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D E C I S I O N
of 28 January 2003

Case Number: T 0293/00 - 3.2.2

Application Number: 92912008.7

Publication Number: 0597864

IPC: A61B 8/12

Language of the proceedings: EN

Title of invention:
CORONARY ARTERY IMAGING SYSTEM

Applicant:
Feldman, Charles L.

Opponent:
-

Headword:

Relevant legal provisions:
EPC Art. 123(2)

Keyword:
"New subject-matter (yes)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0293/00 - 3.2.2

D E C I S I O N
of the Technical Board of Appeal 3.2.2
of 28 January 2003

Appellant: Feldman, Charles L.
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 16 November 1999 refusing European patent application No. 92 912 008.7 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: W. D. Weiß
Members: S. S. Chowdhury
J. C. M. De Preter

Summary of Facts and Submissions

I. This appeal is against the decision of the examining division dated 16 November 1999 to refuse European patent application No. 92 912 008.7.

The grounds of refusal were that method claim 11 of the main request was not allowable under the provisions of Art 52(4) EPC since it related to surgical method, and claim 1 of each of the first and second auxiliary requests was unclear since it attempted to define constructional features by reference to the manner of use of the device. Claim 1 of the second auxiliary request was additionally objectionable under Art 123(2) EPC. The decision also noted that the device of claims 1, 2 to 4 and 6 of the main request lacked novelty and that claims 5 and 7 to 10 did not meet the requirement of Art 52(1) EPC with respect to inventive step.

II. On 17 January 2000 the appellant (applicant) lodged an appeal against the decision and paid the prescribed fee on the same date. On 8 March 2000 a statement of grounds of appeal was filed.

III. The appellant appeals against the decision of the examining division only in respect of the second auxiliary request, and requests that the decision under appeal be set aside and that a patent be granted on the basis of the second auxiliary request refused by the examining division, or the case be remitted to the examining division for further prosecution.

IV. Independent claim 1 of this request reads as follows:

1. "An imaging system for providing a representation of a blood vessel having a wall, the system comprising: a catheter (12) for insertion into said blood vessel and having a first transducer (120) for generating and receiving echo waves reflected from said wall and converting said echo waves into electrical imaging signals; location means for deriving location signals indicative of the first transducer location; an imaging circuit (38) coupled to said first transducer for detecting the imaging signals; and a location circuit (16) for detecting the location signals; and **characterised by** the catheter having a second transducer (128) for generating doppler signals and receiving doppler echo signals indicative of fluid velocity within the blood vessel and converting said doppler signals into flow signals the second transducer being positioned on the catheter such that, in use, it receives signals from blood flow that has not been substantially interfered with by the catheter; the location means deriving location signals indicative of the second transducer location; a flow circuit (18) coupled to said second transducer for detecting the flow signal, and; a computer (20) in which equations for fluid flow are stored for processing the signals detected from the imaging circuit, flow circuit and location circuit and for computing the three-dimensional location in space of the transducers, a three-dimensional representation of a blood vessel wall segment at predetermined locations and for determining local fluid flow conditions, including the direction and magnitude of local fluid flow, at points within cross sections of said vessel at the predetermined locations from signals from the flow circuit and imaging circuit signals and the stored equations."

V. The appellant argues as follows:

The examining division's objection under Art 123(2) EPC was wrong since the feature "the second transducer being positioned on the catheter such that, in use, it receives signals from blood flow that has not been substantially interfered with by the catheter" was clearly supported by page 9, lines 5 to 26 of the description.

This part of the claim, moreover, clearly defined a constructional feature and not a use feature, so the examining division was wrong in this respect also.

VI. Following a communication from the Board, in which objections to the claims were set out, the appellant's representative informed the Board, by letter dated 23 December 2002, that they would not be attending the oral proceedings scheduled for 28 January 2003. The oral proceedings were held, nevertheless, and culminated in a decision dismissing the appeal.

Reasons for the Decision

1. The appeal is admissible.

2. *The application*

The present application relates to apparatus for characterizing both intracoronary plaque obstruction and coronary artery blood vessel flow. The apparatus includes a catheter probe for introduction into a coronary artery, which has a first rotating sonic transducer, or a fixed array of transducers for imaging

the wall of the artery, and a second sonic transducer at the tip, which generates and receives sonic doppler signals indicative of fluid flow through the artery at a predetermined volume near the plaque. A location transducer is provided which generates position signals indicative of catheter location. The three sets of signals are detected and processed in individual circuits and coupled to a computer wherein three-dimensional representations of plaque characteristics and catheter location and local fluid flow conditions at the artery are calculated, displayed and stored. The local fluid flow conditions include the direction and magnitude of fluid flow, from which sheer stress at the artery wall may also be determined.

In the imaging mode, shown in Figure 2, the catheter is disposed within the artery with the sonic transducer array positioned opposite a portion of a stenotic lesion or plaque, and sonic pulses emitted and received in order to build a 3-D image of the artery wall.

At the end of the imaging mode the catheter is withdrawn to a position, shown in Figure 3, where it does not interfere with the blood flow near a branching segment of the artery, and doppler measurements are performed with the doppler transducer for determining local flow conditions including the direction and magnitude (velocity) of fluid flow from which sheer stress at the wall may also be determined to indicate that force exerted by the fluid on the endothelium.

3. *Interpretation of claim 1*

Claim 1 relates to a "an imaging system" and is interpreted as a device claim since it defines several

constructional features (catheter, location means, imaging circuit, etc), and since the second auxiliary request before the examining division was filed in response to an objection under Art 52(4) EPC against the method claims of the main request and the second auxiliary request is intended to overcome this objection by including only device claims. The features of a device claim must be constructional features or functional features suggestive of some sort of construction.

Therefore, the feature "the second transducer being positioned on the catheter such that, in use, it receives signals from blood flow that has not been substantially interfered with by the catheter", in the characterising part of the claim, is taken to be a functional feature intended to define a construction, in particular how the transducer is located on the catheter so as to ensure the desired effect of receiving signals from un-interfered blood flow.

4. *Article 123(2) EPC*

4.1 The feature of claim 1 "the second transducer being positioned on the catheter such that, in use, it receives signals from blood flow that has not been substantially interfered with by the catheter" was not originally disclosed since nowhere in the application as originally filed is it stated or suggested that the second transducer receives signals from blood flow that has not been substantially interfered with by the catheter by virtue of the position of the transducer on the catheter.

What was originally disclosed was that the catheter was

removed from the position as shown in Figure 2 to that shown in Figure 3 so as not to interfere with blood flow near an artery segment, which is not the same as saying that this non-interference is caused by virtue of the second transducer's position on the catheter (rather than the catheter's position in the artery).

According to the appellant the above feature is supported by page 9, lines 5 to 26, of the application. This passage, however, clearly describes how the wall geometry is determined with intraluminal ultrasound echoing by transducer array 120 positioned as shown in Figure 2 and then the total volumetric flow may be measured with the doppler 128 positioned such that it does not significantly alter the local flow conditions in the segment as shown in Figure 3. It is clearly the positioning of the catheter that enables the above two measurements to be taken and in the Figure 3 position to avoid interference with the blood flow, and not the position of the transducer 128 on the catheter that allows it to receive signals from blood flow not interfered with by the catheter.

5. The second auxiliary request is not allowable since it does not meet the requirement of Art 123(2) EPC, accordingly.

Order

For these reasons, it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

V. Commare W. D. Weiß