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EXAMINER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte REINHOLD BUCK, JENNY DEIBERT,
and ARND WOCHNER

Appeal 2018-001719
Application 12/453,821¹
Technology Center 1700

Before KAREN M. HASTINGS, JAMES C. HOUSEL, and
JEFFREY R. SNAY, *Administrative Patent Judges*.

HASTINGS, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants seek our review under 35 U.S.C. § 134(a) of the Examiner's decision rejecting claims 1–7 and 10–14² under 35 U.S.C. § 103(a) over Buck (US 2006/0144782 A1, published July 6, 2006) (“Buck”) in view of Krause et al. (WO 2006/106133 A1, published Oct. 12, 2006) (“Krause”).

We have jurisdiction over the appeal under 35 U.S.C. § 6(b).³

¹ Appellants identify the real party in interest as Gambro Lundia AB (Appeal Br. 2).

² Claims 8 and 9 have been withdrawn from consideration. Final Act. Office Action Summary.

³ We refer to the Specification, filed May 22, 2009 (“Spec.”); the Appeal Brief, filed May 22, 2017 (“Appeal Br.”); the Examiner's Answer, mailed Oct. 12, 2017 (“Ans.”), and the Reply Brief filed Dec. 7, 2017 (“Reply Br.”).

We AFFIRM.

Independent claim 1 below is illustrative of the subject matter on appeal (emphasis added):

1. A semipermeable asymmetric hollow fiber membrane comprising a polyethersulfone and a polyvinylpyrrolidone (PVP), said polyvinylpyrrolidone having a low molecular weight component having a molecular weight of below 100 kD, and a high molecular weight component having a molecular weight of 100 kD or more, *wherein the membrane has a sieving coefficient for myoglobin in aqueous solution of between 86% and 90% and a sieving coefficient for albumin in aqueous solution of 9% or less.*

Appeal Br. 22 (Claims Appendix).

ANALYSIS

Appellants group the claims as follows: claims 1, 4, 5, 7, and 10–13; claims 2 and 14; claims 3 and 14; and claim 6 (Appeal Br. 3). We address these groups below.

Claims 1, 4, 5, 7, and 10–13

Appellants' principle argument on appeal is the combination of Buck and Krause does not disclose or suggest a membrane having the sieving coefficients recited in claim 1 for myoglobin and albumin in an aqueous solution (Appeal Br. 3–9; Reply Br. 2–3). Specifically, Appellants assert Buck discloses sieving coefficients for substances in whole blood, not in aqueous solution, and measurements in whole blood provide different results than those for aqueous solutions, as indicated by Figure 3b of Buck (Appeal Br. 4–8).

Appellants' arguments are unpersuasive. First, the broadest reasonable interpretation of "aqueous solution" in view of Appellants'

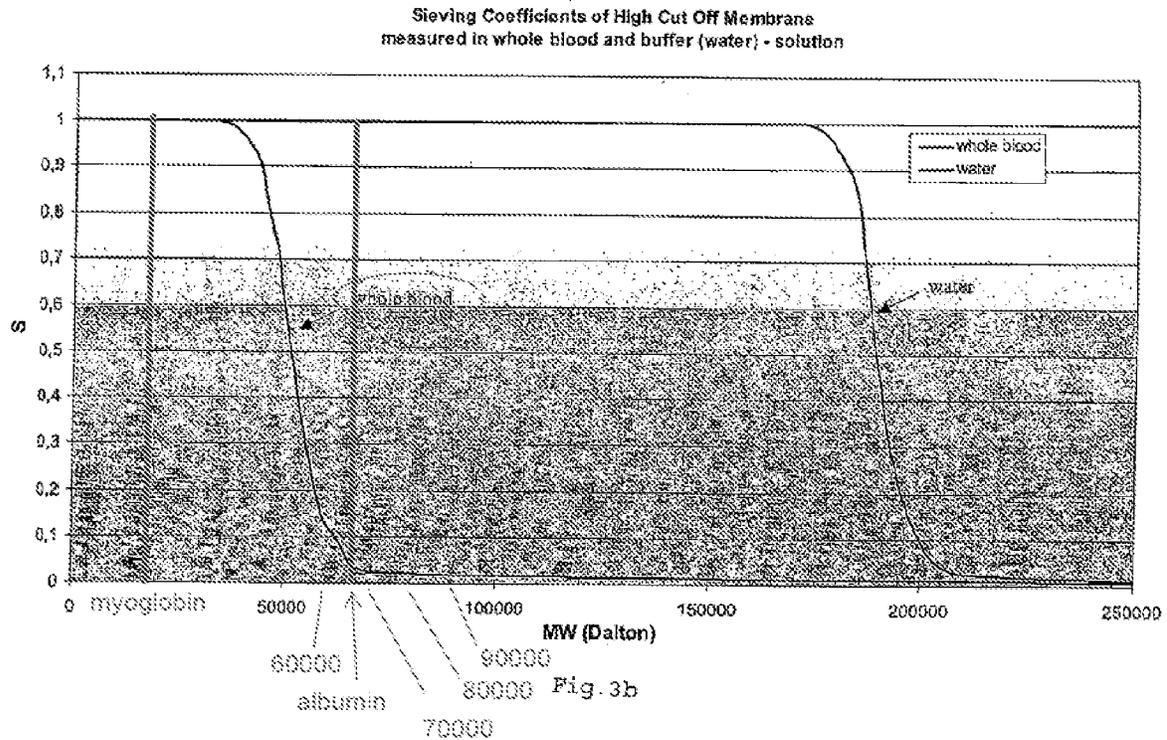
Specification does not exclude blood. Specifically, the Examiner determines that blood contains water and other components and “[t]hus, blood could be an aqueous solution in the broadest reasonable interpretation of the term” (Ans. 4). In response, Appellants assert the Examiner’s interpretation is mistaken because the Specification states sieving coefficients are measured in aqueous solutions, particularly phosphate buffered saline (PBS) (Reply Br. 3–6).

“[T]he PTO must give claims their broadest reasonable construction consistent with the specification. . . . Therefore, we look to the specification to see if it provides a definition for claim terms, but otherwise apply a broad interpretation” (*In re ICON Health & Fitness, Inc.*, 496 F.3d 1374, 1379 (Fed. Cir. 2007)). “[A]s applicants may amend claims to narrow their scope, a broad construction during prosecution creates no unfairness to the applicant or patentee” (*id.*). Furthermore, an applicant “may demonstrate an intent to deviate from the ordinary and accustomed meaning of a claim term by including in the specification expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope” (*In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1365 (Fed. Cir. 2004)).

Here, Appellants cite to passages in the Specification discussing the use of PBS as an aqueous solution. However, Appellants do not direct us to any passages that demonstrate an intent to limit aqueous solutions to PBS or to exclude blood from aqueous solutions. Nor do Appellants dispute that blood contains water, as stated by the Examiner (Ans. 5). Therefore, we agree with the Examiner that the broadest reasonable interpretation of “aqueous solution” encompasses blood, such as whole blood.

We therefore turn to whether Buck’s membrane would possess the

sieving coefficients of claim 1 in which blood is an aqueous solution. To address this, we provide an annotated copy of Buck's Figure 3b:



Annotated copy of Buck's Figure 3b

Appellants disclose that the molecular weight (MW) for myoglobin is 17,053 Dalton and the molecular weight for albumin is 66,248 Dalton (Spec. 6:2-4). In the copy above, Buck's Figure 3b has been annotated to label the marks for 60,000 Da, 70,000 Da, 80,000 Da, and 90,000 Da (due to their low visibility) and to show the approximate locations for myoglobin and albumin on the horizontal axis, which represents molecular weight (MW).⁴ The

⁴ Appellants provide an annotated copy of Buck's Fig. 3b at page 7 of the Appeal Brief. We decline to use that copy because the location for albumin's molecular weight does not appear to be correctly labeled. Specifically, Appellants appear to have labeled the molecular weight for

vertical axis indicates the sieving coefficient (S) in decimal form rather than a percentage for a substance of a particular molecular weight. As shown above, myoglobin would have a sieving coefficient of 1 (i.e., 100%) in whole blood (the curve in the left hand part of Figure 3b) and albumin would have a sieving coefficient of less than 0.09 (i.e., 9%). Therefore, although Buck does not explicitly disclose a sieving coefficient for myoglobin, Figure 3b suggests Buck's membrane would possess the claimed sieving coefficients for myoglobin and albumin in whole blood (e.g., an "aqueous solution" under its broadest reasonable interpretation).

Second, regardless of whether "aqueous solution" encompasses blood, the Examiner explains why it would have been obvious to optimize the pore structure of Buck's membrane and result in a membrane having the sieving coefficients of claim 1. "[D]iscovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art." *In re Boesch*, 617 F.2d 272, 276 (CCPA 1980).

In particular, the Examiner finds pore size is a result-effective variable affecting sieving coefficients, citing the results presented in paragraph 74 of Buck (Final Act. 3–4). We agree that the table included in paragraph 74 of Buck demonstrates that changes in a membrane's pore size affect the sieving coefficient for a substance. For example, when the pore size of a membrane is greatly increased from 10–15 nm and 20–40 nm to greater than 100 nm, the sieving coefficient for albumin (having a relatively high MW of 66,248 Da) greatly increases from 0.002 and 0.011 to 0.146 (Buck ¶ 74). Conversely, when pore size is decreased to 10–15 nm, the sieving

albumin at or near the mark for 60,000 Dalton instead of the approximate location for 66,248 Dalton.

coefficients for β -2-microglobulin and interleukin6 (which have relatively low MWs of 11,800 Da and 26,000 Da, respectively) decrease (*id.*). Moreover, Buck teaches that a proper pore structure optimizes various types of permeability and “sieving properties” (*id.* ¶ 60).

As a result, it would have been obvious to modify Buck’s membrane by determining workable or optimal pore sizes to achieve optimal sieving properties and permeability as a matter of routine experimentation and design within the level of the ordinary skill, thus arriving at an arrangement or configuration within the scope of claim 1. As noted by the Examiner (Ans. 3), such an arrangement provides a structure encompassed by claim 1 and thus would inherently possess the claimed sieving coefficients.

Appellants do not direct us to any evidence or persuasive technical reasoning that Buck’s membrane, as modified in view of its teachings regarding the effect of pore size upon sieving properties, would not possess the claimed sieving coefficients.

In addition, Appellants contend there would have been no motivation to modify Buck to include the PVP mixture disclosed by Krause because the claimed membrane does not require additional components disclosed by Buck and Krause, which would have indicated the proposed modification was not as simple or predictable as the Examiner would think and one of ordinary skill would have had to consider (Appeal Br. 9–11). Appellants further argue the Examiner has improperly used the benefit of hindsight in making the rejection over Buck and Krause (*id.* 11–13).

These arguments are also unpersuasive. The Examiner finds Krause discloses a membrane including polyethersulfone and PVP having a low molecular weight component of less than 100 kD and a high molecular

weight component of 100 kD or more (Final Act. 4). The Examiner concludes it would have been obvious to modify Buck's membrane in view of Krause's teachings because Krause discloses that two component PVP mixtures provide the possibility to tune the hydrophobic/hydrophilic properties of a membrane in a very fine manner and within a wide range (*id.*).

Krause's disclosure at page 4, lines 12–21, and page 6, lines 20–24, supports the Examiner's findings and conclusion. As a result, the Examiner has articulated a rationale with rational underpinnings in the applied references why it would have been obvious to modify Buck in view of Krause. Appellants' arguments regarding additional factors one of ordinary skill in the art would have needed to consider and the possible unpredictability associated therewith are merely that; arguments without evidence or persuasive technical reasoning explaining why the combination would have been too unpredictable or why one of ordinary skill in the art would have lacked a reason to combine or a reasonable expectation of success. For the latter we note that “[o]bviousness does not require absolute predictability of success. . . . all that is required is a reasonable expectation of success” (*In re O'Farrell*, 853 F.2d 894, 903-904 (Fed. Cir. 1988)). Furthermore, to the extent the combination of Buck and Krause would include components not recited in claim 1, the latter uses “comprising” language, which permits the inclusion of additional elements.

In view of the above, Appellants' arguments do not identify a reversible error in the Examiner's rejection of claim 1. Appellants do not argue claims 4, 5, 7, and 10–13 separately from claim 1 (Appeal Br. 3–13).

Claims 2, 3, 6, and 14

As noted above, Appellants argue claims 2 and 14, claims 3 and 14, and claim 6 as separate groups. We address these groups together for purposes of efficiency.

For claims 2, 3, 6, and 14, Appellants reiterate Buck and Krause do not disclose the sieving coefficients recited in claim 1 and further argue the Examiner has not shown where the combination of Buck and Krause does not disclose the recitations of claims 2, 3, 6, and 14, the applied references do not provide a motivation to provide the recitations of those claims, and the Examiner has relied upon impermissible hindsight (*id.* 13–20).

In order to overcome the Examiner’s rejection, Appellants must identify with sufficient particularity what the Examiner did wrong, i.e., identify a reversible error in the Examiner’s rejection. *In re Jung*, 637 F.3d 1356, 1365–66 (Fed. Cir. 2011); *Ex parte Frye*, 94 USPQ2d 1072 (BPAI 2010). Here, the Examiner has set forth findings and conclusions to support a prima facie case of obviousness (Final Act. 4–7). Appellants’ arguments, which are general in nature and lacking in any degree of specificity by merely alleging claim recitations are missing in the applied references and asserting the Examiner has not set forth a proper rationale, do not identify a reversible error in the Examiner’s rejections of claims 2, 3, 6, and 14.

For the reasons discussed above and those set forth in the Examiner’s Answer, we sustain the Examiner’s § 103(a) rejection of claims 1–7 and 10–14.

DECISION

The Examiner’s rejection of claims 1–7 and 10–14 is affirmed.

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED