Martek Biosciences Corporation *v* Cargill International Trading Pte Ltd [2011] SGHC 71

Case Number	: Originating Summons No. 156 of 2010
Decision Date	: 29 March 2011
Tribunal/Court	: High Court
Coram	: Tay Yong Kwang J
Counsel Name(s)	: Dr Stanley Lai, SC and Mr Vignesh Vaerhn (Allen & Gledhill LLP) for the applicant; Mr Daniel Koh (instructed) (Eldan Law LLP) and Ms Wendy Low Wei Ling (Rajah & Tann LLP) for the respondent.
Parties	: Martek Biosciences Corporation — Cargill International Trading Pte Ltd

Patents and Inventions

29 March 2011 Judgment reserved

Tay Yong Kwang J:

Introduction

1 This is an appeal by the Applicant against the decision (the "Decision") of the Deputy Registrar of Patents and the Principal Assistant Registrar of Patents (the "Tribunal") dated 31 December 2009. The Respondent appeals against certain aspects of the Decision as well.

2 For the reasons which follow, I allow the Applicant's appeal against the Tribunal's decision in the Respondent's application for revocation of the Patent (the "Revocation Proceedings") and dismiss both parties' appeal and cross-appeal against the Tribunal's decision relating to the Respondent's objections to the Applicant's various sets of amendments to its patent (the "Amendment Proceedings") except with regard to Claim 42 and consequently Claim 45 in the Proposed 2006 Amendments (see [9] below for the explanation on this set of amendments).

3 Unless otherwise indicated, all references to statutory sections below are to the Patents Act (Cap 221, 2005 Rev Ed) (the "Act").

The facts

4 The Applicant is Martek Biosciences Corporation, a company incorporated under the laws of the State of Delaware of the United States of America. The Respondent is Cargill International Trading Pte Ltd, a company incorporated in Singapore.

5 The Applicant is the proprietor of the Singapore Patent P-No. 49307, entitled "Microbial Oil Mixtures and Use Thereof" (the "Patent"), granted by the Intellectual Property Office of Singapore ("IPOS"). It applied for a grant of the Patent on 13 April 1996 under section 116(6) of the Patents Act (Cap. 221, 1995 Rev Ed) and was granted the Patent on 10 January 2002.

6 The Application filed two sets of amendments prior to the grant of the Patent. One set is dated 2 July 1997 (the "1997 Amendments") and the second is dated 13 October 1999 (the "1999 Amendments").

7 On 20 January 2006, the Respondent filed an application to revoke the Patent on the following grounds:

(i) That the invention was not a patentable invention under section 80(1)(a) of the Act.

(ii) Insufficiency, *i.e*. the specification of the Patent did not disclose the invention clearly and completely for it to be performed by a person skilled in the art, as required by section 80(1)(c) of the Act; and

(iii) That the 1999 Amendments disclosed matter in the specification of the Patent beyond that disclosed in the application for the Patent as filed, within the meaning of section 80(1)(d)(i) of the Act.

8 The Applicant filed a counter statement on 15 September 2006.

9 This was accompanied by a copy of proposed amendments to the claims in the Patent (the "Proposed 2006 Amendments") pursuant to section 83 of the Act and Rule 80(3) of the Patents Rules (Cap 221, R1, 1996 Rev Ed) (the "Patents Rules"). This was advertised in The Patents Journal (Issue 200610A) on 30 October 2006. During the opposition period allowable, the Respondent filed a notice of opposition to the amendments under section 83(2) of the Act and Rule 85(1) of the Rules. The Respondent alleged that the Proposed 2006 Amendments constituted additional subject matter extending beyond the application as originally filed and are therefore not allowable under section 84(3)(a) of the Act.

10 The Applicant obtained leave to file another set of amendments and did so on 19 March 2008 (the "Proposed 2008 Amendments"). By a letter dated 27 March 2008, the Respondents objected to these amendments on the ground that they extended the protection conferred by the Patent. Other than this letter, no notice of opposition was received during the allowable opposition period pursuant to the advertisement of the Proposed 2008 Amendments in The Patents Journal on 28 May 2008.

11 At a Case Management Conference on 28 April 2008, the IPOS Hearing Officers informed the parties of their intention to cause the Patent to be re-examined under section 80(2) of the Act. The Respondent followed by filing the request for re-examination under Rule 81(1)(a) of the Rules. The Patent was then re-examined by an examiner from the Danish Patent and Trademark Office who then produced a report (the "Re-examination Report"). The Re-examination Report was made available to the parties on 6 January 2009.

12 The Revocation Proceedings and the Amendment Proceedings were consolidated and heard together by the Tribunal from 16 to 18 February 2009.

The Tribunal's Decision

13 In summary, the Tribunal held:

(i) The 1999 Amendments are allowable under s 84, except for claim 30;

(ii) The Proposed 2006 and 2008 Amendments contain some claims which do not meet the requirements of s 84;

(iii) All the claims in the Proposed 2006 and 2008 Amendments as well as the 1999 Amendments are not patentable;

(iv) All the claims in the Proposed 2006 and 2008 Amendments as well as the 1999 Amendments meet the threshold of sufficiency, *i.e*. disclose the invention clearly and completely for it to be performed by a person skilled in the art.

The Tribunal held accordingly that the Respondent succeeded in its application to revoke the Patent and ordered the Applicant to pay the Respondent its costs to be taxed or agreed save for the costs relating to the Respondent's witness, Dr Puah Chum Mok.

The Patent

14 It is useful at this point to summarise the Patent and its claims. The invention that is the subject of the Patent is entitled "Microbial Oil Mixtures and Uses Thereof". The abstract of the invention reads:

> "The present invention relates to compositions including blends of microbial oils, methods of using such compositions, particularly as supplements for infant formula, and methods of increasing the amount of long chain polyunsaturated fatty acids in infant formula."

15 In their opening statements below, both parties explained the structure of polyunsaturated fatty acids ("PUFAs") and long chain polyunsaturated fatty acids ("lcPUFAs"). Basically, a PUFA is an unsaturated fatty acid which has at least 2 carbon double bonds in its fatty acid tail. An lcPUFA is a PUFA that additionally has at least 20 carbon atoms in its fatty acid tail. Arachidonic acid ("ARA"), for example, is an example of an lcPUFA in the omega-6 fatty acid family. Docosahexaenoic acid ("DHA") is an example of an lcPUFA in the omega-3 fatty acid family.

The prior art

16 The documents cited before the Tribunal were referenced as D1 to D35 and T1 to T4. Before me, parties focused particularly on D1, D2, D3, D27 and D34:

(a) D1 refers to European patent application 90111558.4, published as EP0404058A2 on 27 December 1990;

(b) D2 refers to "Omega-3 Fatty Acids: Alternative Sources of Production" by Wichien Yongmanitchai and Owen P. Ward;

(c) D3 refers to European patent application 87101310.8, published as EP0231904A2 on 12 August 1987;

(d) D27 refers to INFORM 1990 Annual Meeting Abstracts, "Long-Term Docosahexaenoate (DHA) and Eicosapentaenoate (EPA) Supplementation of Preterm Infants: Effects on Biochemistry, Visual Acuity, Information Processing and Growth in Infancy", Carlson et al, at 306; and

(e) D34 refers to "The influence of different types of [omega]-3 polyunsaturated fatty acids on blood lipids and platelet function in healthy volunteers", Sanders and Roshanai, Clinical Science (1983) 64 at 91-99.

The witnesses below

Respondent's witnesses

17 There were two expert witnesses who filed Statutory Declarations on behalf of the Respondent (the applicant below): Dr Puah Chum Mok ("Dr Puah") and Dr Nga Been Hen ("Dr Nga").

18 Dr Puah was from the Singapore Polytechnic where, at the time of the hearing below, he headed the Technological Centre for Life Sciences.

19 At the hearing below, the Respondent informed the court of its decision to withdraw Dr Puah from taking the stand despite not withdrawing his Statutory Declaration. The Appellant therefore did not have the opportunity to cross-examine Dr Puah on the evidence in his Statutory Declaration. This was a significant issue before me and I deal with it below at [39].

20 Dr Nga was from the National University of Singapore Department of Chemistry and, at the time of the hearing below, had 38 years of working knowledge in microbial fermentation.

21 In the proceedings below, the Applicant objected to the admission of Dr Nga's evidence, on the basis that it was not confined to evidence in reply to Dr Lien's statutory declaration and therefore prejudicial. The Tribunal held that the Applicant had not suffered any prejudice as it had sufficient opportunity in cross-examination to refute Dr Nga's evidence (Decision at [44]). The Applicant did not appeal this finding before me.

22 In the course of his evidence, Dr Nga admitted that he was not an expert in the use of microbial oils in the human diet, that he did not have broad knowledge of general nutrition and was not an expert in the field of paediatric nutrition. He also admitted during cross-examination that his evidence and conclusion on the prior art documents were made with the benefit of hindsight after reading the Patent. The Tribunal thus held that they would be "cautious" about relying on Dr Nga's evidence because he did not appear to have specific expertise in microbial oils and his conclusions were made with the benefit of hindsight (Decision at [46]). I address the significance of this below at [40].

Applicant's witnesses

23 Two expert witnesses filed Statutory Declarations on behalf of the Applicant: Dr Eric Lien ("Dr Lien") and Dr David Kyle ("Dr Kyle").

24 Dr Lien is a consultant to the Applicant since 2005 and is an expert in the areas of dietary fatty acids and proteins and infant formula research. In the Respondent's submissions below, the Respondent questioned Dr Lien's objectivity but elected not to challenge his testimony during cross-examination. Dr Lien's testimony challenging Dr Puah's construction of the Patent therefore remained

unchallenged.

25 Dr Kyle is the sole inventor of the Patent and an expert in micro-organisms and PUFAs found in polar lipids and non-polar lipids. He was employed by the Applicant since 1985 but left in 2001 to start his own company and was therefore no longer employed by the Applicant at the time of the hearing below.

26 The Tribunal held that, while it accepted the testimonies of Dr Kyle and Dr Lien where they were relevant to the technical issues pertaining to the prior art, it had to scrutinise the testimonies with greater care because of the "increased likelihood of bias". I will deal with this issue at [42] below.

The decision

27 As explained above, the Applicant filed four sets of amendments: in 1997, 1999, 2006 and 2008. Only the 1997 Amendments remained unchallenged below. The Tribunal first examined the allowability of each set of amendments before examining the validity of the Patent as amended by each set respectively. It seems to me that a better approach would have been to first examine whether the Patent is valid in the first place and, if it is, then to examine whether the respective sets of amendments are allowable. I thus adopt this approach.

28 The Respondent does not appeal against the Tribunal's decision to allow the 1999 Amendments save for claim 30. I will therefore examine the validity of the Patent *as amended by the 1999 Amendments* (save for claim 30). If it is valid, I will then go on to examine the allowability of the Proposed 2006 Amendments and the Proposed 2008 Amendments respectively.

The Validity Issue

The law

29 A patent may be revoked on the grounds that the invention is not a patentable invention (section 80(1)(a)) or if the specification of the patent does not disclose the invention clearly and completely for it to be performed by a person skilled in the art (the "Sufficiency" condition) (section 80(1)(c)).

30 A patentable invention must: (1) be new; (2) involve an inventive step; and (3) be capable of industrial application (s 13(1)). I will refer to (1) as the "Novelty" condition and (2) as the "Inventive Step" condition respectively. The Novelty condition is satisfied if the invention "does not form part of the state of the art" (section 14(1)). In order to invalidate the patent, the prior art must disclose clear and ambiguous directions which, if followed, would lead to an infringement of the patent (*Muhlbauer AG v Manufacturing Integration Technology Ltd* [2010] 2 SLR 724 at [17] ("*Muhlbauer*"). This question is to be approached as at the date of publication of the prior art rather than *ex post facto* and each prior art document must be construed separately rather than combined into a mosaic to arrive at the invention (*Muhlbauer* at [18]). The "Inventive Step" condition is satisfied if the step is "not obvious to a person skilled in the art" (section 15).

31 The Respondent challenges the Patent on the three grounds of Novelty, Inventive Step and Sufficiency.

32 As stated above, I assess these issues based on the Patent as amended by the 1999 Amendments, so all my references are to claims in the 1999 Amendments unless otherwise indicated.

What were the inventive concepts?

33 The Applicant's position is that there are two distinct inventions in the Patent both of which aim to provide an infant formula which is simple, safe, and as effective as human breast milk ("HBM").

34 The first invention is an infant formula supplement which comprised a blend of two microbial oils, one containing ARA and the second containing DHA. The Applicant claims that the state of the art then was that infant formula supplements should match HBM as closely as possible in both the types and amounts of lcPUFAs present. Contrary to this, the inventor of the Patent discovered that it was unnecessary to match HBM with respect to all lcPUFAS. Rather, supplementation with only ARA and DHA was sufficient to produce an infant formula with the beneficial effects of all the lcPUFAs found in HBM. Thus, the invention was to produce an improved infant formula with a blend of microbial DHA-containing oil and microbial ARA-containing oil, which made it unnecessary to include other lcPUFAs found in HBM (the "First Invention").

35 The second invention involves a blend of fish oil and a microbial oil containing ARA to produce a supplement for adding lcPUFAs to infant formula. The Applicant claims that the state of the art then was that supplementing infant formula with fish oil was considered to lead to a decreased weight gain in infants. However, according to the Applicant, the precise cause of this effect was not identified, since fish oil contains both DHA and eicosapentaenoic acid ("EPA"). The invention was therefore the discovery that the problems of low weight gain associated with fish-oil supplemented infant formula could be overcome by the addition of ARA in the form of microbial oil to the formula (the "Second Invention"). This stemmed from the discovery that it was an excess of EPA that causes the low weight gain problem, by inhibiting the metabolic conversion of linoleic acid ("LOA") to ARA and that this excess could be overcome by adding ARA.

Findings on the First Invention

36 The Respondent contends that the First Invention is not consistent with the Patent specifications. According to the Respondent, the claims specified in the Patent are not limited to DHA and ARA only but includes other lcPUFAs. The Tribunal agreed, finding at [137] that the Patent was directed instead at providing a process of supplementing infant formula such that the supplemented infant formula would contain PUFAs in amounts comparable to those in HBM. In particular, the Tribunal found that the Patent did not exclude other PUFAs.

37 I disagree with the Tribunal on this finding. I accept the Applicant's submissions that the Patent discloses the First Invention for the reasons which follow.

38 First, a particularly striking feature of this case is the extraordinary state of the evidence before me. The evidence of the Applicant's expert witnesses was almost completely unchallenged. The Respondent chose not to cross-examine Dr Lien at all, which is extraordinary given that Dr Lien's evidence extensively rebutted the evidence of the Respondent's first expert witness Dr Puah. While the Respondent did cross-examine Dr Kyle, it never challenged Dr Kyle's testimony on the First Invention [note: 1]. The Applicant's expert testimony that the Patent disclosed the First Invention is therefore entirely unrebutted.

39 As far as the Respondent's experts' testimony goes, the Respondent chose to withdraw Dr Puah from cross-examination, right before Dr Puah was due to take the stand. In doing so, the Respondent explicitly took the position that Dr Nga's evidence was sufficient for its case. [note: 2] I will deal with Dr Nga's evidence in a while, but first I should make it clear that the withdrawal of Dr Puah from

cross-examination means that his evidence should bear no weight at all. O 38 r 1(2) of the Rules of Court (Cap 332, R5, 2006 Rev Ed) ("Rules of Court") makes it clear that a witness's affidavit will not be received in evidence if he is not cross-examined, except with leave of court. Of course, O 38 r 1(2) applies to actions commenced by writ, not usually to hearings before IPOS. However, in my view O 38 r 1(2) should apply with equal force here, with the witnesses' statutory declarations analogous to affidavits in a trial. The parties agreed at a Case Management Conference on 6 February 2009 that the Evidence Act would apply to their proceedings [note: 3] and implicitly the Rules of Court too by virtue of section 137 of the Evidence Act. In any case, whether in a trial or in IPOS proceedings, it would clearly prejudice the Applicant for the Respondent to refuse to present its main witness for cross-examination, especially at the last minute, and still seek to keep that witness's statutory declaration on record. [note: 4] I take cognisance of the Applicant's argument before me that Rule 80 of the Patents Rules leaves open the procedure of revocation proceedings and therefore it is important for this case to clarify the evidential consequences of irregularities such as the one here. In my view, where parties have clearly agreed to conduct IPOS proceedings like court trials, namely, applying the Evidence Act and the Rules of Court, they must abide by the principles governing court trials.

40 The only evidence in favour of the Respondent, therefore, remains Dr Nga's. The problem is that Dr Nga's expertise is not specific to the field involved in this case. Dr Nga admitted under cross-examination that he had no experience in general nutrition, much less paediatric nutrition. His expertise pertained to the genetics of micro-organisms, without possessing specific knowledge of the use of microbial oils in the human diet, specifically the diet of infants. While his evidence cannot be "wholly disregarded" as the Applicant urges, it cannot be denied that the evidence of the Applicant's witnesses, by virtue of their greater expertise in this field, would be of greater assistance to this court than Dr Nga's evidence.

41 The final picture we have of the evidence before me, therefore, is quite extraordinary. On the one hand, the Applicant's evidence as to the First Invention is completely unchallenged – by the Respondent's own election – and on the other hand, the Respondent's evidence is confined to that of one expert without sufficient expertise in the relevant field. The Respondent argues, of course, that the evidence of the Applicant's witnesses must be treated with caution because of their alleged bias. In the circumstances of this case, I give no weight to this argument. In *Muhlbauer* at [46]-[47], the Court of Appeal refused to discount the evidence of one witness on the grounds of apparent bias, because he was one of the actual inventors of the patented machine. The Court of Appeal affirmed that, for the purposes of determining whether the evidence of an expert should be discounted, the relevant test is one of actual partiality rather than apparent partiality. The Respondent did not adduce any evidence of actual partiality here. In fact, the Respondent did not put any allegation of bias at all to Dr Kyle or Dr Lien on the witness stand. Instead, it chose to make its allegations of bias by way of legal submissions, giving Dr Kyle and Dr Lien no opportunity to respond to the same. In any case, even if there is an increased likelihood of bias on the part of an allegedly non-independent witness, it is for the adverse party to challenge his testimony and demonstrate its unreliability. Given that the Respondent has chosen not to challenge the testimony of Dr Lien at all and the testimony of Dr Kyle with regard to the Patent disclosing the First Invention, it is insufficient for the Respondent to merely allege bias.

42 There is the "third" source of evidence before me, *i.e*. the Re-examination Report, which agreed with the Respondent that the Patent did not disclose the First Invention but rather included other lcPUFAs besides ARA and DHA. It is common ground that the Re-examination Report is not binding on this court. Furthermore, the Re-examination Report was made based on the statutory declarations of the various witnesses taken at face value, without taking into account the limitations of Dr Puah's

and Dr Nga's evidence as subsequently demonstrated during the proceedings. For the reasons I have already analysed above, the Re-examination Report's value has therefore been greatly diminished.

43 I now turn to my second point, *i.e*. the objective evidence before the court, in the form of the text of the Patent specification itself. This is the sole basis upon which the Tribunal rejected the Applicant's submission that the Patent disclosed the First Invention, despite the unusual state of the evidence that I have already highlighted above. If the Tribunal were right in its interpretation of the Patent specification, then it would have been right to reject the Applicant's submission notwithstanding the expert evidence – a court is always entitled to examine an expert's evidence based on logic and rationality. However, I could not agree with the Tribunal's interpretation of the text of the Patent specification.

44 The Tribunal found that the Patent specification was inconsistent with the Appellant's submission that the inventive concept was that only DHA and ARA were needed, based on extracts from the specification such as:

- "… it is an object of the present invention to provide a PUFA-enriched additive, the composition of which when added to commercial infant formula will provide desired long chain PUFAs in amounts comparable to the amounts of those PUFAs found in human breast milk" (Specification Replacement Sheet dated 2 July 1997, page 3, paragraph 2);

- "it is to be understood that the present invention encompasses the use of a single-microbial oil containing at least two desirable PUFAs, such as ARA and DHA" (Specification Replacement Sheet dated 2 July 1997, page 5, paragraph 1);

- "the most preferred microbial oils are those rich in an omega-3 or omega-6 PUFA, especially DHA, GLA and ARA" (Specification Replacement Sheet dated 2 July 1997, page 5, paragraph 4);

- "Long chain PUFA-containing microbial oils from at least two microorganisms can be obtained and blended together to provide the desired composition. The blend then can be added to an infant formula. Preferably, an amount of the blend effective to provide an amount of the desired PUFAs substantially similar to that found in human breast milk will be provided" (Specification Replacement Sheet dated 2 July 1997, page 7, paragraph 5, line 13 to page 8, paragraph 1);

- "In a preferred embodiment, the microbial oils include ARASCO (ARA single cell oil) and DHASCO (DHA single cell oil) and EPASCO (EPA single cell oil) or any combination thereof" (Specification Replacement Sheet dated 2 July 1997, page 8, paragraph 3) [long names added].

45 In construing a patent, the *claims* are the principal determinants of the patent – the details of the specification may assist but are ultimately secondary (s 113 of the Act as interpreted in *First Currency Choice Pte Ltd v Main-Line Corporate Holdings Ltd and another appeal* [2008] 1 SLR(R) 335 at [23] ("*Main-Line*")). Furthermore, it is trite law that a patent should be construed purposively rather than by a strict literal approach (*Main-Line* at [25]).

46 Claim 1 reads:

> A process for supplementing infant formula with docosahexaenoic acid (DHA) and arachidonic acid (ARA) characterized in that it comprises:
>
> (a) blending an oil containing DHA and an oil containing ARA, wherein at least one oil is a microbial oil and the other oil is selected from a microbial oil, a fish oil and a vegetable oil, the oils being blended to provide a ratio of about 2 to 12 parts by weight ARA to about 1 to 5 parts by weight DHA, and
>
> (b) adding said oil blend to said infant formula in an amount sufficient that the amounts of DHA and ARA in said formula are comparable to the amounts of DHA and ARA in human breast milk.

47 Claim 2 reads:

> A process for supplementing infant formula with DHA and ARA, which comprises:
>
> (a) preparing an oil blend comprising an oil containing DHA and an oil containing ARA, wherein at least one of said DHA-containing oil and said ARA-containing oil is a microbial oil and oils are blended to provide an ARA:DHA:EPA ratio of from 5:1:1 to 20:10:1 parts by weight; and
>
> (b) adding said oil blend to said infant formula in an amount sufficient that the amounts of DHA, ARA and EPA in said formula are comparable to the amounts of DHA, ARA and EPA in human breast milk.

48 It seems clear enough from the text of Claims 1 and 2, at least, that the Patent disclosed the First Invention. Furthermore, Dr Lien testified that a person skilled in the field of infant formula would appreciate from reading the claims and the specification that the preferred oil blend for supplementing infant formula is a blend of only one DHA-containing oil and one ARA-containing oil. The Tribunal appeared to have construed the Patent solely on a piece-meal analysis of the text of the specification, without addressing the text of the claims themselves or the expert evidence as to what a skilled addressee would understand the claims to convey.

49 Furthermore, even the parts of the specification cited above (at [44]) are not as damning to the Applicant's submissions as the Tribunal considered them to be. The stated objective of the Patent, for example, being to "provide a PUFA-enriched additive, the composition of which when added to commercial infant formula will provide *desired* long chain PUFAs in amounts comparable to the amounts of those PUFAs found in human breast milk" [emphasis added] does not necessarily show that Patent taught the inclusion of as many lcPUFAs present in HBM as possible. Dr Lien gave evidence that the word "desired" indicates that not all lcPUFAs are included in the supplement. [note: 5] The same applies to the fourth passage cited at [44] above.

50 The Tribunal seems to have been inconsistent in its understanding as to whether the Patent teaches the use of only two microbial oils. At [87] of the Decision, it allowed one of the Proposed 2006 Amendments on the ground that "Example 5 [of the Patent application as originally filed] *showed that DHA oil and ARA oil are to be the only lcPUFAs required for the oil blend*" [emphasis added]. This would contradict its finding on the inventive concept of the Patent.

51 In conclusion, the weight of the evidence shows that the first inventive concept in the Patent was to produce an improved infant formula with a blend of *only* a microbial DHA-containing oil and a microbial ARA-containing oil, thus making it unnecessary to include as many lcPUFAs present in HBM

as possible. It is this inventive concept that we must then test against the requirements of Novelty and Inventive Step.

Findings on the Second Invention

52 With respect to the Second Invention, the dispute between the parties is different. Whereas the first dispute was over whether the First Invention was a proper *characterisation* of the inventive concept disclosed by the Patent, in this second dispute the Respondent does not challenge the characterisation of the inventive concept. Rather, the Respondent disagrees with the Applicant as to what the state of the art was then. The Respondent contends that the state of the art then already included the knowledge that it was EPA that caused the problem of low weight gain, by inhibiting the conversion of linoleic acid ("LOA") to ARA, thus rendering the solution provided in the Second Invention obvious. This thus goes to the issues of Novelty and Inventive Step.

Novelty

53 The Tribunal found Claim 1 to be novel, like Claim 1 of the Proposed 2006 Amendments, on the basis that the relevant prior art D1 only discloses a ratio range for omega-6:omega-3 fatty acids, whereas Claim 1 discloses a specific range for ARA:DHA [note: 6] It accordingly found Claim 2 novel too because Claim 2 is similar to Claim 1 except that the second oil stated therein can be selected from any oils instead of from a microbial oil, a fish oil or a vegetable oil, and the ratio range now includes EPA. It presumably found the remaining dependent claims novel.

54 While the Tribunal was right to hold that the claims in the Patent are novel, I should clarify that it is not the ratio ranges of omega-6:omega-3 fatty acids that should be tested against the requirements of Novelty and Inventive Step but rather the First Invention and Second Invention as characterised above. The Court of Appeal emphasised in *Muhlbauer* at [40] that in assessing the validity of a patent, the parties and the court must characterise the invention accurately. In *Muhlbauer*, the tribunal below had erroneously based its analysis of Novelty and Inventive Step on the quantity of pick-up heads in the machine taught by the patent against the machines taught by the respective prior art publications when the enquiry should be really the *overall qualitative difference* between the respective machines. Similarly, in this case, the Tribunal's analysis should not therefore have been about ratio ranges disclosed by the Patent against prior publications but whether the First and Second Inventions were novel and contained inventive steps.

55 As prior publications cannot be assembled into a 'mosaic' for the purposes of assessing the novelty of an invention, we must compare the First and Second Inventions against each individual piece of prior art to see if any of them has anticipated the respective inventions.

The First Invention: did any of the prior art teach the use of only an ARA-containing microbial oil and a DHA- containing microbial oil?

D1

56 D1 is an invention directed to a fatty acid mixture to prepare nutritional compositions, especially infant formula. It is clear that D1 does not anticipate the First Invention. While D1 teaches that PUFAs are needed by infants, there is no evidence that D1 contemplates that only an ARA-containing and a DHA-containing microbial oil are sufficient to replicate the benefits of HBM. In fact: (i) D1 teaches the use of at least 4 and preferably 6 fatty acids; (ii) D1 does not refer to or teach microbial oils; and (iii) D1 teaches the matching of as many of the lcPUFAs found in HBM as possible. All these three points were conceded by Dr Nga in cross-examination.

D2

57 D2 relates to the development of commercial sources for purified omega-3 lcPUFAs in the free acid or methyl ester to replace the use of fish oil for pharmaceutical uses. The Tribunal read D2 as disclosing microorganisms as potential sources of PUFAs [note: 7] and the Respondent submits that D2 teaches a commercial microbial source of DHA and a commercial microbial source of ARA. Insofar as the Respondent submits that D2 teaches a source of ARA, however, this is wrong. As the Applicant pointed out at the hearing before me, D2 is explicitly concerned with alternative sources of only *omega-3 fatty acids*, which includes EPA and DHA but *not* ARA which is an omega-6 fatty acid. On that ground alone, D2 clearly does not anticipate the First Invention, not to mention the fact that D2 does not refer to infant formula supplements at all nor even considers whether the use of the microorganisms listed is safe in a food application.

D3

58 D3 clearly does not anticipate the First Invention. The fatty mixture taught in D3 can be obtained by a number of sources including fish oils, egg oil, cows' and pigs' liver and kidney fat and vegetable oils, rather than specifically microbial oils as taught in the Patent. The only basis on which the Respondent argues that D3 teaches the use of microbial oils is the reference to "algae oils" on page 4 [note: 8] but the Applicant points out that the algae listed are all seaweeds and would not be considered sources of microbial oil [note: 9]. This is buttressed by the fact that Dr Nga also conceded that D3 does not teach the use of microbial oils [note: 10]. In fact, Dr Nga also conceded that D3 teaches that lcPUFAs other than ARA and DHA are required. This being the case, D3 clearly did not teach the use of only an ARA-containing and a DHA-containing microbial oil for the purpose of replicating the benefits of HBM in an infant formula supplement.

59 It follows that the First Invention is not anticipated by any prior art and is novel.

The Second Invention: did any of the prior art teach that it is an excess of EPA that causes the problem of low weight gain problem associated with fish-oil supplemented infant formula and that this can be overcome by the addition of ARA in the form of microbial oil to the formula?

D27

60 D27 is central to the dispute over whether the Second Invention was already part of the state of the art. Also known as the "Carlson Study", D27 states at p306 that:

> DHA/EPA supplemented infants weighed less from 48 (n=60) through 92 weeks (n=30) PCA. Omega-3 supplementation during infancy…appeared to result in the accumulation of less body fat".

61 The Respondent contends that the Carlson Study therefore already observed the problem that fish oil led to lower weight gain and the Second Invention is therefore not novel. However, two points can be made: first, the Carlson Study did not identify whether it is the DHA or the EPA in fish oil that causes the lower weight gain; second, even if we assume that it did identify the problem, nowhere does it identify the *solution* to this problem. It is these two aspects that are the essence of the Second Invention. Furthermore, as the Applicant argues, there is no indication in the first place that the Carlson Study considered this lower weight gain to be a *problem* that had to be addressed before fish oil could continue to be fed to infants. D27 therefore does not anticipate the Second Invention.

D34

62 D34 is a report on a test comparing a linseed oil supplement with a MaxEPA supplement on adults, where MaxEPA contains EPA and DHA. The Respondent argues that D34 discloses that EPA inhibits the metabolic conversion of LOA to ARA in that it states:

- "The proportion of arachidonic acid (20:4w3) was substantially decreased by the MaxEPA supplement but not by the linseed oil supplement" (page 91, column 1, paragraph 3, lines 5-8);

- "The lower proportion of AA and 22:4w6 imply that their synthesis from linoleic acid (18:2w6) was decreased (page 96, column 1, paragraph 1, lines 21-23).

63 The Applicant contends that D34 does not even pertain to the effects of MaxEPA on *infants*, rather than adults. Even if we assume for the sake of argument that the effects of MaxEPA on adults and infants are identical, D34, like D27, does not identify whether it is the EPA or the DHA that is responsible for this effect. This is something Dr Nga again conceded in cross-examination. Furthermore, as highlighted by Dr Lien and unrebutted by the Respondent, D34 does not draw any causal link between the inhibited production of ARA and reduced weight gain.

64 Therefore, the Second Invention is also not anticipated by any prior art and is novel.

Inventive Step

65 The burden of proof is on the party attacking the validity of a patent to show that no inventive step was involved. The Court of Appeal in *Muhlbauer* at [19] affirmed that the primary evidence with regard to this element will be that of properly qualified expert witnesses who will say whether or not in their opinion the relevant step would have been obvious to a skilled man having regard to the state of the art. Once again, the Respondent never challenged this aspect of Dr Kyle's and Dr Lien's evidence. Its own expert evidence is confined to Dr Nga's, who is not an expert in the relevant field. The Respondent has clearly failed to discharge its burden of showing that the First and Second Inventions were obvious to a person skilled in the art.

66 In any case, the First Invention falls within the clear case of non-obviousness *i.e.* when the invention *goes against conventional wisdom*. As articulated by the English Court of Appeal in *Pozzoli SpA v BDMO SA* [2007] FSR 37 at [27]: "A patentee who contributes something new by showing that, contrary to the mistaken prejudice, the idea will work or is practical has shown something new. He has shown that an apparent 'lion in the path' is merely a paper tiger. Then his contribution is novel and non-obvious and he deserves his patent". The First Invention showed that supplemented infant formula need not include as many lcPUFAs found in HBM as possible to replicate the benefits of HBM.

67 This also applies to the Second Invention insofar as the expert evidence is that conventional wisdom held fish oil to be beneficial for infants, without identifying the need to solve the problem of lower weight gain. As established at [61] above, even D27, the prior publication closest to the Second Invention, does not identify the phenomenon of lower weight gain as a *problem* that had to be addressed before fish oil could continue to be fed to infants as a supplement. In fact, the preferred examples disclosed in D1, which teaches a fatty acid mixture to prepare nutritional compositions especially for infant formulas, contain *much higher levels of EPA* than HBM. [note: 11]

This demonstrates that the state of the art did not see fish oil as problematic for infant consumption and the Respondent has adduced no prior art that teaches to the contrary. Even if the state of art had identified lower weight gain as a problem that needed to be solved, the essence of the Second Invention was to single out EPA rather than DHA as the source of the problem. The Respondent has not been able to point to any prior art that suggests any attempt to isolate which component of fish oil it was that caused lower weight gain. The Patent's identification of EPA as the source, and going one step further to provide the solution, is therefore non-obvious.

68 Additionally, the Applicant submits that the commercial success of the Patent illustrates that the inventions were non-obvious. It is true that commercial success may play a role in establishing non-obviousness, albeit not conclusively (Ng-Loy Wee Loon, *Law of Intellectual Property of Singapore* (Sweet & Maxwell Asia, Rev Ed, 2009) at paragraph 30.1.52 ("*Law of IP in Singapore*")). However, I would not accord too much weight to this factor here. The "commercial success" referred to by the Applicant is Dr Kyle's evidence that the only sources currently used in infant formula are "the designer oils, DHA and ARA, designer oils or a combination of the fish oil with the ARA designer oil". This is despite the fact that D1 has long been revoked and is therefore free for everyone to use. While this may well be true, in my view this evidence is not specific enough to establish the Patent's commercial success. It was only mentioned in passing during the oral examination of Dr Kyle, unlike in *Muhlbauer* where evidence was specifically submitted that more than 100 of the patentee's machines had been sold as compared to only four units of the machine taught in a prior publication. The evidence is certainly insufficient to prove that the alleged commercial success was due to the invention itself rather than extrinsic factors such as successful marketing (*Law of IP in Singapore* at paragraph 30.1.52). In any case, this does not affect the outcome of this case. I have found above that both the First and Second Inventions did contain inventive steps.

Sufficiency

69 The Respondent further contends that the Patent should be revoked under s 80(1)(c) for lack of sufficiency, *i.e*. the specification of the patent does not disclose the invention clearly and completely for it to be performed by a person skilled in the art. It challenges the sufficiency of claims in the 1999 Amendments, the Proposed 2006 Amendments and the 2008 Amendments respectively. The Tribunal found that all claims in the respective Amendments were sufficient. I reiterate that I only examine the validity of the Patent based on the 1999 Amendments. Therefore, I turn to the Respondent's submissions that the claims in the 1999 Amendments are insufficient.

70 The Respondent submits that three parts of the 1999 amended claims in particular are insufficient:

(i) The phrase, "comparable to…in human breast milk", in Claims 1, 2, 21 and 22;

(ii) The phrase, "substantially free of EPA", in Claims 3, 8 and 16; and

(iii) Claims 7, 20 and 26 where the Patent "does not disclose products that are not directly obtainable from the claimed processes"

71 With regard to (i) and (ii) above, the Respondent's objection is one of lack of clarity. The phrase in (i) allegedly lacks clarity because the lcPUFA content of HBM varies according to factors

such as the ethnicity of the mother. The phrase in (ii) does not specify a quantitative limit on the amount of EPA.

72 However, to revoke a patent on the grounds of insufficiency, it is not enough for the Respondent to highlight ambiguities in the plain language of the claims. As the court in *Rediffusion Simulation v Link-Miles* [1993] FSR 369 at 388 affirmed:

> [T]here is seldom a case where a person, who is asked to look at every word of a specification to try and destroy it, cannot make out a case of potential ambiguity. That is not the correct approach. The specification *should be read through the eyes of the skilled addressee attempting to give it practical meaning and endeavouring to ascertain the intention of the draftsmen*. [emphasis added]

73 The Respondent has adduced no expert testimony to prove that the above phrases would render the invention unworkable *from the point of view of a skilled addressee*. In contrast, Dr Lien at pages 3 to 8 of his Statutory Declaration explained how a skilled addressee would understand how to work the invention. In particular, Dr Lien explained at pages 11 to 13 how the phrase in (i) would be clear to the person skilled in the field of infant formula and this evidence has remained unrebutted by the Respondent.

74 As for (iii), the Respondent merely alludes to the fact that these claims are product-by-process claims. I do not see how this is an objection based on sufficiency. [note: 12]

75 I therefore find that the claims in the 1999 Amendments meet the requirement of sufficiency.

Status of corresponding patents in other jurisdictions

76 It only remains for me to address one final point. Both in the proceedings below and before me, the Respondent highlighted the status of the Applicant's various foreign patents that allegedly correspond to this Patent. In particular, the Respondent stressed foreign proceedings where the Appellant was either unsuccessful in obtaining a patent or unsuccessful in defending its granted patents in opposition proceedings. I appreciate the Respondent's efforts in highlighting the similarities between the Patent and each foreign patent individually. Unfortunately, however, this does not really aid in either proving or disproving the validity of this Patent. In my view, the Tribunal was correct to rely on the Court of Appeal's judgment in *Main-Line* at [2] that:

> Ultimately, it must also be acknowledged that an adjudication on patent rights is predicated upon not only the applicable regulatory framework and practices, but also the evidence presented as well as the submissions made to the tribunal concerned. *Care must therefore be taken by counsel when referring to and/or relying on another apparently similar decision on the "same" issue from another jurisdiction*. [emphasis added].

77 While it is true that the court in *Main-Line* did contemplate at [58] that the decision of the New Zealand patent office could be "of some penumbral assistance" in that case, that was because the court found that there was some consistency between the statutory matrices of Singapore and New Zealand. The Respondent has made no such submissions here.

Conclusion on the Validity Issue

78 For the above reasons, I find that the Patent fulfilled the requirements of Novelty, Inventive Step and Sufficiency. I therefore dismiss the Revocation Proceedings.

The Amendments Issue

79 I turn next to the issue of whether the Appellant's amendments to the Patent should be allowed. As established above, the Appellant filed four set of amendments in total. The 1997 Amendments were never challenged and the Respondent has discontinued its appeal with regard to the 1999 Amendments. Only the Proposed 2006 Amendments and the Proposed 2008 Amendments therefore remain in dispute. Insofar as the Applicant appeals against the Tribunal's decision to disallow claim 30 of the 1999 Amendments ("Claim 30"), Claim 30 also remains in issue.

80 I note that the Respondent does not resurrect its argument below that the Proposed 2008 Amendments are prohibited because section 80 of the Act affords patentees only *one* opportunity to amend a patent during revocation proceedings. As the Tribunal pointed out at [115]-[116] of the Decision, there is no statutory basis for this contention.

The law

81 Section 84(3) of the Act provides that no amendment will be allowed if it: (a) results in the specification disclosing additional matter; or (b) extends the protection granted by the patent. With regard to section 84(3)(a), the subject matter will be considered "additional matter" if it is not clearly and unambiguously disclosed, either implicitly or explicitly, in the application as originally filed (*Bonzel v Intervention Ltd* [1991] RPC 553 at 574). With regard to section 84(3)(b), it is to be noted that the scope of an individual claim may be extended so long as it does not extend the overall monopoly of the patent (*Siegfried Demel v Jefferson* [1999] RPC 155).

The 1999 Amendments – Claim 30

82 Claim 30 discloses that the microbial oil containing DHA and/or the microbial oil containing ARA are "in triglyceride form". The only basis of this claim in the original Patent specification is Example 1 on page 12, where it states:

> "The second fraction was predominantly phospholipids whereas the first fraction contained a mixture of phospholipids and triglycerides. The combined fractions produced an oil containing about 30-35% arachidonic acid and no detectable EPA."

83 The Re-Examiner took this to indicate that "during production of the microbial oils it appears that fatty acids are in the form of phospholipids and triglycerides" and on this basis concluded that Claim 30 did not disclose additional matter. [note: 13] However, in my view the Tribunal was right to find that Example 1 is inconclusive support for Claim 30. Example 1 indicates that different fractions in the production of the microbial oils were different mixes of phospholipids and triglycerides, with the second fraction apparently containing no triglycerides at all. Example 1 thus does not "clearly and unambiguously" disclose the subject matter of Claim 30.

84 The Applicant's appeal against the Tribunal's finding in this regard is therefore dismissed.

The Proposed 2006 Amendments

85 I turn now to the Proposed 2006 Amendments.

(1) "Substantially lower" – Claim 2

86 The first proposed amendment to claim 2 is to include that:

the amount of each other long chain polyunsaturated fatty acid (lcPUFA) in said supplemented infant formula is *substantially lower* than the amount of that lcPUFA in human breast milk [emphasis added].

87 "Each *other*" lcPUFA refers to the fact that this claim only refers to lcPUFAs other than ARA and DHA.

88 The Tribunal allowed this amendment on the basis that this feature is disclosed in Tables 2 and 7 of Examples 5 and 10 respectively ("Tables 2 and 7") in the original application. The Tribunal found that Tables 2 and 7 reflected that the amount of lcPUFAs other than ARA and DHA in the supplemented infant formula is either lower or in significantly lower amount compared to that in HBM. In my view, this is correct. I note in particular that in interpreting the Tables, care must be taken to examine only the relevant profiles – as clarified by the Applicant and the Tribunal, some of the profiles reflected in the Tables are *not* lcPUFAs but other types of fatty acids. An examination of the relevant profiles reflects substantially lower amounts than in HBM.

89 I find, contrary to the Respondent's argument, that the skilled person *is* guided to the quantitative meaning of "substantially lower". The specification of a patent should be read through the eyes of the skilled addressee, "*attempting to give it a practical meaning and endeavouring to ascertain the intention of the draftsmen*" (*Rediffusion Simulation v Link Miles* [1993] FSR 369 at 388) [emphasis added]. In this light, I find that the Tribunal was right to hold that a skilled addressee, reading the Patent and attempting to give it a practical meaning, would have been able to obtain the results as stated in Examples 5 and 10 had he carried out the necessary experiments.

(2) Replacement of "comprising of" with "consisting of" – Claims 2 and 26

90 The second proposed amendment is to amend the phrase "comprising of" to "consisting of" in claims 2 and 26.

91 The Tribunal allowed this amendment on the basis that it constituted a positive limitation on the claim. The Respondent contends that the amendment is the Applicant's way of distinguishing its alleged invention from prior art by excluding any additional features that were disclosed by the prior art.

92 I do not think there is any dispute as to the effect of the proposed amendment. The Tribunal held that "comprising" is commonly understood to mean "including but not limited to" whereas "consisting of" is close-ended. However, that is not what the Respondent is objecting to. The Respondent's objection is that this limitation conveys the meaning that the oil blend consists *only* of ARA-containing oil and DHA-containing oil to the exclusion of all other types of oils and additives. In other words, this is the Respondent's argument on the validity issue, which I have already addressed earlier. Given that I have already held that the Patent did disclose that an oil blend of only a microbial oil containing ARA and a microbial oil containing DHA is necessary, the dispute over this amendment is moot. In fact, I have already noted that it is somewhat strange for the Tribunal to have found at [87] of the Decision that "Example 5 showed that DHA oil and ARA oil are to be the only lcPUFAs required for the oil blend", and yet reach the conclusion it did on the revocation issue.

(3) "An infant formula that is substantially free of lcPUFAs" – Claims 2 and 26

93 The third proposed amendment is to include the phrase "an infant formula that is substantially free of lcPUFAs" in claims 2 and 26.

94 The Tribunal allowed this amendment on the basis that it was disclosed in Tables 2 and 7 in Examples 5 and 10 respectively, as with the first proposed amendment at [88] above. I agree. The Respondent contends that the Tables merely describe the composition of the unsupplemented infant formula and there is no teaching in the Patent that this infant formula is intended to be "substantially free of lcPUFAs". However, this fails to consider that a description of the composition of the unsupplemented infant formula can implicitly teach that this infant formula is "substantially free of lcPUFAs". This is especially when we examine the Tables from the viewpoint of a person skilled in the art. In my view, the profiles reflected in the Tables do this.

(4) "At least 25% by weight DHA" – Claims 3, 16, 29 and 46; " Rich in DHA" – Claims 2, 15, 26, 31, 43 and 48

95 The fourth proposed amendment is to amend claims 3, 16, 29 and 46 to include the phrase "At least 25% by weight DHA". The fifth proposed amendment is to amend claims 2, 15, 26, 31, 43 and 48 to include the phrase "Rich in DHA". The Tribunal addressed these two proposed amendments together because the arguments involved were interlinked.

96 The Tribunal disallowed both amendments, in my view correctly. It found that, while not disclosing additional matter, the amendments extend the protection granted by the Patent. It found that the amendments do not disclose additional matter because the Patent specifications, at lines 8-9 at page 5 read with line 6 at page 9, do disclose a *lower limit* of 25% and the teaching of "richness" in DHA and ARA. However, lines 5-6 at page 9 also disclose an *upper limit* of 40% by weight DHA. The phrases "at least 25% by weight DHA" and "rich in DHA" therefore extend the scope of protection granted by the Patent because they disclose only lower limits, not an upper limit. The Applicant contended below on the basis of lines 8-9 on page 5 that the Patent did not impose an upper limit but only that the microbial oils should be "rich" in DHA. However, the Applicant cannot pick and choose parts of the specifications to rely upon for the purposes of establishing what the Patent disclosed. Having urged the Tribunal to read lines 8-9 at page 5 *together* with line 6 at page 9 in order to establish that no additional matter was disclosed, it cannot then ignore the latter and rely only upon the former to argue that the Patent did not impose an upper limit of 40%.

(5) "At least 20% by weight ARA" – Claims 4, 17, 27 and 44; "Rich in ARA" – Claims 2, 15, 26 and 43

97 The sixth and seventh proposed amendments are to amend claims 4, 17, 27 and 44 to include the phrase "at least 20% by weight ARA" and to amend claims 2, 15, 26 and 43 to include the phrase "rich in ARA". The submissions here are the same as with the fourth and fifth proposed amendments above on the proportion of DHA. For the same reasons, therefore, I find that the Tribunal was correct to disallow these amendments as well.

(6) All other claims

98 Apart from the proposed amendments above, the Proposed 2006 Amendments contained other amendments which the Respondent did not specifically submit on below. Nevertheless, the Tribunal stated that save for Claim 45, the proposed amendments to all other claims were allowable. Insofar as these claims are dependent claims, their allowability depends on the allowability of the relevant parent claim analysed above. Also, Claims 1 and 25 are no longer in issue because the Respondent has withdrawn its appeal with regard to these claims. [note: 14]

99 As for Claim 45, it is for "the composition of any one of claims 42 to 44". I have already held earlier that amended Claims 43 and 44 are not allowed. It follows that Claim 45 is disallowed insofar as

it is dependent on claims 43 or 44. On the other hand, the Tribunal held that Claim 45 is allowed insofar as it is dependent on Claim 42, which it allowed. I disagree with the Tribunal's finding that Claim 42 be allowed for the reasons stated below at [101]-[103] where I consider the allowability of certain Proposed 2008 Amendments because those amendments involve the same phraseology as the Proposed 2006 Amendment to Claim 42.

The Proposed 2008 Amendments

100 Under the Proposed 2008 Amendments, substantive amendments were made only to Claims 2, 15 and 26 in addition to the deletion of Claims 31 and 48. The rest of the claims remain substantively identical to those in the Proposed 2006 Amendments. I therefore need only consider the proposed amendments to Claims 2, 15 and 26 (together with Claim 42 as explained above at [99]), as well as the proposed deletion of Claims 31 and 48.

(1) Replacement of "rich in" with "containing" – Claims 2, 15, 26 and 42

101 The first proposed amendment is to replace the term "rich in" with the term "containing" in claims 2, 15 and 26. This amendment was also already made to claim 42 under the Proposed 2006 Amendments.

102 The Tribunal disallowed this amendment. I find that it was correct to do so because the amendment extends the scope of protection conferred by the Patent within the meaning of section 84(3)(b) of the act. The words and terms in a claim are to be given their ordinary English meaning unless: (a) a word or expression has a specialised meaning in the relevant art (*Electric & Musical Industries Ltd v Lissen Ltd* [1939] 56 RPC 23 at 24); or (b) the specification may indicate an ambiguous meaning thereby justifying resort to the body of the specification to define the words used in the claim (*Interlego AG v Toltoys Pty Ltd* (1973) 130 CLR 461). I accept the Respondent's submission that, given their ordinary English meanings, it is clear that "containing" is wider than "rich in". The former would mean that the microbial oil may contain *any amount* of DHA or ARA whereas the latter requires a *large amount* of the same. This is sufficient to dispose of the issue although the Respondent also objects to the amendment on the basis of section 84(3)(a) as well *i.e.* that it discloses additional matter.

103 It follows that Claim 42 (which is the same in both the Proposed 2006 and 2008 Amendments) should not be allowed. Consequently, Claim 45 of the Proposed 2006 Amendments is also not allowed (see above at [99]).

(2) Deletion of old proposed dependent Claims 31 and 48

104 This is no longer an issue as the Respondent has withdrawn its cross-appeal against the decision of the Tribunal to allow this deletion.

(3) All other claims

105 The allowability of all other claims in the Proposed 2008 Amendments depends on the allowability of their equivalent claims in the Proposed 2006 Amendments.

Conclusion on the Amendments Issue

106 In conclusion, I dismiss both parties' appeal and cross-appeal against the Tribunal's findings on the allowability of the claims in the Proposed 2006 and 2008 Amendments, with the sole exception

that I overturn the Tribunal's finding that Claim 42 of the Proposed 2006 Amendments is allowable and that therefore Claim 45 of the Proposed 2006 Amendments is also allowable insofar as it is dependent on Claim 42.

Conclusion

107 For all the above reasons, I allow the Applicant's appeal against the Tribunal's decision in the Revocation Proceedings and dismiss both parties' appeal and cross-appeal against the Tribunal's decision in the Amendment Proceedings except with regard to Claim 42 and consequently Claim 45 in the Proposed 2006 Amendments.

108 In the circumstances of the case, a fair order as to costs would be to order the Respondent to pay the Applicant 95% of its costs for the hearing before the Tribunal and for the appeal before me and I so order.

[note: 1] Merrill Legal Solutions Transcripts at pp45-62 (18 February 2009)

[note: 2] Merrill Legal Solutions Transcripts at p6 (17 February 2009)

[note: 3] Item 5.5, Minutes of Case Management Conference attached to Allen & Gledhill's letter of 2 February 2011

[note: 4] Merill Legal Solutions Transcripts at p11 (17 February 2009)

[note: 5] Declaration of Dr Eric Lien, Tab 5 of Applicant's Core Bundle of Documents Vol II, at [6]

[note: 6] Decision at [130]

[note: 7] At [31]

[note: 8] Respondent's Case at [138.1]

[note: 9] Applicant's Case at [247].

[note: 10] Applicant's Case at [249].

[note: 11] Applicant's Case at [233]

[note: 12] Respondent's Case at [329], referring to [159]-[164]

[note: 13] Re-examination Report at Sheet No. 3

[note: 14] Respondent's Case at [80]