

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Ex parte HIROSHI FUKUDA
and
MASAYOSHI OMURA

Appeal No. 2005-2035
Application No. 10/281,417

ON BRIEF

Before McQUADE, NASE, and BAHR, Administrative Patent Judges.
NASE, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1 to 7, which are all of the claims pending in this application.

We REVERSE.

BACKGROUND

The appellants' invention relates to an ultrasonic probe and ultrasonic diagnostic equipment provided with an ultrasonic transducer used for ultrasonic observation (specification, p. 1). A copy of the claims under appeal is set forth in the appendix to the appellants' brief.

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

Lochner et al. (Lochner)	4,686,057	Aug. 11, 1987
Dias et al. (Dias)	5,400,788	Mar. 28, 1995

Claims 1 to 7 stand rejected under 35 U.S.C. § 103 as being unpatentable over Dias in view of Lochner.

Rather than reiterate the conflicting viewpoints advanced by the examiner and the appellants regarding the above-noted rejection, we make reference to the answer (mailed November 16, 2004) for the examiner's complete reasoning in support of the rejection, and to the brief (filed August 27, 2004) and reply brief (filed January 10, 2005) for the appellants' arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to the appellants' specification and claims, to the applied prior art references, and to the respective positions articulated by the appellants and the examiner. Upon evaluation of all the evidence before us, it is our conclusion that the evidence adduced by the examiner is insufficient to establish a prima facie case of obviousness with respect to the claims under appeal.¹ Accordingly, we will not sustain the examiner's rejection of claims 1 to 7 under 35 U.S.C. § 103. Our reasoning for this determination follows.

In rejecting claims under 35 U.S.C. § 103, the examiner bears the initial burden of presenting a prima facie case of obviousness. See In re Rijckaert, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993). A prima facie case of obviousness is established by presenting evidence that would have led one of ordinary skill in the art to combine the relevant teachings of the references to arrive at the claimed invention. See In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988) and In re Lintner, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972).

¹As such there is no need for us to weigh the Masayoshi Omura declaration (filed April 26, 2004).

With this as background, we analyze the prior art applied by the examiner in the rejection of the claims on appeal.

Dias shows in Figure 1 the basic construction of a previously known ultrasound diagnostic probe 20. The probe 20 consists of a catheter 22, a piezoelectric transducer 24 at the distal end 38 of the catheter, electric wires 26 that connect piezoelectric transducer 24 to external circuitry at the proximal end, an acoustic reflector 28 at the distal end, a rotating drive shaft 34 coupled to a small motor/shaft encoder at the proximal end, and a plastic radome 30 (i.e., an acoustic window that has the same acoustic impedance as a fluid) filled with a liquid 32 that fits over piezoelectric transducer 24 and acoustic reflector 28. Piezoelectric transducer 24 is stationary and when excited by an external source, it produces an acoustic signal 36 that travels through the liquid in radome 30 and strikes acoustic reflector 28. The surface of acoustic reflector 28 resides at an angle of 45° from acoustic signal 36 and it reflects acoustic signal 36 at an angle of 90° from its original path. The reflected acoustic signal 36 travels through liquid 32 in radome 30 and propagates through the blood until it encounters the arterial wall. Depending on the penetration into the arterial wall, several echoes return to piezoelectric transducer 24 by retracing essentially the same path. Piezoelectric transducer 24 converts these echoes into corresponding electrical pulses and wires 26 carry these electrical pulses to electrical circuitry located at the proximal

end. Since acoustic reflector 28 continuously rotates, acoustic signal 36 continuously rotates. Echoes from each angular position are collected, processed and displayed on a CRT screen.

Lochner's invention relates to a pasty damping medium for damping mechanical and/or acoustic vibrations, based on a liquid phase and at least one finely-divided solid material. Lochner teaches (column 5, line 64, to column 6, line 2) that:

The damping media according to the invention are suitable for hydraulically-operating damping devices, especially as media for engine bearings, wheel dampers, impact absorbers, steering dampers, shock absorbers, devices for rail vehicles and aeroplanes, vibration absorbers of all kinds, seat dampers and for vibration-free bedding of machines.

Lochner teaches that a polyglycol having a viscosity of at least $20 \text{ mm}^2/\text{s}$ at 50° C . is used as basic material for the liquid phase. The liquid phase has added to it solids which make up 20 to 80% by weight, based on the total weight of the damping medium. If there is less than 20% by weight of solid material, the damping medium has too low a viscosity, so that it can hardly be used as an effective damping medium. If more, than 80% by weight of solid material is used the resulting substance is so firm that the flow property is impaired. The paste-like damping media has a viscosity of about 100000 to $4 \times 10^6 \text{ mPa s}$, in particular of about 150000 to $3 \times 10^6 \text{ mPa s}$ at 18° C .

After the scope and content of the prior art are determined, the differences between the prior art and the claims at issue are to be ascertained. Graham v. John Deere Co., 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966).

Based on our analysis and review of Dias and claims 1 to 7, it is our opinion that one difference is the limitation that a hydrocarbon-based oil having a kinematic viscosity of 20 mm²/s or less is used as an acoustic medium.

With regard to this difference, the examiner determined (answer, p. 4) that it would have been obvious to an [sic] ordinary skill in the art at the time the invention was made to modify Dias's ultrasonic probe such that the acoustic medium (32) is replaced with the hydrocarbon-based oil of Lochner^[2] in order to achieve a viscosity of 20 mm²/s so that acoustic imaging technique is improved.

The appellants argue that the applied prior art does not suggest the claimed subject matter. We agree for the following two reasons.

First, the claimed hydrocarbon-based oil is not readable on polyglycol as disclosed by Lochner. A hydrocarbon is a compound containing only the elements

²It is the examiner's position that the claimed hydrocarbon-based oil is readable on polyglycol which is used as the basic material for the liquid phase of Lochner's damping medium.

hydrogen and carbon. Since polyglycol contains oxygen as well as hydrogen and carbon, polyglycol is not a hydrocarbon. Thus, the claimed hydrocarbon-based oil is not readable on polyglycol when it used as the basic material for the liquid phase of Lochner's damping medium.

Second, there is no motivation, suggestion or incentive in the combined teachings of Dias and Lochner that would have made it obvious at the time the invention was made to a person having ordinary skill in the art to have utilized Lochner's damping medium based on polyglycol as Dias' liquid 32. In that regard, Lochner's medium based on polyglycol and Dias' liquid 32 have distinct uses. Lochner's medium based on polyglycol is used for damping while Dias' liquid 32 is used to transmit an ultrasonic wave. In addition, Lochner's damping medium based on polyglycol also includes solids which would wreak havoc in Dias' ultrasound probe. In our view, the only suggestion for modifying Dias in the manner proposed by the examiner stems from hindsight knowledge derived from the appellants' own disclosure. The use of such hindsight knowledge to support an obviousness rejection under 35 U.S.C. § 103 is, of course, impermissible. See, for example, W. L. Gore and Assocs., Inc. v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984).

For the reasons set forth above, the decision of the examiner to reject claims 1 to 7 under 35 U.S.C. § 103 is reversed.

CONCLUSION

To summarize, the decision of the examiner to reject claims 1 to 7 under 35 U.S.C. § 103 is reversed.

REVERSED

JOHN P. McQUADE
Administrative Patent Judge

JEFFREY V. NASE
Administrative Patent Judge

JENNIFER D. BAHR
Administrative Patent Judge

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