

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 25

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte FRANCIS A. SPELMAN, PAGE READ, N. MANI PRAKASH,
JAMES A. NELSON, CHARLES E. POPE, MARGARET HEITKEMPER,
and JAMES D. ROTHERMEL

Appeal No. 1997-2245
Application No. 08/402,872

ON BRIEF¹

Before BARRETT, FLEMING, and LEVY, Administrative Patent Judges.
LEVY, 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 1-14², which are all of the claims pending in this application.

¹ The Oral Hearing was waived by appellants in a communication received July 31, 2001.

² An amendment (Paper No. 9, filed April 1, 1996) filed subsequent to the final rejection (Paper No. 7, mailed February 6, 1996) was denied entry by the examiner (Paper No. 10, mailed April 24, 1996).

BACKGROUND

Appellant's invention relates to a non-evasive gut motility monitor. An understanding of the invention can be derived from a reading of exemplary claim 1, which is reproduced as follows:

1. An apparatus for non-invasive monitoring of gut motility in a patient, comprising:

a magnet sized to be ingestible by the patient;

a compass external of the patient directionally sensitive to movement of the magnet in the patient's abdomen for monitoring of gut motility according to movements of the ingested magnet.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Leibing 1934	1,971,189	Aug. 21,
Golden et al. (Golden) 1995	5,425,382	Jun. 20,
		(filed Sep. 14, 1993)
Mishin et al. (Mishin) 1985 (Russian Patent) ³	1,174,021	Aug. 23,

Weitschies, W. et al. (Weitschies), Magnetic Markers as a Noninvasive Tool to Monitor Gastrointestinal Transit, IEEE

³ A translation of this reference, prepared by the United States Patent and Trademark Office, is appended to the decision on appeal.

Transactions on Biomedical Engineering, Vol. 41, No. 2
(February 1994) pp. 192-195.

Macri, M. A. et al. (Macri), Measurement of gastrointestinal transit time by means of biomagnetic instrumentation: preliminary results, Clin. Phys. Physiol. Meas., Vol. 12, Suppl. A, (1991) pp. 111-115.

Claims 1, 5, 8, and 12 stand rejected under 35 U.S.C. § 103 as being unpatentable over Mishin, Weitschies, or Macri in view of Leibing.

Claims 2-4, 6, 7, 9-11, 13, and 14 stand rejected under 35 U.S.C. § 103 as being unpatentable over Mishin, Weitschies, or Macri in view of Leibing, and further in view of Golden.

Rather than reiterate the conflicting viewpoints advanced by the examiner and appellants regarding the above-noted rejections, we make reference to the final rejection (Paper No. 7, mailed February 6, 1996) and examiner's answer (Paper No. 13, mailed September 5, 1996) for the examiner's complete reasoning in support of the rejections, and to appellants' brief (Paper No. 12, filed June 20, 1996), supplemental appendix (Paper No. 14, filed October 22, 1996), and reply brief (Paper No. 16, filed November 4, 1996) for appellants' arguments thereagainst. Only those arguments actually made by appellants have been considered in this decision.

OPINION

In reaching our decision in this appeal, we have carefully considered the subject matter on appeal, the rejections advanced by the examiner, and the evidence of obviousness relied upon by the examiner as support for the rejections. We have, likewise, reviewed and taken into consideration, in reaching our decision, appellants' arguments set forth in the briefs along with the examiner's rationale in support of the rejections and arguments in rebuttal set forth in the examiner's answer.

It is our view, after consideration of the record before us, that the evidence relied upon and the level of skill in the particular art would not have suggested to one of ordinary skill in the art the invention as set forth in claims 1-14. Accordingly, we reverse, essentially for the reasons set forth by appellants.

We begin with the rejection of claims 1, 5, 8, and 12 stand rejected under 35 U.S.C. § 103 as being unpatentable over Mishin, Weitschies, or Macri in view of Leibing. Turning

first to the rejection of independent claim 1, the examiner's position (final rejection⁴, page 3) is that

Mishin, Weitschies et al. and Macri et al., while appearing to teach the use of an ingestible magnetic substance for monitoring the motility of the gastrointestinal tract, do not appear to specifically teach the use of a compass to detect the displacements of the magnetic substances instead, they make use of induction coils, SQUID and MRI systems.

To overcome this deficiency of Mishin, Weitschies, and Macri, the examiner turns to Leibing for a teaching of using a compass in systems for locating concealed objects. The examiner asserts (final rejection, page 4) that Leibing discloses a magnetic detector including a casing 11 having a plurality of magnetized needles. In operation, the casing is moved along the floor until the position of the needles indicates that the casing is directly above a magnet which is concealed in the floor. The examiner concludes (id.) that one of ordinary skill in the art would have modified the devices of Mishin, Weitschies, and Macri "to have made use of a simple, reliable, relatively inexpensive compass detecting device as taught by Leibing to locate and measure the

⁴ Incorporated by reference into the answer (page 3).

displacement of concealed, ingested magnetic means. Such a modification, would, as suggested, reduce costs and simplify the procedure."

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one having ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. Such reason must stem from some teaching, suggestion or implication in the prior art as a whole or knowledge generally available to one having ordinary skill in the art. Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir. 1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985); ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed.

Cir. 1984). These showings by the examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. Note In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). If that burden is met, the burden then shifts to the applicant to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole. See id.; In re Hedges, 783 F.2d 1038, 1039, 228 USPQ 685, 686 (Fed. Cir. 1986); In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984); and In re Rinehart, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976).

Appellants and the examiner are in agreement that Mishin, Weitschies, and Macri are not directed to the use of a compass for detecting the displacement of the ingested magnetic material. Appellants assert (brief, page 6) that Leibing is directed to a detector for locating a magnetized pin concealed within a building wall or floor, in a fixed position. Appellants argues (id.) that because Leibing is not directed to sensing directional movement, there is no

suggestion in the prior art to make the modification proposed by the examiner.

From our review of the collective teachings of Mishin, Weitschies, Macri, and Leibing, we are in agreement with appellants that the suggestion of replacing the magnetic field strength measuring devices of Mishin, Weitschies, or Macri with a compass comes from appellants' disclosure. In each of Mishin, Weitschies, and Macri gut motility is measured.

In Mishin (pages 1 and 2), a mixture including finely dispersed magnetic particles is ingested. Pairs of induction coils are placed around the patient, and the velocity of the advance of the magnetic particles is recorded on the basis of the electromotive force induced in the magnetic induction coils.

In Weitschies (page 191, col. 2 and page 193, col. 1), magnetic markers in the form of magnetite coated pellets are ingested. A seven channel SQUID device was used for measurement of weak magnetic fields (page 193, col. 2, and page 192, col. 1) as the ingested markers move through the gut. Because slight changes in the orientation of the marker can cause significant changes to be registered, data

registered consecutively at different instants do not necessarily represent the field. As a result, only during epochs without significant reorientations of the marker can consistent data sets be provided, i.e., location of the marker could only be provided when the marker was at rest during the five seconds of recording (page 193, col. 1 and 2).

In Macri, a magnetic sphere was ingested and measurements of transit time were performed with an RF SQUID. Progression of the marker along the bowel was determined by measuring the magnetic field normal to the horizontal plane over the subject's abdomen. Contour maps were determined at points of a rectangular grid normalized to the patient's dimensions. Anatomical data was then obtained using magnetic resonance images. From these teachings, we find that none of Mishin, Weitschies, Macri teach or suggest using a compass for determining directional movement of the marker in the patient.

Leibing is directed toward the use of a compass for locating a magnet 19, that is concealed in a fixed position in the wall or floor of a building. Leibing is not related to using a compass for determining directional movement of

magnetic material in a patient. Nor is Leibing broadly directed to using a compass for determining the directional movement of a concealed magnetic material. The examiner is correct that Leibing discloses using a compass to locate a concealed object. However, the fact the Leibing uses a compass to locate a concealed magnet in a building does not suggest replacement of the EMF or magnetic field sensors of Mishin, Weitschies, and Macri as a mere substitution of one location measuring means for another, as advanced by the examiner.

Each of Mishin, Weitschies, and Macri measure field strength in sensing gut motility. However, none of these references recognizes the benefits obtained from use of a compass for sensing directional movement. Leibing is not related to use of a compass to locate a magnet inside of a person, and is not related to using a compass to track directional movement in an apparatus for measuring gut motility. The examiner's rationale in support of the rejection (final rejection, page 4) is that the modification would reduce costs and simplify the procedure. We consider the examiner's rationale to be directed to the benefits that

would result from the proposed modification, and not reasons as to why the proposed modification would have been considered obvious to a skilled artisan. Obviousness may not be established using hindsight or in view of the teachings or suggestions of the inventor. Para-Ordnance Mfg. V. SGS Importers Int'l, 73 F.3d 1087, 37 USPQ 2d at 1239 (Fed. Cir. 1995), citing W. L. Gore & Assocs., v. Garlock, Inc., 721 F.2d at 1551, 1553, 220 USPQ at 311, 312-13 (Fed. Cir. 1983). Accordingly, the rejection of claim 1 is reversed. As the other independent claim 8 contains similar language, the rejection of claim 8, as well as dependent claims 5 and 12, is reversed.

Turning next to the rejection of claims 2-4, 6, 7, 9-11, 13, and 14, the examiner additionally relies upon the teachings of Golden for the claimed electronic flux-gate compass. The examiner's position (final rejection, page 5) is that Golden discloses a method and apparatus for locating a medical tube in the body of a patient. The tube includes a magnet which is located by a detection apparatus which senses the static magnetic field gradient. The sensors used by Golden include SQUID and flux-gate. According to the examiner

(id.) it would have been obvious to have used flux-gate sensors. We note that claim 2 requires a flux-gate compass, and not just a flux-gate sensor. The examiner states (answer, page 4) that "Applicant is correct in stating that Golden et al., similar to Mishin, Weitschies et al., and Macri et al., senses magnetic field strength." We find that in Golden (col. 5, lines 37-43) the location of a medical tube is detected by sensing the static magnetic field strength gradient produced by a permanent magnet associated with the tube. A magnet 91 (figure 4) is associated with a medical tube, such as a motility catheter (col. 5, lines 29 and 30). Sensing of the magnetic field strength is performed by a detection apparatus including a pair of flux-gate sensors 81a and 81b. Each sensor includes a toroid 10a, 20a, excitation winding 10c, 20c, and detection windings 10b, 20b. The flux-gate sensors (figure 3 and col. 9, lines 3-16) are spaced apart and fixed at each end of a mounting arm 82 with their detection winding axes aligned and parallel to the length of the mounting arm. The purpose of spacing the sensors is to separate out the earth's ambient magnetic field from the magnetic field of the magnet. The earth's magnetic field

strength will have an equivalent strength when read by either sensor. However, the magnet's magnetic field strength will not have equivalent values when read by the sensors because of the different distance between each sensor and the magnet (col. 6, line 42-58). Thus, the distance between the sensors provides a gradient between the magnet's magnetic field sensed by the spaced apart sensors, while at the same time nulling the sensing of the ambient magnetic field. To ensure that the signal sensed represents the magnet in the patient, the magnet is manipulated i.e., by turning the tube, until the polarity changes.

From these teachings of Golden, we find that Golden does not use the flux-gate sensors as part of a compass. In our view⁵, in order for a flux-gate sensor to form a compass, a second set of output excitation windings would need to be provided in quadrature with the first set of output windings, with one output winding set to represent north/south and the second set of output windings set to represent east/west with accompanying circuitry for operation as a flux-gate compass.

⁵ See U.S. Patent 5,090,231 entitled "Electronic Compass System" col. 1, lines 18-61.

In addition, although not brought to our attention by either the examiner or appellants, we observe that Golden discloses, in the Background of the Invention, reference to U.S. Patent No. 4,809,713 to Grayzel who discloses the use of a compass to determine the location of a magnet inside of a patient. Golden states (col. 2, lines 7-29) that in Grayzel, a cardiac-pacing catheter is held in place against the inner heart wall of a patient by the attraction between a small magnet located in the tip of the pacing catheter and a large magnet located on e.g., sewn into, the patient's chest. The compass is used to determine the best location for the large magnet. From the description of Grayzel found in the Golden patent and our review of the Grayzel reference, we find that the compass of Grayzel is inherently directionally sensitive to movement of the small magnet within the patient. However, even though the compass could be used to detect directional movement of a magnet within a patient, we find no teaching or suggestion for using the compass other than for locating the small magnet which is in a fixed position within the patient's chest.

As Golden only teaches the use of flux-gate sensors for measuring static magnetic field strength, and does not teach or suggest a flux-gate compass, we find that the flux-gate sensors of Golden do not suggest the claimed flux-gate compass of claims 2-4, 6, 7, 9-11, 13, and 14. Accordingly, the rejection of claims 2-4, 6, 7, 9-11, 13, and 14 under 35 U.S.C. § 103 is reversed.

CONCLUSION

To summarize, the decision of the examiner to reject claims 1-14 under 35 U.S.C. § 103 is reversed.

REVERSED

MICHAEL R. FLEMING)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
LEE E. BARRETT)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
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)	
)	
STUART S. LEVY)	
Administrative Patent Judge)	

SSL/gjh

Appeal No. 1997-2245
Application No. 08/402,872

Page 17

JAMES C. EAVES JR.
GREENEBAUM DOLL & MCDONALD PLLC
3300 NATIONAL CITY TOWER
101 SOUTH FIFTH STREET
LOUISVILLE, KY 40202

APPEAL NO. 1997-2245 - JUDGE LEVY

APPLICATION NO. 08/402,872

APJ LEVY

APJ BARRETT

APJ FLEMING

DECISION: **REVERSED**

Prepared By: GJH

DRAFT TYPED: 13 Jun 02

FINAL TYPED: