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Bezeichnung der Erfindung:
Title of invention:
Titre de l'invention : A liquid separating and evacuating device for fluid suction equipment and, in particular, for dental surgery equipment.

Klassifikation / Classification / Classement : A61C 17/04

ENTSCHEIDUNG / DECISION

vom / of / du 10 November 1989

Anmelder / Applicant / Demandeur :

Patentinhaber / Proprietor of the patent / Titulaire du brevet : Officine Augusto CATTANI & C.S.p.A.

Einsprechender / Opponent / Opposant : Dürr-Dental GmbH & Co. KG

Stichwort / Headword / Référence :

EPÜ / EPC / CBE Article 56 EPC

Schlagwort / Keyword / Mot clé : "inventive step - yes";
"the closest prior art has to be a specific, well-defined and workable device and cannot be the result of a combination of unspecified and undisclosed possibilites";
"general objective problem not directed to particular deficiencies";
"a skilled person, in particular a competitor, is able to achieve technical improvements in observing the known techniques in a rather critical attitude";
"general objective problem without definite elements determining an obvious solution".

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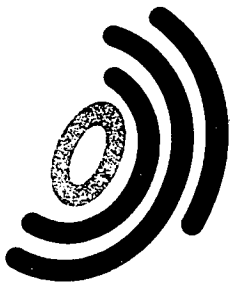

Case Number : T 276/86 - 3.2.2

D E C I S I O N
of the Technical Board of Appeal 3.2.2
of 10 November 1989

Appellant : (Opponent)
Dürr-Dental GmbH & Co. KG
Höpfigheimer Straße 17
Postfach 305
D-7120 Bietigheim (DE)

Representative :
Dipl.-Ing. G. Utermann
Kilianstraße 7 (Kilianspassage)
Postfach 3525
D-7100 Heilbronn (DE)

Respondent : (Proprietor of the patent)
Officine Augusto Cattani & C.S.p.A.
Via Mantova 90/A
43100 Parma (IT)

Representative :
M. Bonfreschi
Bugnion S.p.A.
Viale Trento Trieste 25
41100 Modena (IT)

Decision under appeal :
Decision of the Opposition Division of the European Patent Office dated 4 March 1986 rejecting the opposition filed against European patent No. 13667 pursuant to Article 102(2) EPC.

Composition of the Board :

Chairman : K. Stamm
Members : C. Andries
W. Moser

Summary of Facts and Submissions

I. European patent No. 0 013 667, comprising four claims was granted to the Respondent on 8 June 1983 in response to European patent application No. 80 830 001.6 filed on 11 January 1980.

Claim 1 reads as follows:

"Liquid separating and evacuating device for fluid suction equipment and, in particular, for dental surgery equipment, comprising:

- a first chamber (5) into which extracted fluid arrives, designed to bring about separation of the liquid and air constituting said fluid and kept at lower than atmospheric pressure throughout operation of the device;

- a second chamber (6) positioned beneath said first chamber (5);

- a pneumatic valve (24) whose obturation means consists of a diaphragm (25) actuated by a pneumatic distributor (20) tripped by the level of liquid present within the first chamber (5), which pneumatic valve (24) in a first position (A) of the diaphragm (25) places the second chamber (6) in communication with the atmosphere via an external channel (27), thereby creating a pressure level within said second chamber (6) which is substantially identical to that of the atmosphere when the level of liquid in said first chamber (5) is lower than a pre-set value (fig. 4);

- two chamber-bottom valve means (16, 18), an upper one (16) of which is designed for alternate admission and prevention of passage of liquid from said first chamber (5) to said second chamber (6), and the lower one (18) of which is designed for alternate admission and prevention of passage of liquid out of said second chamber (6), the lower chamber-bottom valve means (18) being arranged in such a way that passage of liquid out of said second chamber (6) is allowed only on the condition that the pressure therein approximates to that of the atmosphere (fig. 4) and is prevented on the condition that the pressure in said first (5) and second (6) chambers is approximately equal (fig. 3), characterised

- in that said pneumatic valve (24) in a second position (B) of the diaphragm (25) places the second chamber (6) in communication with the first chamber (5) via the external channel (27), thereby creating a pressure level within said second chamber (6) which is substantially identical to that of said first chamber (5) when the level of liquid therein is above said pre-set value (fig. 3),

- and in that the upper chamber-bottom valve means (16) is arranged in such a way that passage of liquid from the first (5) to the second (6) chamber is allowed only on the condition that the pressure in the two chambers (5, 6) is approximately equal (fig. 3) and prevented on the condition that the pressure in the second chamber (6) approximates to that of the atmosphere (fig. 4)."

II. The Appellant filed an opposition against the European patent and requested the revocation of the patent on the grounds that its subject-matter was not patentable (Articles 52 to 57 EPC) mainly in the light of document DE-A-2 713 321 (D1).

III. By its decision, dated 4 March 1986 and dispatched 13 May 1986, the Opposition Division rejected the opposition.

IV. The Appellant lodged an appeal against the decision on 10 July 1986, paying the appeal fee on the same date. The Statement of Grounds was submitted on 13 September 1986.

During the proceedings, the Appellant raised the following objections:

- the subject-matter of Claim 1 would not be novel and would not involve an inventive step, since the small differences existing between the subject-matter of Claim 1 on the one hand and the device according to document D1 on the other are obvious for a person skilled in the art;

- that it would be obvious for a skilled person to use the external channel 141 in the device according to document D1 to connect the second chamber 130 not only with the atmosphere but also with the first chamber 72;

- that the wording of Claim 1 would not be properly limited with respect to the device according to document D1;

- that the bottom valves 132 and 155 according to document D1 would not require a mechanical actuation;

- that bottom valve 132 according to document D1 would be comparable with valve 24 of the device according to the patent in suit, since both valves are used for pressure-equalisation purposes;

- that a valve which functions as valve 16 of the device according to the patent in suit would be known from

DE-A-2 459 881 (D2; valve 18); and that it would be obvious to use such a valve in a device according to document D1 since that valve opens after pressure-equalisation has taken place,

- that pressure-equalisation as applied in the patent in suit would be commonly known and would therefore be obvious to apply, particularly since that method would be one of only two possible pressure-equalising solutions;

- that the function of the features present in the characterising portion of Claim 1 of the patent in suit would be the same as described in document D1;

- that the features present in the characterising portion of Claim 1 would have no link with the pretended avoidance of foaming or frothing;

- that foaming or frothing would be no relevant technical problem in a device according to document D1;

- that there would be no technical problem to be solved in the patent in suit.

V. The Respondent contested the above arguments and argued that the subject-matter of Claim 1 would be patentable within the meaning of Article 52(1) EPC.

VI. The Appellant requested that the decision under appeal should be set aside and the patent should be revoked.

The Respondent requested the dismissal of the appeal and that the Appellant should be ordered to reimburse the Respondent for all costs incurred during the appeal proceedings.

Reasons for the Decision

1. The appeal is admissible.

2. **Clarity and the two-part form of Claim 1**

Lack of clarity of Claim 1 and an allegedly incorrect two-part form of Claim 1 constitute no grounds for opposition as defined in Article 100 EPC. By virtue of Rule 66(1) EPC, these grounds are irrelevant in the appeals procedure as well (cf. two-part form: T 99/85, OJ EPO, 1987, 413).

Despite this, the Board would like to remark that Claim 1 is clear for a man skilled in the art. Indeed, the Board agrees with the Respondent that the embodiment shown in Figures 1 to 4 of the patent in suit has to be considered as a preferred embodiment and not as a limitative embodiment (description: column 3, lines 55 to 61) and that it is therefore clear to a person skilled in the art that the so-called second chamber can be vented to atmosphere either by a direct or by an indirect passage as implicitly defined by the wording of Claim 1.

The expressions "valve in a first position of the diaphragm places the second chamber in communication with the atmosphere via an external channel" and "valve in a second position of the diaphragm places the second chamber in communication with the first chamber via the external channel" only mean that the valve with its diaphragm having two working positions is able to control the communication of the second chamber via said external channel with either the atmosphere or the first chamber. It is up to a design engineer to construct an appropriate switching.

In the light of the description it is also clear that the wording of Claim 1 describes the functioning of the valves during operation of the fluid suction equipment.

3. **Novelty**

None of the documents cited in the proceedings discloses a liquid separating and evacuating device having one pneumatic valve which - in addition to its first function, namely of placing, in a first position of its diaphragm, the second chamber in communication with the atmosphere via the external channel - has the function of connecting in a second position of the same diaphragm, the second chamber with the first chamber via the external pipe, thus equalising the pressures of the two chambers.

3.1 Document D1 discloses a pneumatic (142) or an electro-magnetic (282, 325) valve which can connect the second chamber (130) with the atmosphere. These valves however do not, in a second position of a diaphragm (if at all present, see for example valves 282 and 325) of that valve, connect the second chamber (130) with the first chamber (72, 109) via an external channel which has already been used to enable the first connection. Such a functioning is neither explicitly nor implicitly disclosed in document D1. Equalisation of the pressures of the two chambers in a device according to document D1 is achieved by slots in the diaphragm of another (different) valve, located between these two chambers, when that valve is for its part actuated in a direction to be opened.

3.2 Document D2 does not come closer to the subject-matter of Claim 1.

3.3 The subject-matter of Claim 1 therefore is novel within the meaning of Article 54 EPC.

4. **Closest state of the art**

4.1 The patent relates to a liquid separating and evacuating device according to the pre-characterising portion of Claim 1. Such a device is known from document D1.

4.2 In order to be able to assess an inventive step, the nature of the problem should be determined on the basis of objective criteria, i.e. by starting from the closest prior art (cf. Decision T 24/81, OJ EPO, 1983, 133). In the present case, such a prior art has to be a specific, well-defined and workable device, known before the priority date of the patent in suit, and cannot be, as has been suggested by the Appellant, a state of the art which results of a combination of unspecified and undisclosed possibilities and which therefore seems to be rather the result of an ex post facto analysis.

Therefore, the specific device as shown in Figures 1 to 16 of document D1 has been taken by the Board as the starting point. It is true that the wording of Claim 1 of that document has a more general content (e.g. no second chamber, no specific indication of the actuation of the valves), but it is however not possible to find in the disclosure of that document, either explicitly or implicitly, indications towards features (actuation of the bottom valves, bottom valve construction), which allow a combination of these features which comes closer to the device according to Claim 1 of the patent in suit than the device according to Figures 1 to 16 of document D1. For example, although it is correct to state that the bottom valves can be actuated pneumatically or otherwise (Claims 45 to 47), it is clear for a person skilled in the art, from the whole content of document D1, that the indicated actuation is the forced actuation of the tappet 150 connected to both bottom valves. There is no

disclosure at all in document D1 that the bottom valves could be self-actuating (without any additional actuating means).

4.3 Document D1 discloses not only the presence of a first and a second chamber and two chamber-bottom valve means, but also the presence of a pneumatic valve (142) comprising a pneumatically actuated diaphragm (190) which in a first position (Figure 2) places the second chamber (130) in communication with the atmosphere via an external channel (141). In its other position (Figure 3), the diaphragm only closes that communication, so that no additional communication (second to first chamber) is provided by said pneumatic valve.

Alternatives to said pneumatic valve (142) are also disclosed in document D1. Although these alternative valves (Figures 17 and 18: valve 282; Figure 19: valve 325) enable the second chamber to be connected with the atmosphere, document D1 does disclose neither that these valves comprise a diaphragm, nor that these valves are intended to open or close the communication between the second chamber and the first chamber.

It is also indicated in document D1 that the upper valve (132) is opened by force (mechanically, electro-mechanically, electro-magnetically or pneumatically; page 26, third paragraph; Claims 45 to 47), so that a pressure equalisation between the chambers (130; 72, 109) is only obtained during the forced opening movement of the upper valve, and not before the opening of that valve. Opening of the upper valve is started even though atmospheric pressure is still present in the second (lower) chamber (page 39, lines 9 to 14; and page 48, line 23 to page 49, line 13) so that it cannot be said within the meaning of the patent in suit that the passage of liquid from the first to the

second chamber is prevented on the condition that the pressure in the second chamber is the atmospheric pressure, particularly since no indication in the disclosure of document D1 suggests another possibility for the opening of that upper valve.

4.4 In accordance with the teaching of document D1, its device has to be constructed in such a manner that a steady movement of the fluid stream through the device should be maintained, by adapting all internal parts of the device which are in contact with the liquid to be evacuated (Claim 1; page 18, line 17 to page 19, line 7; page 50, lines 24 to 31).

Furthermore, the actuation of both bottom valve means (132, 155) is obtained via the tappet (150), which is movable within a tube (105) connected to a float (115). During the opening of the upper bottom valve (132) a pressure-equalisation takes place through the valve between the atmosphere pressure below that valve and a pressure lower than atmospheric above the valve.

According to the description of the patent in suit, the device according to document D1 is complex in construction and therefore expensive to manufacture.

Complexity of the device in constructional terms means according to the description of the patent in suit that it is difficult to keep it clean and to service it.

Furthermore, it is indicated that it is possible that frothing or foaming may occur following said particular pressure-equalisation.

5. **Problem and Solution**

5.1 An objective assessment of what is actually achieved over the prior art allows the problem to be formulated as to obtain a reliable device which is simple and economical both in terms of construction and servicing.

The Board cannot agree, therefore, with the argument of the Appellant that no technical problem to be solved is disclosed in the patent in suit, since even a simple problem (avoid complexity), be it known or unknown, has to be considered as a problem to be solved. The objection that the problem underlying the invention is already solved by the cited prior art is of no importance in view of the patentability of the subject-matter of Claim 1, because the problem to be solved need not be new and inventive. Consequently, another new and inventive solution of a known problem can be patentable too.

5.2 The Board is satisfied that the above mentioned problem is solved by the features of Claim 1, in particular by those of the characterising portion of Claim 1. Indeed, due to the claimed connecting possibilities of the pneumatic valve (24), the chamber bottom-valves do not need a complex valve actuation means any more. Since the pressures in the two chambers are equal before opening of the connecting valve, and since the air present in the second chamber is not necessarily forced to pass through the liquid during the opening of bottom-valve 16, but can pass, if required, from the second (lower) into the first (upper) chamber via the external channel, the result of gurgles of air entering through the upper chamber bottom valve being thereby avoided.

5.3 The **objective problem** to be solved - i.e. structural and functional simplicity, good conditions for cleaning of the

device, or general improvements - does not go beyond the usual design requirements. In such a general form no hints are comprised relative to special deficiencies. Specific deficiencies oblige the skilled person to investigate their causes. The comprehension of the involved facts can lead to appropriate means available to the repertoire of the skilled person: it could be possible that he disposes of definite elements directed to an obvious solution.

As such a specific deficiency the Respondent alleged the occurrence of unfavourable foaming or frothing during the opening of the valve. The Appellant, however, has consistently emphasised that, in reality, such a deficiency would not occur or, if at all, its extent would be completely irrelevant.

The Board is of the opinion that these statements of the Appellant, being the specialist who produces the prior art device and who furthermore offered, during the opposition proceedings, to prove by means of a demonstration the non-existence of that foaming effect, are credible. If, however, the skilled man did not at all realise that such a deficiency existed, then it follows that overcoming such a deficiency could not form part of the problem to be solved and that it therefore could not comprise obvious elements of a solution which were determined by that problem.

6. **Inventive step**

6.1 A person skilled in the art, starting from a device according to document D1, who would try to obtain a reliable device which is simple and economical both in terms of construction and servicing, could not find, however, an indication or an encouragement in the cited documents to use the features according to Claim 1.

An object of the subject-matter according to document D1 was to provide a device which could be used all day (page 17, line 10 up to the end; page 50, lines 24 to 31) without having to fear that a culture medium for germs is created.

In view of obtaining that object, a lot of features, among others, the peculiar form of valve 132 (page 50, lines 14 to 19; page 39, lines 14 to 16; page 24, lines 13 to 27; and page 18, lines 17 to 30) can be used. Indeed, Claim 1 of document D1 indicates in a general wording firstly that all features, included in its Claim 1, form a closed entity; and secondly that all surfaces which come into contact with the fluid have means to maintain a steady movement of the separated fluid through the apparatus. The description of document D1 (page 18, lines 17 to 30) reveals to a person skilled in the art that the indicated surfaces include the valve-surfaces which by their form, their movement and possibly by the material to be found at their surface should avoid the deposition of particles on their surfaces. The description, however, only discloses one specific valve construction (Figures 15 and 16) without any other suggestion for another construction so that the Board considers the movement of the valve diaphragm (161), which can only be obtained owing to the pressure difference existing between the two chambers (72 to 130), as an essential feature for a proper functioning of the device according to document D1, which provides the device with a self-cleaning valve.

Since it is the object of the patent in suit not only to avoid the complexity of the constructional aspect of the apparatus as such, but also the difficulties of the various parts of the apparatus of keeping themselves clean, a person skilled in the art is not led by document D1 to modify the functioning of the valve (132) which is linked

to the existence of a pressure difference between the chambers, because of the inherent risk of creating thereby a culture medium for germs.

Indeed, having regard to the jurisprudence of the Boards of Appeal (cf. T 02/83, OJ EPO, 1984, 265), the question to be answered when assessing an inventive step in the present case is whether a person skilled in the art would have considered the claimed features in the expectation of some improvement or advantage in respect of the closest prior art represented by document D1. In the present case, a skilled person is confronted with a valve which, due to the existing pressure difference during its opening, is self-cleaning, so that he will be very reluctant to modify that valve as regards its self-cleaning aspect, since he could not expect a further improvement there.

Therefore, the argument put forward by the Appellant, according to which pressure equalisation before opening a connecting valve is commonly known and has to be considered as an alternative for the used pressure equalisation, is not sufficient to lead a skilled person to the claimed invention.

Contrary to the opinion expressed by the Appellant, a person skilled in the art was rather led away from another pressure-equalisation method (for example: using the external channel as suggested by the Appellant) by the teaching of document D1, since the self-cleaning aspect of the bottom-valve required the presence of a pressure difference before and during opening the bottom-valve (cf. 6.2).

According to the Board's opinion, to suggest the use of another pressure-equalisation method via the external channel constitutes therefore the result of an ex-post-

facto analysis. Indeed, such a system, as suggested by the Appellant, which is neither explicitly nor implicitly disclosed in document D1, eliminates the pressure difference required for the self-cleaning function of the valve according to document D1.

6.2 Document D1, as follows from the above, does not present any suggestions directed to a solution according to the contested claim. The Board, however, is not of the opinion that a person skilled in the art would only come to solutions in line with suggestions presented in known documents. A skilled person, in particular a competitor, is also able to achieve technical improvements in observing the known techniques -which he tries to attack - in a rather critical attitude.

It has to be examined, therefore, whether the contested improvement would have been accessible to a **skilled competitor** only as a result of a critical analysis and calling a known device in question.

In the present case, even assumed that the skilled man would have watched more closely the special functions and rather complex structure of valve 132, it seems highly indefinite what possible results he then might have found. At first, he would have to start with the given functional and structural complexity of the known valve. Improvements by means of **obvious deviations** might consist in amendments of the used material or in optimizing the used shapes.

The recognition, however, that the beginning of the opening of the valve would be feasible without the difference in pressure of the adjoining chambers - which knowledge might be regarded as a first step directed to the contested invention - would already comprise a **far reaching deviation** with regard to the given functional relationships in the

known device. Such a perception would imply a selection under the totality of the numerous structural and functional relations, and would also imply isolating essential parts of the known device from their given conditions (such as requirement of pressure difference for actuating the valve, for the functioning of it and for providing self-cleaning properties).

Thus, such a recognition would, in the view of the Board, already involve an imagination beyond the usual practice of a skilled person. But even after such a cognition could have been found, the skilled person would find himself anew in front of an indefinite multitude of structural and functional possibilities when he envisages the ways of how to prevent such a pressure difference as well as the implied design consequences.

The Board is, therefore, of the opinion that the known device according to D1 could not lead the person skilled in the art in a definite and thus obvious manner to the very solution defined in Claim 1.

6.3 Document D2 describes a liquid separating and evacuating device comprising one chamber (5) having a bottom-valve (18) which is moved to its open and closed position by the existing pressure above and below the valve. The pressure in the chamber, above the bottom valve is controlled by simple floating means (19), which open or close the suction tube (11, 13), so that a pneumatic valve allowing two different communications in the meaning of the patent in suit is not disclosed by this document.

6.4 Taking the above considerations into account, the Board comes to the conclusion that the subject-matter of Claim 1 defines an invention which - if an analysis ex post is to be avoided - was not determined to a person skilled in the

art only by the problem and the cited documents, even in combination, and, therefore, is considered as involving an inventive step in the sense of Article 56 EPC.

7. The subject-matter of Claim 1 therefore is patentable within the meaning of Article 52 EPC.

8. Article 104(1) EPC provides that each party to proceedings bears his own costs. Any departure from this principle requires special circumstances such as improper behaviour which makes it equitable to award costs against one of the parties. As a rule, such circumstances arise from a party's conduct in proceedings. In the present case, the Appellant has merely rediscussed his case before the Board of Appeal, which is his legal right. Therefore, the Board sees no reason to award the costs of the appeal against the Appellant at the request of the Respondent.

Order

For these reasons, it is decided that:

1. The appeal is dismissed.

2. The request that costs be awarded against the Appellant is refused.

The Registrar: The Chairman:

S. Fabiani K. Stamm

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W. Moser