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Datasheet for the decision of 24 January 2008

Case Number: T 0957/05 - 3.2.05

Application Number: 00934818.6

Publication Number: WO 00/77429

IPC: F16K 15/14

Language of the proceedings: EN

Title of invention:
A non-return valve

Applicant:
Global Valve Technology PTY Limited

Headword:
-

Relevant legal provisions:
EPC Art. 56

Relevant legal provisions (EPC 1973):
-

Keyword:
"Inventive step - yes"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0957/05 - 3.2.05

D E C I S I O N
of the Technical Board of Appeal 3.2.05
of 24 January 2008

Appellant: (**Applicant**): Global Valve Technology PTY Limited
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 7 January 2005 refusing European application No. 00934818.6 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: W. Zellhuber
Members: H. Schram
M. J. Vogel

Summary of Facts and Submissions

I. The appeal is against the decision of the Examining Division dated 7 January 2005 refusing European patent application No. 00 934 818.6 with the title "A non-return valve" (publication No. 1 210 536 / WO 00/77429) on the grounds that the subject-matter of claim 1 of the main request of the appellant (applicant) was not new (Article 54 EPC) and that the subject-matter of claim 1 of the first and second auxiliary requests of the appellant did not involve an inventive step (Article 56 EPC).

II. In the statement setting out the grounds of appeal the appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the claims 1 to 9 of the main request, or claims 1 to 9 of the first or second auxiliary request in that order, or claims 1 to 13 of any of the third to fifth auxiliary requests in that order (corresponding to the main request and first and second auxiliary requests, respectively, filed before the Examining Division), all filed on 17 May 2005. Oral proceedings were requested on an auxiliary basis.

III. On 17 January 2008, the appellant filed a new set of claims 1 to 6 as his sole request, and withdrew his auxiliary request for oral proceedings on condition that the Board was prepared to allow the appeal.

IV. On 18 January 2008, the appellant filed amended pages 12 to 14 of the description.

The appellant requested as final request that the decision under appeal be set aside and that a patent be granted on the basis of claims 1 to 6 filed on 17 January 2008, pages 1 to 11, 15 and 16 of the description filed on 17 January 2008, pages 12 to 14 of the description filed on 18 January 2008, and drawings sheets 1/15 to 14/15 (i.e. drawing sheet 15/15 deleted) filed on 22 August 2003.

V. By a fax communication dated 18 January 2008, the oral proceedings to be held on 24 January 2008 were cancelled by the Board.

VI. Claim 1 according to the sole request of the appellant reads as follows:

"1. A non-return valve and nozzle arrangement comprising:

a valve body (52) including a fluid passageway (56) which defines a fluid inlet (58) and a fluid outlet (60), the fluid passageway (56) being adapted to allow a flow of fluid from the inlet (58) to the outlet (60);

a valve diaphragm (54) in the form of a generally conical-shaped diaphragm having a collapsible aperture (70) located at or adjacent its apex which is oriented in a downstream flow direction, said diaphragm (54) being connected across the fluid passageway (56) and being constructed of a resiliently flexible material wherein the diaphragm (54) itself at least initiates closure of the collapsible aperture (70) to prevent fluid flowing in a reverse direction toward the inlet (58); and

a nozzle (68) configured to deflect the diaphragm (54) to expose the aperture (70) and allow the nozzle (68) to pass through the collapsible aperture (70);

characterised in that the diaphragm (54) forms about the nozzle (68) when the nozzle (68) passes through the collapsible aperture (70) to prevent fluid escape."

VII. The following documents are referred to in the present decision:

D1 US-A 3,822,720

D8 US-A 5,727,770.

VIII. In support of his request, the appellant argued essentially as follows. Of all the cited documents in the examination proceedings, only documents D1 and D8 disclosed arrangements which could be interpreted as being non-return valve and nozzle arrangements. Document D1, which related (see column 1, lines 8 to 10) to a simple and inexpensive valve for e.g. a toy balloon, did not disclose a generally conical-shaped diaphragm provided with a collapsible aperture. Document D8 related to an entirely separate technical field, namely to a double valve cannula seal for use during surgery to seal an incision made in a patient, wherein one valve sealed the cannula when an instrument was present and another valve sealed the cannula when no instrument was present (see column 1, lines 4 to 13). None of these documents contained a hint or indication to provide a non-return valve and nozzle arrangement as claimed in claim 1 of the sole request. The subject-

matter of claim 1 thus involved an inventive step, Article 56 EPC.

Reasons for the Decision

1. *Allowability of the amendments, Articles 84 and 123(2) EPC*

Apart from the insertion of reference signs, claim 1 according to the sole request of the appellant differs from claim 1 as filed in that the claim is no longer directed to "a non-return valve" but to a "non-return valve and nozzle arrangement". Moreover, the feature "*whereas pressure imposed on an inlet side of the diaphragm deflects the diaphragm to expose the aperture and allow fluid to flow through the passageway from the inlet to the outlet only*" has been replaced by the feature "*and a nozzle (68) configured to deflect the diaphragm (54) to expose the aperture (70) and allow the nozzle (68) to pass through the collapsible aperture (70)*" and the feature "*characterised in that the diaphragm (54) forms about the nozzle (68) when the nozzle (68) passes through the collapsible aperture (70) to prevent fluid escape*" has been added at the end of claim 1.

A basis for the amendments is claim 1, claim 3, and the passage on page 10, lines 2 to 5, and page 10, lines 15 to 23, which describes the non-return valve and nozzle arrangement shown in Figure 6, of the application as filed (published version). The dependent claims 2 to 6 correspond to claims 6, 7, 9, 11 and 12, respectively, of the application as filed (published version). The

amendments thus satisfy the requirements of Article 123(2) EPC. Since the claims are also clear and supported by the description, the requirements of Article 84 EPC are also complied with.

2. *Interpretation of claim 1*

From the wording of the characterising part of claim 1, viz. "*when the nozzle (68) passes through the collapsible aperture*" (emphasis added by the Board) in combination with the feature in the preamble "*wherein the diaphragm (54) itself at least initiates closure of the collapsible aperture (70) to prevent fluid flowing in a reverse direction toward the inlet (58)*" it is clear that claim 1 encompasses an arrangement whereby the nozzle is received within the valve and an arrangement whereby the nozzle is retracted from the valve. The term "nozzle" in claim 1 is understood as meaning a projecting pipe or sprout from which fluid is discharged.

In the exemplary embodiment of the invention described on page 10, lines 15 to 28, of the application as filed (published version), whereby the valve body fits about a filler tube of a fuel tank, the non-return valve and arrangement is operated as follows:

"*In use, a filler nozzle 68 is retractably received within the valve 10 so as to deflect the diaphragm 54 to permit a flow of gasolene into the fuel tank via the nozzle 68. Thus, the diaphragm 54 is resiliently deformed so as to expose a collapsible opening 70 through which the nozzle 68 passes. Importantly, the diaphragm 54 forms about the nozzle 68 to prevent the*

escape of gasoline vapours from the filler tube 64 or tank. When the nozzle is retracted from the valve 50 the valve membrane 54 returns to its collapsed condition wherein it obstructs or closes the collapsible opening 70. Thus, in the collapsed condition fuel vapour is prevented from escaping the tank or flowing in a reversed direction toward the inlet 58."

3. *Inventive step, Article 56 EPC*

3.1 Document D1 relates to a flow control assembly, more particularly to an inexpensive valve for sealing simple structures such as inflated toy balloons.

This document discloses a non-return valve 11 of commonly called duckbill valve shape having a collapsible aperture (slit opening 26) located at or adjacent its apex which is oriented in a downstream flow direction, said diaphragm (lip members 16, 16'; central body portions 22, 22'; peripheral portions 21, 21') being connected across the fluid passageway (first and second open ends 14, 15) and being constructed of a resiliently flexible material wherein the diaphragm itself at least initiates closure of the collapsible aperture (slit opening 26) to prevent fluid flowing in a reverse direction toward the inlet 14, see Figures 1 to 4, column 2, lines 52 to 65, and column 3, lines 66 to 68. The valve can be manipulated to permit flow in the opposite direction by applying a force to the main body of the valve in a line parallel to the slit opening 26, and thus opening the slit for passage of air or fluid, see column 3, lines 58 to 66.

In Figure 7 of document D1 "another use of the present invention" is described. In the embodiment shown in Figure 7 the structure (valve) not only serves as a control for fluid passing there through but as "*a gripping member 41 for articles such as fibrous member 42 porous to fluid inserted through the opening*", see column 4, lines 38 to 42, and column 2, lines 42 and 43. Said fibrous member 42 is not a retractable nozzle in the sense of claim 1 of the present application, it rather appears to be a kind of capillary line for conveying writing fluid. Document D1 does not disclose in which direction(s) the fluid passing through the valve and the fibrous member is controlled in Figure 7, i.e. it does not disclose that the valve is used as a non-return valve. It may be noted that claim 1 of the present application defines unidirectional fluid passageway "being adapted to allow a flow of fluid from the inlet to the outlet", the outlet corresponding to the apex of the diaphragm. There is no disclosure in document D1 that the fibrous member 42 is retractable from gripping member 41.

Although Figure 7 seems to disclose that the end portions of the lip members of the valve tightly form about the fibrous member 42 when the fibrous member 42 is present and thus preventing fluid escape, in the judgement of the Board, document D1 is not a particularly relevant document for the subject-matter of claim 1 of the sole request, since document D1 fails to disclose a non-return valve and nozzle arrangement with a retractable nozzle. Moreover, the valve diaphragm shown in document D1 is not "generally conical-shaped" as required by claim 1 of the present application.

3.2 Document D8, which is considered to represent the closest state of the art, discloses (see column 2, lines 44 to 53, and Figures 1 to 4) a double valve sealing device to prevent escape of liquids or gases through a cannula, comprising a diaphragm-type valve 20 and a conical split valve 30. An instrument can be inserted through the two valves into the cannula. Document D8 does not disclose that the instrument 98 (see Figure 7) can be a nozzle, and thus fails to disclose a "non-return valve and nozzle arrangement" as claimed in claim 1 of the sole request.

Whilst the diaphragm-type valve 20 seals the fluid opening if, and only if, an instrument 98 is inserted, the conical split valve 30 seals the cannula if, and only if, no instrument is present in the cannula. This follows from the following: Figure 4 shows that the diaphragm-type valve 20 has no closable collapsible aperture. The conical split valve 30 has first and second cone halves 34, 35, which must have sufficient rigidity to maintain shape when no instrument 98 is present in the cannula (see column 4, lines 55 to 60). Figure 7 shows that, when an instrument is inserted, the first and second cone halves 34, 35 are pushed apart, but that these first and second cone halves 34, 35 do not seal the instrument 98.

It follows that document D8 does not disclose that the conical split valve 30 forms about the instrument so as to prevent fluid escape when the instrument is inserted in said valve.

3.3 The subject-matter of claim 1 thus differs from the double valve sealing device known from document D8 in that a non-return valve and nozzle arrangement is defined comprising "a nozzle (68) configured to deflect the diaphragm (54) to expose the aperture (70) and allow the nozzle (68) to pass through the collapsible aperture (70)", whereby "the diaphragm (54) forms about the nozzle (68) when the nozzle (68) passes through the collapsible aperture (70) to prevent fluid escape".

3.4 The problem the invention seeks to solve is to provide a non-return valve and nozzle arrangement having a low number of components, is easy in operation and whereby fluid escape through the valve is prevented irrespective of whether the nozzle is received within the valve or retracted from the valve.

This problem is solved by the subject-matter of claim 1. In particular, if the nozzle is received within the valve, the conical-shaped diaphragm forms about the nozzle so as to prevent fluid escape; if the nozzle is retracted from the valve, the conical-shaped diaphragm constructed of a resiliently flexible material initiates closure of the collapsible aperture to prevent fluid flowing in a reverse direction.

3.5 In the judgement of the Board, document D8 itself, or any other of the prior art documents cited in the proceedings, cannot suggest to the person skilled in the art, starting from the double valve sealing device and instrument arrangement known from document D8, to replace the instrument by a nozzle and providing a conical-shaped diaphragm with a collapsible aperture that forms about said nozzle when said nozzle passes

through the collapsible aperture to prevent fluid escape.

In document D8 fluid is prevented from escaping - when an instrument is present in the cannula - by a the diaphragm-type valve 20 forming about the instrument. In this situation, i.e. when an instrument is present in the cannula, fluid escape is not prevented by the conical split valve 30, since the two rigid cone halves 34, 35 are pushed apart. The person skilled in the art would not leave out the diaphragm-type valve 20, since its function, viz. preventing fluid escape when an instrument is present in the cannula, cannot be taken over by the conical split valve 30 without redesigning said conical split valve 30.

4. Consequently, the Board comes to the conclusion that the subject-matter of claim 1 according to the sole request of the appellant is not obvious to the person skilled in the art and therefore involves an inventive step within the meaning of Article 56 EPC. The subject-matter of claims 2 to 6 which are appendant to the claim 1 similarly involve an inventive step.

5. The International patent application was published with the title "A non-return valve", see WO 00/77429. This title is reproduced on the cover page of this decision. This title seems no longer to be appropriate (cf. Rule 41(2)(b) EPC), since the sole independent claim is now directed to "A non-return valve and nozzle arrangement".

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 following documents:

Claims, No.:
1 to 6 filed on 17 January 2008;

Description, pages:
1 to 11, 15 and 16 filed on 17 January 2008,
12 to 14 filed on 18 January 2008; and

Drawings, sheets:
1/15 - 14/15 filed on 22 August 2003.

The Registrar: The Chairman:

D. Meyfarth W. Zellhuber