

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 32

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MICHAEL D. CRANDALL

Appeal No. 1999-1951
Application No. 08/797,062

HEARD: JANUARY 17, 2002

Before LIEBERMAN, KRATZ, and DELMENDO, Administrative Patent Judges.

LIEBERMAN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the rejection of the examiner refusing to allow claims 1 through 40, which are all the claims pending in this application.

THE INVENTION

The invention is directed to a retroreflective article comprising a layer of retroreflective elements at least partially embedded in a binder layer. The binder layer comprises a polyurethane having specific molecular weight and end group unsaturation requirements. Additional limitations are described in the following illustrative claims.

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THE CLAIMS

Claims 1 and 40 are illustrative of appellant's invention and are reproduced below:

1. A retroreflective article comprising:

a layer of retroreflective elements at least partially embedded in a binder layer that comprises a polyurethane polymer that is the reaction product of (i) a polyether polyol having a number average molecular weight of at least 4,000 and having an end group unsaturation level of no greater than 0.04 milliequivalents per gram of polyether polyol and (ii) a polyisocyanate.

40. An exposed lens retroreflective article that comprises:

a layer of retroreflective elements partially embedded in a binder layer that comprises a polyurethane polymer that is the reaction product of (i) a polyether polyol having a number average molecular weight of at least 2,000 and having an end group unsaturation level of no greater than 0.04 milliequivalents per gram of polyether polyol and (ii) a polyisocyanate.

THE REFERENCES OF RECORD

As evidence of obviousness, the examiner relies upon the following references:

Griswold	3,846,378	Nov. 5, 1974
Belisle et al. (Belisle)	4,725,494	Feb. 16, 1988
Li	5,338,595	Aug. 16, 1994

THE REJECTIONS

Claims 1 through 26, 28 through 33, and 36 through 39 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Belisle in view of Griswold.

Claims 27, 34, 35 and 40 stand rejected under 35 U.S.C. § 103(a) as being

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unpatentable over Belisle in view of Griswold and Li.

OPINION

We have carefully considered all of the arguments advanced by the appellant and the examiner, and agree with the appellant that the rejections of the claims under § 103(a) are not well founded. Accordingly, we reverse these rejections.

Rejections under 35 U.S.C. § 103(a)

"[T]he examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a *prima facie* case of unpatentability." See In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). The examiner relies upon a combination of at least two references to reject the claimed subject matter and establish a prima facie case of obviousness. The premise of the rejection is that, "it would have been obvious to increase the molecular weight of the polyol component." See Answer, page 5. We disagree.

The Belisle reference is directed to a retroreflective sheeting construction comprising a monolayer of reflective transparent spheres embedded in a polymeric binder. See column 1, lines 10-11. We find that the polymeric layer containing the reflective spheres is reacted to a substantially insoluble state and comprises urethane linkages. See column 2, lines 31-36 and column 4, line 35 to column 5, line 5. Various isocyanate terminated polyols are disclosed. See column 5, lines 11-53. The particularly preferred polyol is

a linear diol of polycaprolactone. See column 6, lines 8-11. We find however, that the only molecular weights disclosed are for the polycaprolactone diol. The molecular weight range disclosed is "between about 500 and 2,000." Id. There is no disclosure of a polyether polyol having the molecular weight required by the claimed subject matter. Nor is there any disclosure directed to "end group unsaturation," as required by the claimed subject matter.

The Belisle reference refers to polyols disclosed in U.S. Patent No. 3,846,378 to Griswold. We find that Griswold discloses polyurethane prepared from a variety of polyols, column 4, lines 24-51. However, as in the primary reference, there is likewise no disclosure directed to the molecular weight of the polyols nor their end group unsaturation.

In contrast, Li is directed to a retroreflective applique comprising a monolayer of retroreflective elements partially embedded in and partially protruding from the front surface of a binder layer. See Abstract and column 2, lines 6-24. We find the binder material contains one or two component urethanes. See column 5, lines 7-9. We find that Example 1 comprises glass microsphere retroreflective elements embedded in a polyurethane binder prepared from a polyether polyol based on polytetramethylene oxide having a hydroxy equivalent weight of 3000. Polyols are customarily defined as having two or more hydroxy groups or being a polyhydric alcohol. Accordingly, we conclude that the polytetramethylene oxide of Li has a molecular weight of at least 6000,

which is well within the scope of the molecular weight requirements of the claimed subject matter. We find however, no disclosure directed to the end group unsaturation as required by the claimed subject matter.

One of the references cited in the specification states that, "[w]ithout wishing to be bound by any particular theory, it is speculated by the present inventor that unsaturated end groups result in monofunctional species that act as chain stoppers in elastomer formation. In polyol synthesis with KOH catalysis the unsaturation formed increases as a direct function of equivalent weight. Eventually conditions are established wherein further propylene oxide addition fails to increase the molecular weight." See Reisch (U.S. Patent No. 4,985,491, issued Jan. 15, 1991) column 2, line 67 to column 3, line 7, cited by appellant in the specification at page 5, line 20. In as much as the polyol of polytetramethylene oxide has a hydroxy equivalent weight of 3,000, it would appear that the proportion of unsaturation could be within the limits established by the claimed subject matter.

On the record before us however, there is insufficient evidence to support this position. Accordingly, although Li otherwise meets each of the limitations of claim 40 and indeed claim 1 to which it has not been applied, in the absence of evidence meeting the requirement of "having an end group unsaturation level of no greater than 0.04 milliequivalent per gram of polyether polyol," as required by the claimed subject matter, the examiner has failed to establish a prima facie case of obviousness with respect to the claimed subject matter.

The examiner's position in this respect is that, "[t]here is no showing that Griswold's polyether polyol used in Example 1 has an end group unsaturation higher than [that] claimed in the instant invention." See Answer, page 10. The burden of proof however, is on the examiner to establish a prima facie case of obviousness with respect to that specific limitation in the claimed subject matter. This burden has not been met.

DECISION

The rejection of claims 1 through 26, 28 through 33, and 36 through 39 under 35 U.S.C. § 103(a) as being unpatentable over Belisle in view of Griswold is reversed.

The rejection of claims 27, 34, 35, and 40 under 35 U.S.C. § 103(a) as being unpatentable over Belisle in view of Griswold and Li is reversed.

The decision of the examiner is reversed.

REVERSED

	PAUL LIEBERMAN)	
	Administrative Patent Judge)	
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)	BOARD OF PATENT
)	PETER F. KRATZ
)	APPEALS)	
	Administrative Patent Judge)	AND
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	ROMULO H. DELMENDO)	
	Administrative Patent Judge)	
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