

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte DONALD MACLEOD,  
LONG VAN NGUYEN, ALIREZA RAHIMI,  
and ROBERT NOTTINGHAM

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Appeal No. 98-0816  
Application 08/286,287

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HEARD: April 20, 2000

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Before FLEMING, DIXON, and FRAHM, Administrative Patent Judges.

FRAHM, Administrative Patent Judge.

DECISION ON APPEAL

Appellants have appealed to the Board from the examiner's final rejection of claims 1 to 21, 23, 25 to 30, and 33 to 37, which constitute all of the pending claims in the application before us on

appeal. Claims 18 to 22, 31, 32, and 37 stand allowed. Claim 24 has been canceled, and claims 28, 31 and 32 stand objected as being allowable if rewritten to include all of the features of its base claim and any intervening claim. Accordingly, only claims 1 to 17, 23, 25, 26, 27, 29, 30, and 33 to 36 stand rejected and are before us on appeal.

### BACKGROUND

The subject matter on appeal is directed to a spindle motor assembly of a magnetic disc drive for rotating the disc wherein the motor assembly includes a rotor, a stator, and a magnet. Appellants disclose that, conventionally, magnets are held to the rotor hub using adhesive. (specification at page 1.) Appellants provide the improvement of holding the magnet in place without adhesive, and in particular holding the magnet in place using a retaining ring and an elastic washer for biasing the magnet axially (see claims 1 and 2 on appeal).

Representative claim 1 is reproduced below:

1. A spindle motor assembly adapted for rotationally supporting a load about a base, the spindle motor assembly comprising:

a rotor rotatably mounted on the base, the rotor having an outer periphery capable of supporting the load, the rotor having a radially-extending surface;

a stator mounted on the base, the stator for providing a magnetic field;

a magnet opposing the radially-extending surface of the rotor, the magnet supplying a force in response to the magnetic field of the stator for rotating the rotor, and;

a retaining ring attached to the rotor for biasing the magnet axially, the biasing force securing the magnet axially against the radially extending surface.

The following references are relied on by the examiner:

Starcevic	3,988,622	Oct. 26, 1976
Hoyer-Ellefsen	4,340,830	Jul. 20, 1982
Müller et al. (Müller)	4,604,665	Aug. 5, 1986
Tatukawa et al. (Tatukawa)	4,701,654	Oct. 20, 1987
Silvaggio et al. (Silvaggio)	4,816,710	Mar. 28, 1989
Schuh	4,922,406	May 1, 1990
Hishida et al. (Hishida)	5,045,738	Sep. 3, 1991
Connors et al. (Connors)	5,091,809	Feb. 25, 1992
Girault	5,126,612	Jun. 30, 1992
Kanaya et al. (Kanaya)	5,155,401	Oct. 13, 1992
Elsasser et al. (Elsasser)	5,173,814	Dec. 22, 1992
Jabbari et al. (Jabbari)	5,177,650	Jan. 5, 1993
Frugé et al. (Frugé)	5,200,866	Apr. 6, 1993
Okada et al. (Okada)	5,245,234	Sep. 14, 1993
Cossette et al. (Cossette)	5,267,737	Dec. 7, 1993
Tanaka et al. (Tanaka)	5,319,270	Jun. 7, 1994
Kloeppel et al. (Kloeppel)	5,454,724	Oct. 3, 1995 (filed Jul. 22, 1994)

Claims 1, 6, 8, 9, 11, 26, and 34 stand rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Hishida in view of Schuh.

Claim 27 stands rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Hishida in view of Schuh, further in view of Tanaka.

Claim 29 stands rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Hishida in view of Schuh, further in view of Hoyer-Ellefsen.

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Claim 30 stands rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Hishida in view of Schuh, further in view of Müller.

Claims 1, 6, 8, 11, 26, and 34 stand rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Okada in view of Schuh.

Claim 9 stands rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Okada in view of Schuh, further in view of Kanaya.

Claims 2 to 4 stand rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Hishida or Okada in view of Schuh, further in view of Hoyer-Ellefsen.

Claim 5 stands rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Hishida or Okada in view of Schuh, further in view of Hoyer-Ellefsen and Kloeppe.

Claims 7 and 33 stand rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Hishida or Okada in view of Schuh, further in view of Frugé.

Claim 10 stands rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Hishida or Okada in view of Schuh, further in view of Müller.

Claims 12, 16, and 17 stand rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Elsasser in view of Cossette, further in view of Tatukawa.

Claims 13 and 14 stand rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Elsasser in view of Cossette and Tatukawa, further in view of Hoyer-Ellefsen.

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Claim 15 stands rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Elsasser in view of Cossette and Tatukawa, further in view of Hoyer-Ellefsen and Kloeppe.

Claims 23 and 25 stand rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Hishida in view of Silvaggio and Girault.

Claim 35 stands rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Connors in view of Schuh, further in view of Hoyer-Ellefsen.

Claim 36 stands rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner relies upon Jabbari in view of Tanaka, further in view of Starcevic.

Claims 18 to 22 and 37 stand allowed.

Claims 28, 31 and 32 stand objected to as depending on a rejected base claim (claim 26), and was stated by the examiner as being allowable if rewritten in independent form to include all of the limitations of its base claim and any intervening claim (claims 27 and 26, respectively).

Rather than repeat the positions of appellants and the examiner, reference is made to the Briefs and the Answers for the respective details thereof.

#### OPINION

In reaching our conclusion on the issues raised in this appeal, we have carefully considered appellants' specification and claims, the applied references, and the respective viewpoints of appellants and the examiner. As a consequence of our review, we are in general agreement with the examiner

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(see Answer, pages 18 to 19) that the combination of Hishida, Silvaggio, and Girault would have fairly suggested the invention of claims 23 and 25 on appeal. However, because we agree with appellants (see Brief, pages 9 to 47 and 50 to 52; Reply Brief, pages 4 to 14; Supplemental Reply Brief, pages 3 to 5; and Second Supplemental Reply Brief, pages 2 to 4) that the applied prior art fails to teach or suggest the recited claims on appeal, we cannot sustain the rejection of claims 1 to 17, 26, 27, 29, 30, and 33 to 36 on appeal. For the reasons which follow, we will sustain the decision of the examiner rejecting claims 23 and 25 under 35 U.S.C. § 103, and we will reverse the decisions of the examiner rejecting claims 1 to 17, 26, 27, 29, 30, and 33 to 36 under 35 U.S.C. § 103.

Rejection of Claims 23 and 25 Under 35 U.S.C. § 103:

Turning first to the rejection of claims 23 and 25 under § 103, we find that claims 23 and 25 on appeal would have been obvious to one of ordinary skill in the art at the time the invention was made in light of the collective teachings of Hishida, Silvaggio, and Girault.

We agree with the examiner (Answer, pages 18 to 19) that the ordinarily skilled artisan looking at the combined teachings and suggestions of Hishida, Silvaggio, and Girault would have modified the stator assembly including coils as taught by Hishida by encapsulating them with an electrically insulative overmold such as taught by Silvaggio and Girault. We agree with the examiner (Answer, page 19) that it would have been obvious in light of the teachings of Silvaggio and Girault to provide motor windings with protective overmolds as claimed in order to insulate and protect the windings during assembly and/or operation of the motor. We also agree with the examiner that the resultant overmold would

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"provide a substantially flat surface over the wire coils," especially to the extent that such a feature is broadly recited. We are not persuaded by appellants' argument (Brief, pages 49 to 50) that Girault teaches away and is therefore not combinable with Hishida and Silvaggio since all three references pertain to stator assembly coil windings in a motor. Accordingly, we will sustain the examiner's rejection of claims 23 and 25.

Rejection of Claims 1 to 11, 26, 27, 29, 30, 33 and 34 Under 35 U.S.C. § 103:

We turn next to the question of the obviousness of claims 1 to 11, 26, 27, 29, 30, 33 and 34 under § 103. Each of independent claims 1 and 26 and their corresponding dependent claims on appeal recite the details of a spindle motor assembly and a method for making the assembly wherein the assembly includes a rotor, a stator, a magnet, and a retaining ring. More specifically, these claims call for the magnet to oppose "the radially-extending surface of the rotor," and for the retaining ring to provide an axial biasing force "securing the magnet axially against the radially extending surface" (see claims 1 and 26 on appeal). Each of claims 1 to 11, 26, 27, 29, 30, 33 and 34 stands rejected over the reference to Schuh in combination with either Hishida or Okada. The examiner points to either of Hishida or Okada as teaching a spindle motor assembly having a rotor, stator, and magnet, and relies on Schuh to teach the retaining ring for axially biasing the magnet to the radially-extending surface of the rotor. We cannot agree with the examiner that these features either would have been taught or suggested by the applied references, taken alone or in combination.

As argued by appellants (Brief, pages 36 to 38), the retaining rings taught by Schuh only serve to pre-load the ball bearings used in the motor, and they do not serve to bias a first structure (the rotor) against a second structure (the magnet) such that the second structure (the magnet) is secured against a radially extending surface of the first structure (the rotor). We agree with appellants, and we find that the applied prior art fails to teach or suggest such a feature of securing a magnet by providing a bias against a radially extending surface of a rotor. We also agree with appellants that Schuh concerns retaining rings used to secure ball bearings and not a magnet. Further, none of the prior art applied, taken singly or in combination, would have suggested modifying the Hishida or Okada references to achieve the goal of providing such a feature. Accordingly, we cannot sustain the examiner's rejection under 35 U.S.C. § 103 as to claims 1 to 11, 26, 27, 29, 30, 33 and 34.

We find that the retaining ring defined in appellants' independent claims 1 and 26 is neither taught nor suggested by the applied combination of Hishida and Schuh or Okada and Schuh. Accordingly, since the rejections of claims 1 to 11, 26, 27, 29, 30, 33 and 34 are based on the combination of either Hishida and Schuh or Okada and Schuh, we will reverse the rejections of these claims.

Rejection of Claims 12 to 17 Under 35 U.S.C. § 103:

We turn next to the question of the obviousness of claims 12 to 17 under § 103. Independent claim 12 and its corresponding dependent claims on appeal recite the details of a spindle motor assembly wherein the assembly includes a rotor mounted on a shaft, a magnetic seal assembly for

providing magnetic flux flow and electric flow between the rotor and shaft, and a shield adhesively attached to the rotor for biasing the magnetic seal assembly to a radially-extending surface of the rotor (see claim 12). The examiner admits (see Answer, page 15) that the primary reference to Elsasser fails to teach attaching a shield to the rotor without adhesives, relies upon Cossette to teach the shield (although attached with adhesives), and relies upon Tatukawa to teach the elimination of adhesives (albeit, to attach rotor magnets and not a shield).

We agree with appellants (see Brief, pages 41 to 42) that neither Elsasser nor Cossette teaches a shield which is adhesively attached to the rotor, and that Tatukawa fails to teach or suggest adhesiveless attachment of a shield to a rotor. More specifically, we find that one of ordinary skill in the art would not have modified the spindle assembly of Elsasser, as modified to include the shield of Cossette, with the cup-shaped magnet retainer member 5 of Tatukawa which attaches magnets 4 without adhesive, in order to attach the shield of Cossette. This is because, as properly pointed out by appellants (see Brief, page 42), use of Tatukawa's shield would prohibit proper magnetic seal assembly function in Elsasser and Cossette. This is due to the fact that magnetic flux flow and electric flow are needed between the rotor and the shaft, and use of a cup-shaped retaining member inside the magnetic seal assembly would interfere and prevent direct magnetic flux flow and electric flow from occurring between the rotor and shaft.

Accordingly, we will reverse the examiner's rejection of claim 12 based on Elsasser in view of Cossette and Tatukawa. We note that the examiner additionally relied upon Hoyer-Ellefsen in the

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rejection of claims 13 and 14, however, this reference was only relied upon for its general teaching of a partially compressed elastic washer and adds nothing to the base references. We also note that the examiner additionally relied upon Kloeppel in the rejection of claim 15, however, this reference was only relied upon for its general teaching of a foam washer and adds nothing to the base references. Claims 13 to 17 depend from independent claim 12 and include the same salient feature as to the adhesiveless attachment of a shield in a spindle motor assembly. Therefore, claims 13 to 17 fall with our consideration of claim 12 for the same reasons given above. Accordingly, we will reverse the rejections of claims 12 to 17 under 35 U.S.C. § 103.

Rejection of Claim 35 Under 35 U.S.C. § 103:

We turn next to the question of the obviousness of claim 35 under § 103. We note at the outset that appellants admit (Brief, page 10) that independent claim 35 has been copied verbatim from Connors (see claim 1 of Connors). According to appellants, claim 35 was not copied for purposes of interference (and we note that no interference proceedings have been established by the examiner), and claim 35 is alleged to be patentably distinct from Connors under In re Donaldson, 16 F.3d 1189, 29 USPQ2d 1845 (Fed. Cir. 1994), since the disclosed structure corresponding to the "means for attaching . . ." clause differs as between Connors and appellants' claim 35 on appeal. Although appellants' claim 35 and Connors' claim 1 are identical in wording, we find that their meanings differ due to the patentably distinct structures found in their disclosures supporting the "means for attaching . . ." clause. In Connors, the "means for attaching . . ." consists of screws or adhesive to perform the

attaching function, whereas appellants' disclosure employs a retaining ring, an elastic washer, and an axially-extending spindle hub portion for attaching the back iron against the radially-extending end wall portion of the spindle hub. The combination of these three elements as taught by appellants achieves the important function of compressing the back iron in the axial direction in order to hold it in place without the use of adhesives. The main issue before us then, is whether or not appellants' claim 35 would have been obvious over Connors in view of the applied secondary references to Schuh and Hoyer-Ellefsen.

The examiner rejects claim 35 (see Answer, pages 21 to 24) over Connors (as teaching a disc drive) in view of Schuh (as teaching a retaining ring) and Hoyer-Ellefsen (as teaching an elastic washer), stating "that use of a retainer ring and an elastic washer would have been obvious" (Answer, page 23), and "would have resulted in structure equivalent to that set forth in the present application as corresponding to the 'means for attaching . . . ' language in question" (Answer, page 24). We cannot agree with this reasoning. As stated by appellants at pages 11 to 12 of the Brief, an analysis of the corresponding structure of the means-plus-function language at issue here, the "means for attaching . . ." found in claim 35, requires the following structure in order to achieve the claimed function: a retaining ring, a compressed elastic washer, and a spindle hub having a disc receiving portion extending axially from a radially extending end wall portion to a recess for the retaining ring. This structure, along with its attendant function as recited in claim 35 and disclosed in the specification, is not met by any combination of the references applied by the examiner.

We agree with appellants (Brief, pages 14 and 19) that the examiner has failed to treat the axially extending portion of the spindle hub in his analysis of the corresponding structure, and that this is an important part of the structure and function corresponding to the "means for attaching . . ." We also agree with appellants (Brief, page 18) that the retaining ring of Schuh does not perform the recited function of attaching one structure to a radially extending end wall portion of a second structure. The retaining rings taught by Schuh only serve to pre-load the ball bearings used in the motor, and they do not serve to attach a radially extending surface of a first structure (the spindle hub) to a second structure (the back iron). We also agree with appellants that Schuh concerns retaining rings used to secure ball bearings and not a magnet, and that therefore the artisan, concerned with attaching a back iron with screws or adhesive as in Connors, would not look to Schuh to use a retaining ring to attach a back iron and magnet. Further, none of the prior art applied, taken singly or in combination, would have suggested modifying Connors to achieve the goal of providing such a feature.

Finally, we agree with appellants' arguments pertaining to the nonobviousness of modifying Connors and Schuh with Hoyer-Ellefsen (Reply Brief, pages 4 to 7), particularly that Hoyer-Ellefsen fails to teach the axially extending portion of the hub and that "the resilient wave washer 72 of Hoyer-Ellefsen does not teach attachment of a first structure to a second structure at all" (Reply Brief, page 6). Accordingly, we cannot sustain the examiner's rejection under 35 U.S.C. § 103 as to claim 35.

Rejection of Claim 36 Under 35 U.S.C. § 103:

We turn next to the question of the obviousness of claim 36 under § 103. We note at the outset that appellants admit (Brief, page 26) that independent claim 36 has been copied verbatim from Jabbari (see claim 1 of Jabbari). According to appellants, claim 36 was not copied for purposes of interference (and we note that no interference proceedings have been established by the examiner), and claim 36 is alleged to be patentably distinct from Jabbari under In re Donaldson, 16 F.3d 1189, 29 USPQ2D 1845 (Fed. Cir. 1994), since the disclosed structure corresponding to the "means for mounting . . ." clause differs as between Jabbari and appellants' claim 36 on appeal. Although appellants' claim 36 and Jabbari's claim 1 are identical in wording, we find that their meanings differ due to the patentably distinct structures found in their disclosures supporting the "means for mounting . . ." clause. In Jabbari, the "means for mounting said stator to said stationary shaft and for supporting said stator in a generally fixed position relative to said hub" consists of support 70 which has an unspecified attachment to the stator, whereas appellants' disclosure employs a clamp spring, a headed fastener, and an offset flange surfacer for performing the recited function. The combination of these three elements as taught by appellants achieves the important function of mounting the stator to the hub in order to hold it in place without the use of adhesives by compressing the stator in an axial direction. The main issue before us then, is whether or not appellants' claim 36 would have been obvious over Jabbari in view of the applied secondary references to Tanaka and Starcevic.

The examiner rejects claim 36 (see Answer, pages 4 to 8) over Jabbari (as teaching a disc drive having a stator mounted on a support in an undefined fashion) in view of Tanaka (as teaching a

fastener such as a screw) and Starcevic (as teaching a clamp spring and washer), stating that use of a clamp spring, and screw would have been obvious (Answer, page 7), and "would have resulted in structure equivalent to that set forth in the present application as corresponding to the 'means for mounting . . .' language in question" (Answer, page 8). We cannot agree with this reasoning. As stated by appellants at pages 27 to 28 of the Brief, an analysis of the corresponding structure of the means-plus-function language at issue here, the "means for mounting . . ." found in claim 36, requires the following structure in order to achieve the claimed function: a clamp spring, a screw threaded fastener, and an offset flange surface. This structure, along with its attendant function as recited in the claim and disclosed in the specification (i.e., mounting by compressing the stator axially), is not met by any combination of the references applied by the examiner.

We agree with appellants (Brief, pages 27 to 28 and 33) that the examiner has failed to treat the offset flange surface in his analysis of the corresponding structure, and that this is an important part of the structure and function corresponding to the "means for mounting . . ." We also agree with appellants (Brief, page 28) that a clamp washer is not essential to achieving the function recited in claim 36 of mounting the stator. We also agree with appellants (Brief, pages 33 to 36) that Starcevic concerns a large hydroelectric generator with radially stressed stator laminations and not a means for mounting a stator in a disc drive assembly to axially compress the stator without using adhesive, and that therefore the artisan concerned with mounting a stator in a disc drive assembly as in Jabbari would

not look to Starcevic to use a clamp spring. Further, none of the prior art applied, taken singly or in combination, would have suggested modifying Jabbari to achieve the goal of providing such a feature.

Even assuming Starcevic is analogous art, we note our agreement with appellants' arguments that Starcevic's spring washer 20 "does not extend across an offset between a first structure (i.e., the clamping flange) and a second structure mounted thereto (i.e., the clamping surface of the stator)" and because Starcevic's spring washer 20 is not tensioned between the two structures it is not a clamp spring as set out in appellants' specification and in claim 36 (Brief, page 31). We agree with appellants' arguments (Brief, page 32) that a clamp spring which extends across an offset between a flange surface 376 and a clamping surface of the stator 352 (see appellants' Figure 11), for axially compressing the stator laminations, is neither taught nor suggested by Starcevic or any other applied reference. We note that Starcevic places radial tension on the stator assembly (see Figure 18), while allowing for both radial and axial movement of the stator lamination assembly (see column 7, line 42 to column 8, line 2), whereas appellants' recited means for mounting "provides a dependable compressive force for axially holding stator 352 in place" (appellants' specification, page 16). Accordingly, we find that the disc drive of Jabbari modified with Starcevic and Tanaka is not an equivalent structure as that in claim 36, as interpreted in light of the disclosed structure and it does not perform a claimed function. Therefore, we cannot sustain the examiner's rejection under 35 U.S.C. § 103 as to claim 36.

We note as to claims 35 and 36, copied from Connors and Jabbari respectively, that at Oral Hearing appellants' representative raised the issue of whether or not these claims should have been

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rejected under 35 U.S.C. § 112, second paragraph, as failing to provide proper notice to the public as to what is being claimed. This is based on the fact that should we reverse the art rejections of these claims, as we have, the circumstance would exist that identical claims would issue as a result of the prosecution of the instant application as compared with the claims in Connors and Jabbari, the only difference lying in the interpretation of the means-plus-function limitations as are defined in the specifications. We will not accept appellants' invitation to make a new ground of rejection under the notice provisions of 35 U.S.C. § 112, second paragraph, as this issue has not been fully briefed and developed in the record before us. With respect to this issue, the examiner should take a course of action the examiner deems appropriate upon receiving this application. That is, if the examiner deems appropriate that a rejection of claims 35 and 36 should be made under the notice provisions of 35 U.S.C. § 112, second paragraph, then the examiner should reopen prosecution and so proceed.

In light of the foregoing, we find that the differences between the subject matter recited in claims 23 and 25 and the prior art are such that the claimed subject matter as a whole would have been obvious within the meaning of 35 U.S.C. § 103. Accordingly, we sustain the standing rejections of claims 23 and 25. We reach the opposite conclusion with respect to claims 1 to 17, 26, 27, 29, 30, and 33 to 36. Accordingly, we reverse the standing rejections of these claims.

#### CONCLUSION

The decision of the examiner rejecting claims 23 and 25 under 35 U.S.C. § 103 is affirmed.

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The decisions of the examiner rejecting claims 1 to 17, 26, 27, 29, 30, and 33 to 36 under 35 U.S.C. § 103 are reversed.

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

AFFIRMED-IN-PART

Michael R. Fleming	)	
Administrative Patent Judge	)	
	)	
	)	
	)	
Joseph L. Dixon	)	BOARD OF PATENT
Administrative Patent Judge	)	APPEALS AND
	)	INTERFERENCES
	)	
	)	
Eric Frahm	)	
Administrative Patent Judge	)	

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