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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/377,579	08/08/2014	Graham Smith	MERCK-4216	4840

23599 7590 09/25/2019

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EXAMINER	
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ART UNIT	PAPER NUMBER
1761	

NOTIFICATION DATE	DELIVERY MODE
09/25/2019	ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte GRAHAM SMITH, OWAIN LLYR PARRI, VICKI COOK, GEORG BERNATZ, DAVID WILKES, JONATHAN HENRY WILSON, MARK JAMES, and PHILIP EDWARD MAY

Appeal 2019-000751
Application 14/377,579
Technology Center 1700

Before BRADLEY R. GARRIS, MICHAEL P. COLAIANNI, and MERRELL C. CASHION, JR., *Administrative Patent Judges*.

COLAIANNI, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the Examiner's decision to reject claims 1–4, 13–15, and 18. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

[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 Merck Patent GmbH. Appeal Br. 1.

Appellant's invention is directed to a reactive mesogen (RM) formulation comprising a conductive additive (Spec. 1:5–8; Claim 1).

Claim 1 is representative of the subject matter on appeal:

> 1. A formulation comprising >50% by weight of one or more polymerisable mesogenic compounds, and one or more conductive additives, wherein the formulation comprises:
>
> 30 to 99.9% by weight of polymerisable mesogenic compounds having two or more polymerisable functional groups,
>
> 0 to 90% by weight polymerisable mesogenic compounds having only one polymerisable functional group,
>
> 0.01 to 5% by weight of one or more conductive additives,
>
> 0 to 5% by weight of one or more surfactants, and
>
> 0 to 5% by weight of one or more polymerisation initiators.

Appellant argues the claims as a group (Appeal Br. 3–7). We select claim 1 as representative of the group.

FINDINGS OF FACT & ANALYSIS

The Examiner's findings and conclusions regarding Goetz are located on pages 2 to 3 of the Final Action. The Examiner finds that Goetz teaches a mesogenic compound "PY" where the various substituents for R^1, R^2, Z^Y, Z^X, B, L^3, and L^4 may be chosen so that the PY compound includes formula Id in Appellant's claim 15 (Final Act. 3). The Examiner finds that if the two end groups R^1 and R^2 of the PY compound are chosen to include a –CH=CH- group, then the compound is polymerizable (Final Act. 3). Citing Goetz' paragraph 253, the Examiner finds that the unsaturated carbon double bond gives the PY compound two polymerizable groups (Final Act. 3). The

Examiner finds that the amount of the mesogenic compound PY in the formulation is 1 to 60% (Final Act. 3).

Appellant argues that Goetz does not teach including a mesogenic compound having two polymerizable functionalities in an amount of greater than 50% as recited in claim 1 but, instead, teaches using less than or equal to 5% of polymerizable reactive mesogens (Appeal Br. 4). Appellant contends that Goetz teaches that polymer stabilized (PS) or polymer-sustained alignment (PSA) displays typically use less than 1% of a polymerizable compound in a liquid crystal (LC) medium (Appeal Br. 4). Appellant argues that Goetz teaches away from including greater than 50% of one or more polymerizable mesogenic compounds in the formulation because Goetz teaches a maximum of a small amount of at most 5% of polymerizable compounds (Appeal Br. 5). In addition, Appellant argues that Goetz does not disclose that the unsaturated double bond in the R^1 and R^2 groups are located on the terminal ends and, thus, Goetz's compound would not be considered a polymerizable compound (Appeal Br. 4–5). Appellant contends that Goetz differentiates between polymerizable compounds and the LC mixture that includes the PY compound (Appeal Br. 5).

Claim 1 requires a formulation comprising greater than 50% by weight of one or more polymerizable mesogenic compounds wherein 30 to 99.9% of the polymerizable mesogenic compounds have two or more polymerizable functional groups.

Goetz discloses making a liquid crystalline (LC) medium composed of a polymerizable reactive mesogen (RM) component (Component A) and a liquid crystalline (LC) mixture or host mixture (Component B) (Goetz ¶¶ 23–25). The LC mixture component of the LC medium may include the

compound PY (Goetz ¶ 66). Goetz does not disclose that the LC mixture component of the LC medium is a polymerizable mesogen. Although the Examiner finds that the unsaturated carbon double bond on each end of the PY compound would be polymerizable, there is disclosure to support Appellant's contention that Goetz differentiates between polymerizable compounds and the LC mixture that includes the PY compound. The Examiner cites to paragraph 253 of Goetz for the teaching that the unsaturated carbon double bond is suitable for polymerization (Final Act. 3). Goetz's paragraph 253 disclosure is made in the context of the polymerizable reactive mesogenic compounds of the general formula R^a—B^1—$(Z^b$—$B^2)_m$—R^b (¶¶ 173–174, 176, 253). The Examiner has not shown that the unsaturated carbon double bond in Goetz's PY compound would yield a polymerizable mesogen. Thus, it appears that Goetz teaches that the reactive mesogens are part of the polymerizable component A, not the LC mixture component that may include the PY compound (¶¶ 172, 173).

Goetz further teaches that the amount of polymerizable compounds for use in polymer-sustained alignment (PSA) devices should be less than 5% (¶ 167). Goetz's goal is to achieve a formulation for use in polymer-stabilized (PS) or PSA devices (¶¶ 1, 3, 167). In other words, the Examiner's citation to paragraph 143 of Goetz as teaching to use up to 60% of the PY compound in the LC mixture (i.e., component B) of the LC media, fails to teach the claim requirement of greater than 50% of a polymerizable, mesogen. Rather, Goetz teaches to limit the polymerizable portion (i.e., component A) of the LC media to less than 5% by weight. In light of these teachings, we find that the Examiner has not established that Goetz would

have suggested a formulation that uses a polymerizable mesogen in an amount of greater than 50% by weight of the composition as claimed.

On this record, the preponderance of the evidence favors Appellant's arguments for of nonobviousness. We reverse the Examiner's § 103 rejection over Goetz.

CONCLUSION

In summary:

Claims Rejected	Basis	Affirmed	Reversed
1–4, 13–15, 18	§ 103 Goetz		1–4, 13–15, 18
Overall Outcome			1–4, 13–15, 18

REVERSED