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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte CHAPMAN S. MAYO, KENNETH L. DART, and
JEFFREY T. MCCLELLAN

Appeal 2019-005072
Application 12/262,834
Technology Center 1600

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

KATZ, *Administrative Patent Judge.*

DECISION ON APPEAL

Appellant¹ seeks our review, under 35 U.S.C. § 134(a), of the Examiner’s decision to reject claims 1–7, 9–11, 13, 15–23, 25, and 26 (Appeal Brief filed January 7, 2019 (“App. Br.”) 1.)²

We have jurisdiction under 35 U.S.C. § 6(b). We REVERSE.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the Real Party in Interest as the Assignee, Agro-K Corporation. (*See* App. Br. 3; *see also* Assignment Reel/frame 021770/0315.)

² Claims 8, 12, 14, and 24 are cancelled.

Appellant's Specification provides a combination of calcium phosphite (CaHPO_3) mixed with prohexadione calcium. (Specification October 31, 2008 ("Spec.") ¶ 9.) The Specification discloses that prohexadione calcium [calcium 3-oxido-5-oxo-4-propionylcyclohex-3-enecarboxylate] is a known plant growth regulator used for regulating shoot growth in apple trees. (*Id.* ¶ 2.) The manufacturer of prohexadione calcium instructs against mixing the compound with added calcium due to reduced efficacy of prohexadione calcium. (*Id.* ¶ 4.) Because calcium is a commonly used micronutrient, calcium must be applied separately from prohexadione calcium. (*Id.*) The Specification alleges that in contrast to the prior art expectations, the combination of calcium phosphite with prohexadione calcium has shown improved shoot growth suppression rather than reduced efficacy. (*Id.* ¶ 10.)

Appellant's claim 1 recites:

A method of treating agricultural crops, comprising:
applying a composition to a crop, wherein the composition comprises prohexadione calcium and one or more metal phosphites in aqueous solution;
wherein the one or more metal phosphites are selected from the group consisting of zinc phosphite, manganese phosphite, magnesium phosphite, calcium phosphite, iron phosphite and copper phosphite; and
wherein at least one of the one or more metal phosphites comprises calcium phosphite.

(App. Br. 35.) Independent claims 10 and 19 recite a composition comprising, *inter alia*, prohexadione calcium and calcium phosphite.

The Examiner rejects the claims as follows:

Claims Rejected	35 U.S.C. §	Basis	Final Office Action
1, 10, 19	103(a)	Stringfellow, ³ Evans '882, ⁴ Lovatt ⁵	3–6
1–7, 10, 11, 13, 15–23, 25, 26	103(a)	Stringfellow, Evans '882, Lovatt '200 ⁶	6–12
1, 9	103(a)	Stringfellow, Evans '882, Evans '831 ⁷	12–19

Analysis

The Examiner finds Stringfellow teaches a composition for treating agricultural plants including a mixture of a phosphite compound, a non-phosphite pesticide, and water. (Final Office Action mailed August 10, 2018 (“Final Act.”) 3–4, citing Stringfellow ¶ 5.) The Examiner finds Stringfellow teaches that the phosphite may include the calcium salt of phosphorous acid, i.e., calcium phosphite. (*Id.* at 4, citing Stringfellow ¶ 7.) The Examiner finds Stringfellow teaches that the non-phosphite pesticide compound may include a plant growth regulator, e.g., prohexadione. (*Id.*, citing Stringfellow ¶¶ 13, 96, 102.)

The Examiner acknowledges that Stringfellow does not teach that the prohexadione is prohexadione calcium. (*Id.*) The Examiner finds Evans '882 teaches prohexadione calcium is an effective plant growth

³ Stringfellow et al., WO 2005/115144 A1, published December 8, 2005.

⁴ Evans et al., US 6,083,882, issued July 4, 2000.

⁵ C. J. Lovatt and R. L. Mikkelsen, *Phosphite Fertilizers: What Are They? Can You Use Them? What Can They Do?* 90 Better Crops 11–13 (2006).

⁶ Lovatt, US 5,514,200, issued May 7, 1996.

⁷ Evans et al., US 6,022,831, issued February 8, 2000.

regulator useful for improving the overall nutritive value and growing of alfalfa. (*Id.* at 4–5, citing Evans ’882 2:31–35; 3:11–21.) The Examiner finds one of ordinary skill in the art would have recognized that the combined prior art would provide a pesticidal composition that has an increased efficacy for the treatment of agricultural plants, e.g., alfalfa. (*Id.* at 5.)

Appellant asserts that Longfellow teaches calcium salts of phosphoric acid, i.e., calcium phosphate, and not calcium phosphite. (App. Br. 20, citing Stringfellow ¶ 7.) Appellant further asserts that Stringfellow discloses at least several thousand potential phosphite compounds in addition to six broad classes of suitable pesticide compounds. (*Id.* at 28–29.) Appellant contends that “Stringfellow is silent with respect to guidance on pairing any particular phosphite compound with a corresponding pesticide compound.” (*Id.* at 29.) Appellant contends accordingly, that the Examiner has failed to show a reasonable expectation of success without undue experimentation. (*Id.* at 28.)

We do not agree with Appellant’s characterization of the prior art. Stringfellow teaches:

Suitable phosphorous acid salts include inorganic or mineral salts and organic salts. Useful inorganic salts include alkali or alkaline earth metal salts such as those including lithium, sodium, potassium, rubidium, cesium, beryllium, magnesium, calcium, strontium, and barium salts of phosphoric acid.

(Stringfellow ¶ 7.) The first sentence of the paragraph unambiguously refers to inorganic salts of phosphorous acid, not phosphoric acid. Consistent with the format of paragraphs 6 and 8–12, paragraph 7 introduces a genus of

compounds, e.g., inorganic salts of phosphorous acid, followed by a listing of species within the genus, e.g., calcium phosphite as the inorganic salt. (See Stringfellow ¶¶ 6–12.) Stringfellow confirms this interpretation by separately listing phosphoric acid salts, i.e., phosphates as optional compounds. (Stringfellow ¶¶ 104, 105.) Although we agree with Appellant that paragraph 7 ends with the recitation of “barium salts of phosphoric acid,” this appears to be a typographical error, particularly in view of the duplication of the language in paragraph 105 referring to phosphates. Accordingly, we agree with the Examiner that Stringfellow teaches calcium phosphite, in addition to a non-phosphite pesticide, e.g., prohexadione.

With respect to the numerous potential combinations taught by Stringfellow, disclosing a multitude of effective combinations does not render any particular formulation less obvious. *Merck & Co. v. Biocraft Labs., Inc.*, 874 F.2d 804, 807 (Fed. Cir. 1989). Stringfellow teaches a pesticide composition including an effective combination of a phosphite and non-phosphite pesticide. Picking and choosing among the disclosed phosphites and pesticides to arrive at calcium phosphite and prohexadione is entirely proper in the context of an obviousness rejection, where Appellant is afforded an opportunity to rebut with objective evidence any inference of obviousness which arises from the similarity of the claimed invention to the prior art. *See in re Arkley*, 455 F.2d 586, 588 (C.C.P.A. 1972).

Appellant submits objective evidence to rebut the Examiner’s inference of obviousness. Appellant asserts that combining prohexadione calcium and other calcium sources has been avoided in the art. (App. Br. 22,

citing Spec. ¶ 4.) As supporting evidence, Appellant submits the Apogee®⁸ product label, containing 27.5% prohexadione calcium as the active ingredient. (Apogee® 1.) Apogee® states: “Do not tank mix **Apogee** with calcium sprays because research has shown that added calcium will reduce the effectiveness of **Apogee.**” (Apogee® 5; *see* App. Br. 23–24.)

Appellant also submits Greene⁹ which explains that the effect of Apogee will be reduced if applied with hard water containing 500 ppm or greater calcium. (Reply Brief dated June 19, 2019 (“Reply Br.”) 4, citing Greene 2.) Appellant further submits a Declaration by Wilbur H. Palmer (“Palmer Decl.”),¹⁰ which states:

[P]ersons of ordinary skill in the art of the use of agricultural chemicals, at the time of the effective filing date of the present application, would have understood the warnings against combining the APOGEE brand of plant growth regulator with other calcium sources to be warnings against combining prohexadione calcium with another calcium source, regardless of the manner of combination.

(Palmer Decl. ¶ 11.)

The Examiner responds that Appellant’s evidence is not commensurate in scope with the claims. (Examiner’s Answer mailed April 19, 2019 (“Ans.”) 5.) The Examiner finds that Apogee® warns against increasing the total concentration of calcium in the Apogee product to

⁸ BASF, *Apogee® plant growth regulator* (2000) (“Apogee®”), of record in App. Br. 39–45 (Appendix B).

⁹ Duane W. Greene and Wesley R. Autio, *Apogee® - A New Growth Retardant for Apples*, F-127R University of Massachusetts (2002), of record in App. Br. 46–48 (Appendix B).

¹⁰ Declaration by Wilbur H. Palmer dated May 19, 2017.

greater than 27.5% by weight prohexadione calcium. (*Id.* at 5–6.) Because the claims do not require any minimum amount of calcium, the Examiner finds the combined teaching of the cited references do not teach away from the claimed invention. (*Id.* at 6.)

We find Appellant’s evidence of teaching away to be probative of nonobviousness. Both Apogee® and Greene unambiguously instruct against combining prohexadione calcium with “added calcium.” (Apogee® 5; Greene 2.) Greene teaches that as little as 500 ppm added calcium may reduce the efficacy of prohexadione calcium. (Greene 2.) Greene repeats the warnings of Apogee®, and further teaches that prohexadione calcium’s effectiveness may be reduced by calcium residue left on leaves. (*See* Greene 2.) The Palmer Declaration attests that at the time of filing the application, a person of ordinary skill in the art would have understood the warnings against combining prohexadione calcium with any other calcium source. (Palmer Decl. ¶¶ 9–10.) In determining whether the prior art suggests combining the references, the full field of the invention must be considered including that which might lead away from the claimed invention. *In re Dow Chem. Co.*, 837 F.2d 469, 473 (Fed. Cir. 1988). Fairly considering the evidence that supports, rather than negates, patentability, we find that the prior art teaches away from the combination of prohexadione calcium and added calcium, without limitation on source or amount. (*See id.*)

In addition to evidence of teaching away, Appellant submits evidence of experimental results. (App. Br. 30–31.) Appellant submits test data comparing a composition containing prohexadione calcium and calcium phosphite with compositions containing prohexadione calcium alone, or in

combination with other calcium sources. (*Id.*, citing Spec. ¶¶ 18–19, Fig. 2.) Each of the compositions also included an identical amount of ammonium sulfate surfactant, commonly used with prohexadione to condition the water carrier by removing mineral calcium (*see also* Greene) and improve leaf coverage during application. (Reply Br. 5–6.) Appellant asserts the test data confirms the prior art warning that added calcium, other than calcium phosphite, reduces the efficacy of prohexadione calcium. (App. Br. 30–31.) Appellant asserts that adding calcium phosphite to prohexadione calcium unexpectedly did not reduce efficacy, but in fact resulted in improved efficacy. (*Id.*)

We find that this additional evidence is probative of nonobviousness in that it confirms the expectation of those skilled in the art. Particularly, the test data confirms that added calcium generally reduces efficacy of prohexadione calcium as expected from the evidence submitted by Appellant, except for Appellant’s inventive combination. Weighing the objective indicia of nonobviousness against the evidence of obviousness, we conclude that the evidence when considered as a whole does not support a finding of obviousness for claims 1, 10, and 19.

Because we find that the prior art taught away from the combination of prohexadione calcium and calcium phosphite, the prior art rejections of the remaining claims on appeal that contradict this finding fall with the rejection of claims 1, 10 and 19.

CONCLUSION

Upon consideration of the record and the reasons given, the rejections of claims 1–7, 9–11, 13, 15–23, 25, and 26 are not sustained.

In summary:

Claims Rejected	35 U.S.C. §	Basis	Affirmed	Reversed
1, 10, 19	103(a)	Stringfellow, Evans '882, Lovatt		1, 10, 19
1–7, 10, 11, 13, 15–23, 25, 26	103(a)	Stringfellow, Evans '882, Lovatt '200		1–7, 10, 11, 13, 15–23, 25, 26
1, 9	103(a)	Stringfellow, Evans '882, Evans '831		1, 9
Overall Outcome				1–7, 9–11, 13, 15–23, 25, 26

REVERSED