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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* LARS NAERUM and POVL NISSEN

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Appeal 2019-002848  
Application 13/809,362  
Technology Center 1700

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Before RAE LYNN P. GUEST, GEORGE C. BEST, and  
DONNA M. PRAISS, *Administrative Patent Judges*.

PRAISS, *Administrative Patent Judge*.

DECISION ON APPEAL<sup>1</sup>

Pursuant to 35 U.S.C. § 134(a), Appellant<sup>2</sup> appeals from the Examiner’s decision to reject claims 38–57. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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<sup>1</sup> In this Decision, we refer to the Specification filed Jan. 9, 2013 (“Spec.”), the Final Office Action dated Feb. 7, 2018 (“Final Act.”), the Appeal Brief filed Aug. 6, 2018 as corrected Mar. 19, 2018 (“Appeal Br.”), the Examiner’s Answer dated Dec. 26, 2018 (“Ans.”), and the Reply Brief filed Feb. 25, 2019 (“Reply Br.”).

<sup>2</sup> We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Rockwool International A/S is identified as the real party in interest. Appeal Br. 3.

## STATEMENT OF THE CASE

The subject matter on appeal relates to a bonded mineral fiber product, which is used in thermal or acoustical insulation products and generally produced by converting a melt made of suitable raw materials to fibers, spraying the fibers with a binder solution, randomly depositing the fibers as a mat or web, and curing in a curing oven. Spec. 1:3–13. Claim 38, the sole independent claim, is illustrative and reproduced from the Claims Appendix to the Appeal Brief (disputed limitations italicized).

38. A bonded mineral fiber product, wherein the mineral fiber product comprises man-made vitreous fibers (MMVF) bound by a cured binder composition, the non-cured binder composition comprising

(a) a sugar component,  
and one or both of

(b) *a polycarboxylic acid component and an alkanolamine*, and

(c) a reaction product of a polycarboxylic acid component and an alkanolamine,

*(a) being present in a concentration of from 42 % to 72 % by weight, based on a total dry matter weight of binder components, which concentration further is sufficient for the cured product to exhibit a fire resistance in accordance with Class A1 of Standard EN 13501-1.*

## ANALYSIS

We review the appealed rejections for error based upon the issues Appellant identifies, and in light of the arguments and evidence produced thereon. *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential) (cited with approval in *In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011))

("[I]t has long been the Board's practice to require an applicant to identify the alleged error in the examiner's rejections."). After considering the argued claims and Appellant's arguments, we are not persuaded of reversible error in the appealed rejections.

The Examiner rejects claims 38–57 as follows. Final Act. 2–6.

<b>Claim(s) Rejected</b>	<b>35 U.S.C. §</b>	<b>Reference(s)/Basis</b>
38–40, 42–51, 54–57	103	Hawkins <sup>3</sup>
41, 52, 53	103	Hawkins, Hansen <sup>4</sup>

Appellant separately argues the rejection of claims 38, 48, 50, and 51. Appeal Br. 6–11. Accordingly, claims 39, 40, 42–47, and 54–57 will stand or fall with claim 38 from which they depend and claim 49 will stand or fall with claim 48 from which it depends. *See* 37 C.F.R. § 41.37(c)(1)(iv). Appellant argues the rejection of claims 41, 52, and 53 as a group. Appeal Br. 12–14. We select claim 41 as representative of grouped claims 41, 52, and 53, therefore, claims 52 and 53 will stand or fall with claim 41. Claims 38, 41, 48, 50, and 51 are addressed below.

### *Claim 38*

Appellant contends the Examiner erred in rejecting claim 38 over Hawkins because Hawkins does not teach or suggest employing a combination of polycarboxylic acids and amino alcohols as crosslinking

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<sup>3</sup> US 2011/0086567 A1, published Apr. 14, 2011. Our decision does not include the parallel citations to Hawkins U.S. Provisional Application No. 61/250,187, filed Oct. 9, 2009, because there is no dispute regarding Hawkins's prior art status.

<sup>4</sup> US 2006/0111480 A1, published May 25, 2006.

agents and also does not mention fire resistance. Appeal Br. 7. According to Appellant, because Hawkins broadly discloses suitable crosslinking agents and combinations which comprise components (a) to (c), it cannot be assumed that Hawkins teaches or suggests the claimed binder composition. *Id.* at 7–8.

The Examiner responds that Hawkins discloses using sugar in an amount of 60–95 weight percent in a binder composition that includes crosslinking agents. Ans. 3 (citing Hawkins ¶¶ 32, 34, 35, 61). The Examiner finds that because Hawkins discloses carboxylic acids (e.g., such as a citric acid) and alkanolamines (e.g., triethanolamine) as examples of suitable crosslinking agents, it would have been obvious to combine the crosslinking agents for the same purpose which “flows logically from their having been individually taught in the prior art.” *Id.* at 3–4 (quoting *In re Kerkhoven*, 626 F.2d 846, 850 (CCPA 1980)). The Examiner determines that even though Hawkins does not disclose the claimed fire resistance property, the claimed properties are deemed to flow from the structure of the composition in which the sugar content overlaps with the claimed sugar content. *Id.* at 4–5 (citing Hawkins ¶¶ 34, 61, 75).

In the Reply Brief, Appellant maintains that Hawkins discloses employing crosslinking agents individually in a binder composition, not in combination, therefore there would have been no motivation for a person having ordinary skill in the art to employ combinations of crosslinking agents let along the specific combination of crosslinking agents claimed. Reply Br. 3. Appellant also asserts that the obvious choice of combinations of crosslinking agents would have been those which react with the sugar component rather than with each other. *Id.* at 4. According to Appellant,

under normal conditions, the carboxylic acid groups of polycarboxylic acid will react with the amino (and also the hydroxyl groups) of the alkanolamine. *Id.*

Appellant's arguments do not persuade us that the Examiner reversibly erred in rejecting the claims as obvious over Hawkins's teachings. Appellant does not dispute that Hawkins discloses a binder composition comprising (a) a sugar component in an amount that overlaps the claimed range and one or both of (b) a polycarboxylic acid component and an alkanolamine, and (c) a reaction product of a polycarboxylic acid component and an alkanolamine. The Examiner's findings are supported by the record cited in this Appeal. Hawkins ¶¶ 32, 34, 35, 61. Appellant's argument (Reply Br. 4) that a person having ordinary skill in the art would have chosen crosslinking agents which react with the sugar component rather than with each other is not persuasive of error for two reasons. First, Hawkins discloses the use of alkanolamines to improve the degree of crosslinking of the carbohydrate based binder. Hawkins ¶ 61. Second, Appellant's arguments are unpersuasive given the lack of evidence in support thereof. *See In re Geisler*, 116 F.3d 1465, 1471 (Fed. Cir. 1997) (argument by counsel cannot take the place of evidence).

Although Appellant argues that choosing from the "millions of binder compositions encompassed by the broad disclosure of HAWKINS" would be required to arrive at a composition within the Appellant's claims (Appeal Br. 8), Appellant does not provide a substantive argument as to why Hawkins's disclosure of components that function as crosslinkers, and the use of alkanolamines specifically (Hawkins ¶ 61), would not have led one of ordinary skill in the art to binder compositions encompassed by Appellant's

claim. Appellant does not direct us to any evidence of criticality of the claimed range of sugar component concentration or claimed components in the composition to rebut the Examiner's rejection. The record has a preponderance of evidence that Hawkins discloses the same composition required by claim 38, which justifies requiring Appellant to prove that Hawkins's product does not necessarily or inherently possess the claimed fire resistance property. *See In re Best*, 562 F.2d 1252, 1255 (CCPA 1977) (“[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product. . . . Whether the rejection is based on ‘inherency’ under 35 U.S.C. § 102, on ‘prima facie obviousness’ under 35 U.S.C. § 103, jointly or alternatively, the burden of proof is the same, and its fairness is evidenced by the PTO’s inability to manufacture products or to obtain and compare prior art products.” (footnote omitted)). Appellant has not provided any such proof.

The preponderance of the evidence in this appeal record, therefore, supports the Examiner's conclusion that the claimed subject matter would have been obvious in view of Hawkins. Accordingly, we sustain the Examiner's rejection of claim 38 for the above reasons and those expressed in the Answer, including the Response to Argument section.

*Claims 48, 50, and 51*

Appellant contends that the Examiner erred in rejecting claim 48, which depends from claim 38, because claim 48 recites “wherein (a) consists of one or more sugars having a total dextrose equivalent (DE) of from 40 to 100” and excludes sugar components with a significantly lower DE. Appeal Br. 9, 10. Appellant asserts that if dextrose were employed as a carbohydrate

component in Hawkins's binder composition, it would be employed with a carbohydrate (polymer) having a dextrose equivalent of from 2 to 20 because that is a required feature of Hawkins's binder composition. *Id.* at 9. (citing Hawkins ¶ 10, Table 3). Appellant also argues that Hawkins's Table 4 "teaches away" from a total (combined) dextrose equivalent of at least 40 because it shows that properties do not improve with increasing DE. *Id.* at 9–10.

Even if Hawkins permitted relatively small amounts of a carbohydrate having a dextrose equivalent of from 2 to 20, Appellant contends that the combination with other sugar components having a significantly higher DE would not meet a total DE of 90 as required by claim 50. Appeal Br. 11. Claim 50 depends from claim 48 and recites "wherein (a) has a total DE of from 90 to 100." Claim 51 depends from claim 50 and recites "wherein (a) consists of a glucose syrup." Appeal Br. 17 (Claims Appendix).

The Examiner responds that Hawkins is not limited to its preferred embodiments and that it cannot be said to teach away from the claimed component when it broadly discloses that the carbohydrate may be glucose. Ans. 6 (citing Hawkins ¶ 32).

In the Reply Brief, Appellant maintains that it is a required feature of Hawkins that the carbohydrate component has a DE of from 2 to 20 even if dextrose is one of the components. Reply Br. 4. Appellant cites Hawkins's Table 4 as evidence that the binder properties do not improve with increase DE because Sample 5 has the best properties, but has a DE intermediate between the two other maltodextrins employed in the other samples. *Id.* at 5.

We do not find Appellant's arguments persuasive of error. Appellant does not dispute the Examiner's finding that dextrose has a DE of 100. Final

Act. 5–6. Appellant’s argument (Appeal Br. 9; Reply Br. 4) that even if dextrose with a DE of 100 is used in Hawkins’s binder composition, Hawkins requires that it be combined with other sugars to have a DE of from 2 to 20 is not persuasive because it is not supported by the record. Hawkins states “[t]he carbohydrate **may** have a dextrose equivalent (DE) from 2 to 20.” Hawkins ¶ 10 (emphasis added). Hawkins’ teachings, therefore, do not preclude a carbohydrate having a DE of “from 40 to 100” recited by claim 48 or “total DE of from 90 to 100” recited by claim 50, or “a glucose syrup” as recited by claim 51.

Appellant’s argument that Hawkins’ Table 4 teaches away from a binder having an increased DE value is not persuasive because it is not supported by the cited record in this Appeal. As Appellant notes, the sample with the carbohydrate having an intermediate DE value, not the lowest value, has the best tensile strength. Appeal Br. 5. Therefore Hawkins’s Table 4 does not show any trend to suggest that Hawkins’ binder composition requires a dextrose equivalent of 20 or less, let alone teach away from a dextrose equivalent that was not even tested (i.e. DE greater than 20).

Accordingly, we affirm the Examiner’s rejections of claims 48, 50, and 51 under 35 U.S.C. § 103.

For these reasons and those the Examiner provides, we uphold the Examiner’s rejection of claim 48 under 35 U.S.C. § 103 as obvious over Hawkins.

#### *Claim 41*

Claim 41 depends from claim 40 and recites “wherein (b) comprises a reaction product of diethanolamine, tetrahydroterephthalic anhydride and trimellitic anhydride.” Appeal Br. 15 (Claims Appendix). Claim 40, in turn,

depends from claim 38 and recites “wherein the non-cured binder composition comprises (b).” *Id.* The Examiner rejects claim 41 over the combination of Hawkins and Hansen because Hawkins discloses a bounded mineral fiber product and Hansen discloses trimellitic anhydride can be used to react with alkanolamine in binder compositions for bounded mineral fiber products. Final Act. 6 (citing Hansen ¶¶ 22–24). The Examiner determines it would have been obvious to use trimellitic anhydride in a binder composition for the same purpose known in the art. *Id.*

Appellant contends that the Examiner erred in rejecting claim 41 because Hansen discloses aromatic polycarboxylic acids as reactants for forming binder components, not as binder components as such, and Hawkins does not disclose aromatic polycarboxylic acid or any reaction products of crosslinking agents. Appeal Br. 12. Appellant also contends that Hawkins does not disclose tetrahydroterephthalic acid or trimellitic anhydride. *Id.* at 13.

The Examiner responds that Appellant is attacking the cited references individually. Ans. 9. The Examiner finds Hansen discloses using trimellitic anhydride to react with alkanolamine in binder compositions for bounded mineral fiber products and concludes that substituting one known compound for another for the same purpose is known. *Id.* (citing Hansen ¶¶ 22–24).

We are not persuaded that the Examiner erred in rejecting claim 41 over the combination of Hawkins and Hansen because the Examiner’s finding that Hansen discloses using the claimed trimellitic anhydride as well as the claimed tetrahydrophthalic anhydride to react with alkanolamine in a binder composition for bounded mineral fiber products is supported by the

record. Hansen ¶¶ 22–24, Title. Appellant does not adequately rebut the Examiner’s finding that it would have been a matter of substitution of Hawkins’ carboxylic acid and an alkanolamine component for Hansen’s carboxylic acid and an alkanolamine component as both disclose a binder composition for a mineral fiber. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007) (“when a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result.”). Even if Hawkins uses exclusively aliphatic polycarboxylic acids in its examples and Hansen discloses aromatic polycarboxylic acids as reactants for forming binder components, Appellant does not adequately explain why a person having ordinary skill in the art would have understood the teachings of Hawkins to be so limited. In an obviousness determination, a reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill in the art. *Merck & Co. v. Biocraft Labs.*, 874 F.2d 804, 807 (Fed. Cir. 1989) (“That the [prior art] patent discloses a multitude of effective combinations does not render any particular formulation less obvious.”). Moreover, “a reference is not limited to the disclosure of specific working examples.” *In re Mills*, 470 F.2d 649, 651 (CCPA 1972) (citation omitted).

Accordingly, we affirm the Examiner’s rejection of claim 41 under 35 U.S.C. § 103.

For these reasons and those the Examiner provides, we uphold the Examiner’s rejection of claims 41 and its dependent claims 52 and 53 under 35 U.S.C. § 103 as obvious over the combination of Hawkins and Hansen.

**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)(1)(iv).

**CONCLUSION**

In summary:

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Reference(s)/Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
38–40, 42–51, 54–57	103	Hawkins	38–40, 42–51, 54–57	
41, 52, 53	103	Hawkins, Hansen	41, 52, 53	
<b>Overall Outcome</b>			38–57	

**AFFIRMED**