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# D E C I S I O N
## of 7 December 2001

**Case Number:** T 0177/99 - 3.4.1

**Application Number:** 93830153.8

**Publication Number:** 0599786

**IPC:** A61N 2/04

**Language of the proceedings:** EN

**Title of invention:**
Electromagnetic dental mineralizer

**Applicant:**
Diodato, Enzo Lino

**Opponent:**
-

**Headword:**
-

**Relevant legal provisions:**
EPC Art. 56

**Keyword:**
"Inventive step (no)"

**Decisions cited:**
-

**Catchword:**
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

**Case Number:** T 0177/99 - 3.4.1

**D E C I S I O N**
**of the Technical Board of Appeal 3.4.1**
**of 7 December 2001**

**Appellant:** Diodato, Enzo Lino
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**Representative:** Savi, Alberto
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**Decision under appeal:** **Decision of the Examining Division of the European Patent Office posted 16 October 1998 refusing European patent application No. 93 830 153.8 pursuant to Article 97(1) EPC.**

**Composition of the Board:**

**Chairman:** G. Davies
**Members:** R. Q. Bekkering
H. K. Wolfrum

## Summary of Facts and Submissions

1. The appellant (applicant) lodged an appeal, received on 18 December 1998, against the decision of the examining division, dispatched on 16 October 1998, refusing the European patent application No. 93 830 153.8 (publication No. EP-A-0 599 786). The fee for the appeal was paid on 18 December 1998. The statement setting out the grounds of appeal was received on 18 December 1998 with the notice of appeal.

The appellant requested that the decision under appeal be set aside and a patent be granted on the basis of the following documents:

**Claims:**

No. 1,2 filed with the statement of grounds of appeal on 18 December 1998

**Description:**

Pages 1, 2 as filed with the letter of 6 March 1998
Page 3 as filed with the letter of 9 September 1998

**Drawings:**

Sheets 1 to 3 as filed with the letter of 9 September 1998.

The wording of the claims reads as follows:

"1. Electromagnetic dental mineralizer device (5), comprising:

- two coils (9) defining a space for receiving a tooth, said two coils (9) being arranged in such way to produce an electromagnetic field crossing the space defined by said coils (9), the magnetic field being directed in a substantially straight way from one coil to the other, while the electric field being directed in such a way that whwn [sic] a tooth is received in said space the electric field crosses the tooth in a substantially longitudinally way,

- a programmable impulse generator operatively connected to said coils (9)

characterised in that

- the programmable impulse generator operates in the range of the cardiac pulse, in order to make the device action more effective.

2. Electromagnetic dental mineralizer device, according to claim 1, wherein the impulse are [sic] square wave."

2. Oral proceedings were arranged at the request of the appellant.

In the communication accompanying the summons to oral proceedings reference was made to the following documents:

D2: Physikalische Medizin, Volume 4 "Elektro- und Lichttherapie", edited by H. Drexel et al, published by Hippokrates Verlag GmbH, Stuttgart, Germany, 1988, Chapter 8, "Niederfrequente

Magnetfeldtherapie", pages 111 to 118

D3: EP-A-0 143 748

In a preliminary assessment by the board it was held that claim 1 offended against Article 84 EPC and that claim 2 was not admissible under Article 123(2) EPC. Furthermore it was held that under the assumption that the claims were amended to overcome these objections, the subject-matter of such claims would not involve an inventive step with respect to documents D2 and D3 (Articles 52(1) and 56 EPC).

3. With the letter of 19 October 2001 the appellant announced that nobody would be present at the oral proceedings.

4. The arguments submitted by the appellant may be summarized as follows:

As regards the claimed orientation of the electric field, it was indeed difficult to determine in a complex tissue the orientation of single magnetic field lines. But the probability that the electric field was directed "substantially longitudinally" was higher than that it was directed at 90 or 180 degrees.

Moreover, the claimed subject-matter was inventive because it claimed that the impulse generator could be triggered by the cardiac pulses. This feature was not covered by D2 and D3 and could be deduced from the original text "... it is well established that the generator frequency operates in the range of the cardiac pulses, in order to make the device more

effective."

5. With a notification dated 31 October 2001 the appellant was informed that the oral proceedings, due to take place on 21 November 2001, had been cancelled.

## Reasons for the Decision

1. The appeal is admissible.

2. *Inventive step*

2.1 The closest prior art for a device according to claim 1 is considered to be provided by document D2. From document D2 (cf figure 4 and corresponding description) an electromagnetic device is known comprising in accordance with claim 1 under consideration:

two coils ("Magnetfeldspule") defining a space, said two coils being arranged in such way to produce an electromagnetic field crossing the space defined by said coils, the magnetic field being directed in a substantially straight way from one coil to the other, and

an impulse generator operatively connected to said coils.

The device according to claim 1 is defined to be an electromagnetic dental mineralizer device and the space defined by the two coils is defined to be for receiving a tooth. These definitions imply, in terms of structural features of the device, that the coils are such that a tooth would fit in the space therebetween.

Furthermore the electric field is defined to be directed in such a way that when a tooth is received in said space the electric field crosses the tooth in a substantially longitudinal way. In this context it becomes evident from the sole embodiment shown in the application that the specified electric field is the electric field induced within a tooth by the changing magnetic field generated by two coils coaxially arranged on opposite sides of the tooth. Although the board has serious doubts as to whether the electric field generated in these circumstances would be correctly defined as crossing the tooth in a "substantially longitudinal way", it interprets this feature for the purpose of the present decision as implying, in terms of structural features of the device, that the coils are coaxially arranged such that a tooth would fit in the space therebetween with the tooth's longitudinal axis perpendicular to the magnetic field in the space, because any other structural arrangement would be at variance with the original disclosure.

Also these structural features are provided by the device known from document D2 (cf figure 4). In this respect it is noted that the device of document D2 is for treatment of bones in general and thus including relatively small bones eg bones of fingers, infants etc... Consequently the teaching of document D2 includes a device which would have dimensions rendering it suitable for receiving a tooth between the coils with the tooth's longitudinal axis perpendicular to the magnetic field.

2.2 Accordingly the device according to claim 1 differs from this known device in that:

- the impulse generator is programmable, and

- the programmable impulse generator operates in the range of the cardiac pulse, in order to make the device action more effective.

Hence, the objective problem-to-be-solved by the present application may be seen as being to select a suitable impulse generator and operating frequency.

The selection of a programmable impulse generator must be regarded as a trivial selection for the skilled person, as such generators are commonly used and have obvious advantages in terms of flexibility in operation. This is all the more true as in the present case no specific use is made of the programmability of the impulse generator.

As far as the selection of the operating frequency range is concerned, the frequency range of the cardiac pulse would typically lie between about 0.8 Hz and 3 Hz (corresponding to a pulse rate of 48 to 180 pulses/minute). In this respect, document D2 envisages for pulsed magnetic fields in treatments of the type ("konservative Magnetfeldtherapie") discussed in conjunction with figure 4, frequencies between 1 Hz and 2000 Hz (cf page 117, left-hand column, second paragraph). A similar range of frequencies is suggested in document D3 (cf in particular page 1, lines 1 to 11; page 2, lines 12 to 20; and claim 2) for the application of pulsed magnetic fields *inter alia* when treating teeth for the purpose of prophylaxis and care of dental caries. Thus, the selection of an operating frequency in the range of the cardiac pulse corresponds in substance to the lower end of the ranges suggested

in documents D2 and D3. In the absence of any surprising effect caused hereby, this selection must be seen as being arbitrary and thus devoid of an inventive step. In this context, the specification "in order to make the device action more effective" has to be seen as a mere desideratum and not factually supported.

As regards the appellant's argument, in support of the presence of an inventive step, that documents D2 and D3 did not refer to devices having impulse generators triggered by cardiac pulses, it is noted that neither claim 1 nor claim 2 contains this feature, nor is it disclosed in the originally filed application documents.

Accordingly, the subject-matter of claim 1 lacks an inventive step in the sense of Article 56 EPC, contrary to the requirements of Article 52(1) EPC.

2.3 Dependent claim 2 is not allowable insofar as it presupposes an allowable claim 1. Moreover the subject-matter of claim 2 lacks an inventive step. The square wave impulse is merely one of a limited number of per se well-known impulse types available to the skilled person. Furthermore, in the device of document D2 it is suggested to use sinusoidal, steep-sloped impulses (cf text of figure 4). The selection of square wave impulses therefore would be obvious to the skilled person.

## Order

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar: The Chairman:

R. Schumacher G. Davies