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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte SIMON R. LANCASTER-LAROCQUE, PAUL CHOINIERE, DINESH C. MATHEW, and PATRICK MAGANNIG BOYLE

Appeal 2020-003670
Application 15/702,648
Technology Center 2800

Before BEVERLY A. FRANKLIN, JAMES C. HOUSEL, and MERRELL C. CASHION, JR., *Administrative Patent Judges.*

HOUSEL, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the Examiner's decision to reject claims 1–4, 6–9, and 12–23. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM, but designate a new ground of rejection pursuant to 37 C.F.R. 41.50(b).

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[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 Apple Inc. Appeal Br. 2.

CLAIMED SUBJECT MATTER

The claims are directed to electronic devices including first and second structures, such as a housing and a display mounted in the housing. In one embodiment, a polymer gasket including a protective enzyme is disposed in a gap between these structures. Claim 1. In another embodiment, first and second double-sided adhesive tape layers include a lipoxygenase enzyme and are disposed between a gasket and respective first and second structures. Claim 4. In a third embodiment, a layer of adhesive containing a lipoxygenase enzyme couples the structures together. Claim 9.

Claim 9, reproduced below from the Claims Appendix to the Appeal Brief, is illustrative of the claimed subject matter. The limitation at issue is italicized.

> 9. An electronic device, comprising:
>
> a first structure;
>
> a second structure;
>
> a layer of adhesive that couples the first structure to the second structure; and
>
> *a lipoxygenase enzyme* in the layer of adhesive that prevents degradation of the layer of adhesive.

Appeal Br. 14–15 (Claims Appendix).

REFERENCES

The Examiner relies on the following prior art:

Name	Reference	Date
McDaniel et al. ("McDaniel")	US 2010/0210745 A1	Aug. 19, 2010
Mathew et al. ("Mathew")	US 2013/0329460 A1	Dec. 12, 2013
Bae et al. ("Bae")	US 2014/0091536 A1	Apr. 3, 2014

We additionally rely on Appellant's admitted prior art ("AAPA") in the Specification, paragraph 70, as will be explained in more detail below.

REJECTIONS

The Examiner maintains the following grounds of rejection under 35 U.S.C. § 103:

1. Claims 1–4, 6–9, 12–20, 22, and 23 as unpatentable over Bae in view of McDaniel; and
2. Claims 1–3 and 21 as unpatentable over Mathew in view of McDaniel.

OPINION

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 each of Appellant's arguments, we are not persuaded of reversible error in the appealed rejections. We offer the following for emphasis only.

Rejection 1: Obviousness over Bae and McDaniel

Although Appellant indicates that Rejection (1) is to be reviewed on appeal (Appeal Br. 5), Appellant separately argues claims 4, 9, 13, 18, and 22 only. Appellant fails to present any argument with regard to the rejection of claims 1–3, 21, and 23. Accordingly, we summarily affirm Rejection (1) as applied to claims 1–3, 21, and 23. We address Appellant's arguments against the rejection of the separately argued claims below.

Claims 4, 9, and 22

Appellant presents substantially the same arguments with regard to each of independent claims 4 and 9, and dependent claim 22. *See* Appeal Br. 5–9, 11. Specifically, Appellant argues that Bae's coupling member 20 would not be modified to include McDaniel's enzyme because doing so would merely complicate Bae's sealing member without providing protection on a surface exposed to a biological material. *Id.* at 6. According to Appellant, Bae's coupling member 20 will not be exposed to a biological material because it is on the interior of the device. *Id.*

This argument is not persuasive of reversible error because Appellant fails to direct our attention to any evidentiary support for the assertion that Bae's coupling member 20 would not be exposed to any biological, or lipid, contaminants. On the contrary, Bae and Appellant disclose the same or similar device, as well as the same location for the adhesive layer or the double-sided adhesive tape as Appellant. Thus, those skilled in the art would have reasonably expected that Bae's coupling member 20 would be exposed to the same contaminants as Appellant's device.

Appellant next argues that McDaniel does not suggest a lipoxygenase enzyme because the only enzyme McDaniel uses to catalyze the degradation of fatty acids is a lipase enzyme which requires the presence of water.

Appeal Br. 6–7. Appellant asserts that McDaniel's lipase enzyme would be inoperable because Bae's device cannot be washed. *Id.* at 7. On the other hand, Appellant contends that because lipoxygenase enzymes facilitate degradation unsaturated fatty acids by converting the fatty acids to hydroperoxides, which spontaneously degrade, water isn't needed with these enzymes. *Id.* Appellant urges that "[t]he use of lipoxygenase enzymes to degrade fatty acids in electronic devices is not recognized in the cited references, is critical to use in electronic devices, provides a different function from the enzymes disclosed in the cited references, and is not a 'design choice.'" *Id.*, citing *Ex Parte Maeda*, 2012 WL 5294326 (BPAI 2012). In this regard, Appellant alleges that the lipoxygenase incorporated into a double-sided adhesive tape of an electronic device "has different properties than McDaniel's lipase by way of degrading fatty acids in a different way, thereby having the superior property of allowing its integration into electronic devices." *Id.* at 7–8.

This argument is also not persuasive of reversible error because it mischaracterizes the basis of the rejection and relies on an overly restrictive view of McDaniel's teaching regarding the selection of a protective enzyme. Initially, we note that the Examiner finds that lipoxygenase enzymes were known materials. *See* Final Act. 3, 4, 6 ("to select a known material"). Appellant does not dispute that lipoxygenase enzymes were known in the art at the time of filing and, indeed, Appellant discloses that such enzymes have been purified from diverse organisms and are widely expressed in animals, plants, fungi, bacteria, and cyanobacteria. *See* Spec. ¶ 70. The Examiner also finds that, in addition to lipases, McDaniel teaches other enzymes including both simple enzymes and complex enzymes, such metalloenzymes. Ans. 5;

McDaniel ¶ 70. The Examiner finds, and Appellant does not dispute, that lipoxygenases are metalloenzymes. Ans. 5; *see* Spec. ¶ 71 ("lipoxygenases may utilize either iron or manganese in their active sites"). In addition, we note that McDaniel teaches oxidoreductase enzymes, including oxygenases, which catalyze an oxido-reduction of a substrate (McDaniel ¶ 75), and lipolytic enzymes which act on and degrade lipid substrates (*id.* ¶ 86). Because Appellant acknowledges that lipoxygenase enzymes were known in the art and McDaniel teaches that a wide variety of enzymes, including lipolytic enzymes, metalloenzymes, and oxido-reductase enzymes (all of which include lipoxygenases), may be used to improve the service life of polymeric materials, including adhesives or sealants (McDaniel ¶¶ 3, 10) and double-sided adhesive tapes (*id.* ¶ 857), a preponderance of the evidence supports the Examiner's obviousness conclusion.

Although Appellant attempts to distinguish the recited lipoxygenase from McDaniel's lipase on the basis that lipases require the presence of water which Appellant urges is incompatible with electronic devices, Appellant fails to dispute or otherwise address the Examiner's finding that sufficient water may be present in the air to permit lipase activity. *See* Ans. 5 ("[S]election of the lipase as the enzyme does not require the device to be washed. Water molecules may be present in the air and come in contact with the adhesive layer . . . "); *see also* Bae ¶ 8. Also, Appellant fails to direct our attention to any evidentiary support for the assertion that lipoxygenases hold any superiority over lipases in terms of allowing integration into electronic devices.

Therefore, we affirm the Examiner's obviousness rejection of claims 4, 9, and 22 over the combination of Bae and McDaniel. However, because

we rely not only on Appellant's disclosure at paragraph 70 that lipoxygenases were known as admitted prior art (AAPA), but also portions of McDaniel's disclosure beyond those on which the Examiner relies, we designate our affirmance as a new ground of rejection. Because Appellant does not separately argue dependent claims 12, 14–17, 19, and 20, these claims fall with the claim from which they depend. 37 C.F.R. § 41.37(c)(1)(iv) (2018).

Claim 13

Claim 13 depends from claim 9, via claim 12 (requires a material in the gap adjacent to the layer of adhesive), and further requires a coating that covers the material that is in the gap adjacent to the layer of adhesive.

Appellant argues that Bae fails to show or suggest any coating that covers sealing apparatus 100. Appeal Br. 9–10. Appellant contends that Bae, instead, forms sealing apparatus 100 on the interior of the device and provides no motivation for including a coating thereon. *Id.* at 10.

In response, the Examiner explains that Bae teaches two components 20, one of which is the layer of adhesive and the other is the coating. Ans. 7. In addition, the Examiner finds that the contact surface of Bae's coupling member 20 is coated onto at least a surface of sealing apparatus 100, which itself is adjacent to the other coupling member or layer of adhesive 20. *Id*.

Appellant counters that Bae fails to show or suggest that coupling member 20 is a coating. Reply Br. 5. Appellant contends that coupling member 20 itself is an adhesive provided between part 110 and either touch panel 12 or body 11 to fix sealing apparatus 100 in place. *Id.*

Appellant's argument is not persuasive of reversible error because claim 13 merely requires "a coating that covers the material that is in the gap

adjacent to the layer of adhesive." This claim does not limit what material can comprise the coating and, importantly, does not exclude an adhesive layer being the coating. Nor does claim 13 provide any structural limitation or location for the coating other than covering the material in the gap adjacent the layer of adhesive. As such, Appellant has not shown that the Examiner interpretation of Bae's structure such that first coupling member 20 between part 110 and body 11 corresponds to the adhesive layer of claim 9, part 110 corresponds to the material adjacent the adhesive layer of claim 12, and second coupling 20 between part 110 and touch panel 12 corresponds to the coating of claim 13, is unreasonable.

Therefore, we affirm the Examiner's obviousness rejection of claim 13 over the combination of Bae and McDaniel, as modified above to include Appellant's admitted prior art (AAPA).

Claim 18

Claim 18 depends from claim 9, via claim 17,[2] and further requires a hydrophobic coating that covers the polymer material.

Appellant argues that Bae's polymer material cannot be covered by a hydrophobic coating if it contains an enzyme as taught by McDaniel because McDaniel's enzyme requires hydrolysis to degrade fatty acids. Appeal Br. 10. Appellant, therefore, contends that doing so would render the enzyme inoperable for its intended purpose. *Id.*

[2] We note that claim 17 is an improper dependent claim because it does not include all the limitations of the claim from which it depends. Claim 17 recites that the lipoxygenase enzyme is not in the layer of adhesive, but claim 9 from which it depends requires that this enzyme is in the layer of adhesive. The Examiner and Appellant should address this issue upon further prosecution in this application.

In response, the Examiner explains that Bae teaches two components 20, one of which is the layer of adhesive and the other is the coating. Ans. 8. Further, the Examiner finds that the contact surface of Bae's coupling member 20 is coated onto at least a surface of sealing member 100. *Id.* The Examiner also finds that even if the selected enzyme is in the polymer material and requires hydrolysis to degrade fatty acids, Bae's polymer material is still exposed on at least one of its sides. *Id.*

Appellant's argument is not persuasive of reversible error in the obviousness rejection of claim 18 because Appellant fails to dispute or otherwise address the Examiner's additional findings and explanation provided in the Answer. Moreover, as discussed above, Appellant's argument relies on an overly restrictive view of McDaniel's teaching regarding the selection of a protective enzyme.

In addition, we note that claim 17 merely requires that a polymer material be adjacent to the adhesive layer and the polymer material, not the adhesive layer, contains the lipoxygenase enzyme, while claim 18 merely recites a hydrophobic coating covering the polymer material. Given the breadth of these claims, the polymer material may correspond to any structure of Bae's device including body 11, touch panel 12, the substrate of either coupling member 20, and part 110. Further, because coupling members 20 may be double-sided adhesive tape, the polymer material may also correspond to the tape's substrate on whose surfaces adhesive is provided. McDaniel's teaching suggests that a protective enzyme may be provided in any of these structures to extend service life. McDaniel also teaches that an enzyme may be provided in a variety of polymeric materials including fluoropolymers (McDaniel ¶ 879), which are known to be

hydrophobic. It would have been obvious to have any or all of Bae's structures, especially coupling members 20 (or their substrate in the case of double sided tape) and part 110 made of fluoropolymers as such are well known materials of construction for films and gaskets as taught by McDaniel. The resulting structure would provide a hydrophobic coating covering a polymeric material adjacent to an adhesive layer as explained above with regard to claim 13.

Therefore, we affirm the Examiner's obviousness rejection of claim 18 over the combination of Bae and McDaniel.

Rejection 2: Obviousness over Mathew and McDaniel

Although Appellant indicates that Rejection (2) is to be reviewed on appeal (Appeal Br. 5), Appellant does not present any argument against this rejection. Accordingly, we summarily affirm Rejection (2).

CONCLUSION

Upon consideration of the record and for the reasons set forth above and in the Final Office Action and the Examiner's Answer, the Examiner's decision to reject claims 1–4, 6–9, and 12–23 is *affirmed*.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed	New Ground
1–4, 6–9, 12–20, 22, 23	103	Bae, McDaniel, AAPA	1–3, 21, 23		4, 6–9, 12–20, 22
1–3, 21	103	Mathew, McDaniel	1–3, 21		

Overall Outcome			1–3, 21, 23		4, 6–9, 12–20, 22

TIME PERIOD FOR RESPONSE

This decision contains a new ground of rejection pursuant to 37 C.F.R. § 41.50(b). 37 C.F.R. § 41.50(b) provides "[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review."

37 C.F.R. § 41.50(b) also provides that the Appellant, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

> (1) *Reopen prosecution*. Submit an appropriate amendment of the claims so rejected or new Evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the prosecution will be remanded to the examiner. . . .
>
> (2) *Request rehearing*. Request that the proceeding be reheard under § 41.52 by the Board upon the same Record. . . .

Further guidance on responding to a new ground of rejection can be found in the Manual of Patent Examining Procedure § 1214.01.

AFFIRMED; 37 C.F.R. 41.50(b)