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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MAKOTO MIURA, KAZUKI NAKAGAWA, SHIGEYUKI TAKEUCHI, and KAZUMASA WATANABE

Appeal 2015-004566
Application 13/021,083
Technology Center 1700

Before CHUNG K. PAK, JEFFREY T. SMITH, and WESLEY B. DERRICK, *Administrative Patent Judges*.

PAK, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants[1] appeal under 35 U.S.C. § 134(a) from the Examiner's decision finally rejecting claims 1, 3, 11, and 17 through 22.[2] We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

The subject matter on appeal is generally directed to a feed additive for pigs that comprises monosodium L-glutamate and L-tryptophan. (Spec. ¶ 15.) The mass ratio of free monosodium L-glutamate and free L-

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[1] Appellants identify the Real Party in Interest as Ajinomoto Co., Inc. (Appeal Brief filed November 17, 2014, ("App. Br.") 3.)
[2] Final Office Action entered April 10, 2014 ("Final Act.").

tryptophan in the feed additive is from 0.5 to 30, and the free monosodium L-glutamate is in the form of monosodium L-glutamate monohydrate. (Spec. ¶¶ 15, 16.)

Details of the appealed subject matter are recited in representative claim 1, which is reproduced below from the Claims Appendix to the Appeal Brief:

> 1. A feed additive for pig, which comprises monosodium L-glutamate and L-tryptophan, wherein the mass ratio of free monosodium L-glutamate and free L-tryptophan (GLU/TRP ratio) is from 0.5 to 30, and wherein the free monosodium L-glutamate is in the form of monosodium L-glutamate monohydrate.

The Examiner maintains the following grounds of rejection in the Answer entered on January 15, 2015 ("Ans."):

Claims 11, 20, and 22 under 35 U.S.C. § 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter that the inventors regard as the invention.

Claims 1, 3, 17–19, and 21 under 35 U.S.C. § 103(a) as unpatentable over the disclosures of U.S. Patent 4,738,852 issued in the name of Watanabe et al. on April 19, 1988 (hereinafter referred to as "Watanabe"), Zhang et al., *Tryptophan Enhances Ghrelin Expression and Secretion Associated with Increased Food Intake and Weight Gain in Weanling Pigs*, 33 Domestic Animal Endocrinology 47 (2007) (hereinafter referred to as "Zhang"), Pastuszewska et al., *Effects of Supplementing Pig Diets with Tryptophan and Acidifier on Protein Digestion and Deposition, and on Brain Serotonin Concentration in Young Pigs*, 132 Animal Feed Science

and Technology 49 (2007) (hereinafter referred to as "Pastuszewska"), Lewis et al., *Determination of the Optimum Dietary Proportions of Lysine and Tryptophan for Growing Pigs Based on Growth, Food Intake and Plasma Metabolites*, 107 J. Nutr. 1369 (1977) (hereinafter referred to as "Lewis"), and U.S. Patent 3,362,828 issued in the name of Thrasher et al. on January 9, 1968 (hereinafter referred to as "Thrasher") as evidenced by Mike Varley, *Taking Control of Feed Conversion Ratio* (April 1, 2009) www.pigprogress.net (hereinafter referred to as "Varley"), Proteins and Amino Acids (2001) http://www.ncsu.edu/project/swine_ extension/nutrition/nutritionguide/protein%20and%20amino0/o20acidsi,Qro taa.htm (hereinafter referred to as "Proteins and Amino Acids"), and Wikipedia, *Glutamate Flavoring* (January, 2008) en.wikipedia.org/wiki/Glutamate _flavoring (hereinafter referred to as "Wikipedia").

DISCUSSION

Upon consideration of the evidence on this appeal record and each of Appellants' contentions, we determine that Appellants have not identified reversible error in the Examiner's rejection of claims 11, 20, and 22 under 35 U.S.C. § 112, second paragraph and the Examiner's rejection of claims 1, 3, 17–19, and 21 under 35 U.S.C. § 103(a). Accordingly, we affirm these rejections for the reasons set forth in the Answer. We add the discussion below primarily for emphasis and completeness.

Rejection of Claims 11, 20, and 22 under 35 U.S.C. § 112, Second Paragraph

The Examiner determines that because claims 11, 20, and 22 depend from cancelled claim 9, it is unclear which independent or dependent claims they further limit, and the Examiner therefore does not further examine these claims with respect to the prior art. (Ans. 2.)

Appellants argue that the Examiner should have objected to claims 11, 20, and 22, rather than rejecting them under 35 U.S.C. § 112, second paragraph, and contend that the Examiner should have rejected these claims over the prior art based on an interpretation of the claims that renders the prior art applicable. (App. Br. 6–7.)

However, because claims 11, 20, and 22 depend from cancelled claim 9, it is impossible to determine the metes and bounds of the subject matter encompassed by these claims. Hence, we find that the Examiner does not err in rejecting these claims for indefiniteness, and does not err in declining to examine these claims with respect to the prior art because to do so would require considerable speculation with regard to the metes and bounds of the claimed subject matter. *In re Steele*, 305 F.2d 859, 862 (CCPA 1962) ("Our analysis of the claims indicates that considerable speculation as to meaning of the terms employed and assumptions as to the scope of such claims were made by the examiner and the board. [W]e do not think a rejection under 35 U.S.C. § 103 should be based on such speculations and assumptions."); *In re Wilson*, 424 F.2d 1382, 1385 (CCPA 1970) ("If no reasonably definite meaning can be ascribed to certain terms in the claim, the subject matter does not become obvious— the claim becomes indefinite."). We

accordingly sustain the Examiner's rejection of claims 11, 20, and 22 under 35 U.S.C. § 112, second paragraph.

Rejection of Claims 1, 3, 17–19, and 21 under 35 U.S.C. § 103(a)[3]

Appellants do not dispute the Examiner's finding that Watanabe discloses that incorporating 0.001%–0.1% by weight of free L-tryptophan into swine feed increased the body weight of the swine. (*Compare* Ans. 4, 6 *with* App. Br. 7–11.) Appellants also do not dispute the Examiner's finding that Zhang discloses that increased ingestion of tryptophan by pigs improved the pigs' weight gain and feed conversion. (*Compare* Ans. 4–5 *with* App. Br. 7–11.) Nor do Appellants dispute the Examiner's finding that Pastuszewska discloses that tryptophan regulates feed intake in pigs, and tryptophan deficiency depresses pigs' feed intake and growth. (*Compare* Ans. 5 *with* App. Br. 7–11.)

The Examiner acknowledges that Watanabe, Zhang, and Pastuszewska do not disclose the use of monosodium L-glutamate as a feed additive for pigs, and the Examiner relies on Thrasher's disclosure that feeding pigs 0.005–0.02%[4] by weight monosodium glutamate increases their

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[3] We limit our discussion to those claims separately argued, and claims not separately argued stand or fall with the argued claims. 37 C.F.R. § 41.37(c)(1)(iv). Appellants appear to argue claims 1, 3, 17–19, and 21 as a group on the basis of claims 1 and 21. (*See generally* App. Br. 7–11.) Therefore, for the purposes of this appeal, we select claims 1 and 21 as representative, and decide the propriety of the rejection of claims 1, 3, and 17–19 based on these claims alone.

[4] Thrasher discloses swine feed containing 0.01% to about 5% monosodium glutamate, and we find no disclosure in Thrasher of feed containing 0.005% to 0.02% monosodium glutamate as the Examiner asserts.

growth rate. (Ans. 5–6.) The Examiner acknowledges that Thrasher does not disclose that the monosodium glutamate utilized in the pig feed was *monohydrate* monosodium glutamate, and the Examiner relies on an evidentiary reference—the Wikipedia article—as well as Appellants' Specification, which teach that when glutamic acid and its salts, such as monosodium glutamate, are dissolved in aqueous solution, such as that occurs in the mouth, they are converted to glutamate ions, the form that enhances taste. (Ans. 9–10.) The Examiner determines that a patentable distinction therefore does not exist between monosodium glutamate and monohydrate monosodium glutamate used in pig feed. (*Id.*)

The Examiner concludes that because Watanabe, Zhang, Pastuszewska, and Thrasher are all drawn to increasing weight gain in pigs, it would have been obvious to feed pigs a combination of both tryptophan and monosodium L-glutamate or monosodium L-glutamate monohydrate to increase weight gain. (Ans. 6–7.) The Examiner further concludes that one of ordinary skill in the art would have arrived at the ratio of free monosodium L-glutamate to free L-tryptophan recited in claim 1 through routine experimentation and the ratio of the amount of tryptophan disclosed in Thrasher and the amount of monosodium glutamate disclosed in Watanabe falls within the claimed range. (*Id.*)

Claim 21 depends from claim 1 and recites a method for improving the feed conversion ratio and body weight gain efficiency of pigs that comprises feeding the pigs the feed additive of claim 1. The Examiner determines that improving the feed conversion ratio and body weight gain efficiency of pigs would have naturally flowed from following the

suggestion stemming from the combined disclosures of Watanabe, Zhang, Pastuszewska, and Thrasher of feeding pigs a combination of tryptophan and monosodium L-glutamate having a ratio of free monosodium L-glutamate to free L-tryptophan recited in claim 1. (Ans. 9.)

Appellants argue that the applied prior art, alone or in combination, does not teach or suggest a combination of L-tryptophan and monosodium glutamate, particularly monohydrate monosodium glutamate, and also does not suggest the ratio of free monosodium L-glutamate to free L-tryptophan recited in claim 1. (App. Br. 7–8.) Appellants further contend that the applied prior art references do not disclose or suggest feed conversion ratio, as recited in dependent claim 21, and therefore, one of ordinary skill in the art would not have been motivated to combine the applied prior art in order to determine the ratio free L-tryptophan to free monosodium L-glutamate that would optimize the feed conversion ratio. (App. Br. 11.)

However, Zhang discloses that weight gain and feed conversion improve in pigs when levels of dietary tryptophan increase, consistent with Watanabe's disclosure that incorporating free L-tryptophan into swine feed increases body weight, and Pastuszewska's disclosure that tryptophan deficiency in pigs depresses their growth. (Zhang Abstract; Watanabe col. 2, ll. 35–39, 48–59; Pastuszewska 50.) Thrasher discloses that feeding swine monosodium glutamate increases their growth rate and improves feed conversion. (Thrasher col. 6, ll. 26–33.) Accordingly, we concur with the Examiner that one of ordinary skill in the art seeking to increase body weight and feed conversion in pigs reasonably would have been led to incorporate either tryptophan or monosodium glutamate in the monohydrate

form, or a combination of both tryptophan and monosodium glutamate in monohydrate form, into feed for the pigs with a reasonable expectation that using a combination of both amino acids would result in successful improvements in weight gain and feed conversion. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007) (quoting *Sakraida v. Ag Pro, Inc.*, 425 U.S. 273, 282 (1976) ("[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."); *In re Kerkhoven*, 626 F.2d 846, 850 (CCPA 1980) ("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 which is to be used for the very same purpose.")

With respect to the ratio of free monosodium L-glutamate to free L-tryptophan recited in claim 1, Appellants do not dispute the Examiner's finding that the ratio of the amount of L-tryptophan disclosed in Watanabe as useful for promoting weight gain in swine to the amount of monosodium glutamate disclosed in Thrasher as useful for increasing growth rate in pigs, is inclusive of the ratio of free monosodium L-glutamate to free L-tryptophan recited in claim 1. (*Compare* Ans. 6 *with* App. Br. 7–11.) *In re Peterson*, 315 F.3d 1325, 1329–330 (Fed. Cir. 2003) ("In cases involving overlapping ranges, we and our predecessor court have consistently held that even a slight overlap in range establishes a *prima facie* case of obviousness."). Nor do Appellants dispute the Examiner's determination that one of ordinary skill in the art would have optimized the ratio of free monosodium L-glutamate to free L-tryptophan in pig feed through nothing

more than routine experimentation to arrive at the ratio recited in claim 1. (*Compare* Ans. 7 *with* App. Br. 7–11.) *In re Aller*, 220 F.2d 454, 456 (CCPA 1955) ("[W]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."). Accordingly, Appellants' arguments that the applied prior art does not disclose or suggest the ratio of free monosodium L-glutamate to free L-tryptophan recited in claim 1 are unpersuasive of reversible error.

Appellants further argue that the monohydrate form of monosodium L-glutamate imparts a surprising and unpredictable improvement in feed conversion ratio in pigs as compared to glutamic acid.[5] (App. Br. 8–11.) In support of this assertion, Appellants rely on data from the experimental examples provided in the Specification. (*Id.*) Specifically, Appellants assert that the improvement in feed conversion ratio obtained by feeding pigs Samples 1 and 2 from Example 1, and Sample 4 from Example 2, which contained monohydrate monosodium L-glutamate, was much larger than the improvement in feed conversion ratio obtained by feeding pigs Samples 5 and 6 from Example 3, which contained glutamic acid. (App. Br. 8–10; Spec. ¶¶ 67–95.) Appellants explain that these improvements in feed

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[5] As indicated *supra*, Thrasher, one of the closest pieces of prior art, describes using monosodium L-glutamate, rather than glutamic acid. *In re Baxter Travenol Labs.*, 952 F.2d 388, 392 (Fed. Cir. 1991) ("[W]hen unexpected results are used as evidence of nonobviousness, the results must be shown to be unexpected compared with the closest prior art.")

conversion ratio were determined by normalizing the results from experimental Samples 1, 2, 4, 5, and 6 against results from Comparative Samples 4, 8, and 12, which contained only L-tryptophan, and no monosodium glutamate or glutamic acid. (App. Br. 9.)

However, Appellants do not show that the improvement in feed conversion ratio obtained from feeding pigs Samples 1, 2, and 4 containing monohydrate monosodium L-glutamate and L-tryptophan would have been unexpected. (App. Br. 8–11.) When the feed conversion ratio obtained from Sample 2, containing 0.11% L-tryptophan and 1.13% monohydrate monosodium L-glutamate, is compared to the feed conversion ratio obtained from Control 7, containing 1.13% monohydrate monosodium L-glutamate, and Control 8, containing 0.11% L-tryptophan, it appears that the improvement in feed conversion ratio for Sample 2 reflects nothing more than the expected, additive effect of feeding pigs both L-tryptophan and monohydrate monosodium L-glutamate relative to feeding pigs each compound individually. (Spec. ¶¶ 72–74, 81–83, 91–93.) Such results would not have been unexpected in view of Thrasher's teaching that monosodium glutamate improves feed conversion, and Zhang's teaching that tryptophan improved feed conversion. (Thrasher col. 6, ll. 26–33; Zhang Abstract.) In other words, Appellants do not demonstrate that the feed conversion ratio data obtained from the relied-upon experimental examples are not a result of the total amount of the compounds, which is far greater than the amount of the individual compound employed, known to improve feed conversion that was fed to the pigs, rather than the result of the monohydrate form of monosodium L-glutamate fed in combination with

tryptophan at a specific ratio. (App. Br. 8–11.); *In re Freeman*, 474 F.2d 1318, 1324 (CCPA 1973) (to show unexpected results, applicant must establish: "(1) that there actually is a difference between the results obtained through the claimed invention and those of the prior art, . . . and (2) that the difference actually obtained would not have been expected by one skilled in the art at the time of invention") (citation omitted); *In re Klosak*, 455 F.2d 1077, 1080 (CCPA 1972) ("the burden of showing unexpected results rests on he who asserts them"). In fact, Appellants fail to direct us to any statement in the Specification attesting to the unexpected nature of the relied-upon data, or to any other persuasive evidence or averment evincing that these results would have been unexpected by one of ordinary skill in the art at the time of the invention. (App. Br. 8–11); *see, e.g.*, *In re Geisler*, 116 F.3d 1465, 1471 (Fed. Cir. 1997) ("Geisler made no such assertion [that results were unexpected] in his application. Nor did Geisler submit any such statement through other evidentiary submissions, such as an affidavit or declaration under Rule 132 . . . . Instead, the only reference to unexpected results was a statement by Geisler's counsel . . . that Geisler's results were 'surprising.'").

In addition, Appellants do not demonstrate that the relied-upon, narrow showing of five inventive Samples supports patentability over the entire scope of the feed additives recited in claim 1. (App. Br. 8–11.) While the showing is limited to using the specific amounts of L-tryptophan and monohydrate monosodium L-glutamate to an unknown specific feed, the claims are not so limited. *In re Harris*, 409 F.3d 1339, 1344 (Fed. Cir. 2005) ("Even assuming that the results were unexpected, Harris needed to

show results covering the scope of the claimed range. Alternatively Harris needed to narrow the claims."); *In re Greenfield*, 571 F.2d 1185, 1189 (CCPA 1978) ("Establishing that one (or a small number of) species gives unexpected results is inadequate proof, for 'it is the view of this court that objective evidence of non-obviousness must be commensurate in scope with the claims which the evidence is offered to support.'") (quoting *In re Tiffin*, 448 F.2d 791, 792 (CCPA 1971)).

Thus, we find no reversible error in the Examiner's determination that the evidence of unobviousness relied on by Appellants does not outweigh the evidence of obviousness proffered by the Examiner. We accordingly sustain the rejection of claims 1, 3, 17–19, and 21 under 35 U.S.C. § 103(a).

CONCLUSION

In view of the reasons set forth in the Answer and above, we affirm the Examiner's rejection of claims 11, 20, and 22 under 35 U.S.C. § 112, second paragraph, and the Examiner's rejection of claims 1, 3, 17–19, and 21 under § 103(a).

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