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LUCAS & MERCANTI, LLP
30 BROAD STREET
21st FLOOR
NEW YORK, NY 10004

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MATOS NEGRON, TAINA DEL MAR

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* MICHAEL J. UNHOCH,  
NICOLE WISE, and DEREK FRANCIS PARISH

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Appeal 2015-004123  
Application 13/623,626  
Technology Center 1600

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Before JEFFREY N. FREDMAN, JOHN G. NEW, and  
DEVON ZASTROW NEWMAN, *Administrative Patent Judges*.

FREDMAN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal<sup>1</sup> under 35 U.S.C. § 134 involving a water treatment composition. The Examiner rejected the claims as obvious. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

*Statement of the Case*

*Background*

“Chlorine releasing compounds have been used in a wide variety of applications as a sanitizer or disinfectant . . . In some applications, particularly swimming pools and spas, it is desirable to have chlorine to

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<sup>1</sup> Appellants identify the Real Party in Interest as Arch Chemicals, Inc. (*see* Br. 1).

slowly be released into the water” (Spec. ¶ 6). “It would be advantageous if the static dissolution rate could be controlled in order to prevent both high chlorine level and low pH resulting from continued dissolution of the tablet” (Spec. ¶ 8).

The Specification teaches that “forming a blend of a particulate polyfluorinated polymer and a particulate halogen-releasing compound, and forming a unitary structure from the blend, will provide a unitary structure having a controlled dissolution rate, thus allowing the unitary structure of the blend to last longer and need to be replaced less often” (Spec. ¶ 27).

#### *The Claims*

Claims 1–26 are on appeal.<sup>2</sup> Claim 1 is representative and reads as follows:

1. A water treatment composition, comprising:  
50 – 99.9 wt.% of a particulate halogen-releasing compound, said halogen-releasing compound comprising a compound selected from the group consisting of chlorinated isocyanuric acids, chlorine containing hydantoins, bromine-containing hydantoins and mixtures thereof; and  
0.1 – 10 wt.% of particulate fluoropolymer,  
wherein all weight percentages are based on the total weight of said composition.

#### *The Issues*

A. The Examiner rejected claims 1, 4, 9, 10, 12, 13, 16, 17, and 20–26 under 35 U.S.C. § 103(a) as obvious over Bridges,<sup>3</sup> Unhoch ’208,<sup>4</sup> and Johnson<sup>5</sup> (Final Act. 3–6).

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<sup>2</sup> We note that while the parties agree that claims 1–26 are rejected (*see* Final Act. 12; Br. 2), claims 5 and 6 are not included in the pending rejections.

B. The Examiner rejected claims 2, 3, 11, 15, 18, and 19 under 35 U.S.C. § 103(a) as obvious over Bridges, Unhoch '208, Johnson, and Halley<sup>6</sup> (Final Act. 6–7).

C. The Examiner rejected claims 7, 8, 14, and 18 under 35 U.S.C. § 103(a) as obvious over Bridges, Unhoch '208, Johnson, Halley, and Unhoch '646<sup>7</sup> (Final Act. 7–8).

*A. 35 U.S.C. § 103(a) over Bridges, Unhoch '208, and Johnson*

The Examiner finds Bridges teaches “a composition and the method for sustaining biocidal activity of chlorinated hydantoin beads” where the “sources of chloride or bromide can include halohydantoin . . . in an amount of 40% wt.” . . . and trichloroisocyanurate . . . in an amount of 28% wt.” (Final Act. 3). The Examiner further finds that Bridges teaches “polytetrafluoroethylene [p.9, ln 26] as polyfluoropolymer in an amount of 25-57 % wt.” (*Id.*).

The Examiner acknowledges that Bridges does not “teach the amount range of halogen-containing hydantoins instantly claimed, or sulfate salts and their respective amount range” (*Id.*).

The Examiner relies on Unhoch '208 for an “amount of bromine-containing hydantoins [that] range from 1-99% by weight” (Final Act. 3–4)

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<sup>3</sup> Bridges et al., WO 2005/033004 A1, published Apr. 14, 2005 (“Bridges”).

<sup>4</sup> Unhoch et al., US 2008/0274208 A1, published Nov. 6, 2008 (“Unhoch '208”).

<sup>5</sup> Johnson et al., US 5,009,806, issued Apr. 23, 1991 (“Johnson”).

<sup>6</sup> Halley, J., US 3,753,676, issued Aug. 21, 1973 (“Halley”).

<sup>7</sup> Unhoch, M., WO 2011/025646 A1, published Mar. 3, 2011 (“Unhoch '646”).

and Johnson for an “amount range of the particulate polytetrafluoroethylene [that] is from about 0.001-1.0 % weight” (Final Act. 4).

The Examiner finds it obvious “to combine bromine-hydantoins, chlorine-hydantoins, trichloroisocyanuric acid, polytetrafluoroethylene and sulfate salts to develop a water treatment composition because Bridges *et al.*, Unhoch *et al.* and Johnson *et al.* teach that these components can be included in a water treatment composition” (Final Act. 5).

The issues with respect to this rejection is:

(i) Does the evidence of record support the Examiner’s conclusion that Bridges, Unhoch ’208, and Johnson render claim 1 obvious?

(ii) If so, have Appellants presented evidence of secondary considerations that, when weighed with the evidence of obviousness, is sufficient to support a conclusion of non-obviousness?

*Findings of Fact*

1. Bridges teaches “water purification systems, including systems employing polymers having pendant heterocyclic amine groups, such as polystyrene having pendant hydantoin and halogenated hydantoin groups” (Bridges 1:5–7).

2. Bridges teaches:

[O]ne or more compounds capable of releasing chlorine and/or bromine at predetermined low concentrations in flowing or stagnant water that is determined by the design of the article, including the article’s solubility, density, erosion rate, ratio of volume to surface area, and optionally, the amount and/or type of binders and tableting aides,

(Bridges 7:3–7).

3. Bridges teaches “halohydantoin, including but not limited to 1,3-dichloro-5,5-dimethylhydantoin 1,3-dibromodimethylhydantoin, 1-chloro-3-bromo-5,5-dimethylhydantoin or 1-bromo-3-chloro-5,5-dimethylhydantoin” (Bridges 7:24–26).

4. Bridges teaches “chlorinated isocyanurate or a metal salt of a chlorinated isocyanurate, including but not limited to trichloroisocyanuric acid, dichloroisocyanuric acid, potassium trichloroisocyanurate, sodium trichloroisocyanurate, potassium dichloroisocyanurate or sodium dichloroisocyanurate” (Bridges 7:27–30).

5. Bridges teaches that “[f]or an article comprising dichlorodimethylhydantoin, sodium metaphosphate and polytetrafluoroethylene (TEFLON®7), the ratio of the respective compounds is about 2:2:1 . . . For an article comprising sodium trichloroisocyanurate, sodium metaphosphate, and polytetrafluoroethylene (TEFLON®7), the ratio of the respective compounds is about 2:1:4.” (Bridges 9:19–27). The Examiner calculates the first article comprises 40% hydantoin and 20% fluoropolymer and the second article comprises 28% isocyanuric acid and 57% fluoropolymer (*see* Final Act. 3).

6. Bridges teaches, in Example 4, a “solid, ¼-inch diameter, 240 mg compressed tablet (Parr Pellet Press, Parr Instruments Co.) having a density of 2.388 g/cc of well mixed powdered dichlorodimethylhydantoin, sodium metaphosphate, and TEFLON 7® (DuPont) at a ratio of 2:2:1 by weight” (Bridges 16:17–20).

7. Bridges teaches “it is to be appreciated that ratios can deviate from the following depending on the chosen water purification system and the other variable factors affecting the article” (Bridges 9:15–17).

8. Unhoch '208 teaches “a composition for reducing the levels of microorganisms in recreational water systems, comprising: (1) a biocidal effective amount of dibromonitripropionamide (DBNPA); (2) optionally, a biocidal effective amount of an algaecide” (Unhoch '208 ¶ 9).

9. Johnson teaches “a mixture of granular calcium hypochlorite and finely divided polyfluorinated polymer may be compressed and formed into an article which, when placed in contact with water, dissolves more slowly than an article composed of calcium hypochlorite without the polyfluorinated polymer (or other binders)” (Johnson 1:68 to 2:5).

10. Table 1 of the Specification is reproduced below:

TABLE 1 Formulations

Sample	TCCA	PFTE	Copper Sulfate	Aluminum Sulfate	Zinc Sulfate
A	30 g	-	-	-	-
B	29.40 g	0.6 g	-	-	-
C	29.475 g	0.525 g	-	-	-
D	28.05 g	-	0.45 g	1.5 g	-
E	28.05 g	0.6 g	0.45 g	0.9 g	-
F	28.32 g	0.6 g	-	0.18 g	0.9 g
G	28.32 g	0.525 g	-	0.255 g	0.9 g

“Various 30 gram (g) sticks, labeled as Samples A-G were formed using the process described below containing the composition shown in Table 1” (Spec. ¶¶ 43–44).

*Principles of Law*

“The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007). “If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability.” *Id.* at 417. As noted by the Supreme Court in *KSR*, “[a] person of ordinary skill is also a person of ordinary creativity, not an automaton.” *Id.* at 421.

*Analysis*

*Prima Facie Obviousness*

Bridges teaches a water treatment composition (FF 1) that comprises between 28 to 40% of a halogen releasing compound (FF 5) where the halogen releasing compound may be either a halohydantoin or a chlorinated isocyanuric acid such as dichloroisocyanuric acid (FF 3–4) and between 20 and 57% of a fluoropolymer including polytetrafluoroethylene (FF 5).

While Bridges does not teach the use of 50% of the halogen releasing compound or 10% of the fluoropolymer, Bridges does teach that “it is to be appreciated that ratios can deviate from the following depending on the chosen water purification system and the other variable factors affecting the article” (FF 7).

Thus, Bridges recognizes that the amounts and ratios of these two components are results optimizable variables. “[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.” *In re Aller*, 220 F.2d 454, 456 (CCPA 1955). This rule is limited to cases in

which the optimized variable is a “result-effective variable.” *In re Applied Materials, Inc.*, 692 F.3d 1289, 1295 (Fed. Cir. 2012) (citing *In re Antonie*, 559 F.2d 618, 620 (CCPA 1977)).

Because Bridges teaches to optimize the amounts of halogen-releasing compound and fluoropolymer so that they are results optimizable variables, and teaches specific wt.% values for these compounds that are reasonably close to the end points of the range recited in claim 1, we agree with the Examiner that “it is well known from the prior art that polyfluoropolymer are used in recreational water treatment compositions to control the rate of dissolution, accordingly, adjusting the amount of polyfluoropolymer would have been obvious to optimize rate of dissolution” (Ans. 11). The Examiner’s position is supported by Johnson, who teaches that addition of polyfluorinated polymer slows the dissolution rate when incorporated into water treatment compositions (FF 9).

Appellants contend:

[T]he Examiner is required to give patentable weight to the fact that the claimed compounds are organic compounds. Further, because patentable weight must be given to the organic nature of Appellants’ claimed compounds, the Examiner cannot disregard Appellants’ arguments of record regarding organic, halogen-releasing compounds versus inorganic, halogen-releasing compounds. *See* Declaration of Michael Unhoch at paragraphs 7–10.

(Br. 3).

We find this argument unpersuasive because the only reason that the Examiner relies upon Unhoch ‘208 is for the amount of bromine-containing compounds and “sulfate salts such zinc sulfate and copper sulfate . . .

because these can be used in as an algacides” (Ans. 3–4). However, because we take the position that routine optimization of the ratio and amounts of the halogen releasing compounds taught by Bridges renders the particular amounts required by claim 1 obvious as routinely optimized, we do not rely upon the inorganic halogen releasing compounds of Unhoch ’208, only upon Unhoch ’208’s teaching of algacides directed towards dependent claims 9 and 10.

Appellants contend that “the most logical direction for the fluoropolymer of Bridges to be adjusted is upwards because 25% is the lower limit taught by Bridges. *See* Declaration at paragraph 6. Merely because a modification is possible, does this mean that one skilled in the art will automatically make the modification?” (Br. 4).

We find this argument unpersuasive because “discovery of an optimum value of a result effective variable . . . is ordinarily within the skill of the art” *In re Boesch*, 617 F.2d 272, 276 (CCPA 1980). Here, the ordinary artisan would have had reason to modify the amounts of Bridges halogen release compound and fluoropolymers because Bridges teaches “it is to be appreciated that ratios can deviate from the following depending on the chosen water purification system and the other variable factors affecting the article” (FF 7). This express suggestion to modify answers Appellants’ question, because it suggests modifying the amounts and ratio of the components to the person skilled in the art.

Appellants contend that:

[T]he claimed invention in *In re Aller* was rejected as obvious over a single reference that disclosed all the elements of the claimed invention but for the specific claimed

temperatures and concentrations of the sulfuric acid used in the reaction . . . The present facts here are not analogous by any stretch of the imagination.

(Br. 4–5).

We find this argument unpersuasive because Bridges is a single reference that teaches a water treatment composition comprising 40% of a particulate halogen releasing compound within the scope of claim 1 and 20% of a particulate fluoropolymer within the scope of claim 1 (FF 3–6) and specifically suggests optimizing the amounts of these two components (FF 7). These facts are substantially similar to those in *Aller*, and reasonably support the Examiner’s reliance on the optimization rationale in making the rejection (*Aller*, 220 F.2d at 456; *see* Ans. 11).

*Secondary Considerations*

Appellants contend:

[T]he Examiner stated that Appellants’ claims are not commensurate with composition “E” of example 1 cited by Appellants as rebuttal evidence in the submitted 132 declaration . . . However, Appellants are unaware of any requirement to test a “myriad of possibilities” in order to demonstrate unexpected results indicative of non-obviousness.

(Br. 5).

“[O]bjective evidence of non-obviousness must be commensurate in scope with the claims which the evidence is offered to support”. *In re Tiffin*, 448 F.2d 791, 792 (CCPA 1971). *Harris* found that “showing of unexpected results is not commensurate in scope with the degree of protection sought by the claimed subject matter because . . . the record does not show that the improved performance would result if the weight-

percentages were varied within the claimed ranges.” *In re Harris*, 409 F.3d 1339, 1344 (Fed. Cir. 2005).

Applying *Tiffin* and *Harris* to the instant factual situation, the results asserted in Tables 1 and 2 of the Specification are all drawn to ranges of the halogen releasing compound between 93.5% for Sample E to 98.5 % for Sample I and fluoropolymer from 1 % for sample L to 2 % for sample B. When compared to the scope of claim 1, which encompasses 50 to 99.9 % of halogen releasing compound and 0.1 to 10 % of fluoropolymer, we agree with the Examiner that the evidence, even if unexpected, is not commensurate in scope because the record does not show that the improved performance would result if the ratios or weight-percentages varied within the ranges of claim 1. *Harris*, 409 F.3d at 1344.

We note that the facts for commensurate in scope are actually much worse than Appellants acknowledge, because not only are the ranges not commensurate in scope, but claim 1 reasonable encompasses any fluoropolymer and the Specification details a large number of such fluoropolymers (Spec. ¶¶ 34–35). In addition, Appellants’ results are solely demonstrated for one PFTE fluoropolymer, despite that the claim generally recites a “fluoropolymer” (FF 10). This is an additional dimension on which the scope of claim 1 is not commensurate with the results in the Specification.

We have also considered the Unhoch Declaration,<sup>8</sup> which states that “the discovery that small amounts of particulate fluoropolymer can slow the dissolution rate the claimed organic halogen-releasing compounds was

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<sup>8</sup> Declaration of Dr. Michael J. Unhoch, dated Mar. 31, 2014.

considered surprising because excipients typically have the opposite effect with these compounds” (Unhoch Dec. ¶ 9).

We do not find the Unhoch Declaration persuasive, however, because Johnson teaches that a mixture with fluoropolymer “dissolves more slowly than an article composed of calcium hypochlorite without the polyfluorinated polymer” (FF 9). Thus, Johnson evidences that the result of slower dissolution rate that Appellants assert as surprising would have been expected from the addition of a fluoropolymer, not unexpected. *See In re Skoner*, 517 F.2d 947, 950 (CCPA 1975) (“Expected beneficial results are evidence of obviousness of a claimed invention. Just as unexpected beneficial results are evidence of unobviousness.”)

Appellants contend:

[T]he Examiner clearly considered just example 1 and nothing more based on the Examiner’s assertion in the Advisory Action that Appellants’ failed to test a “myriad of possibilities” to show unexpected results commensurate with the claims. Nothing in the record indicates that the Examiner considered Appellants additional data in the specification, as filed.

(Br. 6).

We find this argument unpersuasive because the Examiner specifically addresses all of the data, but concludes that the evidence of secondary considerations was not persuasive (*see* Ans. 14). We agree with the Examiner because, as already discussed, the evidence of record does not clearly demonstrate that the results are unexpected relative to the teachings of Johnson, nor does the evidence demonstrate that the results are commensurate in scope with claim 1.

*Conclusion of Law*

(i) The evidence of record supports the Examiner's conclusion that Bridges, Unhoch '208, and Johnson render claim 1 obvious.

(ii) Appellants have not presented evidence of secondary considerations that, when weighed with the evidence of obviousness, is sufficient to support a conclusion of non-obviousness.

*B. 35 U.S.C. § 103(a) over Bridges, Unhoch '208, Johnson, and Halley*

Appellants do not separately argue this obviousness rejection, instead relying upon their arguments to overcome Bridges, Unhoch '208, and Johnson. The Examiner provides sound fact-based reasoning for combining these references with Halley (*see* Final Act. 6–7). Having affirmed the obviousness rejection of claim 1 over Bridges, Unhoch '208, and Johnson for the reasons given above, we also find that the further combination with Halley renders the rejected claims obvious for the reasons given by the Examiner.

*C. 35 U.S.C. § 103(a) over Bridges, Unhoch '208, Johnson, Halley, and Unhoch '646*

Appellants do not separately argue this obviousness rejection, instead relying upon their arguments to overcome Bridges, Unhoch '208, Johnson, and Halley. The Examiner provides sound fact-based reasoning for combining these references with Unhoch '646 (*see* Final Act. 7–8). Having affirmed the obviousness rejection of claim 1 over Bridges, Unhoch '208, Johnson, and Halley for the reasons given above, we also find that the further combination with Halley renders the rejected claims obvious for the reasons given by the Examiner.

SUMMARY

In summary, we affirm the rejection of claim 1 under 35 U.S.C. § 103(a) as obvious over Bridges, Unhoch '208, and Johnson. Claims 4, 9, 10, 12, 13, 16, 17, and 20–26 fall with claim 1 pursuant to 37 C.F.R. § 41.37(c)(1)(iv).

We affirm the rejection of claims 2, 3, 11, 15, 18, and 19 under 35 U.S.C. § 103(a) as obvious over Bridges, Unhoch '208, Johnson, and Halley.

We affirm the rejection of claims 7, 8, 14, and 18 under 35 U.S.C. § 103(a) as obvious over Bridges, Unhoch '208, Johnson, Halley, and Unhoch '646.

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