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Richard C. Litman Nath, Goldberg & Meyer 112 S. West Street Alexandria, VA 22314			KANTAMNENI, SHOBHA	
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ZIYAD BINKHATHLAN,
ABDULLAH H. ALOMRANI, AWS ALSHAMSAN,
IBRAHIMI. ALJUFFALI, and RAISUDDIN ALI

Appeal 2020-000703
Application 15/084,441
Technology Center 1600

Before RICHARD M. LEBOVITZ, JASON V. MORGAN, and
DEBORAH KATZ, *Administrative Patent Judges*.

LEBOVITZ, *Administrative Patent Judge*.

DECISION ON APPEAL

The Examiner rejected the claims under 35 U.S.C. § 103 as obvious. Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject the claims. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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 King Saud University, Riyadh, Saudi Arabia. Appeal Br. 3.

STATEMENT OF THE CASE

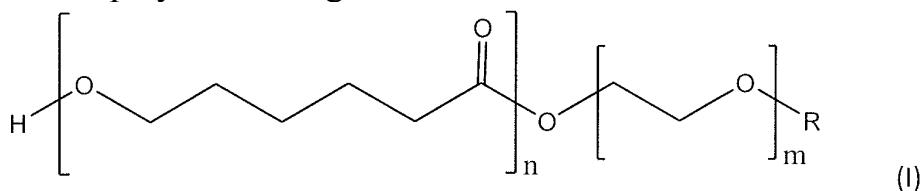
Claims 1 and 4 stand rejected by the Examiner as follows:

Claims 1 and 4 under 35 U.S.C. § 103 as obvious in view of Bogdanov et al. (*Polymer*, 1998, 39(8–9):1631–36) (“Bogdanov”). Final Act 3; Ans. 3–4.

Claims 1 and 4 under 35 U.S.C. § 103 as obvious in view of JP 3818457 (published Sept. 6, 2006) (English translation) (“Kuroda”). Final Act. 5; Ans. 7–8.

Independent claim 1 is reproduced below:

1. A poly(ϵ -caprolactone)-ethoxylated fatty alcohol copolymer, comprising a block copolymer having at least one ϵ -caprolactone units and ethoxylated fatty alcohol units, the block copolymer having the structural formula:



wherein n and m are integers, and further wherein n is 1 to 100, m is 10 to 100, and R is an alkyl group having 18 carbon atoms.

REJECTION BASED ON BOGDANOV

The Examiner found that Bogdanov describes a caprolactone block copolymer having a structure similar to the structure recited in claim 1. Final Act. 3. The Examiner found that Bogdanov does not describe the recited n and m values or the R alkyl group as having 18 carbon atoms as recited in the claim. *Id.* However, the Examiner found it would have been obvious to one of ordinary skill in the art to make a polymer with the recited n and m values because Bogdanov “teaches that copolymers with different PCL [poly(ϵ -caprolactone)] block length can be obtained by varying the

concentration of caprolactone monomer” and that it would have been routine optimization to do so. *Id.* at 4.

The Examiner also found that, based on Bogdanov’s teachings, it would have been obvious to one of ordinary skill in the art to make the copolymer with an R alkyl group having 18 atoms with the expectation of obtaining a biodegradable polymer with the desired properties. Ans. 4.

Appellant argues that Bogdanov “does not teach or suggest or render obvious the claimed caprolactone block copolymer having a structural formula as in Claim 1,” but does not identify a defect in the Examiner’s fact-finding or reasoning. Consequently, we find that the Examiner met the initial burden of presenting a prima facie case of obviousness. *In re Huai-Hung Kao*, 639 F.3d 1057, 1066 (Fed. Cir. 2011). Once the examiner establishes a prima facie case of obviousness, the burden shifts to the applicant to rebut that case. *Id.*

In rebuttal, Appellant contends that “the chain length of C18 provides superior drug solubilization capacity and membrane activity than those with shorter or longer chain lengths.” Appeal Br. 12. As evidence of this, Appellant cites Ribeiro,² which Appellant argues demonstrates that “the R value is critical and that R being 18 provides unexpected and superior results over that of Bogdanov.” Appeal Br. 13. Appellant also states that Ribeiro “demonstrated that poly(ethylene oxide) based copolymers, Brij 78 (C18H37E20) showed superior results in loading drugs as compared to other Brij surfactants having different R values and other di-block[]and tri-block copolymers.” *Id.* This evidence, as found by the Examiner, is not persuasive.

² Ribeiro et al., “Solubilisation capacity of Brij surfactants,” *International Journal of Pharmaceutics*, 2012, 436:631–35.

“One way for a patent applicant to rebut a *prima facie* case of obviousness is to make a showing of ‘unexpected results,’ i.e., to show that the claimed invention exhibits some superior property or advantage that a person of ordinary skill in the relevant art would have found surprising or unexpected.” *In re Soni*, 54 F.3d 746, 750 (Fed. Cir. 1995). The burden of establishing unexpected results rests with the appellant. *In re Klosak*, 455 F.2d 1077, 1080 (CCPA 1972). To meet this burden, appellant must provide objective evidence demonstrating that the claimed subject matter imparts results that would have been unexpected by one of ordinary skill in the art at the time of the invention, relative to the closest prior art. *See 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.”).

In this case, as discussed by the Examiner, Ribeiro only analyzed the drug solubilizing properties of poly(ethylene oxide)-based copolymers have an R group alkyl chain of 18 carbon atoms. Ans. 6. Specifically, Ribeiro compared the ability of Brij 78, Brij 98, and Brij 700, each with an 18 carbon atom alkyl chain and a poly(ethylene oxide) chain, to solubilize a poorly water-soluble drug. Ribeiro, Abstract. The Brij compounds had the same length alkyl chain of 18 carbon atoms, but differed in the number of oxyethylene (E) groups present in the poly(ethylene oxide) chain. *Id.* Ribeiro found that drug solubility varied with the number of oxyethylene groups. *Id.* Ribeiro did not show that a carbon chain length of 18 carbon atoms was superior to carbon chain lengths of any other number; only one carbon chain length was tested by Ribeiro. The effect on solubility was shown by Ribeiro

to be related to the poly(ethylene oxide) chain, not the length of the alkyl group. *Id.*

These results are not sufficient to establish unexpected superiority of a compound of claim 1 having an R alkyl group of 18 carbon atoms. To establish unexpected results, there must be a comparison to the closest prior art. *Baxter*, F.2d at 392. Here, there was no comparison made to a compound have the number of R groups disclosed in the compounds described by Bogdanov. No comparison was made to any other R group length. It cannot be determined whether the claimed compound having an R alkyl group of 18 carbon atoms is unexpectedly superior to compounds with the same structure, but differing by the length of the alkyl group chain. Appellant also presented no arguments regarding the n and m values.

Appellant also did not provide any evidence that the results described in Ribeiro would have been unexpected by *one ordinary skill in the art* as required by *Soni*, 54 F.3d at 750. The only statement of “superiority” we have been directed to, was made by the attorney in the Appeal Brief.

An applicant cannot prove unexpected results with attorney argument and bare statements without objective evidentiary support. *See In re Lindner*, 59 C.C.P.A. 920, 457 F.2d 506, 508 (CCPA 1972); *In re Geisler*, 116 F.3d 1465, 1470 (Fed. Cir. 1997) (“attorney argument [is] not the kind of factual evidence that is required to rebut a prima facie case of obviousness”); *In re Soni*, 54 F.3d 746, 750 (Fed. Cir. 1995) (“It is well settled that unexpected results must be established by factual evidence. Mere argument or conclusory statements . . . [do] not suffice.”) (quoting *In re De Blauwe*, 736 F.2d 699, 705 (Fed. Cir. 1984)). *CFMT, Inc. v. Yieldup Intern. Corp.*, 349 F.3d 1333, 1342 (Fed. Cir. 2003).

Consequently, because the Examiner established prima facie obviousness of the claimed subject matter, and Appellant did not provide adequate rebuttal evidence, after considering all the evidence anew, we affirm the obviousness rejection of claim 1 and dependent claim 4 which was not separately argued.

REJECTION BASED ON KURODA

The Examiner found Kuroda describes a block copolymer with the same general structure as the formula recited in claim 1. Final Act 5–6. The Examiner also found that Kuroda teaches that various alcohols can be used to make the claimed structure, including stearyl alcohol which has an R alkyl group of 18 carbon atoms as recited in the claim. *Id.* The Examiner stated that Kuroda does not describe the specifically recited n and m values, but determined it would have been obvious to have made a copolymer with the claimed values by optimizing result specific parameters. *Id.* at 6.

With respect to the claimed compound having an R alkyl group of C18, the Examiner also found Kuroda describes a copolymer where the R alkyl group is C19, a difference of one CH₂ group. Final Act. 6. The Examiner found such difference to be obvious because “homologous compounds are considered to be obvious” and cited case law to support this statement. *Id.* The Examiner also cited Kuroda’s disclosure of stearyl alcohol having an R alkyl group of 18 atoms as further evidence of the obviousness of the claimed compound. *Id.* at 6–7.

Appellant argues that Kuroda “does not teach or suggest or render obvious the claimed caprolactone block copolymer having a structural formula as in Claim 1,” but does not identify a defect in the Examiner’s fact-

finding or reasoning. Appeal Br. 13. Consequently, we find that the Examiner met the initial burden of presenting a prima facie case of obviousness. *Huai-Hung Kao*, 639 F.3d at 1066. Once the examiner establishes a prima facie case of obviousness, the burden shifts to the applicant to rebut that case. *Id.*

Appellant contends that the claimed compound provides “unexpected and superior results over that of Kuroda.” Appeal Br. 13. However, Appellant does not provide any objective evidence that the claimed compound has superior properties to the compound described in Kuroda. There is only a statement by the attorney in the Appeal Brief that the results are unexpected. As indicated above, [a]n applicant cannot prove unexpected results with attorney argument and bare statements without objective evidentiary support.” *CFMT*, 349 F.3d at 1342.

Consequently, because the Examiner establish prima facie obviousness of the claimed subject matter, and Appellant did not provide adequate rebuttal evidence, after considering all the evidence before us, we affirm the obviousness rejection of claim 1 and dependent claim 4 which was not separately argued.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	References	Affirmed	Reversed
1, 4	103	Bogdanov	1, 4	
1, 4	103	Kuroda	1, 4	
Overall Outcome			1, 4	

Appeal 2020-000703
Application 15/084,441

TIME PERIOD

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