Paper No. 14

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ROBERT J. CORNELL, DARILYN H. ROBERTS
and WILLIAM R. TRUE

Appeal No. 1996-2113
Application No. 08/192,220

ON BRIEF

Before GARRIS, WALTZ, and KRATZ, Administrative Patent Judges.

WALTZ, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1 through 4. The remaining claims in this application are claims 5 and 6, which stand withdrawn from further consideration by the examiner as drawn to a nonelected invention (Answer, page 1).

According to appellants, the invention is directed to the discovery that select amounts of a first reactive ingredient and a second reactive ingredient, when combined in a chemically-reactive environment, produce a reaction product that is effective for reducing the rate at which insoluble sulfur converts to a migratable form of sulfur (Brief, page 3, citing the specification, page 3, ll. 7-21). The first reactive ingredient is itself a reaction product of an aliphatic ketone and a primary aromatic amine while the second reactive ingredient is an acid anhydride (*id.*). Illustrative claim 1 is reproduced below:

1. In a formulation which includes insoluble sulfur, the improvement which comprises an effective amount of a reaction product in the formulation, wherein the reaction product is produced by combining:

(A) a first reactive ingredient, itself produced by reactively combining an aliphatic ketone with a primary aromatic amine, and

(B) a second reactive ingredient, which is an acid anhydride, wherein the reaction product is present in the formulation in an amount that is effective for reducing the rate at which insoluble sulfur converts to a migratable form of sulfur.

The examiner has relied upon the following references as evidence of obviousness:

Massie	2,561,524	July 24, 1951
Hill et al. (Hill)	2,955,100	Oct. 4, 1960
New et al. (New)	3,337,493	Aug. 22, 1967
Kilbourne	3,413,253	Nov. 26, 1968
Parker	4,247,664	Jan. 27, 1981

All of the claims on appeal stand rejected under 35 U.S.C. § 103 as unpatentable over Hill, Parker, Kilbourne, and New alone or combined with Massie (Answer, paragraph bridging pages 2-3).[1] We *reverse* the examiner's rejections for reasons which follow.

OPINION

The examiner's rejection is stated as follows (Answer, page 3):

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[1]The final rejection of claims 1 through 4 under 35 U.S.C. § 112, first and second paragraphs, has not been repeated in the Answer (see the final rejection dated Oct. 21, 1994, Paper No. 6, page 3). Accordingly, we consider this rejection as withdrawn by the examiner. *See Paperless Accounting v. Bay Area Rapid Transit Sys.,* 804 F.2d 659, 663, 231 USPQ 649, 652 (Fed. Cir. 1986).

Claimed formulation differs from Hill, New, Parker (B) or Kilbourne in that second reactive ingredient anhydride is not explicitly used. Used [sic, use] of anhydride would be motivated since (1) primary references use acids, and the derivatives such as anhydride would be expected to be compatible with sulfur and (2) secondary reference Massie (column 3, top) teaches that acid anhydride and its acid are normally equivalent when used for rubber processing.

We agree with the examiner that the primary references (Hill, New, Parker and Kilbourne) fail to disclose or suggest the second reactive ingredient (an acid anhydride) required by the claim 1 on appeal. However, we disagree with the examiner's interpretation of the claim and these primary references. Hill, New and Kilbourne do "use acids" as found by the examiner but fail to disclose or suggest a reaction product produced by combining the first reactive ingredient (dihydroquinolines[2]) with "a second reactive ingredient" which is an acid anhydride as required by claim 1 on appeal. The only acid disclosed or suggested by Hill, New and Kilbourne is stearic acid, which is a conventional or commonly used

[2]It is well known that the reaction of an aliphatic ketone with a primary aromatic amine, as recited in claim 1 on appeal for the "first reactive ingredient," produces dihydroquinolines. See the specification, page 1, ll. 26-30; page 6, ll. 28-31; Hill, col. 1, ll. 63-67.

ingredient in the *base rubber* formulation. See Hill, col. 3, ll. 4-17; New, col. 3, ll. 50-57; col. 4, ll. 28-37; and Kilbourne, col. 2, ll. 51-69. None of these primary references disclose or suggest an acid ingredient that is *reactive* with the first reactive ingredient of claim 1, i.e., dihydroquinolines.

Parker discloses 2,2,4-trimethyl-1,2-dihydroquinoline (TMDQ) which is blocked with an acidic blocking agent before reaction with a vinyl aromatic polymer (e.g., styrene) to produce an antioxidant product with an outstanding lack of bloom[3] to the surface of the rubber article. See Parker, col. 3, ll. 31-49; col. 5, ll. 17-30; and col. 5, ll. 65-67. Parker also discloses that dihydroquinolines may be prepared by the well known reaction of an aliphatic ketone with a primary aromatic amine (col. 5, ll. 40-46). However, Parker teaches that the acidic blocking agent must be removed to effect the stabilizing or antioxidant property of this reaction product (col. 6, ll. 10-13). Therefore the acid

[3]Soluble sulfur is known to migrate to the surface of uncured rubber articles and migration of this sort is called sulfur "bloom." See appellants' specification, page 2, ll. 14-16.

blocked TMDQ of Parker would not have been present in a rubber formulation in an amount effective to reduce the rate at which insoluble sulfur converts to a migratable form of sulfur, as required by claim 1 on appeal.

The examiner has applied Massie "to show employment of anhydrides in rubber formulations is well known in the art." (Answer, page 3). Massie discloses the relative equivalency of bicyclo [2.2.1]-5-heptene-2,3-dicarboxylic acid and its anhydride to retard incipient vulcanization or scorch during the mixing, forming and storage stages of rubber processing and to improve the action of accelerator compounds (col. 1, ll. 1-11; col. 2, ll. 1-11; col. 2, l. 55-col. 3, l. 12; and see the Brief, page 8). The examiner has failed to provide any support for his statement that "derivatives such as anhydride would be expected to be compatible with sulfur" (Answer, page 3). "It is well established that before a conclusion of obviousness may be made based on a combination of references, there must have been a reason, suggestion or motivation to lead an inventor to combine those references." *Pro-Mold and Tool Co. v. Great Lakes Plastics Inc.,* 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1629 (Fed. Cir. 1996). The

examiner has not established any convincing reason, suggestion or motivation for combining the references as proposed (see the Brief, page 10). The examiner has only made general statements that acids and anhydrides are normally equivalent "when used for rubber processing" (Answer, page 3). The examiner has not addressed the specific disclosure and teachings of Massie that a specific anhydride and acid are relatively equivalent when used to retard incipient vulcanization or scorch and improve the action of accelerator compounds. In this context, the examiner must provide specific reasons or suggestions for combining the teachings and disclosures of Massie with the primary references, none of which are directed to retarding incipient vulcanization and scorch and improvement of the action of accelerator compounds. *In re Dembiczak,* 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999)("[T]he showing [of evidence of a suggestion, teaching, or motivation to combine] must be clear and particular."). Accordingly, even assuming *arguendo* that the primary references disclose or suggest the reaction product of dihydroquinolines and acids, the examiner has not established

any convincing reason or suggestion to modify the acids of the primary references to acid anhydrides.

For the foregoing reasons, we determine that the examiner has not established a *prima facie* case of obviousness in view of the reference evidence. Therefore we need not address the sufficiency of appellants' rebuttal evidence (Brief, page 4; Answer, page 4). *In re Geiger,* 815 F.2d 686, 688, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987). Accordingly, the examiner's rejections of claims 1 through 4 under 35 U.S.C. § 103 as unpatentable over Hill, Parker, Kilbourne, and New alone or combined with Massie are reversed.

The decision of the examiner is reversed.

REVERSED

BRADLEY R. GARRIS)
Administrative Patent Judge)
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	)	BOARD OF PATENT
THOMAS A. WALTZ	)	APPEALS
Administrative Patent Judge	)	AND
	)	INTERFERENCES
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PETER F. KRATZ	)	
Administrative Patent Judge	)	

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JEROME DONALD DRABIAK
UNIROYAL CHEMICAL COMPANY, INC.
WORLD HEADQUARTERS
MIDDLEBURY, CT 06749

Leticia

Appeal No. 1996-2113
Application No. 08/192,220

APJ WALTZ

APJ KRATZ

APJ GARRIS

DECISION: REVERSED
Send Reference(s): Yes No
or Translation (s)
Panel Change: Yes No
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Draft Final

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PALM / ACTS 2 / BOOK
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