Federal Court  Cour fédérale

Date: 20180507

Docket: T-56-15

Citation: 2018 FC 485

Ottawa, Ontario, May 7, 2018

PRESENT: The Honourable Madam Justice Gagné

BETWEEN:

MIPS AB

Plaintiff

and

BAUER HOCKEY LTD. and BAUER HOCKEY, LLC

Defendants

JUDGMENT AND REASONS

I. Overview

[1] MIPS AB was a rather small Swedish company at the time that it filed its application for what would become Canadian Patent No. 2,798,542 [**MIPS 542 Patent**], entitled "Helmet with sliding facilitator arranged at energy absorbing layer." The technology of the MIPS 542 Patent is used for absorbing rotational energy in all kinds of sports helmets [also known as the **MIPS II**

technology]. MIPS is now a publicly traded company and a global leader in innovative sports helmet technology.

[2] At the end of 2016, MIPS had license agreements with 45 different partners, representing 212 different helmet models and a yearly 1.7 million units sold.

[3] In February 2017, Bauer Hockey Ltd. and Bauer Hockey, LLC [collectively, "**Bauer**"], acquired all of the original defendants' assets through a sale authorized by the Ontario Superior Court of Justice, made pursuant to the *Companies' Creditors Arrangement Act*, RSC 1985, c C-36. Bauer is one of the largest manufacturers and distributors of hockey equipment and related products worldwide. Bauer applied for and obtained Canadian Patent No. 2,784,316 [**Bauer 316 Patent**] and, subsequently, Divisional Patents Nos. 2,821,540 [**Bauer 540 Patent**], 2,838,103 [**Bauer 103 Patent**] and 2,847,669 [**Bauer 669 Patent**], all of which are entitled "Sports helmet with rotational impact protection" [collectively the "**Bauer Patents**"].

[4] MIPS is hereby seeking a declaration that Bauer, and more specifically its RE-AKT and RE-AKT 100 hockey helmets, infringe the MIPS 542 Patent, along with a permanent injunction to restrain Bauer from manufacturing, distributing, offering for sale, licensing or otherwise making available helmets within the scope of any claim of the MIPS 542 Patent.

[5] MIPS is further asking that the Bauer Patents be declared invalid and impeached, mainly for obviousness and double patenting.

[6] In the alternative, MIPS is seeking a declaration that its employees are the true inventors or co-inventors of the subject-matter claimed in the Bauer Patents, along with either i) an order striking the current owners and inventors of the Bauer Patents, replacing them with MIPS and its employees; or ii) adding its employees as co-inventors and replacing Bauer with MIPS as the sole owner of the Bauer Patents.

[7] Bauer, on the other hand, denies having stolen MIPS' technology and insists on the fact that the SUSPEND-TECH floating liner in both its RE-AKT and RE-AKT 100 helmets was developed entirely by its employees. It denies infringing any of the claims of the MIPS 542 Patent and adds that, in any event, the MIPS 542 Patent is invalid for anticipation and obviousness, and its claims are broader than the invention made.

[8] I propose to reverse the order of MIPS' claims for relief and start with its allegation that Bauer stole its technology. This will require reviewing the facts of the case and, more specifically, the business relationship between the parties at one point in time. We will look into the different development stages of the RE-AKT and RE-AKT 100 helmets in an attempt to distinguish what really occurred from what may be simply coincidence and/or misperception. Part of the evidence adduced before the Court is contradicted but in discussing that evidence below, I will expose the factual framework as I understand it to have occurred, based on the entirety of the evidence presented.

[9] However, even if the Court finds that Bauer developed its own product without any assistance from MIPS, the question as to whether it infringes the MIPS 542 Patent remains since,

if valid, the latter has priority over the launch of the RE-AKT and RE-AKT 100 helmets and over the Bauer Patents.

II. Issues

[10] This case raises three main issues, along with the following sub-issues:

A. *Who are the inventors and owners of the Bauer Patents?*

1) What inventive contribution, if any, did MIPS have to the Bauer Patents?

2) What rights flow from the agreements entered into between the parties?

B. *Is Bauer selling helmets that are within the subject-matter of a valid patent owned by MIPS (the MIPS 542 Patent)?*

1) What is the subject-matter of the claims of the MIPS 542 Patent? (Claim construction)

2) Do the Bauer RE-AKT and/or RE-AKT 100 helmets fall within the subject-matter of the MIPS 542 Patent? (Infringement of the MIPS 542 Patent)

3) Is the subject-matter of the MIPS 542 Patent new and non-obvious and do the claims have an appropriate “breadth”? (Validity of the MIPS 542 Patent)

C. *Is Bauer entitled to its own patent rights on rotational impact protection, given the prior invention and disclosures made by MIPS?*

1) What is the subject-matter of the claims of the Bauer Patents? (Claim construction of the Bauer 316 Patent)

2) Is the subject-matter of the Bauer Patents non-obvious given the MIPS products on the market? (Validity of the Bauer Patents)

3) Are the Bauer 540, 103 and 669 Patents [**Bauer Divisional Patents**] "patentably distinct" from the subject-matter of the Bauer 316 Patent? (Double patenting)

III. Analysis

A. *Inventors and ownership of the Bauer Patents*

[11] MIPS seeks a declaration that should this Court find that any one or more of the claims of the Bauer Patents are valid, it possesses at least a partial ownership interest, if not the entire interest, in the respective patent(s) by way of i) title passing from the inventive contribution of MIPS' employees; and/or ii) agreements entered into between the parties.

(1) MIPS' inventive contribution to the Bauer Patents

(a) *MIPS' background*

[12] Dr. Peter Halldin is one of MIPS' shareholders and founders. He was its Chief Executive Officer from 2001 to 2009 and is now its Chief Technological Officer. He holds a PhD in biomechanical engineering from the KTH Royal Institute of Technology in Stockholm, Sweden. His PhD director was Professor Hans von Holst, a brain surgeon at Karolinska Hospital in Stockholm who, at the time, was interested in and working on head and neck injury prevention combining medical and technical competencies.

[13] U.S. Patent No. 6,658,671 [**MIPS I Patent**] (Joint Book of Documents (**JBD**) 1876 or exhibit tendered at trial (**TX**) 14, tab B), filed in December 1999, on which Dr. Halldin and Dr. von Holst are named inventors, came out of Dr. Halldin's work at KTH. We will review the MIPS I Patent in more detail when looking at the prior art, but suffice it to say at this stage that it describes a protective helmet with an outer shell and an inner shell, with a sliding facilitator that makes possible displacement between the hard outer shell and the inner energy absorbing layer (or between two layers of energy absorbing material). This sliding aims to reduce rotational energy (made of a combination of linear and angular acceleration), which had been known to cause concussions and other brain injuries for some time.

[14] Dr. Halldin was a motorcyclist, so he concentrated his initial research on motorcycle helmets. Reports from the time indicated that a motorcycle accident was most likely to result in an impact striking the head at a 30 degree angle (if 90 degrees is a straight down impact). Around 2000, he worked with a British professor to develop a test rig to test rotational impact protection, whereby a helmet installed on a head form was dropped onto a sliding plate accelerated by a pneumatic cylinder. Shortly thereafter, Dr. Sven Kleiven, a colleague from KTH, presented his PhD thesis on numerical modelling of the human head and brain. A head form using Dr. Kleiven's modeling and the test rig developed in the U.K. were used to test the first MIPS I prototypes.

[15] MIPS was founded as a private company in 2001. The MIPS I Patent was granted in Sweden in September 2002 and in the United States in December 2003.

[16] The EQ1 equestrian helmet (JBD-1205), the first helmet incorporating MIPS I technology, was launched in 2007 but discontinued in 2008 after MIPS encountered production quality problems in China. This helmet was manufactured by MIPS and branded as such.

[17] In 2009, MIPS changed its business strategy to become an "ingredient brand," providing its technology through licenses to helmet manufacturers. Its first client was Back on Track who used the MIPS I technology in its EQ2 equestrian helmet (JBD-1204). That same year, the POC Receptor Backcountry helmet (JBD-2058, TX-30) using the MIPS I technology was launched for use in snowboarding.

[18] However, at the time, in-mold helmets were a new trend and a challenge that MIPS recognized that it would have to address with a new solution; the MIPS I technology could not be implemented in an in-mold helmet.

[19] By October or November of 2009, after undertaking various tests, Dr. Halldin and the MIPS R&D team discovered what would become the MIPS II technology. They discovered that it was possible to insert a head attachment device into an in-mold helmet in order to obtain sliding inside the helmet rather than within the inner liner of the helmet or, in other words, to obtain relative motion between the wearer's head and the helmet rather than between the outer shell and the energy absorbing layer.

[20] In early 2010, MIPS tested its MIPS II prototype inside Biltex bicycle helmets. The main focus of this testing was to assess whether the new MIPS II technology could reduce rotational energy through relative motion.

[21] The Swedish patent application for MIPS II was filed on May 7, 2010 and an American patent application was filed on May 12, 2010. From August to November of that year, MIPS issued promotional material and attended several bicycle trade shows to present its MIPS II technology. It presented a Limar bike helmet (JBD-243) with an early MIPS II prototype and a Lazer P-Nut bike helmet (JBD-1073) equipped with the yellow MIPS attachment device, along with a promotional video of a child wearing a MIPS-equipped Lazer P-Nut helmet (JBD-167). MIPS' promotion of its new technology continued throughout 2011. However, the MIPS II technology was not available on the market before February 2012.

(b) *Bauer's background*

[22] During the relevant time period, the Bauer helmet development team was composed of Jean-François Laperrière (Director of Protective Equipment Development, mechanical engineer), Marie-Claude Généreux (Senior Product Development Engineer), Jacques Durocher (Senior Industrial Designer) and Denis Côté (Industrial Design Technician, hockey helmet developer).

[23] The development of hockey helmets at Bauer starts more than two years before launch and it follows a precise development cycle with the following eleven steps and deadlines:

1. Advanced research: Ongoing basis

2. Preparation of the product brief: January-June (Year 1)

3. Design of the helmet: March-September (Year 1)

4. Engineering of the helmet: September (Year 1)-May (Year 2)

5. Tooling and production of prototypes: December (Year 1)-January (Year 2)

6. Testing: February-May (Year 2)

7. Design freeze and certification: May-June (Year 2)

8. Development of the other sizes: June-November (Year 2)

9 Presentation of the new helmet to key clients: September-October (Year 2)

10. Start of production: November (Year 2)

11. Helmet hits retail: April-May (Year 3)

[24] From a design and marketing perspective, the three most important criteria in the development of a new hockey helmet are fit, comfort and weight.

[25] However, for the R&D team, protection is the most crucial criteria. Starting in 2006-2007, Mr. Laperrière and Ms. Généreux began to attend conferences and certification meetings where, more and more, the subject of interest revolved around concussions suffered by hockey players and the management of rotational energy in order to prevent concussions.

[26] At the June 2007 Bauer Product Camp, a PowerPoint (JBD-1404) was shown that included a concussion study from Dr. Patrick J. Bishop, chair of the Canadian Standards Association (CSA) committee that sets standards for hockey helmets and face protectors, and a

study from Dr. Blaine Hoshizaki of the University of Ottawa on the use of different materials to manage impact forces at different energy levels.

[27] In May 2008, Ms. Généreux attended the 5th International Symposium on Safety in Ice Hockey. At the conference, Philippe Rousseau, a student of Dr. Hoshizaki's, presented a new way of testing helmets that introduced an angular acceleration component. The previous testing methods only took into account linear components.

[28] In December of the same year, an article entitled "A Comparison of Peak Linear and Angular Head Form Accelerations Using Ice Hockey Helmets" was published by Dr. Hoshizaki and his students. According to Mr. Laperrière, this article was where Bauer first learned that using a softer liner like Vinyl Nitrate [**VN**] or PORON, instead of a harder one like Expanded Polypropylene [**EPP**], would better protect against the effects of rotational impact.

[29] Mindful of the eleven development steps discussed above, it is during the summer of 2009 that Mr. Durocher began working on the design of the Next Generation helmet [**NG helmet**] that would eventually be known as the RE-AKT (JBD-1931, 1252), which was expected to be launched during the Back to Hockey 2012 [**BTH12**] season. As a designer, his focus was on fit, comfort and weight. In addition, he was asked by the marketing department to focus on the positioning of the helmet on the head, which was directed not to exceed the height of one finger above the eyebrows in order to be attractive to professional hockey players. That quality is important, since if a helmet is worn by professional hockey players, it will sell.

[30] In June 2009, a PowerPoint was presented at the Bauer Product Camp (JBD-2000). It mostly dealt with the helmet to be released during BTH11 – a model known as the HH9900 – but also included the early development stages of the NG/RE-AKT helmet. The PowerPoint summarized various technologies and materials being considered for upcoming helmets, including PORON XRD foam. Mr. Durocher stated that their takeaway from this PowerPoint was that: i) PORON XRD foam performs best at low velocity and low energy; ii) it may be a good idea to combine PORON XRD foam with another kind of foam to reduce its weight; and iii) PORON XRD foam is very spongy, so it could potentially replace the Polyvinyl Chloride [**PVC**] comfort foam. The overall suggestion was that PORON XRD foam is the best option for optimizing both profits and performance impact at different energy levels.

[31] Ms. Généreux stated that at the end of 2009, beginning of 2010, the general perspective on the effect of rotational impacts on concussions was that it was a new area that needed to be explored, with new methods of testing to be developed. The move from linear component testing to angular/rotational component testing was just beginning and there was, as of yet, no consensus on the best way to perform tests to capture this element.

[32] It was only at the beginning of 2010 that the official design of the RE-AKT helmet began, starting with the input of the engineering team. On January 12, a PowerPoint entitled "Helmet product camp II – BTH12" (JBD-1438) was presented at Product Camp. It referenced a joint project between Bauer and McGill University to determine a new way of measuring impact forces sustained by hockey players. It also discussed the use of PORON XRD foam on the inside of a hockey helmet. It summarized the four different forms of PORON XRD considered by

Bauer: foam sheets, a flat poured foam, 3D XRD moulded foam and XRD poured foam. Finally, the presentation summarized the advantages and disadvantages of the new EXPANCEL liner concept.

[33] Generally speaking, the RE-AKT helmet included the following new features:

- The head shape was reworked to improve fit and comfort;
- A new longitudinal blockage system, down the centre of the helmet, was introduced;
- The occipital lock, version 3, was developed. There was now just one central button to adjust the occipital lock and padding;
- A new ear protection feature was added;
- The SUSPEND-TECH floating liner was introduced and made of PORON XRD foam;
- For the energy absorbing layer, EPP was abandoned in favour of EXPANCEL foam since it is a lighter material that responds better to impacts;
- The look of the helmet fit very close to and very low on the head;
- A new mechanism was added to better adjust the helmet to the wearer's head.

[34] What is important for us is that the first version of the SUSPEND-TECH floating liner presented in a March 2010 PowerPoint (JBD-1450, slide 27) included 12 mm cylinders or protrusions that were extended to be in contact with the outer shell through corresponding holes or recesses in the EXPANCEL liner:

[35] Mr. Durocher explained that the SUSPEND-TECH floating liner had, in his mind, two main advantages. First, the fact that the comfort liner was floating instead of glued to the energy absorbing layer solved a problem that Bauer had been trying to solve for several years, where the liner became unglued from the energy absorbing layer and became stuck to the wearer's head. Second, using PORON XRD as the material for the floating liner served a dual purpose: to absorb high and low energy and to act as a comfort liner.

[36] It is important to note that PORON XRD is an exclusive patented material manufactured by Rogers Corporation and its sub-contractors, and that it mostly comes in yellow.

[37] At the June 2010 Product Camp, the RE-AKT development team first advanced the idea that Mr. Durocher's floating liner concept could also help to manage rotational forces. This hypothesis was influenced by various reports and studies coming out of Dr. Hoshizaki's lab, which indicated that soft liners (like VN foam) provide better rotational impact protection than hard liners (like EPP). Mr. Laperrière testified that they understood from Dr. Hoshizaki's work

that to successfully manage rotational forces, it was necessary to have a liner that not only compressed but also deformed along every axis to be able to absorb linear and rotational forces.

[38] The team also discussed a project that Bauer wanted to initiate with Dr. Hoshizaki's lab. In fact, a document attached to a June-July 2010 email chain between Bauer (Mr. Laperrière) and the University of Ottawa (Dr. Hoshizaki) (JBD-1487) defines the scope of this project as being:

> Improve protection and safety of hockey players by developing a new helmet performance testing protocol. This protocol will include the traditional linear acceleration performance criteria as well as angular acceleration, which angular acceleration we think should become part of the ice hockey helmet's performance criteria. It will also include the use of finite element analysis of a brain model to evaluate and quantify the effect of impacts to the brain.

[39] The team further concluded that they should tell the marketing department to revise its product brief to include the diversion of rotational forces as a feature of the RE-AKT helmet (see Ms. Généreux's notes, JBD-1323, TX-55).

[40] The first prototype of the SUSPEND-TECH floating liner was manufactured in July 2010 by PolyWorks, Rogers' sub-contractor (JBD-1476). The weight was as Bauer hoped but the cost of producing the liner was extremely high.

[41] Shortly thereafter, Bauer put this prototype into a Bauer 7500 (JBD-1250). The model was assembled by Feng Tay, Bauer's manufacturer in Asia.

[42] During the course of August 2010, the R&D team pushed to get the project with the University of Ottawa on track as they really wanted to be able to show off the helmet's ability to manage rotational forces and needed a testing partner to be able to do so. Unfortunately, Bauer received confirmation that Dr. Hoshizaki's lab had signed a similar testing agreement with their competitor, CCM.

[43] This news increased the pressure on Mr. Laperrière and his team to find another testing partner as soon as possible.

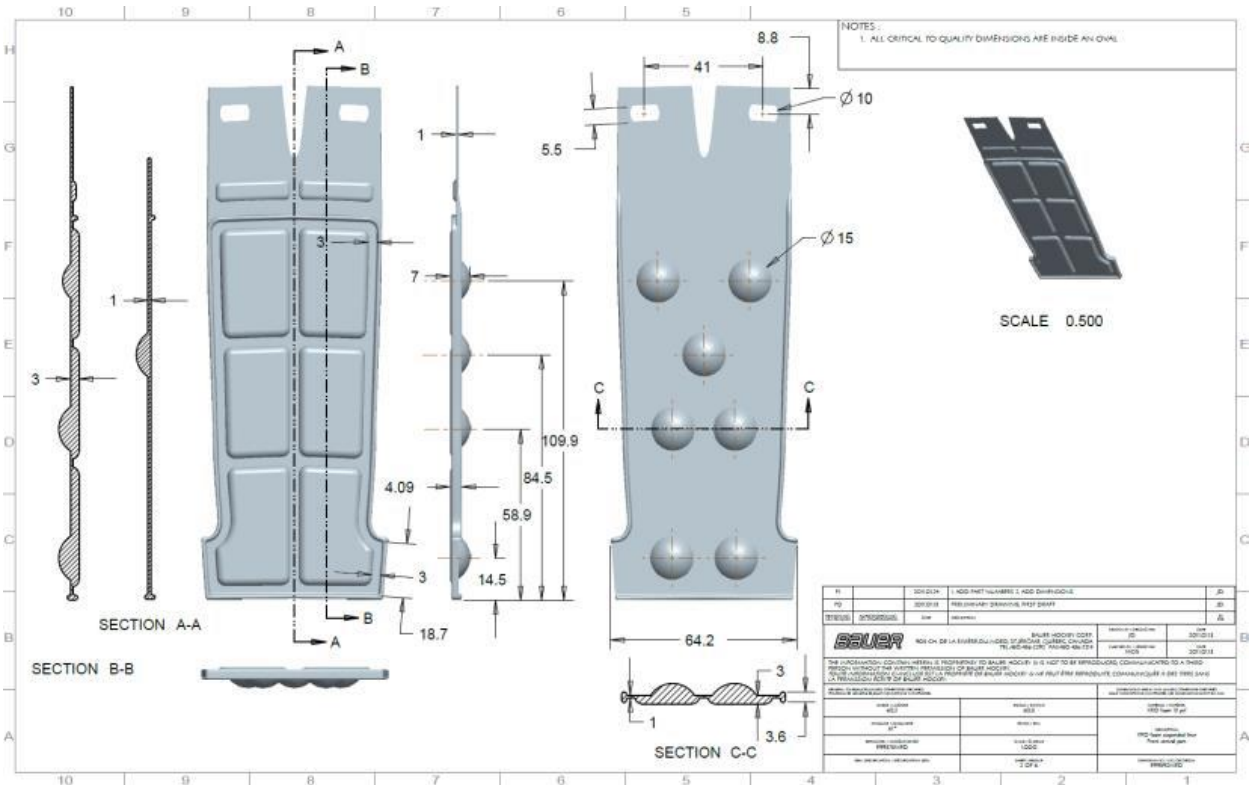
[44] In early September 2010, the development team began thinking of other testing options and made a list of labs to contact (JBD-1497). This list included MIPS, McGill University, Biokinetics, Simbex, a university in the U.K. and Dr. Bishop at the University of Waterloo.

[45] On September 7, 2010, Ms. Généreux wrote an email to Professor David Pearsall at McGill University (JBD-1499). She mentioned that Bauer was seeking a scientific partner to help them develop testing methods to show the effect of angular accelerations on hockey helmets during impact. She also mentioned that they had heard of MIPS, a Swedish company that developed a system to reduce angular acceleration during impact. She asked if he knew of their company, technology and testing methods.

[46] Also during the month of September 2010, the R&D team discussed the need to revise the design of the floating liner in view of the prohibitive cost of the parts and the technical challenges encountered by Feng Tay. The EXPANCEL liner with recesses was too fragile (see

Ms. Généreux's notes, JBD-1323, TX-60) and it was decided to move away from the floating liner with 12 mm protrusions and to simplify the design. Mr. Durocher came up with a new idea of an EXPANCEL liner with smaller recesses and a SUSPEND-TECH floating liner with small dimples to match the corresponding recesses.

[47] Although Bauer understood the manufacturing problems in the fall of 2010, it was only in January 2011 that Mr. Durocher finalized his 2D design drawings of the SUSPEND-TECH floating liner with small dimples (JBD-1784):



[48] On September 21, 2010, Mr. Laperrière sent the following email to MIPS' general address (JBD-193):

> Subject: MIPS in Bauer hockey helmet
>
> Hi,
>
> I'm in charge of the development of the new helmet at Bauer. Bauer manufacture hockey helmet and we would like to know more about your MIPS protection system. Is-it possible to obtain some samples of the MIPS component kit, so we can evaluate the possibility of using this one in our helmet [sic].
>
> Feel free to communicate with me via e-mail or you can call me at [phone number omitted].
>
> Regards,
>
> jf

[49] The content of this email had a significant impact on the parties' perceptions of Bauer's needs and intentions at the time. Considering the subject of this email and MIPS' business strategy and mission, Mr. Johan Thiel – now MIPS' CEO, but responsible for sales and marketing at the time – understood Bauer to have been interested in implementing MIPS technology into Bauer helmets. However, and as the evidence shows, Bauer may have been interested, or at least curious, about the MIPS technology but, in the short term, it was far more interested in its testing methods and facilities. Mr. Laperrière testified that his choice of words ("MIPS in a Bauer hockey helmet") was intended to trigger a quicker response from MIPS than if he had referred solely to MIPS' testing capacity. Not only is Mr. Laperrière's testimony on that subject credible and uncontradicted, but it is also corroborated by the rest of the evidence and by the agreements later entered into by the parties.

[50] As a result of the contact initiated by Bauer, a first meeting between Bauer and MIPS was scheduled for November 16, 2010 at the Bauer facility in Saint-Jérôme, Quebec.

[51] In preparation for this meeting, Mr. Laperrière and Mr. Durocher reviewed MIPS' website which, at the time, referred only to its MIPS I technology. The patent application regarding the MIPS II technology had been filed in May 2010, but had not yet been granted and its claims were still confidential.

[52] In a very subtle way, MIPS suggests that the sliding feature in the MIPS I technology may have influenced Bauer's move from the 12 mm protrusions to the small dimples in its SUSPEND-TECH floating liner, so as to cause relative movement. However, and as will be further discussed below, this is a somewhat dangerous route for MIPS to take as it could give ammunition to Bauer's argument that the MIPS 542 Patent is invalid for obviousness. Furthermore, and as discussed above, the evidence shows that the reasons for the change are instead related to the manufacturing costs and technical challenges encountered in prototype development.

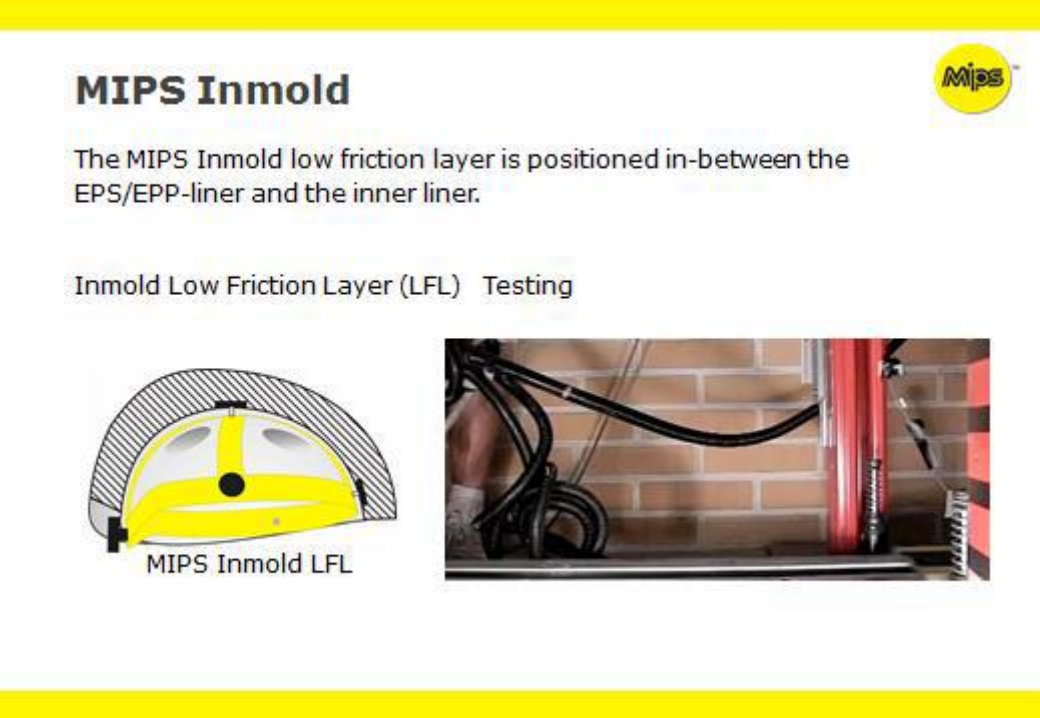
(c) *First meeting held on November 16, 2010 and subsequent events*

[53] At this meeting, Mr. Laperrière, Ms. Généreux and Mr. Durocher were present for Bauer and Mr. Thiel was present for MIPS.

[54] Mr. Thiel presented MIPS and its technology via a PowerPoint presentation (JBD-172). During his testimony in chief, he highlighted slide 18 – "MIPS Inmold" – which showed the MIPS II technology and the relative motion created between the attachment device and the energy absorbing layer. This slide was added to an existing MIPS I focused PowerPoint presentation in August 2010. Mr. Thiel admitted in cross-examination that the MIPS II

technology was not commercially available at that time and that he was not yet sure which of either the MIPS I or MIPS II technologies could be implemented into a two-shell hockey helmet.

[55] It is to be noted that Mr. Thiel had both presentations on his laptop, the one with slide 18 and the one without, and that none of Bauer's representatives recall specifically having seen slide 18, which can be seen below:



[56] Mr. Thiel also brought with him a large bag of sample helmets. He had a POC Receptor Backcountry helmet with the MIPS I technology (JBD-2058) and a Lazer P-Nut incorporating the MIPS II technology (JBD-1073). Mr. Thiel testified that he only showed the Lazer P-Nut very briefly, as the helmet belonged to Lazer and was merely a prototype; no commercialization agreement had yet been signed between Lazer and MIPS. He admitted that the only products commercially available at the time used the MIPS I technology.

[57] On the Bauer side, Mr. Laperrière and Ms. Généreux took notes during the meeting (JBD-20, 2124, respectively).

[58] Mr. Laperrière's notes include "Cost – 10-15 U.S." which refers to an estimate of $10K-$15K for MIPS to do the initial testing, a sum amenable to Bauer.

[59] Mr. Laperrière recalled having informed Mr. Thiel at the outset of the meeting about Bauer's strict policy regarding confidentiality and non-disclosure. He told Mr. Thiel that since they had not signed a Non-Disclosure Agreement [NDA], he could not discuss any Bauer product that was not yet on the market. He asked Mr. Thiel to do the same with regard to MIPS products. He also recalled agreeing to a two-stage project – Phase 1 involving tests and Phase 2 involving the insertion of MIPS' technology into a Bauer helmet. Mr. Laperrière testified that they discussed Phase 2 as a result of Bauer initiating talks with MIPS under the premise of collaboration. However, he added that they were doubtful that the MIPS I technology available at the time could be implemented into a two-shell adjustable hockey helmet. Mr. Thiel told them that MIPS had not done testing for other parties in the past, but seemed very open and receptive to the possibility of doing so for Bauer.

[60] Ms. Généreux's notes only refer to two MIPS patents: the MIPS I Patent and a U.S. patent for a "rubber suspension system" not at stake in this file. She admitted that she was informed that the MIPS I technology involved rotational motion of the outer shell and that motion was tied to the idea of a reduction of rotational energy transmitted to the brain.

[61] We can also read in her notes: “Could work as a consultant for testing our own helmets” and “adding MIPS in a helmet.” Her takeaway from this meeting was that it was possible to use MIPS’ services for testing Bauer helmets. As far as implementing MIPS’ technology into Bauer helmets, she saw that as a potentially much more long-term option, given MIPS’ unfamiliarity with hockey helmets.

[62] Mr. Durocher confirmed that Mr. Thiel presented MIPS, its background, the capacity of its laboratory, the research that led it to test rotational forces, the helmet technologies that it developed and its products. He understood that, at that time, the technology presented by Mr. Thiel could not be adapted into a two-shell adjustable hockey helmet. However, Mr. Thiel said he was happy to try and find a solution, so he asked for and was provided with a Bauer 7500 helmet to take back to Sweden with him.

[63] Mr. Durocher and Ms. Généreux do not recall having seen a helmet at this meeting; Mr. Laperrière only remembers having seen a MIPS I snowboard helmet.

[64] In early January 2011, Bauer followed up with MIPS: “Have you been able to modify the helmet that I gave you during our last meeting, we would like to develop a testing protocol for a hockey helmet and we would like to see if your MIPS system could be implement [sic] in our helmet. Could you tell us if your firm is still interested to work with us and give us a preliminary time line and cost to do this project?” (Mr. Laperrière’s email, JBD-297).

[65] Meanwhile at MIPS, the development of the Burton RED HiFi had begun and was intended to be ready for the Snowsports Industries America [SIA] Tradeshow in Denver scheduled from January 27 to January 31, 2011. This helmet implemented the MIPS II technology and included a yellow attachment device with comfort lining and two fixation members (JBD-2086):

[66] This Burton RED HiFi was also shown in February 2011 at the ISPO Tradeshow in Munich.

[67] At Bauer, the team continued developing the RE-AKT helmet. At a Product Camp held in January 2011, a PowerPoint was presented (JBD-1990). It referred to the MIPS technology, to its

scientific research and to its patented system managing rotational forces with a low-friction layer system. The launch date to have this technology implemented in Bauer helmets was identified as BTH14. A further slide referred to a multi-phase relationship between MIPS and Bauer, including the negotiation of a partnership agreement and testing Bauer helmets. One of the bullet points on this slide states: "Look at the possibility to use MIPS patented system."

[68] As indicated above, it is also in January 2011 that Mr. Durocher prepared his 2D design drawings of the SUSPEND-TECH floating liner with small dimples instead of the 12 mm protrusions (JBD-1791). An EXPANCEL liner without recesses was also drawn up, since the plan became to make matching recesses for the small dimples by hand.

[69] Mr. Durocher explained that the sizing of this latest prototype was a little off from past Bauer helmets and that it sat too high up on the head. He needed to work on redesigning the prototype. Two different prototypes were internally fit tested: one had recesses in the EXPANCEL liner, while the other one did not (JBD-2003). Feedback was solicited from the marketing department.

[70] Ms. Généreux prepared drawings of the EXPANCEL liner with small recesses in March 2011 (JBD-2044). These recesses were intended to make room for the matching dimples on the SUSPEND-TECH liner, in an effort to improve the helmet's fit.

[71] During that period, meeting minutes (see for example JBD-1526, 1527) show that Mr. Durocher still needed to work on the design to improve the size and fit of the RE-AKT helmet.

[72] Effective March 17, 2011, the parties executed a NDA in advance of their next meeting (JBD-324). The content of this NDA will be discussed later.

(d) *Second meeting held on March 30, 2011 and subsequent events*

[73] At this Saint-Jérôme meeting, Mr. Laperrière, Ms. Généreux and Mr. Ken Covo (Vice-President, Research and Development) were present for Bauer and Mr. Thiel was present for MIPS. Both Ms. Généreux and Mr. Covo took notes during the meeting (JBD-1565, 1969, respectively).

[74] The parties agreed to a project quotation that day, though it was only executed on May 11, 2011 (JBD-538, 1591). The project scope was divided into three phases:

> **Project scope**
>
> In this scope the project is divided in three phase (sic). MIPS will carry the projects on helmets provided by Bauer for the explicit purpose defined below.
>
> **Short term**
>
> *Phase 1*: with the purpose to carry out a pre-study of three Bauer helmets and one with MIPS.
> *Phase 2*: to refine the test protocol more towards Hockey and continue with test of Bauer helmet without and with MIPS plus compare with competitor's helmets. FE-modling [*sic*] will be carried out and more in-depth report/conclusions will be delivered.

Long term

Phase 3: A two year plan to develop test protocol and helmet together with Bauer. This phase will be carried out in a step by step approach. By a defined brief sub-projects will be set up and quoted separately.

[75] Phase 1 testing was to be performed on an assembled Bauer RE-AKT helmet, as well as HH5100 and HH7500 helmets. Bauer was also to provide MIPS with a disassembled HH7500 to be provisionally implemented with MIPS technology and tested. This phase was to be performed from May 1st to July 15, 2011.

[76] Phase 2 testing was to be performed on an assembled RE-AKT helmet and on competitors' helmets for the sake of comparison. This phase included a disassembled RE-AKT helmet being provisionally implemented with MIPS technology and tested. The timeframe for this second phase was July 15 to October 1st, 2011.

[77] Bauer witnesses recalled discussing mainly testing protocol during that second meeting. However, their notes confirm Mr. Thiel's testimony that the MIPS II technology was summarily discussed. In Ms. Généreux's notes, we can read: "MIPS II: 0.7 mm to 0.8 mm thick – with elastic mvmt 10 mm – seems enough to reduce rotational force by 50%." In Mr. Covo's notes, we find the following: "7-8 mm low friction layer 10-15 mm show displacement – MIPS II multi-impact vs (crash helmet) single impact – rubber fixations." We know that, at that time, MIPS had only worked on single impact helmets, such as motorcycle, ski and bicycle helmets.

[78] On the other hand, Ms. Généreux's notes indicate: "See Red Burton Helmet", which suggests that the Burton helmet was not shown and that she made a note to herself to look at it in the future, since it integrated the MIPS II technology summarily discussed during the meeting.

[79] On April 8, 2011, and as a result of fitting issues and technical challenges with the RE-AKT prototype, Bauer requested and received samples of the SUSPEND-TECH floating liner without dimples from Feng Tay for testing purposes.

[80] MIPS' theory of contribution to or ownership of the SUSPEND-TECH floating liner inventive concept is dependent on the fact that the dimples were removed at MIPS' suggestion. Its original position was expressed in its Thrice Amended Statement of Claim (at paras 21, 23) and reads as follows:

> ….Additionally, beyond the scope of the originally planned testing, on June 22, 2011, an employee of MIPS named Daniel Lanner determined that the RE-AKT helmet needed to be modified to enable a relative movement between the outer surface of the attachment device and the other portions of the helmet. This modification as determined by MIPS effectively eliminated Bauer's change to the MIPS system by removing the bumps that Bauer had included in the outer surface of the RE-AKT's attachment device. This system with the bumps removed was later tested and included in the test results.
>
> …
>
> On July 10-11, 2011, Mr. Laperriere and Ms. Généreux visited the MIPS facility in Stockholm, Sweden. During the two-day meeting, MIPS explained the testing and fully demonstrated the HH7500 helmet as modified by MIPS to include the MIPS rotational impact protection system. MIPS also recommended to Bauer that the bumps included by Bauer on the RE-AKT attachment device be removed.
>
> [My emphasis.]

[81] However, Bauer's decision to remove the dimples was taken on June 1st, 2011 (JBD-1605), Ms. Généreux's computer-aided design [CAD] drawings of the EXPANCEL liner were revised accordingly on June 10, 2011 (JBD-1809, 1811, 1813) and Mr. Durocher revised his CAD drawings for the floating liner on June 13, 2011 (JBD-1621).

[82] Meanwhile, on June 3, 2011, Mr. Durocher finalized his Invention Disclosure Form (JBD-1609), which was revised on June 7, 2011 (JBD-1613, 1614). The principle set out in that document was a system allowing the head to move within the helmet during an angular impact, thus limiting the movement of the brain inside the skull. The initial form did not disclose dimples but the revised version did. Mr. Durocher explained that he wanted the disclosure to be as broad as possible, since contrary to Mr. Laperrière and Ms. Généreux, he still thought that the dimples could improve protection against low energy impacts without compromising too much on fit.

[83] In light of the foregoing evidence, MIPS changed its approach at trial (departing from the position that MIPS only determined on June 22 that dimples had to be removed). Mr. Thiel testified that during a telephone conversation he had with Mr. Laperrière on June 10, 2011, he recommended that the dimples be removed from the SUSPEND-TECH floating liner.
Mr. Laperrière and Ms. Généreux do not recall receiving any recommendation from MIPS on removing the dimples before the July 2011 meeting in Stockholm.

[84] The Court prefers Bauer's evidence on this point, not only because it is consistent with MIPS' original pleadings, but also because it is consistent with MIPS' impression when it first received RE-AKT helmet samples with the dimples and matching recesses on June 2, 2011. At

that time, MIPS' management team wondered whether that version of the SUSPEND-TECH floating liner infringed the MIPS 542 Patent. If the feeling was that the SUSPEND-TECH floating liner with dimples might infringe, why suggest eliminating "Bauer's change to the MIPS system…." as seen in paragraph 21 of MIPS' Thrice Amended Statement of Claim? It is more likely that MIPS' suggestion would not have been made before the parties' first discussion of possible infringement during the July 2011 Stockholm meeting.

[85] On July 7, 2011, MIPS received new samples of the RE-AKT helmet without dimples and matching recesses for testing. However, the evidence shows that the box was not opened before the July Stockholm meeting.

(e) *Third meeting held on July 11-12, 2011 and subsequent events*

[86] Mr. Laperrière and Ms. Généreux attended the third meeting in Stockholm on Bauer's behalf. The first day, they met with Mr. Thiel at the MIPS lab on the KTH campus. They saw the test rig and brain model and they agreed on modifications to the testing protocol for Phase 2, to better replicate the real life conditions under which hockey helmets undergo impacts.

[87] The second day, they visited Niklas Steenberg, then CEO of MIPS, Mr. Thiel and Mr. Daniel Lanner, Product Manager, at MIPS' office in central Stockholm. MIPS presented the test results from Phase 1 and discussed Phase 2 testing. During the lunch – where he chose chicken over beet salad with goat cheese and walnuts – Mr. Lanner told Bauer's representatives that he cut off the dimples from the RE-AKT samples in order to lower friction and improve test results, suggesting that Bauer implement this change going forward. According to Mr. Lanner,

Mr. Laperrière was surprised as he thought that high friction would be better than low friction to absorb rotational energy. Mr. Lanner admitted to being later informed that MIPS had in fact already received samples of the RE-AKT helmet without dimples.

[88] During the same month, MIPS' promotional video showing the Lazer P-Nut with MIPS II technology became available on YouTube (JBD-377).

[89] On July 27, 2011, Bauer filed its U.S. provisional patent application, from which it claims its priority date for the Bauer Patents (JBD-1059, 1238).

[90] All of the parties' discussions from that point forward, regarding mainly Phase 3 of their project, included the core issue of infringement. MIPS wanted Bauer to acknowledge that the RE-AKT helmet, and eventually the RE-AKT 100 helmet, incorporated the MIPS II technology, and Bauer insisted upon the fact that the RE-AKT helmets were the result of its own rotational impact management technology. Consequently, their relationship ended in January 2012 without the parties ever reaching an agreement on the scope of Phase 3 of their project.

[91] From the above, I note a few events or coincidences that contributed to MIPS' misperception of the facts in this case. For example:

- The fact that Mr. Laperrière's first email referred to Bauer's interest in MIPS' technology rather than its testing abilities tainted MIPS' perception of its relationship with Bauer. However, it became clear after the first meeting that Bauer's short term interest was in MIPS' testing services. That could at least partly

explain why Mr. Laperrière had to repeatedly follow up with MIPS in order to finally schedule the second meeting and why MIPS' interest seemed to have dropped. In any event, the scope of the short term mandate given to MIPS is clearly limited in the signed quotation to testing Bauer's existing and RE-AKT helmets;

- Upon receipt of the first samples of the RE-AKT helmet – with the dimples – MIPS's management internally raised the issue of infringement. The fact that the SUSPEND-TECH floating liner, just like MIPS' attachment device, is mainly yellow seems to have contributed to that reaction. But as indicated above, PORON XRD is a patented material and it does come in yellow;

- MIPS' testing team only opened the box containing the second samples of the RE-AKT helmet after the July Stockholm meeting during which removing the dimples was discussed. However, the uncontradicted evidence shows that the box was received by MIPS before the meeting.

(f) *The law as it applies to these facts*

[92] An inventor is generally presumed to be the owner of an invention, unless he or she was employed for the express purpose of inventing.

[93] In *Apotex Inc v Wellcome Foundation Ltd*, 2002 SCC 77 (at paras 96-97, 100, 102), the Supreme Court of Canada (per Justice Binnie) defined inventorship as follows:

> [96] Inventorship is not defined in the Act, and it must therefore be inferred from various sections. From the definition of

> "invention" in s. 2, for example, we infer that the inventor is the person or persons who conceived of the "new and useful" art, process, machine, manufacture or composition of matter, or any "new and useful" improvement thereto. The ultimate question must therefore be: who is responsible for the inventive concept?
>
> [97] … It is therefore not enough to have a good idea (or, as was said in *Christiani, supra*, at p. 454, "for a man to say that an idea floated through his brain"); the ingenious idea must be "reduced ... to a definite and practical shape" (*ibid*.). Of course, in the steps leading from conception to patentability, the inventor(s) may utilize the services of others, who may be highly skilled, but those others will not be co-inventors unless they participated in the conception as opposed to its verification. As Jenkins J. notes in *May & Baker Ltd. v. Ciba Ltd.* (1948), 65 R.P.C. 255 (Ch. D.), at p. 281, the requisite "useful qualities" of an invention, "must be the inventor's own discovery as opposed to mere verification by him of previous predictions".
>
> …
>
> [100] … If Glaxo/Wellcome had soundly predicted that AZT could cure nausea in the weightlessness of space, it might require NASA and all its rocket ship expertise to "establish" the utility, but NASA would not on that account become a co-inventor.
>
> …
>
> [102] There is no question that the ATH8 cell line developed by Drs. Broder and Mitsuya at NIH was original and offered a testing environment that Glaxo/Wellcome could not duplicate in-house. For this achievement they obtained a patent, as mentioned earlier. But the patentees of an invention for testing do not, by virtue of executing tests using that invention, become co-inventors of every sound idea that is so tested.

[94] The facts of this case do not support MIPS' assertion that its employees invented or even participated in the invention of the Bauer Patents. They tested the RE-AKT helmet with and without the dimples and matching recesses but they are not at the origin of the inventive concept found therein, nor did they come up with the idea of removing the dimples to improve rotational

impact management. As a consequence of this finding, MIPS cannot be owner or partial owner of the Bauer Patents.

[95] Before the November 16, 2010 meeting, the only MIPS technology publicly available was its MIPS I technology. The evidence is amply clear that the MIPS I technology was not Mr. Durocher's inspiration for his first version of the SUSPEND-TECH floating liner with 12 mm protrusions and matching recesses in the EXPANCEL liner.

[96] Bauer also knew before the November 16, 2010 meeting that Mr. Durocher's design could manage rotational impacts in addition to improving protection against linear impacts, both at high and low energies. That belief came from Dr. Hoshizaki's work demonstrating that softer liners perform better than harder liners at rotational impact protection.

[97] Also, SUSPEND-TECH was a floating liner from the time it was first conceived and has always been able to move relative to the energy absorbing material, albeit at different degrees.

[98] The evidence is also clear that Bauer changed its design from having 12 mm protrusions to small dimples as a consequence of manufacturing difficulties encountered with the EXPANCEL liner being too fragile to withstand multiple recesses. Ms. Généreux testified – and in fact made the demonstration during trial – that EXPANCEL is a very friable material. During fabrication, the material is not yet covered with "non-woven" film and it broke when being unmolded. Bauer was thus informed by Feng Tay that it needed to modify and simplify its design.

[99] Finally, the evidence shows that the dimples were eventually removed to solve fitting issues. Ms. Généreux had struggled with the recesses' positioning. It took a while for her to determine their exact positioning and to choose which recesses needed to be oblong in order for all the dimples to remain in their matching recesses when the helmet was adjusted. Bauer's development team was working with SUSPEND-TECH prototypes with and without dimples before MIPS' recommendation to remove them. As I retain from the evidence that MIPS' recommendation first came during the July 2011 Stockholm meeting, when MIPS initially raised the issue of infringement, it is clear that Bauer's decision to get rid of the dimples was made prior to MIPS' recommendation.

[100] For these reasons, the Court finds that MIPS did not contribute to the inventive concept of the Bauer Patents.

(2) Agreements entered into between the parties

[101] Another exception to the principle that an inventor is presumed to be the owner of an invention is when there is an express contract to the contrary.

[102] First, from the quotation arrived at by the parties during the March 30, 2011 meeting, it is clear that the parties had yet to reach full agreement on the conditions pertaining to Phase 3 of the project. As the evidence shows, Bauer did not expect to have MIPS technology in its helmets before BTH14. And as indicated above, the parties never agreed on the terms and conditions of Phase 3, since they were unable to resolve the alleged infringement issue. So MIPS never

developed a system for new Bauer helmets. It did some testing on the HH7500 helmet that had been temporarily outfitted with a standard MIPS yellow attachment device. It also tested the RE-AKT helmet by gluing the SUSPEND-TECH floating liner to the EXPANCEL energy absorbing layer and adding a standard MIPS yellow attachment device and. But that was all part of Phases 1 and 2 testing, not Phase 3 development.

[103] In addition, article 7 of the NDA signed by the parties on March 17, 2011 (JBD-324) deals with their respective intellectual property:

> 7. Intellectual Property: Ownership of Inventions
>
> a. The Parties agree that imparting of Confidential Information under this Agreement by BAUER creates no ownership or license rights in MIPS and BAUER reserves all patent, trade secret and all other proprietary rights it might have.
>
> b. MIPS will continue to own all Technology and all Intellectual Property Rights ("IP Rights") relating to the MIPS Technology.
>
> c. MIPS shall continue to own all Technology and IP Rights in all improvements to the MIPS Technology and Components, regardless of by whom developed.
>
> d. BAUER shall continue to own all Technology and IP rights in all improvements to the BAUER Technology for the BAUER Helmet Parts.

[104] This provision indicates that, even if the idea of removing the dimples came from MIPS, which is not the Court's conclusion, the IP rights in the Bauer Patents would still be vested in Bauer.

[105] Finally, the parties reiterated their intentions with regard to IP in the Consulting Agreement they signed on September 1st, 2011 (effective March 15, 2011) (JBD-643):

> 5. OWNERSHIP OF TECHNOLOGY, INTELLECTUAL PROPERTY, AND OUTCOME FROM PROJECTS; NO LICENSE
>
> 5.1 **Test Reports**. Unless otherwise stated in the Project Order, the specific Project test reports to be issued by MIPS thereunder will become the property of the Bauer Group upon issuance, subject to the provisions of Section 5.3 below [dealing with MIPS technology and improvement thereto].
>
> 5.2 **Bauer Parts and IP and Improvements Thereto**. The Bauer Group will continue to own all Bauer Group technology and Bauer Group intellectual property rights in all helmets parts owned and /or provided by the Bauer Group and in all improvements to such technology or helmet parts that do not include or involve any of the MIPS Technology.

[106] As I am of the view that MIPS did not participate in the development of the RE-AKT helmet or in any of the Bauer Patents, any improvements to the Bauer technology – like removing the dimples – clearly belong to Bauer.

B. *Expert evidence tendered at trial*

[107] MIPS called two expert witnesses, Dr. Rémy Willinger and Mr. Michael Lowe.

[108] Dr. Willinger is a professor at the University of Strasbourg, in France, where he has led a research group specializing in head trauma biomechanics since 2000. He obtained his degree in civil engineering from the National School in Arts and Industries in Strasbourg in 1983. He

further obtained his PhD on the muscular forces in a joint, and modelling of muscular constitutive laws, from the University of Strasbourg in 1988.

[109] Dr. Willinger has over twenty-five years' experience working on the biomechanics of head and neck impacts and the development of protective systems for both head and neck. His work includes simulating real world head and neck trauma to establish head and neck injury criteria. His work also involves human body finite element modelling, which is the development of sophisticated computational modelling systems to assess the effects of impacts to the human head and neck. Dr. Willinger's research group has collaborated with car and helmet manufacturers and assisted in the development and testing of protective systems tailored to their specific impact environments.

[110] At trial, Dr. Willinger was qualified as an engineer, a professor, an expert in head trauma biomechanics and helmet evaluation, with specific expertise in finite element modelling and physical testing of helmets.

[111] Mr. Lowe has over twenty years' experience in sports helmet development. He is currently a product development consultant, advising on the development of helmets for hockey, football and power sports. Prior to this position, he worked for a number of helmet manufacturers in a variety of senior roles. He obtained a Bachelor of Science in Industrial Design from San Jose State University in 1995. Mr. Lowe holds five patents in the U.S. related to helmets and impact protection.

[112] At trial, Mr. Lowe was qualified as an industrial designer and expert in helmet design and commercialization, with expertise in hockey, lacrosse, football, bike, snow and power sports.

[113] Bauer called two expert witnesses, Mr. Christopher Withnall and Dr. Jeffrey Scott Delaney.

[114] Mr. Withnall is a professional engineer working in the specialized field of human impact biomechanics for over twenty-seven years. His work primarily involves helmet design and testing, as well as preventing injury associated with impact to the human body. He is an employee of and a minority shareholder in Biokinetics and Associates Ltd., a research and development organization that performs its own research and development work and provides commercial testing services to third parties. Unrelated to this matter, Biokinetics and Associates Ltd. has previously performed helmet testing for both MIPS and Bauer.

[115] Mr. Withnall is the chair of the Canadian Standards Association (CSA) working group on rotational acceleration measurement towards implementing rotational kinematics in ice hockey standards. He has also participated in American Standards for Testing and Materials [ASTM] helmet standards development since 1995, where he currently works on rotational acceleration issues. He is a named inventor on numerous U.S. and Canadian patents related to helmets and helmet testing methods.

[116] At trial, Mr. Withnall was qualified as a professional engineer, with expertise in i) helmet design, construction and testing, including helmets for transportation, sports (including hockey

and football), and police/military; and ii) the area of human impact biomechanics, including the biomechanics of inertially induced brain injury from mild concussions to catastrophic injury.

[117] Dr. Delaney is an emergency and sports medicine physician and an associate professor in the Division of Emergency Medicine at McGill University, where he has taught since 1997. He obtained his M.D. from McGill University in 1991 and completed a Fellowship in Sports Medicine in 1997. His research interests are focused on concussions and neck injuries.

[118] At trial, Dr. Delaney was qualified as a medical doctor practicing in emergency medicine and sports medicine with expertise in the study and treatment of concussion and neck injuries in both the athletic and emergency department populations.

C. *Person skilled in the art*

[119] The person of skill in the art, whom may comprise a team, is the notional person through whose eyes a patent is to be construed and the prior art is to be considered. The skilled person is unimaginative and uninventive, but is reasonably diligent in keeping up with developments in the area. The skilled person is not the lowest common denominator of the group, but the ordinary or average person.

[120] There was little dispute between the parties as to the notional addressee of the patents. The notional person of ordinary skill in the art was identified by the experts as (Willinger Expert Report (TX-10) at paras 49-51, see also Lowe Expert Report (TX-45) at paras 25-31 and Withnall Responding Report (TX-73) at para 10):

> 49. The skilled person or team of persons would include someone with an academic background in industrial design or mechanical engineering, or someone with the equivalent practical experience as an industrial product designer in the helmet industry or academia. This experience would include the design of the look and shape of helmets in various sports and how all of the components are integrated into a functional unit. A product designer would typically have knowledge of the mechanical behaviour of materials and the manufacturing processes used to make helmets. The product designer would understand the different choices for raw materials, fabrication issues, required tooling, and manufacturing equipment, as well as the costs associated with these design choices.
>
> 50. The skilled person or team of persons would also include someone with an understanding of biomechanics and the mechanisms of brain injury. This would be an individual with a degree in biomechanics or biomechanical engineering, or may include someone with the equivalent level of experience in industry or academia. This experience would include an understanding of the different types of impacts that helmets may be exposed to, the performance of helmet components during impact, and how this performance affects the head and brain.
>
> 51. The above experience would also include an understanding that helmet test standards dictate what levels of exposure are considered acceptable for linear impacts and, where standards exists, for oblique impacts (expressed in terms of tangential force). The skilled person would have an appreciation of helmet standards and knowledge of the appropriate standards that a helmet must meet to be offered for commercial sale. The skilled person would understand the certification standards including the test methodologies employed as well as what design features would be required to meet the standard.

D. *Common general knowledge*

[121] “Common general knowledge” is the knowledge generally known by the skilled person at the relevant time, and includes what the skilled person may reasonably be expected to know and be able to find out. Common general knowledge can be derived from the practical question of

what would in fact be known to the skilled person. It is not the same as “public knowledge” or the “state of the art” (*Uponor AB v Heatlink Group Inc*, 2016 FC 320 at paras 46-48). While the common general knowledge may include information from the “state of the art”, just because information is known in the art does not necessarily mean it has become so widely known to become part of the common general knowledge.

[122] Dr. Willinger and Mr. Lowe defined the common general knowledge in their respective reports and there was no real dispute from Mr. Withnall with respect to their definition.

[123] The skilled person would be familiar with helmets and helmet design, and would be familiar with the variety of different sports and activities where helmets are required. The skilled person would be familiar with the common components found in sports helmets. These components include: an outer shell, made of one or two pieces (with a hockey helmet typically being a two-shell adjustable helmet); an energy absorbing layer; a comfort liner or comfort padding; and various methods to adjust the size or fit of the helmet.

[124] The skilled person would also be familiar with the physics and mechanical principles that go into helmet design. The skilled person would understand that helmet design involves an appreciation of the impact conditions that the human head may be subject to, depending upon the activity in question. The skilled person would understand that impacts are typically assessed according to the initial velocity of the helmeted head just prior to impact. The skilled person would understand that there are three main types of head injury mechanisms: skull fractures, subdural haematomas, and neurological injuries, such as concussions.

[125] The skilled person would understand that helmets are typically designed to protect against linear impacts, understood as impacts perpendicular to the surface being impacted. However, by the years 2010-2011, the skilled person would understand that helmets must also be designed to protect against rotational impacts, which are responsible for causing serious brain injury, including concussions. Rotational impacts are also known as oblique or tangential impacts. A rotational impact can be described as an impact coming at an angle relative to the surface being impacted. Thus, by the years 2010-2011, the skilled person would know that helmets must also include components to protect against rotational acceleration to the brain.

[126] The skilled person would be aware of the different certification standards that must be met for a helmet to be sold commercially, and understand that the standards may differ according to geographical jurisdiction. The skilled person would also have an understanding of the various helmet testing methodologies that are used to meet these certification standards.

E. *Claim construction – legal principle*

[127] In *Wellcome Foundation*, above, the Supreme Court of Canada described Canada's patent system as being based on a "bargain" whereby an inventor is granted exclusive monopoly rights in an invention, but only in exchange for full and frank disclosure of that invention:

> [37] A patent, as has been said many times, is not intended as an accolade or civic award for ingenuity. It is a method by which inventive solutions to practical problems are coaxed into the public domain by the promise of a limited monopoly for a limited time. Disclosure is the *quid pro quo* for valuable proprietary rights to exclusivity which are entirely the statutory creature of the *Patent Act*.

[128] The disclosure requirement is captured in subsection 27(3) of the *Patent Act*, RSC 1985, c P-4. Paragraph 27(3)(*a*) requires that an inventor, in his or her specification, "correctly and fully describe the invention and its operation or use as contemplated by the inventor". Paragraph 27(3)(*b*) further requires the inventor to set out clearly the method of constructing, making, compounding or using the invention in such full, clear, concise and exact terms as to enable a person skilled in the art to make, construct, compound or use the invention.

[129] To meet that bargain, the inventor is required to disclose his or her invention in sufficient enough detail to enable the skilled person to make the same successful use of the invention, when the monopoly has expired, as the inventor could at the time the application was filed (*Teva Canada Ltd v Pfizer Canada Inc*, 2012 SCC 60 at paras 70-71).

[130] The first step in a patent dispute is to construe the claims at issue. They must be given the same interpretation for the purposes of both the infringement and validity analyses (*Whirlpool Corp v Camco Inc*, 2000 SCC 67 at paras 43, 49(b)). However, the claims should not be construed without understanding where disputes between the parties lie, or "where the shoe pinches" (*Valence Technology Inc v Phostech Lithium Inc*, 2011 FC 174 at para 62, aff'd 2011 FCA 237).

[131] The patent has two distinct sections: the claims and the description or disclosure (*Patent Rules*, SOR/96-423, s 2 and *Patent Act*, s 27(3), 27(4)). The claims are the starting point which define the statutory monopoly (Roger T Hughes et al, *Hughes and Woodley on Patents*, 2nd ed (Toronto: LexisNexis, 2005) (loose-leaf updated 2018) at 305). If the language of the claims is

clear and unambiguous, it is unnecessary to resort to the description. The description can otherwise be used to assist in understanding unclear terms used in the claims, but never to vary their scope or ambit. In other words, it could assist in comprehending the meaning of the words of the claims chosen by the patentee (Hughes, above at 316).

[132] The *Patent Act* and the purposive construction mandated by the Supreme Court of Canada in *Free World Trust v Électro Santé Inc* (2000 SCC 66 at paras 30-31) require adherence to the language of the claims, which promotes fairness and predictability. The claim language must be read in an informed and purposive way, rather than a purely literal one.

[133] A purposive construction gives meaning to the words of the claims with regard to the intention of the inventor, as disclosed in the patent. The analysis identifies the particular words or phrases in the claims that describe what the inventor considers to be the “essential” elements of the invention. The elements of a claim are presumed to be essential. For an element to be considered non-essential, sufficient evidence must establish that the person skilled in the art would understand that the omission or substitution of the specific element would have no effect on the way the invention works (*Free World Trust*, above at para 31).

[134] The assumption that claims are not redundant is known as the principle of “claim differentiation” and was well described by this Court in *Halford v Seed Hawk Inc*, (2004 FC 88, aff’d 2006 FCA 275):

> [93] In its simplest form, claim differentiation simply requires that "limitations of one claim not be 'read into' a general claim". A more expansive comment on claim differentiation appears in *D.M.I., Inc. v. Deere & Co.*:

> The district court said "As a general rule a limitation cannot be read into a claim to avoid infringement" … Where, as here, the limitation sought to be "read into" a claim already appears in another claim, the rule is far more than "general". It is fixed. It is long and well established. It enjoys an immutable and universally applicable status comparatively rare among rules of Law. Without it, the entire statutory and regulatory structure governing the drafting, submission, examination, allowance and enforceability of claims would crumble. This court has confirmed the continuing life of the rule ... Indeed, in Kalman, this court quoted with approval this clear statement of the rule found in *Deere & Co. v. International Harvester Co*.:
>
> Where some claims are broad and others narrow, the narrow claim limitations cannot be read into the broad whether to avoid invalidity or to escape infringement.
>
> [Citations omitted.]

[135] Finally, the skilled person will approach the claims and the disclosure of a patent with "a mind willing to understand, not [with] a mind desirous of misunderstanding" (*Lister v Norton Brothers & Co* (1886), 3 RPC 199 (Ch D) at 203). The skilled person is going to try to achieve success; the skilled person is not one who is looking for difficulties or seeking failure (*Free World Trust*, above at para 44).

F. *MIPS 542 Patent*

(1) Construction of the MIPS 542 Patent

[136] Only those claims of the MIPS 542 Patent that contain points of contention between the parties will be addressed in this section.

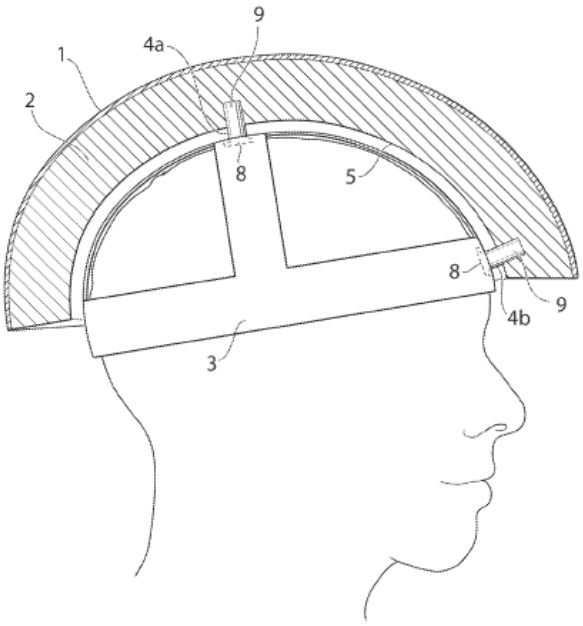
(a) *Claim 1 of the MIPS 542 Patent*

[137] Claim 1 of the MIPS 542 Patent reads as follows, with the points of contention set out in bold, for emphasis:

> A helmet, comprising: an energy absorbing layer comprising an energy absorbing material that absorbs energy by compression of the energy absorbing material, the energy absorbing layer including an inside surface and an outside surface opposite the inside surface such that the inside surface is adapted to be closer to a wearer's head than the outside surface and the inside surface faces the attachment device; **an attachment device provided for attachment of the helmet to the wearer's head**; and a **sliding facilitator**, wherein the sliding facilitator is provided between the inside surface of the energy absorbing layer and the attachment device, wherein the sliding facilitator is fixated to at least one of the attachment device or the inside surface of the energy absorbing layer for **providing slidability between the energy absorbing layer and the attachment device**.

[138] The "**attachment device**" contemplated in claim 1 is a new concept for helmets. It is not a term commonly used in the industry and it should not be confused with a retention system, such as a chin strap. Paragraph 10 of the MIPS 542 Patent helps the reader understand what an attachment device is not: "Chin straps or the like are not attachment devices according to the present embodiments of helmets." This is also consistent with figure 2 of the MIPS 542 Patent (JBD-986), which shows the attachment device (3).

Fig.2



[139] That distinction, however, does not mean, as suggested by Mr. Withnall, that the attachment device has an extra function, that of retaining the helmet on the wearer's head. Nor does it mean that the helmet could be worn without a chin strap. In fact, a MIPS II bike helmet without a chin strap would likely not conform to the industry standard.

[140] That said, Dr. Willinger described the attachment device as providing an interface surface between the wearer's head for interaction with the energy absorbing layer. He said that this is a necessary structural element of the helmet described in the patent, as it provides an anchored surface on the wearer's head that can interact with the inside surface of the energy absorbing layer. To illustrate his point, Dr. Willinger described the attachment device as a cap that provides

"anchoring" of the helmet to the wearer's head. He stated that the wearer's head needs to "be securely held within the attachment device when the helmet is worn" (TX-10 at paras 75, 78).

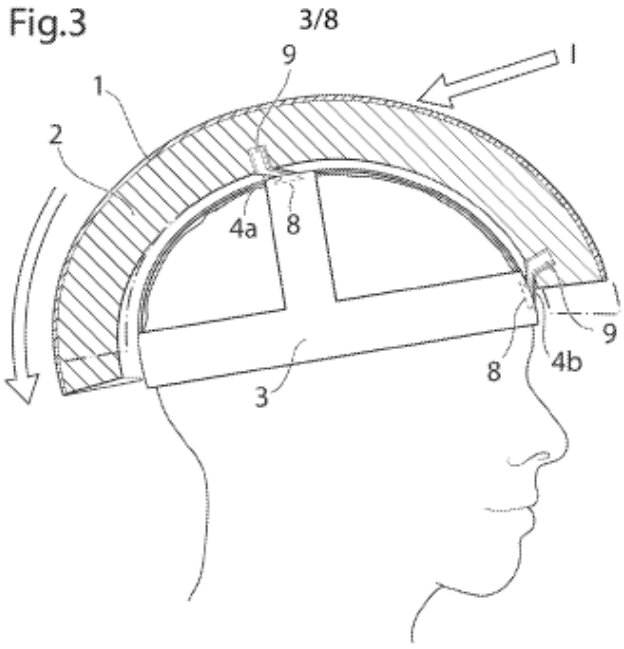
[141] Mr. Lowe construed the "attachment device" to require that it be "coupled" to the wearer's head, and that it "[stay] coupled to the wearer's head upon an impact to the helmet" (TX-45 at para 65), allowing sliding between the attachment device and the inner padding. For Mr. Lowe, prior to the MIPS II technology, there was no additional component between the comfort padding and the energy management layer. The attachment device was introduced by the inventor as a new component to couple to the head to create an interface between the head and the energy management layer to permit decoupling during a tangential impact. Upon impact, the purpose of the attachment device is to create a decoupling surface that slides first, before any sliding between the head and the attachment device occurs.

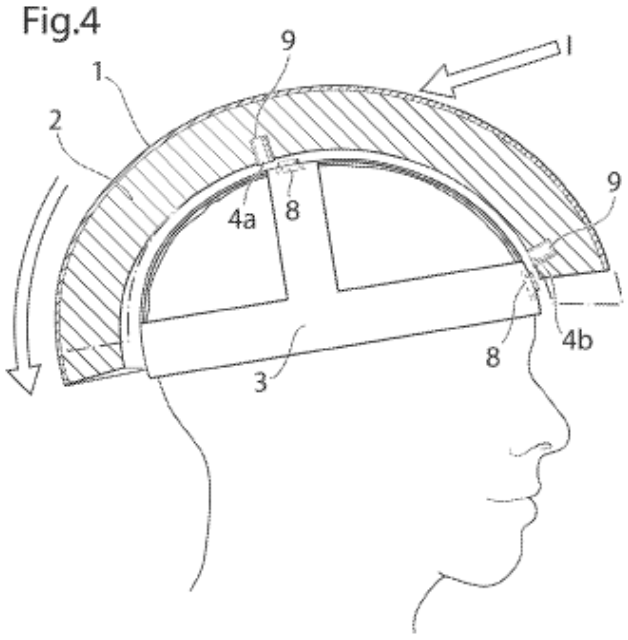
[142] However, when considering infringement, both MIPS' experts broadened their interpretation of the attachment device and minimized the degree of attachment needed in order to achieve the purpose of the invention. They suggested that:

- temporary or "impact-only" attachment is sufficient;
- the attachment device need only "rest on and around the wearer's head";
- the attachment device need only be "configured to fit the wearer's head or at least a portion of the wearer's head"; and
- the attachment device need only be the component that is "closest to the wearer's head".

[143] On the other hand, Mr. Withnall construed the "attachment device provided for attachment of the helmet to the wearer's head" of claim 1 to require that the attachment device provide a fixation or coupling to the wearer's head, such that a reliable and secure alignment of the helmet on the wearer's head is maintained both prior to and during an impact.

[144] All experts agree that the attachment device must maintain its position during an impact in order for decoupling to take place between the helmet and the attachment device, at least before any decoupling is possible between the attachment device and the wearer's head. Figures 3 and 4 of the MIPS 542 Patent demonstrate what takes place during an impact. The attachment device (3) maintains its position on the wearer's head notwithstanding an oblique impact (the "I" arrow), in order for the energy absorbing layer (2) and outer shell (1) to slide relative to the attachment device (3) and thus become decoupled from the wearer's head.





[145] In my view, the MIPS 542 Patent does not provide for temporary or impact-only attachment. The attachment device needs to be coupled to the wearer's head on most of the surface covered by the helmet. In order to achieve that goal, and to remain attached to the

wearer's head while decoupling in any given direction, all parts of the attachment device need to remain solidary amongst them. The references in the specification to a cap or a head band confirm that the attachment device needs to fit the wearer's head (like a cap) or at least a portion of the wearer's head (like the head band shown in most of the MIPS 542 Patent figures).

[146] First, not only are the words "at the time of impact" or any similar expression absent from claim 1, but figures 2 and 3 of the MIPS 542 Patent demonstrate that the attachment device provides the same level of attachment to the wearer's head both prior to and during an impact.

[147] Second, the original and more limited interpretation of the attachment device provided for by MIPS' experts is more in line with the plain wording of claim 1.

[148] Third, I agree with Mr. Withnall that since it is impossible to predict the angle of an impact and since the sliding or decoupling is multi-directional, it is important that the attachment device maintains the helmet in the correct position prior to an impact in order for the invention to function.

[149] As a result, I am of the view that a person skilled in the art would understand the attachment device not as being what keeps the helmet on the wearer's head at the time of impact, but rather as being what mostly stays in place on the wearer's head when, at the time of an impact, the helmet rotates on the wearer's head in any given direction. The attachment device is thus what allows for full, and not partial, decoupling between the helmet and the wearer's head when the head is subject to rotational impact.

[150] The "**sliding facilitator**" is fixated to at least one of the attachment device or the inside surface of the energy absorbing layer to provide slidability.

[151] The debate regarding the meaning of this component of claim 1 is crucial, as it will confirm whether or not friction is one of the mechanisms disclosed by the inventor to absorb rotational energy.

[152] According to MIPS' experts, a sliding facilitator merely encourages or allows relative movement between the attachment device and the rest of the helmet. They are of the view that it does not need to improve slidability and that, although a low friction interaction is preferred, it is not required.

[153] They rely on the five different places in the MIPS 542 Patent where the sliding facilitator is referenced, and in each place the description speaks of "allowing" or "permitting" slidability – rather than maximizing slidability or minimizing friction. In the words of the patent (at para 15): "The sliding facilitator gives the helmet a function (slidability)." Without a sliding facilitator in the helmet that functionality, according to them, is absent.

[154] They add that the sliding facilitator may be a low friction material, but it doesn't have to be. Potential low friction materials may include: a waxy polymer, such as PTFE (Teflon), PFA (PerFluoroAlkoxy), FEP (Polyfluoroethylenepropylene), PE (Polyethylene) and UHMW PE (Ultra-high molecular weight polyethylene), or a powder material, which could be infused with a lubricant (see para 44 of the MIPS 542 Patent). They are of the view that the skilled person

would understand that the type of sliding facilitator would be dependent on the application for which the helmet will be used and the magnitude of expected impacts, and would understand how to tune the type of material and resulting friction for the application they are working on.

[155] Mr. Withnall, on the other hand, opines that the use of the term "sliding facilitator" suggests a separate component of the helmet that enables sliding and submits that the claim promotes a low friction interaction between the attachment device and energy absorbing layer. According to Bauer, friction is thus not a significant means of reducing rotational energy in the MIPS II technology.

[156] First, I do not agree with MIPS that without a sliding facilitator, the slidability function of the invention would be absent. Since the attachment device is not solidary to the energy absorbing layer, movement or slidability would be possible without a sliding facilitator, though to a lesser extent.

[157] Second, I also do not agree that a sliding facilitator only allows for slidability. In my view, it needs to facilitate, aid, promote or make sliding between both surfaces easier than without the presence of a sliding facilitator.

[158] The ASTM International definition of friction is:

> Friction is the resisting force that arises when a surface of one substance slides, or tends to slide, over an adjoining surface of itself or another substance.

> (ASTM Standard D1894, 1993, "Standard Test Method for Static and Kinetic Coefficients of Friction of Plastic Film and Sheeting", ASTM International, West Conshohocken, PA, 1993)
>
> [Emphasis added.]

[159] The more sliding there is between two surfaces, the lower the resistance and thus the lower the amount of friction. Slidability and friction are, according to that definition, inversely proportional.

[160] On the other hand, in order to create friction, what's required are two surfaces that slide or tend to slide against one another. The minute the surfaces slide, friction occurs – the level of which will depend on the level of resistance.

[161] It is important to point out that all experts agree on the fact that most impacts have both linear and tangential components. They also agree that the greater the amount of linear impact energy, the more friction or resistance there will be between the attachment device and the energy absorbing layer, leading to less decoupling.

[162] Based on these notions, I agree with MIPS' experts that the person of skill in the art would understand that friction is one of the means to manage rotational energy as disclosed in the MIPS 542 Patent. That person would understand that the sliding facilitator is added to at least one surface to facilitate slidability and to counteract the resistance created by the linear component of an impact.

[163] I therefore agree with the fact that low friction interaction is only a “best mode” or preferred embodiment of the invention. The important feature of the invention is to lower the resistance between the two surfaces (the attachment device and the energy absorbing layer) in order to allow decoupling to occur. The type of sliding facilitator, and its coefficient of friction, will thus be dependent on the application for which the helmet will be used and the magnitude of expected impacts.

[164] First, the plain words used in claim 1, as indicated above, suggest that the inventor wanted to facilitate, aid, promote or make sliding easier between the two surfaces. In other words, the inventor wanted to find a way to reduce resistance or friction.

[165] Second, all references made in the specification to that functionality suggest that the goal is to facilitate sliding in order to allow decoupling. In all instances, the inventor uses “could” and provides for options. For example, paragraph 40 states: “The sliding facilitator could be a material having low friction coefficient of friction or be coated with a low friction material….It is furthermore conceivable that the sliding is enabled by the structure of the material, for example by the material having a fiber structure such that the fibers slide against each other” [emphasis added]. Of course, nowhere in the specification does it say that average or high friction is an option to achieve the desired functionality: slidability. That is because slidability and decoupling are crucial to the invention.

[166] Contrary to other MIPS patent applications (JBD-996, TX-41) which suggest that, for the purpose of those inventions, low friction is preferably between 0.05 and 0.3 but not higher than

0.3, the MIPS 542 Patent does not disclose any specific coefficient of friction. Dr. Halldin and Mr. Laperrière, who can both be considered as persons skilled in the art, testified that, in their view, a low friction coefficient is below 0.3.

[167] In my view, the person skilled in the art would understand claim 1 of the MIPS 542 Patent as requiring a sliding facilitator that reduces friction, without necessarily aiming at a resulting coefficient of friction below 0.3. If the invention required achieving a given coefficient of friction, the inventor would have said so.

[168] Finally, the person skilled in the art would not understand there to be no friction as a result of lowering the resistance between both surfaces in order to allow slidability or decoupling – especially in the presence of a high linear impact component.

(b) *Claim 3 – 'wherein the attachment device is fixated to the energy absorbing layer or the outer shell by means of at least one fixation member'*

[169] The parties agree that the term "**fixation members**" is not one that was commonly used in the art at the relevant time and that a skilled person would understand that they perform two functions: i) they connect the attachment device to the energy absorbing layer; and ii) they absorb rotational energy generated by an oblique impact to the helmet. However, this second function is not specifically addressed in claim 3.

[170] Divergence lies in the fact that for Bauer, the fixation members are an essential element of the invention of the MIPS 542 Patent and a skilled person in the art would understand that

they must be present in all of its embodiments. As Bauer's expert is of the opinion that friction and deformation of the attachment device are not significant ways to reduce rotational energy in the MIPS 542 Patent, deformation or stretching of the fixation members has to be the most effective, if not the only means by which to reduce rotational energy. Without them, the invention would simply not work.

[171] In response, MIPS maintains that its patent is properly drafted. It also submits that a skilled person would understand that the fixation members are not the key aspect of the MIPS 542 Patent and that the system would still work without them. The crux of the invention is relative movement between the attachment device and the inner padding. Without fixation members, energy is still absorbed through friction heat.

[172] As I am of the view that relative movement enabling decoupling will generate friction during a rotational impact, I am also of the view that the person skilled in the art, with a mind willing to understand, would understand that the invention could work without fixation members. As the Court should assume that claims are not redundant and claim differentiation requires that limitation of one claim not be 'read into' a general claim, I am also of the view that the fixation members are an additional feature or embodiment that can be added to claim 1.

(c) *Claim 4 – 'wherein the fixation member is able to absorb energy and forces by deforming in an elastic, semi-elastic, or plastic way'*

[173] When present, the fixation members may be adapted to absorb energy and forces upon impact to the helmet by deforming in an elastic, semi-elastic, or plastic way. The fixation

members may also be hyper elastic, such that the material absorbs energy elastically while, at the same time, partially deforming plastically, without failing completely.

[174] Again, the claim differentiation principle requires that claims 1 and 3 be construed as not requiring that fixation members absorb energy.

(d) *Claim 5 – 'the fixation member comprises at least one suspension member'*

[175] The skilled person would understand the "**suspension member**" of claim 5 to be an embodiment of the "fixation member", which provides for separation between the attachment device and the energy absorbing layer or the outer shell, thus performing a suspension function.

(e) *Claim 6 – 'wherein the sliding facilitator is a low friction material'*

[176] As indicated above, using a low friction material is one means by which to achieve slidability or to reduce resistance between the attachment device and the energy absorbing layer, but it is not the only one. For example, another way to achieve slidability or to reduce resistance would be to use a material with a fiber structure, whereby the fibers slide against each other.

(2) Infringement of the MIPS 542 Patent

(a) *Infringement – legal principles*

[177] Section 42 of the *Patent Act* gives the holder of a patent the right to exclude others, for the term of the patent, from making, constructing or using the invention, or selling it to others to be used. Infringement is any act that interferes with the full enjoyment of the monopoly granted by this section (*Monsanto Canada Inc v Schmeiser*, 2004 SCC 34 at para 34).

[178] Bauer's intention, whether innocent or not, is immaterial to the question of whether there is infringement (*Apotex Inc v Astrazeneca Canada Inc*, 2017 FCA 9 at para 77).

[179] The onus lies with the party asserting infringement, that is MIPS, to establish on a balance of probabilities, the infringement of its patent (*Eli Lilly and Company v Apotex Inc*, 2009 FC 991 at para 211, aff'd 2010 FCA 240). A patentee will prevail even if only one valid claim is infringed.

[180] Infringement is a mixed question of fact and law. After the claims are construed (a question of law), infringement is determined by comparing the allegedly infringing process or product with the words of the claims (a question of fact), as properly construed (*Whirlpool* at para 76). One needs to remember that:

(i) the subject of the analysis is the defendant's actual product (here, Bauer's RE-AKT and RE-AKT 100 helmets), not a patent which may describe that product (*Lapierre v Echochem International Inc*, 2002 FCT 617 at paras 4-6 at paras 4-6, citing *Free World Trust*); and

(ii) the defendant's product is compared against the asserted patent claim(s) in issue, not the patentee's commercial products (such as helmets that incorporate the MIPS II technology) (*Lammli v Cousins*, 2002 FCT 437 at paras 11, 15-17).

[181] In this section, the development of Bauer's product, as reviewed above, is not relevant.

[182] Section 32 of the *Patent Act* states that even if the defendant has made an improvement over the patented invention (and holds patents in those improvements), it does not obtain any right under the original invention. The Court must look at the overall product (including any changes or improvements) and determine whether that product infringes the claims at issue. Adding features to a device that uses the patented invention does not avoid infringement: "The superadding of ingenuity to a robbery does not make the operation justifiable" (*SmithKline Beecham Pharma Inc v Apotex Inc*, 2001 FCT 770 at paras 60-61, aff'd 2002 FCA 216).

[183] Specifically, infringement occurs where the defendant's product includes all of the essential elements of a patent claim. Substituting or omitting non-essential elements will not avoid infringement (*Free World Trust*, above at paras 31 f), 68).

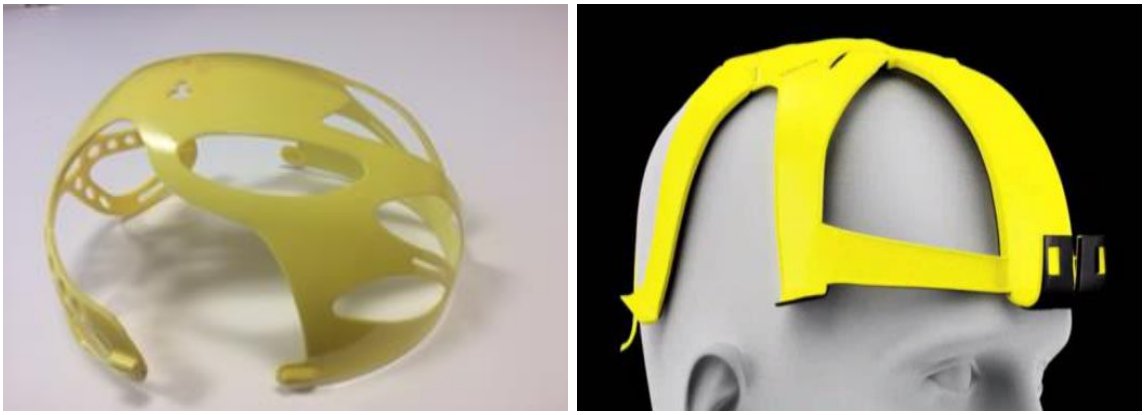
(b) *Bauer's RE-AKT and RE-AKT 100 helmets*

[184] MIPS' position is that the RE-AKT and RE-AKT 100 helmets infringe the MIPS 542 Patent because they include a new structure (the SUSPEND-TECH floating liner) that is located between the wearer's head and the energy absorbing layer and that, on oblique impact, it permits a relative sliding motion between that structure and the energy absorbing layer. This rotational

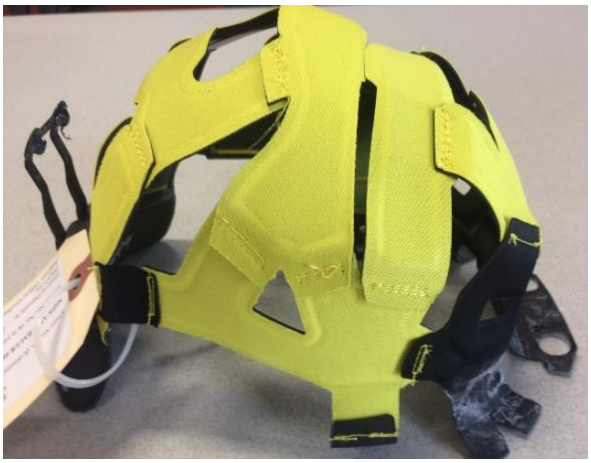
impact protection was new to Bauer and was introduced into the market by Bauer after MIPS had already filed to obtain exclusive rights in what became the MIPS 542 Patent in Canada.

[185] According to MIPS, the SUSPEND-TECH and SUSPEND-TECH 2 floating liners of the RE-AKT and RE-AKT 100 helmets, respectively, are "**attachment devices**" as this term is used in the claims of the MIPS 542 Patent. The SUSPEND-TECH and SUSPEND-TECH 2 floating liners are located between the energy absorbing layer and the head of the wearer. They rest on and around the wearer's head when the helmet is worn and provide anchoring at the time of impact. Both liners provide an interface surface between the wearer's head for interaction with the energy absorbing layer of the helmet. The SUSPEND-TECH and SUSPEND-TECH 2 floating liners are configured to fit the wearer's head or a least a portion of the head, so MIPS argues that they are clearly attachment devices.

[186] In order to illustrate its point, MIPS first compares its Lazer P-Nut attachment device (as reproduced in Dr. Willinger's Expert Report (TX-10) at page 83) with a screen capture of the SUSPEND-TECH floating liner from Bauer's RE-AKT promotional video (JBD-1937):



[187] MIPS makes a second comparison between the image of the MIPS II attachment device as it appears in its promotional material (JBD-172, slide 22) and the image of the SUSPEND-TECH 2 floating liner from the RE-AKT 100 (TX-86):



[188] One can easily understand why these images were put side by side by MIPS: the yellow color and the shape of the attachment device and the SUSPEND-TECH floating liner give them some apparent similarity. Yet the color is a simple coincidence, resulting from branding for MIPS and from the choice of a third party for Bauer. As for the common shape of these devices, it is easily explained by the fact that both are components of a helmet that is worn on the head.

[189] However, the look of these devices is not what needs to be assessed and compared; rather, it is how the inventions work.

[190] As indicated above, for infringement purposes, Bauer's product is to be compared against the MIPS 542 Patent claims at issue and not against MIPS' commercial products. Additionally, it

is Bauer's RE-AKT and RE-AKT 100 helmets that are at stake, not a sketch reproduced in any of the Bauer Patents or a picture found in a given promotional catalogue.

[191] Although I do not have to rule on this issue, I tend to agree with Mr. Withnall that it is far from obvious when looking only at the Lazer P-Nut attachment device that it is one that is contemplated by the claims of the MIPS 542 Patent. One would need to see the attachment device inserted into the helmet in order to assess whether, when combined with its other components (like the little plastic straps that keep the parts of the attachment device together), it forms a cap or a head band that would stay coupled to the head during impact.

[192] In my view, the SUSPEND-TECH floating liner, found in Bauer's RE-AKT helmet, is not an attachment device. It does not perform an attachment function in accordance with the MIPS 542 Patent. It does not couple to the head before impact and does not stay fully coupled to the head at the time of impact, since it necessarily remains attached to the periphery of the helmet. Like all hockey helmets, the RE-AKT is designed to be attached to the wearer's head with a combination of tight fit adjustment mechanisms and a chin strap. These are the mechanisms that provide for the reliable and secure alignment of the helmet on the wearer's head both prior to and during an impact – not the SUSPEND-TECH floating liner.

[193] The SUSPEND-TECH floating liner is made up of different soft PORON XRD bands sewn together. These bands or parts of the SUSPEND-TECH floating liner are not solidary with each other. They move relative to each other.

[194] It is true that the SUSPEND-TECH floating liner partially couples to the wearer's head at the time of impact, but as it is made of soft PORON XRD, the rest of the floating liner stretches and deforms as a result of: i) its partial coupling to the head; and ii) its attachment to the periphery of the helmet. Partial and "impact only" anchoring to the wearer's head are not sufficient to assimilate the SUSPEND-TECH floating liner to an attachment device.

[195] I agree with MIPS' experts that the evidence does not show that the SUSPEND-TECH floating liner absorbs a significant amount of linear energy. However, in addition to offering minimal linear impact protection and rotational impact protection, it is the helmet's comfort padding. The SUSPEND-TECH floating liner does not attach to the wearer's head, but rather to the helmet as its comfort padding. Put differently, the mere fact that the SUSPEND-TECH floating liner is not completely solidary with the energy absorbing layer – as if it was glued – is not sufficient to make it an attachment device as per the MIPS 542 Patent. The feature of relative motion is not sufficient either. The SUSPEND-TECH floating liner simply does not perform in the same way as the MIPS 542 Patent's attachment device.

[196] I am also of the view that all of the above comments apply equally to the SUSPEND-TECH 2 floating liner, even though it has more of a cap/head-band shape.

[197] As the attachment device is a crucial element of all of the MIPS 542 Patent claims, a finding that the SUSPEND-TECH and the SUSPEND-TECH 2 floating liners are not attachment devices is a finding that the Bauer RE-AKT and RE-AKT 100 helmets do not infringe the MIPS 542 Patent.

[198] I will nevertheless continue and review the parties' positions with respect to the other contentious elements of the MIPS 542 Patent: the "sliding facilitator", the "fixation members" and the "suspension member".

[199] MIPS' experts are of the opinion that the RE-AKT and RE-AKT 100 helmets each have two "**sliding facilitators**" between the inside surface of the energy absorbing layer and the SUSPEND-TECH floating liner. They identified the first sliding facilitator as the soft and smooth black textile material affixed to the back of the SUSPEND-TECH floating liner that is glued or fused to it. This material interacts with the opposing surface of the energy absorbing layer to encourage relative movement between the SUSPEND-TECH floating liner and the inside surface of the energy absorbing layer (i.e. to provide slidability). In addition, the EXPANCEL padding is covered with a non-woven film. They view this film as an additional sliding facilitator.

[200] Both Dr. Willinger and Mr. Lowe described the soft and smooth black textile material on the SUSPEND-TECH floating liner as a low friction material based on the texture of the material to the touch and its interaction with the corresponding surface of the EXPANCEL padding.

[201] However, MIPS' experts failed to consider the reasons behind the materials selected by Bauer for its RE-AKT and RE-AKT 100 helmets. Mr. Laperriere and Ms. Genereux both explained that PORON XRD being a permeable foam, it is not suitable for the inside of a hockey helmet, as it retains water and sweat. It has to have some sort of coverage. In its first certified version of the RE-AKT helmet, both sides of the SUSPEND-TECH floating liner were covered

with the same TPU (Thermoplastic Polyurethane) or rubber-like material. At the request of the supplier who was experiencing manufacturing issues and a high rate of rejections, the soft and smooth black textile material was substituted in place of the TPU on one side of the SUSPEND-TECH floating liner. No real explanation was given as to the reason why Bauer chose the inside of the SUSPEND-TECH floating liner to be so covered but, as indicated by the test results shown below, that decision had no real impact on slidability.

[202] In fact, MIPS' argument is partly contradicted by Bauer's internal coefficient of friction testing that shows the soft and smooth black textile material on the SUSPEND-TECH floating liner to have a coefficient of friction, when rubbed against an aluminum standard surface, of 0.387 as compared to 0.354 when covered with TPU:

	ID#2079					
	Poron XRD recouvert de tissus noir de Rodgers					
	sur aluminium		sur Expancel gris non-recouvert		sur Expancel recouvert de non-woven	
	Essai	résultat °	Essai	résultat °	Essai	résultat °
	1	21.1	1	54.9	1	31.7
	2	21.1	2	54.1	2	29.3
	3	21.5	3	54.4	3	27.8
	4	21.3	4	55.0	4	27.6
	5	20.8	5	54.5	5	28.6
	Moyenne	***21.2***	***Moyenne***	***54.6***	***Moyenne***	***29.0***
tan ϑ = μ = coefficient friction		***0.387***		***1.406***		***0.554***
Comparatif : Poron recouvert de TPU		***0.354***		***1.441***		***0.524***
% de différence Poron recouvert de tissus vs Poron recouvert de TPU		***9.306%***		***-2.419%***		***5.728%***

[203] As for the non-woven film affixed to the EXPANCEL padding, its coefficient of friction was tested at 0.398. But the same test results also show that adding the non-woven film to the EXPANCEL reduces its coefficient of friction against the soft and smooth black textile material by more than half (from 1.406 to 0.554).

[204] This coefficient of friction testing was the only such testing conducted by Bauer in support of its own patent filings, so these results ought to be sufficient to confirm that the soft and smooth black textile material on the SUSPEND-TECH floating liner had no impact on slidability, as compared to the TPU. The test results also confirm that adding the non-woven film onto the EXPANCEL padding had a significant impact on slidability.

[205] No such testing was performed on the RE-AKT 100. Only MIPS' experts testified that it is apparent to the touch that there will be more sliding with the RE-AKT 100 than with the RE-AKT helmet. According to them, the first sliding facilitator in the RE-AKT 100 is a yellow textile material affixed to the surface of the SUSPEND-TECH 2 floating liner that faces the energy absorbing layer. This material appears to be the same material that is used in the RE-AKT (i.e. a soft and smooth material). The second sliding facilitator of the RE-AKT 100 is the "very smooth" material that has been applied to the RE-AKT 100's energy absorbing layer. This material functions to encourage relative movement between the two surfaces, as would occur on an oblique impact.

[206] MIPS has not provided sufficient evidence to convince me that the RE-AKT and RE-AKT 100 helmets contain a sliding facilitator as disclosed in the MIPS 542 Patent.

[207] The soft and smooth black textile material affixed to one side of the PORON XRD making up the SUSPEND-TECH floating liner appears to have an insignificantly higher coefficient of friction than the side covered with TPU (0.387 versus 0.354 when tested against

aluminum and 0.554 versus 0.524 when tested against the EXPANCEL padding covered with non-woven film).

[208] As for the non-woven film covering the EXPANCEL padding, I am not convinced that it was added in order to facilitate slidability. The evidence shows that the EXPANCEL padding needs to be covered in order to maintain its structure; the non-woven film is, in that sense, part of the structure. As demonstrated by Ms. Généreux during her testimony, EXPANCEL is a very fragile and friable material that easily shatters upon simple pressure from the fingers. It can therefore be said that the non-woven film has a different function than to facilitate sliding: that of ensuring the integrity of the energy absorbing layer. It may also be that the non-woven film was chosen to contribute to the aesthetics of the helmet, as the film has a soft and shiny finish. No evidence was presented that the non-woven film has a lower friction surface than any other film or material that could have been used to maintain the integrity of the RE-AKT helmet's energy absorbing layer. In order to determine if the non-woven film facilitates sliding, it would need to have been compared to another material that could have been used to maintain the integrity of the EXPANCEL, and not to the uncovered EXPANCEL padding itself.

[209] For the reasons set out above, I am of the view that MIPS has not met its onus to prove that Bauer's RE-AKT and RE-AKT 100 helmets have a "sliding facilitator……for providing slidability" as set out in claim 1 of the MIPS 542 Patent.

[210] Finally, MIPS asserts that the RE-AKT and RE-AKT 100 helmets have "**fixation members**". Its experts view the elastically deformable portions of PORON XRD located in the

front and back of the RE-AKT helmet (and sides of the RE-AKT 100 helmet) that connect the SUSPEND-TECH floating liner to the rest of the helmet to be fixation members as contemplated by claim 3 of the MIPS 542 Patent.

[211] According to that theory, the skilled person would appreciate that the PORON XRD portions of the SUSPEND-TECH floating liner that are glued to the periphery of the helmet would deform elastically upon oblique impact. These fixation members are integrated into the SUSPEND-TECH floating liner and are both: i) part of the attachment device; and ii) fixation members. The RE-AKT 100 helmet has two additional fixation members, made up of resilient and rigid black plastic parts that are screwed to the shell of the helmet and also connect to the PORON XRD portions.

[212] Since these fixation members would deform and dissipate energy upon impact, MIPS asserts that they also infringe claim 4 of the MIPS 542 Patent.

[213] I do not agree with MIPS.

[214] First, the MIPS 542 Patent does not suggest in any way that part of the attachment device could also be a fixation member. Not only is it a separate component of the helmet, but in contrast to the attachment device, the fixation member is not an essential element of the independent claim 1.

[215] As for the flat plastic pieces that connect the SUSPEND-TECH 2 floating liner to the sides of the RE-AKT 100 helmet, they could be considered to perform the first function of a fixation member covered by claim 3 of the MIPS 542 Patent: connecting the attachment device to the energy absorbing layer. However, they cannot be considered to perform its second function covered by claim 4 of the MIPS 542 Patent: absorbing rotational energy generated by an oblique impact to the helmet.

[216] These flat plastic pieces are sandwiched between the helmet's hard plastic ear cover and its hard plastic outer shell. They are held there by screws. I agree with Bauer that since the majority of the flat plastic pieces are not exposed, they would not be subject to deformation or displacement, so as to absorb rotational energy generated by an impact.

[217] I also agree that these flat plastic pieces are made of a material that is much less resilient than PORON XRD. As a result, the connecting parts of the SUSPEND-TECH floating liner would stretch or deform long before any portion of the flat plastic pieces would.

[218] Finally, if any portion of the flat plastic piece were to stretch or deform in any material way, it would do so plastically. In such case, the flat plastic piece would need to be replaced, and the helmet could not be used again until it was replaced. Such a helmet would not be suitable for use as a multi-impact hockey helmet.

[219] As a result, were I to find that: i) the SUSPEND-TECH 2 floating liner is an attachment device as disclosed in the MIPS 542 Patent; and ii) the RE-AKT 100 helmet has a sliding facilitator; I would find that the flat black plastic pieces that connect the SUSPEND-TECH 2 floating liner to the RE-AKT 100 helmet are fixation members as contemplated in claim 3 of the MIPS 542 Patent (connection function), but not as contemplated in its dependent claim 4 (energy absorbing function).

(3) Validity of the MIPS 542 Patent

[220] As duly published patents are presumed valid, the burden of proof, in this section, shifts and lies on the shoulders of Bauer, the party alleging invalidity.

[221] Bauer argues, and is called upon to prove, that the MIPS 542 Patent is invalid for anticipation, obviousness and for having claims that are broader than the invention made. In its initial proceeding, Bauer also asserted that the MIPS 542 Patent was also invalid for lack of utility. This latter argument was rightfully abandoned at trial.

(a) *Anticipation*

[222] The subject-matter of a claim must be novel, which means not anticipated by prior art. Subsection 28.2(1) of the *Patent Act* requires that:

> a. "[t]he subject-matter defined by a claim in an application for a patent in Canada […] must not have been disclosed […] in such a manner that the subject-matter became available to the public in Canada or elsewhere"
>
> > i. by the applicant, directly or indirectly, more than one year before the appropriate filing date (s 28.2(1)(a)), or
> >
> > ii. otherwise before the claim date of the application (s 28.2(1)(b)); and
>
> b. the subject-matter must not be disclosed in a Canadian patent application, filed by another applicant and having an earlier claim date ((s 28.2(1)(c) and (d)).

[223] As stated in *Fox on the Canadian Law of Patents*: "It is not enough to point to the invention in a general way, or to describe in a general way the basic concept of the invention, or to merely suggest something from which the patent in suit might have evolved" (Donald H MacOdrum, *Fox on the Canadian Law of Patents*, 5th ed (Toronto: Thompson Reuters, 2017) (looseleaf 2017-6), ch 5 at 35).

[224] In *Apotex Inc v Sanofi-Synthelabo Canada Inc*, 2008 SCC 61 at paragraph 49, the Supreme Court of Canada crystalized a two-step approach for anticipation:

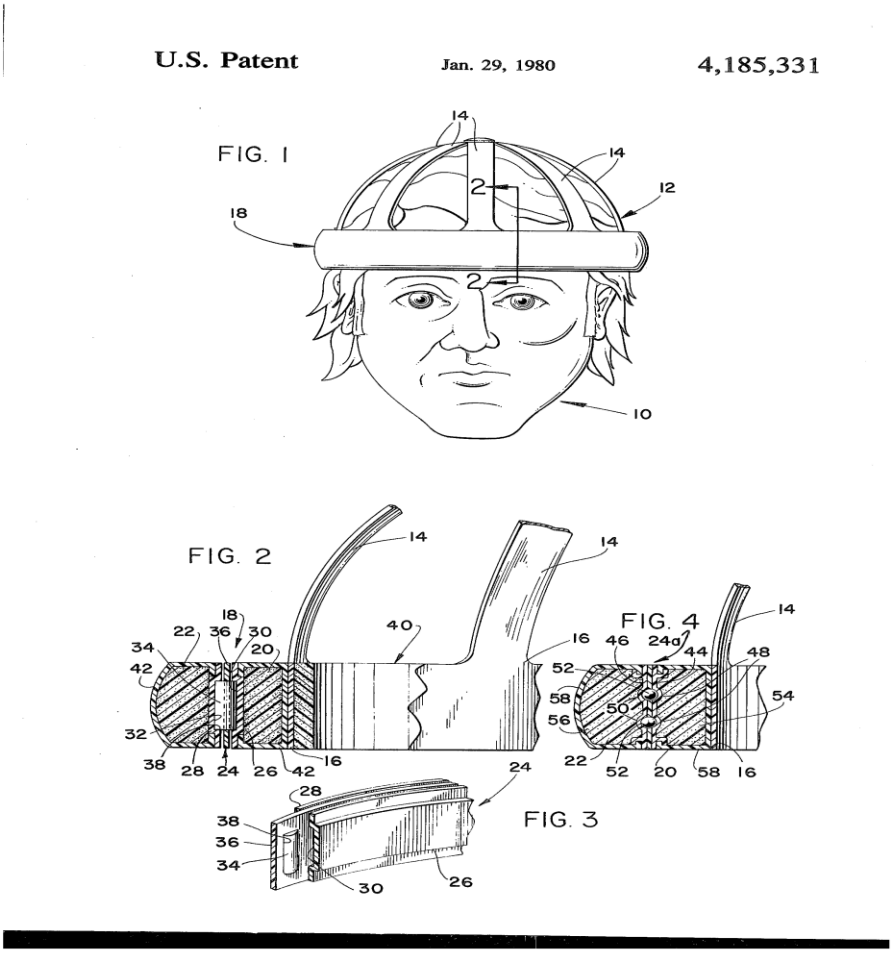
i. the prior reference must disclose subject-matter that would necessarily infringe the claim at issue if practiced (disclosure); and

ii. the prior art must enable a person skilled in the art to practice that subject-matter (i.e. work the invention) without undue trial and error (enablement).

[225] Anticipation is generally difficult to establish. It is not sufficient to find the "bits and pieces" of the invention in a dossier of prior art – one must find all the information practically needed by the skilled person to produce the invention in a single publication (*Free World Trust*, above at paras 25-26).

[226] As exposed above, the attachment device is the most essential element of the invention disclosed in the MIPS 542 Patent. As such, it would need to be anticipated in order for the patent to be invalid on that count. I agree with MIPS that none of the cited prior art references disclose an attachment device located between the wearer's head and the energy absorbing layer, as required by the independent claim 1 of the MIPS 542 Patent.

[227] U.S. Patent No. 4,185,331, also known as the Nomiyama Patent, discloses a head device comprising two head bands – an inner band and an outer band – with free motion existing between them. Upon impact, the outer band rotates or spins around the inner band on a roller bearing:



[228] Although this head device, or “mounting means”, looks like a cap and has a form similar to that of the MIPS 542 Patent’s attachment device, it does not provide for attachment of a helmet to the wearer’s head. That said, I am of the view that this head device is not a helmet. As the only energy absorbing material is found in both head band layers, it would only locally protect the head against radial impact. As such it would not qualify, in my view, as a protective helmet.

[229] In addition, the Nomiyama Patent does not allow for multi-directional decoupling of the energy absorbing layer from the attachment device, but instead only allows for decoupling on a single axis (around the head).

[230] The only other two pieces of prior art referenced by Bauer for the anticipation analysis are U.S. Patent No. 6,658,671, also known as the Von Holst or MIPS 1 Patent, and the U.S. 2004/0117896 publication, also known as the Madey publication. Yet Mr. Withnall acknowledged that should the Court construe the attachment device disclosed in the MIPS 542 Patent in a restrictive way, i.e. in a way that would not cover a component such as Bauer's SUSPEND-TECH floating liner, then the claims of the MIPS 542 Patent would not have been anticipated by the MIPS 1 Patent or the Madey publication.

[231] As the Court did not retain the broader interpretation of the attachment device suggested by MIPS' experts for the purpose of infringement, Bauer's argument of invalidity for anticipation can be put to rest.

(b) *Obviousness*

[232] Section 28.3 of the *Patent Act* dictates that obviousness is concerned with whether the unimaginative, uninventive person of skill in the art would have come directly and without difficulty to the solution taught by the patent:

Invention must not be obvious

28.3 The subject-matter defined by a claim in an application for a patent in Canada must be subject-matter that would not have been obvious on the claim date to a person skilled in the art or science to which it pertains, having regard to

(a) information disclosed more than one year before the filing date by the applicant, or by a person who obtained knowledge, directly or indirectly, from the applicant in such a manner that the information became available to the public in Canada or elsewhere; and

(b) information disclosed before the claim date by a person not mentioned in paragraph (a) in such a manner that the information became available to the public in Canada or elsewhere.

Objet non évident

28.3 L'objet que définit la revendication d'une demande de brevet ne doit pas, à la date de la revendication, être évident pour une personne versée dans l'art ou la science dont relève l'objet, eu égard à toute communication : **a)** qui a été faite, plus d'un an avant la date de dépôt de la demande, par le demandeur ou un tiers ayant obtenu de lui l'information à cet égard de façon directe ou autrement, de manière telle qu'elle est devenue accessible au public au Canada ou ailleurs;

a) qui a été faite, plus d'un an avant la date de dépôt de la demande, par le demandeur ou un tiers ayant obtenu de lui l'information à cet égard de façon directe ou autrement, de manière telle qu'elle est devenue accessible au public au Canada ou ailleurs;

b) qui a été faite par toute autre personne avant la date de la revendication de manière telle qu'elle est devenue accessible au public au Canada ou ailleurs.

[233] An allegation of obviousness may be based on common general knowledge alone or on prior art in combination with the common general knowledge (*Eli Lilly* at para 415).

[234] Any information or prior art reference that was available to the public may be considered. A combination or "mosaic" of prior art references may also be relied upon, if it is reasonable to expect that the person skilled in the art would have located those documents in a diligent search (*Pollard Banknote Limited v BABN Technologies Corp*, 2016 FC 883 at para 194) and considered the referenced documents as a whole (*Eli Lilly*, above at paras 416-419).

[235] Where the prior reference being relied upon is the public display of a product, the issue is whether the relevant elements of the invention were revealed to the person skilled in the art (*Easton Sports Canada Inc v Bauer Hockey Corp*, 2011 FCA 83 at paras 65-68).

[236] As set out by the Supreme Court of Canada in *Sanofi-Synthelabo* (above at para 67), the obviousness inquiry may follow a four-step approach:

> (1) Identify the notional "person skilled in the art" and 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?

[237] The Federal Court of Appeal has recently added that there is no single "hard and fast rule" or categorical approach to obviousness. Rather, the analysis should be approached in an "expansive and flexible" manner (*Bristol-Myers Squibb Canada Co v Teva Canada Limited*, 2017 FCA 76 at paras 59-62).

[238] Ultimately what matters in the obviousness analysis is the difference between what is claimed and the prior art. As well put by Justice Pelletier in *Bristol-Myers* (above at paras 65-68), the obviousness analysis asks whether the distance between two points – the state of the prior art at the relevant date and the invention as disclosed by the patent – can be bridged by the skilled person using only the common general knowledge available to such a person.

[239] Having concluded that, with the exception of claim 5 of the MIPS 542 Patent, each of the other claims were either i) anticipated by the Nomiyama Patent; or ii) anticipated by the MIPS 1 Patent and the Madey publication - should the attachment device be construed broadly enough to cover the SUSPEND-TECH floating liner, Bauer and its expert concentrated their obviousness argument on claim 5 of the MIPS 542 Patent and on the "suspension member".

[240] Mr. Withnall points to the U.S. 2004/0250340 publication, also known as the Piper publication, which discloses a "rivet" (321) that supports the weight of the outer layer (314) from the inner layer (313) on the head of the wearer:

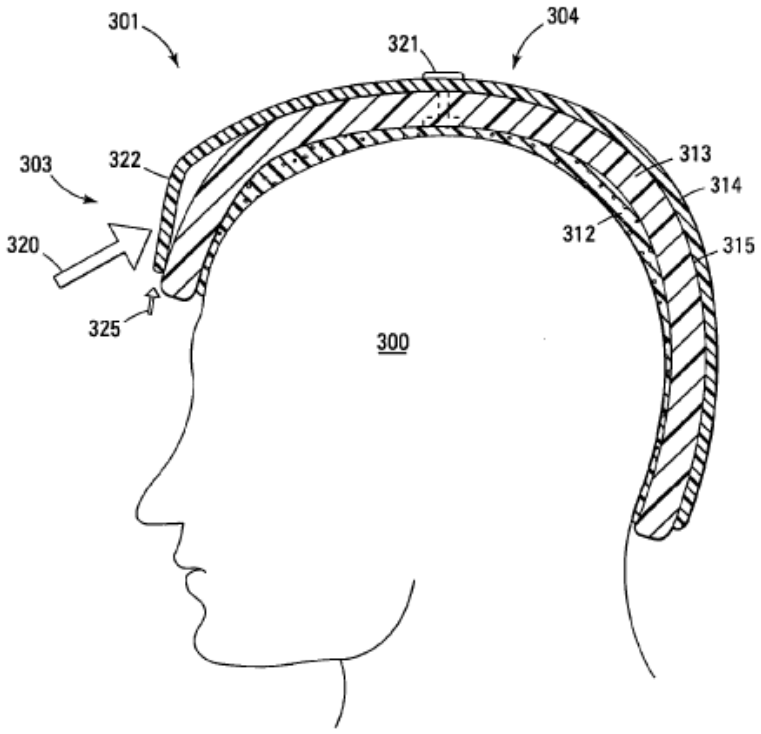


Fig. 4

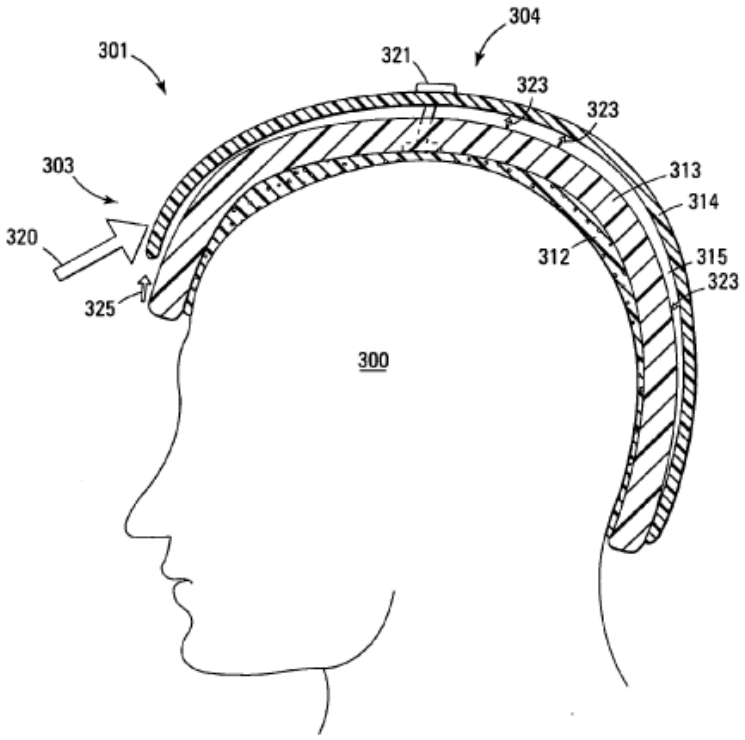


Fig. 5

[241] Mr. Withnall is thus of the opinion that it would have been obvious for a person skilled in the art to have combined the teachings of the rivet from the Piper publication with the teachings of the attachment device – if broadly construed – from the MIPS 1 Patent and the Madey publication, to arrive at a helmet that includes the "suspension member" of claim 5 of the MIPS 542 Patent, without requiring any degree of inventiveness.

[242] Mr. Withnall also views the typical construction hard hat as disclosing many of the elements of the claims of the MIPS 542 Patent, the most important being the outer shell and the suspension member of claim 5. As a result, he believes that it would have been obvious for the

person skilled in the art to combine the teachings of the suspension component from the construction hard hat with the teachings of the MIPS 1 Patent or the Madey publication.

[243] The obviousness attack on the MIPS 542 Patent is doomed to fail for the same reason that the anticipation attack did: the Nomiyama Patent does not disclose an attachment device providing for attachment of the helmet to the wearer's head. As for the construction hard hat, it does not allow for decoupling between an attachment device and the rest of the helmet, as the two components are not even meant to touch. The outer shell is to remain suspended to protect the wearer's head from falling objects. In addition, when construed restrictively, the attachment device is not found in the MIPS 1 Patent or in the Madey publication.

[244] However, if I were to find that any of the prior art disclosed an attachment device as disclosed in the MIPS 542 Patent, I would agree that claim 5 would be invalid for obviousness. I see no major difference between the suspension member disclosed therein and the rivet disclosed in the Piper publication. Both perform a suspension function and both comprise two portions: one fixated to the energy absorbing layer or outer shell and the other fixated to the attachment device (when construed broadly).

(c) *Claims broader than invention made*

[245] The claims of a patent may not exceed the invention made by the inventor(s), or the invention described in the specification. The nature of the invention made is a question of fact. What was disclosed is a question of law turning on a construction of the disclosure and a determination of what it says. In both cases, a comparison must be made with the claims of the

patent to determine if the breadth of the claims exceeds either what the inventor(s) actually did or what the disclosure actually says (*Pfizer Canada Inc v Canada (Health)*, 2008 FC 11 at paras 45-46).

[246] If the claims are soundly predicted and there has been sufficient disclosure of how to make the invention, then there can be no overbreadth of the claims (*Gilead Sciences, Inc v Idenix Pharmaceuticals Inc*, 2015 FC 1156 at para 784).

[247] A claim is overbroad where it fails to claim an essential element of the invention made or disclosed. The analysis must thus be made in relation to an essential element of the invention (*Illinois Tool Works Inc v Cobra Fixations Cie Ltée – Cobra Anchors Co Ltd*, 2002 FCT 829 at paras 94-95, aff'd 2003 FCA 358), keeping in mind that it is not enough for the feature to be discussed in the specifications or to be of the essence of the patent (*Nova Chemicals Corporation v Dow Chemical Company*, 2016 FCA 216 at para 50).

[248] Here, Bauer focusses on the "fixation member" component and the fact that it is absent from the independent claim 1 of the MIPS 542 Patent.

[249] Bauer reviewed MIPS' test reports made prior to the May 3, 2011 filing date and argues that they show that the fixation members are an essential element of the invention, as they mainly absorb rotational energy.

[250] Bauer relies on MIPS' 1112 Test Report (JBD-1082), which describes testing on a prototype where Teflon tape was used as a sliding facilitator and two rubber backstraps (fixation members) were used to attach the attachment device to the energy absorbing layer. Energy was absorbed by the two rubber backstraps and the helmet showed significant reduction in the rotational energy transmitted to the head.

[251] Bauer also relies on other test results which emphasize that the sliding facilitator's purpose is to permit the attachment device to slide with minimal friction. The prototypes used for these tests included at least one rubber backstrap.

[252] However, at trial, Mr. Lanner described a helmet test video from October 2010 (JBD-226) that showed a POC Trabec helmet with a mock-up low friction layer tested in lateral impact configuration. He explained that the helmet shown in the video was "one of these early stage prototypes where we just put down a low friction layer at hand into the helmet without any fixation members, without anything, just to make sure that it shows a relative motion compared to the conventional helmet without a low friction layer in it" (Trial Transcript Vol 7, page 1274, lines 22-27 of the transcript).

[253] Mr. Thiel and Dr. Halldin also confirmed that, prior to the filing date, testing was done both with and without fixation members, since the key was to create relative motion between two surfaces. Mr. Thiel explained: "If you can't create that motion, then you have difficulties to reduce strain on the brain" (Trial Transcript Vol 5, page 861, lines 26-28).

[254] Therefore, by way of testing performed prior to the filing date, MIPS did demonstrate that a helmet with no fixation members to connect the attachment device to the energy absorbing layer showed a reduction in rotational velocity and rotational acceleration.

[255] These test results show, in accordance with my conclusion on the role of friction in the MIPS 542 Patent as discussed above, that friction is a mean to absorb energy in the invention disclosed by the MIPS 542 Patent and that fixation members are not an essential aspect or key element of the patent.

[256] I am therefore of the view that Bauer did not discharge its burden to prove, on a balance of probabilities, that the MIPS 542 Patent is invalid for anticipation, for obviousness or for having claims broader than the invention made.

G. *Bauer Patents*

[257] MIPS claims that the Bauer Patents are invalid as being obvious due to MIPS' own public disclosure and sale of helmets containing the MIPS II technology before Bauer first filed a patent application to which these patents claim priority.

[258] MIPS further claims that the three patents that followed the Bauer 316 Patent are not "patentably distinct" and are therefore invalid for running afoul of the rule against double patenting.

[259] The parties' experts are in agreement that the person skilled in the art to which the Bauer Patents are addressed would be the same as the skilled person for the MIPS 542 Patent. The common general knowledge attributable to that person would also generally be the same. However, the Bauer Patents focus more closely on adjustable helmets for use in hockey and lacrosse.

[260] As with issues of infringement and validity concerning the MIPS 542 Patent, the first step in determining the extent of Bauer's patent rights is to construe the Bauer Patents.

[261] In this section, the spotlight is not on the RE-AKT and RE-AKT 100 helmets, since they only represent embodiments of the invention(s) disclosed in the Bauer Patents. The spotlight is on the claims of the Bauer Patents.

[262] For ease of presentation, I will do as MIPS did and focus on the important claims in the Bauer 316 Patent.

(1) Construction of the Bauer Patents

(a) *Claim 1 of the Bauer 316 Patent*

[263] Claim 1 of the Bauer 316 Patent reads as follows, with the important elements set out in bold, for emphasis:

> A sports helmet for protecting a head of a wearer, comprising:
>
> (a) an outer shell comprising an external surface of said sports helmet;

> (b) an inner padding disposed between said outer shell and the wearer's head when said sports helmet is worn, said inner padding defining a cavity for receiving the wearer's head;
>
> (c**) a rotational impact protection device** disposed between said inner padding and the wearer's head when said sports helmet is worn; and
>
> (d) an adjustment mechanism operable by the wearer to vary an internal volume of said cavity to adjust a fit of said sports helmet on the wearer's head;
>
> wherein said outer shell comprises a first shell member and a second shell member moveable relative to one another once said adjustment mechanism is operated by the wearer to vary said internal volume of said cavity;
>
> wherein said **rotational impact protection device comprises a surface movable relative to said external surface of said sports helmet in response to a rotational impact on said outer shell to absorb rotational energy from the rotational impact**; and
>
> wherein said rotational impact protection device has a portion that undergoes displacement when said first shell member and said second shell members are moved relative to one another.

[264] Dr. Willinger and Mr. Lowe are of the opinion that this claim – or rather the rotational impact protection device feature disclosed therein – is all about the decoupling that allows for relative movement between the head and the external surface in order to absorb rotational energy. The common general knowledge sets out that when looking for rotational impact protection, there is decoupling along a sliding surface. They believe that a person of skill in the art would thus understand that relative movement could be achieved by putting a rotational impact protection device inside the padding of a two-piece helmet. They view claim 1 as being complete and as bringing nothing that was not already disclosed in the prior art.

[265] In contrast, Mr. Withnall is of the view that the expressions "**rotational impact protection device**" and "**to absorb rotational energy from the rotational impact**" found in claim 1 of the Bauer 316 Patent would not be immediately understood by the skilled person, who would therefore look to the specification to understand their meaning. He cites several paragraphs from the Bauer 316 Patent's "Detailed description of embodiments" (see JBD-1229 at 11), such as: i) the description of the floating liner 50, which is "allowed a certain degree of freedom of movement" (JBD-1229 at 14); ii) the fact that movement between the inner padding 15 and the floating padding 50 creates friction that dissipates rotational energy, in addition to inducing an elastic deformation of the floating liner 50 and stretching so as to curve in the direction of the rotational force RF to absorb rotational energy associated with rotational impact; and iii) the fact that the floating liner 50 also provide radial impact protection by compression (JBD-1229 at 20, 21). Figure 59 of the Bauer 316 Patent illustrates these different components:

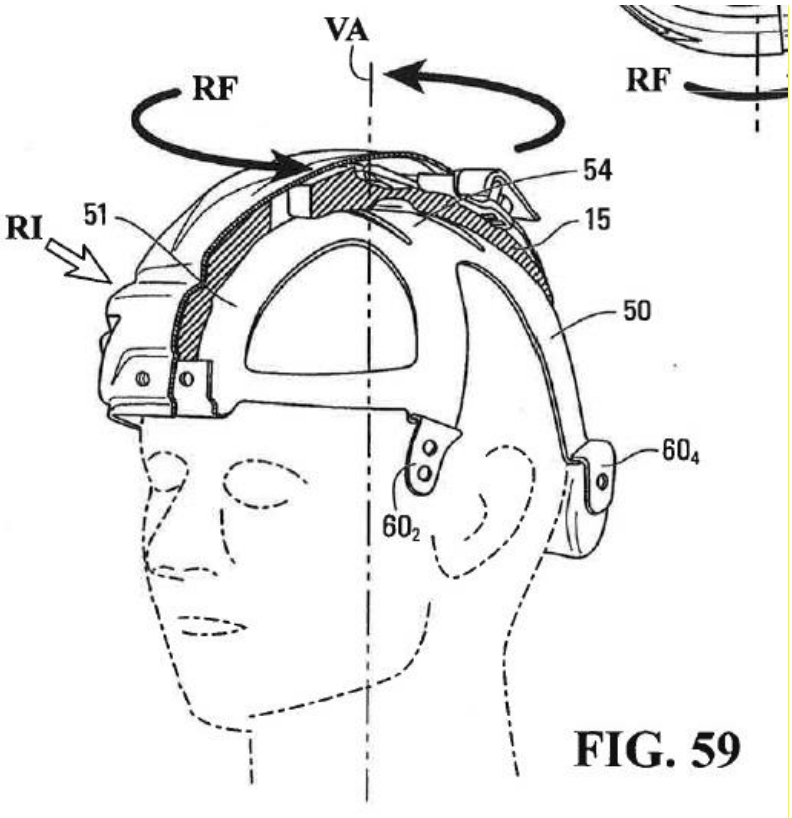


FIG. 59

[266] Dr. Willinger's response to that is that claim 1 simply does not identify the three mechanisms for energy absorption referenced elsewhere in the patent (friction, stretching and compression) and that said identification is not necessary to make sense of the claim. In his view, Mr. Withnall reads dependent claims – or the inventor's preferred embodiment – into the independent claim 1, which goes against the instructions of the case law in this area. He emphasizes this point for compression in particular, as compression is concerned with linear impact, and not rotational impact as discussed in claim 1.

[267] I agree with MIPS that a person of skill in the art would understand claim 1 of the Bauer 316 Patent as not specifically comprising compression and stretching as mechanisms to absorb energy. I also agree that the dependent claims 9, 11, 14 and 16 should not be read in for the purpose of construing claim 1. The only energy absorption mechanism disclosed in claim 1 comes from the movement between the external surface of the sports helmet and a surface of the rotational impact protection device in response to a rotational impact. As discussed above, when two surfaces slide against each other, the resistance creates friction. What was true for the attachment device referenced in claim 1 of the MIPS 542 Patent is also true for the rotational impact protection device found in claim 1 of the Bauer 316 Patent: it is not necessary to specifically mention friction for the person skilled in the art to understand that friction is the resistance created when two surfaces slide or tend to slide against each other.

[268] It is true that Dr. Willinger and Mr. Lowe agreed on cross-examination that the specification details the use of a combination of the mechanisms of stretching, friction and/or compression. However, the fact that a feature or a specific embodiment is discussed in the

specification does not necessarily mean that such a feature is an essential element of a specific claim.

[269] If it is improper to rely on the description to vary the scope of a claim, it is not improper to look at the dependent claims as an aid in interpreting the independent claim. However, "[a] limitation appearing in one claim cannot be read into another claim not having such a limitation" (*Hughes*, above at 318).

[270] Yet dependent claims 9, 11, 14 and 16 of the Bauer 316 Patent, which will be discussed below, introduce such limitations: the rotational impact protection device being a floating liner; stretching of the floating liner absorbing at least part of the rotational energy; compression of the floating liner absorbing radial energy in addition to rotational energy; and the interface between the floating liner and the inner padding having a coefficient of friction of at least 0.2.

[271] The principle of claim differentiation dictates that "the starting assumption must be that claims are not redundant" (*Ratiopharm Inc v Canada (Health)*, 2007 FCA 83 at para 33). If a limitation cannot be read into a claim to avoid infringement (*Halford*, above at paras 91-96), it can no more be read in to inflate the inventive concept disclosed in a claim in order to avoid invalidity for obviousness. Claim differentiation is a rebuttable presumption, but a strong one when the limitation found in the dependent claim is the only meaningful difference between an independent and a dependent claim (*Halford*, above at para 94).

[272] Again, the claims are the starting point in construing a patent. They define the patentee's monopoly. Claim 1 must be construed so as not to require that: i) the rotational impact protection device be a floating liner; ii) stretching be a mechanism that absorbs at least part of the rotational energy; iii) the floating liner be compressible to also absorb radial energy; and iv) the interface between the floating liner and the inner padding have a coefficient of friction of at least 0.2.

(b) *Claim 9 of the Bauer 316 Patent*

[273] Claim 9 introduces the floating liner that was abundantly discussed above and is referred to in claims 11, 14 and 16, which also need to be construed. It reads as follows:

> 9. The sports helmet of any one of claims 1 to 4, wherein said rotational impact protection device is a floating liner disposed between said inner padding and the wearer's head when said sports helmet is worn.

[274] I agree with the experts that the skilled person would understand the floating liner to be a more specific, less general, "rotational impact protection device". I also agree that that person would further understand the term "floating liner" to be essentially a comfort liner that is allowed a certain degree of freedom of movement relative to the inner padding of a helmet. The liner is "floating" in that it is moveable relative to one or more other components of the helmet in response to a rotational impact to the outer shell.

[275] However, I disagree with Mr. Withnall that the "floating liner" must necessarily include within its own structure the three energy absorbing mechanisms that he has read into claim 1.

(c) *Claim 11 of the Bauer 316 Patent*

[276] Claim 11 introduces the possibility that the floating liner be made of stretchable material and that rotational energy be absorbed by stretching of that material.

[277] The skilled person would understand that a "stretchable material" is an elastic material that deforms relatively easily.

[278] With respect to the absorption of rotational energy, the Bauer 316 Patent description states: "In addition, movement of the outer shell 12 and the inner padding 15 relative to the floating liner 50 induces an elastic deformation of the floating liner 50. More particularly, in this embodiment, the floating liner 50 stretches so as to curve in a direction of the rotational force RF. This stretching of the floating liner 50 absorbs rotational energy associated with the rotational impact Rl" (JBD-1229 at 21). The skilled person would understand that any stretching of this nature would only occur if the floating liner is fixed to the inner padding at its periphery.

(d) *Claim 14 of the Bauer 316 Patent*

[279] Claim 14 refers to a compression of the floating liner due to a radial impact force component of a rotational impact. It defines the floating liner as having an additional compression function, in addition to the rotational movement role that is dealt with in claim 1.

(e) *Claim 16 of the Bauer 316 Patent*

[280] Claim 16 deals with friction in the following terms:

> 16. The sports helmet of any one of claims 9 to 15, wherein said floating liner has an inner surface for facing the wearer's head and an outer surface facing said inner padding, said outer surface and said floating liner being in frictional engagement with said inner padding in response to the rotational impact such that at least part of the rotational energy is dissipated by friction between said inner padding and said outer surface of said floating liner, said outer surface of said floating liner having a coefficient of friction with said inner padding of at least 0.2 measured according to ASTM G115-10.

[281] MIPS highlights the fact that this claim does not restrict the energy absorbing of the rotational motion that leads to sliding to a high friction system (i.e. a coefficient of friction over 0.3). It also points out that at the time that Bauer's application was filed, there were helmets on the market that used friction as an energy absorbing mechanism.

(2) Validity of the Bauer Patents

(a) *Obviousness*

[282] Bauer filed a first provisional patent application on July 27, 2011, and a second provisional patent application, adding the concept of friction as an energy absorbing mechanism, on January 16, 2012 (by then, Bauer had run additional, conclusive testing on friction). As its regular patent application in Canada was filed within the twelve-month period following its first provisional patent application, Bauer claims priority from its first provisional application, except

for claim 16 of the Bauer 316 Patent that relates specifically to friction. In the latter case, Bauer claims January 16, 2012 as a priority date such that the MIPS 542 Patent published on November 10, 2011 would be citable for obviousness.

[283] I view the inventive concept disclosed in claim 1 of the Bauer 316 Patent as being a rotational impact protection device for a two-shell adjustable sports helmet that permits relative movement between the head and the outer shell during an oblique impact, and absorbs energy through friction (at any coefficient). The key aspect is that the rotational impact protection device is located between the inner padding and the wearer's head.

[284] That said, I see no significant difference – or no difference that would require a degree of inventiveness – between the inventive concept of that claim and the prior art. The only novelty would be that the rotational impact protection device is designed to be implemented in a two-shell helmet.

[285] The prior art promotion and sales of the MIPS II helmets were the focus of the evidence at trial. The evidence was that MIPS promoted its Lazer P-Nut and Burton HiFi MIPS II technology helmets at tradeshows and elsewhere in 2010 and 2011. A large number of examples of the ways in which MIPS made its MIPS II technology available to the public before the Bauer filing on July 27, 2011 were provided to the Court by Mr. Thiel and via PowerPoint presentations, photographs and videos.

[286] It would have been obvious for the person of skill in the art to integrate the yellow liner of the Lazer P-Nut or Burton HiFi into a two-shell hockey or lacrosse helmet. In fact, this was one of the reasons that Bauer contacted MIPS to begin with and the parties never really abandoned the idea of implementing MIPS II technology into Bauer's hockey helmets.

[287] At trial, counsel for MIPS made a demonstration during oral argument. Mr. Stratton took a Bauer 7500 helmet, put the attachment device of the Lazer P-Nut bike helmet into it and argued that all elements of claim 1 of the Bauer 316 Patent were present. I agree with him.

[288] However, I view the inventive concept disclosed in the dependent claims 9, 11, 14 and 16 to be sufficiently different from the prior art to not have been obvious for the person of skill in the art. The additional steps disclosed therein required a certain degree of inventiveness.

[289] With respect to **claim 9**, none of the prior art used the helmet's comfort padding as a rotational impact protection system at the relevant date. Both the Lazer P-Nut and Burton HiFi helmets have comfort paddings distinct from their yellow liner.

[290] As for **claim 11**, none of the prior art disclosed a device that stretches in response to an oblique impact to itself absorb rotational energy from the oblique impact.

[291] **Claim 14** is also novel, since no previous floating liner was made of compressible material that also absorbs energy from a radial impact or the radial component of an oblique impact.

[292] Finally, **claim 16** departs from prior art that promotes slidability to reduce the resistance between surfaces, thus reducing friction, by requiring the coefficient of friction between the floating liner and the inner padding to be at least 0.2 (but preferably between 0.5 and 0.6).

[293] The development of the RE-AKT and RE-AKT 100 helmets, which resulted from trial and error, and the numerous manufacturing and fit issues encountered by Bauer's R&D team confirm the inventive steps required to go from the prior art to the invention disclosed in the Bauer 316 Patent read as a whole.

[294] For these reasons, I find only claim 1 of the Bauer 316 Patent to be invalid for obviousness.

(b) *Double patenting*

[295] Subsection 36(1) of the *Patent Act* provides that "[a] patent shall be granted for one invention only…" In other words, as restated by the Supreme Court of Canada in *Whirlpool* (above at para 63), the inventor is only entitled to "a" patent for each invention. If a patent application describes more than one invention, the *Patent Act* provides a mechanism for the applicant to limit the claims to one invention only, and make any other disclosed invention the subject of a "divisional application".

[296] The relevant inquiry involves a comparison of the claims of both patents to determine if what is claimed in the second patent: i) is "identical or co-terminus" with the claims of the first patent; or ii) would have been obvious or not "patentably distinct" from those of the earlier

patent. In other words, does the second patent merely add non-inventive bells and whistles to the first patent?

[297] MIPS argues that there is no substantively new information provided in the 540, 103 and 669 Bauer Patents that is not already in the Bauer 316 Patent, nor are there any new inventive aspects disclosed.

[298] MIPS summarizes the differences in Dr. Willinger and Mr. Withnall's conceptions of the inventive concepts in the Bauer Patents as follows:

> **Willinger - 316 Patent, Claim 1**:
>
> A component for an adjustable sports helmet that absorbs rotational energy by relative movement between the component and the outer shell during an oblique impact; the component being located between the inner padding and the head, and the component adjusts in size as the cavity formed by the inner padding is adjusted in size.
>
> **Withnall - 316 Patent, Claim 1**:
>
> the novel rotational impact protection device (e.g. floating liner) for a two-piece shell adjustable sports helmet that permits relative movement between the head and the outer shell during an oblique impact, and absorbs energy through stretching, friction and/or compression; the device being located between the inner padding and the head, and a portion of the device adjusts in size as the cavity formed by the inner padding is adjusted in size by the wearer using an adjustment mechanism of the helmet.
>
> **Willinger - 540 Patent, Claim 1**:
>
> A means that absorbs rotational energy during an oblique impact to an adjustable sports helmet; the means being located between the outer shell and the head, and the means adjusts in size as the cavity formed by the inner padding is adjusted in size.

Withnall - 540 Patent, Claim 1:

a novel rotational impact protection means for an adjustable sports helmet that reduces rotational acceleration during an oblique impact through stretching, friction and/or compression; the component being located somewhere between the outer shell and the head, and the rotational impact protection means and the linear impact padding adjust in size simultaneously when the helmet is adjusted to fit the wearer's head.

Willinger - 103 Patent Claim 1:

An arrangement that includes thin and flexible material that stretches to absorb rotational energy during an oblique impact to an adjustable sports helmet; the arrangement being located between the outer shell and the head, and the arrangement adjusts in size as the cavity formed by the inner padding is adjusted in size.

Withnall - 103 Patent, Claim 1:

the novel use of thin and flexible energy damping material in a rotational impact cushioning arrangement (which is part of a shock absorbing system which also includes a linear impact cushioning arrangement and which is located anywhere between the outer shell and the wearer's head) for a hockey or lacrosse helmet that distorts or stretches to absorb energy from a rotational or oblique impact, and thus reduces the rotational acceleration of the head; an adjustment mechanism is configured to allow a dimensional change of the linear or rotational impact cushioning arrangement when the fit of the helmet is adjusted.

Willinger - 669 Patent Claim 1:

An arrangement that includes elastic material that stretches to absorb rotational energy during an oblique impact to an adjustable sports helmet; the arrangement being located between the outer shell and the head, and the arrangement adjusts in size as the cavity formed by the inner padding is adjusted in size.

Withnall - 669 Patent, Claim 1:

the novel use of elastic material in a rotational impact cushioning arrangement (which is located anywhere between the outer shell and the wearer's head) for an adjustable sports helmet, that stretches to absorb energy from a rotational or oblique impact, and thus reduces the rotational acceleration of the head; the cushioning arrangement being located at selected locations about the wearer's head, and parts of the cushioning arrangement move relative to

> other parts of the arrangement as the fit of the helmet is adjusted by the wearer using an adjustment mechanism.

[299] I first note that the respective constructions by Dr. Willinger and Mr. Withnall of the inventive concept of the 103 and 669 Bauer Patents are somewhat similar, with slightly broader language used by Dr. Willinger.

[300] Mr. Withnall provided testimony on the main non-obvious differences between the first independent claim of each of the Bauer Patents. He was in fact cross-examined on the differences between claim 1 of the Bauer 316 Patent and claim 1 of the Bauer 540 Patent, but not on the differences between claim 1 of the Bauer 316 Patent and claim 1 of the 103 and 669 Bauer Patents. Bauer has convinced me that sufficient non-obvious differences exist between the inventive concepts of the 316 Patent and each of the 103 and 669 Bauer Patents. The latter two patents introduce the idea of a cushioning arrangement that is absent from the Bauer 316 Patent.

[301] I also agree with Bauer that a sufficient non-obvious difference exists between the Bauer 316 Patent and the Bauer 540 Patent. And it is the same non-obvious difference that exists between the MIPS I and the MIPS II concepts: the location of the rotational impact protection device.

[302] That said, the issue of “double patenting” is somewhat academic in a case like the one before me where all patents claim the same priority date. As such, the Bauer Divisional Patents that claim the same priority date as its 316 Patent do not amount to “evergreening” or to an

attempt to extend the monopoly that was granted on the first patent by filing new patents at a later date (*Mylan Pharmaceuticals ULC v Eli Lilly Canada Inc*, 2016 FCA 119 at para 26).

[303] In my view, Bauer legitimately used divisional applications to make the subject of the additional inventions disclosed in its original application the subjects of divisional applications and thus, MIPS' "double patenting" attack on the Bauer Patents must fail.

IV. Conclusion

[304] I am therefore of the view that the MIPS 542 Patent is valid as being non-anticipated by prior art, non-obvious when prior art and the common general knowledge are considered, and that its claims are not broader than the invention made. I am also of the view that none of the MIPS 542 Patent's claims are infringed by Bauer's RE-AKT and RE-AKT 100 helmets, and that those helmets use a different technology to reduce the rotational energy transmitted to the brain by a rotational impact.

[305] With respect to the Bauer 316 Patent, I find independent claim 1 to be invalid for obviousness; the person of skill in the art would easily and without ingenuity integrate the yellow liner of the Lazer P-Nut or Burton HiFi (the rotational impact protection device) into a two-shell hockey or lacrosse helmet and come up with claim 1 of the Bauer 316 Patent. The remainder of the claims are non-obvious and therefore valid.

[306] The parties have requested that the Court reserve judgment on costs (including the potential effect of Rule 420) and that the parties be allowed to submit written submissions on the issue within 30 days of the issuance of the present Judgment and Reasons. I will do so.

JUDGMENT in T-56-15

THIS COURT'S JUDGMENT is that:

1. Plaintiff's action is granted in part;

2. Canadian Patent No. 2,798,542 is valid and not infringed by Bauer's RE-AKT and RE-AKT 100 helmets;

3. Claim 1 of Canadian Patent No. 2,784,316 is invalid for obviousness; the remainder of the claims of Canadian Patent No. 2,784,316 are valid;

4. Divisional Patents Nos. 2,821,540, 2,838,103 and 2,847,669 are also valid;

5. The Court reserves judgment on costs and requests that the parties submit written submissions on this issue within 30 days of the issuance of the present Judgment and Reasons.

"Jocelyne Gagné"
Judge

FEDERAL COURT

SOLICITORS OF RECORD

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