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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte DANIEL HASSAN, SYED M. SHAH,
FRED HASSAN, and CHRISTOPHER DIORIO

Appeal 2020-002991
Application 15/586,578
Technology Center 1600

Before DONALD E. ADAMS, RICHARD M. LEBOVITZ, 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, 4–11, 13, 14, 17–20, 22–24, 29–34, and 43–45 (Office Act.[2] 1). We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM, however, because our rationale differs from that of Examiner's we designate the affirmance a new ground of rejection.

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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 the real party in interest as "Physician's Seal, LLC" (Appellant's December 2, 2019 Appeal Brief (Appeal Br.) 1).

[2] Examiner's June 28, 2019 Non-Final Office Action.

STATEMENT OF THE CASE

Appellant's disclosure "relates to the field of therapeutic compositions for gastroesophageal conditions and, more particularly, to floating raft-type active ingredient delivery systems" (Spec.[3] ¶ 2). Claims 1, 14, 23, 24, and 33 are reproduced below:

1. A composition comprising:

a therapeutically effective oral pharmaceutical dosage form having therein:

an active ingredient combination including an amino acid source and a zinc source including zinc alginate;

an effervescent agent; and

wherein the dosage form is effective for releasing the amino acid source and zinc from the zinc alginate while buoyant on gastric fluid;

wherein the effervescent agent makes the zinc alginate buoyant upon contact with gastric fluid.

(Appeal Br. 19.)

14. A composition comprising:

a therapeutically effective oral pharmaceutical dosage form having

therein:

2% w/w to 10% w/w of an amino acid source;

10% w/w to 55% w/w of zinc alginate;

1 % w/w to 15% w/w of a bicarbonate; and

wherein the dosage form is effective for releasing the amino acid source and zinc from the zinc alginate while buoyant on gastric fluid;

[3] Appellant's January 2, 2019 Specification.

wherein the bicarbonate makes the zinc alginate buoyant upon contact with gastric fluid.

(*Id.* at 21.)

23. The composition of claim 14, wherein the amino acid source includes glutamine.

(*Id.* at 22.)

24. A method of treating a gastroesophageal condition associated with stomach acid, the method comprising locally delivering zinc and an amino acid to a distal esophagus of a patient by administering to a patient in need thereof:

a therapeutically effective oral pharmaceutical dosage form having

therein:

an active ingredient combination including an amino acid source and a zinc source including zinc alginate;

an effervescent agent; and

wherein the dosage form releases the amino acid source and zinc from the zinc alginate while buoyant on gastric fluid and neutralizes stomach acid while promoting healing of epithelial cells in the distal esophagus.

(*Id.* at 22–23.)

33. The method of claim 24, wherein the zinc alginate is 5% to 50% w/w/ of the dosage form.

(*Id*. at 24)

Grounds of rejection before this Panel for review:

Claims 1, 4–11, 13, 14, 17–20, 43, and 44 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Crouch,[4] Asmussen,[5] and Aslani.[6]

Claims 24, 29–34, 36, and 45 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Crouch, Asmussen, Aslani, and Kirchoff.[7]

Claim 23 stands rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Crouch, Asmussen, Aslani, Kirchoff, and Shive.[8]

ISSUE

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

FACTUAL FINDINGS (FF)

FF 1. Crouch "relates to nutritional supplements and/or pharmaceutical agents providing zinc to a subject in need of treatment" (Crouch ¶ 2; *see generally* Ans. 3–4).

FF 2. Crouch discloses that "[o]ral high dose zinc preparations are associated with a high incidence of dose dependent gastric irritation which

[4] Crouch, US 2012/0058055 A1, published Mar. 8, 2012.
[5] Asmussen et al., US 2010/0129445 A1, published May 27, 2010.
[6] Aslana et al., *Studies on diffusion in alginate gels. I. Effect of cross-linking with calcium or zinc ions on diffusion of acetaminophen*, 42 J. Controlled Release 45–82 (1996).
[7] Kirchhoff et al., *Zinc Salts Provide a Novel, Prolonged and Rapid Inhibition of Gastric Acid Secretion*, 106 Am. J. Gastroenterol. 62–70 (2011).
[8] Shive et al., US 2,868,693, issued Jan. 13, 1959.

typically manifests as nausea and abdominal pain" and that "by applying gastro-retentive sustained release technology" it was "able to greatly increase tolerability of oral zinc therapy without sacrificing bioavailability, minimum threshold intestinal zinc exposure required to induce metallothionein nor desired location of gastrointestinal metallothionein induction in the proximal intestines" (Crouch ¶¶ 36 and 39; *see* Ans. 3).

FF 3. Crouch discloses that "prolonged stomach retention time and delayed zinc release is accomplished entirely with excipients and binding agents (that combine the properties of pill swelling and effervescence effect in gastric juice to increase pill buoyancy for increased residence time and pill motility in the stomach)" (Crouch ¶ 39; *see* Ans. 3).

FF 4. Crouch discloses "that the use of noncellulose-based swelling/sustained release agents . . . provide improved zinc bioavailability compared to cellulose-based agents . . . as the latter appear to bind zinc and reduce systemic absorption and bioavailability in humans compared with non-cellulose based agents" (Crouch ¶ 42; *see* Ans. 3–4).

FF 5. Crouch discloses "that through the addition of basic ingredients or antacids, such as potassium bicarbonate and sodium bicarbonate, the tolerability of oral zinc therapy taken away from food can also be greatly improved" (Crouch ¶ 39; *see* Ans. 3).

FF 6. Examiner finds that Crouch discloses that "the oral zinc preparation contains at least 150 mg of zinc" and, preferably, comprises "the amino acid cysteine to improve the oral bioavailability of zinc" and "a non-cellulose swelling/sustained release agent[] such as CARBOPOL® 971P NF" (Ans. 3 (citing Crouch ¶¶ 42, 43, and 55); *cf.* Spec. ¶ 42 (Appellant's amino acid source may be cysteine)).

FF 7. Examiner finds that Crouch discloses a composition comprising:

> 7.5–300 mg elemental zinc as zinc acetate for example; 0–1 g of L-cysteine (other amino acid such as histidine, methionine or arginine may also be used); 0–300 mg of the polyacrylic acid crosslinked polymer CARBOPOL® 971P; 0-300 mg of potassium bicarbonate and preferably 0-30 mg of citric acid as an effervescence promoter and stearic acid.

(Ans. 4 (citing Crouch 4–5: Table 1).)

FF 8. Examiner finds that Crouch discloses both a "once daily [tablet] formulation" comprising approximately "59% of zinc source, 12% amino acid, 11% polymer, 18% bicarbonate and 1.2% effervescence agent" and "two [tablet] . . . daily formulation" comprising approximately "47% zinc source, 9% amino acid, 19% polymer, 22% bicarbonate and 1.9% effervescence agent," wherein "[t]ablets were prepared by blending . . . the various ingredients followed by compaction using a tablet press" (Ans. 4 (citing Crouch ¶ 63)).

FF 9. Examiner finds that Crouch fails to disclose "[t]he use of alginate [as] a swelling/sustained release agent" (Ans. 4).

FF 10. Asmussen discloses a:

> gastroretentive system which[may be a single or multi-layered tablet, or a press coated tablet,] compris[ing] two elements that function independently from each other, but which are firmly connected to one another. The first element (element A) is at least one swelling body which prolongs the retention time of the system in the stomach and which is preferably based on a sodium alginate. The second element (element B) is at least one release device for the active pharmaceutical ingredient which enables a controlled release of said active pharmaceutical ingredient; for example, an osmotically controlled or an erosion-controlled release.

(Asmussen ¶¶ 30 and 67; *see* Ans. 4.)

FF 11. Asmussen discloses that

> sodium alginate . . . is characterized by its good swelling properties. After its introduction in the stomach, the welling body can develop its full size. In the environment present in the human intestine, the swelling body quickly dissolves so that after it has been emptied from the stomach, its accumulation in the intestine and thus a potentially threatening intestinal obstruction can be avoided.

(Asmussen ¶ 36; *see also id.* ¶¶ 37–38; Ans. 4–5.)

FF 12. Examiner finds that Asmussen discloses that its composition may comprise "calcium ions, zinc and/or aluminum ions" in an amount "between 0.1 and 30% by weight relative to the mass of the swelling body" (Ans. 5 (citing Asmussen ¶¶ 41, 42, and 75)).

FF 13. Aslani discloses that "[s]odium alginate is a water soluble salt of alginic acid, a naturally occurring non-toxic polysaccharide found in all species of brown algae" (Aslani 75 § 1).

FF 14. Aslani discloses that "[a]lthough calcium is the most widely employed cation in gel formation by cross-linking, other cations can cause gelation of sodium alginate. Zinc is able to cross-link less selectively with sodium alginate than calcium and may cause more dense cross-linking" (Aslani 79 § 4; *see* Ans. 5–6).

FF 15. Examiner finds that the combination of Crouch, Asmussen, and Aslani fails to disclose the "[a]dministration of the dosage form to treat a gastroesophageal condition associated with stomach acid" (Ans. 9).

FF 16. Kirchhoff discloses "that zinc offers a novel rapid and prolonged therapy to inhibit gastric acid secretion in human and rat models" (Kirchhoff, Abstract; *see also id.* 68 (Kirchhoff discloses "that zinc offers a rapid and prolonged inhibition of gastric acid secretion," "increasing the

concentration of the essential element zinc can provide an alternative or supplemental treatment strategy for patients with gastroesophageal reflux disease, and breakthrough gastroesophageal reflux disease by providing a rapid inhibition and protection from the hypersecretion of acid," and "[t]his new therapeutic can target patients that are unhappy with their present acid suppression therapy as well as providing an essential element for cell function that is potentially lost on conventional PPI therapy"); Ans. 9).

FF 17. Examiner finds that the combination of Crouch, Asmussen, and Aslani fails to disclose "[t]he use of the amino acid glutamine to treat gastroesophageal conditions" (Ans. 10).

FF 18. Examiner finds that Shive "discloses a pharmaceutical preparation that comprises glutamine for the treatment of peptic ulcers . . . . Dosages as low as 0.2 g (200 mg) can be administered . . . and as it [is] in powder form, it can be orally administered in forms such as capsules" (Ans. 10 (citing Shive 1:15–18; *id. at* 1: 67–71; *id.* at 2: 5–71).

ANALYSIS

The rejection over the combination of Crouch, Asmussen, and Aslani:

Appellant's claims 1 and 14 are representative and reproduced above.

Claim 1:

Based on the combination of Crouch, Asmussen, and Aslani, Examiner concludes that, at the time Appellant's invention was made, it would have been prima facie obvious to use Asmussen's zinc alginate as the noncellulose-based swelling/sustained release agent of Crouch's therapeutically effective oral pharmaceutical dosage form having an active ingredient combination including an amino acid source, a zinc source, and

an effervescent agent, because Asmussen's zinc alginate, like Crouch's noncellulose-based swelling/sustained release agents, is effective in prolonging the retention time of a therapeutically effective oral pharmaceutical dosage form in the stomach (*see* FF 1–12; *see generally* FF 13 (Aslani discloses that "[s]odium alginate is a water soluble salt of alginic acid, a naturally occurring non-toxic polysaccharide found in all species of brown algae")). In addition, "[i]n the environment present in the human intestine, . . . [Asmussen's zinc alginate] quickly dissolves so that after it has been emptied from the stomach, its accumulation in the intestine and thus a potentially threatening intestinal obstruction can be avoided" (*see* FF 11).

Asmussen discloses that zinc alginate is a swelling agent (FF 10). Crouch discloses that the combined properties of swelling and an effervescence effect in gastric juice increases its therapeutically effective oral pharmaceutical dosage form's, i.e., pill's, buoyancy resulting in increased residence time and pill motility in the stomach. Thus, at the time of Appellant's claimed invention, a person of ordinary skill in this art would have found it prima facie obvious that the effervescent agent in the therapeutically effective oral pharmaceutical dosage form made obvious by the combination of Crouch, Asmussen, and Aslani will make zinc alginate buoyant upon contact with gastric fluid (*see* FF 1–12).

For the foregoing reasons, we are not persuaded by Appellant's contention that a conclusion of obviousness based on the combination of Crouch, Asmussen, and Aslani is based on improper hindsight (Appeal Br. 4; *see also id.* at 6).

We are not persuaded by Appellant's contention that Asmussen fails to specifically exemplify compositions using zinc salts of the alginate

(Appeal Br. 6). A reference disclosure is not limited only to its preferred embodiments, but is available for all that it discloses and suggests to one of ordinary skill in the art. *In re Lamberti*, 545 F.2d 747, 750 (CCPA 1976); *see also In re Susi*, 440 F.2d 442, 446 n.3 (CCPA 1971) (Disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or non-preferred embodiments.).

As discussed above, Asmussen discloses the use of zinc alginate as a swelling component of a therapeutically effective dosage form to prolong the retention of the dosage form in the stomach (*see*, *e.g.*, FF 10–11). Thus, we are not persuaded by Appellant's contention that Asmussen "fails to discuss how zinc salts would modify the properties of the sodium alginate swelling body" (Appeal Br. 6).

For the foregoing reasons, we are not persuaded by Appellant's contention that "Asmussen and Aslani explicitly point the skilled person toward using sodium or calcium salts, not zinc salts, in alginate formulations" (*id.* at 6–7; *cf.* FF 10–14).

Because the obviousness rationale discussed above does not rely on the use of more than one "swelling means" or the use of zinc to "improv[e] the buoyancy of Crouch's composition when there is little liquid in the stomach," we are not persuaded by Appellant's contentions regarding these issues (*see* Appeal Br. 8–14).

Claim 14:

Initially, we note that Appellant included claim 14 with its contentions concerning claim 1 (*see* Appeal Br. 14). For the reasons set forth above, we are not persuaded by these contentions.

The composition of Appellant's claim 14 comprises, *inter alia*, 10% w/w to 55% w/w of zinc alginate. Examiner finds that Crouch discloses the use of 0–300 mg noncellulose-based swelling/sustained release agent, i.e., polyacrylic acid crosslinked polymer CARBOPOL® and exemplifies compositions having, *inter alia*, 11% and 19% noncellulose-based swelling/sustained release agent (*see* FF 7–8). Thus, we find no error in Examiner's conclusion that the combination of Crouch, Asmussen, and Aslani makes obvious a composition comprising 0–300 mg and, more specifically 11% and 19% of a noncellulose-based swelling/sustained release agent, such as zinc alginate (*see generally* Ans. 7), wherein, as discussed above, at the time of Appellant's claimed invention it would have been prima facie obvious to a person of ordinary skill in this art to utilize alginate, as described in Asmusson, as the noncellulose-based swelling/sustained release agent in Crouch's composition. *See Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1322 (Fed. Cir. 2004) ("[W]here there is a range disclosed in the prior art, and the claimed invention falls within that range, there is a presumption of obviousness."). In addition, we note that "where[, as here,] the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456 (CCPA 1955). Thus, we find no error in Examiner's conclusion that it would have been prima facie obvious to optimize, *inter alia*, the concentration of noncellulose-based swelling/sustained release agent, i.e., zinc alginate, in the composition made obvious by the combination of Crouch, Asmussen, and Aslani, within the range disclosed by Crouch.

Because the obviousness rationale discussed above relies on the concentrations of the noncellulose-based agent in Crouch, and not the concentration of zinc alginate in Asmussen's composition, we are not persuaded by Appellant's contentions regarding Asmussen's disclosure of a zinc alginate concentration (*see* Appeal Br. 15–18).

For the reasons discussed above, we are not persuaded by Appellant's contention that "the skilled person would not find any suggestion to modify Crouch's composition to include 10%-55% w/w zinc alginate" (*id.* at 16). For the same reasons, we are not persuaded by Appellant's contention that a person of ordinary skill in this art would not have found it routine to discover the optimum or workable ranges of the noncellulose-based swelling/sustained release agent, i.e. zinc alginate, in the composition suggested by the combination of Crouch, Asmussen, and Aslani (*id.* at 17).

For the foregoing reasons, we are not persuaded that the rejection discussed above is based on conclusory statements (*id.* at 17–18).

The rejection over the combination of Crouch, Asmussen, Aslani, and Kirchoff:

Appellant's claims 24 and 33 are representative and reproduced above.

Claim 24:

The combination of Crouch, Asmussen, and Aslani is discussed above (*see* FF 1–14). Examiner recognizes, however, that the combination of Crouch, Asmussen, and Aslani fails to disclose the "[a]dministration of the dosage form to treat a gastroesophageal condition associated with stomach acid" (FF 15). Kirchhoff, however, discloses that "zinc offers a rapid and

prolonged inhibition of gastric acid secretion," that "increasing the concentration of the essential element zinc can provide an alternative or supplemental treatment strategy for patients with gastroesophageal reflux disease[] and breakthrough gastroesophageal reflux disease by providing a rapid inhibition and protection from the hypersecretion of acid," and that "[t]his new therapeutic can target patients that are unhappy with their present acid suppression therapy as well as providing an essential element for cell function that is potentially lost on conventional [protein pump inhibitor (PPI)] therapy" (FF 16).

Thus, we find no error in Examiner's conclusion that, at the time Appellant's invention was made, it would have been prima facie obvious to administer the dosage form made obvious by the combination of Crouch, Asmussen, and Aslani, to treat a gastroesophageal condition associated with stomach acid, as suggested by Kirchoff (*see* FF 1–16; *see generally* Ans. 9).

As Examiner recognizes, Appellant "present[s] no arguments relating to Kirchoff" (Ans. 17). To be complete, however, we note that Appellant included claim 24 in its contentions relating to Appellant's claim 1 (*see* Appeal Br. 14). We are not persuaded by Appellant's contentions, for the reasons set forth above with respect to Appellant's claim 1.

Claim 33:

Appellant's claim 33, reproduced above, depends from and further limits Appellant's claim 24. As noted above, Appellant "present[s] no arguments relating to Kirchoff" (*see* Ans. 17).

To be complete, however, we note that Appellant included claim 33 in its contentions relating to Appellant's claim 14 (*see* Appeal Br. 15). We are

not persuaded by Appellant's contentions, for the reasons set forth above with respect to Appellant's claim 14.

The rejection over the combination of Crouch, Asmussen, Aslani, Kirchoff, and Shive:

Appellant's claim 23 is reproduced above.

Based on the combination of Crouch, Asmussen, Aslani, Kirchoff, and Shive, Examiner concludes that, at the time Appellant's invention was made, it would have been prima facie obvious to include glutamine, as suggested by Shive, in the composition made obvious by the combination of Crouch, Asmussen, Aslani, and Kirchoff (*see* FF 1–18; *see also* Ans. 10).

As Examiner recognizes, Appellant "present[s] no arguments relating to Shive" (Ans. 17).

CONCLUSION

The preponderance of evidence relied upon by Examiner supports a conclusion of obviousness.

The rejection of claims 1 and 14 under 35 U.S.C. § 103(a) as unpatentable over the combination of Crouch, Asmussen, and Aslani is affirmed. Claims 4–9, 13, 17–20, 43, and 44 are not separately argued and fall with claim 1. Claims 10 and 11 are not separately argued and fall with claim 14. Because our rationale differs from Examiner's we designate the affirmance of this rejection a new ground of rejection.

The rejection of claims 24, 29–34, 36, and 45 under 35 U.S.C. § 103(a) as unpatentable over the combination of Crouch, Asmussen, Aslani, and Kirchoff is affirmed. Claims 29–32, 36, and 45 are not separately argued and fall with claim 24. Claim 34 is not separately argued and fall with claim 33. Because our rationale for combining Crouch, Asmussen, and

Aslani differs from Examiner's we designate the affirmance of this rejection a new ground of rejection.

The rejection of claim 23 under 35 U.S.C. § 103(a) as unpatentable over the combination of Crouch, Asmussen, Aslani, Kirchoff, and Shive is affirmed. Because our rationale for combining Crouch, Asmussen, and Aslani differs from Examiner's we designate the affirmance of this rejection a new ground of rejection.

DECISION SUMMARY

In summary:

Claims Rejected	**35 U.S.C. §**	**Reference(s)/ Basis**	**Affirmed**	**Reversed**	**New Ground**
1, 4–11, 13, 14, 17–20, 43, 44	103	Crouch, Assmussen, Aslani			1, 4–11, 13, 14, 17–20, 43, 44
24, 29–34, 36, 45	103	Crouch, Assmussen, Aslani, Kirchoff			24, 29–34, 36, 45
23	103	Crouch, Assmussen, Aslani, Kirchoff, Shive			23
Overall Outcome					1, 4–11, 13, 14, 17–20, 24, 29–34, 36, 43–45

TIME PERIOD FOR RESPONSE

This decision contains a new ground of rejection pursuant to 37 C.F.R. § 41.50(b) (effective September 13, 2004, 69 Fed. Reg. 49960 (August 12, 2004), 1286 Off. Gaz. Pat. Office 21 (September 7, 2004)). 37 C.F.R. § 41.50(b) provides "[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review."

37 C.F.R. § 41.50(b) also provides that the appellant, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

> (1) *Reopen prosecution*. Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the proceeding will be remanded to the examiner. . . .
>
> (2) *Request rehearing*. Request that the proceeding be reheard under § 41.52 by the Board upon the same record. . . .

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; 37 C.F.R. § 41.50(b)