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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ANDREW D. MALEC,
TIMOTHY M. FIGLEY, and KRISTA L. TURPIN

Appeal 2019-006038
Application 12/456,567
Technology Center 1600

BEFORE DONALD E. ADAMS, ULRIKE W. JENKS, and TAWEN CHANG, *Administrative Patent Judges*.

ADAMS, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from Examiner's decision to reject claims 1–16, 18–24, 26, 27, 29, and 31 (Final Act.[2] 2).[3] We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

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[1] We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies "Stepan Company" as the real party in interest (Appellant's February 14, 2019 Appeal Brief (Appeal Br.) 1).
[2] Examiner's August 21, 2018 Final Office Action.
[3] Appellant's claims 32–42, 44–50, 52, 53, and 55 stand withdrawn from consideration (Final Act. 2).

STATEMENT OF THE CASE

This is the second Appeal of Appellant's claimed subject matter, which "relates to a storage stable, aqueous, herbicidal formulation containing an ultra-high concentration of glyphosate salt in combination with a surfactant system" (Spec.[4] ¶ 2; *see also* Appeal Br. 12–13).

In the first Appeal, 2013-005196, the Board affirmed obviousness rejections over Pallas[5] alone or in combination with Parker.[6] Our reviewing court subsequently "vacate[d] the Board's [2013-005196] decision holding [Appellant's] claims 1–31 . . . obvious and remand[ed] for further proceedings consistent with [its] opinion." *In re Stepan Company*, 868 F.3d 1342, 1348 (Fed. Cir. 2017). The Board subsequently remanded the Application to "Examiner for further fact finding, analysis, and consideration consistent with the court's holding in *Stephan*" (Remand[7] 2).

On remand, Examiner reopened prosecution to enter a rejection under 35 U.S.C. § 103(a) over Becher[8] (*see* Non-Final Act.[9] 2–7). Upon further prosecution, Appellant amended its claims. Examiner maintained the rejection over Becher, and Appellant appealed, bringing this second Appeal to this Board.

[4] Appellant's June 17, 2009 Specification.
[5] Pallas et al., US 2003/0087764 A1, published May 8, 2003.
[6] Parker et al., US 5,843,866, issued Dec. 1, 1998.
[7] Decision on Remand, entered November 21, 2017.
[8] Becher et al., US 2006/0019828 A1, published Jan. 26, 2006.
[9] Examiner's January 12, 2018 Non-Final Office Action.

Appellant's only independent claim, claim 1, is reproduced below:

1. An ultra-high load, aqueous glyphosate salt-containing concentrate comprising:

(a) water;

(b) glyphosate salt in solution in the water in an amount greater than about 39 weight percent of acid equivalent, based on the weight of the concentrate, said glyphosate salt being selected from the group consisting of the isopropylamine salt of glyphosate, the potassium salt of glyphosate, mixtures of the isopropylamine salt and the potassium salt of glyphosate and mixtures of the potassium salt and the ammonium salt of glyphosate;

(c) a surfactant system in an amount ranging from about 1 to about 20 weight percent, based on the weight of the concentrate, comprising:

(i) from about 10 to about 60 weight percent, based on the weight of the surfactant system, of one or more dialkoxylated alkylamines having the formula

$$R^1\text{-}N(R^2)(R^3)$$

wherein R^1 is a C_8-C_{24} straight or branched chain, saturated or unsaturated hydrocarbyl group, R^2 is an $(AO)_nH$ group and R^3 is an $(AO)_{n'}H$ group wherein A represents an alkylene group and n and n' are integers such that n+n' has an average value of from 2 to 20;

(ii) from about 5 to about 30 weight percent, based on the weight of the surfactant system, of one or more water miscible solubilizers selected from the group consisting of monohydric alcohols, dihydric alcohols, polyhydric alcohols, alkylene glycols and polyalkylene glycols; and

> (iii) from about 30 to about 75 weight percent, based on the weight of the surfactant system, of one or more amine oxides having the formula
>
> $$R^4R^5R^6N\rightarrow O$$
>
> wherein R^4 is a C_8-C_{24} straight or branched chain, saturated or unsaturated hydrocarbyl group or $R^7CONH(CH_2)_n$, wherein R^7 is a C_8-C_{24} straight or branched chain, saturated or unsaturated hydrocarbyl group and n is from 1 to 3; R^5 and R^6 are independently C_1-C_3 hydrocarbyl groups or substituted C_1-C_3 hydrocarbyl groups;
>
> said concentrate having a cloud point above at least 70°C. or no cloud point when the concentrate is heated to its boiling point.

(Appeal Br. 12–13.)

Claims 1–16, 18–24, 26, 27, 29, and 31 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Becher.

ISSUE

Does the preponderance of evidence relied upon by Examiner support a conclusion of obviousness?

FACTUAL FINDINGS (FF)

FF 1. Becher discloses, *inter alia*,

> an aqueous herbicidal concentrate composition comprising glyphosate, predominantly in the form of the potassium salt thereof in a concentration of at least 65 grams acid equivalent per liter, and an auxin herbicide comprising one or more auxin herbicides selected from the group consisting of 2,4-D, 2,4-DB, dichlorprop, MCPA, MCPB, mecoprop, dicamba, picloram, quniclorac and agriculturally acceptable salts or esters thereof. The herbicidal concentrate composition further comprises a first surfactant component in solution or stable suspension, emulsion

> or dispersion comprising one or more surfactants selected from the group consisting of secondary or tertiary amines, dialkoxylated quaternary ammonium salts, monoalkoxylated quaternary ammonium salts, quaternary ammonium salts, ether amines, amine oxides, dialkoxylated amines, aminated alkoxylated alcohols, alkyl alkoxylated phosphates and alkylpolyglycosides.
>
> Yet another embodiment of the present invention is directed to an aqueous herbicidal concentrate composition comprising glyphosate, predominantly in the form of the isopropylammonium salt thereof in a concentration of greater than 360 grams acid equivalent per liter, an auxin herbicide component comprising one or more auxin herbicides selected from the group consisting of 2,4-D, 2,4-DB, dichlorprop, MCPA, MCPB, mecoprop, dicamba, picloram, quniclorac and agriculturally acceptable salts or esters thereof, and a surfactant component in solution or stable suspension, emulsion or dispersion, comprising one or more surfactants. The glyphosate (acid equivalent basis) and the auxin herbicide component (acid equivalent basis) are present in a weight ratio of at least 9.5:1 and the composition has a cloud point of at least about 50° C. and a crystallization point not higher than about 0° C.
>
> [A]nother embodiment of the present invention is directed to a method of killing or controlling weeds or unwanted plants comprising diluting an aqueous herbicidal concentrate composition in an amount of water to form an application mixture and applying a herbicidally effective amount of the application mixture to foliage of the weeds or unwanted plants, wherein the weeds or unwanted plants comprise Commelina and the aqueous herbicidal concentrate composition comprises glyphosate or a herbicidal derivative thereof, an auxin herbicide component comprising one or more auxin herbicides selected from the group consisting of 2,4-D, 2,4-DB, dichlorprop, MCPA, MCPB, mecoprop, dicamba, picloram, quniclorac and agriculturally acceptable salts or esters thereof, and a surfactant

> component in solution or stable suspension, emulsion or dispersion, comprising one or more surfactants.

(Becher ¶¶ 11–13; *see* Ans. 4 (citing Becher Abstract and ¶¶ 11–13 and 41–42) (Examiner finds that Becher discloses aqueous "herbicidal compositions comprising glyphosate . . . having [a] cloud point of at least 50 degrees Celsius comprising at least 65 g/L of glyphosate in the form of the potassium salt or the isopropylamine salt and surfactants selected from amine oxides and dialkoxylated amines," wherein Becher's "dialkoxylated alkylamines include Ethomeen C/12, C/15, C/20, T/12, T/20 and T/25" and "amine oxides include Chemoxide L70"); *see also* Ans. 4 (citing Becher ¶¶ 102–103 (Examiner finds that Becher exemplifies "[e]thoxylated tallowamine and myristyl dimethyl amine oxide"); Ans. 4 (citing Becher ¶¶ 20–32) (Examiner finds that Becher's "formulations may include a co-herbicide and ammonium salt as well"); Ans. 7–8 (citing Becher ¶¶ 11–13).

FF 2. Becher discloses that "the surfactant component [of its aqueous herbicidal composition] is present in an amount of at least about 5 wt. % based on the total weight of the composition" (Becher ¶ 34; *see also* Ans. 4 (citing Becher ¶ 34) (Examiner finds that "[t]he amount of surfactants [in Becher's composition] are at least 5% of the total weight of the formulation"); Ans. 8 (citing Becher ¶ 34)).

FF 3. Examiner finds that Becher discloses that its "formulations comprise ratios of glyphosate to surfactant can be about 1:1 to about 20:1" (Ans. 9 (citing Becher ¶ 52)).

FF 4. Examiner finds that Becher's composition may comprising "[a]dditional excipients include[ing] PEG 600, 1500, 4000 and 6000" (Ans. 4 (citing Becher ¶ 71); *see also* Ans. 8 (citing Becher ¶ 71)).

FF 5. Examiner finds that Becher does not disclose

> the specific ranges within the surfactant system for the dialkoxylated alkyl amine, diethoxylated tallow amine (10-60% of the solvent component); the water miscible solubilizers (5-30%); and the amine oxides (30-75%) to form a concentrate having a cloud point above at least 70 degrees Celsius when the concentration is heated to its boiling point.

(Ans. 4–5.)

ANALYSIS

As our reviewing court explained, Appellant's Specification

> is directed to herbicidal formulations containing glyphosate salt with a surfactant system. Surfactants can enhance glyphosate's effectiveness as an herbicide by providing better adherence to leaves, thereby enhancing penetration. According to the [S]pecification, "[t]he present invention is based on the unexpected discovery that surfactant systems comprising dialkoxylated alkylamine, water miscible solubilizer and amine oxide allow for formulation of ultra-high loaded ('high-strength') glyphosate salt concentrates possessing high or no cloud points." [Spec.] ¶ 13. A cloud point is the temperature at which a solution becomes cloudy due to the surfactants becoming insoluble and separating into layers. Cloudiness can be avoided if the cloud point is higher than the solution's temperature or if the solution is cooled before adding the surfactant. The [S]pecification explains that because glyphosate salt is created at about 75°C, it is advantageous to formulate glyphosate with a surfactant system exhibiting a high cloud point to "obviate the necessity of waiting for the temperature of the glyphosate salt reaction product to cool down." [Spec.] ¶ 7. Surfactant systems with high cloud points or no cloud point, in which the solution never becomes cloudy, allow for quicker formulation of glyphosate concentrates and thus quicker delivery to the market. *Id.*

Stepan, 868 F.3d at 1344.

Examiner recognizes that Becher does not disclose

> the specific ranges within the surfactant system for the dialkoxylated alkyl amine, diethoxylated tallow amine (10-60% of the solvent component); the water miscible solubilizers (5-

> 30%); and the amine oxides (30-75%) to form a concentrate having a cloud point above at least 70 degrees Celsius when the concentration is heated to its boiling point.

(FF 5). Examiner finds, however, that Becher discloses: (a) "[S]urfactants range from at least 5% of [its] formulation whereas [Appellant's] claims only require 1-20% of surfactant" and (b) "the cloud point temperature to be at least 50 degrees Celsius, which means any temperature above 50 degrees is contemplated and thus encompasses a cloud point temperature of 70 degrees since 70 degrees[, which] meets the definition of 'at least above 50 degrees'" required by Appellant's claimed invention (Ans. 5; *see also* FF 1–2). Therefore, based on Becher, Examiner concludes that, at the time Appellant's invention was made, it would have been prima facie obvious "to formulate the specific solvent system with components i), ii) and iii) with a reasonable expectation of success" (Ans. 5). In this regard, Examiner reasons that "[o]ne of ordinary skill would have been motivated to make the formulation since Becher teaches that the surfactants can range from at least 5% of the formulations" (*id.*; *see id.* at 6 (Examiner finds that Becher discloses "all the components found in the surfactant system and also teach formulating glyphosate formulations with a cloud point greater than 50 Degrees Celsius. Therefore, the claimed invention would have been prima facie obvious to one of ordinary skill in the art at the time of [Appellant's] invention"); *id.* at 7 (Examiner reasons that because "Becher teaches that other surfactants may be selected, one of ordinary skill in the art would have been motivated to combine different surfactants into the formulations in order to make alternative solutions")).

In sum, Examiner reasons that because Becher discloses an aqueous composition comprising, *inter alia*, glyphosate and surfactants, having a

cloud point of at least about 50º C, there would have been a reasonable expectation that a person of ordinary skill in this art would optimize Becher's composition to achieve a cloud point above at least 70º C, because "a cloud point of at least 50 degree Celsius . . . encompasses formulations with a cloud point of at least about 70 degrees Celsius" and "where the claimed ranges 'overlap or lie inside ranges disclosed by the prior art' a prima facie case of obviousness exists" (Ans. 11 (citing MPEP § 2144.05 and *In re Wertheim*, 541 F.2d 257 (CCPA 1976)); *see* FF 1; *see also* Ans. 5).

This is, however, the same rationale our reviewing court found unpersuasive in *Stepan*. *See Stepan*, 868 F.3d at 1345 (In *Stepan*, Examiner found that "Pallas disclose[d] highly-loaded glyphosate compositions containing surfactants having a cloud point of at least 50ºC and ideally 60ºC" and, although, "Pallas does not teach a cloud point about 70ºC . . . achieving this cloud point would be a matter of 'optimizing the formulation' because Pallas teaches the ideal cloud point should be above 60ºC."). On this record, Examiner failed to explain why it would have been routine optimization to select, from Becher's disclosure, the specific surfactants required by Appellant's claimed invention and then adjust the concentration of these surfactants to achieve a cloud point about at least 70º C as required by Appellant's claims (*see* Appeal Br. 4 (Appellant contends that Examiner recognizes that "Becher fails to teach the claimed ranges for Appellant['s] claimed surfactant combination and fails to teach that the formulation should have a cloud point greater than 70º C"); *see* FF 5; Reply Br. 2 (Appellant contends that its "claims require not only a specific combination of surfactant classes . . ., but also a specific proportion of those components, particularly a high proportion of the amine oxide" resulting in a composition having a cloud point above at least 70º C or not

cloud point when the concentrate is heated to its boiling point). *Cf. Stepan*, F.3d at 1346 ("Missing from the Board's analysis is an explanation as to *why* it would have been routine optimization to arrive at the claimed invention"). Stated differently, even if a person of ordinary skill in this art would select, from Becher, the specific components required to achieve Appellant's claimed surfactant system, Examiner fails to establish an evidentiary basis on this record to support a conclusion that Becher suggests optimizing the concentration of the components of this surfactant system to achieve a cloud point above 70º C. Thus, we agree with Appellant's contention that "Examiner erroneously concluded that any combination of the surfactants disclosed by Becher and used at 5% or more would yield success in making formulations having cloud points greater than 70º C because Becher's teachings as a whole do not support that position" (Appeal Br. 10; *cf.* Ans. 10 (Examiner concludes that because Becher discloses "herbicidal compositions comprising glyphosate which have a cloud point of at least 50 degrees Celsius," Becher teaches "one of ordinary skill . . . to make a glyphosate formulation with a cloud point of at least about 70 degrees Celsius with a reasonable expectation of success"); Ans. 11 (Examiner asserts that because Becher discloses "glyphosate compositions with a cloud point greater than 50 degrees Celsius . . . cloud points of at least about 70 degrees Celsius are encompassed by Becher")).

Further, here, as in *Stepan*, Examiner failed to establish that a person of ordinary skill in this art would have had a reasonable expectation of success in formulating a composition having a cloud point of at least 70º C. *See id.* at 1347 ("Reciting Pallas' teachings that 'any combination' of surfactants may be used and that a cloud point above 60ºC is desired fails to illuminate why a skilled artisan would have selected the claimed

combination of surfactants and reasonably expected a cloud point above at least 70ºC.").

Examiner's reliance on *Wertheim* to establish a prima facie case of obviousness is inapplicable for the two reasons set forth in *Stepan*:

> First, for the reasons discussed above, . . . [Examiner] did not establish a prima facie case of obviousness because it failed to adequately articulate its reasoning. *See In re Kahn*, 441 F.3d 977, 986 (Fed. Cir. 2006) ("[T]o establish a prima facie case of obviousness based on a combination of elements disclosed in the prior art, . . . [Examiner] must articulate the basis on which it concludes that it would have been obvious to make the claimed invention."). Second, . . . [Appellant] does not merely claim a range of surfactants that is within or overlaps with the range of surfactant systems taught by [Becher]. The claimed surfactant system contains four elements. The first three elements describe the surfactants, and their respective ranges, that comprise the surfactant system. The fourth element limits the combination of those surfactants to only those combinations that produce a cloud point above at least 70°C or no cloud point at all. The cloud point thus limits and defines the scope of what surfactant combinations satisfy the claimed composition. It therefore may be that not all compositions that contain the claimed combination and range of surfactants fall within the claims. As an element of the composition claims, it . . . [is Examiner's] burden to show that achieving a cloud point above 70°C would have been obvious to a person of ordinary skill in the art.

Stepan, F.3d at 1348; *see* Appeal Br. 8 (Appellant recognizes that Becher discloses compositions having cloud points greater than 70º C, but contends that Becher fails to provide a person of ordinary skill in this art a reasonable expectation of success in achieving a composition, comprising an amine oxide as a surfactant component, that has a cloud point greater than 70º C); Reply Br. 5 (Appellant contends that "Becher offers the skilled person no such reasonable expectation [of success]").

CONCLUSION

The preponderance of evidence relied upon by Examiner fails to support a conclusion of obviousness. The rejection of claims 1–16, 18–24, 26, 27, 29, and 31 under 35 U.S.C. § 103(a) as unpatentable over Becher is reversed.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1–16, 18–24, 26, 27, 29, 31	103(a)	Becher		1–16, 18–24, 26, 27, 29, 31

REVERSED