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Datasheet for the decision of 3 March 2015

Case Number: T 0261/11 - 3.4.03

Application Number: 00939345.5

Publication Number: 1180265

IPC: H01J35/16, A61B6/14

Language of the proceedings: EN

Title of invention:
DENTAL X-RAY APPARATUS

Patent Proprietor:
Gendex Corporation

Opponent:
Sirona Dental Systems GmbH

Headword:

Relevant legal provisions:
EPC 1973 Art. 100(a), 100(c), 54(1), 56

Keyword:
Added subject-matter (no)
Inventive step (yes)

Decisions cited:

Catchword:

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Case Number: T 0261/11 - 3.4.03

D E C I S I O N
of Technical Board of Appeal 3.4.03
of 3 March 2015

Appellant: (Patent Proprietor)	Gendex Corporation 2099 Pennsylvania Avenue, N.W. Washington, DC 20006-1813 (US)
Representative:	Hartz, Nikolai Wächtershäuser & Hartz Patentanwaltspartnerschaft mbB Weinstrasse 8 80333 München (DE)
Appellant: (Opponent)	Sirona Dental Systems GmbH Fabrikstrasse 31 64625 Bensheim (DE)
Representative:	Sommer, Peter PRIO Patentanwälte Augustaanlage 22 68165 Mannheim (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 6 December 2010 concerning maintenance of the European Patent No. 1180265 in amended form.**

Composition of the Board:

Chairman	G. Eliasson
Members:	R. Bekkering
	T. Karamanli

Summary of Facts and Submissions

I. The appeals by the patent proprietor and the opponent are against the interlocutory decision of the opposition division to maintain the European patent no. 1 180 265 in amended form.

The opposition was filed against the patent as a whole. The grounds for opposition invoked were lack of novelty and lack of inventive step, Articles 100(a), 52(1), 54 and 56 EPC and added subject-matter, Article 100(c) EPC.

II. Reference is made to the following documents:

D1: US 4 157 476 A

D4: C. Gerthsen et al., "*Physik*", 16th edition, Springer Verlag, 1992, pages 604, 605 and 919,

D5: A. Ehrhardt et al., "*LUEGER Lexicon der Technik*", 4th edition, Deutsche Verlags-Anstalt Stuttgart, 1961, pages 788 and 789,

D8: US 4 756 014 A

D11: Hubell, J.H. and Seltzer, S.M., "*Tables of X-Ray Mass Attenuation Coefficients and Mass Energy-Absorption Coefficients*", 1989, 1990, 1996, http://wvvw.nist.gov/pml/data/xravcoef/index.cfm

D12/D12': "*Grundwissen des Ingenieurs*", 11th edition, VEB Fachbuchverlag Leipzig, 1982, Section WE, Chapter 2.3, "*Nichteisenmetalle*", pages 59-67;

Section WE, Chapter 2.3, "*Nichteisenmetalle*", pages 77-79;
Section Ch, Chapter 3, "*Anorganische Chemie*", pages 44-45, 70;
Section Ph, Chapter 4, "*Physik*", pages 41, 42

D13: Wikipedia, "*Formguss*"

D14: Datasheet relating to Plenco 1529.

III. As requested by both the patent proprietor and the opponent, oral proceedings were held before the board on 3 March 2015.

IV. The patent proprietor requested at the oral proceedings that

Main request:

the decision under appeal be set aside and the opposition be rejected,

Auxiliary request:

the appeal of the opponent be dismissed.

Moreover, the patent proprietor requested that documents D12/D12' and D13, filed after oral proceedings were arranged, not be admitted into the proceedings and, should the documents be admitted, that the case be referred back to the opposition division.

V. The opponent requested at the oral proceedings that the decision under appeal be set aside and that the patent be revoked.

VI. Claim 1 as granted reads:

"*A dental x-ray apparatus (10) having an x-ray tube (21) contained with a tubehead (11) characterized in that said tubehead (11) being formed from cast zinc or zinc alloy.*"

VII. Claim 1 as maintained in amended form in accordance with the decision under appeal reads:

"*A dental x-ray apparatus (10) having an x-ray tube (21) contained with a tubehead (11) and supported by tubehead components (20) characterized in that said tubehead (11) being formed from cast zinc or zinc alloy.*"

VIII. The patent proprietor argued in substance as follows:

The opposition division concluded incorrectly that the application as filed did not provide a basis for an x-ray tube not supported by tubehead components. The examination of Article 100(c) EPC had to be based on the content of the application as filed and not on the scope of a claim. Moreover, there was no technical difference between a claim as granted and a claim including additionally the feature that the x-ray tube was "*supported by tubehead components*", in that there were always tubehead components including highly insulating material between the housing and the x-ray tube. Accordingly, the subject-matter of the claims as granted was in line with the original content of the application as filed.

Documents D12/D12' and D13 were late-filed and not suitable to demonstrate the common general knowledge of the skilled person and should, therefore, not be admitted into the proceedings.

Moreover, the subject-matter of claim 1 as granted involved an inventive step. In the disclosure of D1 there was no basis for a change of the material of the tubehead for the sake of improving radiation shielding. Rather, the material of the cover and lower housing part were selected for reasons of reducing the weight of the components. D1 pointed specifically to aluminium as a lightweight, low-atomic number element. On the other hand, zinc seemed hardly compatible with the description of a lightweight low-atomic number element. D1 was limited to providing an additional shielding by surrounding the x-ray tube by a casing composed of resin impregnated with barium sulphate. In the light of the limitation of the disclosure of D1 with regard to any modification of the tubehead, the consideration of D8 in order to derive cast zinc as a material for the tubehead required an *ex post facto* analysis of the invention. The decision under appeal was, thus, correct in its analysis of inventive step of the present invention.

IX. The opponent submitted in substance the following:

The opposition ground based on Article 100(c) EPC prejudiced the maintenance of the patent as granted due to the omission in claim 1 of the feature "*and supported by tubehead components*" included in claim 1 as originally filed. Claim 1 as granted contained the additional information that the x-ray tube could be supported by means other than tubehead components.

According to the description, however, inside the tubehead, the x-ray tube was supported by a mechanical part known as the tube holder.

Moreover, the subject-matter of claim 1 did not involve an inventive step. Document D1 clearly taught that if minimising weight was not to be pursued, a better shielding against x-rays was achievable with other materials having a higher atomic number and weight. Document D8 taught that zinc die-casting was especially well suited for the absorption of scattered radiation. The skilled person charged with solving the problem of improving the x-ray shielding of the tubehead of D1, would in view of the teachings of D1 and D8 receive the clear hint that a tubehead made of cast zinc would provide a good shielding. The skilled person would follow this hint and arrive at an apparatus according to claim 1.

Reasons for the Decision

1. The appeal is admissible.

2. Patent proprietor's main request (patent as granted)

2.1 *Added matter (Article 100(c) EPC 1973)*

According to the opponent and as held in the decision under appeal, due to the removal of the feature "*and supported by tubehead components*" included in claim 1 as originally filed, claim 1 as granted violated

Article 123(2) EPC. Therefore, the opposition ground based on Article 100(c) EPC 1973 prejudiced the maintenance of the patent as granted.

The opponent argued that claim 1 as granted contained the additional information that the x-ray tube could be supported by means other than tubehead components. Yet, according to the description, inside the tubehead, the x-ray tube was supported by a mechanical part known as the tube holder, made out of a high-insulate and high electric tensile strength material, which performed essentially two functions:
1) to securely and precisely hold the x-ray tube in position, in relation to the surrounding construction and in particular to the output windows and the external Beam-Limiting-Device; it ensured the accurate geometrical position of the x-ray source;
2) to generate high-voltage insulation between the x-ray tube (one or more of whose electrodes were at extremely high electrical potential) and the surrounding constructive metallic parts (in particular the housing) which were grounded (cf description as filed, page 1, line 25 to page 2, line 6).
No other supporting arrangement was originally disclosed. Hence, claim 1 as granted constituted an inadmissible broadening providing the patent proprietor with an undue advantage.

As argued by the patent proprietor, however, the assessment of the admissibility of the amendment should not be based on a comparison of claim 1 as originally filed and claim 1 as granted. Rather, the admissibility of the amendment should be assessed in the light of the disclosure of the original application as a whole.

According to the decision under appeal, "*The aim of the invention is to provide a dental x-ray apparatus having improved structural and shielding components (see page 3, lines 12-13 of the original application). In the application as filed this aim is achieved by either:*
- the use of particular materials for the tubehead;
- the use of particular materials for the tubehead components; or
- a combination of both" (Reasons 13.3).

The board agrees. Indeed, the application as originally filed discloses separately,
- the fabrication of the tubehead from a cast of zinc material (cf page 1, lines 9 to 10; page 3, lines 14 to 15; page 4, line 26 to page 5, line 10), and
- the fabrication of the other components of the tubehead from a plastic material impregnated with a radiation absorber (cf page 1, lines 10 to 13; page 3, lines 16 to 21; page 5, line 11 to page 6, line 2).

Accordingly, however in contrast to what is concluded therefrom in the decision under appeal, claim 1 as granted, which is limited to the above first distinct aspect of the invention (the use of particular materials for the tubehead), does not contain subject-matter which extends beyond the content of the application as filed.

In particular, at no point the application as originally filed suggests that the other components of the tubehead (or even the fact that these are fabricated from a plastic material impregnated with a radiation absorber) would be indispensable in conjunction with the fabrication of the tubehead from a cast of zinc material for improving the shielding function.

Accordingly, in the board's judgment the ground for opposition under Article 100(c) EPC 1973 invoked by the opponent does not prejudice the maintenance of the patent as granted.

2.2 Admission of documents D12/D12', D13 and D14

Documents D12' and D13 were filed by the opponent with letter dated 27 February 2015, shortly before the oral proceedings held on 3 March 2015.

Document D12, corresponding essentially to document D12' but with poor readability, had in fact been filed somewhat earlier with letter dated 13 February 2015.

The patent proprietor argued that the documents were late filed and not relevant since not suitable as evidence for the common general knowledge of the skilled person. Accordingly, the documents should not be admitted into the proceedings.

The opponent argued that the documents were submitted in reply to issues raised by the patent proprietor in the course of the proceedings. In particular, document D12/D12' was submitted inter alia to counter the argument of the patent proprietor that cast aluminium, as used in D1 for the tubehead housing, would cause oil leakage. Document D13 was merely cited to explain certain terms (eg "*verwickelte Gussstücke*") used by the opponent and objected to by the patent proprietor as being unclear.

The board sees no reason why documents D12 and D13 should not be admitted into the proceedings. The documents are parts of common textbooks relevant to the issues to be discussed and decided in the present case.

The documents are not unduly lengthy or complex, so as to prevent one from appreciating their content, and at any rate relate to the common general knowledge of the person skilled in art working in the technical field at issue in the present case, with which the parties may safely be assumed to be familiar.

As such, documents D12/D12' and D13 do not raise issues which the board or patent proprietor cannot reasonably be expected to deal with without adjournment of the oral proceedings.

Incidentally it is noted that the argument of the patent proprietor that the documents were unsuitable to establish the common general knowledge of the skilled person as they provided selected information singled out with hindsight, is not convincing. It is not the citing of the evidence of the common general knowledge of the skilled person *per se*, or, for that matter, of the state of the art as found during the search, that should be without foreknowledge of the invention. Indeed, only with knowledge of the invention, relevant evidence can be cited. This does, however, not mean that in an obviousness argument all evidence can be pieced together at will so as to arrive at the claimed invention. Most inventions, in fact, consist of *per se* known elements. Yet, the assessment whether the claimed invention would be arrived at in an obvious manner based on the cited evidence must be devoid of hindsight.

Accordingly, documents D12/D12' and D13 are admitted into the proceedings under Article 13 RPBA.

Document D14 was filed by the patent proprietor with letter dated 2 March 2015.

The opponent did not object to its admission into the proceedings. The board sees no reason either why document D14 should not be admitted into the proceedings.

Accordingly, also document D14 is admitted into the proceedings under Article 13 RPBA.

Moreover, documents D12/D12' and D13 and their introduction into the proceedings do not raise any new issues which could justify referring the case back to the department of first instance as requested by the patent proprietor.

Accordingly, the request of the patent proprietor to refer the case back to the department of first instance should these documents be admitted, is refused.

2.3 Novelty, inventive step (Articles 100(a), 54(1), 56 EPC 1973)

2.3.1 The opponent has further opposed the patent on the ground that the subject-matter of claim 1 as granted lacks novelty and does not involve an inventive step, notably over document D1, pursuant to Article 100(a) EPC.

2.3.2 Document D1, cited in the application as filed, discloses a dental x-ray apparatus having an x-ray tube (25) contained within a tubehead (10) in accordance with the pre-characterising portion of claim 1 as granted.

The claimed apparatus differs from that disclosed in D1 in that the tubehead is formed from cast zinc or zinc alloy whereas in D1 the tubehead is made of cast aluminium (cf D1, column 3, lines 38 to 45).

Accordingly, the subject-matter of claim 1 is new over document D1 (Article 54(1) EPC 1973).

2.3.3 The patent proprietor argued that the objective problem to be solved starting from D1 would be to improve x-ray-shielding, avoid oil leakage from the tubehead and maintain mechanical stability.

In the board's view, however, avoiding oil leakage is not part of the objective problem. The objective problem to be solved relative to the closest prior art is derived from the effect which the distinguishing features of claim 1 over the closest prior art bring about. Claim 1 is silent about any oil being present in the tubehead. Moreover, even if oil is present in the tubehead it need not be contained by the tubehead housing. Hence, it is not evident that oil leakage is prevented. In fact, it is not even evident that oil leakage would occur in the tubehead of D1. In D1 the cast aluminium tubehead is filled with insulating oil, but no mention is made of any leakage. Indeed, as is generally known, cast aluminium need not be porous if appropriate measures are taken in the die casting process.

2.3.4 The opponent argued that the objective problem to be solved was to improve the x-ray shielding of the dental x-ray apparatus by improving the shielding provided by the tubehead.

According to the opponent the skilled person would learn from D1 that:

- the tubehead housing was only preferably made of cast aluminium,
- cast aluminium was mentioned as a preferred material in view of a minimisation of the weight of the apparatus, and
- it was commonly known that aluminium, like other elements with a low atomic number, provided a very low shielding against x-rays.

Accordingly, D1 clearly taught that if minimising weight was not to be pursued, a better shielding against x-rays was achievable with other materials having a higher atomic number and weight.

Document D8 concerned a dental x-ray apparatus, comprising an x-ray tube (4) and a film cassette holder (5). At least the housing half (5b) containing the secondary diaphragm was composed of zinc die-casting, which was especially well suited for the absorption of scattered radiation (column 5, lines 11 to 16).

The skilled person charged with solving the problem of improving the x-ray shielding of the tubehead of D1, would in view of the teachings of D1 concerning the material of the tubehead and of D8 concerning the good x-ray shielding properties of cast zinc, receive the clear hint that a tubehead made of cast zinc would provide a good shielding. The skilled person would, following this hint, arrive at an apparatus according to claim 1. Accordingly, the subject-matter of claim 1, having regard to the state of the art, was obvious and, thus, did not involve an inventive step in the sense of Article 56 EPC 1973.

2.3.5 As indicated in the application, the effect of the distinguishing feature over D1 is that the tubehead provides shielding against x-ray radiation (cf application, page 5, lines 1 to 4).

According to the application, other components of the tubehead such as the carrier used to support the x-ray tube are preferably fabricated from a plastic material impregnated with a radiation absorber (cf page 5, line 11 to page 6, line 2). Claim 1 indeed leaves open whether there is any shielding at the x-ray tube. The tubehead from cast zinc or zinc alloy accordingly either provides additional shielding or just shielding at a different location.

The objective technical problem to be solved starting from D1 accordingly is generally to provide alternative shielding for a tubehead.

In the board's judgment, however, the skilled person would not receive from D1 and D8 the hint that a tubehead made of cast zinc would provide good shielding. As argued by the patent proprietor, the teaching of document D1 is not to impart any shielding function to the tubehead housing (45, 46), allowing this part to be lightweight. This notably avoids the pantograph type support arm used to support the tubehead for movement with all degrees of freedom to be designed for handling unduly high weight (cf column 1, lines 17 to 38). Shielding is accomplished according to D1 by providing an x-ray tube shield casing (60) made of resin impregnated with barium sulphate.

If the skilled person were to alter the x-ray shielding properties of the tubehead of D1, be it to improve the shielding or merely to modify it, he would, following

the teaching of D1, modify the x-ray tube shield casing (60).

Document D8 would also not lead the skilled person to the solution claimed. Document D8 is not concerned with shielding of the x-ray tube. The document is in fact entirely silent about shielding of the x-ray or radiation source 4. Document D8 is mainly concerned with the film cassette holder 5. Only in passing it notes that at least the housing half 5b of the film cassette holder containing the secondary diaphragm is composed of zinc die-casting, which is especially well suited for the absorption of scattered radiation (cf column 5, lines 11 to 16). Accordingly, document D8 fails to address the objective problem to be solved which concerns the shielding of the tubehead and fails to provide any hint to replace the material of the tubehead so that it provides shielding rather than to modify the shield casing holding the x-ray tube.

In the board's judgement the skilled person, having considered the teaching of document D8, would thus not arrive at the claimed solution.

Neither would he arrive at the claimed solution based on his common general knowledge, notably that of cast zinc and zinc alloy and of general physics concerning the absorption of x-rays, as exemplified by documents D4, D5, D11, D12/D12' and D13 submitted by the opponent.

It is uncontested that the skilled person in the present case would indeed be aware of the material properties of cast zinc and zinc alloy and know that materials with higher atomic numbers provide better shielding against x-rays. Still, there is nothing

suggesting the skilled person to replace in the apparatus of D1, cast aluminium used for the tubehead by cast zinc or zinc alloy, as the teaching of D1 emphasises the need for weight reduction.

Accordingly, in the board's judgment, having regard to the state of the art, the subject-matter of claim 1 as granted is not obvious to a person skilled in the art and, therefore, involves an inventive step (Article 56 EPC 1973).

2.3.6 Therefore, the grounds for opposition under Article 100(a) EPC 1973 invoked by the opponent do not prejudice the maintenance of the patent as granted either.

3. In view of the above the auxiliary request of the patent proprietor need not be considered.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The opposition is rejected.

The Registrar: The Chairman:

S. Sánchez Chiquero G. Eliasson

Decision electronically authenticated