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D E C I S I O N
of 8 July 2002

Case Number: T 1039/98 - 3.2.2

Application Number: 92921981.4

Publication Number: 0606390

IPC: A61B 17/00

Language of the proceedings: EN

Title of invention:
Apparatus and method for vasodilation

Applicant:
THE GENERAL HOSPITAL CORPORATION

Opponent:

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Headword:

-

Relevant legal provisions:

EPC Art. 84, 123(2)

Keyword:

"Clarity and adequate support (yes, after amendment)"

Decisions cited:

-

Catchword:

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Boards of Appeal

Chambres de recours

Case Number: T 1039/98 - 3.2.2

D E C I S I O N
of the Technical Board of Appeal 3.2.2
of 8 July 2002

Appellant: THE GENERAL HOSPITAL CORPORATION
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Representative: Deans, Michael John Percy
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 17 June 1998
refusing European patent application
No. 92 921 981.4 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: W. D. Weiss
Members: M. G. Noël
J. C. M. De Preter

Summary of Facts and Submissions

- I. European application No. 92 921 981.4 (publication No. WO 93/06780) was refused by the Examining Division on the grounds that the claimed subject-matter lacked clarity (Article 84 EPC) and extended beyond the content of the application as filed (Article 123(2) EPC).
- II. The reasons given by the first instance were that the expression "without emission of a shock wave" in claim 1 was unclear and not unambiguously derivable from the application as originally filed. More specifically, the definitive exclusion of the generation of any shock waves in the fluid column did not have proper support and even was in contradiction to the description, where the exclusion referred only to purportedly destructive shock waves within the blood vessel.
- III. The appellant lodged an appeal against this decision and filed a statement of grounds along with new sets of claims and a new document in support of its contentions:
- D7: "Non-Invasive Determination of Shock Wave Pressure Generated by Optical Breakdown", A.G. Doukas et.al, Applied Physics B, vol. B53, No. 4., October 1991, pp. 237-245.
- IV. In a communication dated 19 December 2001, the appellant was presented with a formally acceptable set of claims amended by the Board in order to remove still pending objections under Articles 84, 123(2) and 52(4) EPC, and was informed of the Board's intention to remit

the case to the first instance for further prosecution.

- V. The appellant replied on 22 April 2002 and submitted a new set of claims 1 to 10 amended as suggested by the Board and incorporating some additional amendments for the sake of clarity.

The appellant requested the grant of a patent on the basis of the latest filed set of claims or, failing that, remittal of the case for further prosecution.

- VI. Claim 1 reads as follows:

"An apparatus for transmitting a wave front into an occluded blood vessel, comprising:

a catheter (12) having a lumen for containing a fluid (14), and

energy conducting means (16) arranged within said lumen, and connected to an energy source for generating wave fronts through the fluid in the catheter

said catheter having a distal end (11) from which wave fronts are further propagated

and wherein

said conducting means (16) is spaced (A) from said distal end (11) with a column of fluid (14) in said lumen therebetween, and

said energy source is adjusted such that no shock wave is propagated from said distal end."

Reasons for the Decision

1. The appeal is admissible.
2. *Amendments*
 - 2.1 Claim 1 relates to an apparatus for transmitting a wave front into an occluded blood vessel, as recited in the PCT application as originally filed (cf. page 5, lines 16 to 18 and page 6, lines 10 to 11).

The features which refer to the structure of the apparatus, i.e. a catheter 12 having a lumen for containing a column of fluid and energy conducting means 16 arranged within said lumen and spaced (A) from the distal end 11 of the catheter, are fairly supported by the application as filed, in particular from page 6, line 22 to page 7, line 16.

The remaining, more functional, features according to which the conducting means are connected to an energy source for generating wave fronts through the fluid, and further beyond the distal end of the catheter, said energy source being adjusted such that no shock wave is propagated from said distal end, are also properly supported by the original description, partly by the above quoted passages and partly by page 5, lines 25 to 32 and page 6, lines 14 to 20.

In order to prevent damage of the blood vessel into which the catheter is inserted, the present apparatus makes use of high frequency waves, e.g. harmless hydraulic or acoustic waves for producing and propagating a wave front through the fluid in the catheter and then in the blood vessel so as to induce

vasodilation (cf. page 2, lines 23 to 29). Even if a shock wave is produced by a laser-induced breakdown within the catheter following the formation of a cavitation bubble in the catheter lumen, by appropriately adjusting the laser energy this shock wave will be rapidly dissipated by the column of fluid over the distance A and converted into a hydraulic or acoustic wave, which is much slower than a shock wave (cf. page 5, lines 22 to 32) before it can emerge from the distal end of the catheter. Such cavitation phenomenon and shock wave generation during optical breakdown are known, as clearly explained e.g. in latest filed document D7, where it is specified, in particular, that initially induced shock waves dissipate rapidly into acoustic waves (cf. pages 237 and 243 (discussion); Figures 3 and 4 and text referred to).

Therefore, according to the invention, energy adjustment is made so that no destructive shock wave is generated within the blood vessel, even if the wave front generated by laser pulse forms a cavitation bubble within the catheter (cf. page 4, lines 12 to 16 and 27 to 30; page 6, lines 14 to 16). This is in accordance with the last feature of claim 1.

Moreover, the Board observes that while the functional features of claim 1 refer to the use of the device and do not allow, by themselves, to distinguish the device itself, they, however, do so in combination with the structural features and, in addition, are essential to the definition of the invention.

2.2 Dependent claims 2, 4, 5, 6, 7, 8, 10 are based on original claims 2, 3, 4, 5, 8, 6, 9, respectively.

Claim 3 is supported by the original description page 5, lines 22 to 25 and 30 to 32.

Claim 9 is based on original claim 7 and on the description page 6, lines 7 to 13 and page 7, lines 9 to 12.

- 2.3 It results therefrom that all claims are clear and supported by the description and that the amendments made are not such as to extend the claimed subject-matter beyond the content of the application as filed, as required by Article 84 and 123(2) EPC.

3. *Remittal*

Since the refusal by the Examining Division was based on formal objections under Article 84 and 123(2) EPC, now removed, and considering that the claims have been further amended by the appellant, the Board considers it appropriate to remit the case to the first instance for further prosecution on the substantive issues and subsequent adaptation of the description. In this respect, it would be appropriate to restore in the description the terminology of the original disclosure but restricted to the apparatus. As to the two-part form of the main claim, it can only be decided upon once the substantive comparison with the closest prior art has been made.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the Examining Division for further prosecution.

The Registrar:

The Chairman:

G. Rauh

W. D. Weiß