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Datasheet for the decision of 21 May 2007

Case Number: T 0382/04 - 3.2.04

Application Number: 96927472.9

Publication Number: 0852671

IPC: F02M 25/07

Language of the proceedings: EN

Title of invention:
Electrical connection between closure cap and internal actuator of an electrically actuated valve

Applicant:
Siemens VDO Automotive Inc., et al

Opponent:
PIERBURG GMBH

Headword:
-

Relevant legal provisions:
EPC Art. 52(1), 56, 100(a), 114(2)
EPC R. 71(2)

Keyword:
"Inventive step (no)"
"Late submitted material - document (admitted)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0382/04 - 3.2.04

D E C I S I O N
of the Technical Board of Appeal 3.2.04
of 21 May 2007

Appellant: (Opponent)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 19 January 2004 rejecting the opposition filed against European patent No. 0852671 pursuant to Article 102(2) EPC.

Composition of the Board:

Chairman: M. Ceyte
Members: A. De Vries
T. Bokor

Summary of Facts and Submissions

I. The Appellant (Opponent) lodged an appeal against the Opposition Division's decision of 19 January 2004 to reject the opposition.

Opposition was filed against the patent as a whole and based on Article 100(a) together with Articles 52(1) and 56 EPC for lack of inventive step.

The Opposition Division held that the grounds for opposition mentioned in Article 100 EPC did not prejudice the maintenance of the patent as granted, having regard to the following documents among others:
D1 = DE-C2-37 25 980
D3 = DE-A1-40 00 436
D4 = "Automachine and General Products", Sales brochure of AMP, dated 10/93, pp 14-1 to 14-7

II. The Appellant (Opponent) requested that the decision under appeal be set aside and the patent be revoked in its entirety. In the statement of the grounds of appeal the following document was cited in support:

D6 = DE-A1-26 09 381.

The Respondent (Proprietor) requested that the appeal be dismissed, and that document D6 not be admitted into the proceedings.

Both parties requested as an auxiliary request oral proceedings.

III. Oral proceedings were duly held before this Board on 21 May 2007. Though duly summoned the Respondent by fax of 14 May 2007 declined to attend and was not represented at the oral proceedings. According to the provisions of Rule 71(2) EPC the oral proceedings were continued without him.

IV. The wording of the sole independent claim as granted is as follows:

"1. An electrically actuated valve (20) comprising valve body structure (24) containing a valve mechanism (44, 46) and an electric actuator (70) for operating said valve mechanism (44, 46) said valve body structure comprising at least one electric terminal (T) that provides for electrically connecting said electric actuator (70) to an external control, said at least one terminal (T) having one end portion that terminates at the exterior of said valve body structure (24), wherein said at least one electric terminal (T) is mounted on a body member (26) that mounts on said valve body structure (24), said at least one terminal (T) has an opposite end portion that is disposed within said valve body structure (24) when said body member (26) is mounted thereon, said electric actuator (70) comprising at least one electric terminal (98) for mating with a respective one of said at least one terminal (T) on said body member (26) when said body member (26) is mounted on said valve body structure (24), characterised in that the mating of said at least one terminal (T) on said body member (26) with a respective at least one terminal (98) of said electric actuator (70) comprises a flat blade (98a) that is resiliently flexed and that has a thickness that is less than the

thickness of an immediately adjoining portion of said blade (98a)".

V. The Appellant argued as follows:

With respect to the closest prior art of D1 the only differences reside in the final two features (denoted as (b) and (c)) that the blade is resiliently flexed and has different thickness portions. Feature (b) cannot refer to the mounted condition as there is no such disclosure in figures or drawings, but refers rather to the functioning of the thinner blade during assembly. As such it is interpreted as the blade being "resiliently flexible", i.e. as a relative term unsuitable for limiting the claim's scope. Confronted with the problem of manufacturing a blade with the right resiliency characteristics the skilled person would as a matter of course apply the teaching of D6 that resiliency can be determined with a desired accuracy by reducing its thickness. D6 is filed only in the appeal stage as it is highly relevant to an important point in the reasoning first raised in the decision.

VI. The Respondent argued as follows:

The Appellant has not shown that the feature of a flat blade (feature (a)) is anticipated. As for feature (b) this must be considered independently of (c). Moreover, it is to be construed purposely and reasonably and as such is sufficiently clear, as is for example the term "spring".

D6 is cited at a very late stage (in opposition appeal) and should not be allowed into the procedure in accordance with long established jurisprudence.

In any case D6 is a specialist patent document which relates to a terminal with two tongues that are not necessarily flat.

Reasons for the Decision

1. The appeal complies with Articles 106 to 108 and Rule 64 EPC and is therefore admissible.

2. *Document D6*

D6 was submitted with the statement setting out the grounds of appeal, and thus well after the expiry of the nine-month period under Article 99(1) EPC. Though late-filed, its subject-matter is not complex, and has indeed already been discussed by the respondent. Nor will its admission occasion serious procedural complications or delays. More particularly however, the Board considers this document, in the light of the discussions before it, to be relevant to the issue of inventive step. The Board therefore decides to admit the document into the procedure using its discretion under Article 114(2) EPC.

3. *Inventive Step*

3.1 It is common ground that D1 discloses the closest prior art, and in particular discloses (see e.g. figures 2, 4 and 8 in conjunction with columns 2-4) a valve having

the features of the preamble of claim 1. The relevant terminals and their mating are shown in detail in figure 8 (see also figure 12) and described in column 4, line 66, to column 5, line 16. Thus, (female) terminal or leaf contact 37 mounted on cap 9 mates with actuator terminal 5 mounted on the valve body. Though the Respondent questions the disclosure of this feature in D1 after an earlier acknowledgement, it is manifestly evident to the Board from figure 8 as well as from the indication in column 5, lines 7-8, that it has a rectangular cross-section ("Kontaktstift 5 mit einem rechteckförmigen Querschnitt"), that terminal 5 is a *flat blade*, so that the first feature of the characterizing part of claim 1 is thus also known from D1.

3.2 D1 does not explicitly disclose that the flat blade is *resiliently flexed* (feature (b)) or has a *thickness less than that of an adjoining portion of the blade* (feature (c)*)*. Interpreting feature (b) in the light of the originally filed description of the granted patent, the only relevant passage on page 12, lines 5 to 14 indicates that the reduced thickness "impart[s] a greater degree of resilient flexibility to the flat blade portions so that as they are being inserted into the respective space [178 of female contact 98] during assembly of the closure cap 26 to close cap 24, they will flex significantly more than the thicker tab 176 [of female contact 98]". From this passage it follows that the expression "resiliently flexed" in the claim must refer to the flexing of the blade *during assembly* rather than denoting the flexed condition of the blade once the cap has been mounted and the terminals are mated. Claim 1 is moreover silent as to geometry and

mechanical properties of the other mating terminal in relation to which the resilient flexing of the flat blade might have been defined. It follows therefore that feature (b) must be interpreted as meaning nothing more than that the flat blade is *resiliently flexible.* The Board accepts that this term does convey some technical information as to the blade's material properties. Nevertheless, it is a relative term which is unsuitable to render the blade's properties sufficiently distinct from those of the prior art blade. It stands to reason that in D1 the elongate contact pin 5 of rectangular cross section, though most likely less flexible than female terminal 37 (as may be inferred from their relative thicknesses in figure 8 and assuming like materials), must still be sufficiently resiliently flexible to allow its forward edge to be guided past and by the outwardly bent front portions of the opposing blades of terminal 37 into its home position projecting through opening 55 as shown in figure 8.

The Board concludes that the only difference of the valve of claim 1 as granted vis-à-vis D1 must reside in feature (c).

3.3 In reference to the passage on page 12 cited above, the effect of feature (c) applied to the pin in D1 is to *increase* its resilient flexibility. As a result assembly (of the mating terminals) is facilitated, while the resultant electrical connection is more reliable. The objective technical problem can be formulated accordingly as adapting the mating of the electrical terminals to facilitate assembly and render it more reliable.

3.4 The skilled person, whose knowledge in the present case will extend to the field of electrical connectors, is aware from his general knowledge in that field that ease of mating and reliability depend amongst others on appropriate and reproducible resilient characteristics of each terminal. From D6 in the relevant field of leaf contacts he derives the teaching - see the paragraph bridging page 2 and 3, and page 5, line 22, to page 6, line 3 - that the resilient characteristics of the contact blades can be determined precisely and reproducibly by pressing the blade or tongue to a reduced thickness. The resultant thinner blade has well-defined increased resilience, while additionally surface roughness and stress concentration ("Kerbwirkung") are reduced, thus further reinforcing reliability of the blade. Though the blade in question is that of an intermediate product in the manufacture of a female leaf contact with two blades or tongues, this is immaterial as it is obvious to the skilled person that the measure of pressing a blade to reduced thickness to the above effects is applicable to leaf contacts in general, e.g. flat blade male terminals of the type shown in D1. Application of this measure known from D6 to the flat blade or pin 5 of D1 with the obvious aim of improving reliability results in the valve with mating having the features of claim 1 as granted.

3.5 In conclusion the Board finds that the subject-matter of independent claim 1 does not involve an inventive step. The grounds mentioned under Article 100(a) EPC taken in combination with Articles 52(1) and 56 EPC

therefore prejudice the maintenance of the patent as granted.

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

G. Magouliotis M. Ceyte