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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ANA GONZALEZ-GARCIA, PEDRO P. MARTIN,
NIEVES LAPENA, and MAIK WONNEBERGER

Appeal 2019-005689
Application 14/591,855
Technology Center 1700

Before MICHAEL P. COLAIANNI, MONTÉ T. SQUIRE, and
MICHAEL G. McMANUS, *Administrative Patent Judges*.

McMANUS, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ seeks review of the Examiner's decision to reject claims 1, 3–8, 10–13, and 21–23. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as The Boeing Company. Appeal Brief dated April 12, 2019 (“Appeal Br.”) 2.

CLAIMED SUBJECT MATTER

The present application generally relates to “fire resistant sustainable aircraft interior panels comprising a sandwich panel structure.” Specification filed May 12, 2016 (“Spec.”) ¶ 2. The Specification teaches that aircraft interior panels are “sandwich” structures comprising a core sandwiched between outer skins. *Id.* ¶ 5. Conventionally, the outer skins include phenolic resins and glass fibre pre-pregs or other materials all of which have “known environmental limitations.” *Id.* ¶ 6. The use of such materials presents difficulties during manufacture and at the end of an aircraft’s useful service life. *Id.* ¶ 8. The Specification teaches that it would be desirable to have sandwich panels that are more environmentally friendly while maintaining excellent technical performance. *Id.* ¶ 9.

The Specification teaches an aircraft interior panel where the first and second skins both comprise a composite comprising natural fibres set within a biopolymeric resin thereby forming a sustainable aircraft interior panel. *Id.* ¶ 10.

Claim 1 is illustrative of the subject matter on appeal and is reproduced below with certain limitations bolded for emphasis:

1. An aircraft interior panel comprising:
 - a core sandwiched between first and second skins,
 - wherein the first and the second skins both comprise a composite comprising fibres set within a biopolymeric resin,
 - wherein **the biopolymeric resin consists of 50% to 80% by weight of a natural thermoset polymer derived from one of linseed oil or soya oil**, 10% to 30% by weight of a viscosity-fixing agent, and **1 % to 10% by weight of an initiator**,
 - wherein **the initiator consists of Initiator BK, methyl ethyl**

ketone peroxide, or benzoyl peroxide,

wherein the fibres are bonded to the core by the biopolymeric resin; and

a coating, on an outer surface of at least one of the first and the second skins to increase fire resistance of the aircraft interior panel, wherein the coating is a halogen-free fire resistant protective coating.

Appeal Br. 18 (Claims App.) (reformatted for clarity)

REFERENCES

The Examiner relies upon the following prior art:

Name	Reference	Date
Wolfers et al. (“Wolfers”)	US 4,219,674	Aug. 26, 1980
Martin et al. (“Martin”)	US 2012/0148824 A1	June 14, 2012
Chen et al. (“Chen”)	US 2016/0243583 A1	Aug. 25, 2016
Webster et al. (“Webster”)	US 2016/0280842 A1	Sept. 29, 2016

REJECTIONS

The Examiner maintains the following rejections:

1. Claims 1, 3, 5–8, 10–13, 22, and 23 are rejected under 35 U.S.C. § 103 as being unpatentable over Martin in view of Webster. Final Action dated Sept. 25, 2018 (“Final Act.”) 3–5; Examiner’s Answer dated May 13, 2019 (“Answer”) 3–6.
2. Claim 4 is rejected under 35 U.S.C. § 103 as being unpatentable over Martin in view of Webster, and further in view of Wolfers. *Id.* at 5–6.
3. Claim 21 is rejected under 35 U.S.C. § 103 as being

unpatentable over Martin in view of Webster, and further in view of Chen. *Id.* at 6–7.

DISCUSSION

Rejection 1. The Examiner rejects claims 1, 3, 5–8, 10–13, 22, and 23 as obvious over Martin in view of Webster. Answer 3–6. In support of the rejection, the Examiner finds that Martin teaches each element of the claim other than the biopolymeric resin. *Id.* at 4. The Examiner further finds that Webster teaches a composite material that includes a resin that satisfies the biopolymeric resin limitation. *Id.* at 5.

Webster teaches that “methacrylated epoxidized sucrose soyate (MAESS) oligomers . . . may be formulated into thermosets and cured via a free radical mechanism using styrene, for example, as the reactive diluent.” Webster ¶ 11. In view of Webster’s teachings, the Examiner finds that “[t]he matrix resin comprises 70 wt% of a polyfunctional bio-based methacrylate oligomer with 30% of a diluent and 4 wt% of initiators (paragraph 53 and table 3).”

Appellant argues that the rejection is in error on several bases. Appeal Br. 5–16.

“1 % to 10% by Weight of an Initiator”

First, Appellant argues that Webster does not teach a biopolymeric resin consisting of 1% to 10% by weight of an initiator. *Id.* at 6–8, 10–12. Appellant directs us to the Examiner’s reliance on paragraph 65 of Webster, which teaches “Luperox P (2% of total resin weight) and Luperox 10M75 (2% of total resin weight) were utilized as the free-radical initiators.”

Appeal Br. 7 (citing Webster ¶ 65). Appellant correctly asserts that neither of the listed initiators is one of the specific initiators recited in the claims. *Id.* at 8. Appellant contends that “the scope of the ‘initiator’ (of 1% to 10% by weight) in claims 1 and 7 is limited to including only one of these [listed] substances. As such, other substances may not be employed for the ‘initiator’ of claims 1 and 7.” This is not persuasive of error in the Examiner’s rejection.

As conceded elsewhere in Appellant’s Brief, the Examiner relies on a different portion of Webster as teaching the use of methyl ethyl ketone peroxide. Final Act. 4 (citing Webster ¶ 50). Paragraph 50 of Webster provides that “[f]or thermal curing, a thermally initiated free radical initiator is needed. Suitable thermally initiated free radical initiators include . . . ketone peroxides such as, for example, methyl ethyl ketone peroxide.” Webster ¶ 50. Appellant has not shown that the Examiner erred in relying upon this portion of Webster as teaching the use of methyl ethyl ketone peroxide as an initiator in a biopolymeric resin.

Appellant additionally argues that the Examiner errs in finding that Webster teaches that the initiator should be present in a quantity of “1% to 10% by weight” as claimed. Appeal Br. 10–12. Appellant observes that Paragraph 50 of Webster (relied on by the Examiner as teaching methyl ethyl ketone) “does not indicate the percentage by weight of methyl ethyl ketone peroxide that should be used.” *Id.* at 12. Appellant argues that a person of ordinary skill in the art would not have had reason to assume that methyl ethyl ketone peroxide would be used in the same quantity as the initiators of Example 1 (described in paragraph 65 as present at 4% by weight).

In the Answer, the Examiner additionally finds that “claim 18 recites that the initiator is present in an amount from 0.5 to 15% by weight based on the total weight of the curable composition.” Answer 5. The Examiner determines that the prior art range encompasses the claimed range and establishes a prima facie case of obviousness. *Id.* at 5, 9.

In its Reply Brief, Appellant argues that the range taught by Webster’s claim 18 “is so broad that it totally encompasses and greatly exceeds the range claimed by independent claims 1 and 7.” Reply Br. 7. Appellant further asserts that the prior art range is 38% larger than the claimed range. *Id.*

This is inadequate to show error in the Examiner’s determination. The range of Webster’s claim 18 (0.5 to 15% by weight), considered in conjunction with the value taught by its Example 1 (4% by weight) is generally similar to the claimed range of 1 to 10% by weight. *See* Appeal Br. 18–19 (Claims App.).

As persons of scientific competence in the fields in which they work, examiners are responsible for making findings, informed by their scientific knowledge, as to the meaning of prior art references to persons of ordinary skill in the art. Absent legal error or contrary factual evidence, those findings can establish a prima facie case of obviousness. *In re Berg*, 320 F.3d 1310, 1315 (Fed. Cir. 2003).

Here, Appellant has not shown error in the Examiner’s finding that it would have been a matter of routine engineering to arrive at a value within the claimed range. Answer 5. Appellant does not argue or offer evidence in support of the criticality of the claimed range.

In view of the foregoing, we determine that Appellant has not shown error with regard to the Examiner’s findings relating to the claimed initiator.

Teaching Away

Appellant additionally argues that Webster teaches away from the claimed biopolymeric resin. Appeal Br. 8–10.

Claim 1 requires that “the biopolymeric resin ***consists of***” a thermoset polymer, a viscosity-fixing agent, and an initiator. Claim 7 is similar. Appellant argues that claimed resin may not include additional components (although not explicitly stated, apparently as a result of the use of the closed transition term “consists of”). *Id.* at 9. Appellant directs us to Webster’s teaching that “[t]he invention also relates to the use of a composition comprising the polyfunctional bio-based methacrylated oligomers of the invention, ***together with the optional*** initiators, diluents, catalysts, inhibitors, pigments, and solvents discussed herein, as a matrix resin for composites.” Webster ¶ 53 (emphasis added); *see also* Appeal Br. 8–9.

Appellant argues that the composition of Webster “may comprise . . . a multitude of different combinations of substances including catalysts, inhibitors, pigments, and/or solvents and, thus, the composition [of] Webster teaches away from a biopolymeric resin that is limited to” the enumerated elements. *Id.* at 10 (emphases omitted).

Prior art may teach away if it “criticize[s], discredit[s], or otherwise discourage[s] the solution claimed.” *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004). “[M]ere disclosure of alternative designs does not teach away.” *Id.*

Here, Appellant does not direct us to any portion of Webster that criticizes, discredits, or otherwise discourages use of the claimed resin. Rather, Appellant merely points out that Webster includes various alternatives. As a result, Appellant has not shown that Webster teaches away from the “biopolymeric resin” limitation of claims 1 and 7.

“Biopolymeric Resin” and “Natural Thermoset Polymer”

Appellant argues that “the Examiner is erroneously analogizing the polyfunctional bio-based methacrylate oligomer [MAESS] of Webster to the claimed natural thermoset polymer (derived from linseed oil or soya oil).” Appeal Br. 12; *see id.* at 12–14.

Claim 1 requires a biopolymeric resin that consists of “a natural thermoset polymer derived from one of linseed oil or soya oil” and other components. *Id.* at 18 (Claims App.). In the Final Action, the Examiner finds that methacrylated epoxidized sucrose soyate (MAESS) satisfies the natural thermoset polymer limitation. Final Act. 4.

Webster teaches that bio-based epoxy resins can be “synthesized from the epoxidation of vegetable or seed oil esters of polyols” and describes an embodiment where “the vegetable or seed oil is selected from corn oil, castor oil, *soybean oil*, safflower oil, sunflower oil, *linseed oil*” and others. Webster ¶ 39 (emphasis added); *see also* Appeal Br. 13. Webster additionally teaches that “[t]he invention relates to polyfunctional bio-based methacrylate oligomers prepared by the ring-opening reaction between at least one ethylenically unsaturated acid . . . and a polyfunctional bio-based epoxy resin[.]” *Id.* ¶ 37. Thus, a vegetable or seed oil is epoxidized to form the epoxy resin. *Id.* ¶ 39. The epoxy resin is subsequently subject to a ring-

opening reaction to yield “bio-based methacrylic oligomers.” *Id.* ¶ 37; *see also id.* ¶ 86 (describing preparation of MAESS oligomers by ring-opening reaction between methacrylic acid and epoxidized sucrose soyate).

Appellant argues that the epoxy resin (rather than the subsequently formed oligomer) “should be analogized” to the claimed polymer because it is the resin that is synthesized from linseed or soy oil. Appeal Br. 14. We interpret this to mean that the Appellant contends that the resin (the precursor) satisfies the “natural thermoset polymer” limitation, and it is the methacrylic oligomer (the reaction product) that is taught to be combined with styrene and initiator. Thus, we understand the Appellant to argue, Webster does not teach a natural thermoset polymer “derived from one of linseed or soya oil” that is combined with a viscosity-fixing agent (styrene) and initiator to form the recited “biopolymeric resin.”²

This argument is not persuasive. The Examiner determines that “the natural thermoset polymer derived from linseed oil or soya oil of the claimed invention includes a bio-based polymer for which at least one portion of the polymer consists of a material produced from linseed oil or soya oil.”

Answer 5. The Examiner further finds that “[t]he polyfunctional bio-based methacrylate oligomer [of Webster] is a bio-based methacrylate-epoxy resin derived from soya oil and thus meets a generic definition of the natural thermoset polymer set out in Appellant’s disclosure.” *Id.* at 6.

Appellant argues that the epoxy resin of Webster is “a natural thermoset polymer derived from one of linseed oil or soya oil” but offers

² To the extent that Appellant contemplates some different argument, it is not adequately stated so as to present an issue for appeal. *See* 37 C.F.R. § 41.37(c)(1)(iv).

little argument that the “bio-based methacrylate oligomers” of Webster fall outside the scope of such term. Appellant does not address the scope of the term “derived from.”

In its Reply, Appellant offers argument that Webster teaches an “oligomer” rather than a “polymer.” Reply Br. 4. This issue, however, was not squarely presented in the Appeal Brief, nor has Appellant sought to show good cause why such argument should be considered. Nor has the Examiner had an adequate opportunity to respond to such argument. Accordingly, we will not consider such argument. *See* 37 C.F.R. § 41.41(b)(2).

In view of the foregoing, we determine that Appellant has failed to show error in the rejection of claims 1, 3, 5–8, 10–13, 22, and 23.

Rejections 2 and 3. The Examiner rejects claims 4 and 21 as obvious over Martin in view of Webster and certain additional references. Final Act. 5–7. Appellant argues that these rejections are in error for the same reasons discussed above. Appeal Br. 16. As we have not found such arguments to be persuasive, we determine that reliance on such arguments does not show error with regard to the rejection of claims 4 and 21. Appellant additionally presents new argument regarding claim 4 in its Reply Brief. *See* Reply Br. 8–9. This is a novel argument not discussed in Appellant’s principal brief. As Appellant has not shown good cause why such argument should be considered, we decline to address it. *See* 37 C.F.R. § 41.41(b)(2).

CONCLUSION

The Examiner's rejections are affirmed.

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1, 3, 5-8, 10-13, 22, 23	103	Martin, Webster	1, 3, 5-8, 10-13, 22, 23	
4	103	Martin, Webster, Wolfers	4	
21	103	Martin, Webster, Chen	21	
Overall Outcome			1, 3-8, 10-13, 21-23	

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