

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

Paper No. 27

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PIETER J. VAN DER ZAAG, JACOBUS J.M. RUIGROK and
HARALD VAN KAMPEN

Appeal No. 1998-0200
Application No. 08/698,193

ON BRIEF

Before THOMAS, DIXON and BLANKENSHIP, Administrative Patent Judges. BLANKENSHIP,
Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of
Claims 2-6, 9-12, and 15-17.

We reverse, and enter a new ground of rejection in accordance with 37 CFR § 1.196(b).

BACKGROUND

The invention is directed to the thin film structure of a magnetic head. Claim 12 is reproduced below.

12. A thin film magnetic head comprising a thin film structure on a substrate, one end of the substrate and the thin film structure defining a head face, the thin film structure comprising at least one flux guiding element of a magnetically permeable material having a relatively high magnetic permeability on said substrate, a magnetoresistive element on¹ the flux guiding element, a peripheral area of the magnetoresistive element overlying an edge of the flux-guiding element, and an intermediate layer of an electrical insulating material separating the magnetoresistive element and the flux guiding element, characterized in that at least the portion of the intermediate layer which is between the peripheral area of the magnetoresistive element and the flux guiding element is magnetically permeable and has a relative magnetic permeability in the range of about 1.1 to 25, thereby increasing the magnetic flux between the magnetoresistive element and the flux-guiding element, and improving the efficiency of the magnetic head.

The examiner relies on the following reference:

Jeffers	4,754,354	Jun. 28, 1988
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Claims 2-6 and 9-12 stand rejected under 35 U.S.C. § 112, second paragraph as being indefinite.

Claims 2-6, 9-12, and 15-17 stand rejected under 35 U.S.C. § 103 as being unpatentable over Jeffers.

We refer to the Final Rejection (Paper No. 21) and the Examiner's Answer (Paper No. 26) for a statement of the examiner's position and to the Brief (Paper No. 25) for appellants' position.

¹ In the Appendix of claims submitted with the Brief, Claim 12 is incorrectly reproduced as reading "above" the flux guiding element. The word was changed to "an" by the preliminary amendment filed September 18, 1995 (Paper No. 20), which directed entry of a previously proposed amendment to the claim.

OPINION

The rejection for indefiniteness

The examiner has rejected Claims 2-6 and 9-12 under 35 U.S.C. § 112, second paragraph, because “Claim 12...fails to recite all the elements necessary to constitute a ‘magnetic head’ as recited in the preamble....” (Final Rejection, page 2.) “It is unclear how the listed elements are placed and/or cooperate to function as a ‘magnetic head’.” (Id.) The examiner’s first assertion appears to be based on a belief that the claims are “incomplete.” The second assertion appears to be based on a belief that the interrelationships of the recited structure are not properly set forth. The function of claims is (1) to point out what the invention is in such a way as to distinguish it from the prior art; and (2) to define the scope of protection afforded by the patent. In re Vamco Mach., Inc., 752 F.2d 1564, 1577 n.5, 224 USPQ 617, 635 n.5 (Fed. Cir. 1985).

With regard to the above-noted first requirement, we have no difficulty in comparing the subject matter of the claims with the prior art. The examiner apparently had no such difficulty, either. The examiner made an art rejection, but did not submit that any assumptions were being made with regard to how the claims were to be interpreted differently from their literal terms.

We now consider the above-noted second function of the claims. The legal standard for definiteness is whether a claim reasonably apprises those of skill in the art of its scope. In re

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Warmerdam, 33 F.3d 1354, 1361, 31 USPQ2d 1754, 1759 (Fed. Cir. 1994). The inquiry is merely to determine whether the claims do, in fact, set out and circumscribe a particular area with a reasonable degree of precision and particularity. In re Moore, 439 F.2d 1232, 1235, 169 USPQ 236, 238 (CCPA 1971). The definiteness of the language employed must be analyzed -- not in a vacuum, but in light of the teachings of the prior art and of the particular application disclosure as it would be interpreted by one possessing the ordinary level of skill in the pertinent art. Id.

Here, we are convinced that an artisan would be reasonably apprised as to the subject matter covered by the instant claims in light of the specification. Contrary to the stated rationale for rejection, Claim 12 does recite how the listed elements are placed to function as a magnetic head. For example, the claim recites “a magnetoresistive element on the flux guiding element, a peripheral area of the magnetoresistive element overlying an edge of the flux-guiding element.” The claim further recites “an intermediate layer of an electrical insulating material separating the magnetoresistive element and the flux guiding element.” Although the claim is broadly drawn, there are definite interrelationships set forth with regard to physical arrangement of the claimed elements. As disclosed, the particular arrangement claimed is necessary for the proper function of the magnetic head.

We therefore do not sustain the rejection under 35 U.S.C. § 112, second paragraph of Claims 2-6 and 9-12.

The rejection over Jeffers

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Appellants do not provide separate arguments for patentability of any claim. We therefore select Claim 12 as representative of the subject matter on appeal, and decide disposition accordingly. See 37 CFR § 1.192(c)(7).

Jeffers discloses, with regard to Figure 2 and column 2, lines 43 through 62, a thin film magnetic head structure which includes an intermediate layer of magnetically conductive material between a magneto-resistive layer 140 and a permeable layer 180. The magnetically conductive material, which is also electrically insulating, replaces a prior art electrically insulating SiO₂ layer. Jeffers teaches replacing the SiO₂ layer of the prior art because it acts as a “flux barrier” between the magneto-resistive element and the flux conducting limb. See Jeffers, column 1, lines 52 through 57. Although the reference does not disclose a numeric value for the relative magnetic permeability of the layer of magnetically conductive material, nor give examples of acceptable ranges thereof, according to the examiner the claimed ranges of relative magnetic permeability “would have been an obvious result of routine optimization.” (Final Rejection, page 3.)

Appellants respond that Jeffers discloses that the intermediate layer has a “relatively high magnetic permeability,” and would not have suggested anything to lead an artisan to the “relatively low magnetically permeable layer” as set forth in Claim 12. (See Brief, pages 7 and 8.)

The examiner responds in turn, on pages 4 and 5 of the Answer, that the disclosure of Jeffers as a whole would have suggested more than the “relatively high” permeability of the preferred

embodiment, and arriving within the Claim 12 range of permeability would have resulted from routine experimentation and optimizing.

We note that Jeffers was confronted with the same problem as appellants -- overcoming the deleterious effect of the required electrically insulating intermediate layer. The reference teaches replacing the prior art layer with a material that promotes coupling of the magnetic flux between the flux conducting limb and the magnetoresistive element. However, appellants have chosen to use a material of relatively low permeability (see, e.g., specification, page 2, lines 10 through 16), as opposed to the material of relatively high permeability disclosed by Jeffers. Appellants chose a material of relatively low permeability for purposes of simpler construction. (See specification, page 2, line 29 through page 3, line 9).

Appellants' specification gives a range of "relatively low permeability²," and provides an example of what is considered a relatively high relative magnetic permeability -- 1000 -- albeit with respect to material suitable for flux guides. (See specification, page 1, lines 11 through 15). Jeffers, at column 2, lines 43 through 62, discloses that the electrically non-conductive material is of "relative high magnetic permeability," and refers to U.S. Patent 4,477,319 for details of depositing a thin film of the magnetically conductive layer. U.S. Patent 4,477,319 (to Abe et al.) does not deal with permeability of

² We note in passing that appellants' Figure 18 appears to show as an ordinate F_r ranging from $1 \cdot 10^0$ (= 1) to $1 \cdot 10^3$ (= 1.331). However, we assume that the range shown is 1×10^0 (= 1) to 1×10^3 (= 1000), and the curve shows the selected range of F_r , consistent with the written description, of 1.1 to 25.

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materials. Nor does Jeffers refer to the patent for examples of other materials suitable for use as the intermediate layer. Thus, the only explicit disclosure in Jeffers is of a layer having relatively high magnetic permeability.

We agree with appellants that Jeffers would not have suggested to the artisan to employ a material having relative magnetic permeability in or about the range as set forth in appellants' Claim 12. The reference appears to suggest increasing the relative magnetic permeability of the intermediate layer (see, for example, column 1, lines 37 through 57 of Jeffers), rather than decreasing the permeability -- moving toward a relatively low relative magnetic permeability -- for maximizing sensitivity of the magnetic head. Absent additional evidence of an art-recognized reason for moving toward a relatively low permeability, a rejection for obviousness over Jeffers appears to be a hindsight reconstruction of appellants' invention. After all, according to appellants' specification, appellants were not optimizing the permeability of the intermediate layer, nor optimizing the sensitivity of the magnetic head. Appellants chose a range of relatively low permeability of the intermediate layer for reasons unrecognized by the prior art before us -- for easier construction of the intermediate layer -- yet with acceptable, although sub-optimal, magnetic permeability.

Since the reference fails to support a prima facie case of obviousness of the claimed subject matter, we do not sustain the rejection of Claims 2-6, 9-12, and 15-17 under 35 U.S.C. § 103 as being unpatentable over Jeffers.

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New Ground of Rejection -- 37 CFR § 1.196(b)

We enter the following new ground of rejection against the claims in accordance with 37 CFR § 1.196(b): Claims 16 and 17 are rejected under 35 U.S.C. § 112, second paragraph as being indefinite.

Appellants' Claim 16 recites a "method of manufacturing the magnetic head having a magnetoresistive element and a flux-guiding element as recited in Claim 12...." Although Claim 16 is technically an independent claim -- drawn to subject matter in a different statutory class from that of Claim 12 -- we interpret the claim as incorporating all the limitations of Claim 12.

The last three lines of Claim 16 recite that the intermediate layer is "characterized in that said intermediate material is deposited on said layer of electrical insulating material until the relative magnetic permeability thereof is between 1.1 and 25." The recitation "said intermediate material" lacks proper antecedent in the claims. Assuming that the recitation should be "said intermediate layer" (or "said electrical insulating material"), then the claim recites that the intermediate layer (or the electrical insulating material) is deposited on the layer of electrical insulating material "until the relative magnetic permeability thereof is between 1.1 and 25." By either interpretation, the claim recites that a layer or material is deposited on itself, which does not particularly point out and distinctly claim the invention.

On the other hand, one might assume that the recitation was intended to mean that the electrical insulating material is deposited on the flux-guiding element "until the relative magnetic permeability

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thereof is between 1.1 and 25.” However, such an interpretation of Claim 16 cannot be harmonized with the drawings (the steps shown in Figures 9-12) or the written description of the process. (See specification, page 5, lines 6 through 9, “the intermediate layer 21 has a relative permeability F_r of 5. The intermediate layer 21...is formed by means of laser ablation or MO-CVD of an oxidic soft-magnetic material....,” and page 6, lines 3 through 7, “[t]he intermediate layer 121, which is formed from an oxidic soft-magnetic material...is directly provided on the magnetically well-conducting flux-guiding element 117a....”)

We thus consider the scope of Claim 16 (and depending Claim 17) to be indeterminate, and therefore conclude that the claims fail to pass muster under 35 U.S.C. § 112, second paragraph.

CONCLUSION

All rejections of Claims 2-6, 9-12, and 15-17 are reversed.

Claims 16 and 17 are newly rejected by us under 35 U.S.C. § 112, second paragraph.

This decision contains a new ground of rejection pursuant to 37 CFR § 1.196(b)(amended effective Dec. 1, 1997, by final rule notice, 62 Fed. Reg. 53,131, 53,197 (Oct. 10, 1997), 1203 Off. Gaz. Pat. & Trademark Office 63, 122 (Oct. 21, 1997)). 37 CFR § 1.196(b) provides that, "A new ground of rejection shall not be considered final for purposes of judicial review."

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37 CFR § 1.196(b) also provides that appellants, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of proceedings (§ 1.197(c)) as to the rejected claim:

(1) Submit an appropriate amendment of the claim so rejected or a showing of facts relating to the claim so rejected, or both, and have the matter reconsidered by the examiner, in which event the application will be remanded to the examiner. . . .

(2) Request that the application be reheard under § 1.197(b) by the Board of Patent Appeals and Interferences upon the same record. . . .

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

REVERSED; 37 CFR § 1.196(b)

JAMES D. THOMAS)
Administrative Patent Judge)
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) BOARD OF PATENT

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JOSEPH L. DIXON)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
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HOWARD B. BLANKENSHIP)	
Administrative Patent Judge)	

HBB/caw

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CORPORATE PATENT COUNSEL
US PHILIPS CORPORATION
PATENT DEPARTMENT
580 WHITE PLAINS ROAD
TARRYTOWN , NY 10591