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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/498,508	08/03/2006	Malcolm B. Burleigh	60597US005	9479
32692	7590	07/12/2017	EXAMINER	
3M INNOVATIVE PROPERTIES COMPANY PO BOX 33427 ST. PAUL, MN 55133-3427			SERGENT, RABON A	
			ART UNIT	PAPER NUMBER
			1765	
			NOTIFICATION DATE	DELIVERY MODE
			07/12/2017	ELECTRONIC

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* MALCOLM B. BURLEIGH,  
JAMES G. CARLSON, and ARAN J. BECKHAM

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Appeal 2016-008156  
Application 11/498,508  
Technology Center 1700

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Before MICHAEL P. COLAIANNI, JAMES C. HOUSEL, and  
JANE E. INGLESE, *Administrative Patent Judges*.

INGLESE, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants<sup>1</sup> appeal under 35 U.S.C. § 134(a) from a final rejection of claims 1, 4–10, 14–17, and 21–39. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

STATEMENT OF THE CASE

Appellants' claim compositions comprising a first fluorochemical urethane polymer or oligomer comprising the reaction product of

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<sup>1</sup> Appellants identify the real party in interest as 3M Innovative Properties Company. Appeal Brief filed December 2, 2015 (“App. Br.”), 3.

components comprising one or more polyisocyanates and one or more fluoroalcohols, and a second urea polymer or oligomer distinct from the first urethane polymer or oligomer that comprises the reaction product of components comprising one or more diisocyanates and water; and methods of treating a substrate to impart repellency properties to the substrate comprising applying such compositions to the substrate. App. Br. 4.

Claim 1 illustrates the subject matter on appeal and is reproduced below:

1. A composition comprising:

(a) a first fluorochemical urethane polymer or oligomer comprising the reaction product of components comprising (1) one or more polyisocyanates, (2) one or more fluoroalcohols, and optionally (3) one or more other isocyanate-reactive materials;

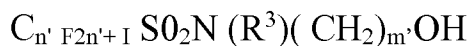
wherein the ratio of isocyanate groups to isocyanate-reactive groups is about 1/1 or less;

wherein the one or more polyisocyanates comprise at least one polyisocyanate having the formula  $Z-[NCO]_n$ , wherein  $n$  is 3 or more, and  $Z$  is an aliphatic group, cycloaliphatic group, or combination thereof, optionally containing heteroatoms;

wherein the one or more fluoroalcohols have the formula:



where  $n'$  is 3 to 14 and  $m'$  is 1 to 12; or



where  $R^3$  is H or methyl,  $n'$  is 3 to 14, and  $m'$  is 1 to 12;

and

(b) a second urea polymer or oligomer, which is distinct from the first urethane polymer or oligomer, wherein the second urea polymer or oligomer comprises the reaction product of components comprising (1) one or more diisocyanates, (2) water, and optionally (3) one or more other isocyanate-reactive materials;

wherein the one or more diisocyanates have the formula  $Z-[NCO]_n$ , wherein  $n$  is 2, and  $Z$  is an aliphatic group, cycloaliphatic group, or combination thereof, optionally containing heteroatoms;

wherein about 60 to about 95 mole percent of the isocyanate groups of the diisocyanate of the second polymer or oligomer are reacted with the water;

wherein the weight ratio of said first polymer or oligomer to said second polymer or oligomer is from about 12/88 to 75/25; and

wherein the composition is in the form of an emulsion comprising an ionic surfactant.

App. Br. (Claims Appendix).

Appellants request review of the following rejections set forth in the Final Office Action entered June 29, 2015 (“Final Act.”), which the Examiner maintains in the Answer entered June 27, 2016, 2016 (“Ans.”):

I. Claims 36–39 under 35 U.S.C. § 112, first paragraph for failing to comply with the written description requirement;

II. Claim 1, 4–10, 14–17, 21–23, 25–29, and 31–35 under 35 U.S.C. § 103(a) as unpatentable over Audenaert et al. (US 2004/0077237 A1, published April 22, 2004) (“Audenaert 237”);

III. Claims 1, 4–10, 14–17, 21–24, 26–28, and 30–35 under 35 U.S.C. § 103(a) as unpatentable over Audenaert et al. (US 2004/0077238 A1, published April 22, 2004) (“Audenaert 238”) in view of Qiu et al. (US 2003/0026997 A1, published February 6, 2003);

IV. Claims 36–39 under 35 U.S.C. § 103(a) as unpatentable over Audenaert 237 in view of Smith (US 5,672,651, issued September 30, 1997); and

V. Claims 36–39 under 35 U.S.C. § 103(a) as unpatentable over Audenaert 238 in view of Qiu and Smith.

## DISCUSSION

Upon consideration of the evidence relied upon in this appeal and each of Appellants' contentions, we affirm the Examiner's rejection of claims 36–39 under 35 U.S.C. § 112, first paragraph for failing to comply with the written description requirement, and rejections of claims 1, 4–10, 14–17, and 21–39 under 35 U.S.C. § 103(a), for the reasons set forth in the Final Action, the Answer, and below.

### Rejection I

The Examiner finds that Appellants' Specification does not provide written description support for treating a substrate with a composition as recited in claims 1 and 15 to impart repellency properties to the substrate that are retained after two or more steam cleanings, as recited in claims 36–39, which depend from claims 1 and 15. Final Act. 2. The Examiner finds that the compositions of Examples 2–4 and 6 of Appellants' Specification, which Appellants rely on for written description, are not of the same scope as the compositions recited in claims 1 and 15, and therefore do not provide written description support for the full scope of the compositions encompassed by the claims possessing the recited repellency properties after two or more steam cleanings. *Id.*

Appellants argue that Examples 2 to 4 in their Specification demonstrate that using the fluoroalcohol N-methyl perfluorobutanesulfonyl ethanol (MeFBSE), which Appellants assert is representative of fluoroalcohols of the second formula recited in claims 1 and 15, results in a composition with the claimed repellency properties. App. Br. 24–25. Appellants argue that Example 6 demonstrates that using the fluoroalcohol Fluowet® EA600, which Appellants assert is representative of

fluoroalcohols of the first formula recited in claims 1 and 15, results in a composition with the claimed repellency properties. Appellant argue that these examples therefore provide “support for the subject matter of claims 36–39.” App. Br. 25.

However, in Examples 2–4 and 6, repellency properties were determined after 2 steam cleanings only, and Appellants do not direct us to any disclosure in their Specification demonstrating that the inventors were in possession at the time of filing of a process that imparts repellency properties to a substrate that are retained after two *or more* steam cleanings as recited in claims 36–39. App. Br. 24–25. *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1563–1564 (Fed. Cir. 1991) (To fulfill the written description requirement “the applicant must . . . convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of *the invention*. The invention is, for purposes of the ‘written description’ inquiry, *whatever is now claimed*.”) Appellants’ arguments are thus unpersuasive of reversible error.

We accordingly sustain the Examiner’s rejection of claims 36–39 under 35 U.S.C. § 112, first paragraph for failing to comply with the written description requirement.

### Rejection II

Appellants argue claims 1, 4–10, 14–17, 21–23, 25–29, and 31–35 as a group. App. Br. 17–20. Therefore, for the purposes of this appeal, we select claim 1 as representative, and decide the appeal as to Rejection II based on claim 1 alone. 37 C.F.R. § 41.37(c)(1)(iv) (2015).

Audenaert 237 discloses a fluorochemical composition comprising an emulsion of a fluorinated polyether compound and an extender, which is

stabilized with an ionic surfactant. Audenaert 237 ¶¶ 6, 157, 160.

Audenaert 237 discloses that the weight ratio of the total amount of the extender to the total amount of the fluorinated polyether compound in the composition is between 5:95 and 95:5, preferably between 20:80 and 50:50.

Audenaert 237 ¶ 158. Audenaert 237 discloses that the composition renders a fibrous substrate oil and/or water repellent, and discloses that the repellency properties are substantially maintained after several washing or dry cleaning cycles. Audenaert 237 ¶¶ 6, 166.

Audenaert 237 discloses that the fluorinated polyether compound may be obtained by reacting a functionalized perfluorinated polyether, a polyisocyanate, and one or more coreactants. Audenaert 237 ¶ 26.

Audenaert 237 discloses that suitable coreactants include compounds of formula  $C_4F_9-SO_2NR-CH_2CH_2OH$  in which R is hydrogen or a lower alkyl of 1 to 4 carbons such as methyl, ethyl, and propyl (corresponding to a fluoroalcohol as recited in claim 1). Audenaert 237 ¶¶ 66–70, 76. The Examiner finds that the fluorinated polyether compound disclosed in Audenaert 237 thus corresponds to the first fluorochemical urethane polymer recited in claim 1. Final Act. 3.

Audenaert 237 discloses that the extender comprises a non-fluorinated organic compound comprising one or more blocked isocyanate groups, which is referred to as a “blocked isocyanate.” Audenaert 237 ¶¶ 141–143. Audenaert 237 discloses that the blocked isocyanate compound is preferably produced by reacting between 100% and 40% of the isocyanate groups in a polyisocyanate with a blocking agent, and reacting the remainder of the isocyanate groups with water and/or an optional non-fluorinated organic compound. Audenaert 237 ¶¶ 144, 150. The Examiner finds that the

extender disclosed in Audenaert 237 thus corresponds to the second urea polymer recited in claim 1. Final Act. 3–4.

The Examiner concludes that although Audenaert 237 discloses suitable fluorinated polyether compounds and extenders other than those discussed above, it would have been obvious to one of ordinary skill in the art at the time of Appellants' invention to use the relied-upon compounds in “virtually any combination” because the skilled artisan would have expected that any of the fluorinated polyether compounds and extenders disclosed in Audenaert 237 would “produce viable repellent compositions.” Final Act. 4.

Appellants argue that Audenaert 237 would not have provided a reason for one of ordinary skill in the art to select a fluoroalcohol as recited in claim 1 from the numerous coreactants disclosed in the reference. App. Br. 18. Appellants further argue, relying on *Takeda Chemical Industries, Ltd. v. Alphapharm Pty., Ltd.*, 492 F.3d 1350, 1358 (Fed. Cir. 2007), that the Examiner does not identify anything in Audenaert 237 that would have suggested to one of ordinary skill in the art that the fluoroalcohols recited in claim 1 “would be the best candidate” for increasing repellency of a substrate. *Id.*

However, one of ordinary skill in the art seeking to produce a fluorochemical composition that renders a fibrous substrate oil and/or water repellent as disclosed in Audenaert 237 would have found it obvious to utilize any of the suitable coreactants disclosed in the reference for producing the fluorinated polyether component of the composition—including compounds of formula  $C_4F_9-SO_2NR-CH_2CH_2OH$ , in which R is hydrogen or a lower alkyl of 1 to 4 carbons such as methyl, ethyl, and propyl (corresponding to a fluoroalcohol as recited in claim 1). Audenaert 237's



disclosure of a multitude of effective coreactants does not render any particular coreactant less obvious. *Merck & Co., Inc. v. Biocraft Labs., Inc.*, 874 F.2d 804, 807 (Fed. Cir. 1989) (“That the ’813 patent discloses a multitude of effective combinations does not render any particular formulation less obvious. This is especially true because the claimed composition is used for the identical purpose.”); *In re Susi*, 440 F.2d 442, 445 (CCPA 1971) (obviousness rejection affirmed where the genus of the prior art was “huge, but it undeniably include[d] at least some of the compounds recited in appellant’s generic claims and [was] of a class of chemicals to be used for the same purpose as appellant’s additives”).

In addition, in the portion of *Takeda* cited by Appellants, our reviewing court concluded that the district court did not err in finding that, based on the prior art as a whole, one of ordinary skill in the art would not have selected a particular compound (“compound b”) as a lead compound for antidiabetic treatment, because this compound was singled out in the prior art as causing considerable increases in body weight and brown fat weight, and any suggestion to select this compound was therefore negated by this disclosure. Contrary to Appellants’ arguments, *Takeda* thus does not stand for the proposition that the prior art must have suggested that a particular compound “would be the best candidate” for a desired application to render obvious claims directed to that compound.

We further note that the factual situation in *Takeda* differs significantly from that of the present case. Specifically, Appellants do not direct us to any disclosure in Audenaert 237, or any other evidence, indicating any disadvantage of utilizing a coreactant of formula  $C_4F_9-SO_2NR-CH_2CH_2OH$ , in which R is hydrogen or a lower alkyl of 1 to 4

carbons such as methyl, ethyl, and propyl (as disclosed in Audenaert 237), to produce a fluorinated polyether included in a fluorochemical composition used to render a fibrous substrate oil and/or water repellent. App. Br. 18. Appellants' arguments are therefore unpersuasive of reversible error.

Appellants further argue that Audenaert 237 does not teach or suggest that specific ratios of the fluorinated polyether (first polymer) and extender (second polymer) are required to retain repellency properties after steam cleaning. *Id.* Appellants contend that Table 5 of their Specification demonstrates that "certain ratios are not sufficient to retain repellency properties after steam cleaning." *Id.* Appellants argue that the Examiner's proposed combination of "virtually any" of the fluorinated polyethers and extenders disclosed in Audenaert 237 would therefore not produce viable repellent combinations. App. Br. 18–19.

However, as discussed above, Audenaert 237 discloses that the fluorochemical composition described in the reference renders a fibrous substrate oil and/or water repellent, and discloses that the repellency properties are substantially maintained after several washing or dry cleaning cycles. In addition, as also discussed above, Audenaert 237 explicitly discloses that the weight ratio of the total amount of the extender (second urea polymer) to the total amount of the fluorinated polyether compound (first fluorochemical urethane polymer) in the fluorochemical composition is between 5:95 and 95:5, preferably between 20:80 and 50:50. Thus, Audenaert 237 indicates that the weight ratio of the fluorinated polyether compound (first fluorochemical urethane polymer) to the extender (second urea polymer) in the fluorochemical composition is from 5:95 to 95:5, which encompasses the range of 12/88 to 75/25 recited in claim 1, and Audenaert

237 discloses that the preferred ratio is between 50:50 and 80:20, which is encompassed by the recited range, rendering the range recited in claim 1 prima facie obvious. *In re Peterson*, 315 F.3d 1325, 1329–30 (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. . . . Selecting a narrow range from within a somewhat broader range disclosed in a prior art reference is no less obvious than identifying a range that simply overlaps a disclosed range. In fact, when as here, the claimed ranges are completely encompassed by the prior art, the conclusion is even more compelling than in cases of mere overlap.”)

Appellants do not establish the criticality of the range recited in claim 1 because they do not demonstrate that the data provided in Table 5 of their Specification are commensurate in scope with the claimed subject matter. Specifically, the data in Table 5 were generated by testing compositions prepared from a single Part A component comprising one type of fluoroalcohol (N-methyl perfluorobutanesulfonyl ethanol or MeFBSE) and one type of polyfunctional isocyanate (DESMODUR® N-3300A) and a single Part B component comprising the same fluoroalcohol used in Part A (MeFBSE) and one diisocyanate (DESMODUR® I or IPDI). Appellants do not explain why the effect observed for the tested fluorochemical compositions—in which the ratio of a single Part A component to a single Part B component was varied—would hold true for compositions comprising the full scope of first fluorochemical urethane polymers and oligomers, and the full scope of the second urea polymers or oligomers, encompassed by claim 1. App. Br. 18–19. *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)).

Therefore, Appellants do not meet their burden of establishing the criticality of the weight ratio of the first polymer or oligomer to the second polymer or oligomer recited in claim 1. *In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990) (indicating that in cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims, the Applicants must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range.). Appellants’ arguments are therefore unpersuasive of reversible error in the Examiner’s finding that a combination of the relied-upon fluorinated polyethers and extenders disclosed in Audenaert 237 in the ratio disclosed in the reference would produce viable repellent compositions.

Appellants further argue that Audenaert 237 does not teach or suggest the importance of reacting about 60 to about 95 mole percent of the isocyanate groups in a polyisocyanate with water to produce the blocked isocyanate extender compound described in the reference. App. Br. 19. Appellants contend that although Audenaert 237 discloses that isocyanate groups may be reacted with water, the reference teaches that such a reaction is made only if the reaction of isocyanate groups with the blocking agent is

not complete. *Id.* Appellants further argue that Audenaert 237 suggests that, in the event of an inefficient reaction between isocyanate groups and the blocking agent, the unreacted isocyanate groups should be reacted with non-fluorinated organic compounds instead of water, because the reference teaches that “[p]referably, between 99 and 40% of the isocyanate groups are reacted with one or more blocking agents and between 1 and 60% of the isocyanate groups is reacted with one or more non-fluorinated organic compound.” *Id.* Appellants argue that the Examiner does not explain why, in light of these disclosures, one of ordinary skill in the art “would have been motivated to react about 60 to about 95 mole percent of the isocyanate groups of the diisocyanate of the second polymer or oligomer with water, as claimed.” App. Br. 19–20.

However, Audenaert 237’s disclosure of a preferred embodiment that involves reacting between 99 and 40% of the isocyanate groups in a polyisocyanate with one or more blocking agents, and reacting between 1 and 60% of the isocyanate groups with one or more non-fluorinated organic compounds, does not negate Audenaert 237’s broader disclosure of producing a blocked isocyanate compound by reacting between 100% and 40% of the isocyanate groups with a blocking agent, and reacting the remainder of the isocyanate groups with water and/or an optional non-fluorinated organic compound. Audenaert 237 ¶ 150. *In re Fulton*, 391 F.3d 1195, 1200 (Fed. Cir. 2004) (“[C]ase law does not require that a particular combination must be the preferred, or the most desirable, combination described in the prior art in order to provide [the] motivation [or reason] for the current invention.”).

One of ordinary skill in the art seeking to produce a fluorochemical composition that renders a fibrous substrate oil and/or water repellent as disclosed in Audenaert 237 would have been led to produce a blocked isocyanate extender compound for use in the composition by reacting between 100% and 40% of the isocyanate groups in a polyisocyanate with a blocking agent, and reacting the remainder of the isocyanate groups with water, because Audenaert 237 explicitly discloses that this is a suitable method for producing a blocked isocyanate extender compound useful in a such a fluorochemical composition. *Merck*, 874 F.2d at 807–08 (quoting *In re Lamberti*, 545 F.2d 747, 750 (CCPA 1976)) (“[T]he fact that a specific [embodiment] is taught to be preferred is not controlling, since all disclosures of the prior art, including unpreferred embodiments, must be considered.”); *In re Boe*, 355 F.2d 961, 965 (CCPA 1966) (All of the disclosures in a prior art reference “must be evaluated for what they fairly teach one of ordinary skill in the art.”). Appellants’ arguments do not establish any distinction between reacting between 100% and 40% of the isocyanate groups in a polyisocyanate with a blocking agent, and reacting the remainder of the isocyanate groups with water as disclosed in Audenaert 237, and reacting about 60 to about 95 mole percent of the isocyanate groups with water as recited in claim 1. App. Br. 19–20. Appellants’ arguments are therefore unpersuasive of reversible error.

Appellants further argue that Examples in their Specification demonstrate that use of the fluorochemicals recited in claim 1, and use of the recited ratio of the first urethane polymer or oligomer to the second urea polymer or oligomer, yield unexpected results. App. Br. 23–24.

However, the burden of analyzing and explaining Specification data to support an assertion of non-obviousness rests with Appellants. *In re Klosak*, 455 F.2d 1077, 1080 (CCPA 1972). In the present case, Appellants do not explain why the relied-upon data in Table 4 for Examples 2, 3, 4, and 6, and data in Tables 5 and 6, are sufficient to show that the full scope of the compositions covered by claim 1 impart unexpected results relative to the closest prior art. App. Br. 23–24. Appellants do not explain why the effect observed for the limited compositions of Examples 2–4 comprising a single type of fluoroalcohol (MeFBSE) and only two different isocyanates (IPDI and Mondur® MA-2300); why data from the composition of Example 6 comprising the fluoroalcohol Fluowet® EA600 and the same isocyanate used in Examples 2 and 4 (IPDI); and why data from the compositions of Table 5 (discussed above), which are the same as the compositions of Table 6, would hold true for compositions comprising the full scope of first fluorochemical urethane polymers and oligomers, and the full scope of the second urea polymers or oligomers, encompassed by claim 1. *Id. Harris*, 409 F.3d at 1344; *Greenfield*, 571 F.2d at 1189.

Nor do Appellants explain why the effect observed for the limited compositions of Examples 2–4 and 6 and Tables 5 and 6 would have been unexpected in view of the relied-upon disclosures of Audenaert 237, the closest prior art. App. Br. 23–24. *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.”).

Accordingly, Appellants do not meet their burden of demonstrating that the composition recited in claim 1 imparts unexpected results.

Therefore, on this record, the preponderance of the evidence supports the Examiner's conclusion of obviousness, and we accordingly sustain the Examiner's rejection of claims 1, 4–10, 14–17, 21–23, 25–29, and 31–35 under 35 U.S.C. § 103(a) as unpatentable over Audenaert 237.

### Rejection III

Appellants argue claims 1, 4–10, 14–17, 21–24, 26–28, and 30–35 as a group. App. Br. 20–22. Therefore, for the purposes of this appeal, we select claim 1 as representative, and decide the appeal as to Rejection III based on claim 1 alone. 37 C.F.R. § 41.37(c)(1)(iv) (2015).

Audenaert 238 discloses a fluorochemical composition that renders a fibrous substrate oil and/or water repellent, and discloses that the repellency properties are substantially maintained after several washing or dry cleaning cycles. Audenaert 238 ¶¶ 2, 90. Audenaert 238 discloses that the fluorochemical composition comprises a dispersion of a fluorinated compound comprising the reaction product of a fluorinated polyether, a polyisocyanate, and a coreactant. Audenaert 238 ¶¶ 6–10. Audenaert 238 discloses stabilizing the dispersion with an ionic surfactant. Audenaert 238 ¶ 78. Audenaert 238 discloses that the coreactant can be water (¶ 40), and discloses reacting between 5 and 60% of the isocyanate groups in the polyisocyanate with the perfluorinated polyether compound, and reacting the remainder of the isocyanate groups with the coreactant. Audenaert 238 ¶ 74. The Examiner finds that this fluorinated compound comprising the reaction product of a fluorinated polyether, an isocyanate, and a water coreactant corresponds to the first fluorochemical urethane polymer recited in claim 1. Final Act. 4–5.



The Examiner finds that although Audenaert 238 discloses that the fluorochemical composition may contain further fluorochemical compounds (¶ 87), Audenaert 238 does not disclose that such additional fluorochemical compounds correspond to the second urea polymer recited in claim 1, and the Examiner relies on Qiu for suggesting this feature. Final Act. 5–6. Qiu discloses fluorochemical urethane compositions that impart oil and water repellency to a substrate. Qiu ¶ 1. Qiu discloses that the fluorochemical urethane compositions comprise emulsions of compounds or oligomers comprising the reaction product of a fluorinated polyol, polyisocyanate, and a monofunctional fluorine-containing compound comprising a functional group reactive with the hydroxyl group of the polyol or with the isocyanate group of the polyisocyanate. Qiu ¶ 51. Qiu discloses that suitable monofunctional fluorine-containing compounds include compounds of formula  $R_fSO_2N(CH_3)CH_2CH_2OH$  in which  $R_f$  is a perfluoroalkyl group having 1 to 12 carbon atoms (corresponding to a fluoroalcohol as recited in claim 1). Qiu ¶¶ 92, 98. The Examiner finds that these compounds or oligomers comprising the reaction product of a fluorinated polyol, polyisocyanate, and a fluoroalcohol of formula  $R_fSO_2N(CH_3)CH_2CH_2OH$  disclosed in Audenaert 238 correspond to the first fluorochemical urethane polymer or oligomer recited in claim 1. Final Act. 5.

The Examiner concludes that, in view of Audenaert 238's disclosure that the fluorochemical composition described in the reference may contain further fluorochemical compounds, and in view of the equivalent utilities of Audenaert 238's and Qiu's compositions, it would have been obvious to one of ordinary skill in the art at the time of Appellants' invention to utilize the relied-upon fluorochemical urethane composition disclosed in Qiu in

combination with the fluorochemical composition disclosed in Audenaert 238 in virtually any ratio to render a substrate oil and/or water repellent. Final Act. 5–6.

Appellants argue that the Examiner fails to “articulate why a skilled artisan would have been motivated to combine the compositions the Examiner asserted are taught by Qui [] and Audenaert ’238.” App. Br. 21.

However, as set forth above, the Examiner provides a reasoned rationale for combining the relied-upon compositions of Audenaert 238 and Qiu based on their equivalent utilities and Audenaert 238’s disclosure that the fluorochemical composition described in the reference may contain further fluorochemical compounds, which one of ordinary skill in the art would have understood would include the fluorochemical compounds disclosed in Qiu. *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.”) Appellants’ arguments are therefore unpersuasive of reversible error.

Appellants further argue that even if a skilled artisan had been motivated to combine compositions having repellency characteristics, the Examiner did not articulate any reason why a skilled artisan would have been motivated to combine the compositions the Examiner asserted are

taught by Qiu and Audenaert 238 to make an emulsion including an ionic surfactant, as recited in claim 1. App. Br. 21.

However, in view of Audenaert 238's disclosure of a fluorochemical composition that renders a fibrous substrate oil and/or water repellent, which may contain further fluorochemical compounds, one of ordinary skill in the art seeking to produce such a composition would have found it obvious to include in Audenaert 238's fluorochemical composition any of the fluorochemical compounds disclosed in Qiu as suitable for inclusion in fluorochemical compositions that render a substrate oil and/or water repellent. Thus, one of ordinary skill in the art would have found it obvious to include compounds comprising the reaction product of a fluorinated polyol, polyisocyanate, and a fluoroalcohol of formula  $R_fSO_2N(CH_3)CH_2CH_2OH$  in which  $R_f$  is a perfluoroalkyl group having 1 to 12 carbon atoms as disclosed in Qiu, in Audenaert 238's fluorochemical. *Merck*, 874 F.2d at 807; *Susi*, 440 F.2d at 445.

Moreover, because Audenaert 238 and Qiu both disclose fluorochemical compositions comprising emulsions of polymers stabilized with ionic surfactants, one of ordinary skill in the art would have found it obvious to formulate the fluorochemical composition suggested by the combined disclosures of the references (discussed above) comprising the relied-upon compounds or polymers from each reference, as an emulsion stabilized with an ionic surfactant. Appellants' arguments are therefore unpersuasive of reversible error.

Appellants also argue that even if a skilled artisan had been motivated to combine the compositions the Examiner asserts are taught by Qiu and Audenaert 238 to make an emulsion, Qiu and Audenaert 238 do not teach or

suggest the importance of the specific ratio of the first polymer or oligomer and the second polymer or oligomer recited in claim 1. App. Br. 21.

Appellants contend that Table 5 of their Specification demonstrates that “certain ratios are not sufficient to retain repellency properties after steam cleaning.” *Id.* Appellants argue that the Examiner’s proposed combination of “virtually any ratio” of the relied-upon compounds or polymers disclosed in Audenaert 238 and Qiu would therefore not produce viable repellent combinations. *Id.*

However, the combined disclosures of Audenaert 238 and Qiu reasonably would have suggested to one of ordinary skill in the art that the relied-upon compounds or polymers from each reference could be combined in any ratio to form a fluorochemical composition that renders a fibrous substrate oil and/or water repellent, because both references disclose that the relied-upon compounds or polymers are useful in fluorochemical compositions having this utility. As discussed above, Appellants do not establish the criticality of the range of ratios recited in claim 1 because they do not meet their burden of establishing that the data provided in Table 5 of their Specification are commensurate in scope with the claimed subject matter. Appellants’ arguments are therefore unpersuasive of reversible error.

Appellants further argue that Audenaert 238 does not teach or suggest the importance of reacting isocyanate groups with water in the amounts recited in claim 1. App. Br. 21–22. Appellants contend that Audenaert 238 teaches reacting a polyisocyanate with a perfluorinated polyether compound, and teaches that the unreacted isocyanate groups can be reacted with a co-reactant. *Id.* Appellants contend that Audenaert 238 further discloses that

“between 0 and 40% of the isocyanate groups” can be reacted with “water or a non-fluorinated organic compound other than an isocyanate blocking agent.” *Id.* Appellants argue that the Examiner does not explain why a skilled artisan, in light of these disclosures, would have been motivated to react a diisocyanate with water instead of any of the other co-reactants and non-fluorinated organic compounds taught by Audenaert 238, or to react about 60 to about 95 mole percent of the isocyanate groups with water, as recited in claim 1. *Id.*

However, Audenaert 238’s disclosure of a preferred embodiment of preparing a fluorinated compound for inclusion in the fluorochemical composition described in the reference that involves reacting between 10% to 30% of isocyanate groups in a polyisocyanate with a perfluorinated polyether compound, between 90% and 30% of the isocyanate groups with an isocyanate blocking agent, and 0 to 40% of isocyanate groups with water, does not negate Audenaert 238’s broader disclosure of reacting between 5% and 60% of the isocyanate groups with the perfluorinated polyether compound and reacting the remainder of the isocyanate groups with a coreactant. In addition, Audenaert 238’s disclosure of numerous suitable coreactants does not negate Audenaert 238’s disclosure of the suitability of water as a coreactant. *Fulton*, 391 F.3d at 1200. One of ordinary skill in the art seeking to produce a fluorochemical composition that renders a fibrous substrate oil and/or water repellent as disclosed in Audenaert 238 would have been led to produce a fluorinated compound for use in the composition by reacting between 5% and 60% of the isocyanate groups in a polyisocyanate with a perfluorinated polyether compound, and reacting the remainder of the isocyanate groups with a water coreactant, because

Audenaert 238 explicitly discloses that this is a suitable method for producing a fluorinated compound useful in such compositions. *Merck*, 874 F.2d at 807; *Boe*, 355 F.2d at 965. Appellants' arguments do not establish any distinction between reacting 5% to 60% of the isocyanate groups in a polyisocyanate with a perfluorinated polyether compound and reacting the remainder of the isocyanate groups with a water coreactant as disclosed in Audenaert 238, and reacting about 60 to about 95 mole percent of isocyanate groups with water as recited in claim 1. Appellants' arguments are therefore unpersuasive of reversible error.

Appellants further argue that the Examples in their Specification demonstrate that use of the fluorochemicals recited in claim 1, and use of the recited ratio of the first urethane polymer or oligomer to the second urea polymer or oligomer, yield unexpected results, as discussed above in connection with Rejection II. App. Br. 23–24. However, for the reasons discussed above, Appellants do not meet their burden of demonstrating that the composition recited in claim 1 imparts unexpected results.

Therefore, on this record, the preponderance of the evidence supports the Examiner's conclusion of obviousness, and we accordingly sustain the Examiner's rejection of claims 1, 4–10, 14–17, 21–24, 26–28, and 30–35 under 35 U.S.C. § 103(a) as unpatentable over Audenaert 238 and Qiu.

#### Rejections IV and V

Appellants argue that Smith fails to remedy the deficiencies of Audenaert 237, and of Audenaert 238 in view of Qiu. App. Br. 22–23. However, for the reasons discussed above, Appellants' position as to these grounds of rejection is without merit.

Appellants further argue that the applied prior art does not teach or suggest that the claimed compositions would have an oil repellency value of at least 2 after two steam cleanings as recited in claims 38 and 39. App. Br. 23.

However, although Audenaert 237 and Audenaert 238 do not explicitly mention an oil repellency value of at least 2 after two steam cleanings as recited in claims 38 and 39, this property would have naturally flowed from following the suggestion in Audenaert 237, and the suggestion stemming from the combined disclosures of Audenaert 238 and Qiu, of forming the claimed compositions, as discussed above. *PAR Pharm., Inc. v. TWI Pharm., Inc.*, 773 F.3d 1186, 1195 (Fed. Cir. 2014) (concept of inherency, when applied to obviousness, is present “when the limitation at issue is the ‘natural result’ of the combination of prior art elements”); *Ex parte Obiaya*, 227 USPQ 58, 60 (BPAI 1985) (“The fact that appellant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious.”); *In re Spada*, 911 F.2d 705, 709 (Fed. Cir. 1990) (explaining that a chemical composition and its properties are inseparable.); *In re Kubin*, 561 F.3d 1351, 1357 (Fed. Cir. 2009) (“Even if no prior art of record explicitly discusses the [limitation], [applicants’] application itself instruct[s] that [the limitation] is not an additional requirement imposed by the claims on the [claimed invention], but rather a property necessarily present in [the claimed invention]”).

Appellants’ arguments are therefore unpersuasive of reversible error, and we accordingly sustain the Examiner’s rejection of claims 36–39 under 35 U.S.C. § 103(a).

Reply Brief

Appellants argue that the Examiner may have set forth a new ground of rejection in the Answer. Reply Br. 1–2. However, we do not address this issue because it is reviewable by a petition under 37 C.F.R. § 1.181, and is therefore not within the jurisdiction of the Board. *Ex Parte Frye*, 94 USPQ.2d 1072, 1078 (BPAI 2010) (precedential).

In addition, we do not consider any new argument raised in the Reply Brief, which could have been raised in the Appeal brief, but was not. 37 C.F.R. § 41.37(c)(1)(iv); 37 C.F.R. § 41.41(b)(2) (arguments raised for the first time in the Reply Brief that could have been raised in the Appeal Brief will not be considered by the Board unless good cause is shown).

DECISION

In view of the reasons set forth above and in the Final Action and the Answer, we affirm the Examiner’s rejection of claims 36–39 under 35 U.S.C. § 112, first paragraph for failing to comply with the written description requirement, and rejections of claims 1, 4–10, 14–17, and 21–39 under 35 U.S.C. § 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).

AFFIRMED