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Datasheet for the decision of 15 May 2007

Case Number: T 0741/05 - 3.2.04

Application Number: 97109427.1

Publication Number: 0836008

IPC: F04D 19/04

Language of the proceedings: EN

Title of invention:
A vacuum pumping device

Patentee:
VARIAN S.p.A.

Opponent:
Pfeiffer Vacuum GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 100 (a)

Keyword:
"Inventive step (no)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0741/05 - 3.2.04

D E C I S I O N
of the Technical Board of Appeal 3.2.04
of 15 May 2007

Appellant: (Opponent)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 18 April 2005 rejecting the opposition filed against European Patent No. 0836008 pursuant to Article 102(2) EPC.

Composition of the Board:

Chairman: M. Ceyte
Members: C. Scheibling
C. Heath

Summary of Facts and Submissions

I. By its decision dated 18 April 2005 the Opposition Division rejected the opposition. On 8 June 2005 the Appellant (opponent) filed an appeal and paid the appeal fee simultaneously. The statement setting out the grounds of appeal was received on 17 June 2005.

II. The patent was opposed on the grounds based on Article 100(a) EPC (lack of inventive step).

III. The following documents played a role in the present proceedings:

E1: EP-B-0 597 365
E3: DE-U-94 17 422

IV. Claims 1 as granted reads as follows:

"1. A vacuum pumping device comprising:
- a vacuum pump (100; 100'; 100'') having a casing (101; 101'; 101'') provided with a suction port (119) and an exhaust port (120), in said casing there being defined
i) a first portion (102; 102'; 102''), housing the gas pumping stages formed by rotor disks (113, 114) secured to a pump rotatable shaft (123), and stator rings (115, 116) secured to said vacuum pump casing and cooperating with said rotor disks (113, 114), and
ii) a second portion (103; 103'; 103''), housing the electric motor (121; 121'') of said vacuum pump and at least one bearing (122) supporting the rotatable shaft (123) of the vacuum pump;

- an electronic control unit (1) comprising a housing (2; 2'; 2'') defining an inner space (17; 17'; 17'') containing the electronic components of an electronic circuit feeding the electric motor (121; 121'') of said vacuum pump,
characterized in that at least said second portion (103; 103'; 103'') of said vacuum pump casing is located within said inner space (17; 17'; 17'') containing the electronic components of said electronic feeding circuit."

V. Oral proceedings before the Board took place on 15 May 2007.

The Appellant (opponent) requested that the decision under appeal be set aside and that the patent be revoked.

It mainly argued as follows:
E1 discloses a vacuum pump comprising a pump casing with a first part housing the pump stages, a second part housing the motor and the electronic control unit and a cover providing access to the second part. The problem to be solved by the patent in suit with respect to E1 is to provide better access to the electronic components. It would be obvious for a skilled person to provide the pump casing with a cup like shaped cover able to house the electronic components and to shift the plane of separation between the cover and the second part in the direction of the first part of the casing such that when the cover is removed from the second part the electronic components remain inside the cover. Such arrangement would also have the advantage that the pump casing

remains under vacuum when removing the electronic components. This arrangement is also rendered obvious by E3, which teaches to provide the electronic components on a circuit board accommodated in a casing that partly houses the motor and in which the electronic components can be accessed and removed without losing the gas tightness of the pump.

The Respondent (patentee) countered the Appellant's arguments and mainly argued as follows:
E1 discloses a vacuum pump casing in which the electronic components are located. This citation thus does not disclose a vacuum pump having its own casing which is separate from the housing of the electronic components. In E3, the electronic components are also accommodated in the pump casing. Thus neither E1 nor E3 discloses an arrangement in which the vacuum pump has its own casing and the control unit its own separate and independent housing, the housing of the control unit being shaped so as to accommodate a portion of the vacuum pump casing.

The Respondent requested that the appeal be dismissed and that the patent be maintained as granted.

Reasons for the Decision

1. The appeal is admissible.

2. *Inventive step:*

2.1 Interpretation of claim 1:

Claim 1 requires that there is a second portion of the pump casing "housing the electric motor". Since claim 1 has to be construed as covering all embodiments of the invention, including the embodiments according to figures 12 to 15 in which only the rotor is housed in the second portion of the pump casing, the Board sees no reason to depart from the interpretation given by the Respondent that in the context of the patent in suit "housing the electric motor" has to be construed as meaning "housing at least the rotor of the electric motor".

2.2 It was agreed by the Opposition division and the Respondent (patent proprietor) that E1 represents the closest prior art. E3 which refers to a vacuum pumping device is to be considered as a less promising starting point since it does not disclose an electronic control unit within the meaning of the invention.

2.3 E1 discloses in essence a two-part vacuum pump casing, with an upper part housing the vacuum pump and removable lower part housing the electric motor and the electronic control unit.
The removable part defines a substantially cylindrical casing whose inner space accommodates the electronic control unit. The electric motor is accommodated in a central cup shaped housing protruding into the inner space of the removable part. The stator of the electric motor is secured to the cup shaped housing, so that when taking the removable part away, the stator of the electric motor remains inside its cup

shaped housing. As seen in Figure 2 of E1 the cylindrical housing of the removable part is provided at its bottom which a disc shaped cover which can be removed to give access to the electronic components.

According to the patent proprietor's submission, the device of E1 suffers from the drawback that when the removable part containing the electronic control unit and the electric motor is taken away, the pump casing is no longer vacuum tight.

According to the patent specification, the problem to be solved by the invention is "to realise a vacuum pumping device that is compact and of small size".

However, this problem has already been solved by the vacuum pumping device of E1 so that the problem underlying the present invention should be redefined.

2.4 Thus starting from E1 as closest prior art the technical problem to be solved by the present invention may be seen in providing a vacuum pumping device of the kind disclosed in E1 which does not present the above drawback while being compact and of small size.

This technical problem is in essence solved by providing the electronic unit with its own housing, the second portion of the vacuum pump casing, which accommodates the electric motor and at least one bearing of the vacuum pump being located within said housing.

2.5 E3 discloses a two-part vacuum pump casing with a first portion 4 and a second portion or chassis 5. The first portion of the casing accommodates the pump and the second portion or chassis the motor, a bearing of the pump as well as a circuit board for motor control ("Platine für die Motorsteuerung"). The rotor of the electric motor is located in a vacuum tight space formed by the chassis and a cylindrical sleeve 21. This cylindrical sleeve 21 thus separates the rotor from the stator which is arranged outside the vacuum tight space but within the inner space provided in the chassis 5. The inner space which is not under vacuum houses not only the stator of the electric motor but also the circuit board for the motor control. A disc shaped cover 16 closes this inner space within the chassis. E3 addresses the problem of compact design (page 1, third paragraph).

2.6 The skilled person in the art of vacuum pumping devices would see from E3 that the problem of removing the electronic components without dismantling the vacuum pump casing would be solved by integrating the rotor of the electric motor and a bearing of the vacuum pump in a cup shaped housing forming the second portion of the vacuum pump casing, while accommodating the electronic components outside the vacuum pump casing into a housing closed by a cover. Accordingly the skilled person would infer from E3 the advantage of opening the housing of the electronic components e.g. to take them away while maintaining the vacuum tight condition in the inner space of the vacuum pump casing.

2.7 For the skilled person faced with the above problem, it would be obvious with the aid of the teaching of E3 to separate in E1 the cup shaped casing containing the electric motor from the removable part and to secure it in a vacuum tight manner to the first portion of the vacuum pump casing, the removable part containing the electronic control unit thus forming a separate housing which could be removed without dismantling the vacuum pump casing and thus maintaining it vacuum tight. The location of a bearing in the cup shaped casing housing the electric motor, which is suggested by E3 (Figure 1) is merely a matter of design convenience which does not imply any inventive skill.

The Respondent argued that a skilled person would reject such design because of the wires extending from the pump casing into the removable housing of the electronic control circuit. However, in the embodiment according to Figure 8 of the patent in suit, there are also wires (60) extending from the pump casing into the housing of the electronic control circuit. Thus, this embodiment shows that the sole presence of wires is not a hindrance that could prevent a skilled person from selecting such a design.

The Respondent further submitted that neither E1 nor E3 discloses an arrangement in which the vacuum pump has its own casing and the control unit its own separate independent housing. Therefore the device claimed in claim 1 could not be obvious over any combination of E1 and E3. However, as has been explained, the electronic components in E3 are located in a separate inner space and thus can be removed while maintaining the vacuum tight conditions in the

vacuum pump casing. In E1 the electronic components are located inside a removable housing. The skilled person has a clear incentive from E3 to design the removable housing of E1 in such a way that when taking it away, the vacuum pump casing is not dismantled and remains vacuum tight. Nothing was submitted from which the Board could reasonably conclude that difficulties encountered in doing so were not surmountable by routine work and without inventive ingenuity.

2.8 Consequently, the subject-matter of claim 1 does not involve an inventive step.

3. *Apportionment of costs:*

Since the Board did not introduce the late filed documents D9 and D10 into the proceedings, it is not necessary to decide upon the respective conditional request of the Respondent for apportionment of costs.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The registrar: The Chairman:

V. Commare M. Ceyte