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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte IAN T. DELL ¹

Appeal 2017-002921
Application 12/677,714
Technology Center 1600

Before FRANCISCO C. PRATS, ULRIKE W. JENKS, and JOHN G. NEW,
Administrative Patent Judges.

JENKS, *Administrative Patent Judge.*

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant appeals from Examiner's decision to reject claims directed to an insect repellent. Examiner rejects the claims as obvious and as being indefinite. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

¹ According to Appellant, the Real Party in Interest is Ian T. Dell. Appeal Br. 2.

STATEMENT OF THE CASE

Claims 1, 2, and 32–38 are on appeal, and can be found in the Claims Appendix of the Appeal Brief. Claim 1, the sole independent claim, is representative of the claims on appeal, and reads as follows:

1. A moderately viscous liquid suitable for being used as an insect repellent, said liquid comprising from 5 to 12 %w/w of PMD-citronellal acetal[[];], from 7 to 14 %w/w isopulegol and the remainder being p-menthane-3,8-diol, which approximates to a ternary eutectic and is liquid at ambient temperatures.

Appeal Br. 11 (Claims Appendix)(bracketing in original).

Examiner rejects the claims as follows:

I. Claim 1 under 35 U.S.C. § 112(b) or pre-AIA § 112, second paragraph as being indefinite. Non-Final Act.² 4.

II. Claims 1, 2, and 32–38 under 35 U.S.C. § 103(a) as unpatentable over Lett³ in view of Molyneux.⁴ *Id.* at 5–6.

I. Indefiniteness

Examiner’s position is that the word “approximates” as used in the claim when referencing a ternary eutectic is unclear because one of ordinary skill would not know whether this encompasses a formulation with two, four, six or more ingredients. Ans. 2.

Appellant contends that “[a] person of skill in the art, in light of the application disclosure and the teachings of the prior art, also knows that the phrase ‘approximates a ternary eutectic’ covers formulations with three

² Non-Final Office Action mailed July 15, 2015 (“Non-Final Act.”).

³ Lett et al., US 5,298,250, issued Mar. 29, 1994 (“Lett”).

⁴ Molyneux, US 6,337,071 B1, issued Jan. 8, 2002.

components that melt at approximately one temperature (i.e., the eutectic temperature).” Appeal Br. 4.

On this record, we find that Appellant has the better position because Examiner’s rejection appears to be taking the term “approximate” out of context. Terms such as “approach each other,” “close to,” “substantially equal,” and “closely approximate” are “ubiquitous in patent claims. Such usages, when serving reasonably to describe the claimed subject matter to those of skill in the field of the invention, and to distinguish the claimed subject matter from the prior art, have been accepted in patent examination and upheld by the courts.” *Andrew Corp. v. Gabriel Electronics, Inc.*, 847 F.2d 819, 821(Fed. Cir. 1988). When a word of degree is used it is reasonable for the court to “determine whether the patent’s specification provides some standard for measuring that degree.” *Seattle Box Co. v. Indus. Crating & Packaging, Inc.*, 731 F.2d 818, 826 (Fed. Cir. 1984). The same analysis applies to a determination of patentability by an Examiner.

Here, the claim recites a composition “which approximates to a ternary eutectic and is liquid at ambient temperatures.” Appeal Br. 11 (Claims Appendix)(emphasis added).

According to the Specification,

para-menthane-3,8-diol is a crystalline material at room temperature which separates as long needle crystals in other methods of synthesis, the method of this invention results in a product which is a viscous liquid. It is believed that the presence of isopulegone and the acetal condensate of citronella) with *para*-menthane-3,8-diol approximates to a ternary eutectic.

Spec. 14.

Although the term “approximate” by itself may be a word of degree, the term in the context of the claim is not used in isolation because the claim

further explains that the mixture “is liquid at ambient temperatures.” We agree with Appellant that one of ordinary skill in the art at the time of the invention would understand that a eutectic mixture is one in which the components when combined lowers the melting point of at least one of the components. Here, the Specification provides that it was observed that the combination of *para*-menthane-3,8-diol with isopulegole and an acetal prevents the crystal formation of *para*-menthane-3,8-diol at room temperature. *See* Spec. 14. The limitation “approximates to a ternary eutectic” in the context of the claim describes the theory of why the composition remains liquid at room temperature. The claim specifically recites that the composition remains liquid at ambient temperatures. Even if one of skill in the art would not know what “approximate” entails as suggested by Examiner, the claim limitation that the composition remains a liquid as opposed to forming crystals at the particular temperature provides a standard for ascertaining the limitation of the claims description of “approximates to a ternary eutectic.”

The evidence of record does not support the Examiner’s conclusion that the claim is indefinite. Accordingly, we reverse this rejection.

II. Obviousness Lett and Molyneux

Examiner finds that Lett is directed to insect repellent formulations that contain *p*-menthane-3,8-diol and a synergist such as PMD-citronellal acetate. Non-Final Act. 5. Examiner finds that this combination in Lett forms a base that is then formulated into insect repellent products. *Id.* at 6. Examiner acknowledges that “Lett fails to teach the composition as comprising isopulegol.” *Id.* Examiner relies on the teaching of Molyneux to

include 9–15% by weight isopulegol into an insect repellent composition.
See id.

The issue is: Does the preponderance of evidence of record support Examiner’s conclusion that based on the teachings of Lett and Molyneux one of ordinary skill in the art at the time the invention was made would have formulated a composition containing PMD-citronellal acetal, isopulegol, and p-menthane-3,8-diol as claimed?

Findings of Fact

- FF1. Lett teaches that p-menthane-3,8-diols are naturally occurring compounds that are known to exert a repellent effect on mosquitos. Lett 1:44–46, *see id.* at 2:11–16. Lett teaches subjecting citronellal to acid catalysed cyclization in order to form p-menthane-3,8,-diols and acetals. *See* Lett 9:30–55. Lett teaches that “[t]he products of such a reaction will include the [p-menthane-3,8-] diols and acetals of formulae C and D [(PMD-citronellal acetal)] . . . to give a synergized insect repellent composition that can then be used as a base to form a variety of insect repellent products.” *Id.* at 6:26–33. Lett teaches p-menthane-3,8-diols and acetals in a weight ratio of 99:1 to 1:99, with a preferred range is 38:1 to 1:19, most preferably 3.5:1 to 1.3:1. *Id.* at 6:44–50.
- FF2. Lett teaches that the base active made according to its described method “[w]ould typically contain $65 \pm 8\%$ w/w of cis and trans p-menthane-3,8-diols in a weight ratio of about 1.4:1-1.6:1 and about $30 \pm 10\%$ w/w acetals C and D.” *Id.* at 10:34–35.
- FF3. Molyneux teaches an oil extract of *Leptospermum liversidgei* which can be used as a mosquito repellent. Molyneux, Abstract. Molyneux

teaches that mosquitoes are attracted by heat and carbon dioxide, and that certain essential oils are able to block the carbon dioxide message in a mosquito. *Id.* at 1:14–20. Molyneux teaches plant extracts having “citronellal and/or analogue content which falls substantially within the range of at least 55–95% of total extractable volatile oil.” Molyneux 1:59–62. “The oil which is most suitable . . . is citronellal however the citronellal analogues isopulegol and pulegol are also effective.” *Id.* at 1:55–57. Molyneux teaches that the oil extract may be formulated into creams or lotions. *Id.* at 2:31–36.

FF4. Molyneux teaches that the oil extract will contain “citronellal, isopulegol and pulegol which fall substantially within the ranges of 59–68%, 9–14% and 0–5% respectively.” *Id.* at 2:1–3. “It is preferred that the extracted oil will contain 55–95% citronella1 and/or the citronellal analogues isopulegol and pulegol. It is more preferred that the oil will comprise at lease [sic] 70% citronella1 and/or analogues.” *Id.* at 2:10–14.

Principle of Law

“[E]xaminer bears the initial burden, on review of the prior art or on any other ground, of presenting a *prima facie* case of unpatentability.” *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

Analysis

Examiner acknowledges that “Lett fails to teach the inclusion of isopulegol,” but finds that this is corrected by the teachings of Molyneux. Ans. 9; *see* FF1–FF4. Specifically, Examiner relies on the teaching in Molyneux to provide isopulegol in the range of 9–15%. *See* Ans. 9; FF4. Examiner, in the Answer, concludes that it “is *prima facie* obvious to

combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.” Ans. 9 (citing MPEP 2144.06 (I)). This rationale differs from Examiner’s rationale presented in the Non-Final Office Action. Specifically, in the Non-Final Action Examiner concluded that one having ordinary skill in the art would have been “motivated to modify Lett so that it further comprised between 9-15% by weight of isopulegol so as to broaden the repellent activity of the final composition.” Non-Final Act. 6.

[O]ne of ordinary skill could have worked within the framework of Lett and identified useful ratios of p-me[n]thane-3,8-diol and the PMD for repelling insects. If it were found that a composition comprised between 5-12% by weight PMD-citronellal acetate, 7-14% by weight isopulegol and the remainder being p-me[n]thane-3,8-diol effectively repelled insects such as mosquitoes, such a composition would have been the product of ordinary skill and common sense.

Id. at 7.

First, Appellant contends that the combination of references does not teach the claimed range of p-menthane-3,8-diol (about 74 to 88 % w/w). Appeal Br. 8 (footnote 23); *see id.* at 11 (claim 2). Second, Appellant contends that even if one were to follow Examiner’s rationale as presented in the Answer, simply mixing the composition of Lett and Molyneux one would still not arrive at the claimed invention. Reply Br. 3. Third, Appellant submits that it was unexpectedly discovered that by combining para-menthane-3,8-diol with of isopulegole and the acetal condensate of citronellal the para-menthane-3,8-diol would not form crystals at room temperature. Appeal Br. 9.

We find that Appellant has the better position. A rejection for obviousness must include “articulated reasoning with some rational underpinning to support the legal conclusion.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007), quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). In formulating the rejection based on the combined references, Examiner is relying on the insect repellent effect taught in both Lett and Molyneux in arriving at the conclusion that is obvious to combine the teachings of these references. We do not disagree with Examiner’s assessment that both references teach insect repellents. We note, however, that Molyneux teaches an oil extract that in addition to citronellal also contains the citronellal analogues isopulegol and pulegol and explains that all three components have insect repelling activity. FF3. Even equipped with the knowledge that isopulegol by itself has insect repelling activity, it is not clear why one of ordinary skill would choose the citronellal analog isopulegol to include in Lett’s active base.

The rationale given by the Examiner is that it is obvious to broaden the repellent activity of the final composition of Lett. *See* Non-Final Act. 6. The Examiner, however, has not explained why one of ordinary skill would select only isopulegol to include in Lett’s base composition in order to broaden the repellent activity when Lett’s base composition also does not contain pulegol or citronellal. In order to arrive at the base active (FF2) Lett teaches removing the known insect repellent component, citronellal, from the base composition. Specifically, Lett teaches that “[a]t the completion of the reaction, the mixture contains about 15–20% low boiling materials, including citronellal about 50–60% p-menthane-3,8-diols and about 20% acetals.” Lett 9:40–43. Lett, then goes on to teach that in order to obtain the

base composition citronellal is removed from the p-menthane-3,8-diols and acetal containing fraction. *See id.* at 9:44–55. Here, Lett specifically removes low boiling martials, such as citronellal a known insect repellent, in order to form the base composition that contains $65 \pm 8\%$ w/w of cis and trans p-menthane-3,8-diols. Because Lett specifically removes a known insect repellent in order to form the base composition, it is not clear why one of ordinary skill in the art at the time the invention was made would then include an analogue of that repellent into the base composition.

Appellant contends that Lett’s base compositions is not taught to be suitable for application to the skin and “Lett’s compositions that are ‘suitable for application to human skin’ (i.e., liquid insect repellent) include from 17.1 to 21.9 %w/w of p-menthane-3,8-diols. These insect repellent compositions have low concentrations of p-menthane-3,8-diol that fall well below the 60% threshold for crystallization described in the instant application.” Appeal Br. 7. We agree with Appellant’s contention that the Examiner has not articulated a sufficient reason why one of ordinary skill in the art would have chosen to add the isopulegol into the Lett’s base composition (FF2) rather than adding the component into the formulated lotion or aerosol insect repellants as taught by Lett in order to broaden the insect repellent activity. *See* Appeal Br. 6–7.

In the Answer, the Examiner presents a new alternative approach to reach the conclusion of obviousness. *See* Ans. 9 (citing MPEP 2144.06(I)). In this approach the Examiner relies on *Kerkhoven* to conclude that:

It [would have been] prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition which is to be used for the very same purpose. . . . [T]he idea of

combining them flows

logically from their having been individually taught in the prior art.

In re Kerkhoven, 626 F.2d 846, 850 (CCPA 1980). Appellant contends that this approach is also flawed because when combining the two compositions to arrive at a third composition one would not necessarily arrive at a mixture that contains the requisite concentration of p-menthane-3,8-diol. *See* Reply Br. 3–4. We agree with Appellant that even if one of ordinary skill in the art would be motivated to arrive at a third composition that can be used for the same purpose, in this case function as an insect repellent, one would not necessarily arrive at the composition as claimed. *See* Reply Br. 4 (table 1). Examiner has not explained why one of skill in the art at the time the invention was made would maintain only the p-menthane-3,8-diol concentration and change the acetal concentration in Lett’s base active in order to accommodate the additional repellent actives taught in Molyneux’s oil extract.

Because the Examiner has not presented a prima facie case of obviousness we do not need to address Appellant’s unexpected result argument.

As the Examiner has failed to adequately articulate any other rationale explaining how the combination of Lett and Molyneux discloses an insect repellent containing at least 74% p-menthane-3,8-diol in conjunction with PMD-citronellal acetal and isopulegol, we are constrained to reverse each rejection that relies on Lett and Molyneux.

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SUMMARY

We reverse the indefiniteness rejection of claim 1.

We reverse the rejection of claims 1, 2, and 32–38 under 35 U.S.C.
§ 103(a) over Lett in view of Molyneux.

REVERSED