UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/622,666	09/19/2012	Jennifer L. Sample	2791-4030-CIP	6892

26085 7590 03/13/2020

THE JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LAB.
OFFICE OF PATENT COUNSEL
11100 JOHNS HOPKINS ROAD
MAIL STOP 7-127
LAUREL, MD 20723-6099

EXAMINER	
CABRAL, ROBERT S	

ART UNIT	PAPER NUMBER
1618	

NOTIFICATION DATE	DELIVERY MODE
03/13/2020	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USPTOComm@jhuapl.edu

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JENNIFER L. SAMPLE, JULIA B. PATRONE, JASON J. BENKOSKI, JENNIFER L. BREIDENICH, LISA A. KELLY, HUONG LE, JAMES C. CROOKSTON, MARCIA W. PATCHAN, LUIS GARZA, XIOMARA CALDERON-COLON, JOSHUA T. WOLFE, MELLISA L. THEODORE, AMANDA NELSON, and SEWON KANG

Appeal 2018-008474[1]
Application 13/622,666
Technology Center 1600

Before RACHEL H. TOWNSEND, CYNTHIA M. HARDMAN, and MICHAEL A. VALEK, *Administrative Patent Judges.*

HARDMAN, *Administrative Patent Judge.*

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134(a) involving claims related to topical compositions comprising a nanoemulsion. The Examiner rejected the claims as obvious under 35 U.S.C. § 103(a). 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 Johns Hopkins University. Appeal Br. 3.

CLAIMED SUBJECT MATTER

Claims 1, 3, 4, 6, 9, 10, 12–14, 16, 19–21, and 27–32 are on appeal. Final Act. 2. The claims are directed to topical compositions comprising a nanoemulsion. Claims 1, 10, and 19 are independent. Claim 1, reproduced below, is illustrative of the claimed subject matter:

> 1. A topical composition comprising a nanoemulsion of a plurality of hydrophobic particles having a hydrophilic coating therein, wherein
>
> the hydrophobic particles are derived from the same or different bulk hydrophobic material and each hydrophobic particle has a melting point less than the melting point of the respective bulk hydrophobic material,
>
> the hydrophobic particles comprise a mean particle size of less than 8 nm, said
>
> hydrophilic coating consists of one or more non-ionic surfactants, and
>
> the nanoemulsion further comprises at least one pharmaceutically active agent;
>
> wherein the bulk hydrophobic material has a melting point of from about 21°C to about 33°C.

Appeal Br. 15 (Claims Appendix).

REFERENCES

The Examiner relied upon the following prior art references:

Name	Reference	Date
De Vringer	US 5,904,932	May 18, 1999
Rosenberger	US 2005/0170004 A1	Aug. 4, 2005
Singh	US 2009/0238878 A1	Sept. 24, 2009
Loxley	US 2010/0062071 A1	Mar. 11, 2010
Nazzal	US 2011/0052704 A1	Mar. 3, 2011
Edelson	US 2011/0212157 A1	Sept. 1, 2011
Nowotnik	US 2012/0231069 A1	Sept. 13, 2012
Silva et al., *Minoxidil-loaded nanostructured lipid carriers (NLC): characterization and rheological behaviour of topical formulations*, 64(3) Pharmazie 177–182 (2009) ("Silva")		
Lee et al., *Detection of hydrogen peroxide with chemiluminescent micelles*, 3(4) Int'l J. Nanomed. 471–476 (2008) ("Lee")		

REJECTIONS

Claims 1, 6, 9, 10, 16, 19, 27 and 30–32 stand rejected under pre-AIA 35 U.S.C. § 103(a) as obvious over Rosenberger, Loxley, and Singh. Final Act. 3.

Claims 14 and 20 stand rejected under pre-AIA 35 U.S.C. § 103(a) as obvious over Rosenberger, Loxley, Singh, and Silva. Final Act. 6.

Claim 21 stands rejected under pre-AIA 35 U.S.C. § 103(a) as obvious over Rosenberger, Loxley, Singh, and Lee. Final Act. 8.

Claims 28 and 29 stand rejected under pre-AIA 35 U.S.C. § 103(a) as obvious over Rosenberger, Loxley, Singh, and Nowotnik. Final Act. 9.

Claims 1, 3, 4, 6, 9, 10, 12, 13, 19, 27, and 30–32 stand rejected under pre-AIA 35 U.S.C. § 103(a) as obvious over Rosenberger, Loxley, Silva, and Nazzal. Final Act. 10.

Claims 1, 6, 9, 27, 28, and 30 stand rejected under pre-AIA 35 U.S.C. § 103(a) as obvious over De Vringer and Edelson. Final Act. 16.

OPINION

"[T]he examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a *prima facie* case of unpatentability." *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). For the following reasons, we conclude that the Examiner has not satisfied this burden.

We first address the obviousness rejections that involve Rosenberger. The same issue is dispositive of each of these rejections; thus, we address them together.

We begin with an understanding of the claim scope. Independent claims 1, 10, and 19 each recite, in relevant part, a "topical composition comprising a nanoemulsion of a plurality of hydrophobic particles having a hydrophilic coating therein."[2] Appeal Br. 15–17 (Claims Appendix). The claims further recite that the "hydrophilic coating **consists of** one or more non-ionic surfactants." Appeal Br. 15–17 (Claims Appendix) (emphasis added).

The phrase "consists of" is a term of art, and when it appears in a clause in the body of a claim, it closes the element preceded by "consists of." *Mannesmann Demag Corp. v. Engineered Metal Prods. Co.*, 793 F.2d 1279, 1282 (Fed. Cir. 1986) (confirming that the phrase "consisting of"

[2] The claim term "therein" injects ambiguity as to the location of the hydrophilic coating, i.e., whether it coats the outside or inside of the hydrophobic particles (e.g. in the case of hollow particles). Based on guidance from the Specification, we construe the claim as requiring the hydrophilic coating to reside at least in part on the outside of the hydrophobic particles. *See* Spec. ¶¶ 57 (describing process of mixing hydrophobic and hydrophilic materials to obtain "solid hydrophobic particles with a hydrophilic coating"); 73 (describing "solid hydrophilic particles" that diffuse into skin).

appearing in a clause of a claim specifically limits the element set forth in that clause); *In re Crish*, 393 F.3d 1253, 1257 (Fed. Cir. 2004) (finding that the term "consists" limits the "said portion" language to the subsequently recited numbered nucleotides). Here, the "consists of" language closes the hydrophilic coating to any class of surfactants other than non-ionic surfactants. In other words, the hydrophilic coating cannot contain ionic surfactant.

To meet the claim limitation directed to a hydrophilic coating that "consists of one or more non-ionic surfactants," the Examiner asserted that Rosenberger's nanoparticles "may comprise a non-ionic surfactant." Rosenberger Final Act. 3 (citing Rosenberger ¶¶ 20, 21, 23). We disagree that Rosenberger meets this claim limitation.

Rosenberger is directed to pharmaceutical compositions comprising "a nanoparticle and any one of a peptide, polysaccharide, or glycoprotein, attached electrostatically thereto." Rosenberger Abstract. Rosenberger teaches that in "order to bond peptide or protein drugs to the surface of the nanoparticles, the nanoparticle needs to be produced with a charged surface." Rosenberger ¶ 59. While Rosenberger discloses that the nanoparticle material (such as a wax) may be emulsified with a non-ionic surfactant, Rosenberger clarifies that where such a non-ionic surfactant is used, "an ionic surfactant need[s to] be added to the wax/surfactant formulation melt in order to obtain charged nanoparticles upon solidification of the microemulsion." Rosenberger ¶ 64; *see also id.* (noting that where non-ionic surfactants are used, "[i]n order to make the charged surface nanoparticles, it is necessary to add a charged surfactant to the wax melt to form the microemulsion with the surfactant groups incorporated"). Thus,

while the Examiner is correct that Rosenberger's nanoparticles "may comprise a non-ionic surfactant," this does not read on Appellant's claims, because Rosenberger makes clear that where a non-ionic surfactant is used, an ionic surfactant must also be added to achieve the charged surface necessary for electrostatic attachment of the drug.

The Examiner disputes this reading of Rosenberger, asserting that Rosenberger's process results "in a hydrophilic coating consisting of a non-ionic surfactant." Ans. 4. This assertion is not supported by any persuasive evidence of record. Indeed, such a result would be at odds with the aim of Rosenberger, which is to electrostatically attach a peptide, polysaccharide, or glycoprotein to a nanonparticle. Rosenberger Abstract. As noted above, Rosenberger discloses that the nanoparticle must have a charged surface in order to bond the drug to the surface of the nanoparticle, and that "[i]n order to make the charged surface nanoparticles, it is necessary to add a charged surfactant to the wax melt." Rosenberger ¶¶ 59, 64.

For the above reasons, we agree with Appellant that the Examiner has not persuasively established that Rosenberger discloses a hydrophilic coating that "consists of" one or more non-ionic surfactants, as required by the claims. *See* Appeal Br. 10–11. Accordingly, we conclude that the Examiner has not established a prima facie case of obviousness with respect to the rejections involving Rosenberger, and we therefore reverse those rejections.

We now turn to the Examiner's rejection of claims 1, 6, 9, 27, 28, and 30 over De Vringer and Edelson. Independent claims 1, 10, and 19 each recite, among other things, that the "hydrophilic particles comprise a mean particle size of less than 8 nm." Appeal Br. 15–17 (Claims Appendix)

(emphasis added). The Examiner found that "De Vringer teaches lipoid nanoparticles having . . . a mean particle size between 50–1000 nm." Final Act. 16 (citing De Vringer 3:29–30). The Examiner further found that Edelson "relates to administering nanoemulsions, which comprise a particle size distribution exclusively between 10 nm and 300 nm." Final Act. 17 (citing Edelson Abstract). The Examiner stated that "[a]lthough De Vringer and Edelson do not teach expressly 'less than 8 nm,' a prima facie case of obviousness exists where the claimed ranges or amounts do not overlap with the prior art but are merely close." Final Act. 17 (citing *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 783 (Fed. Cir. 1985)). According to the Examiner, "[i]t would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of De Vringer . . . in terms of nanoparticle size . . . as taught by Edelson," including because both references teach compositions comprising lipid nanoparticles that are useful for topical administration of drugs. Final Act. 17.

We again conclude that the Examiner has not presented a case of prima facie obviousness. "Obviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention." *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015). De Vringer suggests that the particle size of 50–1000 nm impacts stability of the disclosed suspensions. *See, e.g.*, De Vringer 2:63–3:6 ("It has now been found that by partially or completely replacing the liquid or semisolid lipid containing emulsion, as generally used in the art, by a suspension of solid lipoid particles having a mean particle size of between 50-1000 nm (nanoparticles), a very stable preparation is made . . . . "). The

Examiner has not established a reason why a person of ordinary skill in the art would have been motivated to modify De Vringer's particle size, much less why they would have optimized to Edelson's disclosed particle size distribution.[3] For example, the Examiner did not identify any teaching in Edelson that stability could be improved or even maintained by optimizing to Edelson's disclosed particle size distribution.

Additionally, "[t]he reasonable expectation of success requirement refers to the likelihood of success in combining references *to meet the limitations of the claimed invention*." *Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367 (Fed. Cir. 2016) (emphasis added). Here, the claims recite a "mean particle size of less than 8 nm." Appeal Br. 15–17 (Claims Appendix). Even assuming a person of ordinary skill in the art would have been motivated to modify De Vringer's mean particle size and would have optimized to Edelson's disclosed particle size distribution range, the Examiner did not explain specifically why the skilled artisan would have arrived at a mean particle size of less than 8 nm, which is lower than the low end of Edelson's particle size distribution. Accordingly, the Examiner has not carried the burden of showing that the prior art would have suggested the claimed mean particle size range to a skilled artisan.

Because the Examiner has not established that the combination of De Vringer and Edelson teaches or suggests hydrophobic particles comprising a mean particle size of less than 8 nm, we conclude that the Examiner has not established a prima facie case of obviousness. Accordingly, we reverse the rejection of claims 1, 6, 9, 27, 28, and 30 over De Vringer and Edelson.

---

[3] The Examiner did not identify any teaching in Edelson that discloses a mean particle size.

CONCLUSION

We reverse each of the Examiner's obviousness rejections.

DECISION SUMMARY

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1, 6, 9, 10, 16, 19, 27, 30–32	103	Rosenberger, Loxley, Singh		1, 6, 9, 10, 16, 19, 27, 30–32
14, 20	103	Rosenberger, Loxley, Singh, Silva		14, 20
21	103	Rosenberger, Loxley, Singh, Lee		21
28, 29	103	Rosenberger, Loxley, Singh, Nowotnik		28, 29
1, 3, 4, 6, 9, 10, 12, 13, 19, 27, 30–32	103	Rosenberger, Loxley, Silva, Nazzal		1, 3, 4, 6, 9, 10, 12, 13, 19, 27, 30–32
1, 6, 9, 27, 28, 30	103	De Vringer, Edelson		1, 6, 9, 27, 28, 30
Overall Outcome				1, 3, 4, 6, 9, 10, 12–14, 16, 19–21, 27–32

REVERSED