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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ELLOR JAMES VAN BUSKIRK, CRAIG A. WILSON, and
RICHARD F. KARABIN¹

Appeal 2015-005443
Application 13/784,858
Technology Center 1700

Before ROMULO H. DELMENDO, CHRISTOPHER C. KENNEDY, and
JEFFREY R. SNAY *Administrative Patent Judges*.

KENNEDY, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134(a) from the Examiner's
decision to reject claims 1–6. We have jurisdiction under 35 U.S.C. § 6(b).
We AFFIRM.

BACKGROUND

The subject matter on appeal relates to electrodepositable film-
forming compositions. *E.g.*, Spec. ¶ 1; Claim 1. Claim 1 is reproduced

¹ According to the Appellants, the real party in interest is PPG Industries
Ohio, Inc., which is a wholly owned subsidiary of PPG Industries, Inc. App.
Br. 2.

below from page 16 (Claims Appendix) of the Appeal Brief (some paragraph breaks and indentation added):

1. An electrodepositable film-forming composition comprising a resinous phase dispersed in an aqueous medium, said resinous phase comprising:
 - (1) an ungelled active hydrogen-containing, cationic resin derived from a polyepoxide;
 - (2) a cationic acrylic resin containing urethane functional groups; and
 - (3) an at least partially blocked polyisocyanate curing agent, wherein the acrylic resin comprises a reaction product of a reaction mixture comprising:
 - (i) an acrylic resin having functional groups that are reactive with amines and
 - (ii) a urethane functional amine compound, wherein the urethane functional amine compound comprises a reaction product of a reaction mixture comprising
 - (a) a polyamine having at least one primary amino group and at least one secondary amino group; and
 - (b) a cyclic carbonate.

REJECTIONS ON APPEAL

1. Claims 1–4 and 6 stand rejected under 35 U.S.C. § 103(a) as unpatentable over McCollum et al. (US 2003/0054193 A1, published Mar. 20, 2003) in view of Jacobs III et al. (US 4,897,435, issued Jan. 30, 1990).
2. Claim 5 stands rejected under 35 U.S.C. § 103(a) as unpatentable over McCollum in view of Jacobs, further in view of Swarup et al. (US 6,245,855 B1, issued June 12, 2001).

ANALYSIS

After review of the cited evidence in the appeal record and the opposing positions of the Appellants and the Examiner, we determine that the Appellants have not identified reversible error in the Examiner's rejections. Accordingly, we affirm the rejections for reasons set forth below, in the Final Action, and in the Examiner's Answer. *See generally* Final Act. 2–13; Ans. 3–16.

Rejection 1

The Examiner finds that McCollum teaches an electrodepositable coating composition comprising each element of claim 1, including a cationic acrylic resin having epoxide functional groups, except that (1) McCollum's cationic acrylic resin does not contain urethane functional groups, and (2) McCollum's cationic acrylic resin does not comprise the reaction product recited by claim 1. Ans. 3–4. The Examiner finds that Jacobs discloses “a hydrophilic polymer formed by reaction of polyamines with cyclic carbonate to provide a hydroxyl alkyl carbonate group-containing secondary amine (i.e. urethane functional amine compound) which is reacted with a suitable epoxy resin.” Ans. 4. The Examiner further finds that the polymer of Jacobs “ha[s] indefinite shelf life stability and produce[s] coatings which are not sensitive to water.” *Id.* The Examiner concludes:

[I]t therefore would have been obvious . . . to prepare urethane-functional amine compound from a reaction mixture comprising hexamethylene triamine and propylene carbonate [as disclosed by Jacobs] (i.e. cyclic carbonate), and then react aforementioned urethane-functional amine compound with the acrylic resin having epoxy functional groups (i.e. acrylic resin having functional groups that are reactive with amine) of McCollum et

al. in order to improve shelf life stability of polymers and produce water-resistant coatings, and thereby arrive at the claimed invention.

Id. at 5.

The Appellants argue that a person of ordinary skill in the art would not have been motivated to react the epoxide functional groups of McCollum's acrylic resin with a urethane functional amine compound because McCollum discloses that its "epoxide functional groups are present on the acrylic polymer for conversion to cationic salt groups." *See* App. Br. 10. Relatedly, they argue that "[i]f one were to react the epoxide functional acrylic polymers in McCollum . . . with the [urethane functional amine compound] taught by Jacobs . . . , the [resulting] acrylic polymer could not be rendered cationic as required by McCollum . . . in order to be electrodepositable." *Id.* at 11. They also argue that "there is no indication in the McCollum reference that epoxide groups on the acrylic polymer should be used for anything other than the formation of cationic salt groups." *Id.*

The Appellants' arguments do not persuade us of reversible error in the Examiner's rejection. The Appellants do not identify any teaching in McCollum that disparages or otherwise criticizes the use of acrylic resins containing urethane functional groups. As the Examiner explains, Jacobs—not McCollum—motivates the use of such functional groups in order to enhance the shelf life and water resistance of the coatings. *See* Ans. 5; Jacobs at 2:15–28.

McCollum is directed to an "electrodepositable coating." *E.g.*, McCollum at Title. A person of ordinary skill in the art would have known that, in order for the coating to remain electrodepositable, at least some, but not necessarily all, of the epoxide functional groups would need to be used

for conversion to cationic salt groups. *See* McCollum ¶ 54. Thus, as the Examiner explains, *see* Ans. 7, it would have been obvious to convert some of the epoxide groups to cationic salt groups for purposes of maintaining the electrodepositability of the composition, as suggested by McCollum, and to react some epoxide groups with the urethane functional amine compound of Jacobs in order to impart to the composition the increased shelf life and water resistance benefits taught by Jacobs. The Appellants provide no persuasive basis to doubt that a person of ordinary skill in the art reasonably would have expected the resulting composition to be both electrodepositable and to possess the benefits described by Jacobs.

In the Reply Brief, the Appellants argue that McCollum makes no suggestion of converting some epoxide groups to salt groups and reacting other epoxide groups with urethane functional amine compounds, and they allege that the Examiner proposed that on the basis of the Appellants' Specification. *See* Reply Br. 4–5. Although we agree with the Appellants that McCollum alone does not suggest the composition proposed by the Examiner, as explained above, the Examiner also relies on Jacobs. The Appellants do not persuasively argue that it would have been beyond the ordinary level of skill in the art to convert some epoxide groups to cationic salt groups to maintain electrodepositability, and to react other epoxide groups with urethane functional amine compounds to improve shelf life, as proposed by the Examiner. The fact that the Examiner cites the Appellants' Specification as being consistent with the Examiner's proposed modification, *see* Ans. 7; Reply Br. 4–5, does not establish that the proposed modification would have been beyond the level of ordinary skill in the art.

The Examiner relies on McCollum and Jacobs as providing the motivation to make the modification; not on the Appellants' Specification. *See* Ans. 7.

The Appellants also argue that Jacobs “does not disclose any acrylic resins,” that Jacobs teaches a “self-crosslinkable” polymer that “is taught to be used by itself in a coating composition,” and that “[t]here is no indication in the reference that epoxy functional acrylic resins would even be suitable in the making of the polymers of [Jacobs] or that the polymers of [Jacobs] would be suitable for use in an electrodepositable composition such as that of [McCollum].” App. Br. 10–12.

We are not persuaded by those arguments. The Examiner does not propose the use of Jacobs' polymer. The Examiner acknowledges that Jacobs does not teach a cationic acrylic resin containing urethane functional groups. *See* Ans. 9. Jacobs does, however, teach the reaction of an epoxy resin with a urethane functional amine compound in order to produce a composition having the desirable properties described above. *E.g.*, Jacobs at 2:15–28. Jacobs teaches that its urethane functional amine compound “is reacted with a suitable epoxy resin or the like.” *Id.* at 2:21–22. The Appellants identify nothing persuasive in Jacobs that would have suggested to a person of ordinary skill in the art that the urethane functional amine compound of Jacobs could not be reacted with the epoxide group of McCollum's cationic acrylic resin. Based on the plain teachings of the references, we agree with the Examiner that a person of ordinary skill would have had a reasonable expectation of success in combining McCollum and Jacobs, notwithstanding the fact that Jacobs itself may not teach an acrylic resin having an epoxide group. *See In re Keller*, 642 F.2d 413, 426 (CCPA 1981) (“[O]ne cannot show non-obviousness by attacking references

individually where, as here, the rejections are based on combinations of references.”).

The fact that the polymer of Jacobs is self-crosslinkable and used by itself is not persuasive of reversible error in the Examiner’s rejection. Nor does it “teach[] away from the use of isocyanate crosslinking agents that are present in the coating compositions of McCollum.” *See* App. Br. 12. As the Examiner explains, the polymer of McCollum is not the same as the polymer of Jacobs, and the Examiner does not propose the use of the polymer of Jacobs. *See* Ans. 11–12. The Examiner relies on Jacob for the teaching of the reaction of a urethane functional amine compound with an epoxy resin to produce a composition having desirable properties. *See id.* The Appellants’ arguments provide no persuasive explanation as to why the polymer of Jacobs would have discouraged a person of ordinary skill in the art from pursuing the combination proposed by the Examiner. *See Keller*, 642 at 426; *see also In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004) (to “teach away,” reference must criticize, discredit, or otherwise discourage the claimed solution).

On the record before us, we agree with the Examiner that a person of ordinary skill in the art would have been motivated to modify the cationic acrylic resin of McCollum to include urethane functional groups as taught by Jacobs with a reasonable expectation of achieving the shelf life and water resistance benefits taught by Jacobs.

Rejection 2

Claim 5 depends from claim 1 and further recites “wherein the acrylic resin is a polymerization product of a monomer mixture comprising styrene,

glycidyl methacrylate, hydroxyethyl acrylate, hydroxyethyl methacrylate, and methyl styrene dimer.”

The Examiner finds that McCollum teaches that the acrylic resin may be a monomer mixture of “styrene, glycidyl methacrylate, hydroxyalkyl acrylate, hydroxylalkyl methacrylate, and α -methyl styrene dimer.” Ans. 5–6 (emphasis added). The Examiner acknowledges that, while McCollum teaches hydroxyalkyl acrylate and hydroxylalkyl methacrylate, it does not disclose the specific hydroxyethyl species that are claimed. *Id.* at 6. The Examiner, however, finds that Swarup teaches that “it is well known that acrylic polymer can be prepared from hydroxyl functional monomers such as hydroxyethyl methacrylate, hydroxyethyl acrylate, etc. to impart hydroxyl functionality to the acrylic material.” *Id.* The Examiner concludes that the use of hydroxyethyl methacrylate and hydroxyethyl acrylate in the composition of McCollum would simply have been the obvious use of known materials according to their established functions. *Id.*

The Appellants argue that Swarup concerns an “automotive clear coat,” while the composition of McCollum is “applied directly to a substrate *under a primer.*” App. Br. 14 (emphasis in original). The Appellants argue that a person of ordinary skill “would not reasonably look to the clear coat compositions of Swarup . . . in order to modify the electrodepositable compositions of McCollum . . . , since each of these two types of automotive coatings is designed with different chemistries to provide completely different properties” App. Br. 14.

We are not persuaded by those arguments. The Appellants do not dispute the Examiner’s finding that McCollum discloses the use of an acrylic resin that is a polymerization product of a monomer mixture comprising

hydroxyalkyl acrylate and hydroxylalkyl methacrylate. As Swarup confirms, the ethyl species of hydroxyalkyl acrylate and hydroxylalkyl methacrylate are well known in the art, and they are specifically known to be useful in the formation of acrylic polymers. *See* Swarup at 2:66–3:4.

The Appellants’ argument that Swarup and McCollum concern compositions applied at different stages of the coating process provides no basis to conclude that a person of ordinary skill in the art would not have been motivated to use known species of the genus disclosed by McCollum in the composition of McCollum.² Absent persuasive evidence to the contrary, we agree with the Examiner’s determination that it would have been obvious to use hydroxyethyl acrylate and hydroxyethyl methacrylate where McCollum expressly discloses the use of hydroxyalkyl acrylate and hydroxylalkyl methacrylate, and where Swarup discloses that hydroxyethyl acrylate and hydroxyethyl methacrylate are known species for use in acrylic polymers. The use of known elements according to their established functions typically does not result in nonobvious subject matter. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416–21 (2007) (“The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.”); *see also id.* at 416 (“[W]hen 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.”); *see also In re*

² In fact, in view of McCollum’s disclosure of hydroxyalkyl acrylate and hydroxylalkyl methacrylate, a person of ordinary skill in the art immediately would have been able to envision the specific “ethyl” species of those “alkyl” genera, even in the absence of Swarup’s disclosure.

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Pearson, 494 F.2d 1399, 1405 (CCPA 1974) (“Attorney’s argument in a brief cannot take the place of evidence.”).

We affirm the rejection of claim 5.

CONCLUSION

We AFFIRM the Examiner’s rejections of claims 1–6.

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