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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* LEROY WAINAINA MUYA and  
HOWARD ALLEN KETELSON

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Appeal 2019-004384  
Application 15/421,835  
Technology Center 1600

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Before JOHN E. SCHNEIDER, RACHEL H. TOWNSEND, and  
CYNTHIA M. HARDMAN, *Administrative Patent Judges*.

HARDMAN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant<sup>1</sup> appeals from the  
Examiner's decision to reject claims 19–24 and 26–34. *See* Final Act. 1.  
We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

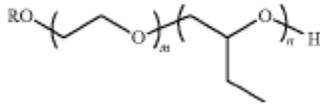
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<sup>1</sup> We use the word Appellant to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Novartis AG. Appeal Br. 3.

### CLAIMED SUBJECT MATTER

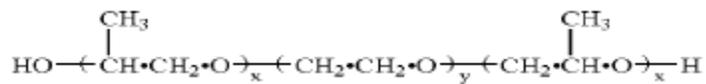
The claims are directed to compositions and methods for disinfecting contact lenses. Claim 19, reproduced below (with formatting added for readability), is illustrative of the claimed subject matter:

19. A composition for disinfecting a contact lens, comprising  
about 0.5 w/v% to about 6 w/v% by weight hydrogen peroxide, at least one poly(oxyethylene)-poly(oxybutylene) di-block copolymer having a structure:



wherein R is selected from the group consisting of hydrogen, methyl, ethyl, propyl and butyl,

and an effective amount of a poly (oxyethylene)-poly (oxypropylene) block copolymer having the structure:



wherein x and y are integers reflecting the respective polypropylene oxide and polyethylene oxide blocks of said copolymer; and the polyoxyethylene component of the block copolymer constitutes less than 50 weight percent of the block copolymer,

wherein the poly(oxyethylene)-poly(oxybutylene) di-block copolymer is of the formula  $(\text{EO})_m(\text{BO})_n$ , wherein EO is oxyethylene and BO is oxybutylene, and wherein m is an integer having an average value of 5 to 15 and n is an integer having an average value of 2 to 10,

wherein the composition is incapable of foaming at any time within a disinfection cycle carried out in a disinfection cup having a platinum-coated plastic disk that catalytically decomposes hydrogen peroxide generating oxygen gas bubbles

excessively to cause overflow of the composition from the disinfection cup.

Amended Appeal Br. 6 (Claims Appendix).

For convenience in the discussion below, we will refer to the claimed poly(oxyethylene)-poly(oxybutylene) di-block copolymer as a PEO-PBO diblock copolymer, and the claimed poly(oxyethylene)-poly(oxypropylene) block copolymer as a PPO-PEO-PPO triblock copolymer.

### REJECTIONS

The claims stand rejected as follows:

Claims 19–24 and 26–34 are rejected under 35 U.S.C. § 112(b) as being indefinite. Final Act. 2.

Claims 19–24 and 26–34 are rejected under 35 U.S.C. § 103 as being unpatentable over Ketelson,<sup>2</sup> Davis,<sup>3</sup> Ward,<sup>4</sup> and Tsao.<sup>5</sup> Final Act. 3.

### OPINION

#### *Indefiniteness*

The Examiner rejected claims 19–24 and 26–34 under 35 U.S.C. § 112(b) as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor regards as the invention. Final Act. 2. With respect to the claimed PEO-PBO diblock

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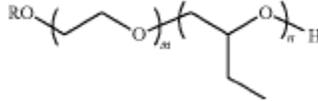
<sup>2</sup> Ketelson, US 2008/0138310 A1, published June 12, 2008.

<sup>3</sup> Davis, US 2011/0300019 A1, published Dec. 8, 2011.

<sup>4</sup> Michael A. Ward, *Soft Contact Lens Care Products*, Contact Lens Spectrum Website (accessed Jan. 11, 2016), <http://www.clspectrum.com/printarticle.aspx?articleID=12384>.

<sup>5</sup> Tsao, US 7,022,654 B2, issued Apr. 4, 2006.

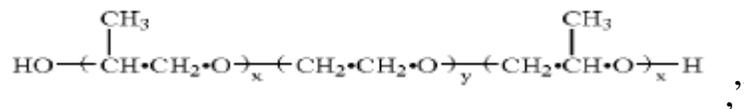
copolymers, the two independent claims 19 and 32 recite that they have the following structure:



as well as the formula  $(EO)_m(BO)_n$ . *See* Amended Appeal Br. 6, 8 (Claims Appendix). According to the Examiner, oxybutylene as used in the formula (abbreviated “BO”) encompasses both branched and straight chain oxybutylene, whereas the structure depicts only branched oxybutylene. Final Act. 2; Ans. 4 (citing Spec. 11:1–13). As such, the Examiner concluded that “the claim is unclear as to whether the claimed structure and the formula  $(EO)_m(BO)_n$  are the same.” Ans. 4.

We agree with the Examiner. The claim contains two different descriptions for the PEO-PBO diblock copolymer, and they do not align. The structural formula depicts a branched oxybutylene, but there is no indication that the oxybutylene in the formula  $(EO)_m(BO)_n$  is limited to branched oxybutylene.

Appellant argues that the formula  $(EO)_m(BO)_n$  “has been clearly further defined to have [the] structure



and that “[a] person skilled in the art would clearly understand claimed structure as BO do not encompass a n-BO because  $(EO)_m(BO)_n$  has been further defined to have the above structure.” Appeal Br. 6. We are not persuaded by this argument. The structure cited by the Appellant relates to the claimed PPO-PEO-PPO triblock copolymer, and thus would not inform a

person of ordinary skill's understanding of the structure of the PEO-PBO diblock copolymer addressed in the indefiniteness rejection.

In view of the above, we affirm the Examiner's rejection of claims 19–24 and 26–34 as indefinite.

*Obviousness*

The Examiner rejected claims 19–24 and 26–34 as obvious over Ketelson, Davis, Ward, and Tsao. Final Act. 3. The Examiner found that Ketelson teaches a contact lens disinfecting composition that includes the claimed PEO-PBO diblock copolymers, but does not teach the use of hydrogen peroxide, the claimed PPO-PEO-PPO triblock copolymers, or the “incapable of foaming” limitation. Final Act. 4, 5 (citing Ketelson ¶¶ 48–54, 62, 63). The Examiner found that Davis teaches a contact lens disinfecting composition that includes a PPO14-PEO24-PPO14 triblock copolymer with hydrogen peroxide, and that Tsao teaches a contact lens disinfecting composition that includes PPO-PEO-PPO triblock copolymers where the polyoxyethylene (PEO) component is less than 50 weight percent, with hydrogen peroxide. Final Act. 4–5 (citing Davis ¶¶ 3, 69, 75; Tsao 3:30–68, 4:54–68, 5:1–18). The Examiner further found that Davis teaches the hydrogen peroxide “is neutralized by a platinum catalyst to oxygen and water so that the lens is safe to reinsert in the eye” after it is disinfected. Final Act. 4. The Examiner also found that Ward discloses use of a platinum-coated plastic disc to catalyze the breakdown of hydrogen peroxide. Final Act. 4 (citing Ward 3).

The Examiner found that a person of ordinary skill in the art would have been motivated to combine the cited prior art because Ketelson discloses that the PEO-PBO diblock copolymers may be combined with

antimicrobial agents, and Davis discloses that hydrogen peroxide is a common antimicrobial agent. Ans. 6. The Examiner further found that Ketelson teaches that PEO-PBO diblock copolymers (1) are interchangeable with triblock copolymers such as the poly (oxybutylene)-poly (oxyethylene)-poly (oxybutylene) (PBO-PEO-PBO) copolymers taught in Davis, and (2) can be used with poloxamers<sup>6</sup>, to provide additive or synergistic effects. Ans. 7 (citing Ketelson ¶¶ 11, 37, 38, 48–50, 58). The Examiner further found that Davis similarly teaches that its PBO-PEO-PBO triblock copolymers can be used with poloxamers such as PPO14-PEO24-PPO14, to provide additive or synergistic effects. Ans. 7 (citing Davis ¶¶ 17, 40, 41, 58, 69). The Examiner thus found that a person of ordinary skill in the art would have been motivated to modify Ketelson to combine the PEO-PBO diblock copolymer with a PPO-PEO-PPO triblock copolymer, to provide additive or synergistic effects. Ans. 7.

The Examiner further found that Davis “discloses that surfactants in the peroxide solution can result in excessive foaming,” and “[a]s such, there is a motivation in the prior art to select di-block and tri-block copolymers having surfactant properties which are low or non-foaming.” Ans. 8 (citing Davis ¶ 19). The Examiner found that Tsao discloses a contact lens disinfection composition comprising hydrogen peroxide and low-foaming or non-foaming copolymers, such as PEO-PPO block polymers of the formula HO[-](PPO)<sub>x</sub>-(PEO)<sub>y</sub>-(PPO)<sub>x</sub>-H, where the PEO component is less than 50 weight percent of the block copolymer. Ans. 8 (citing Tsao 3:30–68, 4:54–

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<sup>6</sup> The Specification states that poloxamers “are nonionic block copolymers composed of a central hydrophobic chain of poly(oxypropylene) flanked by two hydrophilic chains of poly(oxyethylene).” Spec. 15.

68, 5:1–18). The Examiner concluded that a person of ordinary skill in the art would have been motivated to combine the claimed PPO-PEO-PPO triblock copolymer (as taught in Tsao) with Ketelson’s PEO-PBO di-block copolymer where  $m$  is an integer having an average value of 5 to 15 and  $n$  is an integer having an average value of 2 to 10, “with the expectation that the same would be low or non-foaming and thus, suitable for combination with hydrogen peroxide.” Ans. 8.

We adopt the Examiner’s findings and agree that the claims would have been obvious over the cited combination of prior art, for the reasons explained by the Examiner.

Appellant argues that Ketelson does not disclose certain limitations of Appellant’s claims, particularly compositions that include (1) hydrogen peroxide, or (2) the claimed PPO-PEO-PPO triblock copolymer. Appeal Br. 9. We are not persuaded by these arguments because Appellant cannot show nonobviousness by attacking references individually as failing to teach all of the claimed limitations where, as here, the rejection is based on a combination of references, whose teachings together render obvious the claimed invention. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981). Ketelson discloses that its di-block copolymers can be combined with antimicrobial agents, and other references demonstrate that hydrogen peroxide is a common antimicrobial agent. *See* Ans. 6 (citing Ketelson ¶ 61; Davis ¶ 3); *see also* Tsao 1:24–26 (“Hydrogen peroxide systems, particularly 3% hydrogen peroxide solutions, emerged as the disinfectant of choice for all types of daily and extended wear hydrogel lenses.”). Tsao discloses the claimed PPO-PEO-PPO triblock copolymer. *See* Tsao 4:55–5:5.

Appellant additionally argues that Davis discloses use of PPO14-PEO24-PPO14 together with triblock copolymers, not with the claimed diblock copolymers, and that the Examiner has not adequately explained why a person of ordinary skill in the art would have replaced Ketelson's diblock copolymers with Davis's triblock copolymers. Appeal Br. 11. We are not persuaded by this argument, because it misconstrues the Examiner's rejection. As the Examiner explained, neither the rejection nor the claims requires replacement of a diblock copolymer with a triblock copolymer. Ans. 7. Rather, the claims use the transition term "comprising," and thus encompass mixtures of diblock and triblock copolymers.

Further, both Ketelson and Davis disclose that their respective copolymers can be combined with poloxamers to provide additive or synergistic effects. Ketelson ¶ 58; Davis ¶ 68; *see also* Davis ¶ 69 ("Poloxamers . . . are nonionic block copolymers composed of a central hydrophobic chain of poly(oxypropylene) flanked by two hydrophilic chains of poly(oxyethylene). In a preferred embodiment, the PBO-PEO-PBO block polymers of the present invention are used in combination with poloxamer block copolymers."). Accordingly, we agree with the Examiner that one of ordinary skill in the art would have been motivated to combine Ketelson's diblock copolymers, Davis's PBO-PEO-PBO triblock copolymers, or a mixture of both with a poloxamer, with a reasonable expectation that the combination would provide additive or synergistic effects. Ans. 7. "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. . . . [T]he idea of

combining them flows logically from their having been individually taught in the prior art.” *In re Kerkhoven*, 626 F.2d 846, 850 (CCPA 1980).

Appellant argues that the poloxamers in Ketelson and Davis have “directly opposite” structures and are “not [] combinable,” and thus the Examiner has not shown a reasonable expectation of success. Appeal Br. 12–13. Specifically, Appellant argues that Ketelson discloses poloxamers having the structure PEO-PPO-PEO, i.e., a central hydrophobic chain flanked by two hydrophilic chains, whereas Davis’s poloxamers have the structure PPO14-PEO24-PPO14, i.e., a central hydrophilic chain flanked by two hydrophobic chains. Appeal Br. 12–13. We do not find this argument persuasive for several reasons.

First, the rejection does not call for the combination of PEO-PPO-PEO polymers with PPO-PEO-PPO polymers. Rather, the Examiner posited that a person of ordinary skill in the art would have been motivated to modify Ketelson to combine the PEO-PBO diblock copolymer with a nonionic surfactant such as a poloxamer, like those taught in Davis. Ans. 7. Davis teaches that poloxamers in general, include “nonionic block copolymers composed of a central hydrophobic chain of poly(oxypropylene) flanked by two hydrophilic chains of poly(oxyethylene)” and these may be combined with PBO-PEO-PBO block copolymers. Davis ¶¶ 68–69. Pluronic 17R4 having the formula PPO14-PEO24-PPO14 was just one example of a poloxamer identified for use by Davis. *Id.*

Moreover, we agree with the Examiner that Ketelson is not limited to PEO-PPO-PEO poloxamers, as it identifies poloxamers “known by the trade name Pluronic” as being suitable for use, and indicates that “nonionic surfactants (e.g., poloxamer and poloxamine block copolymers . . .)” can be

used in combination with the PEO-PBO block copolymers “to provide additive or synergistic effects.” Ketelson ¶¶ 58, 62. We further note that the Examiner contends that one of ordinary skill in the art would have understood the term “poloxamers” to include both PPO-PEO-PPO and PEO-PPO-PEO polymers in light of Davis disclosing that poloxamers “are poly(oxypropylene) flanked by two hydrophilic chains of poly (oxyethylene) but also disclos[ing] an example of a poloxamer which is the PPO14-PEO24-PPO14.” *See* Ans. 10–11. Appellant does not dispute the Examiner’s assertion and we therefore deem this to be a fact to which Appellant has acquiesced.

Appellant argues that even if the prior art were combined as proposed by the Examiner, a person of ordinary skill in the art would not have formed an expectation regarding the foaming properties of the resulting solution. Appeal Br. 13. We are not persuaded by this argument. Davis and Tsao disclose that surfactants in peroxide solutions can result in excessive foaming (Davis ¶ 19; Tsao 5:65–6:2), thus providing motivation to select copolymers with low or non-foaming properties. Ans. 8. As noted by the Examiner, Tsao discloses non- or low foaming copolymers, including a PPO-PEO-PPO as claimed. Ans. 8 (citing Tsao 3:30–68, 4:54–68, 5:1–18). Tsao further teaches that block copolymers with low ethylene oxide content are the most effective defoamers. Tsao 6:14–15. As such, the Examiner found, and Appellant did not dispute, that when m and n are at the low end of the ranges disclosed for the diblock copolymers of Ketelson, a person of ordinary skill in the art would have expected the copolymers to exhibit low or non-foaming properties. Ans. 9–10. Accordingly, we agree with the

Examiner that the prior art provides a reasonable expectation that the combined composition would have the claimed non-foaming properties.

Finally, we are not persuaded by Appellant’s argument that the “Examiner reconstructed Applicants’ invention through hindsight.” Appeal Br. 13. As discussed in the Final Action, the Examiner’s Answer, and above, the prior art expressly taught the copolymers recited in Appellant’s claims, and provided motivation to combine them with hydrogen peroxide, with a reasonable expectation of success of achieving a composition meeting the claimed “incapable of foaming” limitation. Accordingly, we find that the Examiner’s *prima facie* case was appropriately grounded in the teachings of the prior art.

#### CONCLUSION

We affirm the rejection of claims 19–24 and 26–34 under 35 U.S.C. § 112(b) as being indefinite.

We affirm the rejection of claims 19–24 and 26–34 under 35 U.S.C. § 103 as being unpatentable over Ketelson, Davis, Ward, and Tsao.

#### DECISION SUMMARY

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Reference(s)/Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
19–24, 26–34	112(b)	Indefiniteness	19–24, 26–34	
19–24, 26–34	103	Ketelson, Davis, Ward, Tsao	19–24, 26–34	
<b>Overall Outcome</b>			19–24, 26–34	

Appeal 2019-004384  
Application 15/421,835

TIME PERIOD FOR RESPONSE

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

AFFIRMED