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Bezeichnung der Erfindung:
Title of invention:
Titre de l'invention : Device for applying a high frequency electromagnetic field to living tissue to promote healing thereof

Klassifikation / Classification / Classement : A61 N1/40; A61 N1/06

ENTSCHEIDUNG / DECISION

vom / of / du 21 September 1987

Anmelder / Applicant / Demandeur : Bentall, Richard Hugh Cameron

Patentinhaber / Proprietor of the patent /
Titulaire du brevet :

Einsprechender / Opponent / Opposant :

Stichwort / Headword / Référence :

EPÜ / EPC / CBE Articles 54 and 56

Kennwort / Keyword / Mot clé : "Novelty of one claim (No);
Inventive step of another independent claim (No),
surprising effect (No)"

Leitsatz / Headnote / Sommaire

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Case Number : T 92/87

D E C I S I O N
of the Technical Board of Appeal 3.4.1.
of 21 September 1987

Appellant : Bentall, Richard Hugh Cameron
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Representative : Read, Matthew Charles
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Decision under appeal : Decision of Examining Division 040 of the European Patent Office dated 31 October 1986 refusing European patent application No. 82 304 938.2 pursuant to Article 97(1) EPC

Composition of the Board :

Chairman : K. Lederer
Members : E. Turrini
C. Payraudeau

Summary of Facts and Submissions

I. European patent application 82 304 938.2 (publication number 0 076 074) was refused by decision of the Examining Division 040 of the European Patent Office dated 31 October 1986.

II. The decision under appeal was based on Claims 1 to 10 and 12 to 14 filed on 3 September 1985 and on Claims 11 and 15 filed on 9 December 1985.

III. The reason given for the refusal was that the subject-matter of Claim 1 and Claim 11 are not new (Article 54 EPC) in view of the prior art documents GB-A-1 130 933 (D1) and DE-A-1 489 885 (D2) respectively.

IV. On 30 December 1986, an appeal was lodged against the decision and the appeal fee paid. The appellant subsequently submitted on 2 March 1987 the Statement of Grounds, requesting that the decision of the Examining Division be set aside and a European patent granted on the basis of a new set of Claims 1 to 14 referred to as Exhibit A.

V. Current Claim 1 reads as follows:

"A device for applying a high frequency electromagnetic field to tissue of a patient to promote healing, comprising an antenna (1) adapted to be placed in a pre-selected positional relationship with the patient so as to direct the field thereto, and an oscillator circuit (5) arranged to cause the antenna to propagate electromagnetic energy which when said antenna is in said preselected relationship, has a field strength of less than 100 mW cm^{-2} as measured at the skin of the patient thereby to promote

healing of the tissue without producing any significant heating thereof, characterised in that the antenna has a directive pattern so configured that a substantially greater proportion of said energy is propagated in a forward direction for treating the tissue than in an opposite rearward direction so as to minimise emission of said radiation outwardly of the patient."

Claims 2 to 10 and 14 are dependent from Claim 1.

Current Claim 11 reads as follows:

"A device for applying a high frequency electromagnetic field to tissue of a patient to promote healing, comprising an antenna (15, 16) for assuming a preselected overlying relationship with tissue of a patient, said antenna encompassing a given area for treating a corresponding tissue area of the patient, and electrical oscillator means (16, 17) arranged to energise the antenna to propagate electromagnetic energy such that when in said preselected relationship the propagated energy for said area has a field strength of less than 100 mW cm^{-2} as measured at the skin of the patient and thereby promotes healing of the tissue without producing any significant tissue heating, characterised in that said antenna is arranged to produce said field with a spatially uniform strength over at least a major portion of said given area."

Claims 12 to 14 are dependent from Claim 11.

VI. Following a communication on behalf of the Board of Appeal dated 27 May 1987, the Appellant filed, on 27 July 1987, a letter confirming his position outlined in the Statement of Grounds.

VII. The appellant argued that the invention is concerned with athermal techniques clearly distinguishing from diathermy. He further submitted the following reasoning.

The starting point of the invention as claimed in Claim 1 is prior art document US-A-4 197 851 (D3) which discloses the features of the preamble of Claim 1. Although document D1 discloses the features of the characterising portion of Claim 1, it is not permissible to combine the teaching of D3 with the teaching of D1, the latter referring to a "fundamentally different technique", i.e. to a diathermy apparatus. The purpose of the directional antenna in diathermic devices as that of D1 is to increase the field strength, while this is not the case for the invention in suit. Thus, the subject-matter of Claim 1 is not obvious.

As far as Claim 11 is concerned, its starting point is also document D3. Although document D2 may well disclose the features of the characterising portion of Claim 11, the antenna of D2 does not refer to athermal devices so that its electromagnetic field interacts with the living tissue differently from the electromagnetic field produced by an athermal device. The combination of features of two documents as D3 and D2 is therefore not obvious.

Reasons for the Decision

1. The appeal complies with Articles 106 to 108 and Rule 64 EPC and is, therefore, admissible.

2. There is no objection to the current set of claims as far as Article 123(2) EPC is concerned, since they are adequately supported by the original disclosure. In

particular, actual Claim 1 is supported by original Claim 1 and original description, page 7, second paragraph; actual Claim 11 is supported by original Claim 11 and original description, page 9, first paragraph.

3. Novelty.

3.1 Document D1 (Figures 2 and 3 and corresponding description; page 1 of the description) describes a device for applying a high frequency electromagnetic field to tissue of a patient to promote healing (page 1, left column; page 4, lines 115 to 120), comprising an antenna (20) adapted to be placed in a pre-selected positional relationship with the patient so as to direct the field thereto, and an oscillator circuit (part of the drive circuit) arranged to cause the antenna to propagate electromagnetic energy. The antenna has a directive pattern so configured that a substantially greater proportion of the energy is propagated in a forward direction for treating the tissue than in an opposite rearward direction, (page 3, lines 80 to 90). The healing is obtained without producing any significant heating of the tissue (page 7, lines 7 to 11).

The antenna of D1 also encompasses a given area for treating a corresponding tissue area of the patient (Figure 3 and corresponding description).

Document D1 contrary to the present Claims 1 and 11 does not mention that the value of the field strength should be less than 100 mW cm^{-2} measured at the skin of the patient.

Document D1 does not either disclose the characterising feature of Claim 11 according to which the antenna is arranged to produce a field of spatially uniform strength.

3.2 Document D3 (abstract; Figures 1 and 2 and corresponding

description) describes an (athermic) device for applying a high frequency electromagnetic field to tissue of a patient to promote healing, comprising an antenna (9) adapted to be placed in a pre-selected positional relationship with the patient (i.e. necessarily an "overlaying relationship with tissue of a patient") so as to direct the field thereto, and an oscillator circuit (11) arranged to cause the antenna to propagate electromagnetic energy which has a field strength of less than 100 mW cm^{-2} (col.2, lines 49 and 50), i.e. the field strength measured at the skin of the patient when the antenna is in said preselected relationship is necessarily less than 100 mW cm^{-2} thereby to promote healing of the tissue without producing any significant heating.

Moreover, the antenna of D3 encompasses a given area fortreating a corresponding tissue area of the patient (Figure 1; abstract) and it is arranged to produce the electromagnetic field with a spatially uniform strength over at least a major portion of the given tissue area (column 3,lines 4 to 21,especially lines 19 to 21).

D3 does not mention any feature of the characterising portion of Claim 1, i.e. it does not refer to the features concerning the directive pattern of the antenna so as to minimise the emission of the radiation outwardly of the patient, but it discloses all the features of Claim 11.

3.3 The other cited documents of the prior art are not relevant with respect to the present invention.

3.4 For the above reasons, the subject-matter of Claim 1 is deemed to be novel within the meaning of Article 54 EPC, while the subject-matter of Claim 11 is not new (Article 54 EPC) and therefore not acceptable under Article 52(1) EPC.

4. Inventive step.

4.1 Claim 1 is based on D3, which discloses all the features of the preamble of Claim 1 and is, in the Board's opinion, the nearest prior art.

Starting from D3, the man skilled in the art is faced with the problem of improving the efficiency of the device by reducing the energy losses.

The problem is solved by configuring the antenna with a directive pattern as set out in the characterising portion of Claim 1.

4.2 The identification of the problem is not inventive, since reduction of energy losses is a usual goal in any technical field.

4.3 As far as the solution of the problem is concerned, the skilled man would take into consideration prior art documents in the field of D3, i.e. documents referring to devices for applying a high frequency electromagnetic field to the tissue of a patient to promote healing, without restricting the search to "athermal devices", as is the case of the device of D3. In fact, the problem to be solved is so general that he could well find also in documents referring to "diathermy devices" a reasonable solution applicable to an athermal device. He would, therefore, be expected to consider document D1, despite its application field concerning diathermy (the passage at page 1, lines 33 to 38 and at page 7, lines 3 to 11 hint at diathermy even if not explicitly mentioned).

He would find in the latter document a description of an antenna having a directive pattern (page 3, lines 80 to 90) which is the feature claimed in the characterising part of

Claim 1. According to D1 this feature, i.e. the unidirectional radiation, serves to maximise the field strength. The skilled man would, however, easily realise that such a measure would necessarily reduce the energy losses if applied at the device of D3, wherein the field strength is kept at a very small value. In other words, the problem arising in D1 and that underlying the invention in suit are indeed the same problem of improving the efficiency of the device and the solution proposed in D1 is directly applicable to the device of D3.

The skilled man faced with the problem of energy losses from a device according to D3 would, therefore, as a matter of course, modify this device, as suggested by D1, thus obtaining a device which corresponds to that claimed in Claim 1.

4.4 The appellant submits that diathermy aims to increase the field strength as much as possible and as logical consequence as much energy as possible, e.g. by means of a reflector, should pass into the patient. He stresses that, contrary to diathermy, in the athermal technique the opposite situation arises, so that up until now "it has been felt necessary to provide an antenna which is generally lossy in order to ensure that no heating occurs." The advantages of the invention in suit, e.g. to increase in the case of a portable battery driven unit, the battery lifetime, were thus unexpected.

The appellant's opinion is not shared by the Board. It is common knowledge that low energy levels can be obtained in two ways, either by dispersing a given quantity of energy over a wider solid angle or by reducing, without such dispersion the energy production. It is also self-evident that the second way reduces the losses and increases the performances, e.g. by increasing the life of the energy

source. The skilled man aiming to improve the general efficiency and reliability of an apparatus would, therefore, choose, as a matter of course, the second way.

4.5 The appellant also notes that an application filed in the US, corresponding to the application in suit has matured into the US-A-4 471 787.

In this respect, the Board states that the decisions taken under the European Patent Convention cannot be directly affected by decisions taken under US law because there is no legal interdependence between both laws.

4.6 Thus, the subject-matter of Claim 1 lacks inventive step (Article 56 EPC) and Claim 1 is, therefore, not allowable under Article 52(1) EPC.

5. Claims 1 to 10 and 12 to 14 are referred back to non-acceptable Claims 1 and/or 11. These dependencies render the whole set of claims not allowable under Article 52(1) EPC.

Order

For these reasons, it is decided that:

the appeal is dismissed.

The Registrar The Chairman

F.Klein K.Lederer