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D E C I S I O N
of 10 May 1995

Case Number: T 0917/91 - 3.2.2

Application Number: 85830031.2

Publication Number: 0163610

IPC: A61C 3/02

Language of the proceedings: EN

Title of invention:
Apparatus for cleaning teeth

Patentee:
Restuccia, Francesco, et al

Opponent:
ESM S.A. Electro Medical Systems

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - no"

Decisions cited:
-

Catchword:
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Case Number: T 0917/91 - 3.2.2

D E C I S I O N
of the Technical Board of Appeal 3.2.2
of 10 May 1995

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Decision under appeal: **Decision of the Opposition Division of the European Patent Office dated 7 October 1991 revoking European patent No. 0 163 610 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: H. Seidenschwarz
Members: M. Bidet
M. Aúz Castro

Summary of Facts and Submissions

I. On 23 November 1991 the patentee filed an appeal against the decision of the Opposition Division, issued on 7 October 1991 revoking European patent No. 0 163 610 because of lack of inventive step with regard to documents US-A-3 882 638 (E1) and US-A-2 814 877 (E3). The appeal fee was paid on 20 October 1991 and the statement setting out the grounds of appeal was received on 10 February 1992.

II. Oral proceedings were held on 10 May 1995 in which the Appellant presented as main request a new Claim 1 with the following wording:

"Apparatus for cleaning teeth with water, air and a dental cleaning powder comprising a barrel (1) provided with a multiple nozzle (9) able to direct against the teeth a gas-powder mixture jet and a water-jet, that the said barrel (1) comprises a hollow handgrip (2); a water supply means (12) connected at one end (42,52) to said multiple nozzle (9) and at the other end adapted to be connected to a source of pressurised water; characterised by the fact said hollow handgrip (2) being subdivided into at least a first and a second chamber (39 and 40) respectively communicating with one another through a calibrated passage hole (41); the first chamber (39) being arranged for receiving a powder charge and for mixing it with pressurised air through a duct (43,44); an air supply means (13) communicating, through a duct (45), with said first chamber (39) and with a powder percentage regulator (46) able to regulate the air delivered to said second chamber (4); and means (51,50) to connect said chambers (39,40) to said multiple nozzle (9)."

Claim 1 according to an auxiliary request filed on 6 April 1995 reads as follows:

"Apparatus for cleaning teeth, comprising a multiple nozzle for directing a jet of gas-powder mixture and a jet of water onto the teeth, as well as supply means for the gas-powder mixture and for water, a storage container that can be admitted with gas for the powder with subsequent mixing chamber for preparing the gas-powder mixture and regulating means for the gas, which is subdivided into two partial streams, one partial stream flowing through the powder storage container and the mixing chamber, while the other partial stream serves as transportation means for the gas-powder mixture leaving the mixing chamber, characterised in that the apparatus is designed as barrel (1) serving as handgrip, which is at the one end provided with the multiple nozzle (9) and at the opposite end with means (12) for supplying water being under pressure as well as with means (13) for supplying compressed air and with a lock-up fill-in aperture for the powder, that the barrel (1) is provided with cavities (39,40,47) arranged in series, which are connected with each other by means of calibrated passage holes (41,48), the cavity (39) being connected with the afore-mentioned fill-in aperture for the powder and having the function of a storage container, while the cavities (40,47) are formed as swirl chambers and the cavity (47) is connected with the multiple nozzle (9) via a flexible conduit (50); that the means (12) for the water supply are connected directly with the multiple nozzle (9) via the conduit (42) extending through the cavities (39,40,47) and via the conduit (52); that the means (13) for the supply of compressed air are connected with the conduits (43,45) extending through the barrel (1), with a T-shaped branching element (44) including a nozzle (44a) being provided between the conduits (43,45), which nozzle

discharges into the cavity (39), while the conduit (45) in the area of this cavity (39) is provided with a number of apertures (53); that the compressed air conduit (45) discharges into a regulating means (46) which is arranged in the swirl chamber (40) and is connected therewith in a communicating manner; and that this regulating means (46) enables the amount of air supplied via conduit (45) and fed into the swirl chamber (40) to be regulated by hand."

III. In his statement of grounds of appeal and in the oral proceedings the Appellant argued as follows:

Document E1 disclosed an apparatus for cleaning teeth as it was defined in the pre-characterised portion of Claim 1 according to the main request.

This known device was distinguished mainly from the apparatus according to Claim 1 in that the abrasive mixing device and the regulating and controlling means for the gas-powder mixture were separated from the handgrip. This resulted in the disadvantage that an additional operator was necessary to operate these additional and complicated regulating and controlling means, since these means needed two different control circuits and several control valves.

According to the invention, the powder receiving chamber, the swirl chamber and the control means were in the handgrip, which provided the dentist with a compact apparatus permitting its simple handling and an exact regulation of the homogeneous gas-powder mixture.

Document E3 did not relate to an apparatus of the type claimed since it only had a single nozzle delivering an air-powder mixture without water. It did not disclose a swirl chamber. The air under pressure was fed by a

conduit and entrained the abrasive powder under Venturi action into a mixing chamber. A needle valve associated with the air conduit controlled the admixture of abrasive powder and air. A manually operable valve disposed adjacent to the nozzle controlled the flow of abrasive gas from said nozzle. Therefore, this known device did not have a swirl chamber and the manually operable valve did not work as a means for regulating the amount of powder in the gas stream.

The apparatus according to Claim 1 of the auxiliary request had swirl chambers arranged in series and connected with each other by means of calibrated passage holes which permitted an increase in the flow time of the gas-powder mixture in the handgrip and homogenized still further the gas-powder mixture in said chambers. Document E1, however, did not show such a construction including a T-shaped branching element having a nozzle for conducting air into the powder receiving chamber.

There was therefore no hint leading the skilled person to modify the apparatus according to document E1 in order to provide an abrasive mixing device for the stationary air and a powder percentage regulator, these being integrated to the handgrip as defined by the independent Claims 1 of the main and auxiliary requests.

IV. The Respondent (Opponent) argued as follows:

Document E3 disclosed already the principle underlying the subject-matter of Claim 1 according to the main request, namely to provide the powder receiving chamber and mixing chamber in the handgrip of an apparatus for cleaning teeth. If the mixing of abrasive powder with gas in the mixing chamber was insufficient due to

inexact regulation, it was obvious to the person skilled in the art to use the controlling and regulating means as disclosed by document E1.

As to Claim 1 according to the auxiliary request, first it contravened Articles 84, and 123(2) EPC and secondly it contained only an agglomeration of features which did not result in surprising effects.

V. The Appellant requested that the decision under appeal be set aside and that the patent be maintained as main request on the basis of Claim 1 filed during oral proceedings and Claims 2 to 4 filed on 15 October 1992 together with the description, pages 1 to 7 and Figures 1 to 4, and by way of auxiliary request on the basis of Claims 1 and 2, the description, pages 1 to 8 and Figures 1 to 4, all filed on 6 April 1995.

The Respondent requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

2. *Amendments*

2.1 Claim 1 according to the main request contains two linguistic errors. Lines 4, 5, and 8, 9 should be read as follows:

- ... waterjet, the barrel (1) comprising a hollow handgrip (2) ...; and

- ... characterised by the fact that said hollow handgrip ...

2.2 Claim 1 of the main request is based on the combination of Claims 1 and 4 of the patent as granted. Claim 1 of the auxiliary request is based on Claims 1, 4 and 5 as well as on the drawings and the description, column 2, line 57 to column 4, line 2; or of the application as originally filed, page 4, line 25 to page 6, line 32.

2.3 The amendments of Claim 1 in its two versions therefore do not give rise to objections under Articles 123(2) or (3) EPC.

3. *Prior art*

3.1 Document E1 discloses an apparatus for cleaning teeth with water, air and dental cleaning powder, according to the preambles of Claim 1 of the main and auxiliary requests.

Furthermore, the apparatus comprises means for mixing the powder in the stream of air and a powder percentage regulator. This mixing device includes a first and second chamber communicating with one another through calibrated passage holes. The first chamber is arranged for receiving the powder charge and for mixing it with the pressurized air supplied through a duct. The air supply means communicates through a duct with the first chamber and with a powder percentage regulator comprising a valve which regulates the air delivered to the second chamber and thus the amount of powder in the air stream, whereby the powder is swirled within the second elongated chamber which results in a homogeneous gas-powder mixture. Ducts connect the chambers to the multiple nozzle. (See column 3, lines 28 to 48 and Figures 1 and 2).

The mixing device and the regulator or regulating means are not within the handgrip. Flexible ducts are provided for connecting the output port of the second chamber to the input port of the hollow handgrip for both air-powder mixture and water supply.

3.2 Document E3 relates to an apparatus for cleaning teeth with air and dental cleaning powder comprising a source of compressed gas, a tubular handgrip with an enlarged section defining a chamber for the storage of the cleaning powder, means for maintaining the cleaning powder under pressure within the first chamber; means for regulating the amount of cleaning powder withdrawn from the chamber for transportation to the nozzle. According to a first embodiment shown in Figure 1, the mixing chamber and the chamber for the cleaning powder are located within an enlarged section on the handgrip to obtain a self-contained applicator or mobil cleaning teeth apparatus. In the second embodiment according to Figure 4, the two chambers and the handgrip are spaced apart. A flexible duct connects the output of the stationary mixing device for transport of the gas-powder mixture to the handgrip.

This document does not disclose a cleaning teeth apparatus with dental-powder air mixture and water.

3.3 The other documents cited during the opposition procedure are less relevant than the two above cited documents.

4. *Novelty*

It results from the above that there is no document disclosing in combination all the features specified in Claim 1 of the main and auxiliary requests.

The subject-matter of each Claim 1 is therefore considered to be new within the meaning of Article 54(2) EPC.

5. *Inventive step*

5.1 In the apparatus known from document E1, the dentist operates the handgrip by opening a valve (pinch valve 40) in order to deliver the gas-powder mixture to the handgrip. An adjustable needle valve (41) located upstream from the mixing means (27) provides for adjustment of the quantity of powder in the gas. These valves and the mixing means are bulky and remote from the handgrip. Such an arrangement also implies that the dentist has to switch off the handgrip and to change his position if he wants to change the amount of powder in the gas by adjusting the respective valve; or, he needs an assistant doing it for him.

Therefore, the technical problem to be solved is the provision of an apparatus having the features mentioned in the preamble of the Claims 1, which is compact and simple to operate.

5.2 According to the characterising parts of the Claims 1, this is achieved by adapting the known mixing means together with the regulating means and all necessary air and water supply means to the handgrip in such a manner that these can be fitted completely into the handgrip.

5.3 As mentioned above under point 3.2, document E3 teaches the two possibilities of providing an apparatus for cleaning teeth with the means for mixing the gas with the powder and for regulating the amount of powder in the gas, namely first by the provision of said means separate from the handgrip (see Figure 4) comparable to the apparatus according to document E1, and secondly by

incorporating said means into the handgrip (see Figure 1). This second embodiment is called a "self-contained instrument" and provides an instrument of relatively simple principle, which, because of its compactness, occupies a minimum of space (see column 1, lines 40 to 44; column 2, lines 26 to 57; Claims 1 to 8).

For the person skilled in the art knowing the two embodiments of an apparatus for cleaning teeth, it is obvious to select one of these embodiments dependent on the circumstances in which this apparatus is to be used. Therefore, faced with the above mentioned technical problem (see point 5.1), the person skilled in the art will find the solution to said problem in document E3. That means that it is obvious for him to adapt the principle of the "self-contained instrument" to the apparatus known from document E1 by incorporating the mixing and regulating means in the handgrip of this apparatus. The constructional details concerning the fitting of these means into the handgrip do not lie beyond the technical ability of the skilled person.

5.4 As regards the additional features of Claim 1 according to the auxiliary request, i.e. the lock-up fill-in aperture for the powder in the barrel, three chambers arranged in series, the water supply means extending through the chambers, the air-supply by means of a T-shaped branching element and of apertures in the powder storage chamber, these additional features represent an agglomeration of features which cannot establish an inventive step,

- since it is obvious to the skilled person to provide the powder storage chamber with a lock-up fill-in aperture and to fit the water supply means into the handgrip for ease of manipulation and,

- since the additional chamber arranged in series with first and second chambers concerns no more than the production of a homogeneous gas powder mixture to be discharged from the nozzle, and the T-shaped branching element and the aperture of the air supply means, which are used to produce the gas powder mixture, do not provide the device according to Claim 1 of the main request with any additional effect which could be considered by the skilled person in the art as surprising.

6. For the above reasons, the subject-matter of Claim 1 according to the main and auxiliary requests does not involve an inventive step as required by Article 56 EPC.

7. Therefore the patent in suit cannot be maintained.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

S. Fabiani H. Seidenschwarz