piece" must be consistent with the rest of the words used on claim 1 and elsewhere in the '787 Patent.

[234] The Court notes that the patent specifically contrasts the integrated front cross piece with that of a front cross piece attached "in the same way as the rear cross piece", i.e. with a saddle:

> Figures 12 and 13 make it possible to compare the behaviour of landing gear with an integrated front cross piece 8 according to the invention (figure 13) with that of conventional landing gear (figure 12) with an *inserted* cross piece, in the same way as the rear cross piece.
> [Emphasis added]

[235] Not surprisingly, the translation of at least one technical term in the ‘787 Patent was the object of some confusion at trial. Mr. Logan suggests that the word “inserted” used in the English translation should actually read “attached”, as the US and UK equivalents of the ‘787 Patent read. On that point, the Court agrees with Mr. Logan. Be that as it may, what really matters is that in the claimed invention the front cross piece is not attached to the skids in the same way as the rear cross piece is attached; it must constitute an “integrated front cross piece”; otherwise, claim 1 would have spoken of an “integrated rear cross piece” as well.

[236] In a similar vein, Dr. Malburet suggested that the French term used, “rapporté”, is neutral and does not specify whether the cross piece is integrated or not:

> Les figures 12 et 13 permettent de comparer le comportement d’un train d’atterrissage à traverse avant 8 intégrée conforme à l’invention (figure 13), à celui d’un train d’atterrissage classique (figure 12) à traverse avant *rapportée*, de la même façon que la traverse arrière.
> [Emphasis added]

[237] However, the patent in French clearly distinguishes between the words “intégrée” and “rapportée”. The word “rapportée” refers to the fact that in a conventional landing gear the rear and the front cross pieces (Figure 12) are both attached in the same way. This is not the case for the invention (Figure 13) who has, according to the disclosure and claim 1 of the ‘787 Patent, an “integrated front cross piece” (“une traverse avant intégrée” in French). Thus, in French, the word “rapportée” cannot mean “intégrée”.

[238] Claim 1 uses the word “décalée” in French, which has been translated in English by the word “offset”. The experts agree that the offset of the front cross piece is essential. However, they disagree as to whether the entirety of the front cross piece must be offset (whether it must be forward of the ground contact point) and whether the inclination and offset required by claim 1 must be in the same direction.

[239] First, Dr. Hodges holds that the ‘787 Patent teaches that the transition zone must begin forward of the ground contact point i.e. that C1 begins forward of the ground contact point. Mr. Logan contends that this is merely a permitted variant. However, in the Court’s opinion, there is no language in this section of the patent indicating such an intention.

[240] Second, Dr. Hodges explained that claim 1 calls for both an inclination and an offsetting of the integrated front cross piece, but does not, however, specify the direction of either the inclination or the offset. In cross-examination, Mr. Logan agreed that a forward inclined front cross piece that is offset back from the ground contact point would be covered by claims 1 and 16. In re-examination, however, when prompted by Eurocopter’s counsel, Mr. Logan changed his mind, stating that the offset and the inclination have to be in the same direction. In the Court’s opinion, there is simply no basis for Mr. Logan’s change in position.

[241] Another area of contention relates to the inclination, if any, of the rear cross piece. At first blush, claim 1 does not indicate that the rear cross piece has to be vertical, let alone substantially

vertical. That said, having reviewed the totality of the expert evidence, the Court finds that it would be clear to a POSITA that "rear cross piece" can only mean a conventional, substantially vertical cross piece, meaning 90 degrees, plus or minus a few degrees. The Court dismisses Bell's experts' suggestion (notably Mr. Toner) that the POSITA would not know that the rear cross piece has to be vertical (or substantially vertical). This is clearly contrary to what the '787 Patent teaches. The Court also accepts that a landing gear with a rear cross piece parallel to the front cross piece, both of them vertical or substantially vertical, is not included in claim 1.

[242] For an element of claim 1 of the '787 Patent to be considered non-essential and thus substitutable, a number of requirements must be present. In this regard, the degree of relevance of the documentation related to the certification and testing of the gears at issue is much dependent on the experts' opinions concerning the construction of claim 1, the general functioning of the claimed invention and the obviousness of the variant (i.e. saddle and protruding ski at the front of skids).

[243] The entire concept of the Moustache landing gear is clearly oriented around the necessity of having an "integrated front cross piece" in order to have a more economical, lighter and a more flexible landing gear having the other related benefits disclosed in the patent. Again, Mr. Logan's bare assertion that the double curvature is a non-essential element is unconvincing, not only when compared to the more compelling explanations of its essential nature by Dr. Hodges, but even as per the language and the illustrations of the '787 Patent itself.

[244] Dr. Hodges, Dr. Gandhi and Mr. Toner each independently concluded that the POSITA would not consider the small rounded fillet found on a saddle to constitute the first curve required

by claim 1. Similar saddles with fillets have been used in the prior art for many years and would have been known to the POSITA. For example, the Bell 206 uses angled saddles with fillets to connect the front and rear cross pieces to the skids. In light thereof, it is not reasonable to hold that the writers of the ‘787 Patent intended to capture angled saddles with fillets when the words “double courbure” were used.

[245] Dr. Gandhi’s analysis confirms the POSITA’s expectation that a saddle joint is stiffer and works differently than the double curvature of the inclined transition zone on a Moustache landing gear as described in the ‘787 Patent. The patented landing gear is meant to provide benefits regarding landing gear weight, load factors and cost, as well as susceptibility to ground resonance. From a weight perspective, the POSITA would have obviously appreciated that a stiff saddle connection will be heavier than the double curvature described in the ‘787 Patent. From a load factor perspective, the POSITA would have obviously appreciated that the manner in which loads are distributed through a stiff saddle connection will be different than the manner in which loads are distributed through the double curvature of the Moustache landing gear.

[246] After an exhaustive analysis of the various experts’ opinions, the Court finds that all of the elements of claim 1 are essential and accordingly dismisses Eurocopter’s assertion that only some elements are essential. The Court comes to this conclusion independently and without giving any merit to Bell’s argument that Eurocopter had earlier made in their original statement of claim an admission to the effect that the double curvature was an essential element of claim 1.

[247] That said, claims 2 to 16 of the ‘787 Patent are dependent claims, meaning that they build on the claim or claims (as appropriate) that come before. Thus, each dependent claim at issue introduces an additional limitation to each preceding claim. For example, claims 15 or 16 include a landing gear according to any of claims 1 to 14, as limited by the further characterization introduced in same (i.e. the said integrated front cross piece is offset forwards or backwards).

[248] Claims 2, 3, 4, 5, 7, 9, 10 and 15 are not the subject of a debate in terms of general understanding:

- The assembly of skids and cross pieces is made of aluminium tubes (claim 2).
- The aluminium is characterized by a limit equal to approximately 75% of the fracture strength, and by a relative elongation at fracture at least equal to 12% (claim 3).
- The wall thickness of the tubes of the cross pieces is degressive between the central part of the cross piece and its junction with the corresponding skid (claim 4).
- The ends of the descending branches of the rear cross piece are attached to the longitudinal support surfaces of the skids by means of aluminium couplings (claim 5).
- The front cross piece consists of a single branch whose ends are connected by a removable junction means to the front part of the corresponding skid, said junction means being arranged between the two curves of the transition zone in question (claim 7).
- The connecting device between the front and rear cross pieces and the structure of the helicopter are of the type with controlled friction in rotation, comprising for this purpose two half-collars or similar devices surrounding the tube of the cross piece, with the interposition of a bearing made of elastic material of the elastomer type (claim 9).
- The landing gear includes at least three devices for connection to the structure of the helicopter, one of them being attached centrally to one of the cross pieces and the other two being attached, while being mutually spaced on either side of the longitudinal axis of the gear, to the other cross piece (claim 10).
- The integrated front cross piece is offset forwards in relation to the front delimitation of the plane of contact of the longitudinal support surfaces of the skids on the ground (claim 15).

[249] Briefly coming back to claim 1, it is clear that it claims more than a design as suggested by Bell. Having considered the totality of the expert evidence, the Court finds that claim 1 includes a particular object, here a helicopter landing gear, having two skids and a rear and front cross pieces having the characteristics mentioned in same. There is no limitation introduced in claim 1 with respect to the type of helicopter or use of the gear. The limitations to claim 1 introduced by claims 2 to 16 are either in the nature of physical limitations (e.g. type of metal used, additional elements, etc.) or particular design features (e.g. forward or backward inclination of the front cross piece).

VIII. **INFRINGEMENT OF PATENT**

[250] Now that the claims of the ‘787 Patent have been construed, the Court can proceed to a determination of the issue of infringement. Having already set out the proper legal framework, it is sufficient to recall that infringement is to be determined by comparing the models of gear at issue (the Legacy and Production gears) to the claims, and not to Eurocopter’s own model (the Moustache landing gear) used on the EC120 and EC130. The onus of proof to prove infringement resides on Eurocopter exclusively.

Production Gear

[251] Having considered the totality of the evidence, the Court concludes that the action in infringement must fail with respect to the Production gear. For the sake of brevity and efficiency, the above discussion concerning the construction of the various claim elements of the ‘787 Patent shall not be repeated in the following infringement analysis. Moreover, the discussion of the issue of infringement below is to be read in light of, and on occasion in addition to, the matters raised in the Construction section above.

[252] Notwithstanding the fact that Bell does not dispute the fact that the original landing (Legacy) gear contains all the essential elements of claim 1 of the ‘787 Patent, the question still remains of whether the modified landing (Production) gear comes within the ambit of claim 1 of the ‘787 Patent.

[253] Eurocopter spent a good portion of its trial time exploring the portions of Dr. Wood’s reports that incorporate Pierre Prud’homme Lacroix’s finite element analysis. This analysis was undertaken in an attempt to prove the functional equivalence between the patented landing gear and the Production gear. However, at the risk of sounding simplistic, a patent is not infringed merely because the defendant’s product accomplishes the same function as the patented invention. What matters is whether the defendant’s product incorporated all of the essential elements of the claim, not whether the parties’ products function similarly.

[254] Eurocopter makes much of the fact that the modification of the Legacy gear happened very quickly, arguing that the short time span indicates that the modification was obvious. However, Dr. Wood then states that a POSITA would conduct extensive analysis in order to verify that the landing gear were functionally equivalent, going beyond a simple application of the St. Venant principle, even to the point of developing a finite element model for each landing gear configuration. These two propositions are mutually exclusive: a modification cannot be obvious as well as require extensive analysis.

[255] As concerns Mr. Prud'homme Lacroix's finite element analysis used by Dr. Wood, it is not clear that both the original and modified models take into account all of the modifications made to the Legacy gear, namely the different ground contact point and the additional stiffness introduced by a saddle joint. The Court accepts the evidence of Dr. Hodges and Dr. Gandhi that the additional stiffness of the saddle joint in the Production gear has been undervalued. Nonetheless, his analysis showed differences in the pitch and roll frequencies between the two landing gears. Dr. Wood admitted that if the saddle stiffness had been properly modeled, the difference in frequency would have likely been even greater.

[256] More importantly, while Eurocopter argues that Bell certified the Bell 429 helicopter with the Production gear "primarily by qualifying the Production gear as a slightly modified version of the Legacy gear that functions in an equivalent manner", the evidence does not support such an argument. In actual fact, Bell convinced Transport Canada of the reliability of its advanced finite element analysis software in predicting the results of drop tests on a number of different landing gear configurations, including the Legacy gear. Once it had obtained permission to use the software, Bell conducted extensive analysis on the Production gear for certification purposes.

[257] On the subject of ground resonance, Bell did submit to Transport Canada that the Production gear is dynamically similar to the Legacy gear in roll mode. However, the similarities between the two gears which govern their dynamic behaviour are not the focus of the '787 Patent, which claims monopoly on a landing gear that has an inclined and offset front cross piece which is integrated with the skids. The fact that Transport Canada has accepted Bell's submission that the Production gear is

somewhat “dynamically equivalent” for regulatory purposes is beside the point. In particular, Bell denies that its Production gear contains all the essential elements of claim 1 of the ‘787 Patent.

[258] In final analysis, after an extensive review of the evidence, the Court dismisses Eurocopter’s allegation that the Production gear infringes the ‘787 Patent. Having compared the Production gear with the patented helicopter landing gear, the Court finds that not all of the essential elements of claim 1 are present. This suffices to dismiss the allegation that dependent claims 2, 3, 4, 5, 7, 9, 10 and 15 are also infringed.

[259] Looking at the actual Production gear, the evidence is clear that the front cross piece of the Production gear is attached to the skids by means of saddle joints. Having heard the experts’ arguments and examined the Production gear at the Mirabel facility, the Court finds that notably the Production gear does not feature the “double curvature”, which, as aforesaid, is one of the essential elements of claim 1.

[260] In the event that the double curvature was deemed to be an essential element of claim 1, Mr. Logan has proposed that such a curvature can be found in the rounded fillet on the saddle connection by which the cross piece of the Production gear is attached to the skid. Again, at the risk of repeating the Court’s analysis found in the Construction section, Mr. Logan’s alternate argument that if the double curvature is essential, C1 is found in the rounded fillet of the saddle connection of the front cross piece of the Production gear, must also be rejected.

[261] Mr. Logan claimed that the fillet "creat[es] a curve, albeit more abrupt than the smooth continuous curve of the Original Landing Gear". However, at the viewing of the Production Gear at Mirabel, he stated that one cannot see the curve since it is inside the saddle. When prompted by the Court, he agreed that one must "imagine" the curve.

[262] Indeed, each of Bell's experts has hold independently that a POSITA would not consider the small rounded fillet as constituting the first curve listed in the claims. As this Court has already noted in the Construction section, it goes without saying that replacing one of the curves with a stiff saddle connection will increase the overall stiffness of the landing gear, as confirmed by Mr. Logan himself. Thus, the POSITA would not be in a position to say that such a replacement would obviously not affect the flexible nature of the landing gear.

[263] Further, the Production gear does not have the integrated front cross piece required by claim 1. The Production gear consists of a straight front cross piece connected to a straight skid via a saddle connection, with the skid continuing forward of the saddle and terminating in a ski tip. Thus, a POSITA would understand that the '787 Patent contrasts two different means of attachment, and thus that a cross piece attached with a saddle is, by definition, not integrated.

Legacy Gear

[264] There is no debate on the question of whether all essential elements of claim 1 of the '787 Patent are found in the Legacy gear. There is clear evidence that the Legacy gear falls within the scope of claims 1, 2, 3, 4, 5, 7, 9, 10, and 15 of the '787 Patent. The issue is whether Bell can defeat

the action by raising a defence based on: (1) subsection 55.2(1) of the Act (regulatory or experimental exception); and/or (2) prior art (Gillette).

Regulatory or experimentation exception

[265] Bell argues that it can avail itself of the regulatory or experimentation exception based on subsection 55.2(1) of the Act and the case law, because twenty of the twenty-one Legacy gears manufactured were apparently used for fatigue tests, drop tests and float kit development and testing, all in relation to certification. The remaining Legacy gear was used for a static display at a trade show. All twenty-one Legacy gears are currently in storage; exhibit D-10 provides a summary of the past uses of each of the twenty Legacy gears and their current location.

[266] A buyer does not buy a helicopter landing gear, but rather, a helicopter equipped with a landing gear. In the case at bar, prior to launching the certification process of the Bell 429, Bell had already analysed, experimented and tested different type of gears and had clearly opted and chosen the Legacy gear. The fact that Bell is claiming their ignorance of the ‘787 Patent until May 2008 is beside the point. In the case at hand, twenty-one Legacy gears were manufactured and Bell was just waiting for the certification of the Bell 429 to sell its new helicopter equipped with the Legacy gear.

[267] At least one of the twenty-one gears was used on a non-test aircraft (57704) and was used for a static display at a trade show. Moreover, soliciting advanced orders, signing agreements with clients and promoting a new model of helicopter with a landing gear at trade shows clearly go beyond what both the Act and the common law intended by the above exceptions. During Mr.

Kohler's testimony, it was revealed that each purchase agreement for the Bell 429 involved a deposit of $25,000, and that in October 2007, Bell had approximately $6 million in deposits.

[268] After an examination of the totality of the evidence, the Court finds that Bell did not construct, used or sold the Legacy gear solely for uses reasonably related to the development and submission of information required by law. This is sufficient to render Bell ineligible for the regulatory or common law experimental exception.

Gillette defence

[269] Bell alleges in defence that it was practicing prior art when it designed and manufactured the Legacy gear for the purpose of integrating it to its new flagship helicopter, the Bell 429.

[270] It is not challenged that prior to the publication of the '787 Patent application (i.e. December 10, 1997), Bell had used a conventional landing gear on its Bell 427 helicopter and earlier models, as evidenced by a number of documents and pictures produced in this case: see exhibit P-28 showing a number of Bell helicopters equipped with a conventional landing gear and exhibit JB-224 (the Minderhoud article).

[271] Some earlier documentary evidence suggests that the sleigh type of shape (as per the EC120) may have been initially chosen by Bell for its wirestrike protection properties and its aesthetics, and also because it had a lower risk for the fore/aft resonance mode (JB-372, JB-378 and JB-481). That said, more contemporaneous documentary evidence clearly shows that the improved

dynamic behaviour (ground resonance) and the lower weight were the primary factors for choosing a sleigh type gear over the conventional type.

[272] In an article presented at the American Helicopter Society 64th Annual Forum in Montréal, April 29 – May 1, 2008, entitled "Development of Bell Helicopter's Model 429 Sleigh Type Skid Landing Gear", written by Mr. Peter Minderhoud, (the Minderhoud article) (JB-224), Bell praises the improved dynamic behaviour, energy absorption qualities and lower weight of the chosen "sleigh type skid landing gear" over "the conventional type" and which "has been designed for the first time by Bell Helicopter Textron for use on its new Model 429 civil helicopter".

[273] Speaking of the Legacy gear, Mr. Minderhoud proudly states in 2008: "This helicopter has been designed with a sleigh type landing gear. It's the first time Bell Helicopter uses such a landing gear type. The conventional gear used in all other Bell models consists of parallel front and aft cross tubes which are connected by two longitudinal skid tubes; skid tubes are slightly extended forward of the front cross tube (Figure 3 shows Model 427 with conventional skid gear). The sleigh type gear differs from the conventional one in that the forward cross-tube and the skid tubes have been integrated."

[274] That said, it was known at Bell that the sleigh gear closely resembled the Moustache landing gear of the EC120. Mr. Gardner even testified that the Legacy gear has all of the characteristics of the Moustache landing gear, except for the lower curve. In fact, evidence obtained during discovery reveals that when concerns were raised at the time, Mr. Foster apparently advised Bell's engineers

to “carry on”. He was not called as a witness to either confirm or deny this statement. As it turns out, in practice Bell continued with the Legacy gear.

[275] Be that as it may, Bell argues that all of the features of the Legacy gear were found in the prior art, namely the Obstacle strike documents (JB-204, JB-493 and JB-497). Bell claims that these documents were publicly available and that, as such, they constitute part of the prior art. Each of Bell’s experts agrees that the landing gear in the Obstacle strike documents is inclined. Bell also argues that the Legacy gear is identical, in all material aspects, to the landing gear depicted in the NASA documents (JB-201 and JB-202). These documents were known at Bell and would have been in the public domain.

[276] Consequently, in making the Legacy gear, Bell argues that it was practicing the prior art and any infringement of the ‘787 Patent is without consequence. Given the above, the interplay between anticipation and the Gillette defence is clear: they are the flip-side of one another.

[277] At least two of the Obstacle strike documents (JB-204 and JB-497) were made public and available to a POSITA at the relevant date, here on June 10, 1996. One of the co-authors of the Obstacle strike documents was Mr. Bharat P. Gupta who had been working as project engineer for Textron in Fort Worth, Texas.

[278] The purpose of the Obstacle strike documents was to study design concepts for improving the tolerance of helicopters to in-flight obstacle strikes. Selected concepts derived for the main rotor, tail rotor, fuselage and landing gear (fixed system), and main rotor hub and controls were

comparatively analysed based on their functional, operational, and aircraft integration characteristics, and on their strike damage cost-reduction potential.

[279] The fact that none of the Obstacle strike documents examine the behaviour of different designs of landing gear for the purpose of frequency control and prevention of ground resonance is not relevant. The issue is whether there is one single publication, known to the public, that discloses subject matter which, if performed, would necessarily result in infringement of the ‘787 Patent.

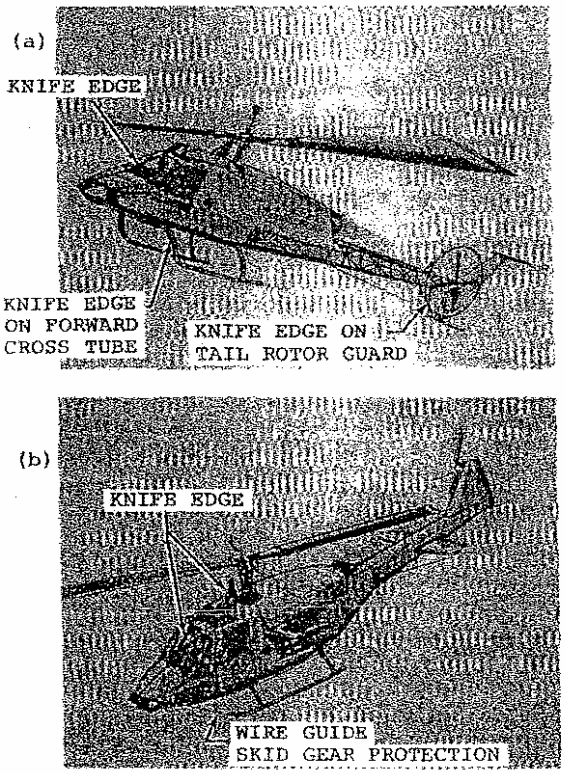
[280] Exhibit JB-204 (as well as JB-493) discloses a method whereby the skid landing gear could be protected from entanglement with suspended wires and cables by either eliminating the forward protruding skid tube (the first concept) or by placing fairings (the second concept). Clearly, there would be no infringement of the ‘787 Patent if the second concept was executed, since it simply calls for the use of add-on fairings that could be put at the end of the existing protruding skid tubes of the conventional landing gear shown on Figure 5 (Figure 24 in JB-493). This leaves the first concept.

[281] It is explained by the authors of the Obstacle strike documents that the first concept (i.e. eliminating the forward protruding skid tube) would be more desirable but would probably be feasible only on a new aircraft design which is not disclosed: “This is due to the support structure and geometry required to give acceptable rollover stability. (Existing designs would require extensive modifications to provide these features.)”

[282] Thus, we are left with a general artistic representation of a flying two-blade helicopter equipped with a skid-type of landing gear having no protruding skid at the front. Figure 4a in JB-204 and Figure 23 in JB-493 are easily subject to misinterpretation, as evidenced by the varying interpretations given to them by the experts.

[283] Figure 4a can be best appreciated if it is compared to Figure 4b where we clearly see the same model of two-blade helicopter equipped with a conventional landing gear. In Figure 4b, the cross tubes are parallel and are perpendicular to the skid gear; we see the guide at the front of the protruding skid provided to deflect wires. In Figure 4a, the protruding skid has disappeared and the front cross tube, which is parallel to the rear cross tube, has a knife edge.

[284] Figures 4a and 4b are reproduced below:



[285] Bell's experts admitted that several different angles are necessary in order to properly appreciate a landing gear configuration, something which the Obstacle strike documents do not provide. The difficulty of determining inclination from simple drawings was made apparent by Mr. Toner's refusal to confirm that the two cross pieces were parallel.

[286] Moreover, the accompanying text is unhelpfully terse on the subject of any inclination; even of the cross piece itself. The experts were required to draw inferences from the other drawings. The two criteria of the anticipation test leave no place for such guesswork. The diagrams and text contained in the Obstacle strike documents do not permit a POSITA to arrive at the patented invention, and as such, the two criteria are not met.

[287] At best, assuming that the front cross piece shown in Figure 4a is actually inclined and offset forwards in relation to the front delimitation of the plane of contact of the longitudinal support surface of the skid on the ground, the double curvature which is an essential element of claim 1 of the '787 Patent is missing. There is apparently no lower curvature, Figure 4a showing a straight kind of angle and not a smooth curvature like the one shown in Figure 1 of the '787 Patent. There is no transition zone within the meaning of the '787 Patent.

[288] Thus, the Court concludes that Bell has failed to prove that the disclosure and the enablement conditions are met in the case of the Obstacle strike documents.

[289] In addition, Bell claims that the Legacy gear is identical, in all respects material to the '787 Patent, to the landing gear depicted in the NASA documents (JB-201 and JB-202). At trial, Mr.

Lambert testified as to his knowledge of JB-201 (NASA), which he said he first saw in the 1990s. He also stated that he was aware that the NASA program had started in the late 1970s.

[290] Bell has failed to establish that the NASA documents (JB-201 and JB-202) are publicly available. The documents produced at trial were found in the company's archives in Fort Worth, Texas. There is no evidence that Bell (or Textron) who was involved in a joint Bell/NASA program, made the NASA documents public. Bell's own expert, Dr. Hodges, even performed a search for these documents, using key words from the documents themselves, and was unable to find them.

[291] Assuming for the purpose of argument that the NASA documents are public, the Court prefers the evidence of Mr. Logan on non-anticipation and finds that the landing gear illustrated in JB-201 does not show a cross piece and that there is insufficient information to disclose the rear of the landing gear. Moreover, the use of an articulated front cross piece and/or the use of damping devices are not covered by the claims of the '787 Patent. Bell's experts' opinion on enablement also proved to be shaky following further questioning at trial by Eurocopter's counsel. In passing, the landing gear implemented by this program was wheeled.

[292] As such, in final analysis, the Court is not satisfied that the NASA documents meet the two criteria test for anticipation. On a balance of probability, Bell has not demonstrated that the NASA documents disclose subject matter which, if performed, would necessarily result in infringement of the '787 Patent and that the enablement requirement is met.

IX. **VALIDITY**

[293] Bell has counter attacked by alleging that claims 1 to 16 of the ‘787 Patent are invalid on various grounds which will now be examined by the Court. Prior to the commencing of the trial, Bell abandoned the ground of invalidity based on the alleged ambiguity of the ‘787 Patent. Moreover, there has been no suggestion that misrepresentations were made in the specification by the inventors. This leaves the allegations of obviousness, insufficient specification, lack of utility and/or overbreadth.

Obviousness

[294] Bell’s experts opinion that the patented landing gear was anticipated is based on two groups of documents: the NASA documents (JB-201 and JB-202) and the Obstacle strike documents (JB-204, JB-493 and JB-497). In the infringement analysis, the Court has already dismissed the Gillette defence and concluded that neither group of documents satisfied the two-part test for anticipation. Accordingly, the allegation made by Bell in its counterclaim that claims 1 to 16 of the ‘787 Patent are deemed invalid on the basis of anticipation must be dismissed as well by the Court.

[295] This leaves the ground of attack based on obviousness. Only claim 1 of the ‘787 Patent is an independent claim. Moreover, there is no dispute that claims 2 to 14 disclose anything novel over claim 1. More particularly, where considered in isolation and not combined with claim 1, Eurocopter admits that the following elements mentioned in claims 2, 3, 4, 7 and 9 are not new:

(a) Using aluminium skids and cross pieces (claim 2);

(b) Said aluminium is characterized by a limit equal to roughly 75% of the break resistance and by a break extension of at least 12% (claim 3);

(c) The thickness of the tube walls of the front and rear cross pieces decreases from the centre of the cross piece to the joint with the skid (claim 4);

(d) The use of an aluminium saddle to attach the rear cross piece to the skid (claim 5);

(e) The cross piece attachment to the skid be removable (claim 7);

(f) The connecting device between the front and rear cross pieces and the structure of the helicopter are of the type with controlled friction in rotation, comprising for this purpose two half-collars or similar devices surrounding the tube of the cross piece, with the interposition of a bearing made of elastic material of the elastomer type (claim 9).

[296] Claim 15 covers the variant whereby the integrated front cross piece is offset forwards in relation to the front delimitation of the plane of contact of the longitudinal support surfaces of the skids on the ground. Conversely, claim 16 covers the variant whereby the integrated front cross piece is offset backwards in relation to the front delimitation of the plane of contact of the longitudinal support surfaces of the skids on the ground. Both variants are covered by claim 1.

[297] Therefore, the only debate with respect to obviousness is in relation to claims 1, 15 and 16 of the ‘787 Patent. That said, the allegation made by Bell that the claimed invention is obvious somewhat contradicts Bell’s assertion that the specification in the ‘787 Patent is wholly insufficient in that it does not describe what the invention is and how to use it as successfully as the inventor (Mr. Prud’homme Lacroix) did in this case (when explaining at trial that in inclining the front cross tube forward, he was able to effect a decrease in the pitch mode).

[298] Having considered the totality of the evidence and the applicable principles and elements of the test on obviousness (para 73 of the present reasons), the Court concludes that claims 1, 15 and 16 of the ‘787 Patent are not obvious. Moreover, in light of this finding, claims 2 to 14 of the ‘787 Patent are not obvious.

[299] The POSITA and the common general knowledge thereof have already been canvassed at length earlier in this judgment, and need not be repeated here.

[300] The invention described in the ‘787 Patent is much more than just a shape (design), as the description makes clear. The inventive concept was to depart from prior art solutions by disclosing a more flexible landing gear. The claimed invention has a particular geometry (inclined, offset front crosspiece and an integrated transition zone) which creates a cantilever, allowing the front cross piece to work in both flexion and torsion modes. This augmented capacity creates several advantages compared to conventional landing gear, notably regarding ground resonance and the reduction of load factors. The resultant was that movements have to be measured using a finite element model working in three dimensions and not just in two dimensions.

[301] The prior art must be interpreted in light of the evidence at hand and the context in which the inventor created his invention:

- The NASA documents disclose elements in composite materials, namely dampers for crash landings.
- The Obstacle strike documents relate to aircraft and obstacles in the surrounding area. There was very little teaching regarding landing gear contained in the documents, and no clear indication that the landing gear had inclined (offset) cross tubes.

- The QH-50 documents (JB-499, JB-500 and JB-501) concern an aircraft that cannot have ground resonance problems.

- JB-536 concerns a landing gear for a hot air balloon, which has no rotor and an unclear load factor, so it certainly cannot have ground resonance problems.

- The XV-I (JB-503) and XV-3 (JB-516 and JB-517) documents concern one-of-a-kind aircraft with stiff inplane rotors, which also cannot have ground resonance problems. They were designed for different applications than the state of the art conventional skid landing gear.

- The industrial drawings (JB-528, JB-529 and JB-539) do not supply any information about the functional characteristics of the illustrated aircraft.

- The US patents (JB-1, JB-531, JB-495, JB-498, JB-532 and JB-507) do not concern landing gear.

[302] The Court concludes that none of the above prior art put forward by Bell's experts reveals the inventive concept contained in the '787 Patent, either because the document was ambiguous, the aircraft in question does not experience ground resonance, or the document was not intended to reveal functional information. Moreover, there is no evidence that the POSITA would come to the solution taught by the '787 Patent with respect to load factors and frequency control. For these reasons, the above documents do not constitute prior art in the sense of the '787 Patent.

[303] Without repeating same, all three of Eurocopter's experts have highlighted in their reports or testimonies a number of differences between the matter cited by Bell's experts as allegedly forming part of the "state of the art" and the inventive concept of claims 1, 15 and 16 of the '787 Patent, in that each of said skids has at the front an inclined transition zone with double curvature orienting itself transversely in relation to said longitudinal ground support surfaces, above the plane of the latter, the two transition zones together constituting, in this way, an integrated front cross piece,

offset – forwards or backwards – in relation to the front delimitation of the plane of contact of the longitudinal support surfaces of the skids on the ground.

[304] The Court agrees with Mr. Logan that it is very difficult to distinguish from JB-195 and JB-196 whether the front cross piece is indeed offset. Be that as it may, the drawing reproduced at paragraph 106 of Mr. Logan's response to validity issues clearly shows that the Bell 205 landing gear has a conventional, orthogonal configuration. Moreover, the Bell 205 is a two-bladed helicopter and is therefore free of ground resonance problems.

[305] According to Mr. Logan, the photographs of the XV-3 found at JB-208 show that the front cross piece is inclined frontward (so is the rear cross piece; the front and rear cross pieces run parallel to one another, which is not the same configuration as the Moustache landing gear). But JB-208 does not show that the front cross piece is offset relative to the front delimitation of the plane of contact. Moreover, there is no mention in JB-208 that the XV-3 landing gear avoided ground resonance.

[306] The photograph of the XV-1 (JB-503) on which Bell's experts rely does not clearly show the offsetting of the front cross piece. Therefore, in my opinion, it is not possible for them to affirm that the front cross piece of the XV-1 is offset relative to the plane of contact of the skid to the ground.

[307] In sum, accepting the evidence of Dr. Logan, the Court finds that none of the prior art references cited by Bell's experts describe inclining or offsetting the front cross piece relative to the

front of the plane of contact of the skid with the ground and structurally integrating the front cross piece with the longitudinal skids, thus allowing the landing gear to avoid ground resonance.

[308] Moreover, if the prior art is compared to the inventive concept as identified above, invention was necessary to get from the one to the other. Eurocopter spent three years, performing hundreds of calculations and considering several different landing gears before achieving the Moustache gear. Bell rented an EC120, trained several of its employees on the helicopter, and ran tests on the aircraft. Eurocopter and Bell were forced to adapt their finite element analysis software in order to take into account the new properties of the sleigh gear. When all of these elements are put together, it is clear that the invention was neither known nor obvious to the POSITA, and that invention was necessary to make that leap.

[309] In light of the above, the Court endorses the analysis and conclusions made in this respect by Eurocopter's experts.

[310] As for the idea that it was "obvious to try", the Court agrees with Eurocopter's statement of the jurisprudential factors to be taken into account for this analysis, as well as Eurocopter's response to each factor:

(a) Was it more or less obvious that what had been proposed would work?

No. Mr. Prud'homme Lacroix himself was sceptical to begin with. Bell's own documents record the exceptional ground resonance characteristics of the Moustache landing gear.

(b) Was the achievement of the intention easy?

No. The Moustache landing gear was developed from 1992-1995, during which time calculations were performed on over a hundred conventional landing gears, and the landing gears were deemed inadequate.

(c) Did the prior art provide a motive to find the solution the patent addresses?

No. Conventional landing gears worked relatively well and had been used successfully.

(d) What steps led to the invention?

For several years, Mr. Prud'homme Lacroix performed calculations on a large number of landing gears, without success.

(e) Was the invention obvious to try?

No. Henry Barquet's idea was the result of complete and utter chance.

[311] According to Bell, the application of these same factors might prove problematic in light of the other validity issues. If claims 1, 15 and 16 of the '787 Patent are not anticipated or otherwise obvious, then Bell subsidiarily and alternatively questions whether the specification of the '787 Patent is sufficient and/or the utility of the invention is demonstrated and/or the claimed embodiments are overbroad.

Insufficient disclosure (best mode)

[312] Bell claims that disclosure (para 27(3)(b) and following of the Act) is insufficient and that the best mode is not indicated (para 27(3)(c) of the Act). Sufficient disclosure is evaluated in function of the date of publication of the patent, namely December 10, 1997. The best mode is evaluated in function of the priority date, namely June 10, 1996.

[313] The first goal of the description is to allow the POSITA to produce the invention, once the term of the patent has expired. In light of this fact, the inventor is obliged to correctly and fully describe his invention, as of the priority date. If the inventor omits information in order to retain an advantage, misleads the public, or does not communicate the full scope of his knowledge, the description is insufficient.

[314] Sizing of a helicopter landing gear is an art that is known by a POSITA. All of the experts heard by the Court recognise that the invention and manufacturing of a landing gear is a series of compromises and that for both a conventional landing gear or the Moustache landing gear, its adaptation to a particular helicopter model depends on several factors, and is a long and fastidious process necessitating run-of-the mill, but nonetheless numerous and complex, calculations.

[315] Bell and Eurocopter's expert witnesses agree on at least this one point: the use of finite element analysis methods was already common practice in 1996. This being said, the Court accepts Eurocopter's experts' testimony that a POSITA who read the description and wanted to produce the invention would know to size the landing gear in relation to the specific aircraft, would know to choose the best angle for inclination, and would not have difficulty determining whether the landing gear had best be attached to the fuselage at three or four points, in function of the weight of the aircraft.

[316] This was recognized by Bell itself, as appears from Mr. Minderhoud's remarks in the already mentioned article presented at the conference held in 2009:

> Although the skid gear configuration is simple in concept, its sizing is complex due to these (conflicting) requirements: the stress level

> for fatigue should be low, for energy absorption high stresses in the plastic zone are required, while the stiffness requirements are independently defined to this. In addition to these structural requirements, minimum weight, low profile, ground clearance and producibility (cost) are other design requirements. In fact the sizing is finding an acceptable compromise between all these requirements. It is worth noting that apart from special operations, a fixed gear adds unusable weight and considerable drag to a flying helicopter. Its only function is to safely land the aircraft.
> …
> A sleigh type skid landing gear was chosen for Model 429 over the conventional type because of the improved dynamic behavior (ground resonance) and the lower weight. The shape of this landing gear creates more loading interaction between both cross tubes and the skid tubes compared to a conventional skid landing gear. It is a new concept at Bell, which required a new approach in the analysis and sizing of the landing gear, resulting in a large number of supporting tests to demonstrate the approach (drop tests, fatigue tests, tests of dynamic and static stability of the rotorcraft). Some of these tests are still underway, but the overall impression is that the landing gear behaves as predicted…

[317] The off-the-cuff remark by Dr. Gandhi that the POSITA would be "lost at sea" appears very surprising. Dr. Hodges' statement that "the wide number of options described in the '787 Patent leave the designer with a huge corpus of combinations to try out" is not determinative either. Dr. Hodges and Dr. Gandhi do not have the extensive practical experience of Mr. Logan and Dr. Wood, whose testimonies are conclusive and most preferred by the Court.

[318] Indeed, Mr. Toner, the Bell's expert who has the most practical experience, testified that the POSITA would dismiss any configuration with too sharp an angle of inclination. The experienced designer would immediately understand the advantages of a landing gear with a front cross piece inclined forwards, as opposed to the other configurations. However, according to the expert evidence in the file, the same experienced designer would not be able to appreciate the behaviour of

each configuration with regards to ground resonance; this would have to be calculated by a dynamics expert.

[319] Mr. Toner testified at trial that a helicopter designer would instinctively know what the limitations are for landing gear, not just in terms of the specific landing gear design, but in terms of protecting the aircraft and allowing it to function as fully as possible, such as on rocky terrain. The position of the cross pieces, the distance between the skids, the angle to the ground and the stability of the aircraft in roll mode are examples of factors that are all carefully considered by the designer.

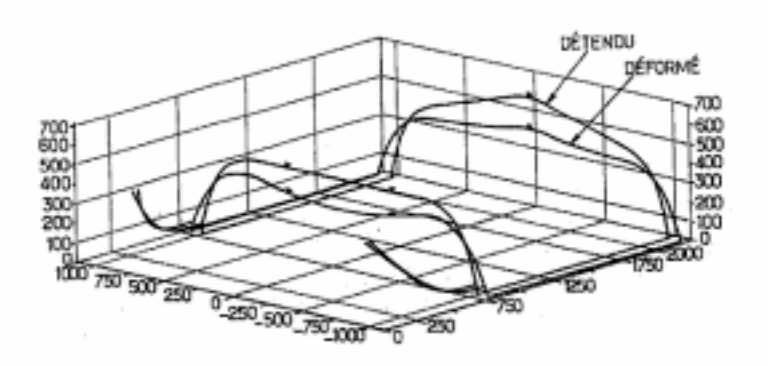
[320] Bell also argues that there are contradictions between the manner in which the ‘787 Patent describes the “invention”, and how Mr. Prud’homme Lacroix, as the inventor, described the purported benefits of the invention in terms of frequency control at trial. In other words, Bell is claiming that the patent specification does not faithfully disclose the invention or its best mode. The Court does not agree with Bell.

[321] The patent at issue must be construed in light of the specification and the understanding a POSITA would have at the relevant dates. Thus, what Mr. Prud’homme Lacroix may have stated at trial with respect to how the claimed invention reduces ground resonance constitutes extrinsic evidence and may not be used by Eurocopter or Bell. The fact is that the disclosed invention provides purported benefits both with respect to the overall energy balance and ground resonance.

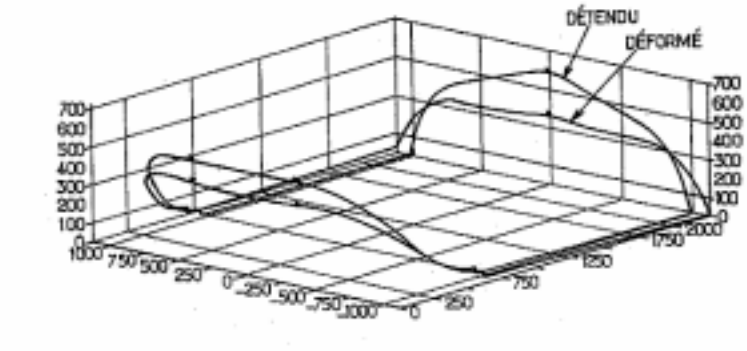
[322] The specification of the ‘787 Patent is clear enough to permit a POSITA to understand the general functioning of the claimed invention and its main features. Essentially, the inventors claim

that the front cross piece, which is integrated into the skid part, will contribute to the overall energy balance and will play, thanks to the bending of the transition zones, a leading role for the absorption of the forces generated during rough and running landings. Besides the explanations provided by the inventors, Figures 12 and 13 are particularly enlightening.

[323] Figure 12 of the ‘787 Patent is a perspective view of the deformations of a conventional landing gear used as a reference:



[324] Figure 13 shows, by way of comparison, with the same scales, the deformations of the Moustache landing gear:



[325] In reference to the behavioural response of the compared gears, the inventors explain that, thanks to the special structure of the tube (wall thickness and strength characteristics determined by the finite element method), the rear cross piece of the Moustache landing gear can undergo a much

greater deformation than the rear cross piece of a conventional landing gear, which makes it possible to absorb landing shocks better. Moreover, according to the specification, the same result is obtained at the front because of the bending deformation of the front cross piece and because of its rotation, allowed by the elastic bending of the transition zones.

[326] With respect to frequency control, the ‘787 Patent specification mentions notably:

> The ground resonance behaviour is characterized in particular by the landing gear’s roll stiffness. Since the landing gear is attached to the structure, for example, by means of a single rear point and two front points, the torsional stiffness in relation to the pitch axis is obtained mainly by the bending of the front cross piece. The variant according to which the ground support points of the front cross piece are offset longitudinally towards the front of the aircraft in relation to the points of attachment to the structure of the latter has the advantage of allowing the roll operation of the assembly to cause the front cross piece to work both in torsion and in bending rather than in pure bending. This results in reduced roll stiffness, which improves the ground resonance behaviour of the helicopter in roll mode, thereby preventing any divergent phenomenon that might cause an accident.

[327] The fact that the specification does not speak about the Moustache landing gear behaviour in modes other than the roll mode is not enough to invalidate the ‘787 Patent on the ground of insufficient specification. What the inventors of the Moustache landing gear are disclosing is a purportedly new design of skid-type landing gear for helicopter which accomplishes different purposes.

[328] The variant according to which the ground support points of the front cross piece are offset longitudinally towards the front is shown on Figure 1, while Figure 11e shows the option of offsetting the integrated front cross piece towards the rear. Both variants are included in claim 1, while claims 15 and 16 specifically cover each variant.

[329] Where the totality of the patent is considered, a POSITA would have no difficulty in concluding that the best mode in the inventors' mind is the embodiment shown on Figure 1. The Court finds the testimonies of Eurocopter's experts conclusive. Once the POSITA has chosen a design where the ground support points of the front cross piece are offset longitudinally towards the front, he will have no difficulty choosing which inclination will provide the best result, depending on the general design and weight of the structure of the helicopter.

[330] The specification of the '787 Patent also explains that optimum results will be achieved if aluminium is used (instead of steel), aluminium being characterized by an elastic limit equal to approximately 75% of the fracture strength, and by a relative elongation at fracture at least equal to 12%. The POSITA will also have no difficulty in deciding whether there should be three or four points of attachments, depending on the weight of the aircraft.

[331] In the end, the experienced designer will be able to choose between various compromises, one which will make it possible to meet the size requirements of the landing gear and to satisfy these three criteria:

- Absorption of energy corresponding to normative vertical impact speeds;
- Critical landing speed resulting in residual deformation, situated outside of the normal operating range; and
- Sufficient flexibility to avoid the use of an additional anti-resonance system.

[332] Overall, the objections raised by Bell's experts with respect to disclosure are specious. Again, the open-minded POSITA, desirous of putting the invention into practice, will have no difficulty complementing the teachings of the '787 Patent with what was already known to a skilled and experienced designer in 1996 and 1997.

Utility and overbreadth

[333] By far, Bell's most serious attack on validity concerns the alleged lack of demonstrated utility or sound prediction at the Canadian filing date of the '787 Patent (June 5, 1997). There is no serious dispute that the invention is useful for certain purposes. However, since the patentee chose to extol certain advantages of its invention in the specification, Bell submits that the promises made in same have to be met across all claimed embodiments, otherwise the '787 Patent and claims 1 to 16 thereof are invalid.

[334] The '787 Patent has already been construed by the Court. Again, the disclosed invention is for a helicopter landing gear which is notably characterized in that each of said skids has at the front an inclined transition zone with double curvature constituting, in this way, an integrated front cross piece, offset either forwards (claim 15) or backwards (claim 16) in relation to the front delimitation of the plane of contact of said longitudinal support surfaces of the skids on the ground. Both inclinations are included in claim 1, thereof. As aforesaid, a number of dependent claims (claims 2 to 14) add further limitations.

[335] Unless a claim refers specifically to a particular use (e.g. in the case of a patented medicine, a new use for an old compound), the requirement for utility of the patented invention should not be

confused with any necessity to put it directly or by inference in the claims (*Mylan Pharmaceuticals ULC*, above, at para 202). Claim 1 to claim 16 inclusive of the ‘787 Patent refer to a helicopter landing gear and not a particular use of same. Thus, the promise of the patent at issue must be found in the specification itself and not in the claims.

[336] In the opening page of the ‘787 Patent, the inventors identify the existing problems to be addressed by the disclosed invention, and then go on to present the objective and the promise of the invention, which is to remedy drawbacks of the prior art. The purported advantages of the Moustache landing gear are expressed in the form of a comparison with conventional landing gear. This becomes relevant when considering whether utility was, in fact, demonstrated at the Canadian filing date.

[337] The Court has rejected any suggestion by Eurocopter’s experts that the utility of the ‘787 Patent is simply to provide a working landing gear. In prior art, the ways of making a working landing gear were already known to a POSITA. What the inventors propose in their patent is a better alternative, indeed, an improvement, to such conventional skid-type landing gears.

[338] In effect, an explicit promise to reduce drawbacks of prior art “significantly” is made by the inventors in the specification, and more particularly:

(a) Elevated acceleration factors upon landing (load factors);

(b) Difficult frequency adaptation with respect to ground resonance; and

(c) High landing gear weight.

[339] This is the promised utility of the disclosed invention.

[340] The specification mentions that in comparison to a conventional landing gear, mass will be reduced by approximately 20%, manufacturing will be simplified and costs reduced by some 20%, load factor on landing will be reduced by some 10%, and mechanical anti-ground resonance systems (which can be found on conventional landing gears) can be eliminated. In light of the expert evidence, the POSITA would interpret these percentages as indicative only.

[341] That said, bearing in mind commercial realities, a comparison between the conventional landing gear of the AS350 and the Moustache landing gear of the EC130 shows a cost reduction of 10.2%, an average reduction of load factors of 17% and a mass reduction of 17%. Such evidence does not go to demonstrated utility or sound prediction, and is admissible as such, even if it is posterior to the Canadian filing date.

[342] Dr. Gandhi notes that in the case of the EC120 and EC130, the noted improvements are partially attributable to the change in material from steel to aluminium (for the rear cross-tube). Be that as it may, there is no evidence that any embodiment covered by the claims would not gain from the more flexible gear disclosed by the inventors in terms of assuring a better absorption of the forces generated during rough and running landings.

[343] If Bell was actually questioning particular percentages mentioned in the specification, the issue would become one of misrepresentations. Again, the promised utility of the Moustache landing gear is in comparison to a conventional landing gear. The POSITA would understand that

there is not one unique model of conventional landing gear and that their weight, configuration and particular sizing will vary from one helicopter to another.

[344] The specification of the ‘787 Patent promises cumulative advantages. Some advantages naturally flow from the inherent characteristics of the disclosed inventions. Others may only be verified by testing, which may pose the question of sound prediction. A distinction must be made between the promised advantages and the data upon which it is based.

[345] While it was known in the art that a helicopter could be supported by a conventional landing gear having parallel, largely vertical cross pieces, with protruding ski tips in front, the ‘787 Patent describes a landing gear that has an inclined and offset front cross piece integrated with the skids. This creates a cantilever, which results in a more flexible landing gear. The principles involved and the functioning of the disclosed invention are set out in the specification, together with some examples or figures.

[346] For example, the prior art included attachment of the front cross piece with a T-saddle and a protruding ski tip. Whether steel or aluminium is used, it is not challenged that the novel design of the Moustache landing gear disclosed in the specification has the effect of reducing the overall weight of the landing gear.

[347] Bell’s experts do not seriously question the fact that the Moustache landing gear presents advantages over the use of conventional landing gear in terms of load factors and that the bending of the transition zones of the Moustache landing gear plays a leading role in the absorption of the

forces generated during rough and running landings. The general figure of 10% has not been seriously questioned by Bell's experts.

[348] To support its attack on utility, Bell mostly relies on the opinions of Dr. Hodges and Dr. Gandhi which have already been highlighted in the section dealing with factual and expert evidence. In a nutshell, having examined the documentation filed by Eurocopter, they are unable to conclude that all possible embodiments will meet the promise of the '787 Patent. Here, the issue is notably whether claims 1 to 16 include elements not disclosed by the inventor or embodiments whose utility could not be demonstrated at the relevant date, but were nevertheless caught by these claims.

[349] At the trial, Bell's experts went further and suggested that perhaps one or more embodiments included in claims 1 to 16 would not meet the promised utility. It turned out that their evidence was highly speculative and that no testing or simulations had been done by Bell to show that a particular embodiment did not work. Eurocopter's experts responded that some embodiments would not even be considered at face value by a POSITA because of the extreme degree of inclination; Mr. Toner agreed on this point.

[350] On a balance of probabilities, Bell has not proven that the invention will not work, or that it will not do what the specification promises it will do. However, Bell nevertheless submits that it has met its burden of proving that, at the Canadian filing date, there was no evidence or data to support a prediction made in the specification with respect to the promised utility of particular embodiments (such as Figures 1 and 11e) included in claims 15 and 16 of the '787 Patent. Absent such evidence

or data, Bell submits that the presumption of validity is not enough to save one or more embodiments.

[351] It is taught in the ‘787 Patent that the ground resonance behaviour is characterized in particular by the landing gear’s roll stiffness. In this regard, the inventors mention in the specification that the variant according to which the support points of the front cross piece are offset longitudinally towards the front of the aircraft (claim 15), such as the embodiment shown at Figure 1, has the advantage of allowing the roll operation of the assembly to cause the front piece to work both in torsion and in bending rather than in pure bending.

[352] Thus, in reading the specification, the POSITA would understand that in making a landing gear similar to Figure 1, the ground resonance behaviour of the helicopter (notably in the roll mode) can be improved. Although reduction in roll stiffness is not specifically promised, a better frequency adaptation, in relation to the phenomenon known as “ground resonance”, is certainly an important promise of the ‘787 Patent, together with other disclosed advantages of the invention. At this point, one must ask itself whether there are tests or data to support such a promise.

[353] Besides having thoroughly reviewed the opinions provided by the experts on both sides, relevant factual evidence on the development and testing of the Moustache landing gear has also been canvassed earlier by the Court and need not to be repeated below. The Court has also reviewed the drawings, calculations and test results on the Moustache landing gear for the period of 1995 to 2000 in light of the testimonies of the inventor himself, Mr. Prud’homme Lacroix, and of the parties’ experts. Included in these documents are drawings of the Moustache landing gear (JB-89 to

JB-95, JB-111, JB-115 and JB-129), finite element analysis and stress calculations including load factor results (JB-105, JB-114, JB-125, JB-128, JB-132, JB-137 and JB-176); static tests results on a one-fifth (1/5) model (JB-176) and drop test results on the full-size gear (JB-117 and JB-178).

[354] On a balance of probability, the Court is satisfied that the utility of an embodiment included in claim 15 of the ‘787 Patent was demonstrated at the Canadian filing date. The Court accepts the opinion of Eurocopter’s experts that a POSITA would not have tested all possible inclinations of the integrated front cross piece, which, according to claim 15, is offset forwards in relation to the front delimitation of the plane of contact of the longitudinal support surfaces of the skids on the ground. With his experience, the POSITA would have had no difficulty in choosing the most appropriate degree of inclination, considering the size and weight of the aircraft.

[355] In December 2005, a one-fifth model of the Moustache landing gear was designed, and subsequently produced in January 2006. Laboratory tests demonstrated that the aircraft equipped with the Moustache landing gear had excellent ground resonance characteristics. The first flight test of the EC120 with the Moustache landing gear occurred on July 4, 1996. The flight report (JB-179) states that there were “no problems with ground resonance at the moment (translation)”.

[356] The evidence clearly establishes that, as of the Canadian filing date, the inventors had made and tested a Moustache landing gear which was made of aluminium and had an integrated front cross piece inclined forward by the angle of that gear, and offset forward from the front delimitation of the plane of contact of the skids on the ground. It had three points of attachment (two at the front and one at the back).

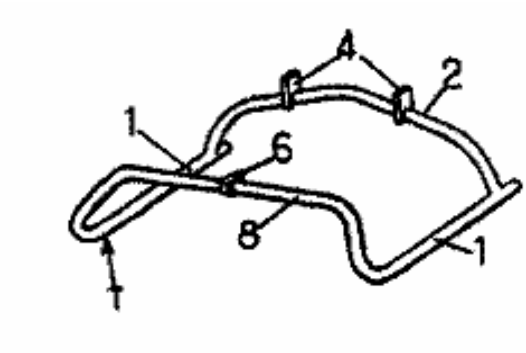
[357] According to the uncontradicted evidence, this embodiment of the Moustache landing gear offered better control of the frequencies in the pitch and roll modes (flowing from the inclination forward of the front cross-tube and its bending). Another advantage over the previous conventional gear used on earlier models developed by Eurocopter was that the Moustache landing gear would now be made entirely of aluminium alloy.

[358] The Moustache landing gears on the EC120 and EC130 (which has four points of attachments), which closely resemble Figure 1 of the ‘787 Patent, both fall squarely within the ambit of claim 15 of the ‘787 Patent which covers a “[l]anding gear according to any of claims 1 to 14, characterized in that said integrated front cross piece is offset forwards in relation to the front delimitation of the plane of contact of the longitudinal support surfaces of the skids on the ground”.

[359] Furthermore, one can presume that the EC120, equipped with the Moustache landing gear, would not have been certified had there been ground resonance problems. Currently, the Moustache landing gear is used on all of the EC120 and EC130 helicopters (over 1,200 aircraft) and according to Mr. Certain, no ground resonance problems have been experienced.

[360] In light of the promises of the ‘787 Patent, on a balance of probability, in final analysis, the Court finds that the utility of an embodiment included in claim 15 (offset forwards) has been demonstrated at the Canadian filing date; however, there is a lack of demonstrated utility or sound prediction with respect to an embodiment included in claim 16 (offset backwards).

[361] Whereas in all of the other embodiments, the front cross piece protrudes forward, meaning that it is offset forwards in relation to the front delimitation of the plane of contact of the longitudinal support surfaces of the skids on the ground, in the embodiment shown in Figure 11e this cross piece is set back meaning that it is offset towards the rear in relation to the aforementioned front delimitation:



[362] According to the specification, the variant in Figure 11e “procures the specific advantages” mentioned elsewhere in the specification. Thus, the POSITA would understand that in choosing to implement this particular embodiment of the Moustache landing gear, it is specifically promised by the inventors that this will also allow a manufacturer of helicopters to reduce costs and to mix flexibility with ground resonance safety.

[363] Apart from the general assertion that the embodiment shown in Figure 11e “procures the specific advantages” mentioned elsewhere in the specification, there is no particular demonstration in the patent, nor testimonial or documentary evidence that, at the Canadian filing date, the inventors had made and tested a Moustache landing gear whose front cross piece was offset backwards.

[364] Moreover, Dr. Wood was very reluctant at trial to conclude that the promised utility of an embodiment whereby the integrated front cross piece is offset backwards had been demonstrated at the Canadian filing date. No calculations or tests were performed prior to the filing date to determine the effect of this configuration on ground resonance.

[365] At the Canadian filing date, the inventors had no evidence that an inclination backwards had any ground resonance advantage. Therefore, the promised advantage with respect to an embodiment included in claim 16 of the ‘787 Patent is speculative and this Court accepts Bell’s experts assertion that there was no factual basis for the prediction.

[366] Furthermore, even if Eurocopter’s experts suggested that this configuration would also yield a flexible landing gear, the Court accepts Dr. Hodges’s testimony that a POSITA would think that such a landing gear “might be more vulnerable to buckling on impact than the forward slant, which would cause the landing gear to suffer a possible mode of failure”.

[367] Even if it is accepted that the results presented at pages 9-14 and Figures 12 and 13 of the ‘787 Patent demonstrate the flexion of the transition zone of a landing gear with a front cross piece offset forwards (claim 15), the fact remains that there was no demonstration for a landing gear with a front cross piece offset backwards (claim 16).

[368] Absent any evidence of actual testing by the inventors, perhaps the inventors had data upon which they could have predicted that the variant in Figure 11e (claim 16) “procures the specific advantages” mentioned elsewhere in the specification. If any such data existed at the time, it has not

been produced in this trial. Monopoly cannot be founded on speculation or guessing. The Court accepts at least on this point Bell's experts' opinion that available data did not support a sound prediction with respect to an embodiment included in claim 16 (offset backwards).

[369] After careful consideration of the factual and expert evidence, the Court finds on a balance of probabilities that contrary to the principle clearly articulated by Justice Layden-Stevenson in *Eli Lilly v Novopharm*, above, at para 60, the inventors had no information upon which to base the promise they expressly made in respect of the variant in Figure 11e. The utility of a helicopter landing gear according to claim 16 had not been demonstrated at the Canadian filing date, namely, June 5, 1997. Moreover, relevant data available prior to June 5, 1997, did not permit the inventors to soundly predict the behaviour of a Moustache landing gear with a front cross piece which is offset backwards and in any event, there is no line of reasoning described in the '787 Patent in that respect.

[370] The embodiment shown in Figure 11e is covered by claim 1 (which covers an inclination towards the front or towards the rear of the front cross piece) and by claim 16 which covers a "[l]anding gear according to any of claims 1 to 14, characterized in that said integrated front cross piece is offset backwards in relation to the front delimitation of the plane of contact of the longitudinal support surfaces of the skids on the ground".

[371] To the extent that claims 1 and 16 cover any embodiment whereby the front cross piece is offset backwards, all dependent claims, except claim 15, must be held invalid. Thus, the Court finds that claims 1 to 14 and claim 16 of the '787 Patent are invalid and void on the basis of lack of demonstrated utility (or sound prediction) and/or overbreadth.

[372] That said, Bell has failed to show that claim 15 of the ‘787 Patent is invalid on the basis of a demonstrated lack of utility or overbreadth. Indeed, there is no evidence on record showing that a landing gear made according to claim 15 will not work, or that it will not do what the specification promises it will do.

[373] Moreover, all other arguments made by Bell with respect to utility and overbreadth of claims 1 to 16 of the ‘787 Patent are otherwise dismissed by the Court.

[374] Rear crosspiece – According to Bell’s expert, notably Mr. Toner, claim 1 addresses all possible inclinations, whether towards the front or backwards, while there is no guarantee that the claimed invention will work. Having already construed the patent at issue, the Court prefers the opinion of Eurocopter’s expert, Mr. Logan, who testified that a POSITA would immediately understand that the rear crosspiece should be substantially perpendicular (as illustrated in Figure 1) because the description never discusses the inclination of the rear crosspiece. Thus, there is no overbreadth in this regard.

[375] Metal used to manufacture the landing gear – Claims 1 and 4 to 16 include landing gears made of steel, as there is no restriction to use aluminium, contrary to claims 2 and 3. Thus, Bell submits that a landing gear made of steel would not provide the promised utility of the ‘787 Patent and that claims 1 and 4 to 16 are overbroad and invalid as a consequence. This is a specious argument. The specification also states that “as a general rule, the cross pieces are made of steel tubes and the skids are made of aluminium tubes”. Consequently, the POSITA will understand that

the choice of material is important. If he wishes to obtain full advantage of the claimed invention, cross pieces should be made of aluminium as well. Thus, there is no overbreadth in this regard.

[376] Three or four devices for connection – Claims 10 and 11 include a landing gear according to any claims 1 to 9, characterized in that it includes three or four devices for connection to the structure of the helicopter. After having heard the experts on both sides and considered the totality of the evidence, the Court dismisses the assertion made by Dr. Hodges that without information about damping, it would be impossible for a POSITA in 1997 to know whether three and four points of attachment would function equally well and be free of ground resonance. Thus, there is no overbreadth in this regard.

X. **DECLARATIONS AND REMEDIES**

[377] Besides seeking the usual declaration of infringement and the issuance of a permanent injunction, Eurocopter also requests that Bell be ordered to remit or destroy any infringing gear, that it be permitted by the Court to elect between payment of its damages or an accounting of Bell's profits, and further seeks punitive damages, with pre and post-judgment interest and costs. Conversely, Bell who opposes these requests, seeks a declaration of invalidity of the claims of the '787 Patent held to be invalid by the Court, along with costs.

[378] The Court pauses to mention that confidential reasons on infringement and validity were communicated to the parties on July 12, 2011 and that an interim stay of proceeding of forty five days was concurrently ordered to allow the parties to have discussions of settlement. Moreover, in these confidential reasons, the Court also observed that lack of time at the trial had prevented

counsel to fully argue the matter of remedies and costs and that these issues would have to be addressed at a later date, if necessary.

[379] Between July 12, 2011 and January 13, 2012, the stay ordered by the Court was continued at the joint request of the parties, with the exception of the last one month extension which was granted on December 7, 2011 despite Bell's opposition. On January 11, 2012, the Court commenced to hear a motion by Eurocopter to maintain the confidentiality of the reasons on infringement and validity until such time a final judgment is rendered on all issues, including remedies. Following discussions with counsel, the confidentiality motion was withdrawn and it was agreed that the Court would render, by the end of the month of January 2012, a final Judgment dealing with infringement and validity, as well remedies.

[380] On January 12, 2012, a supplementary hearing was held to allow counsel to reply to or complete the written and oral submissions on remedies made on February 24 and 25, 2011, and to propose terms of the final Judgment to be rendered. Having reviewed the parties' written and oral submissions, including the disputed terms of Judgment proposed, it is useful to begin by summarizing key findings made by the Court with respect to infringement and validity issues raised by the parties.

Key findings with respect to infringement and validity

[381] Having construed the '787 Patent, the Court concludes that all of the elements of claim 1, the sole independent claim, are essential. Each dependent claim at issue introduces an additional limitation to each preceding claim. That said, helicopter landing gears according to any claims 1 to

14 are covered by claims 15 or 16 of the ‘787 Patent, with the characterization that the integrated front cross piece is offset forwards (claim 15) or backwards (claim 16) in relation to the front delimitation of the plane of contact of the longitudinal support surfaces of the skids on the ground.

[382] Eurocopter has failed to satisfy the Court that all of the essential elements of claim 1 of the ‘787 Patent are found in the Production gear. The Court takes note of the defendant’s admission that the Legacy gear contains all of the essential elements contained in claim 1. Based on the evidence, Eurocopter has further established that the Legacy gear also contains all of the essential elements contained in claims 2, 3, 4, 5, 7, 9, 10 and 15 of the ‘787 Patent.

[383] With respect to the Legacy gear, the Court dismisses the Gillette defence and the regulatory or experimentation exception based on subsection 55.2(1) of the Act or the common law.

[384] The Court also dismisses Bell’s allegations that the ‘787 Patent and claims 1 to 16 are invalid on the basis of insufficient specification (or lack of best mode), anticipation and/or obviousness. This leaves the issues of utility and overbreadth which are disposed of in the following manner.

[385] In light of the promises of the ‘787 Patent, on a balance of probability, in final analysis, the Court finds that the utility of an embodiment included in claim 15 (offset forwards) has been demonstrated at the Canadian filing date; however, there is a lack of demonstrated utility or sound prediction with respect to an embodiment included in claim 16 (offset backwards).

[386] To the extent that claims 1 and 16 cover any embodiment whereby the front cross piece is offset backwards, all dependent claims, except claim 15, must be held invalid. Thus, the Court finds that claims 1 to 14 and claim 16 of the ‘787 Patent are invalid and void on the basis of lack of demonstrated utility (or sound prediction) and/or overbreadth.

[387] All other arguments made by Bell with respect to utility and overbreadth are otherwise dismissed by the Court.

[388] Thus, the Court finds that claim 15 of the ‘787 Patent is valid and has been infringed by the making and use of the Legacy gear by Bell. However, the Court finds that claim 15 has not been infringed by the making and use of the Production gear by Bell, on the basis that not all of the essential elements of claim 1 are present.

Declarations

[389] According to section 42 of the Act, the grant of a patent confers to the patentee and the patentee’s legal representatives for the term of the patent, the exclusive right, privilege and liberty of making, constructing and using the invention and selling to the others to be used, subject to adjudication in respect thereof before any court of competent jurisdiction.

[390] Thus, any act which interferes with the full enjoyment of the statutory monopoly granted to the patentee constitutes infringement (*Monsanto Canada Inc v Schmeiser*, [2004] 1 SCR 902 at paras 34-35 (*Schmeiser*)). This includes the situation where a defendant has used an infringing

device, machine or component which was made or constructed by someone else, such as the Legacy gears manufactured at Bell's request by Aeronautical Accessories Inc.

[391] In the case at bar, both Eurocopter and Bell are entitled to declarations of validity and infringement (claim 15), and of invalidity and non-infringement (claims 1 to 14 and 16). In such a case, section 58 of the Act provides that effect shall be given to the patent as if it contained only the valid claim or claims. Accordingly, the Judgment to be released by the Court shall include the following declarations:

[392] Claim 15 of the '787 Patent is valid and enforceable.

[393] Claims 1 to 14 and 16 of the '787 Patent are invalid, null, void and of no force and effect.

[394] Bell has infringed claim 15 of the '787 Patent by using a Legacy gear as disclosed in exhibit JB-538 and depicted below:

[395] Bell has not infringed claim 15 of the '787 Patent by using and selling a Production gear as disclosed in exhibit JB-537 and depicted below:

[396] This now brings us to the remedies flowing from the granting, in part, of the infringement action. This particular issue has been the object of much debate between the parties, except for the delivery of the infringing landing gears and the calculation of pre and post-judgment interest.

Injunction

[397] Section 57 of the Act provides the Court with the discretionary power to issue an injunction, which will be commonly granted for an infringement or threatened infringement, unless there is some equitable reason not to do so, such as acquiescence, long delay, lack of clean hands, unconscionability, or triviality. Moreover, the granting of injunctive relief is not only to the benefit of a successful party but it is issued by the Court in the public interest to ensure the enforceability of the Canadian patent system (see Harold G. Fox, *Canadian Patent Law and Practice*, 4th ed (Toronto: Carswell, 1969) at page 487; David Vaver, *Intellectual Property Law*, 2nd ed (Toronto: Irwin Law Inc, 2011) at page 618 (Vaver); *Janssen-Ortho Inc v Novopharm Ltd*, 2006 FC 1234, 57 CPR (4th) 58 at para 132, aff'd 2007 FCA 217, 59 CPR (4th) 116 leave to appeal to SCC refused, [2007] SCCA 442 (QL), 383 NR 397 (*Janseen-Ortho*); *Weatherford Canada Ltd v Corlac Inc*, 2010 FC 602 at para 229).

[398] Bell submits that Eurocopter is disentitled to any equitable relief, including the grant of an injunction, because it had knowledge since 2005 that Bell was developing the Bell 429 with a sleigh-type landing gear and waited until May 2008 to institute the present action. Eurocopter also strategically chose not to send a cease and desist letter to Bell to put it on notice of the infringement. Moreover, the timing of Eurocopter's actions appears to have been oriented to produce maximum commercial upheaval. Bell also stresses that its conduct following the serving of the action has been impeccable: the only infringement committed has been long discontinued and there is no probability of its being resumed, all infringing Legacy gears having been quarantined by Bell.

[399] Bell's reading of the evidence provided by Eurocopter's witnesses on the issue of delay is somewhat incomplete. Perhaps a few Eurocopter's employees had seen Bell's model with a sleigh-type of landing gear at certain aviation showrooms in 2005 or 2006, but this is only hearsay evidence. However, it is only in February 2007 that the Bell 429 equipped with the Legacy gear achieved its first flight. In June 2007, the Direction juridique of Eurocopter learned for the first time of Bell's new landing gear on the Bell 429 that could possibly infringe the '787 Patent. Given that only a model had been observed, and that models change, the Court accepts Eurocopter's explanation that it would have been premature to take action at that time.

[400] Less than a year after the Direction juridique learned about the infringement, legal action was taken in May 2008 against Bell in Canada. A cease and desist letter was not sent prior to instituting the present proceeding because concerns were expressed regarding the risk that Bell might react by immediately initiating a declaratory proceeding in the United States (which Bell effectively did afterwards). Eurocopter did not want to lose its preferred choice of forum, which was

Canada. Having considered any prejudice allegedly suffered by Bell, the Court finds that the delays are not unreasonable and that the explanations provided by Eurocopter (notably by Mr. Méo) are reasonable in the circumstances.

[401] The Court pauses to mention that the infringement action was instituted by Eurocopter well before the expiry of the limitation period of six years (section 55.01 of the Act). While Eurocopter may have known for some time that the Legacy gear had been shown to the public at trade shows, "[a] patentee is not required to sue at the first drop of the hat" (*Sandvik, AB v Windsor Machine Co Ltd*, (1986) 8 CPR (3d) 433 at page 443). No cease and desist letter was sent by Eurocopter, but this is not required by law. Despite the fact that there were some delays before the institution of the infringement action, during the same period, Bell was itself experiencing delays in the development of the Bell 429, which still waited for certification when the action was instituted in May 2008. Any prejudice suffered by Bell is minimal in comparison to the prejudice caused to Eurocopter (which includes intangible losses and not only losses of sales, if any).

[402] Moreover, the Court finds that Eurocopter's representatives have not acted improperly at any time (this included their conduct at Le Bourget Airport in 2009). On the other hand, after the institution of the infringement action, Bell continued to maintain that it could use the Legacy gear, while taking steps to mitigate damages by putting in quarantine the gears in question and developing the Production gear in the meantime. However, it is not disputed that Bell's preferred model has always been the Legacy gear, because of its lesser weight and other design advantages over the Production gear. There were no admissions of infringement made by Bell whatsoever in this

proceeding. The Court learned at trial after long questioning of Dr. Hodges, Bell's own expert on infringement, that all the essential elements of the disputed claims were present in the Legacy gear.

[403] In final analysis, the Court has decided to grant an injunction whereby Bell is permanently enjoined, by itself or by its officers, agents, servants, employees, affiliates, subsidiaries, or any other entity under its authority or control, and each of them, and any person having knowledge of this injunction, from manufacturing, using or selling the Legacy gear as disclosed in exhibit JB-538, or any similar landing gear that infringes upon claim 15 of the '787 Patent, or any helicopter comprising such infringing landing gear, until same expires or is otherwise held to be invalid by a Court.

Delivery up of infringing landing gears

[404] Normally, an order for delivery up of infringing material follows the award of an injunction as stated in *Laboratoires Servier*, above, at page 496. In this eventuality, Bell has requested that the destruction order becomes enforceable within no later than thirty days after final judgment disposing of all appeals, except for one Legacy landing gear which it may solely use in corresponding litigation against Eurocopter in other jurisdictions. Eurocopter does not object to this request.

[405] Accordingly, the Court will also order Bell to destroy, under oath, within no later than thirty days after final judgment disposing of all appeals maintaining the validity and infringement of claim 15 of the '787 Patent, all Legacy gears as disclosed in exhibit JB-538 that are in its possession or under its authority or control at the date of this judgment, except one Legacy gear which Bell may

store, or have stored, solely for the purpose of potential use in corresponding litigation against Eurocopter in other jurisdictions, the said one Legacy gear to be destroyed under oath, within no later than thirty days after final judgment disposing of all appeals in the other jurisdictions.

Damages or profits

[406] Once a patentee has successfully demonstrated infringement, the Court has the discretion to grant the patentee's choice of remedies – either damages (pursuant to section 55 of the Act) or an accounting of profits (pursuant to section 57 of the Act). Moreover, an egregiously bad infringer may also be ordered to pay punitive or exemplary damages in addition to general damages or profits (this particular issue will be dealt with separately).

[407] The purpose of an award of damages is to restore the plaintiff to the position in which it would have been had the infringement never occurred. Every infringement is a separate wrong, and thus, each unit made infringes (in this case, each Legacy gear), but "[a] sense of proportion must, however be retained" (Vaver, above, at page 632). The fact that Bell allegedly did not know its acts constituted infringement is irrelevant to its liability; damages for infringement track those for tort generally (Vaver, above, at pages 631-632). As stated by the Supreme Court of Canada in *Schmeiser*, above, at para 37, "[a]s a practical matter, inventors are normally deprived of the fruits of their invention and the full enjoyment of their monopoly when another person, without licence or permission, uses the invention to further a business interest", which was clearly the case in this instance.

[408] Be that as it may, Bell nevertheless submits that there is no automatic right to damages flowing from a finding of infringement. Here, it is pleaded that there have been no sales made by Bell of a helicopter equipped with the Legacy gear and clients could care less what the landing gear looks like. According to Bell, any hypothetical damages suffered by Eurocopter as a result of the infringement would be *de minimis* and are too remote to be claimed. At this point of time, the quantum of any such damages does not have to be determined by the Court in view of the bifurcation order. However, Bell's position that Eurocopter's damages are minimal emphasises the need to address today the question whether punitive damages should be ordered as requested by Eurocopter who pleads that the granting of ordinary damages will be insufficient to meet the objectives of punishment, deterrence and denunciation in this case. This issue will be addressed later on in these reasons.

[409] Here, Eurocopter asks that it be allowed to elect between damages or profits. One advantage of the remedy of account of profits over damages is that it is available even where the claimant can prove no loss or where the wrongdoer has profited more than the patent-holder lost from the infringement. The objective of the award is to restore those actual profits to their rightful owner, the plaintiff, thereby eliminating whatever unjust enrichment has been procured by the defendant. It is, however, necessary to show some basis for the exercise of equity (*Janssen-Ortho*, above, at para 132).

[410] The Court has already dismissed Bell's argument that Eurocopter should be disentitled of the equitable relief of an injunction because of the delays or its conduct. Again, the Court is satisfied that Eurocopter has "clean hands", accepts Eurocopter's evidence of mitigation of damages, finds

that Eurocopter had good reasons not to serve a cease and desist letter to Bell prior to instituting the present action, and also finds that Eurocopter has exhibited no inequitable conduct either before or during trial. But is this enough to allow an accounting of profits?

[411] Bell notably submits that an inquiry as to profits is complex, and because of that, courts have been very reluctant to grant such remedy. Perhaps such complexity does not prevent the Court from exercising its discretion, but there must exist good reasons to do so (*Merck & Co Inc v Apotex Inc*, 2010 FC 1265 at paras 615-616). As explained below, the complexity of an accounting of profits and other relevant factors weigh heavily against such a remedy in this case.

[412] One difficulty is that a landing gear, although essential for the proper functioning and security of a helicopter, represents just a small part of the total cost of a helicopter. In the case at bar, the extent of infringement compared to the non-infringement activities of Bell, the special circumstances of this case, the complexity of the calculation of profits, the added complexity and length of the proceeding and the absence of clear benefits resulting from an accounting of profits, militate strongly in favour of the Court's discretion to refuse the equitable remedy of an account of profits.

[413] It is settled law that the inventor is only entitled to that portion of the infringers' profit which is causally attributable to the invention (*Lubrizol Corp v Imperial Oil Ltd*, [1997] 2 FC 3 (CA) (*Lubrizol*); *Celanese International Corp v BP Chemicals Ltd*, [1999] RPC 203 (Pat Ct) at para 37; *Schmeiser*, above, at para 101). The preferred means of calculating an accounting of profits is what has been termed the value-based or "differential profit" approach, where profits are allocated

according to the value contributed to the defendant's wares (N. Siebrasse, "A Remedial Benefit-Based Approach to the Innocent-User Problem in the Patenting of Higher Life Forms" (2004), 20 CIPR 79; *Schmeiser*, above, at para 102).

[414] Profits flowing from non-infringing activity are not recoverable; thus, Eurocopter cannot recover profits flowing from the sales of Bell 429 helicopters equipped with the Production gear which has been held by the Court not to infringe the '787 Patent. This leaves the twenty-one Legacy gears which were manufactured or used by Bell some time between 2005 and 2008. Determining what Bell has gained in profits from the infringement will be a highly complex and controversial exercise. Eurocopter has alleged that Bell was able to secure sales of the Bell 429 and should not profit from its infringing action. Mr. Kohler testified that prior to May 2008, "non-binding" letters of intent, entailing deposits totalling approximately $6,000,000 had been signed by customers interested in buying the Bell 429 (which would have been equipped with the Legacy gear). In all likelihood, if Eurocopter is permitted to elect between damages or profits, there will be further discoveries. Eurocopter will ask Bell to lay open its books of account, leading to a number of objections. In the present case, an accounting of profits may have no practical use at the end, except generating multiple, time and cost consuming disputes between the parties.

[415] The Court heard general figures of $5,000,000 and $6,000,000 as to the sale price asked by Bell for the Bell 429. Naturally, this does not tell us what is the total cost of a helicopter, nor the amount of net profit made by Bell when it sells a Bell 429. Considering that the monetary value of an individual gear is rather limited (at trial the figure of $20,000 -$25,000 was suggested) and that none was ever incorporated in a helicopter sold by Bell, it is questionable whether an accounting of

profits should be permitted in the first place. After all, Bell was prudent enough in May 2008 to quarantine the Legacy gears and opt for another landing gear (the Production gear), which did indeed limit the amount of profits Eurocopter can claim as a result of the infringement of claim 15 of the ‘787 Patent.

[416] In the final analysis, having balanced the equities, the Court has decided not to permit Eurocopter to elect between an award of damages or an account of profits. The Court finds that Eurocopter is entitled to general damages, which may comprise the loss of profits from sales, or perhaps lost royalty payment in the alternative (*Schmeiser*, above, at para 100). This award includes all compensatory damages suffered by Eurocopter, as long as they are a result of the infringement of claim 15 of the ‘787 Patent.

Punitive damages

[417] Eurocopter also seeks punitive damages; however, if allowed by the Court, their quantum should be assessed later by reference in view of the terms of the bifurcation order. Eurocopter submits that Bell knowingly and maliciously infringed the ‘787 Patent by the making and using of the Legacy gear, which was also shown to the public for the purpose of stimulating orders for the purchase of the Bell 429. Bell’s outrageous conduct caused irremediable damages that simply cannot be corrected by an award of damages or an account of profits, and which are aggravated by the fact that Bell has mislead and continued to mislead the public into believing that the Bell 429 is the first helicopter to use a sleigh type skid landing gear.

[418] While reiterating that any infringing conduct was innocent and not intentional, Bell submits that it would be premature for this Court to make a determination to award punitive or exemplary damages prior to the reference and assessment of the quantum of ordinary damages or profits, as the case may be. Bell also denies that the article presented in Spring 2008 in Montréal at the American Helicopter Society 64th Annual Forum, entitled "Development of the Bell Helicopter's Model 429 Sleigh Type Skid Landing Gear", in Montréal (JB-224), and authored by Mr. Minderhoud is misleading, while questioning the Court's jurisdiction to entertain a general tort of misrepresentations.

[419] There have been many awards of punitive or exemplary damages made by Canadian courts. They have not been limited to defamation and intentional tort situations, where they are most prevalent, but they may be awarded in contract cases, in certain negligence cases, fiduciary relationship cases, and other situations where the court, in a civil case, feels that it is necessary to condemn the outrageous conduct of a defendant. As stated in 1996 by the Federal Court of Appeal in *Lubrizol Corp v Imperial Oil Ltd*, [1996] FCJ 454 at para 33 (*Imperial Oil*), there is "no reason why, in appropriate circumstances, punitive or exemplary damages could not be available in a copyright or patent infringement case, a type of statutory tort claim".

[420] Punitive damages are awarded when a party's conduct has been malicious, oppressive and high-handed, or offends the court's sense of decency, or represents a marked departure from ordinary standards of decent behaviour (*Whiten v Pilot Insurance Co*, [2002] 1 SCR 595 at para 36 (*Whiten*)). Moreover, as cautioned by the Supreme Court of Canada in *Hill v Church of Scientology of Toronto*, [1995] 2 SCR 1130 at para 196 (*Hill*), "it is important to emphasize that punitive

damages should only be awarded in those circumstances where the combined award of general and aggravated damages would be insufficient to achieve the goal of punishment and deterrence".

[421] Punitive and exemplary damages have been awarded in cases of trade-mark and copyright infringement, where, for example, the conduct of the defendants was "outrageous" or "highly reprehensible", or where the defendant's actions constituted a callous disregard for the rights of the plaintiff or for injunctions granted by the Court (*Microsoft Corporation v 9038-3746 Quebec Inc*, 2006 FC 1509 at paras 91, 92, 98 and 110-112; *Louis Vuitton Malletier SA v Yang*, 2007 FC 1179 at paras 45-53; *Louis Vuitton Malletier SA v 486353 BC Ltd*, 2008 BCSC 799 at para 86; and *Microsoft Corporation v PC Village Co Ltd*, 2009 FC 401 at paras 41-44; and *Robinson c Films Cinar inc*, 2009 QCCS 3793 at paras 1036-1072 (QSC), amount of punitive damages reduced in appeal, 2011 QCCA 1361 at paras 229-260).

[422] The standard of proof in punitive or exemplary damage cases, including in a patent infringement affair, is the civil standard of proof – on the balance of probabilities – not the criminal standard of proof – beyond a reasonable doubt (*Imperial Oil*, above, at para 32). While "there is no room for talk of *actus reus* and *mens rea*" (*Imperial Oil*, above, at para 38), the intentional character of the infringement, along with the overall conduct of the defendant, including the fact that the infringement was "planned and deliberate", are relevant factors to consider (*Whiten*, above, at para 113).

[423] The alleged knowledge, or absence of knowledge, of the existence of the statutory monopoly conferred to Eurocopter by the '787 Patent (and in the United States and Europe by the

American and French Patents) related to the “Moustache landing gear” (notably used on the EC120 for many years), can be proven by an admission of a party in a proceeding, a former declaration made out of court, the testimony of a witness, the documents produced at trial, the actions taken by a party or its employees or representations, and any other means.

[424] Starting with section 2 of the Act, “patent” means “letters patent for an invention”, and all patents granted, applications for patents and documents filed in connection therewith, are open for public inspection at the Patent Office. As such, a “patent” is included in the definition of “regulation” found in section 2 of the *Interpretation Act*, RSC 1985, c I-21. That said, after the patent is issued, paragraph 43(2) of the Act creates a presumption of validity, as “it shall, in the absence of any evidence to the contrary, be valid and avail the patentee and the legal representatives of the patentee for [its] term”. In the case at bar, the ‘787 Patent was issued on December 31, 2002 to Eurocopter from an application filed on June 5, 1997, claiming priority based on French Patent application No. 96 07158, filed in France on June 10, 1996.

[425] Having considered the totality of the evidence, the Court finds that Bell’s assertion that it had no knowledge whatsoever of the ‘787 Patent prior to May 2008 is simply not plausible and contrary to the evidence. Mr. Lambert, Mr. Kohler and Mr. Gardner all testified that they had no personal knowledge of the ‘787 Patent, but the issue is whether there was corporate knowledge of same, and the answer is yes. Ignorance of the law is not a valid excuse, and there is no evidence supporting any genuinely held belief that Bell was the first to develop a sleigh type of landing gear having the features of claim 15 of the ‘787 Patent.

[426] Sometimes identified in the documentation as the “original gear”, the Legacy gear was developed by Bell between 2004 and 2007, that is, during the period of validity of the ‘787 Patent which will expire on June 5, 2017. As Bell had never designed a helicopter with an articulated rotor and a sleigh type landing gear, they studied the performance of an EC120 which is equipped with a Moustache landing gear. Bell leased and operated an EC120 helicopter from approximately March to June 2003, during which time Bell performed tests on the EC120 helicopter, including a handshake test. Moreover, Bell employees received training in Dorval, Quebec, on an EC120 helicopter in March 2003. It turned out that the Legacy gear used by Bell and publicised in multiple documents was no more than a slavish copy of the patented Moustache landing gear.

[427] Bell and its parent company, Textron, are sophisticated corporate entities employing thousands of engineers and highly skilled personnel. Both have legal and intellectual property departments. Advanced software permit to search and find applications and patents relevant in the field of helicopters worldwide. Indeed, at the time of infringement, there was a policy manual and guidelines with respect to intellectual property matters, including measures to avoid infringing on valid intellectual property rights held by others (see exhibits JB-397 and JB-398). The technical resource specialists (TRS’s) have the responsibility to maintain cutting edge technical capabilities in their discipline, to maintain cognitions of competitive patents and other intellectual property outside the company, and to advise the leaders of the Integrated Product Teams (IPT’s) of any concern regarding potential infringement that might occur during new product or process developments.

[428] There are a number of credibility concerns with respect to key aspects of the testimonies of Mr. Kohler and Mr. Lambert. For one, Mr. Kohler was not personally involved in the Bell 429

program and the Court has found his testimony to be far from candid. For example, Mr. Kohler first stated that Bell had received no purchase orders for the Bell 429 equipped with the Legacy gear; however, during cross-examination and being confronted with the documentary evidence, Mr. Kohler had to admit that more than 200 purchase orders had been received at that time for the Bell 429 (or the Bell 427i discontinued model) and that deposits totalling $6 million dollars had been received by Bell (see notably exhibits JB-43, JB-233, JB-244 and JB-245).

[429] Mr. Lambert was Chief Engineer for the Bell 429 from 2004 until the time it was certified in 2009. He notably testified that, during the time that he was with Bell, he was aware that an EC120 had been leased to evaluate certain characteristics of the rotor and the landing gear. Mr. Lambert also stated that "benchmarking" with competitive products in the aeronautics industry is a usual practice, including at Bombardier where he is now. As aforementioned, in 2003, it was Mr. Malcolm Foster who was in charge of the MAPL program, and Mr. Lambert admitted that it is Mr. Foster who had brought the concept of a sleigh type of landing gear in the first place.

[430] That said, the documentary evidence (see notably JB-372 and JB-478), and Mr. Gardner's statements during discovery (see exhibit P-22) and his overall testimony at trial, contradict Bell's gratuitous suggestion that the tests and studies performed on the EC120 were strictly for "benchmarking" purposes. Bell did not just compare the performance of an existing Bell helicopter equipped with a conventional gear and the performance of a Eurocopter helicopter equipped with a sleigh type gear, Bell went a step ahead, and decided to import and copy the unique and new patented technology developed by Eurocopter.

[431] There was no mistake of fact. It was known at Bell and Textron that the sleigh gear closely resembled the Moustache landing gear of the EC120. Mr. Gardner even testified that the Legacy gear has all of the characteristics of the Moustache landing gear (except for the lower curve). However, Mr. Lambert did not worry about that, as it was Mr. Foster's job to make the necessary inquiries. In fact, evidence obtained during discovery reveals that when concerns were raised about the similarity between the Legacy gear and the EC120 landing gear, Mr. Foster advised Bell's engineers to "carry on". In pursuing the project, Bell acted in a foolhardy manner (indeed their actions are contrary to their own policy manuals) and its conduct represented a marked departure from ordinary standards of decent behaviour.

[432] When it designed its sleigh type of gear, Bell knew or should have known of the '787 Patent. It is implausible that between 2003 and May 2008, Bell was ignorant of Eurocopter's intellectual property rights. Again, Mr. Foster was responsible to ensure that the chosen design did not infringe the '787 Patent; he was not called as a witness. Mr. Minderhoud who was closely involved in the calculations of the Legacy gear and publicly praised its performance should have known as well; he also did not testify at trial. Bell had an intellectual property service that was specifically responsible for verifying possible infringements; no employee of that department testified at trial, while Bell resisted on grounds of privilege requests for opinions, or has otherwise been evasive on the subject. Accordingly, the Court is allowed to draw a negative inference from these various omissions.

[433] On a balance of probability, the Court finds that there is clear evidence of bad faith and egregious conduct on the part of Bell. This is not a case where the infringement is small, trivial or

isolated, or where the defendant is unsophisticated or ignorant. This is a case of wilful blindness or intentional and planned misappropriation of the claimed invention. Eurocopter has proven that the infringement of the ‘787 Patent by the making and use of the Legacy gear was not innocent or accidental.

[434] The evidence conclusively establishes that Bell had plans to manufacture and incorporate the Legacy gear in its Bell 429 model, as soon as it could obtain certification. Bell actively promoted the sales of the Bell 429 equipped with the Legacy gear. Bell has shown no remorse and offered no excuse for its behaviour. Denying that there was infringement, Bell took a vindictive position throughout the proceeding, pleading that it could avail itself of the regulatory or experimental exception and that it was simply practising prior art.

[435] In exercising its discretion to award punitive damages, the Court also takes into account the fact that the development of a helicopter is a highly complex and costly endeavour, and that only a few players in the industries possess sufficient technology and employ the highly qualified personnel necessary to design, develop, test and manufacture a landing gear that will have all the required characteristics and advantages such a key piece equipment must have before same can be incorporated in a helicopter.

[436] Punitive damages are required in this case not only to punish Bell but to deter others from acting in a similar manner. The fact that only twenty-one Legacy gears were used by or made for Bell is besides the point and does not take into account the reality of the length of time, the gravity and planification of the infringement. Bell’s overall conduct is highly reprehensible and constitutes

a callous disregard for the rights of Eurocopter who was forced to institute the present action. Bell well knew how much time, research, testing and money expenditures were behind the development of the Moustache landing gear.

[437] In its article of April-May 2008 (JB-224), Mr. Minderhoud writes at page 9:

> Looks are deceptive: the sleigh type landing gear is a visually simple design, but its development is very complex and challenging due to the large number of conflicting requirements. Tremendous improvements in predictive analysis tools and data processing have contributed to the development of the fixed skid landing gear from the Bell Model 47 (first flight in 1943) to the new sleigh type landing gear for the Model 429 (first flight 2007); see Fig. 11.

[438] Figure 11 of the Minderhoud article shows a picture of the Bell Model 47 (equipped with a conventional gear) on the ground and of the Bell 429 (equipped with the Legacy gear) in the air. The Legacy gear shown on the picture is presented as a nearly finished product and a major technological breakthrough compared to the conventional type of landing gear (although there may be still some further testing). Both in the summary and the article, reference is made to the fact that this sleigh type of gear "has been designed for the first time" by Bell. This carries a very strong message to the public and the potential buyers.

[439] Bell's counsel suggests that the Court should be indulgent. Readers of the Minderhoud article would have known that the EC120 was already equipped with a similar type of sleigh landing gear. If the statement above carries some ambiguity, any doubt should favour Bell. Having read same in the context of the totality of the Minderhoud article, the Court finds that there is an innuendo that Bell is the "first", and it is debatable whether the careful chosen words suggest that Bell is the first to have designed a sleigh type of landing gear. Otherwise, there would be no purpose

of celebrating in the article the fact that the Bell 429 model is the first helicopter designed by Bell using an already known technology in the field. It turns out that the main purpose of the article is to attract the attention on Bell's technology and to stimulate sales of the Bell 429, and there is no reference whatsoever in the article or a footnote that the sleigh type of landing gear has been in use for some time in the industry.

[440] It is not requested here to entertain a general tort for alleged misrepresentations. The issue is whether punitive or exemplary damages should be awarded to Eurocopter following the Court's finding that the infringing conduct was planned and deliberate, and that same persisted over a lengthy period of time (2004-2008) although only twenty-one landing gears were made for or used by Bell. In this context, the representations publicly made by Bell with respect to the development of the infringing Legacy gear are relevant to determine whether or not the conduct of Bell is truly outrageous. Indeed, the Court finds that the representations contained in the Minderhoud article are rationally connected to the infringement of the '787 Patent by Bell and add to its outrage at the egregious conduct of Bell.

[441] Not only did Bell profit from its misconduct – the development of the Production gear would not have been possible without the development of the Legacy gear – but the evidence shows that Bell concealed the fact to the public and the potential purchasers of the Bell 429 that it had imported from a competitor the sleigh type landing gear and copied the Moustache Landing gear from Eurocopter EC120, while suggesting that the Legacy gear was somewhat a "premiere" at Bell and publicly claiming in the Minderhoud article the unique advantages in terms of improved

dynamic behaviour (ground resonance) and the lower weight of the Legacy gear, all advantages already publicly disclosed in the ‘787 Patent.

[442] Reference at the trial was also made to Bell’s promotional videos showing the features of the Bell 429 (JB-86 and JB-225). These videos very briefly mention that the sleigh type landing gear is one of the key technologies from the MAPL Program. However, according to Bell, the sections of these videos that discuss the sleigh type landing do not suggest that Bell is the first helicopter manufacturer to adopt a sleigh type landing gear. Be that as it may, the Court finds that after the institution of the action in May 2008, Bell and its distributors have continued to promote the Bell 429 equipped with the Legacy gear (see notably exhibits JB-226 to JB-229) which constitutes reprehensible conduct which further aggravates the damages caused by the infringement of the ‘787 Patent.

[443] The Court also dismisses Bell’s argument that it would be premature at this stage to make a determination to award punitive or exemplary damages.

[444] Bell’s counsel relies on the following statement by Justice Sharlow, writing for the Federal Court of Appeal in *Apotex Inc v Merck & Co*, 2003 FCA 291 at para 34 (*Apotex*):

> The purpose of punitive damages is to punish, to deter the wrongdoer and others, and to denounce wrongful behaviour. Punitive damages are awarded only where compensatory damages and other normal civil remedies are insufficient to accomplish those objectives, and in an amount that is no greater than necessary to accomplish that objective: *Whiten, supra; Hill v. Church of Scientology of Toronto*, [1995] 2 S.C.R. 1130. It is axiomatic that until all the ordinary civil remedies are finally determined (which in this case would include a determination as to whether the remedy is an award of damages or an accounting of profits, and the quantum), it is impossible to determine

> whether punitive damages are required to meet the objectives of punishment, deterrence and denunciation.

[445] Eurocopter's counsel stresses that in *Apotex*, above, there had been no trial, but only a summary judgment, and that the whole issue of appropriate remedies, not just quantum, had been bifurcated, as noted in paras 23-24 of *Apotex*, above. Thus, the Federal Court of Appeal's general comments in para 34 have to be evaluated in their proper context. He suggests that the present case is very different from a factual point of view since evidence was adduced and argument was made at trial on the characterization of Bell's conduct.

[446] The Court agrees with Eurocopter's counsel. In order to properly put in context what the Federal Court of Appeal has stated in para 34 of *Apotex*, above, one must bear in mind that this case presented "an unusual situation that arose because the merits of the infringement claim were dealt with by way of summary judgment motions by both parties" and that this "resulted in a *de facto* bifurcation between the liability and remedy phases" [Emphasis added] (*Apotex*, above, at para 23).

[447] A major problem in *Apotex*, above, was that the motions judge should have first allowed "Apotex to discover Merck on issues of remedy so that it could make appropriate submissions on whether Merck should be entitled to make the election", before concluding, as the motions judge apparently did, that "the facts relating to entitlement have not changed" (*Apotex*, above, at para 33). The Federal Court of Appeal further noted that there was "a certain ambiguity in the judgment of the motions judge on the question of whether the referee was empowered to grant punitive damages, or merely to quantify them" (*Apotex*, above, at para 35).

[448] Therefore, it is not surprising that the Federal Court of Appeal found that "the motions judge erred in deciding, before the other remedies are determined, that Apotex is liable for punitive damages" (*Apotex*, above, at para 35). Bell's counsel also relies on *Laboratoires Servier*, where the comments in *Apotex*, above, at para 34, were cited by Justice Snider, but in this case both parties had "agreed that it would be premature for [her] to make that determination prior to the reference on damages" (*Laboratoires Servier*, above, at para 514).

[449] The bifurcation order issued on consent on October 2, 2009 makes it crystal clear that the referee is not empowered to grant damages (or profits), including punitive damages, but merely to calculate the quantum of such damages (or profits). Moreover, only the quantum of damages, profits and punitive damages has been bifurcated and not the entitlement to any such remedies. Accordingly, the trial judge is the only person who can determine whether punitive damages should be allowed to Eurocopter.

[450] If the Court is to accept Bell's argument that it is premature to decide whether Eurocopter is entitled to an award of punitive damages, this means that the amount of ordinary damages would first have to be calculated by the referee. Considering that in all likelihood both parties will file appeals and counter-appeals of this Judgment, the calculation of ordinary damages by the referee will have to wait the exhaustion of all such appeals and counter-appeals.

[451] Subject to any appeal of the referee's decision on the quantum of ordinary damages, this may take several years before the matter of entitlement to punitive damages comes back to the trial judge. Assuming that the trial judge is still in function, he would have the burden of reviewing many

years later the totality of the evidence submitted at trial (more than 20 days of hearing witnesses and some 540 exhibits) to determine whether the behaviour of Bell justifies the granting of punitive damages. Since the trial was conducted years earlier, it may be necessary to permit parties to present new evidence, and perhaps, to even order a new trial if the trial judge is not in function anymore.

[452] If the trial judge renders a final judgment granting punitive damages, Bell may then wish to file an appeal on Eurocopter's entitlement to punitive damages. Again, a hearing by the referee on the calculation of such punitive damages would have to wait the exhaustion of all appeal procedures and a confirmation of the trial judge decision to award punitive damages. Then, and only then, if one accepts Bell's argument, the referee could calculate the amount of punitive damages as a result of the infringement by Bell of the '787 Patent.

[453] There is a key guiding principle, enshrined in Rule 3 of the *Federal Courts Rules*, SOR/98-106, that the application and interpretation of any procedural rule of conduct should not run contrary to the just, most expeditious and least expensive determination of every proceeding on its merits. Accordingly, the Court accepts the submission made by Eurocopter's counsel that it makes no practical sense to defer judgment on the issue of punitive damages, and that it is contrary to the best interests of the parties and the administration of justice not to decide at this stage on Eurocopter's entitlement to punitive damages.

[454] There was full discovery prior trial ample evidence at trial on the respective conduct of the parties. Bell notably claimed that Eurocopter was not entitled to any equitable remedies because of its conduct. The Court has already examined this issue above. The Court has refused to permit

Eurocopter from electing between damages or profits although it found no fault on the part of Eurocopter. This leaves only the assessment of such damages. This makes this case very different from *Apotex*, above.

[455] Perhaps, this case is exceptional and very different from other patent infringement cases. In these instances, the extent of infringement is generally unknown. This is not the case here. Moreover, it is undisputed that twenty-one Legacy gears were made or used by Bell. It also appears that there were no sales of any Bell 429 model equipped with a Legacy gear, although pre-orders were made and deposits were received by Bell prior to the institution of the action in infringement and the certification of the Bell 429 with the Production gear. Considering the evidence presently on record, chances are that, in any case, an award of ordinary damages – which, as submitted by Bell, will be minimal if Eurocopter is unable to prove any losses of sales and causation as a result of the infringement – will simply not be enough to achieve the goal of punishment and deterrence.

[456] In final analysis, the Court finds that Eurocopter is entitled to punitive damages as a result of the infringement by Bell of the ‘787 Patent and the deliberate and outrageous conduct of Bell in this case. However, the quantum of any such damages suffered by Eurocopter as a result of the infringement by Bell of the ‘787 Patent is a matter left for future determination in view of the bifurcation order.

Determination of the quantum of damages

[457] Both parties ask that the quantum of damages be adjudged either by a referee or by the trial judge, if he so chooses and is available to conduct a hearing (after completion of discovery if necessary).

[458] Contrary to a referee, the undersigned Judge is already familiar with the voluminous evidence adduced by the parties. This presents the advantage of avoiding unnecessary duplication of the evidence and imposing a supplementary financial burden on the parties. Moreover, the undersigned Judge is in a privileged position to determine the amount of compensatory and punitive damages, considering that the balancing of aggravating and mitigating factors are also relevant in such an exercise.

[459] Accordingly, the Court shall declare that Eurocopter is entitled to all damages, including punitive damages, resulting from the infringement by Bell of claim 15 of the ‘787 Patent, the quantum of which is to be determined by the trial judge or a referee (if the trial judge is not otherwise available) at a later hearing after exhaustion of all appeals, pursuant to the terms of the bifurcation order, and subject to any further direction or order of the Court.

Pre and post-judgment interest

[460] Parties agree that in the event that this Court orders an award of damages, pre-judgment interest should be allowed in respect of any monetary award of damages. It should not be compounded. The rate of such interest should be calculated separately for each year since the

infringing activity began at the average annual bank rate established by the Bank of Canada as the minimum rate at which it makes short term advances to the banks listed in Schedule 1 of the *Bank Act*, SC 1991, c 46.

[461] Moreover, the parties agree that post-judgment interest, should not be compounded, and should follow the establishment of the quantum of damages at the rate of five percent established by section 4 of the *Interest Act*, RSC 1985, c I-15.

Costs

[462] Both parties agree that the issue of costs be reserved by the Court and be debated at a later date by counsel.

[463] Bell prefers that the matter of costs be reserved by the Court until final Judgment disposing of all appeals, while Eurocopter insists that representations as to costs be dealt with according to a schedule to be determined by the parties and approved by the Court within thirty days of the Judgment to be rendered below.

[464] Failing an agreement between the parties, the matter of costs shall be reserved and may be addressed by either party, by way of a motion in writing, served and filed to the Court within thirty days after this Judgment has become final, and subject to any further direction or order of the Court.

JUDGMENT

THIS COURT ORDERS AND ADJUDGES that:

1. Claim 15 of Canadian Patent No. 2,207,787 is valid and enforceable;

2. Claims 1 to 14 and 16 of Canadian Patent No. 2,207,787 are invalid, null, void and of no force and effect;

3. The defendant has infringed claim 15 of Canadian Patent No. 2,207,787 by using a Legacy Landing Gear as disclosed in exhibit JB 538 and depicted below:

4. The defendant has not infringed claim 15 of Canadian Patent No. 2,207,787 by using and selling a Production Landing Gear as disclosed in exhibit JB-537 and depicted below:

5. The defendant is hereby permanently enjoined, by itself or by its officers, agents, servants, employees, affiliates, subsidiaries, or any other entity under its authority or control, and each

of them, and any person having knowledge of this injunction, from manufacturing, using or selling the Legacy Landing Gear as disclosed in exhibit JB-538, or any similar landing gear that infringes upon claim 15 of Canadian Patent No. 2,207,787, or any helicopter comprising such infringing landing gear, until same expires or is otherwise held to be invalid by a Court;

6. The defendant is hereby ordered to destroy, under oath, within no later than 30 days after final judgment disposing of all appeals maintaining the validity and infringement of claim 15 of Canadian Patent No. 2,207,787, all Legacy Landing Gears as disclosed in exhibit JB-538 that are in its possession or under its authority or control at the date of this judgment, except one Legacy Landing Gear which the defendant may store, or have stored, solely for the purpose of potential use in corresponding litigation against the plaintiff in other jurisdictions, the said one Legacy Landing Gear to be destroyed under oath, within no later than 30 days after final judgment disposing of all appeals in the other jurisdictions;

7. The plaintiff is entitled to all damages, including punitive damages, as a result of the infringement by the defendant of claim 15 of Canadian Patent No. 2,207,787, the quantum of which is to be determined by the trial judge or by a referee (if the trial judge is not otherwise available) at a later hearing after exhaustion of all appeals, pursuant to the terms of the bifurcation order issued on October 2, 2009, and subject to any further direction or order of the Court;

8. The plaintiff shall be entitled to pre-judgment interest on the award of damages, not compounded, at a rate to be calculated separately for each year since the infringing activity

began at the average annual bank rate established by the Bank of Canada as the minimum rate at which it makes short-term advances to the banks listed in Schedule 1 of the *Bank Act*, SC 1991, c 46;

9. The plaintiff shall be entitled to post-judgment interest on the award of damages, not compounded, at a rate of 5% per annum, as established by section 4 of the *Interest Act*, RSC 1985, c I-15. This interest shall commence upon the final assessment of the monetary damages amount, until then pre-judgment interest shall prevail;

10. Failing an agreement between the parties, the matter of costs is reserved and may be addressed by either party, by way of motion in writing, served and filed to the Court within 30 days after this Judgment has become final, and subject to any further direction or order of the Court.

"Luc Martineau"

Judge

FEDERAL COURT

SOLICITORS OF RECORD

DOCKET:	T-737-08
STYLE OF CAUSE:	**EUROCOPTER (SOCIÉTÉ PAR ACTIONS SIMPLIFIÉE) v BELL HELICOPTER TEXTRON CANADA LIMITÉE**
PLACE OF HEARING:	Montréal, Quebec
DATES OF HEARING:	January 17, 2011, January 18, 2011, January 19, 2011, January 20, 2011, January 21, 2011, January 24, 2011, January 25, 2011, January 26, 2011, January 27, 2011, January 28, 2011, January 31, 2011, February 1, 2011, February 2, 2011, February 3, 2011, February 4, 2011, February 7, 2011, February 8, 2011, February 9, 2011, February 10, 2011, February 11, 2011, February 12, 2011, February 14, 2011, February 15, 2011, February 16, 2011, February 17, 2011, February 24, 2011, February 25, 2011, January 11, 2012 and January 12, 2012
REASONS FOR JUDGMENT AND JUDGMENT:	MARTINEAU J.
DATED:	January 30, 2012

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