



Case Number: T 0452/00 - 3.2.1

D E C I S I O N
of 2 September 2002
correcting an error in the decision of
the Technical Board of Appeal 3.2.1
of 25 July 2002

Appellant: Tour & Andersson Hydronics Aktiebolag
(Proprietor of the patent) Box 300
S-520 30 Ljung (SE)

Representative: Siebmanns, Hubertus
Gotapatent AB
Box 154
S-561 22 Huskvarna (SE)

Respondent: Danfoss A/S
(Opponent) DK-6430 Nordborg (DK)

Representative: Knoblauch, Andreas, Dr.-Ing.
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D-60322 Frankfurt/Main (DE)

Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 2 March 2000
revoking European patent No. 0 689 652 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: F. A. Gumbel
Members: J. Osborne
J. Van Moer

In application of Rule 89 EPC the decision of 25 July 2002 is hereby corrected as follows:

Page 9, point 2 of the Order, in the final line indicating the drawings to be included in the documents:

"Figures 1 to 3 as granted" is replaced by

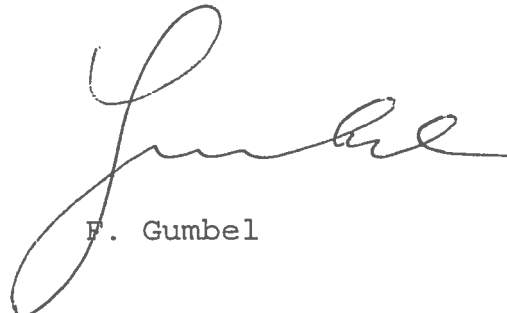
"Figures 1 to 4 as granted".

The Registrar:



S. Fabiani

The Chairman:



F. Gumbel



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D E C I S I O N
of 25 July 2002

Case Number: T 0452/00 - 3.2.1

Application Number: 94911329.4

Publication Number: 0689652

IPC: F16K 17/06, F16K 31/126

Language of the proceedings: EN

Title of invention:
Self-actuating control valve

Patentee:
Tour & Andersson Hydronics Aktiebolag

Opponent:
Danfoss A/S

Headword:
-

Relevant legal provisions:
EPC Art. 56, 123(2)

Keyword:
"Amendments - separation of features (no) - main request"
"Inventive step (yes) after amendment - auxiliary request"

Decisions cited:
-

Catchword:
-



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Summary of facts and submissions

I. The appeal is directed against the decision of the Opposition Division to revoke European patent No. 0 689 652 which was granted on the basis of an application published as WO-A-94/21949 in the form of a translation into English of the original filed in Swedish.

II. The patent had been opposed on the ground that the subject-matter of the claims lacked inventive step. The following evidence was cited during the opposition procedure:

D1: EP-A-0 451 326
D2: DE-C-3 325 715
D3: DE-A-3 708 166.

III. The Opposition Division held that the subject-matter of Claim 1 as granted was rendered obvious by the disclosure of D3 when viewed in the light of the knowledge of the skilled person. The decision of the Opposition Division was posted on 2 March 2000. Notice of appeal and the statement of the grounds of appeal were filed 2 May 2000. The appeal fee was paid on 28 April 2000. The appellant requested that the contested decision be set aside and that the patent be maintained in amended form according to either a main or an auxiliary request.

IV. In a communication dated 19 June 2001 the Board informed the parties of its provisional opinion in respect of the appellant's requests. The Board considered that the amendment to Claim 1 according to the main request contravened the requirements of

Article 123(2) EPC because a feature introduced into the claim had been disclosed only in combination with another which was not introduced. The Board further informed the parties that it considered that Claim 1 according to the auxiliary request satisfied the requirements of the EPC. In response to the Board's communication the appellant indicated its agreement with the opinions expressed by the Board. With a letter dated 30 April 2002 the appellant filed a set of claims according to its auxiliary request. The respondent took no part in the proceedings other than to state that it did not intend to comment in response to the communication of 19 June 2001.

- V. Claim 1 according to the appellant's main request reads as follows. Text which is additional to that as granted is indicated in italics whilst text which has been deleted is included in [-]:

"An automatic adjustment valve (20) designed to maintain at a constant level the differential pressure in a heating or cooling system (1), which valve suitably is connected into a return line (16) of the system (1) between one or several radiators (8, 9) and a main return pipe (4) and which via a pipe (22) is connected to a feed line (5) of the system (1) between a feed pipe (2) and said radiators (8, 9), said valve (20) comprising : a valve body (23), a top piece (26), which is connected to the valve body (23), a spindle (27) mounted within said valve body (23) and said top piece (26) and having a valve cone (25) at one end designed to interact with a seat (24) in said valve body (23), said spindle (27) being surrounded by a compression spring (43), which is supported by an axially displaceable but not rotatable stop element

(45) and said spindle (27) supporting a membrane (51), which via a membrane disc (50) acts on the spindle (27) in its closing direction against the action of said spring (43), characterized in that the stop element (45) is threaded onto the spindle (27) in order to be able to alter its axial position relative to the spindle (27) by means of a tool (58) which transfers rotary movement from outside the valve to the spindle, in that the spindle (27) extends through the membrane (51) and is adjustable in a predetermined way in operation by means of said tool (58) through a rotation in relation to the stop element (45), in that the membrane (51) is loosely supported or is attached to the [membrane] disc (50) [and preferably has a special shape, which encloses the disc edge], and in that the membrane (51) and [possibly also] the membrane disc (50) or a unit, which comprises the membrane and the membrane disc, are displaceably mounted in an axial direction on the other end (48) of the spindle (27) in order to be lifted and to slide with a central hole (54) along said other spindle end (48) *and in that the top piece (26) of the valve is threaded into the valve body (23) and is provided at its end, which is turned away from said body, with a cup-shaped widening (28), which is enclosed by a lid (29) having a central addition (30), which includes a lateral connection (31) for said pipe (22).*"

Claim 1 according to the auxiliary request differs from that of the main request by the addition of the following text at the end of the claim:

"and in that the addition also has a central axial connection (32) which normally is closed from the outside".

In addition to Claim 1, the claims according to the auxiliary request contain dependent Claims 2 to 9 which define preferred embodiments of the subject-matter of Claim 1. The description and drawings remain unchanged from their form as granted.

Reasons for the decision

1. The appeal is admissible.

Main request

2. *Amendments*

- 2.1 The subject-matter of Claim 1 has been amended by the addition of the feature that the lid has "a central addition (30), which includes a lateral connection (31) for said pipe". This feature has been taken from Claim 2 as granted according to which the "central addition" also comprises a central axial connection.

- 2.2 According to the published form of the application on the basis of which the patent in suit was granted a disadvantage of the prior art valves was that a change in the level of differential pressure was not possible during operation (page 1, 2nd paragraph). With the valve disclosed in the application it is possible to adjust the level of the differential pressure during operation by virtue of the combination of the lateral connection for the feed pipe 22 and a central axial connection for insertion of the adjustment tool (page 5, 2nd paragraph). The lateral connection was first mentioned in the claims in Claim 4 which corresponds essentially to Claim 2 as granted and so

also discloses the lateral connection only in combination with a central connection.

2.3 The skilled person would understand from the disclosure of the application as published that the lateral and central connections are both features which are essential to the solution of the problem of changing differential pressure during operation of the valve and so would be provided only in combination. The inclusion of the lateral connection as an essential feature in Claim 1 whilst the central connection remains merely optional therefore presents the skilled person with information which was not derivable from the original disclosure, in contravention of Article 123(2) EPC.

2.4 The main request is therefore refused.

Auxiliary request

3. *Amendments*

3.1 The subject-matter of Claim 1 includes both a central connection and a lateral connection and so the claim overcomes the objection on which the main request founders.

3.2 The wording added in comparison with Claim 1 as granted is essentially that of lines 3 to 10 of Claim 4 of the application as published and corresponding Claim 2 as granted. The remaining features of these earlier claims remain in Claim 2 and relate to a closure and seal of the central axial connection. The skilled person would derive from the application as published that these remaining features are merely preferred and do not have any functional relationship with the features now taken

into Claim 1. Claims 3 to 8 are essentially unchanged from the same claims as granted. New Claim 9 relates to the feature of the enclosure of the disc edge by the membrane which was defined as being optional in Claim 1 both in the application as published and in the patent specification as granted.

3.3 The amendments to the claims therefore do not contravene the requirements of Article 123(2), (3) EPC.

4. *Inventive step*

4.1 The closest prior art is disclosed by D3 which relates to an automatic adjustment valve designed to maintain at a constant level the differential pressure in a heating or cooling system. The valve comprises a valve body 1, a top piece 2 which is connected to the valve body and a spindle 5 mounted within the valve body and the top piece and having a valve cone 53 at one end designed to interact with a seat 12 in the valve body. The spindle is surrounded by a compression spring 7 which is supported by a rotatable, axially displaceable stop element 6. The stop element is threadedly located in the top piece and is rotatable together with the spindle by means of a tool which transfers rotary movement from outside the valve to the spindle, thereby altering the axial position of the stop element (column 4, lines 15 to 23; Figure 2). A membrane 3 is associated with a membrane disc 8 mounted on the other end of the spindle, remote from the valve cone, the membrane acting on its disc to urge the valve cone in its closing direction against the action of the spring. The membrane is loosely supported by its disc and the other end of the spindle slidably projects through a central hole in the membrane which thereby is axially

displaceably mounted on the other end of the spindle in order that it may be lifted away from the disc (Figure 3). The top piece of the valve is threaded at 24 into the valve body and is provided at its end remote from the valve body with a "cup-shaped widening" 21 which is enclosed by a cover 22 having a "central addition" 25 with a connection for the connecting pipe 4 by means of which the pressure in the feed line is communicated to the side of the membrane opposite to the spring.

4.2 The subject-matter of Claim 1 differs from that of D3 in that:

- (a) the stop element is not rotatable and is threaded onto the spindle in order to be able to alter its axial position relative to the spindle by means of the tool;
- (b) the membrane disc or a unit which comprises the membrane and the membrane disc is displaceably mounted in an axial direction on the other end of the spindle in order to be lifted and to slide with a central hole along the other spindle end;
- (c) the central addition includes a lateral connection for the connecting pipe and also a central axial connection which normally is closed from the outside.

4.3 In D3 Figure 2 shows the valve during adjustment of the set value of the pressure difference. The connecting pipe 4 has been removed to allow insertion of the tool to engage the end of the spindle through the "central

addition" 25. The need to remove the connecting pipe 4 has the disadvantage that the spring load cannot be adjusted during operation of the valve. The differentiating features set out in the group (c) in point 4.2 above have the effect that the tool for rotating the spindle may be inserted through the central axial connection without disturbing the connection of the valve to the circuit. The corresponding problem is to permit adjustment of the spring pressure during the valve's operation.

4.4 In D3 Figure 3 shows the same valve having a valve emptying tool 9 fitted in place of the connecting pipe 4. The emptying tool has a central axial port in which is located a tool for lifting the valve spindle away from the membrane and a lateral port to which a pipe is attached to carry liquid passing out of the valve. However, there is no teaching to attach the connecting pipe to the lateral connection and the emptying tool is intended to be attached only when the valve is inoperative.

4.5 D2 relates to a valve for a heating circuit, which may be used both to manually adjust and to shut off the through-flow. In addition to the ports adjacent the valve seat 5 there is an opening co-axial with the valve seat, in which the valve spindle is located. The valve has no spring loaded membrane and no pressure sensing connection and so belongs to a different technical field. The problem addressed by the subject-matter of Claim 1 in suit does not exist. Furthermore, there is no lateral connection additional to the ports adjacent the valve seat.

4.6 D1 relates to a valve for regulating a pressure to

remain at a set value and so also belongs to a different technical field. The regulated pressure is that of the liquid in the main valve body ("lower housing 20") and is applied to the membrane 38 only on the side of the membrane opposite to the spring and opposite to the side from which adjustment of the spring load is carried out. The problem addressed by the subject-matter of Claim 1 in suit therefore does not exist. Moreover, D1 does not disclose a lateral connection additional to the main valve body.

- 4.7 The Board therefore comes to the conclusion that the subject-matter of Claim 1 in suit, and therefore also of Claims 2 to 9, is not rendered obvious by the cited evidence. Claims 1 to 9 therefore are considered to involve an inventive step (Article 56 EPC).

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 maintain the patent on the basis of the following documents:

Description: Columns 1 to 4 as granted

Claims: 1 to 9 filed with a letter of 30 April 2002, received 6 May 2002

Drawings: Figures 1 to 3 as granted.

The Registrar:

The Chairman:

S. Fabiani

F. Gumbel