BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS | BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE | CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

Internal distribution code:
(A) [ ] Publication in OJ
(B) [ ] To Chairmen and Members
(C) [X] To Chairmen

D E C I S I O N
of 21 November 1994

Case Number: T 0130/94 - 3.2.1

Application Number: 89308097.8

Publication Number: 0357264

IPC: F16K 31/06

Language of the proceedings: EN

Title of invention:
Solenoid operated control valve

Applicant:
General Motors Corporation

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56, 113(2)

Keyword:
"Inventive step (yes)"
"Refund of appeal fee (no)"

Decisions cited:
-

Catchword:
-

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0130/94 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 21 November 1994

Appellant: General Motors Corporation
General Motors Building
3044 West Grand Boulevard
Detroit
Michigan 48202 (US)

Representative: Denton, Michael John et al
Patent Section
1st Floor Gideon House
28 Chapel Street
Luton
Bedfordshire LU1 2SE (GB)

Decision under appeal: **Decision of the Examining Division 2.3.07.118 of the European Patent Office dated 12 October 1993 refusing European patent application No. 89 308 097.8 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: F. Gumbel
Members: S. Crane
J.-C. Saisset

Summary of Facts and Submissions

I. European patent application No. 89 308 097.8 was refused by a decision of the Examining Division dated 12 October 1993.

II. The reason given for the decision was that the subject-matter of Claim 1 filed with letter dated 23 October 1992 lacked inventive step with respect to the state of the art represented by the following documents:

(D1) DE-A-2 559 322
(D2) WO-A-87/00903

and the common general knowledge of the person skilled in the art.

III. Claim 1 as considered in the decision of the Examining Division reads as follows:

"A solenoid operated control valve comprising, a housing (62) having a tubular portion (66); a coil winding (18) supported by the housing and having an internal bore (12); a control valve comprising a valve plunger (28) disposed within the internal bore (12); a stop member (38) formed of magnetic material having a portion thereof disposed within the internal bore (12), the valve plunger (28) and stop member (38) having opposed spaced end faces that define an air gap (87), the coil winding (18) when energized generating magnetic flux that traverses the air gap (87); the stop member (38) having an integral external threaded portion (44) threaded into internal wall means (64) of the tubular portion (66) of the housing (62) whereby rotary movement of stop member (38) causes the stop member to be moved axially in the internal bore to adjust the air gap (87);

an end cap (78) closing an open end of the tubular portion (66) of the housing (62); and coupling means (46, 80) connecting the end cap (78) and the stop member (38) and which is operative to prevent relative rotation between the stop member (38) and the end cap (78); characterised in that the housing (62) and the end cap (78) are both formed of plastic material; and in that the end cap is welded to the tubular portion (66) of the housing by a substantially continuous weld that is operative to prevent rotation of the end cap relative to the housing and operative to provide a seal."

Dependent Claims 2 to 5 relate to preferred embodiments of the valve according to Claim 1.

IV. An appeal against the decision of the Examining Division was filed on 4 December 1993 and the appeal fee paid on the same day. The Statement of Grounds of Appeal was received on 1 February 1994.

The Appellants (Applicants) requested that a patent be granted on the basis of the following documents:

Claims: 1 to 5 filed on 27 October 1992 with letter dated 23 October 1992;
Description: page 1 filed on 27 October 1992 with letter dated 23 October 1992;
pages 2 to 9 as originally filed;
Drawings: sheet 1/1 as originally filed.

They also requested refund of the appeal fee and oral proceedings if the Board were to "consider rejecting the application".

V. The arguments of the Appellants in support of their requests can be summarised as follows:

The contested decision lacked any proper substantiation as to why the skilled person should make both the housing and end cap of the valve according to document D1 of plastic material and weld these together. The reasoning in the decision was based on hindsight and inaccurate assertions of common general knowledge. In any case this reasoning appeared in detail for the first time in the decision itself, so that the Appellants had not been given an opportunity to comment on it.

Reasons for the Decision

1. The appeal complies with the requirements of Articles 106 to 108 and Rules 1(1) and 64 EPC. It is therefore admissible.

2. *Formal admissibility of the amended documents*

Present Claim 1 is based on a combination of the features of original Claims 1 and 5 together with features taken from the original description at page 8, lines 3 to 14, concerning the continuous nature of the weld and the fact that the weld forms a seal. Present Claims 2 to 5 correspond to original Claims 2 to 4 and 6 respectively. The description has only been amended to the extent that a reference to document D1 as relevant background art has been included.

There are therefore no objections under Article 123(2) EPC to the amendments made.

3. *State of the art*

3.1 Document D1 relates to a solenoid operated control valve with an adjustable air gap as defined in the preamble of present Claim 1. The end cap has a six-sided stub shaft which extends into a correspondingly shaped recess in the stop member and also an internally toothed ring portion which, after the stop member has been adjusted, can be brought into engagement with the internally toothed end part of the tubular portion of the housing. The end cap is held locked in this position by an encircling locking ring fixed by means of screws to an end flange of the housing. From the drawing of document D1 it would appear to O-rings are disposed between the tubular portion of the housing and the stop member at the end regions thereof.

3.2 Document D2 concerns a solenoid operated control valve in which the armature and the valve member are connected together in such a way that limited axial and radial movement between them is possible. The coil winding and the end flanges of the housing are encased in plastics material.

3.3 The remaining documents cited in the Search Report but not referred to in the contested decision are less relevant than document D1 discussed above, and need not be considered in detail here. They all relate to solenoid control valves with an adjustable air gap wherein the stop member is directly accessible for adjustment from outside the housing and is not adjusted via an end cap.

4. *Novelty*

It is immediately apparent from the above discussion of the state of the art that the subject-matter of Claim 1 is novel. It is distinguished from the closest state of the art according to document D1 by the features specified in the characterising clause of the claim. None of the other prior art documents in the proceedings discloses a solenoid operated control valve having all the features of the preamble of the claim.

5. *Inventive step*

In comparison with the closest state of the art known from document D1 the invention provides a simple arrangement for permanently securing the stop member in its factory-adjusted position, the arrangement also serving to provide a barrier against the ingress of contaminants into the inside of a housing. This is achieved by the fact that the end cap is welded to the tubular portion of the housing by a substantially continuous weld, the housing and the end cap both being formed of plastics material to facilitate this welding operation.

It has become commonplace in recent years for parts which were previously made of metal to be replaced by equivalent parts made of high grade engineering plastics. However, even on the assumption that in the light of these developments the skilled person would have considered replacing the housing and end cap disclosed in document D1 by equivalent plastics parts, the Board can find nothing in the state of the art which could suggest to him replacing the means by which the end cap is secured to the tubular portion of the housing, i.e. by means of interengaging teeth and a locking ring, by a substantially continuous weld between

those parts. Neither of the documents referred to in the contested decisions and none of the other documents cited in the Search Report show anything of like character. The statement in the decision that the weld serves the same function as the locking means and O-rings disclosed in document D1 may in itself be correct but this cannot be seen as evidence of the fact that the use of a weld in this context was a measure which was obvious to the skilled person.

Accordingly the Board comes to the conclusion that the subject-matter of Claim 1 involves an inventive step (Article 56 EPC). This claim together with its dependent Claims 2 to 5 therefore form a suitable basis for the grant of a patent.

5. *Refund of the appeal fee*

The request for refund of the appeal fee is based on an alleged procedural violation in that the contested decision contains more detailed reasoning than the preceding communication. That is however true only to a limited extend. The central arguments on which the decision was based are quite clearly contained in the communication and the Appellants had sufficient opportunity to deal with them. This request must therefore be refused.

Since the auxiliary request for oral proceedings is clearly limited to the case where the Board was contemplating confirming the contested decision, it is apparent that the Appellants did not want to be heard on the question of the refund of the appeal fee alone.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to grant a patent on the basis of the documents listed in section IV above.

3. The request for refund of the appeal fee is refused.

The Registrar: The Chairman:

S. Fabiani F. Gumbel