

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 31

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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***Ex parte*** SUMITOMO SPECIAL METALS CO., LTD.

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Appeal No. 96-3529  
Reexamination Control No. 90/003,499<sup>1</sup>

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HEARD: June 9, 1997

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Before HARKCOM, ***Vice Chief Administrative Patent Judge***, and  
FLEMING and TORCZON, ***Administrative Patent Judges***.

FLEMING, ***Administrative Patent Judge***.

***DECISION ON APPEAL***

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<sup>1</sup> Reexamination for U.S. Patent No. 5,229,723 issued July 20, 1993, based on Application No. 07/550,081, filed July 9, 1990. Request for reexamination filed July 18, 1994.

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This is a decision on appeal from the final rejection of claims 12 through 28 of the reexamination of U.S. Patent No. 5,229,723. Claims 1 through 11 have been canceled.

The invention is directed to an improvement of a magnetic field generating device for a magnetic resonance imaging (MRI) device.

The independent claim 12 is reproduced as follows:

12. A magnetic field generating device for MRI, comprising:

a pair of permanent magnet assemblies disposed opposite one another to form a gap therebetween;

yokes for magnetically linking said pair of assemblies and magnetic pole pieces fixed to air gap-confronting surfaces of said pair of magnet assemblies to generate magnetic fields within said gap, said opposed pole pieces being circular and in symmetry on either side of the gap;

a plurality of magnetic field intensity modifiers comprising at least one of per se known magnetic material segments or permanent magnetic segments, each capable of influencing the magnetic field intensity in the gap and placed at locations on the surface of one or both of the pole pieces for making more uniform the magnetic field intensity in a notational sphere situated symmetrically between the pole pieces within the gap and having a polar axis extending normally between the pole pieces;

at least one of said field intensity modifiers is placed at one selected location on the opposed surfaces of said pair of pole pieces, as a result of measurements taken at a set of measuring locations at the edge of a single plane traversing said notational sphere normally of said polar axis, to

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determine the lack of uniformity of magnetic field intensity at such measuring locations; and said field intensity modifiers being selected and placed at selected locations on said opposed surfaces of said pole pieces in at least one circle concentric with said polar axis, said selection and location being calculated to reduce said lack of uniformity of magnetic field intensity in accordance with said set of measurements determined at said measuring locations.



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Analysis of 35 U.S.C. § 112, second paragraph, should begin with the determination of whether claims set out and circumscribe the particular area with a reasonable degree of precision and particularity; it is here where definiteness of the language must be analyzed, not in a vacuum, but always in light of teachings of the disclosure as it would be interpreted by one possessing ordinary skill in the art. ***In re Johnson***, 558 F.2d 1008, 1015, 194 USPQ 187, 193 (CCPA 1977), *citing In re Moore*, 439 F.2d 1232, 1235, 169 USPQ 236, 238 (CCPA 1971).

On page 2 of the final rejection, the Examiner argues that the recitation found in the last paragraph of claim 12 is indefinite because the limitations are not proper limitations on the structure of an otherwise claimed apparatus. Appellant argues on page 5 of the brief that process limitations are acceptable in apparatus claims providing such limitations are drawn to the making of the apparatus. Appellant further argues on page 6 of the brief that the position of the magnetic segments on the spaced yokes is based upon the claimed process of measuring so as to determine the lack of

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uniformity of the magnetic field intensity. Appellant further argues that the claimed process limitation defines the apparatus and this is analogous to the use of process limitations in product claims where there is no physical structure of the product that is available to define the product. Furthermore, when questioned at oral hearing, Appellant's attorney argued that Appellant's claim 12 is a product-by-process claim.

Upon reviewing Appellant's claim 12, we find that the claim is a product-by-process claim and that the claim sets out and circumscribes the particular area with a reasonable degree of precision and particularity. Stated differently, the scope of claim 12 would be reasonably ascertainable by those skilled in the art. In view of the foregoing, we will not sustain the Examiner's decision that Appellant's claims 12 through 28 are properly rejected under 35 U.S.C. § 112, second paragraph.

In regard to the Examiner's rejection of claim 12 under 35 U.S.C. § 103, Appellant sets forth on pages 10 through 12 of the brief the structural limitations of claim 12 as well as the process limitations. On page 12 of the brief, Appellant

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recognizes that process limitations in claim 12 do not show that Appellant's claim 12 is distinguishable over the Oldendorf reference.

Our reviewing court states in *In re Marosi*, 710 F.2d 799, 803, 218 USPQ 289, 292-93, (Fed. Cir. 1983) that "[w]here a product-by-process claim is rejected over a prior art product that appears to be identical, although produced by a different process, the burden is upon the applicants to come forward with evidence establishing an unobvious difference between the claimed product and the prior art process." In *In re Thorpe*, 777 F.2d 695, 697, 227 USPQ 964, 966 (Fed. Cir. 1985), our reviewing court also states "[i]f the product in a product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process."

On page 11 of the brief, Appellant argues that Oldendorf fails to teach the structure "for making more uniform the magnetic field intensity in a notational sphere situated symmetrically between the pole pieces within the gap and

having a polar axis extending normally between the pole pieces" as recited in Appellant's claim 12, lines 13 through 16. Appellant agrees that Oldendorf teaches structure, magnetic segments, for making more uniform the magnetic field between the poles 70 and 72, but argues that Oldendorf fails to teach a notational sphere which is used for obtaining the necessary measurements of the magnetic field to locate the magnetic segments.

Upon a closer inspection of Oldendorf, we find that Oldendorf teaches on pages 9 through 13 with reference to Figure 5 the utilization of the ring 52 and the slugs 58 for making more uniform the magnetic field intensity in a desired specimen imaging area situated symmetrically between the pole pieces within the gap and having a polar axis extending normally between the pole pieces. In particular, Oldendorf teaches on page 9 of the specification that Figure 5A shows a magnetic field with an air gap where the lines of force are not evenly distributed. On page 10, Oldendorf teaches that Figure 5B shows the distribution of the flux lines within the air gap is made more uniform by utilization of rings 76 and 78. On pages 11 through 12, Oldendorf teaches that Figure 5C

shows that a substantially uniform field between the poles 70 and 72 by a procedure of measuring the magnetic field and adjusting slugs 84 and 86 to make the field uniform. On page 13, Oldendorf teaches a further alternative of the ring structure by substituting the ring for a peripheral ring of slugs 96 as shown in Figure 3. Oldendorf teaches that the ring of slugs 96 may provide even more refined tuning to provide a substantially uniform magnetic field.

Furthermore, we note that Oldendorf is concerned with in vivo imaging of the human body and the problem of providing a uniform magnetic field passing through a volume where the human body may be positioned. See page 10. Oldendorf solves this problem by the structure of Figure 3 and the process of adjusting the slugs. As shown in Figure 5C, Oldendorf teaches that the magnetic field is uniform in a volume suitable for placement of the human body for imaging. Furthermore, we note that this volume which is suitable for the human body for imaging can contain a sphere situated symmetrically between the pole pieces within the gap and having a polar axis extending normally between the pole pieces.

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Turning to Appellant's argument that Oldendorf fails to teach a notational sphere which is used for obtaining the necessary measurements of the magnetic field to locate the magnetic segments, we find that this directed to the process and fails to distinguish the product in the product-by-process claim. Furthermore, as shown above, Oldendorf does teach a structure that provides a uniform magnetic field in a volume which can contain a sphere. Therefore, we find that Oldendorf teaches structure for making more uniform the magnetic field intensity in a notational sphere situated symmetrically between the pole pieces within the gap and having a polar axis extending normally between the poles pieces as recited in Appellant's claim 12.

On pages 12 and 13 of the brief, Appellant argues that Oldendorf fails to teach magnetic segments of the reference that are "placed at selected locations on said opposed surfaces of said poles pieces in at least one circle concentric with said polar axis" as recited in Appellant's claim 12. Appellant further states without further explanation that the ring of slugs 96 are not located "at least one circle concentric with said polar axis" as claimed.

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We disagree. Oldendorf shows in Figure 3 that the ring of slugs 96 are placed in a circle and the center of the circle is concentric with the polar axis, an axis extending perpendicular from the center of the poles 70 and 72.

Therefore, we find that Oldendorf teaches magnetic segments placed at selected locations on said opposite surfaces of said pole pieces in at least one circle concentric with said polar axis as recited in Appellant's claim 12.

Finally, Appellant argues that Oldendorf requires the interaction between several different types of magnetic segments whereas Appellant's apparatus only requires one type of magnetic element. However, we note that Appellant's claim 12 recites "comprising" and thereby does not preclude other structure.

Appellant has not argued the process limitation and has not provided any evidence that establishes an unobvious difference between the claimed product and the prior art product. Since the burden is on the Appellant to come forward with this evidence, we find that the product as taught by Oldendorf is sufficient to establish that Appellant's claim 12 is unpatentable.

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In view of the above, we affirm the Examiner's decision that Appellant's claim 12 is properly rejected under 35 U.S.C. § 103, but we reverse the Examiner's decision that Appellant's claims 12 through 28 are properly rejected under 35 U.S.C. § 112, second paragraph. Accordingly, the Examiner's decision is affirmed-in-part.

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***

GARY V. HARKCOM	)	)
Vice Chief Administrative Patent Judge	)	)
	)	)
MICHAEL R. FLEMING	)	BOARD OF PATENT
Administrative Patent Judge	)	APPEALS AND
	)	INTERFERENCES
	)	)
RICHARD TORCZON	)	)
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