The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

Paper No. 30

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte WARD T. BROWN and JAMES C. DAY

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Appeal No. 2002-1791
Application No. 08/588,945

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ON BRIEF

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Before KIMLIN, PAK, and LIEBERMAN, *Administrative Patent Judges*.

PAK, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 26 and 27, which are all the claims pending in the above-identified application.

According to appellants (Brief, page 4), "the rejected claims stand or fall together." Therefore, for purposes of this appeal, we select claim 26 as representative of all the claims on appeal and decide the propriety of the examiner's rejection based on this claim alone consistent with 37 CFR § 1.192(c)(7)(2000).

Claim 26 is reproduced below:

26. A method of crosslinking a waterborne coating binder polymer bearing at least two carboxylic acid groups comprising admixing said polymer and an aromatic polycarbodiimide having the formula

$H_3C-O-\{-CH_2CH_2-O\}_3-C(O)N(H)-[R-N=C=N-]_n-R'-N(H)C(O)-\{O-CH_2CH_2-\}_p-O-CH_3$

wherein m is an integer of from 5 to 10; n is an integer of from 2 to 7; p is an integer of from 5 to 10; and R and R′ are independently selected from arylene, alkyl-substituted arylene, biarylene alkylene or alkyl-substituted biarylene alkylene.

The prior art references relied upon by the examiner are:

Hoeschele	3,450,562	Jun. 17, 1969
Taylor (Published European Patent Application)	EP 0 241 805 A2	Oct. 21, 1987
Mallon (Published European Patent Application)	EP 0 277 361 A1	Aug. 10, 1988

Claims 26 and 27 stand rejected under 35 U.S.C. § 103 as unpatentable over the combined disclosures of Hoeschele and either Taylor or Mallon.

We have carefully reviewed the claims, specification and applied prior art, including all of the arguments advanced by both the examiner and the appellants in support of their respective positions. This review has led us to conclude that the examiner's Section 103 rejection is well founded.

Accordingly, we will sustain the examiner's Section 103 rejection for essentially those findings of fact and conclusions set forth in the Answer. We add the following primarily for emphasis and completeness.[1]

Under Section 103, the obviousness of an invention cannot be established by combining the teachings of the cited prior art references absent some suggestion or incentive supporting the combination. *See ACS Hosp. Sys., Inc. v. Montefiore Hosp.*, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). This does not mean that the prior art references must specifically suggest making the combination. *See B.F. Goodrich Co. v. Aircraft Braking Sys. Corp.*, 72 F.3d 1577, 1582, 37 USPQ2d 1314, 1318 (Fed. Cir. 1996); *In re Nilssen*, 851 F.2d 1401, 1403, 7 USPQ2d 1500, 1502 (Fed. Cir. 1988). Rather, the test for obviousness is what the combined teachings of the prior art references would have suggested to those of ordinary skill in the art. *In re Young*, 927 F.2d 588, 591, 18 USPQ2d 1089, 1091 (Fed. Cir. 1991); *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981).

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[1] The present application on appeal is copending with another application of the appellants that is also on appeal, U.S. Application Serial No. 08/588,947 filed January 19, 1996 (Appeal No. 2002-2022). Accordingly, the appeals of the present and copending applications are being considered together and will be decided concurrently.

Applying the above test, we have already determined that the combined disclosures of Hoeschele and either Taylor or Mallon would have suggested the claimed aromatic polycarbodiimides.[2]

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[2] The polycarbodiimide preferred in Hoeschele is the urethane-terminated aromatic polycarbodiimides described in U.S. Patent 2,941,983 issued to Smeltz on June 21, 1960, which is also attached to this decision. *See, e.g., Ultradent Prods., Inc., v. Life-Like Cosmetics, Inc.*, 127 F.3d 1065, 1069, 44 USPQ2d 1336, 1339-40 (Fed. cir. 1997). As indicated in the earlier decision on Appeal No. 1999-1007 (Application 08/708,998) entered March 31, 2000 (attache herewith), these preferred aromatic polycarbodiimides are identical to the claimed aromatic polycarbodiimides except for the absence of the claimed hydrophilic polyether linkages (methoxy capped poly(ethylene oxide)). See also Smeltz, column 1, lines 56-67, column 5, lines 11-17 and column 6, lines 25-30. Although Hoeschele employs conventional surface active agents or dispersing agents to improve the dispersibility of its preferred aromatic polycarbodiimides, the examiner took official notice at page 4 of the Answer that "the termination of carbodiimides with hydrophilic polyether chains was [also] known at the time of [the] invention as a means for rendering carbodiimide crosslinking agents water dispersible." We find that Taylor and Mellon also teach using methoxy-capped(ethylene oxide) to advantageously improve the hydrophilicity (dispersibility or dissolving characteristic) of carbodiimides in general. See Taylor, page 4, lines 12-15 and Mellon, page 5, line 55 to page 6, line 11. These resulting carbodiimides can be used together with other surfactants known in the art and can be made from aromatic/aliphatic isocyanates. See Taylor, page 2, line 31 and page 6, lines 26-27 and Mellon, page 2, line 34 and page 6, lines 11-12.

Given the desire to improve the dispersibility of the aromatic polycarbodiimides described in Hoeschele and given the recognized improved effect on dispersibility by terminating polycarbodiimides in general with hydrophilic polyether linkages, one of ordinary skill in the art would have been led to terminate the aromatic polycarbodiimides described in Hoeschele with the hydrophilic polyether linkages of the type described in Taylor or

See our earlier decision on Appeal No. 1999-1007 (Application 08/708,998) entered March 31, 2000. The dispositive question is, therefore, whether it would have been obvious to employ the above-mentioned aromatic carbodiimides as crosslinking agents for a waterborne coating binder polymer bearing at least two carboxylic acid groups. On this record, we answer this question in the affirmative.

As found by the examiner, both Taylor and Mellon teach employing polycarbodiimides in general, including those made from ***aromatic***/aliphatic isocyanates, as a crosslinking agent for a carboxylated latex resin or neutralized carboxylated water soluble polymer. See Taylor, page 2, lines 24-33, and Mellon, page 2, lines 28-38. "The resin systems in which carbodiimide cross-linkers are particularly useful are those in which the material contains reactive carboxyl groups, such as are typically found in aqueous latexes used for coatings." See, e.g., Taylor, page 2, lines 34-36. The polycarbodiimides, especially the aromatic polycarbodiimides[3] described in Hoeschele, modified

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Mellon, motivated by a reasonable expectation of successfully further enhancing the dispersibility (dissolving) characteristics of the aromatic polycarbodiimides.

[3] We note that Hoeschele teaches that its preferred aromatic polycarbodiimides have advantageous properties, e.g., compressive

according to the teachings of Taylor or Mellon as indicated above are especially useful as crosslinking agents for a latex. See Taylor, page 4, lines 12-15 and page 5, line 51 to page 6, line 42; and Mellon, page 5, line 55 to page 6, line 10. The latex described in Taylor or Mellon, according to the examiner's undisputed finding, corresponds to the claimed waterborne coating binder polymer. Compare the Answer, page 5, with the Brief in its entirety.

Given the above teachings, we concur with the examiner that one of ordinary skill in the art would have been led to use the claimed aromatic polycarbodiimides as cross-linking agents (cross-linkers) for a waterborne coating binder polymer bearing at least two carboxylic acid groups (latex polymers) to form a coating solution, motivated by a reasonable expectation of

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strength, as a coating solution for substrates made of cellulosic materials. See column 1, lines 14-27 and column 2, lines 39-48. We also note that Hoeschele, like Taylor and Mellon, teaches that these aromatic polycarbodiimides, like other polycarbodiimides, may also react with carboxyl groups to form a coating material. See Hoeschele, column 7, lines 35-41, together with column 2, lines 48-52. We further note that these polycarbodiimides can further improve their properties, i.e., their hydrophilicity (dispersibility or dissolving characteristic), by incorporating methoxy-capped(ethylene oxide)at their ends. Thus, one skilled in the art interested in obtaining the advantageous properties of the aromatic polycarbodiimides described in Hoeschele would have been led to modify such polycarbodiimides in accordance with the teachings of Taylor or Mellon.

successfully obtaining the advantageous properties indicated in Hoechele, Taylor and Mellon.

The appellants allege (Brief, page 8) that:

> Appellants have provided a method of crosslinking a waterborne coating binder polymer bearing at least two carboxylic acid groups by admixing the polymer and certain water-soluble or water-dispersible aromatic polycarbodiimides, a process which is slow enough for substantially all of it to occur during or after film formation with the result that a number of important requirements for a good coating such as mar resistance and solvent resistance are greatly improved.

The appellants then go on to argue that the applied prior art references do not teach or would have suggested the obtention of the above advantageous coating properties. *Id.*

We are not persuaded by this argument since the above-mentioned suggestion or motivation in the applied prior art references would have led one of ordinary skill in the art to arrive at the claimed subject matter as indicated *supra*. The applied prior art references need not be combined for the same purpose contemplated by the appellants, i.e., for allegedly obtaining the above additional advantageous coating properties so long as some motivation or suggestion to combine the prior art teachings are present. *In re Beattie*, 974 F.2d 1309, 1312, 24 USPQ2d 1040, 1042 (Fed. Cir. 1992)("[a]s long as some motivation or suggestion to combine the references is provided by the prior

art taken as a whole, the law does not require that the references be combined for the reasons contemplated by the inventor"); *In re Dillon*, 919 F.2d 688, 692, 696, 16 USPQ2d 1897, 1901, 1904 (Fed. Cir. 1990)(*en banc*), *cert. denied*, 500 U.S. 904 (1991)(all the utilities or benefits of the claimed invention need not be explicitly disclosed by the prior art references to render the claimed subject matter obvious within the meaning of 35 U.S.C. 103).

To the extent that the appellants are relying on the above alleged improvements as unexpected results, we note that they have not referred to any factual evidence to support such an allegation. *In re De Blauwe*, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984)(arguments in the Brief or conclusory statements in the specification cannot take the place of objective evidence); *In re Lindner*, 457 F.2d 506, 508, 173 USPQ 356, 358 (CCPA 1972)("mere lawyers' arguments unsupported by factual evidence are insufficient to establish unexpected results"). Nor have the appellants averred anywhere in the specification or a Rule 132 declaration that the alleged improvements are unexpected. *See In re Geisler*, 116 F.3d 1465, 1470, 43 USPQ2d 1362, 1365-66 (Fed. Cir. 1997).

Thus, having considered all the evidence of record, we determine that the evidence of obviousness, on balance, outweighs the evidence of nonobviousness. Accordingly, we affirm the examiner's decision rejecting the appealed claims under 35 U.S.C. § 103.

As a final point, we note that the subject matter on appeal is related to the subject matter claimed in Application Serial Nos. 08/588,947 and 08/708,998, and U.S. Patent No. 5,574,083. In the event of further prosecution, the examiner is advised to determine whether the claims of the above applications or patent alone, or in combination with Taylor or Mellon, affect the patentability of the subject matter claimed in this application under the judicially created doctrine of obviousness-type double patenting.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

EDWARD C. KIMLIN Administrative Patent Judge	)	
CHUNG K. PAK Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
PAUL LIEBERMAN Administrative Patent Judge	)	

CKP:hh

Appeal No. 2002-1791
Application No. 08/588,945

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