

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today  
(1) was not written for publication in a law journal and  
(2) is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte CARLTON E. ASH, JON F. GEIBEL  
AND HAROLD D. YELTON

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Appeal No. 95-1077  
Application 07/965,647<sup>1</sup>

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ON BRIEF

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Before JOHN D. SMITH, GARRIS and HANLON, Administrative Patent Judges.

HANLON, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the final rejection of claims 11 and 12. Claim 11 was subsequently canceled in an amendment filed November 25, 1994, in response

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<sup>1</sup> Application for patent filed October 23, 1992.

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to a new ground of rejection set forth in an examiner's answer, leaving only claim 12 for our consideration in this appeal. Claims 1-5 and 7-10 are also pending in the application but have been indicated as allowable by the examiner in an advisory action entered March 7, 1994 (Paper No. 9).

Claim 12 reads as follows:<sup>2</sup>

12. A poly(arylene sulfide) polymer prepared according to claim 1 having a melt flow rate in the range of about 2 to less than 50 g/10 minutes.

For a clearer understanding of the subject matter on appeal

we also reproduce allowable claim 1:<sup>3</sup>

1. A process for producing a high molecular weight, essentially linear poly(arylene sulfide) polymer which

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<sup>2</sup> The examiner's answer indicates that "[t]he copy of the appealed claims contained in the Appendix to the brief is correct" (Answer, p.2). However, the copy of claim 12 contained in the Appendix to the brief does not include amendments thereto filed on February 24, 1994 (Paper No. 8) and November 25, 1994 (Paper No. 16) and entered by the examiner. The copy of claim 12 reproduced in this Decision on Appeal includes these amendments.

<sup>3</sup> The copy of claim 1 reproduced in the Appendix to the brief does not include the amendment thereto filed on February 24, 1994 (Paper No. 8) and entered by the examiner. The copy of claim 1 reproduced in this Decision on Appeal includes this amendment.

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comprises contacting reactants comprising

- a) at least one sulfur source,
- b) at least one dihaloaromatic compound,
- c) a polar organic compound,
- d) at least one lithium salt which is soluble in said polar organic compound, and
- e) water in an amount less than about 1.75 moles water per mole of sulfur in said sulfur source to form a reaction mixture; then subjecting said reaction mixture to polymerization conditions sufficient to form said poly(arylene sulfide) polymer, wherein said polymerization conditions include polymerization temperatures and polymerization pressures sufficient to allow reflux conditions to occur continuously during said polymerization.

The reference relied upon by the examiner is:

Hoover et al. (Hoover)                      5,110,901                      May 5, 1992

The sole issue in this appeal is whether claim 12 was properly rejected under 35 U.S.C. § 103 as being unpatentable over Hoover.<sup>4</sup> After careful consideration of claim 12 on appeal, the arguments presented by the appellants in the

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<sup>4</sup> In an advisory action entered March 7, 1994, claim 12 was rejected under 35 U.S.C. § 102(a) as being anticipated by Hoover (see Paper No. 9). However, the rejection was withdrawn. In an examiner's answer a new ground of rejection of claim 12 was entered under 35 U.S.C. § 103, and that rejection is the subject of this appeal. See Paper No. 15.

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brief, the DECLARATION UNDER 37 CFR § 1.132 filed with appellants' brief, and the arguments presented by the examiner in the answer, we hereby affirm the rejection of claim 12 under 35 U.S.C. § 103 as being unpatentable over Hoover.<sup>5</sup>

The claimed invention

Claim 12 is directed to a poly(arylene sulfide) polymer prepared according to a particular process and having a melt flow rate in the range of about 2 to less than 50 g/10 minutes. The process comprises contacting (a) at least one sulfur source, (b) at least one dihaloaromatic compound, (c) a polar organic compound, (d) at least one lithium salt which is soluble in the polar organic compound, and (e) a specific amount of water to form a reaction mixture and subjecting the reaction mixture to polymerization conditions sufficient to form the poly(arylene sulfide) polymer. The poly(arylene sulfide) polymers produced according to this process are said to be "essentially linear" (Specification p.3, line 35-p.4, line 10).

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<sup>5</sup> A reply brief was filed on September 20, 1994 but was refused entry as not being in compliance with 37 CFR § 1.193(b). Thus, the arguments presented therein are not before us in this appeal. See Paper No. 15.

Rejection of claim 12

Hoover discloses high molecular weight arylene sulfide polymers and two methods of preparing these polymers. The first method disclosed in Hoover comprises contacting, in a polymerization mixture, reactants comprising (col. 5, lines 40-46):

(a) an alkali metal sulfide (compare col. 6, lines 16-20 with appellants' specification p.3, lines 10-14);

(b) a monomer source which comprises at least one dihaloaromatic compound (compare col. 7, line 38-col. 8, line 2 with appellants' specification p.2, line 11-p.3, line 3);

(c) an organic amide (compare col. 6, lines 56-68 with appellants' specification p.3, lines 20-29);

(d) an alkali metal carboxylate (compare col. 7, lines 1-29 with appellants' specification, p.3, lines 30-34); and

(e) water (compare col. 3, line 68-col. 4, line 3 ("the total amount of water present during the polymerization process ranges from about 1.02 mole to about 2.1 moles for each mole of sulfur present in the resulting resin") with appellants' claim 12 ("water in an amount less than about 1.75 moles water per mole of sulfur")).

Thus, Hoover and appellants contact substantially the same reactants in a polymerization mixture to produce arylene sulfide polymers.

As correctly pointed out by the examiner, the arylene

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sulfide polymers disclosed in Hoover have melt flow values preferably ranging from about 5 to about 700 g/10 min., and more preferably, ranging from about 10 to about 500 g/10 min. (col. 10, lines 6-11). Compare appellants' specification p.4, lines 11-14 ("The poly(arylene sulfide) polymers prepared according to the invention process generally exhibit melt flow values (rates) in the range of 2-700 g/10 min."). However, relying on Examples I and II disclosed in Hoover, appellants argue that Hoover does not disclose "essentially linear" arylene sulfide polymers having a melt flow rate within the range recited in claim 12.

The method disclosed in Example II, illustrating the method outlined above, is said to produce an "essentially linear" arylene sulfide polymer which exhibits a melt flow rate of 401 g/10 minutes. In comparison, the method disclosed in Hoover Example I, wherein the monomer source (b) comprises a mixture of at least one dihaloaromatic compound and at least one polyhaloaromatic compound, is said to produce a "branched"

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polymer which exhibits a melt flow rate of 51 g/10 minutes.

Hoover recognizes that (col. 15, lines 59-66):

When comparing the data of Resin 3 [melt flow rate: 401 g/10 min.] and Resin 4 [melt flow rate: 356 g/10 min.], as recorded in Table II, it can clearly be seen that, while employing relatively small amounts of sodium acetate and controlling the level of water present during polymerization, produces a polymer with flow rate very similar to that of Resin 4, this same process results in increasing the Resin's bulk density by approximately 52% compared to that of Resin 4.

Compare appellants' specification p.15, Example IX and Table VII (comparison of flow rates establishes that amount of water present during polymerization effects flow rate).

Therefore, we agree with the examiner that (Answer, pp.5-6):

Hoover et al. teaches that it is known to lower the melt flow value by varying the amount of sodium acetate and controlling the level of water present during polymerization . . . . It would have been obvious to one having ordinary skill in the art at the time the invention was made to lower the melt flow value to less than 50g/min, as taught by Hoover in order to increase or decrease the bulk density as desired.

Compare In re Boesch, 617 F.2d 272, 276, 205 USPQ 215, 219

(CCPA 1980)("discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art"). Appellants have failed to establish

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otherwise. In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984) (“[a]fter a prima facie case of obviousness has been established, the burden of going forward shifts to the applicant”).

The decision of the examiner is affirmed.

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

AFFIRMED

	JOHN D. SMITH	)	
	Administrative Patent Judge	)	
		)	
		)	
		)	
	BRADLEY R. GARRIS	)	BOARD OF
PATENT	Administrative Patent Judge	)	APPEALS AND
		)	INTERFERENCES
		)	
	ADRIENE LEPIANE HANLON	)	
	Administrative Patent Judge	)	

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