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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/821,039	08/07/2015	Santos B. Murty	1907-002 CIP III	1716

1009 7590 11/29/2024

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EXAMINER	
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ART UNIT	PAPER NUMBER
1619	

NOTIFICATION DATE	DELIVERY MODE
11/29/2024	ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte SANTOS B. MURTY and RAM B. MURTY

Appeal 2023-003754
Application 14/821,039
Technology Center 1600

Before ULRIKE W. JENKS, TIMOTHY G. MAJORS, and MICHAEL A. VALEK, *Administrative Patent Judges*.

VALEK, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant[1] submits this appeal under 35 U.S.C. § 134(a) involving claims to a composition of a cannabinoid in a self-emulsifying system, which have been rejected for indefiniteness, lack of written description, being drawn to patent ineligible subject matter, and obviousness. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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[1] We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42(a). Appellant identifies Murty Pharmaceuticals, Inc. as the real party in interest. Herein, we refer to the version of the specification filed Dec. 17, 2015 ("Specification"); Decision in related Appeal 2019-000845 entered June 27, 2019 ("Decision"); Final Action mailed November 12, 2021 ("Final Act."), Appeal Brief filed November 11, 2022 ("Appeal Br."), and Examiner's Answer mailed April 20, 2023 ("Ans.").

STATEMENT OF THE CASE

Appellant's "disclosure relates generally to a delivery system to improve administration of cannabinoids and standardized marijuana extracts to patients and, more particularly, though a self-emulsifying drug delivery system, which optimizes cannabinoid dissolution properties and avoids hepatic first-pass metabolism, thereby enhancing bioavailability though the gastrointestinal tract." Spec. 1:15–20.

Claims 1, 3–5, 9, 11, 13, 15–19, and 21–28 are on appeal. Claims 1 and 18 are independent claims. Claim 1 is representative for most of the arguments on appeal and reads in pertinent part[2] as follows:

> 1. A composition administered to the gastrointestinal system as a dosage form of cannabinoids and/or standardized marijuana extracts in a self-emulsifying system operable to avoid hepatic first pass metabolism via targeted chylomicron/lipoprotein delivery, thereby promoting lymphatic transport, comprising:
>
> (a) about 1 to 60 wt% of a pharmacologically active form of synthetic cannabinoids selected from the group consisting of tetrahydrocannabinol . . . and mixtures thereof and/or standardized marijuana extracts;
>
> (b) an oily medium consisting of: (i) about 15 to 35 wt% of one or more triglycerides formed from long chain fatty [sic] having from C_{13} to C_{24} carbon atoms selected from the group consisting of . . . corn oil . . .; and (ii) about 15 to 44 wt% of one or more mixed glycerides being selected from the group consisting of glyceryl behenate, glyceryl distearate, glyceryl isostearate, glyceryl monolinoleate, glyceryl palmitate, glyceryl

[2] Claim 1 recites lengthy Markush groups in limitations 1(a), 1b(i), 1b(ii), 1(c) and 1(e). The quotation below includes members of those groups pertinent to the rejections on appeal, while marking omitted portions with ellipses.

> palmitostearate, glyceryl ricinoleate, polyglyceryl 10-oleate, polyglyceryl 3-oleate, polyglyceryl 4-oleate, and polyglyceryl 10-tetralinoleate;
>
> (c) about 10 to 60 wt% of a surfactant which promotes self-emulsification, said surfactant being selected from the group consisting of . . . caprylyic/capric glycerides, . . . poloxamer 124, . . . poloxamer 188, . . . poloxamer 407, . . . and mixtures thereof;
>
> (d) about 1 to 70 wt% of solubilizing co-solvents and about 2.5 wt% of a combination of at least two antioxidants; and
>
> (e) free fatty acids having from C_{13} to C_{24} carbon atoms, wherein the one or more free fatty acids are selected from the group consisting of . . . linoleic acid, . . . oleic acid, and mixtures thereof.

Appeal Br. 19–22.

Appellant seeks review of the following rejections:

I. Claims 1, 3–5, 9, 11, 13, 15–19, and 21–28 under 35 U.S.C. § 112 for indefiniteness;

II. Claims 1, 3–5, 9, 11, 13, 15–19, and 21–28 under 35 U.S.C. § 112 for lack of written description;

III. Claims 1, 3–5, 9, 11, 13, 15–19, and 21–28 under 35 U.S.C. § 101 for being directed to patent ineligible subject matter;

IV. Claims 1, 3, 9, 11, 13, 15–19, and 23–28 under 35 U.S.C. § 103 as unpatentable over Peresypkin,[3] Whittle,[4] Rudnic,[5] Gao,[6] and Kottayil;[7]

[3] US 2007/0298099 A1, published Dec. 27, 2007 ("Peresypkin").
[4] US 6,730,330 B2, issued May 4, 2004 ("Whittle").
[5] US 5,952,004, issued Sept. 14, 1999 ("Rudnic").
[6] US 2002/0119198 A1, published Aug. 29, 2002 ("Gao").
[7] US 2006/0160888 A1, published July 20, 2006 ("Kottayil").

V. Claims 4 and 5 under 35 U.S.C. § 103 as unpatentable over Peresypkin, Whittle, Rudnic, Gao, Kottayil, and Schwarz;[8] and

VI. Claims 21 and 22 under 35 U.S.C. § 103 as unpatentable over Peresypkin, Whittle, Rudnic, Gao, Kottayil, and Cort.[9]

See Appeal Br. 12–18.

I. REJECTIONS UNDER 35 U.S.C. § 112

Analysis

We address the indefiniteness and written description rejections together because they arise from the same claim language, i.e., the recitation of "synthetic cannabinoids" and/or "standardized marijuana extracts" in limitation 1(a). *See* Final Act. 2–3 (indefiniteness), 5–6 (written description). First, the Examiner finds the claims indefinite because the Specification "notes that the standardized marijuana extracts include compounds such as tetrahydrocannabinol (THC)," but since such compounds "are recited as being the cannabinoids in the claim, it is unclear how standardized marijuana extracts differentiates from the claimed cannabinoid compounds already recited in the claims." *Id.* at 3. Second, the Examiner asserts that there is no written description for "synthetic cannabinoids" because the Specification describes the use of standardized marijuana extracts "in lieu of incorporating a synthetic cannabinoid or pure cannabinoid into dosage forms" in Example 19 and Example 21 and "does not describe what is meant by a synthetic cannabinoid." *Id.* at 6 (quoting Spec. 53:15–54:1).

[8] US 2005/0037073 A1, published Feb. 17, 2005 ("Schwarz").
[9] W.M. Cort, *Antioxidant Activity of Tocopherols, Ascorbyl Palmitate, and Ascorbic Acid and Their Mode of Action*, 51 J. Am. Oil Chemists' Society 321–325 (1974) ("Cort").

Appellant responds, explaining that the claims are not indefinite "for reciting various cannabinoids as well as standardized marijuana extracts." Appeal Br. 12. Moreover, Appellant contends that the Examiner's position that "synthetic cannabinoids" lacks written description is flawed because it "ignores the fact that the language 'in lieu of' [which the Examiner quotes from the Specification] plainly contemplates that synthetic cannabinoids were used in other examples but were replaced with standardized marijuana extracts in Examples 19 and 21." *Id.* at 14.

In the Answer, the Examiner asserts "the recitation of 'cannabinoids and/or standardized marijuana extracts' renders the metes and bounds of the claim indefinite." Ans. 5. The Examiner also maintains that the claims lack written description because there is no "description or definition of what constitutes a synthetic cannabinoid." *Id.* at 7.

On the current record, Appellant has the better argument. Limitation 1(a) recites a pharmacologically active form of a synthetic cannabinoid selected from the recited Markush group "*and/or* standardized marijuana extracts." Appeal Br. 18–19 (emphasis added). Contrary to the Examiner's suggestion, the mere fact that this recitation is broad because it encompasses standardized marijuana extracts both in addition to or as an alternative to the members of the recited Markush group, does not render the claims indefinite. We also agree with Appellant that the Specification's description of using an extract "in lieu of" a synthetic cannabinoid in Examples 19 and 21 provides sufficient description for the recited distinction between synthetic cannabinoids and extracts. *See* Spec. 53:15–54:1. Accordingly, we reverse both of the Examiner's rejections under 35 U.S.C. § 112.

II. SUBJECT MATTER ELIGIBILITY REJECTION

The Supreme Court has long interpreted 35 U.S.C. § 101 to include implicit judicial exceptions to patent eligibility, i.e., "[l]aws of nature, natural phenomena, and abstract ideas" are not patentable. *E.g.*, *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014) ("*Alice*"). In *Alice*, the Supreme Court described a two-step framework for assessing the application of these exceptions. *Id.* at 217–18.

The Office has provided guidance regarding its application of the *Alice* framework. *See* MPEP § 2106. Under this guidance, we first look to whether the claim recites: (1) a judicial exception, including certain groupings of abstract ideas such as mathematical concepts and mental processes (Guidance Step 2A, prong 1); and (2) additional elements that integrate the judicial exception into a practical application (Guidance Step 2A, prong 2). *Id.* § 2106.04. If the claim does not integrate the recited judicial exception into a practical application, then we next examine whether the claim adds a specific limitation beyond the judicial exception that is not "well-understood, routine, conventional" in the field (Guidance Step 2B). *Id.* § 2106.05. If the answer to both inquiries is no, then the claim is not patent eligible.

Here, the Examiner applies the Office's guidance, determining at step 2A that the claims are directed to a "natural phenomenon (e.g., product of nature)" because "the only composition[] requirement set forth in the composition are naturally occurring ingredients." Final Act. 5. The Examiner finds that the claims do not integrate this judicial exception into a practical application, nor recite an inventive concept, because, according to the Examiner, they "do not recite anything else, compositionally or

structurally, . . . that departs from a natural[ly] occurring product that contains a mixture of natural[ly] occurring ingredients." *Id.*

Appellant disputes the Examiner's findings, urging that "the claim as a whole integrates the recited judicial exception into a practical application of that exception." Appeal Br. 13 (quoting MPEP § 2106.04). In particular, Appellant argues that the independent claims "recite a composition operable to avoid hepatic first pass metabolism via targeted chylomicron/lipoprotein delivery and promot[e] lymphatic transport." *Id.* For this reason, Appellant argues the rejection should be reversed "[b]ecause the claims do amount to significantly more than the judicial exception." *Id.*

We agree with Appellant that the subject matter eligibility rejection should be reversed. As an initial matter, claim 1 does not recite a natural product, but rather a composition formed from the combination of several ingredients. There is no evidence, nor does the Examiner find, that this *combination*, as distinguished from the individual ingredients, is found in nature. Moreover, claim 1 recites that this combination has markedly different characteristics from the individual ingredients because it provides a "self-emulsifying system operable to avoid hepatic first pass metabolism via targeted chylomicron/lipoprotein delivery, thereby promoting lymphatic transport." *See* MPEP § 2106.04(c) ("If the claim includes a nature-based product that has markedly different characteristics, then the claim does not recite a product of nature exception and is [patent] eligible."). Thus, we do not agree with the Examiner's finding that claim 1 recites a judicial exception.

But even if we were to agree with that aspect of the Examiner's reasoning, the rejection would still be flawed because it fails to consider the

claim as a whole. *See* MPEP § 2106.04 (explaining that the proper inquiry is "whether the claim as a whole integrates the exception into a practical application" of the exception). Read as a whole claim 1 recites a combination of ingredients that purportedly provides benefits relating to the delivery of the pharmacologically active agent. The rejection addresses only the individual ingredients without assessing whether the combination as a whole constitutes a practical application of any recited judicial exception. Final Act. 5; *see also* Ans. 6 (focusing on a single ingredient (THC) to urge that its "structure is the same" whether "reproduced in the lab" or naturally occurring, instead of assessing the recited combination as a whole). For the above reasons, we reverse the Examiner's rejection under 35 U.S.C. § 101.

III. OBVIOUSNESS REJECTIONS

Appellant argues the Examiner's three obviousness rejections together for most of the claims, but presents a few additional arguments for claims 4, 21, 22, 27, and 28. *See* Appeal Br. 17–18. We begin by analyzing the Examiner's rejection and Appellant's global arguments as applied to claim 1, which is representative for those arguments, before turning to Appellant's separate arguments for claims 4, 21, 22, 27, and 28.

Findings of Fact

FF1. Peresypkin teaches a "self-emulsifying or self-microemulsifying composition comprising 1) Compound I; 2) a surfactant having an HLB of 1 to 8; and 3) a surfactant having an HLB of over 8 to 20; and optionally, 4) a digestible oil and/or cosolvent and/or antioxidant or preservative." Peresypkin Abst. Compound I is "N-[1S,2S]-3-(4-chlorophenyl)-2-(3-cyanophenyl)-1-methylpropyl]-2-methyl-2-{[5-trifluoromethyl]pyridine-2-yl}oxy}propanamid," which Peresypkin describes as an "inverse agonist of

the Cannabinoid-1 (CB1) receptor." *Id.* at Abst., ¶ 7. Peresypkin teaches that Compound I has "low aqueous solubility (<0.4 μg/ml)" and "[w]hen dosed as a crystalline solid . . . was found to be very poorly orally bioavailable . . . even when surfactant was included in the formulation to increase in vivo compound solubility." *Id.* ¶¶ 6, 10, 79. According to Peresypkin, "oral bioavailability [of Compound I] is surprisingly increased dramatically by using a liquid-filled capsule dosage form" taught therein. *Id.* ¶ 6.

FF2. Peresypkin teaches that the digestible oil in its compositions "acts as a solvent for Compound I" and "disperses to form the (emulsifiable) oil droplet phase once the pre-concentrate has been added to water." Peresypkin ¶ 31. Peresypkin teaches that "[s]uitable digestible oils or fats (liquid or semi-solid vehicles), which can be used alone as the vehicle or in a vehicle which includes a digestible oil as part of a mixture, include . . . long chain triglycerides (LCT, C14–C20), and mixtures of mono-, di-, and triglycerides, or lipophilic derivatives of fatty acids such as esters with alkyl alcohols," including monooleate and corn oil. *Id.* ¶ 37, claim 4.

FF3. Peresypkin teaches that the delivery vehicle may additionally contain co-solvents such as "polyol esters of fatty acids," "oleic acid," and ethanol. Peresypkin ¶¶ 6, 24, 38, 45.

FF4. Peresypkin identifies caprylic/capric glycerides and poloxamers 124, 188, and 407 as exemplary surfactants. Peresypkin ¶¶ 32, 35–36. Peresypkin teaches that "[t]he presence of one or more surfactants can, upon contacting the pharmaceutical composition with water, yield an emulsion that . . . is generated in vivo by contacting the aqueous fluids of the gastrointestinal tract." *Id.* ¶ 28. Peresypkin further teaches that the combination of a low HLB surfactant and a high HLB surfactant in such formulations provides "superior

emulsification." *Id.* ¶ 34. According to Peresypkin, the formation of such emulsions "can improve bioavailability and may reduce the food effect in man (i.e., the effect of food upon absorption and/or bioavailability of a drug)." *Id.* ¶ 28.

FF5. Peresypkin teaches that "[t]he ratio of Compound I, surfactants, digestible oils, and/or cosolvents depends upon the efficiency of emulsification and the solubility, and the solubility depends on the dose per capsule that is desired." Peresypkin ¶ 46. Peresypkin teaches that one "class" of formulations having "advantageous bioavailability are those wherein the ratio of components are: 0.01-25% Compound I; 0-70% digestible oil; 0-50% high HLB surfactant; 0-70% low HLB surfactant." *Id.*

FF6. In addition to these main ingredients, Peresypkin teaches its self-emulsifying vehicle may further comprise other "stabilizing additives" such as antioxidants like tocopherol. Peresypkin ¶ 48.

FF7. Whittle teaches that cannabinoids, such as tetrahydrocannabinol, are lipophilic and "have very low solubility in aqueous excipients." Whittle 2:20–21, 3:29–32. According to Whittle, the "highly non-polar solvents" in which cannabinoids are soluble may not be "pharmaceutically acceptable" and "impose[] a ceiling on the dose which can be given using conventional pharmaceutical methods of formulation." *Id.* at 3:16–25. To address these issues, Whittle teaches "formulation of a cannabinoid in a matrix which contains at least one self-emulsifying surfactant" that "results in the generation of an oil in water (o/w) emulsion" that includes mixed glycerides such as glycerol monooleate at a 1–30 wt%. *Id.* at 3:33–37, 11 (Table 2). Whittle teaches that the "matrix may further comprise one or more viscolising agents (agents which increase viscosity)." *Id.* at 2:8–10.

FF8. In addition to examples intended for sublingual and buccal administration, Whittle teaches "a soft gelatin capsule which can be crushed to release the medicament to give an emulsion." Whittle 7:60–62 (Example 8). According to Whittle, this "capsule provides an emulsified form of medicament [i.e., THC] which can be absorbed from any part of the GI tract." *Id.* at 7:64–66.

FF9. Rudnic similarly describes an "emulsion with pharmaceutical agent," e.g., cannabinoids, that is "suitable for oral delivery" having a hydrophobic discontinuous phase of a long chain carboxylic acid ester dispersed in an aqueous phase. Rudnic Abstr., 6:12–13 (listing "cannabinoids" as an exemplary drug for such emulsions). Rudnic identifies glyceryl monooleate, glyceryl monopalmitate, glyceryl monolinolenate, and glyceryl monostearate as examples of long chain carboxylic acid esters suitable for such emulsions. *Id.* at 4:17–29. Rudnic further exemplifies formulations containing between 5–60 w% of the long chain carboxylic acid ester. *Id.* at 8:4–15 (Ex. 1).

FF10. Gao similarly describes a "self-emulsifying formulation" that "is useful for administering extremely water-insoluble active agents." Gao ¶ 14. Gao teaches "[t]he addition of a fatty acid" to improve "solubility" and "prevent[] or eliminate[] phase separation [of] the components" in such formulations. *Id.* ¶¶ 27, 29. Gao teaches that "fatty acids, preferably containing about 6 to about 22 carbon atoms, are suitable" and that the "amount of fatty acid preferably comprises about 5 wt. % to about 35 wt. % of the formulation." *Id.* ¶¶ 27, 30.

FF11. Gao also teaches that antioxidants such as tocopherol and ascorbyl palmitate can be added to such formulations to increase shelf life. Gao ¶ 34. Gao exemplifies compositions comprising a 1:1 combination of tocopherol

and ascorbyl palmitate in varying amounts. *See id.* ¶¶ 68 (Table 1, Composition D and E), 88 (Table 3, Compositions G–J).

FF12. Kottayil describes cannabinoid formulations in an oil-based carrier contained within a gelatin capsule. Kottayil Abstr. Kottayil teaches the addition of antioxidants such as "Vitamin E (tocopherol)" to stabilize the "cannabinoid (which as a class tend to be prone to oxidation)." *Id.* ¶ 81. Kottayil teaches the addition of antioxidants in an amount ranging "from about 0.001% to about 10%" by weight. *Id.* ¶ 50.

FF13. Schwarz discloses a "solid self-emulsifying dosage form for improved delivery of poorly soluble hydrophobic compounds." Schwarz title. Schwarz teaches that the combination of microcrystalline cellulose and a silicate-type sorbent in such compositions "resulted in a preparation with good flowability, without water granulation, avoid[ed] oil leakage during tableting, and yielded tablets with high hardness and excellent friability." *Id.* ¶ 46. In Example 2, Schwarz describes a self-emulsifying compositions comprising 10.59% magnesium aluminum silicate and 17.65% microcrystalline cellulose. *Id*. ¶ 58.

FF14. Cort describes a study of the antioxidant activity of certain antioxidants, including tocopherols and ascorbyl palmitate. Cort Abstr. Cort discloses results showing "the activity in chicken, pork, and beef fats," and teaches this data show "[b]oth α- and γ-tocopherol are synergized by ascorbyl palmitate." *Id.* at 324.

FF15. Peresypkin teaches that polyoxyethylene sorbitan monooleate may be included as an additional surfactant ingredient in its compositions. Peresypkin ¶¶ 21, 35.

Analysis

The Examiner finds that Peresypkin teaches a "lipophilic self-emulsifying delivery vehicle" comprising most of the ingredients in concentration ranges that overlap with those recited in claim 1, including a mixture of oils, i.e., "glycerol monooleate (mixed glyceride) and corn oil (triglyceride)," surfactants such as "caprylic/capric glycerides or poloxamer 188," co-solvents and free fatty acids such as ethanol and oleic acid, and antioxidants such as tocopherol. *See* Final Act. 7–9. The Examiner acknowledges that Peresypkin does not disclose a cannabinoid (limitation 1(a)), but finds it would have been obvious to use Peresypkin's vehicle to deliver "other hydrophobic active agents such as . . . THC, to improve drug solubility and bioavailability" given Whittle's teaching that "THC (a hydrophobic active agent) can be incorporated with self-emulsifying lipophilic delivery vehicles." *Id.* at 10.

Regarding limitation 1(b)(ii), the Examiner finds that it would have been "obvious to substitute the glyceryl monooleate of Peresypkin's oily vehicle for glyceryl palmitate in an amount from 15–44% . . . by weight given [Rudnic's teaching] that glycer[yl] monooleate and glyceryl palmitate are both . . . self-emulsifying oily carboxylic acid esters for compositions [that] include cannabinoids in amounts inclusive of 5-60 by weight." Final Act. 10. According to the Examiner, this would have been "[t]he simple substitution of one known element for another [that] would have yielded predictable results." *Id.*

Regarding the remaining claim elements, the Examiner finds that "Gao teaches self-emulsifying compositions" that include free fatty acids such as oleic acid and linoleic acid in amounts overlapping with the recited

range for the purpose of "improv[ing] solubility of the composition." Final Act. 12. The Examiner further finds that both Gao and Kottayil teach the addition of mixtures of antioxidants in amounts that overlap with the recited amount. According to the Examiner, it would have been obvious to combine Gao's fatty acids with Peresypkin's oleic acid to improve solubility and prevent phase separation, to include a mixture of at least two antioxidants, as taught in Gao and Kottayil, to increase the stability and shelf life of the product, and to optimize the amount of those antioxidants because that "is a result effective variable to achieve the desirable antioxidant activity of the formulation." *Id.* at 13.

After considering the full record, we agree with and adopt Examiner's findings of fact and conclusion of obviousness as articulated in the Final Action and Answer. *See* Final Act. 7–14; Ans. 8–18; FF1–FF15. As explained below, we are not persuaded by the arguments in the Appeal Brief.

Appellant points out that "claim 1 was previously amended to exclude glyceryl monooleate" from the Markush group of mixed glycerides in limitation 1(b)(ii) and that independent claim 18 was amended to recite "35 to 44 wt%" of mixed glycerides.[10] Appeal Br. 15. According to Appellant, "neither Whittle nor any of the other cited references disclose a composition" including a mixed glyceride from the Markush group in element 1(b)(ii) or in amount of about 15 to 44 wt% as recited in claim 18. *Id.*

[10] Unlike claim 1, claim 18 does not recite a Markush group of mixed glycerides, nor otherwise exclude glyceryl monooleate from this limitation. *See* Appeal Br. 25.

We disagree. Rudnic teaches the addition of long chain carboxylic acid esters to similar compositions, including members of the Markush group recited in claim 1 such as glyceryl palmitate and glyceryl monolinolenate. FF9. Appellant's argument ignores the Examiner's express finding that based on Rudnic's teachings a skilled artisan would have found it obvious to substitute such mixed glycerides for the glyceryl monooleate taught in Peresypkin's vehicle. Final Act. 9–10. Similarly, for the weight percentage range in claim 18, Appellant's argument ignores the Examiner's express finding that both Whittle and Rudnic teach overlapping ranges of mixed glycerides and therefore the recited range is prima facie obvious. *Id.*; *see also In re Peterson*, 315 F.3d 1325, 1329 (Fed. Cir. 2003) ("[W]e and our predecessor court have consistently held that even a slight overlap in range establishes a prima facie case of obviousness."). In both instances, the Examiner's finding is supported by the record (FF7, FF9) and Appellant identifies no evidence to dispute the prima facie showing of obviousness.

Appellant's argument that the Examiner has not articulated any reasoning for combining the teachings of Rudnic is also unavailing. The Examiner has sufficiently articulated a rationale premised on the fact that Rudnic identifies both glyceryl monooleate and glyceryl palmitate as suitable carboxylic acid esters for the hydrophobic phase in self-emulsifying compositions similar to those taught in Peresypkin and Whittle. FF9. As the Examiner explains, "[t]he simple substitution of one known element [i.e., glycerol palmitate] for another [i.e., glyceryl monooleate] would have yielded predictable results." Final Act. 10; Ans. 10. It is well-established that the substitution of known equivalents may be a sufficient rationale for combining references. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418

(2007) ("[W]hen a patent simply arranges old elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement, the combination is obvious." (internal quotations omitted)). And here, Appellant offers no evidence or argument suggesting otherwise.

In addition to its arguments for claim 1, Appellant urges that claim 4 is "independently patentable" because its recitation of a semi-solid inducer is non-obvious. *See* Appeal Br. 17. That is, Appellant suggests that Schwarz's teachings are somehow inapplicable to Peresypkin's compositions given various factual distinctions between the references. *See id.* at 17–18.

Again, we disagree. Schwarz teaches the addition of semi-solid inducers from the Markush group of claim 4 (e.g., magnesium aluminum silicate and microcrystalline cellulose) to aid the preparation of self-emulsifying, oral dosage compositions. FF13. The Examiner finds, and we agree, that this is a sufficient rationale for combining these references. *See* Final Act. 14–15. Indeed, as the Examiner points out, we previously rejected essentially the same arguments from Appellant, explaining that those arguments were unavailing because they attacked the references individually rather than the combination of references on which the rejection was based. Ans. 16; *see also* Dec. 14–15. Appellant does not respond to our prior reasoning, nor offer any persuasive showing to distinguish claim 4 here.

Appellant's separate argument for claims 21 and 22 is likewise unavailing. Appeal Br. 18. That is, Appellant asserts that the combination of 1.25 wt% of Vitamin E and 1.25 wt% ascorbyl palmitate recited in these claims promotes "synergistic stabilization of the composition" based on results shown in the Specification. *Id.* This argument fails for multiple

reasons. First, the reference to "synergistic stabilization" Appellant cites in the Specification refers to testing of "Formulation # 18," which includes a different amount (1.925 wt%) of these antioxidants than the 1.25 wt% recited in claims 21 and 22. *Compare* Spec. 43 (Example 14), *with* Spec. 36–37 (Table 10 identifying ingredients of Formulation 18). Second, the results Appellant relies upon do not appear to include any controls from which one could conclude that the combination confers synergy as compared to using the same antioxidants individually. For these reasons, Appellant has not identified any persuasive results showing synergy for the particular formulation in claims 21 and 22.

But even if Appellant had provided evidence of such, the Examiner has sufficiently demonstrated that such a result would have been expected from the prior art. Cort teaches that the combination of α-tocopherol (i.e., Vitamin E) and ascorbyl palmitate provides a synergistic antioxidant effect. FF14. Moreover, several references teach the addition of the same antioxidants, including in combination, for the purpose of stabilizing a cannabinoid in similar compositions. *See, e.g.*, FF11–12. Accordingly, even if the results in the Specification were sufficient to show synergy for the antioxidant combination recited in claims 21 and 22, the evidence weighed as a whole would still support the Examiner's rejection. *See, e.g., Bayer Pharma AG v. Watson Labs., Inc.*, 874 F.3d 1316, 1329 (Fed. Cir. 2017) (weighing evidence of unexpected results together with other evidence, including "strong evidence of a motivation to make the claimed combination" in the cited prior art, to conclude that combination was obvious); *Bayer Healthcare Pharms., Inc. v. Watson Pharms., Inc.*, 713 F.3d 1369, 1377 (Fed. Cir. 2013) (finding that secondary indicia evidence did not

"overcome[] the plain disclosures and express motivation to combine those disclosures in the prior art").

Appellant's separate argument for claims 27 and 28 is also unavailing. Appeal Br. 18. Appellant contends that "[n]one of the cited references describe a PGP efflux inhibitor" as recited in these claims. *Id.* That assertion is incorrect. As the Examiner points out, polyoxyethlene sorbitan monooleate is recited as a member of the Markush group of PGP efflux inhibitors in claim 28 and Peresypkin teaches the use of the same ingredient as a surfactant in its vehicle. Ans. 17–18 (citing Peresypkin ¶¶ 21, 35); FF15. Thus, the Examiner has sufficiently demonstrated that the articulated combination of references teaches or suggests the additional limitations of these claims.

For these reasons, we determine that the Examiner's obviousness rejections are supported by a preponderance of the evidence and therefore affirm the same.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1, 3–5, 9, 11, 13, 15–19, 21–28	112	Indefiniteness		1, 3–5, 9, 11, 13, 15–19, 21–28
1, 3–5, 9, 11, 13, 15–19, 21–28	112	Written Description		1, 3–5, 9, 11, 13, 15–19, 21–28
1, 3–5, 9, 11, 13, 15–19, 21–28	101	Eligibility		1, 3–5, 9, 11, 13, 15–19, 21–28

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1, 3, 9, 11, 13, 15–19, 23–28	103	Peresypkin, Whittle, Rudnic, Gao, Kottayil	1, 3, 9, 11, 13, 15–19, 23–28	
4, 5	103	Peresypkin, Whittle, Rudnic, Gao, Kottayil, Schwarz	4, 5	
21, 22	103	Peresypkin, Whittle, Rudnic, Gao, Kottayil, Cort	21, 22	
Overall Outcome			1, 3–5, 9, 11, 13, 15–19, 21–28	

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED