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Paper 48
Date: October 1, 2020

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

RIMFROST AS,
Petitioner,

v.

AKER BIOMARINE AS,
Patent Owner.

IPR2018-00295
Patent 9,320,765 B2

Before TINA E. HULSE, CHRISTOPHER G. PAULRAJ, and JOHN E. SCHNEIDER, *Administrative Patent Judges.*

SCHNEIDER, *Administrative Patent Judge*.

DECISION
Denying Patent Owner's Request on Rehearing of Final Written Decision
37 C.F.R. § 42.71(d)

I. INTRODUCTION

On June 12, 2019, the Board issued a Final Written Decision in this proceeding, which included a decision on Patent Owner's Motion to Amend. Paper 35 ("Decision" or "Final Dec."). In the Decision, we determined that claims 1–48 of U.S. Patent No. 9,320,765 B2 ("the '765 patent") and proposed substitute claims 49–56 included with the Motion to Amend ("proposed substitute claims") were unpatentable over the prior art of record. *Id.* at 69.

On July 12, 2019, Patent Owner, Aker Biomarine Antarctic AS, filed a timely Request for Rehearing under 37 C.F.R. § 42.71(d). Paper 36 ("Req. Reh'g"). On August 15, 2019, Petitioner, Rimfrost AS, with our authorization, filed a Response to the Request for Rehearing. Paper 37 ("Resp. Req. Reh'g"). Patent Owner, with our authorization, filed a Reply on September 4, 2019. Paper 38 ("Reply Req. Reh'g").

The asserted grounds for rehearing relate to the Board's reliance on the teachings of Randolph[1] concerning levels of esterified astaxanthin as a basis for finding the proposed substitute claims unpatentable.[2] Req. Reh'g

[1] Randolph et al., US 2005/005728 A1, published March 17, 2005 (Ex. 1011 "Randolph").

[2] While the concluding paragraph of the Motion to Amend portion of our Decision states that only substitute claim 56 was unpatentable over the combination of Sampalis, Catchpole Fricke, Randolph, and NKO (Final Dec. 68), we nonetheless relied upon the teachings of Randolph for our unpatentability analysis for all the proposed substitute claims. As such, the Decision should have stated that proposed substitute claims 49–52, 55, and 56 are unpatentable over Sampalis, Catchpole Fricke, Randolph, and NKO and that proposed substitute claims 53 and 54 are unpatentable over Sampalis, Catchpole Fricke, Bottino, Randolph, and NKO.

1–2. Patent Owner contends that the Board's Decision regarding the proposed substitute claims was in error as the Decision relied on a combination of references that included Randolph that was allegedly not advanced by the Petitioner. Req. Reh'g 10–11. Patent Owner also argues that the Board's Decision violated the Administrative Procedure Act ("APA") in that Patent Owner was not given notice of the combination of references we applied in our Decision and was not afforded an opportunity to respond to the alleged new grounds of unpatentability based in that combination. Req. Reh'g 9.

On November 22, 2019, the Board issued an order authorizing supplemental briefing. Paper 40 ("Reh'g Order"). Specifically, we explained that the Board "erred in concluding that proposed [substitute] claims 49–56 are unpatentable over Sampalis, Catchpole, Fricke, and Randolph without affording Patent Owner the opportunity to fully address Petitioner's argument concerning the teachings of Randolph." *Id.* at 4. The Rehearing Order also pointed out that, although the record contained evidence as to Randolph's teachings, "Petitioner did not apply Randolph to the proposed [substitute] claims until it filed its Sur-Reply." *Id.* Thus, the Board determined that it was appropriate to allow further briefing regarding whether the proposed claims were unpatentable over the combined teachings of Sampalis, Catchpole, Fricke, and Randolph. *Id.* at 5.

Pursuant to that Order, Patent Owner filed an authorized Supplemental Brief on December 3, 2019 (Paper 42 ("Supp. Br.")), Petitioner filed an authorized Response on December 17, 2019 (Paper 43 ("Supp. Resp.")), and Patent Owner filed an authorized Reply on December 20, 2019 (Paper 44 ("Supp. Reply")).

On July 6, 2020, the Precedential Opinion Panel ("POP") issued its decision in *Hunting Titan, Inc. v. Dynaenergetics Europe GmbH*, IPR2018-00600, Paper 67 (PTAB July 6, 2020) (precedential) ("*Hunting Titan*"), which relates to motions to amend and the Board's authority to consider issues of unpatentability not raised by a petitioner. The POP held that the Board may consider such issues, but only in certain rare circumstances. *Id.* at 4. In an email sent July 16, 2020, the Board requested briefing from the parties addressing what impact, if any, *Hunting Titan* has on the present proceeding. Ex. 3001. On July 24, 2020, Petitioner filed a Supplemental Brief Addressing Potential Impact of *Hunting Titan*. Paper 45 ("Pet. HT Br."). Patent Owner filed its Supplemental Response Brief Addressing the Impact of *Hunting Titan* on August 3, 2020. Paper 46 ("PO HT Br.").

II. LEGAL STANDARD

A request for rehearing "must specifically identify all matters the party believes the Board misapprehended or overlooked, and the place where each matter was previously addressed in a motion, an opposition, or a reply." 37 C.F.R. § 42.71(d). The burden of showing a decision should be modified on a request for rehearing lies with the party challenging the decision. *Id*.

III. ANALYSIS

A. The Board Properly Considered a Ground of Unpatentability Including Randolph

As part of our analysis of whether to grant Patent Owner's Request for Rehearing and grant its Motion to Amend, we need to consider the issue of whether the Board properly found the proposed substitute claims unpatentable over a combination of references that includes Randolph. Patent Owner contends that we should not have concluded that the proposed claims were unpatentable as the combination including Randolph was not

properly before the Board and should not have been considered. Req. Reh'g 2–3. Petitioner disagrees. Resp. Req. Reh'g 6–7.

Two recent decisions, one by our reviewing court, *Nike, Inc. v. Adidas AG*, 955 F.3d 45 (Fed. Cir. 2020), and the other by the POP, *Hunting Titan,* guide our analysis. *Nike* addresses whether the Board has the authority to consider a new ground of unpatentability in connection with a motion to amend. *Nike*, 955 F.3d at 51–52. *Hunting Titan* addresses whether, and under what circumstances, the Board *should* exercise any such authority. *Hunting Titan* at 5.

In *Nike*, the Board denied patent owner Nike's motion to amend, finding the proposed claims unpatentable as obvious. *Nike*, 955 F.3d at 49. The Board based its decision on the entirety of the record including a reference that, while part of the record, was not relied upon by petitioner Adidas to challenge the proposed claims. *See id* at 48–49 (noting Adidas relied on Nishida, Schuessler I and Schuessler II, and the Board added Spencer to its analysis). Nike argued that the Board violated the APA by failing to give notice that it would rely on Spencer to support its obviousness conclusion for the substitute claim. *Id.* at 51. The Federal Circuit agreed. *Id.*

The Federal Circuit began its analysis by holding "that the Board may *sua sponte* identify a patentability issue for a proposed substitute claim based on the prior art of record."[3] *Id.* The court distinguished the earlier holdings in *SAS Institute, Inc. v. ComplementSoft, LLC*, 825 F.3d 1341 (Fed. Cir. 2016) and *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1373 (Fed. Cir. 2016) where the Board was limited to addressing the issues raised

[3] The court did not address the issue of whether the Board was permitted to look outside the record to determine the patentability of proposed substitute claims. *Id.* at 51 n.1.

in the petition against already issued claims, noting that those cases did not involve the motions to amend. *Id.* The court continued:

> It makes little sense to limit the Board, in its role within the agency responsible for issuing patents, to the petitioner's arguments in this context. Rather, based on consideration of the entire record, the Board must determine whether the patent owner's newly-presented, narrower claims are "supported by the patent's written description" and "unpatentable in the face of the prior art cited in the IPR."

Id. at 51–52 *(*quoting *Aqua Prods., Inc., v. Matal*, 872 F.3d 1290, 1314 (Fed. Cir. 2017) (citing 35 U.S.C. § 316(d)(3))). Thus, under *Nike*, the Board has the authority to consider a new ground of unpatentability when it considers the substitute claims proposed in a motion to amend.

We next turn to the guidance the POP provided in *Hunting Titan.*

First, the POP held that "the Board may, in certain rare circumstances, raise a ground of unpatentability that a petitioner did not advance, or insufficiently developed, against substitute claims proposed in a motion to amend." *Id.* at 4. The rare circumstances exemplified in the decision include cases where the petitioner has ceased to participate in the proceeding; where the petitioner has not opposed the motion to amend; or "where certain evidence of unpatentability has not been raised by the petitioner, but is readily identifiable and persuasive such that the Board should take it up in the interest of supporting the integrity of the patent system, notwithstanding the adversarial nature of the proceedings." *Id.* at 12–13.

The POP also held that where the Board intends to raise a new ground of unpatentability in connection with a motion to amend, the patent owner must be given notice and an opportunity to address the proposed new grounds. *Id.* 15.

Because the *Hunting Titan* POP decision issued after Patent Owner filed its Request for Rehearing in this case, we requested further briefing from the parties to address the potential impact of its holdings on the present proceeding.

In its Supplemental Briefing, Petitioner contends that the facts of the present case are distinguishable from those in *Hunting Titan* and that the POP decision supports its position that Patent Owner's Request for Rehearing should be denied. Pet. HT Br. 1. Petitioner contends that, unlike in *Hunting Titan*, the issue of whether the proposed substitute claims are obvious over Sampalis, Catchpole, Fricke, and Randolph was raised and sufficiently developed during the proceeding. *Id.* at 2–4. Petitioner also contends that Patent Owner was given notice of the potential new ground and was allowed an opportunity to respond through the supplemental briefing authorized by the Board. *Id.* at 3–4. Petitioner contends that even if the issue of unpatentability based on the four references was not sufficiently developed, the evidence of unpatentability was readily identifiable and persuasive such that "the Board should take it up in the interest of supporting the integrity of the patent system." *Id.* at 4 (quoting *Hunting Titan*, Paper 67 at 13).

Patent Owner contends that *Hunting Titan* is dispositive with regard to its Motion to Amend and its Request for Rehearing and that the request and the Motion to Amend should both be granted. PO HT Br. 1. Patent Owner contends that Petitioner did not adequately develop the ground relied upon by the Board. *Id*. at 1–3. Patent Owner also argues the circumstances of the present case do not compel the Board to advance a new ground of unpatentability that Petitioner did not advance or sufficiently develop. *Id.* at 3–5.

We have considered the arguments advanced by the parties and determine that we appropriately considered Randolph's teachings in assessing the patentability of the proposed claims insofar as Petitioner raised Randolph as prior art against the proposed substitute claims in opposing Patent Owner's Motion to Amend. As such, we are not persuaded that our consideration of Randolph constituted a new ground of unpatentability. Thus, *Hunting Titan* is distinguishable and does not compel us to grant Patent Owner's Motion to Amend.

Patent Owner contends that the Board should not have raised a new ground in this case because Petitioner "vigorously prosecuted its case" and elected not to pursue an argument based on Randolph. PO HT Br. 4. We do not find this argument persuasive as it is inconsistent with the record. As we explain below, Petitioner raised the issue of the teachings of Randolph in its briefing and during arguments before the Board. This is not a case where Petitioner failed to sufficiently advance an unpatentability ground that includes Randolph.In the present proceeding, Petitioner in its Petition challenged some of the original claims based on the combination of Sampalis, Catchpole, Fricke, Breivik, and Randolph. Pet. 7. With respect to the proposed substitute claims, Patent Owner first raised the teachings of Randolph preemptively in its Motion to Amend when it argued that Randolph taught away from the recited astaxanthin concentration because "[t]he lowest amount of astaxanthin ingredient disclosed in Randolph is 1%, which is equivalent to 10,000 mg/kg" and "[t]his is over 13 times greater than the highest amount of astaxanthin esters recited in proposed substitute claim 49." Paper 16 ("MTA"), 18–19. Petitioner responded to Patent Owner's teaching away argument by pointing out that Randolph taught that the compositions could contain "any amount of an astaxanthin ingredient."

Paper 20 ("MTA Opp."), 15–16 (quoting Ex. 1011 ¶¶ 7, 44). Petitioner supported this argument with the declaration of Dr. Tallon in which Dr. Tallon testified that Randolph discloses a krill oil composition having 158 mg/kg astaxanthin ester. *Id.* (citing Ex. 1086 ¶¶ 197–202). Patent Owner cross-examined Dr. Tallon regarding this teaching in Randolph. Ex. 2020, 155–157. In its Sur-Reply to the Motion to Amend, Petitioner specifically cited to this cross-examination testimony when Petitioner argued that Randolph taught a composition having an astaxanthin level falling with the scope of the proposed substitute claims. Paper 30, 10 ("MTA Sur-Reply").

In addition to discussing Randolph in its briefing and through its expert, Petitioner also made specific reference to the teachings of Randolph in the demonstratives used at trial and the Board asked specific questions about the teachings of Randolph and Dr. Tallon's Testimony. Paper 34, 17–18 ("Tr.").

Patent Owner contends that the ground of unpatentability that includes Randolph was not sufficiently developed by Petitioner. PO HT Br. 2–3. Specifically, Patent Owner contends that Petitioner did not adequately address the issue of motivation to combine Randolph with the remaining references nor did it address whether there was a reasonable expectation of success. *Id.*

Based on the foregoing we find that, unlike the situation in *Hunting Titan,* Petitioner in the present case adequately developed the issue of whether the proposed substitute claims are unpatentable over a combination of references that includes Randolph. With respect to the specific unpatentability arguments set forth by Petitioner in its Opposition to the Motion to Amend, we recognize that Petitioner only relied upon Randolph in combination with other references to argue for the unpatentability of

proposed substitute claim 56. MTA Opp. 24–25. However, Petitioner's arguments concerning Randolph were in response to Patent Owner's contention that Randolph taught away from the range of astaxanthin ester (100 mg/kg to 700 mg/kg) recited in *all* the substitute clams. *See* MTA, 18–19 ("Thus, Patent Owner contends that Randolph's disclosure of at least 10,000 mg/kg of an astaxanthin ingredient teaches away from krill oil compositions that include the 100 mg/kg to 700 mg/kg astaxanthin esters recited in proposed substitute claim 49."). Patent Owner was made aware of Petitioner's contentions though the briefing submitted by Petitioner and through the declaration of Dr. Tallon. Furthermore, as discussed more fully below, the MTA briefing and supporting declaration submitted by Petitioner adequately discussed the motivation to combine the references and the reasonable expectation of success. *See, e.g.*, MTA Opp. 24–25; Ex. 1086 ¶¶ 15, 50, 64, 221–223.

Moreover, even if we agreed with Patent Owner that Petitioner did not adequately develop its arguments with respect to Randolph, we would otherwise conclude that we properly considered Randolph in assessing the patentability for all the proposed substitute claims in light of the record in this proceeding and following the guidance in *Hunting Titan*. The POP held that the Board may raise a new ground of unpatentability where the evidence of unpatentability "is readily identifiable and persuasive such that the Board should take it up in the interest of supporting the integrity of the patent system, notwithstanding the adversarial nature of the proceedings." *Hunting Titan*, Paper 67 at 12–13. In the present case, the combination of Randolph with the remaining references is readily identifiable because it was: (1) first raised by Petitioner in response to Patent Owner's argument that Randolph taught away from the recited levels of astaxanthin ester; (2) specifically

asserted by Petitioner against proposed substitute claim 56; (3) discussed by Dr. Tallon in his Declaration in support of Petitioner's Opposition to the Motion to Amend, (4) the subject of cross-examination testimony of Dr. Tallon, (5) discussed by Petitioner in its Sur-Reply to the Motion to Amend, and (6) raised by the panel and discussed with the parties during the oral hearing. Ex. 1086 ¶¶ 197–202; Ex. 2020, 155–157; MTA Sur-Reply 10; Tr. 17–18. The evidence is persuasive in that Randolph teaches the very element that Patent Owner argued was lacking from the prior art and contradicts Patent Owner's argument that Randolph teaches away from the claimed range of astaxanthin ester. *See* MTA 18.

Based on the foregoing we conclude that we properly considered Randolph in determining the patentability of the proposed substitute claims.

B. Supplemental Briefing Cured Any Potential Violation of the APA

Patent Owner contends that it had no proper opportunity to respond to the grounds including Randolph, which violates the APA and is contrary to Federal Circuit precedent. Req. Reh'g, 9–11 (citing *SAS Institute*, 825 F.3d at 1351 and *In re Magnum Oil Tools*, 829 F.3d at 1378).

Petitioner responds that the references and arguments relied upon by the Board were part of the record and the Board properly considered the entirety of the record. Resp. Req. Reh'g 6–7. Petitioner contends that no APA violation occurred as Patent Owner was on notice of Petitioner's reliance on Randolph's teaching with regard to astaxanthin levels because Petitioner presented it in response to Patent Owner's arguments "regarding Randolph's teachings and the patentability of the substitute claims." *Id.* at 8–9.

In its supplemental brief addressing the combination of Sampalis, Catchpole, Fricke, and Randolph, Patent Owner maintained its position that

the Board should limit its analysis to the grounds actually raised by Petitioner in the Opposition challenging the proposed substitute claims. Supp. Br. 1. Patent Owner asserts that it "has been prejudiced by not being able to, among other things, submit expert testimony on the combination of the astaxanthin content of Randolph with the other references." *Id.*

As explained above, we have considered the parties' arguments and are not persuaded that our reliance on the teachings of Randolph concerning levels of esterified astaxanthin in our Final Written Decision was improper or erroneous. Moreover, any alleged prejudice to Patent Owner was mitigated by our authorization of supplemental briefing in this proceeding to allow the parties to address the merits of our reliance on Randolph's teachings. Paper 40.

The Federal Circuit's decision in *Nike,* discussed above is on point. There, the court addressed Nike's argument regarding a violation of the APA and held

> Although the Board was permitted to raise a patentability theory based on Spencer, the notice provisions of the APA and our case law require that the Board provide notice of its intent to rely on Spencer and an opportunity for the parties to respond before issuing a final decision relying on Spencer.

Id. at 52.

The court went on to give two examples as to how the notice requirements of the APA could be met when the Board intends to rely on prior art not addressed by the parties:

> For example, prior to issuing its decision on remand, the Board in this case could have informed the parties that it intended to rely on Spencer for disclosing the disputed limitation of substitute claim 49, and requested supplemental briefing from the parties regarding its proposed ground for unpatentability.

> Alternatively, had the Board held an oral hearing on remand, it could have requested that the parties be prepared to discuss Spencer in connection with substitute claim 49 at the hearing. Either of these actions would satisfy the APA's notice requirements, but neither occurred in this case.

Id. at 54. This approach is also consistent with the POP's holding in *Hunting Titan*. In *Hunting Titan*, the POP held that where a new ground of unpatentability is raised, a patent owner needs notice of the new ground and an opportunity to address the new ground. *Id.* at 15. Although we determine that the Board did not raise a new ground of unpatentability for the reasons set forth above, even if our analysis could arguably be considered a new ground, we provided Patent Owner with the requisite notice and an opportunity to respond.

As discussed above, in response to Patent Owner's request, we authorized supplemental briefing by the parties to specifically address the teachings of Randolph that Petitioner raised in its Sur-Reply and that we relied upon in finding the proposed claims unpatentable. Reh'g Order. The parties have now briefed the issues regarding the teachings of Randolph and the propriety of the combination of references on which we relied.

We find unpersuasive Patent Owner's contention that the additional briefing we authorized could not remedy any potential APA violation because it did not have an opportunity to submit further expert testimony. Following the guidance set forth in both *Nike* and *Hunting Titan*, the Board authorized additional briefing regarding combining Randolph with the other references. Both the Federal Circuit's decision in *Nike* and POP's decision in *Hunting Titan* teach that supplemental briefing is a way for the Board to satisfy the requirement for notice and an opportunity to respond. *Nike,* 955 F.3d at 54; *Hunting Titan,* Paper 67 at 15. But we find nothing in either

decision to suggest that parties must be provided with an opportunity to submit further expert testimony as part of such supplemental briefing in order to satisfy the APA requirements.

Based on the foregoing, we determine that it was proper to find the proposed claims unpatentable based on our consideration of the entire record. Moreover, we determine that allowing the parties to further brief our reliance on Randolph's teachings remedied any potential APA violation.

C. Unpatentability of the Proposed Claims

In the Final Written Decision issued in this case, the Board determined that proposed claims 49 to 56 were unpatentable over the teachings of Catchpole, Fricke, and Randolph. Final Dec. 68; *see also* Reh'g Order 4 (clarifying that the Board found proposed substitute claims 49–56 unpatentable over Sampalis, Catchpole, Fricke, and Randolph). The Board found, in part, that Randolph taught preparing a product having from 100 to 700 mg/kg astaxanthin ester. Final Dec. 67–68.

Patent Owner contends that the Board erred in finding the proposed claims unpatentable. Supp. Br. 1. Specifically, Patent Owner contends that the combination of Catchpole, Fricke, and Randolph does not teach the limitation calling for 100 to 700 mg/kg astaxanthin esters. *Id.* Patent Owner also contends that Petitioner failed to show that one skilled in the art would have been motivated to prepare a krill oil product with an astaxanthin level of from 100 to 700 mg/kg. *Id.* We consider each of these arguments in turn.

1. The Teachings of Randolph

As noted in our Decision, Randolph discloses compositions for modulating cytokines to regulate an inflammatory or immunomodulatory response including, inter alia, rosehips and krill oil. Ex. 1011 ¶ 8. With regard to rosehips, Randolph discloses that the composition may include one

or more rosehip ingredients, such as "dried rosehips, rosehip oil, and rosehip extracts." *Id.* ¶ 24.

Concerning krill oil, Randolph discloses that

> [a] composition of the invention can include krill oil. Krill oil can be obtained from any member of the E. family, for example E. superba. Conventional oil producing techniques can be used to obtain the krill oil. In addition, krill oil can be obtained commercially from Neptune Technologies and Bioresources of Quebec, Canada.

Id. ¶ 39. Randolph further explains that "[a] composition can contain any amount of krill oil," but will typically contain "between about 300 mg and about 3000 mg of a krill oil ingredient." *Id.* ¶ 40.

Randolph teaches:

> A composition can contain any amount of an astaxanthin ingredient. For example, at least about 1 percent (e.g., at least about 2, 3, 4, 5, 10, 15, 20, 25, 30, 35, 40, 50, 60, 70, 80, or 90 percent) of a dietary supplement can be astaxanthin. Typically, a composition contains between about 0.5 mg and about 50 mg of an astaxanthin ingredient.

Id. ¶ 44.

Patent Owner contends we erred in our Decision, as Randolph does not teach the limitation calling for an amount of astaxanthin ester ranging from 100 to 700 mg/kg. Supp. Br. 2–6.

Patent Owner contends that one skilled in the art would have read Randolph as teaching the preparation of krill oil compositions having significantly higher amounts of astaxanthin ester. Supp. Br. 2–3. Patent Owner points to the teaching in Randolph that the krill oil that can be NKO krill oil or krill oil that has been conventionally produced. Supp. Br. 2; Ex. 1011 ¶ 39. Patent Owner contends that the evidence of record shows that

NKO krill oil has an astaxanthin content of 1500 mg/kg and that Randolph does not contain any teachings as to what the astaxanthin content would be for a krill oil composition produced by a conventional technique. Supp. Br. 2–3. Patent Owner contends that Randolph's teaching that the disclosed composition can have "any amount of astaxanthin" refers to the general compositions disclosed in Randolph and not to the krill oil used in the compositions. Supp. Br. 3.

These arguments do not persuade us that we erred in finding the proposed claims unpatentable. As Petitioner argues, Randolph teaches that the disclosed compositions may comprised of *any* amount of krill oil and *any* amount of astaxanthin. MTA Opp., 16; Ex. 1011 ¶¶ 40, 44. Although Randolph teaches that the krill oil can be obtained commercially, that reference does not limit the krill oil to a commercial product. Moreover, although some commercial products contain higher amounts of astaxanthin ester, it was also known, as the present Specification teaches, that certain commercial products at the time had astaxanthin ester levels that fell within the recited range. *See* Ex. 1001, col. 27, ll. 38–50 (Table 16) (NKO commercial product had an astaxanthin level of 472 mg/kg).

We are also persuaded by the testimony of Dr. Tallon, previously made of record with Petitioner's Opposition, that Randolph teaches a range of astaxanthin levels that would yield an astaxanthin ester level within the range recited in the claims. In particular, Dr. Tallon attests that Randolph teaches that the amount of krill oil in the supplement can range from 300 mg to 3000 mg and that the astaxanthin level can range from 0.5 mg to 50 mg. Ex. 1011 ¶¶ 40, 44. Using the values reported in Randolph, Dr. Tallon calculated that the amount of astaxanthin ester present in a supplement containing 3000 mg krill oil and 0.5 mg astaxanthin would yield a

supplement containing about 167 mg/kg of astaxanthin ester. Ex. 1086 ¶¶ 199–202.

Patent Owner contends that Dr. Tallon's calculations of astaxanthin levels in Randolph are based on hindsight in that Dr. Tallon improperly reads Randolph as referring to krill oil compositions when Randolph actually refers to the combined product. Supp. Br. 4. Patent Owner also contends that Dr. Tallon improperly used values at the extreme ends of the ranges for krill oil and astaxanthin to support his conclusion that the ranges of astaxanthin esters would range as low as 158 mg/kg. *Id.* at 5. Patent Owner contends that the calculations in Dr. Tallon's report actually result in an astaxanthin level that is an order of magnitude higher than 158 mg/kg. *Id.* at 6.

Again, we are not persuaded by Patent Owner's arguments. While we agree with Patent Owner that Randolph teaches a combined product, Randolph also teaches that the combined product can comprise at least about 90 percent krill oil resulting in a product that is almost completely comprised of krill oil. Ex. 1011 ¶ 40. We thus find Dr. Tallon's assumption that the krill oil was the source of the astaxanthin to be reasonable and supported.

We are not persuaded by Patent Owner's arguments regarding Dr. Tallon's use of the endpoints of the ranges taught by Randolph. Randolph clearly teaches that the disclosed composition can contain as little as 0.5 mg of astaxanthin and as much as 3000 mg of krill oil creating a logical lower endpoint for a range of combinations taught by Randolph. Ex. 1011 ¶¶ 40, 44. We are not persuaded by Patent Owner's contentions that the use of the two endpoints by Dr. Tallon was improper.

Finally, with respect to Dr. Tallon's calculations, Dr. Tallon clarified during his cross-examination that the calculations reported in his declaration contained a typographical error, and then explained how he reached his conclusion that Randolph teaches an astaxanthin level within the range recited in the claims. Ex. 2020, 154–155.

Based on the foregoing, we did not err in finding that Randolph teaches a krill oil composition containing astaxanthin ester in an amount of from 100 to 700 mg/kg of said krill oil.

2. Motivation to Combine

Patent Owner also contends that we erred in finding the substitute claims unpatentable as Petitioner had not established a motivation to combine the references. Supp. Br. 6. To the contrary, Patent Owner argues that, in fact, one skilled in the art would have been led away from a krill oil composition comprising from 100 to 700 mg/kg astaxanthin esters. *Id.* at 7. Patent Owner contends that Randolph teaches that the supplement can contain at least one percent astaxanthin and that Patent Owner's expert Dr. Heom has calculated that this would be equal to 10,000 mg/kg. *Id.* at 7–8 (citing Ex. 2013 ¶ 57).

Patent Owner also contends that the teachings of the art as a whole would have led one skilled in the art to use higher amounts of astaxanthin ester. *Id.* at 8–9.

We are not persuaded that our Decision was in error. As Petitioner points out, Dr. Tallon testified about the motivation to combine the various references. Supp. Resp. 7–8. Specifically, Dr. Tallon testified that astaxanthin was a known "potent antioxidant," and that a person of ordinary skill in the art would have been motivated to combine krill oil of the cited references because of the health benefits associated with, *inter alia*,

phospholipids and astaxanthin. *See, e.g.*, Ex. 1086 ¶¶ 15, 50, 64, 221–223; *see also* MTA Opp. 24–25 (Petitioner's argument as to motivation to combine).

With respect to the amount of astaxanthin ester, we are not convinced that Randolph teaches away from the claimed range. While Randolph does teach that the amount of astaxanthin may be 1% or greater, in the same paragraph Randolph states that the amount of astaxanthin is typically from about 0.5 mg to 50 mg. Ex. 1011 ¶ 44. Thus, while Randolph may teach high amounts of astaxanthin, it also teaches lower amounts that yield astaxanthin ester amounts within the range recited in the proposed substitute claims.

Similarly, other teachings in the art do not dissuade one skilled in the art from using lower amounts of astaxanthin ester. A reference does not teach away "if it merely expresses a general preference for an alternative invention but [does] not criticize, discredit or otherwise discourage investigation into the claimed invention." *Depuy Spine v. Medtronic Sofmaor*, 567 F.3d 1314, 1327 (Fed. Cir. 2009). Patent Owner has not pointed to nor have we discerned any teaching in the art that would dissuade one skilled in the art from using a lower amount of astaxanthin ester. As discussed above, Randolph specifically teaches lower amounts of astaxanthin, which in turn teaches lower amounts of astaxanthin ester. Ex. 1011 ¶ 44; Ex. 1086 ¶¶ 199–202.

3. Conclusion as to Patentability of the Proposed Substitute Claims

Based on the foregoing, Patent Owner has not persuaded us that we erred in our conclusion that the proposed substitute claims would have been unpatentable. The evidence of record supports our conclusion regarding the teachings of Randolph with respect to astaxanthin esters and demonstrates

that one skilled in the art would have been motivated to combine the teachings of the references.

IV. CONCLUSION

We hereby deny the relief requested in the Request for Rehearing

V. ORDER

Accordingly, it is hereby:

ORDERED that Patent Owner's Request for Rehearing is denied.

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