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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JULIO PIMENTEL and KURT RICHARDSON

Appeal 2019-003516
Application 14/347,626
Technology Center 1600

Before JEFFREY N. FREDMAN, DEBORAH KATZ, and JOHN G. NEW,
Administrative Patent Judges.

FREDMAN, *Administrative Patent Judge.*

DECISION ON APPEAL

This is an appeal^{1,2} under 35 U.S.C. § 134(a) involving claims to an antimicrobial formulation. The Examiner rejected the claims as obvious. We have jurisdiction under 35 U.S.C. § 6(b). We AFFIRM.

¹ Appellant identifies the Real Party in Interest as Anitox Corporation (*see* App. Br. 3).

² We have considered and herein refer to the Specification of Mar. 26, 2014 (“Spec.”); Final Office Action of Jan. 16, 2018 (“Final Act.”); Appeal Brief of Oct. 23, 2018 (“App. Br.”); and the Examiner’s Answer of Jan. 11, 2019 (“Ans.”).

Statement of the Case

Background

“Commercial mold inhibitors and bactericides are composed of single organic or a mixture of organic acids and formaldehyde” (Spec. 7:10–11). Organic acids, including propionic and acetic acid “have been major additive[s] to reduce the incidence of food borne infections” (Spec. 7:11–12). “Several US patents disclose the use of pelargonic acids as fungicides and bactericides” (Spec. 8:10). “New antimicrobials have been found in many plants. . . . These antimicrobials, which are components of the plant essential oils, can be acidic, alcohol or aldehyde-based compounds” (Spec. 1:27–29). For example, trans-2-hexenal has shown biocidal activity in various formulations (*see* Spec. 2:1–5:31). The Specification discloses “[t]he prior art has not suggested or observed that the use of aldehydes in combination with organic acids improved the antimicrobial activity of either of the components by themselves” (Spec. 7:8–9).

“The present invention relates only to the use of some of the aldehydes extracted from plants or chemically synthesized that synergistically improve the antimicrobial capacity of these compounds by the addition of organic acids especially nonanoic [pelargonic] acid” (Spec. 9:10–12).

The Claims

Claims 1, 7, 8, and 15 are on appeal. Independent claim 1 is representative and reads as follows:

1. An antimicrobial composition for extending the shelf-life of water, feed or feed ingredients, comprising:

water,

5–15 wt. % of pelargonic acid,

10–20 wt. % of acetic acid,

40–50 wt. % of propionic acid, and

5–30 wt. % of a C₁–C₂₄ aldehyde selected from the group consisting of trans-2-hexenal, citral, furfural, cinnamaldehyde, undecylenic aldehyde, butyraldehyde, 2,4 decadienal, and decanal.

The Rejections

- A. The Examiner rejected claim 1 under 35 U.S.C. § 103(a) as unpatentable over Schür³ (Final Act. 2–3).
- B. The Examiner rejected claims 7, 8, and 15 under 35 U.S.C. § 103(a) as being unpatentable over Schür and Koenraad⁴ (Final Act. 3–5).

A and B. Obviousness

Because both of the obviousness rejections share similar issues as to the teachings of Schür, we discuss the rejections together.

The Examiner finds “Schür teaches an antimicrobial disinfection composition comprising GRAS [Generally recognized as safe] flavor alcohol, GRAS flavor acids including pel[a]rgonic acid, acetic acid, and C2–C10 acid (prop[.]ionic acid is a C3 acid), polyphenol compounds, [and] aldehydes,” such as 2-hexenal and cinnamaldehyde (Final Act. 2). The Examiner finds “Schür further teaches the GRAS acid content to be 0–70%”

³ Schür, US 7,638,114 B1, issued Dec. 29, 2009.

⁴ Koenraad et al., WO 01/32020 A2, published May 10, 2001.

(Ans. 3). The Examiner finds “Schür teaches the amount of optional ingredients as 25% or less” (Final Act. 3).

The Examiner acknowledges that “Schür does not expressly teach the herein claimed amount of the herein claimed ingredients” (Final Act. 3).

However, the Examiner finds:

The total amount of the instant claimed acids is from 55–85%. Therefore, the herein claimed amount of acids is overlapped with that taught in the cited prior art. Since they are overlapped in range, the skilled artisan would have been motivated to optimize the amount of the acids as claimed, absent evidence to the contrary.

(Ans. 3).

The Examiner further acknowledges that “Schür does not expressly teach the antimicrobial composition to be used in feed and drinking water. Schür does not expressly teach the weight ratio [of] the antimicrobial composition to the feed” (Final Act. 4). The Examiner finds “Koenraad teaches pelargonic acid [and] acetic acid can be used to adjust pH as well as discloses pelargonic acid as antimicrobial for use in food, such as dairy products and fruit juices” (*id.*). The Examiner finds “[t]aking the fact that the carboxylic acids taught in Schür [are] well-known in use for food product[s] according to Koenraad, employing the antimicrobial composition of Schür in food would be reasonably expected to be effective as antimicrobial and preservatives” (*id.* at 4–5).

The issues with respect to these rejections are:

(i) Does a preponderance of evidence of record support the Examiner’s conclusion that the prior art renders the claims obvious?

(ii) If so, has Appellant presented evidence of secondary considerations, that when weighed with the evidence of obviousness, is sufficient to support a conclusion of non-obviousness?

Findings of Fact (“FF”)

1. Schür teaches antimicrobial compositions that contain suitable amounts of from 0.1 to 99% by weight generally recognized as safe in food (“GRAS”) flavor alcohol (component a1) and “from 0 to 70% by weight, preferably from 0.01 to 30% by weight,” of one or more GRAS flavor acids (component b2), among other components (Schür 3:63–4:34).
2. Schür teaches GRAS acids may include pelargonic (nonanoic acid) and “organic acids containing from 2 to 10 carbon atoms,” specifically acetic acid (Schür 3:43; 4:16–22).
3. Schür teaches “[t]he antimicrobial composition may further contain the following components (c) to (h), which are also flavoring agents recognized . . . [as] GRAS” (Schür 4:45–49).
4. Schür teaches the composition may include aldehydes (component (g)), such as, citral, n-decanal, 2-hexenal, and cinnamic aldehyde (Schür 5:11–21).
5. Schür teaches “[t]he proportion of components (c) to (h) in the antimicrobial composition is preferably smaller or equal to 25% by weight” (Schür 5:43–45).
6. Koenraad teaches “it is possible to use nonanoic acid in a mixture with one or more antimicrobial agents which are known per se and are compatible with nonanoic acid, a synergistic effect possibly being able to be obtained” (Koenraad 9:2–4).

7. Koenraad teaches “examples of antimicrobial agents that can be used according to the invention in combination with nonanoic acid are . . . propionic acid and salts thereof” (Koenraad 9:9–12).

8. Koenraad teaches “[t]he nonanoic acid can furthermore be used in combination with agents for adjusting the acidity, including the acids acceptable for foods, such as citric acid, acetic acid and the like” (Koenraad 9:15–17).

Principles of Law

“The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398,416 (2007).

Analysis

We adopt the Examiner’s findings of fact and conclusion of law (Final Act. 2–5 and Ans. 3–4; FFs 1–8) and agree that Schür and the combination of Schür and Koenraad render the claims obvious. We address Appellant’s arguments below.

Prima facie obviousness

Appellant contends the Examiner’s “reliance on the principle of overlapping or close ranges is improper and, as a result, [the Examiner] did not articulate a well-reasoned case of *prima facie* obviousness” (App. Br. 8). Particularly, Appellant contends the Examiner “is relying upon Schür’s ranges of a GRAS flavor alcohol of 0.01–99 wt%, a GRAS flavor acid of 0.01–30 wt%, and an aldehyde of 25 wt% or less as the overlapping ranges for establishing a *prima facie* case of obviousness” (*id.*).

We find this argument unpersuasive. Schür teaches an antimicrobial composition containing 0 to 70 wt.% GRAS flavor acid, with a preferred range of 0 to 30 wt.% (FF 1). Schür teaches the GRAS flavor acid may include a combination of pelargonic acid, and C₂ to C₁₀ organic acids (FF 2). Therefore, Schür teaches an antimicrobial composition containing a range of organic acids including pelargonic acid, acetic acid, and propionic acid that overlap with the claimed ranges. Accordingly, we are not persuaded that the Examiner erred in finding the claimed components in the prior art in ranges that overlap those recited in the claims on appeal.

Appellant contends “a *prima facie* case of obviousness cannot be fairly based on the principle of overlapping ranges and optimization of result-effective variables” (App. Br. 9). Appellant argues “the typical desire for scientists to optimize occurs within narrow disclosed ranges, not expansive ranges such as disclosed by Schür” (*id.*, citing *Genetics Institute, LLC v. Novartis Vaccines & Diagnostics, Inc.*, 655 F.3d 1291, 1306 (Fed. Cir. 2011)). Appellant argues “that the alleged overlapping ranges disclosed by Schür (i.e., 0.01–99.9% and 0–70%) are so broad large [sic] that they cannot, as a matter of law, support a case of *prima facie* obviousness for the ranges set forth in claim 1, especially in view of the more specific and relevant teachings of Schür” (App. Br. 9–10).

We do not find this argument persuasive. As a general rule: “[i]n cases involving overlapping ranges, we and our predecessor court have consistently held that even a slight overlap in range establishes a *prima facie* case of obviousness.” *In re Peterson*, 315 F.3d 1325, 1329 (Fed. Cir. 2003).

First, we find the facts of *Genetics Institute* to be distinguishable from the claims at issue. In *Genetics Institute*, our reviewing court found that:

[The] inventors did not simply “[s]elect[] a narrow range from within a somewhat broader range,” as did the *Peterson* inventors when selecting the range of “about 1–3%” rhenium from the prior art range of “0–7%” rhenium. *Peterson*, 315 F.3d at 1329–30. As noted, the ’112 patent contains 68,000 truncated variants of a protein made up of 2,332 amino acids, and the allegedly interfering inventions differ in terms of the size of the permitted amino acid deletions, the location of those deletions, and the degree of allowable amino acid substitutions. The facts here present a case where the “disclosed range is so broad as to encompass a very large number of possible distinct compositions” thus “requir[ing] nonobvious invention,” not a case, as in *Peterson*, where prior art “ranges that are not especially broad invite routine experimentation to discover optimum values.” *Id.* at 1330 n. 1.

655 F.3d at 1306. As applied to the present claims, the prior art does not disclose a multitude of protein variants made up of a multitude of amino acids. Rather, the prior art discloses an antimicrobial composition with a range of known components that reasonably invites experimentation to discover optimum values of those components.

Second, applying *Peterson*, we find that the ranges of the prior art are not unduly broad, particularly as compared to the claimed ranges. *See In re Harris*, 409 F.3d 1339, 1342–43 (Fed. Cir. 2005) (“*Harris* points to *Peterson* to advance his position that Yoshinari’s ranges are too broad to teach any specific alloy to the skilled artisan. . . . A review of *Peterson* informs the court that this case does not present such a problem”). The claimed range of 45 to 85 wt.% organic acids (pelargonic, acetic, and propionic acid) overlaps the prior art range of 0 to 70 wt.% GRAS flavor acids, including pelargonic, acetic, and propionic acid. *See Harris*, 409 F.3d at 1341 (“Even without complete overlap of the claimed range and the prior art range, a minor difference shows a *prima facie* case of obviousness”) (emphasis added).

Additionally, there is substantial overlap of the claimed range of aldehyde of 5 to 30 wt.% with the prior art range of aldehyde, i.e., 0 to 25 wt.% (FF 5). Moreover, *Peterson's* claimed ranges were narrower than those presently claimed. *See* 409 F.3d at 1343. Because the claims at issue recite broader ranges than the claims in *Peterson* and the claimed ranges substantially overlap with the ranges disclosed in the prior art, we are not persuaded that the Examiner erred. Nor has Appellant demonstrated any criticality in the non-overlapping portions of the range.

Appellant contends “[c]laim 1 contains no limitation regarding a GRAS flavor alcohol but the presence of a GRAS flavor alcohol in the Schür composition must be addressed because it is required to be present in a large amount (i.e., at least 75%) to achieve the desired antimicrobial effect” (App. Br. 10). Appellant contends:

Despite this broad range and Schür’s teachings that the GRAS alcohol content is at least 75 wt% of the composition and preferably at least 90 wt%, a determination of obviousness requires a POSITA to, for some unexplained reason, disregard Schür’s teachings and select a very low amount of GRAS flavor alcohol in order to maximize other possible constituents such a GRAS flavor acid in order to allegedly render obvious the composition of claim 1.

App. Br. 10–11. Appellant argues further that Schür’s claims and examples require the presence of particular components, e.g., propylene glycol, benzyl alcohol, tannic acid, and optionally aldehydes (*see* App. Br. 11–12).

We find Appellant’s argument unpersuasive. We begin with Appellant’s contention as to scope of claim 1. Claim 1 recites the open-ended transitional phrase “comprising,” and thereby permits the inclusion of other materials, e.g., GRAS flavor alcohols. *See In re Baxter*, 656 F.2d 679,

686 (CCPA 1981). Because, the claims allow for additional components, we next consider Appellant's argument as to the amount of these additional components.

Appellant focuses on Schür's preferred and claimed embodiments. "But in a section 103 inquiry, the fact that a specific embodiment is taught to be preferred is not controlling, since all disclosures of the prior art, including unpreferred embodiments, must be considered." *Merck & Co. Inc. v. Biocraft Labs., Inc.*, 874 F.2d 804, 807 (Fed. Cir. 1989) (internal citations omitted). Moreover, the "use of patents as references is not limited to what the patentees describe as their own inventions or to the problems with which they are concerned. They are part of the literature of the art, relevant for all they contain." *In re Heck*, 699 F.2d 1331, 1333 (Fed. Cir. 1983). Schür teaches antimicrobial compositions containing several components, including 0 to 70 wt.% GRAS flavor acids and 0 to 25 wt.% aldehydes (FFs 1, 5). Appellant has not identified any teaching in Schür that would discourage one of ordinary skill in the art from making that combination or criticizes or discredits the combination. *See In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994) ("A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant"). Therefore, we agree with the Examiner that Schür would have provided the ordinary artisan reason to form compositions containing organic acids and aldehydes as claimed.

Appellant contends "[t]here is no evidence that a POSITA would have selected the particular acids . . . or one of the recited C₁-C₂₄ aldehydes . . .

Schür provided no teachings that would lead a POSITA to select the constituents of claim 1 from the lists of possible GRAS acids and aldehydes” (App. Br. 12). Appellant contends that the Examiner “failed to articulate any *guidance* from Schür that would lead to the selections of acids and aldehydes of claim 1” (App. Br. 13). Appellant argues that in view of the lack of guidance there is no reasonable articulation of obviousness (*id.*).

We not find Appellant’s argument persuasive. The disclosure of “a multitude of effective combinations does not render any particular formulation less obvious. This is especially true because the claimed composition is used for the identical purpose taught by the prior art.” *Merck*, 874 F.2d at 807. “[P]icking and choosing may be entirely proper in the making of a 103, obviousness rejection.” *In re Arkley*, 455 F.2d 586, 587 (CCPA 1972). As admitted by Appellant’s Specification and taught by Schür and Koenraad, the claimed components were previously known for their antimicrobial activity in food compositions. Therefore, it would have been *prima facie* obvious to pick and choose from those known components to form an antimicrobial formulation according to Schür.

Before addressing Appellant’s evidence of unexpected results, we consider the rejection of claims 7, 8, and 15 as obvious over Schür in view of Koenraad. Appellant does not raise any argument against the Examiner’s rejection other than “claim 7 is nonobvious over Schür in view of Koenraad for the same reasons set forth above regarding claim 1” (App. Br. 17). Accordingly, for the reasons set forth above, we are not persuaded that the Examiner erred in determining that claims 1, 7, 8, and 15 would have been *prima facie* obvious over the prior art.

Secondary considerations

Appellant contends “[t]he composition of claim 1 is nonobvious because the combination of recited constituents and ranges yield an unexpectedly good antimicrobial composition for treating water, feed, and feed ingredients” (App. Br. 14 (emphasis omitted)). Appellant lists several examples which allegedly “demonstrate a synergy between hexenal and other claimed aldehydes in the presence of pelargonic acid, acetic acid and propionic acid” (App. Br. 16). Appellant contends “[a]t the very least, it has been found that the combination of hexenal and each of the aldehydes can provide antimicrobial activity that is better than that would be expected based on the antimicrobial activity of each of the components in isolation” (*id.*).

We do not find Appellant’s evidence persuasive. Unexpected results must be “commensurate in scope with the degree of protection sought by the claimed subject matter.” *In re Harris*, 409 F.3d 1339, 1344 (Fed. Cir. 2005). Appellant’s independent claims recite a Markush group for the aldehyde component of the composition (*see* Claims 1 and 7). “[W]ithout expressly indicating the selection of multiple members of a Markush grouping, a patentee does not claim anything other than the plain reading of the closed claim language.” *Abbott Labs. v. Baxter Pharm. Prod., Inc.*, 334 F.3d 1274, 1281 (Fed. Cir. 2003). Appellant’s claims do not have qualifying language such as “and mixtures thereof” or “at least one member of the group.” *See id.* Because the claims do not clearly embrace more than one member of the Markush group, only one aldehyde falls within the claim scope. *Id.* The Examiner applied this interpretation to the claims (Ans. 4), and Appellant did not offer a contrary interpretation. Thus, the claims as reasonably

interpreted do not encompass the use of combinations of multiple aldehydes that are present in the test compositions asserted to show unexpected results. *See* 37 C.F.R. § 41.37(c)(iv) (“[A]ny arguments or authorities not included in the appeal brief will be refused consideration by the Board for purposes of the present appeal”).

Even if Appellant’s pending claims encompass combinations of aldehydes, *arguendo*, the unexpected results would not be commensurate with the scope of the claims at issue. “Commensurate in scope” means that the evidence provides a reasonable basis for concluding that the untested embodiments encompassed by the claims would behave in the same manner as the tested embodiment(s). *See In re Lindner*, 457 F.2d 506, 508, 173 USPQ 356, 358 (CCPA 1972) (“Here, only one mixture of ingredients was tested. . . . The claims, however, are much broader in scope, . . . and we have to agree with the Patent Office that there is no ‘adequate basis for reasonably concluding that the great number and variety of compositions included by the claims would behave in the same manner as the [single] tested composition.’”) (bracketed material in original). The results in the Specification are limited to a few combinations of aldehydes in specific amounts and concentrations, several of which have no antimicrobial activity. The results do not provide a reasonable basis for concluding that any combination of the claimed aldehydes within the claimed range would behave in the same manner as the tested embodiments.

Conclusion of Law

A preponderance of the evidence of record supports the Examiner’s conclusion that the prior art renders the claims obvious. Appellant has not presented evidence of secondary considerations, that when weighed with the

Appeal 2019-003516
Application 14/347,626

evidence of obviousness, is sufficient to support a conclusion of non-obviousness.

CONCLUSION

In summary:

Claim(s) Rejected	Basis	Affirmed	Reversed
1	§ 103 Schür	1	
7, 8, 15	§ 103 Schür, Koenraad	7, 8, 15	
Overall Outcome		1, 7, 8, 15	

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