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(11) **EP 1 314 684 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
28.05.2003 Bulletin 2003/22

(51) Int Cl.7: **B67C 3/26, B65B 39/00**

(21) Application number: **02425647.1**

(22) Date of filing: **25.10.2002**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
IE IT LI LU MC NL PT SE SK TR**
Designated Extension States:
AL LT LV MK RO SI

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(30) Priority: **22.11.2001 IT PR20010083**
30.09.2002 IT PR20020051

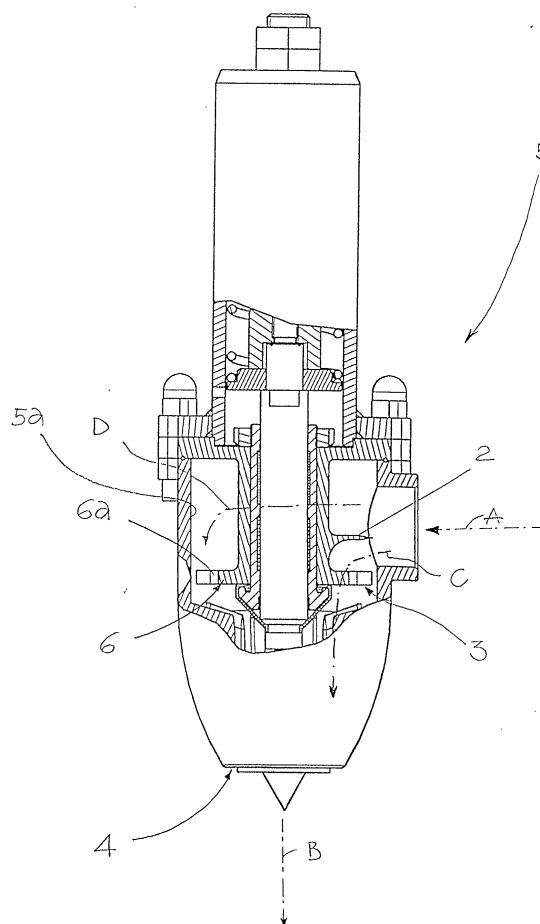
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(54) **Flow distributor apparatus, in particular for a filling valve assembly**

(57) A flow distributor apparatus (1), in particular for a filling valve assembly, comprises at least a deflector element (2) so shaped as to continuously deviating a flow of product from a direction of entry (A) to a direction of exit (B) and means (3) for reducing the turbulence of the flow, directing it towards a dispensing mouth (4) of the filling valve assembly (5). Said means (3) for reducing the turbulence of the flow comprise at least a discoidal element (6) having a plurality of recesses (6a) arranged peripherally thereto and intercepting the flow itself, whilst the deflector element (2) has semi-annular development and is concave with substantially constant radius of curvature.

FIG. 4



Description

[0001] The present invention relates to a flow distributor apparatus, in particular for a valve assembly for filling containers comprised in a bottling plant.

[0002] In the bottling industry, containers (such as bottles, cans, jars) are filled by means of filler machines which, in the rotary case, are provided with a plurality of filling heads positioned in correspondence with the periphery of a rotating platform. To the filling heads are associated respective filler valves. The containers to be filled are positioned below the filler valve, which normally dispenses the filling product through a substantially vertical outflow conduit.

[0003] Oftentimes, the direction of dispensing does not coincide with the direction of flow of the product to the filling valve. In particular, a very widely used type of filling valves provides for the product to be fed to the valve in a substantially radial direction to the outflow conduit, which is normally vertical. The direction change is obtained in a sharp and sudden manner, making the product flow impact against the walls of the conduit.

[0004] An important drawback associated with the aforesaid deviation from a radial direction to an axial direction is represented by the formation of foam consequent to the turbulence that develops in the product flow as a result of the sharp and sudden direction change.

[0005] An aim of the present invention is to eliminate the aforesaid drawback, making available a flow distributor apparatus, in particular for a filling valve assembly, which allows a deviation of the product flow from a direction of inflow to the filling assembly to a direction of dispensing, avoiding the formation of foam.

[0006] An additional aim of the present invention is to propose a distributor apparatus that is able to reduce the turbulence of the flow and to direct it towards a dispensing mouth of the filling assembly.

[0007] Another aim is to obtain a flow distributor apparatus that is applicable to different types of filling assemblies, without requiring substantial modifications to the assembly itself.

[0008] A further aim of the present invention is to obtain this in an extremely simple and economical manner.

[0009] Said aims are fully achieved by the flow distributor apparatus, in particular for a filling valve assembly, of the present invention, which is characterised by the content of the claims set out below and in particular in that it comprises a deflector element so shaped as to continuously deviate a flow of product from a direction of entry to a direction of exit and means for reducing the turbulence of the flow, directing it towards a dispensing mouth of the filling valve assembly.

[0010] Preferably, the direction of entry is substantially radial and horizontal and the direction of exit is substantially vertical.

[0011] This and other characteristics shall become more readily apparent from the description that follows of a preferred embodiment illustrated, purely by way of

non limiting example, in the accompanying drawing tables, in which:

- Figure 1 shows a global perspective view of a flow distributor apparatus according to the invention;
- Figure 2 shows a lateral view of the distributor apparatus shown in Figure 1;
- Figure 3 shows a front view of the distributor apparatus shown in Figure 1;
- Figure 4 shows a global view of a filling valve assembly provided with a distributor apparatus according to the invention.

[0012] With particular reference to Figures 1, 2 and 3, the reference number 1 globally indicates a flow distributor apparatus, in particular for a filling valve assembly. The distributor apparatus 1 is preferably made of a technopolymer. The distributor apparatus 1 comprises a deflector element 2 so shaped as to continuously deviate a flow of product from a direction of entry, which in the illustrated embodiment is substantially radial (and horizontal) to the filling assembly and indicated with the arrow A in Figure 4, to a direction of exit, which in the illustrated embodiment is substantially axial (and vertical) to the filling assembly and indicated with the arrow B in Figure 4. In the described embodiment, the deflector element 2 has a semi-annular development and it is concave with substantially constant radius of curvature.

[0013] The distributor apparatus 1 comprises means 3 for reducing the turbulence of the flow, directing it towards a dispensing mouth 4 of the filling valve assembly 5, shown in Figure 4. With particular reference to Figures 1, 2 and 3, the reference number 6 indicates a discoidal element, comprised in the means 3 for reducing turbulence and provided with a plurality of recesses 6a positioned peripherally thereto and intercepting the flow of product. This allows significantly to reduce the velocity components of the flow that are not oriented in the axial direction. The discoidal element 6, moreover, is positioned inside a filling assembly at a certain distance from the inner walls of the assembly itself, to prevent possible clogging of the recesses 6a in the presence, for instance, of liquids having pulp or fibres in suspension.

[0014] The distributor apparatus 1 further comprises means for splitting the inflow of product into at least two sub-flows before deflecting it. In the illustrated embodiment, said means for splitting the flow coincide with the deflector element 2, which splits the flow, entering according to the arrow A, into a first sub-flow indicated by the arrow C, which is directly deviated in the axial direction by the deflector element 2; a second sub-flow, indicated with the arrow D, is deviated in the axial direction after hitting the distributor apparatus and impacting against inner walls 5a of the filling assembly 5. In an alternative embodiment, not shown herein, it is possible to provide the distributor apparatus with second means for operating the deviation of the second sub-flow, for

instance by means of an additional deflector element. Subsequently, the aforesaid sub-flows rejoin downstream of the discoidal element 6, to restore a single flow that is dispensed by the dispensing mouth 4 of the filling assembly 5.

[0015] The invention achieves important advantages.

[0016] First of all, the distributor apparatus 1, by splitting the inflow in two sub-flows and deviating one of said sub-flows in smooth and continuous fashion, inhibits the formation of foam in the filling liquid.

[0017] In the second place, the presence of the discoidal element 6, by reducing the turbulence of the flow, allows a regular and precise filling, preventing the formation of foam also inside the container. Moreover, said discoidal element, being positioned at a certain distance from the inner walls of the filling assembly, can also be used with liquids having pulp or fibres in suspension.

[0018] Advantageously, said flow distributor is economical and simple to construct.

7. Apparatus as claimed in claim 4, **characterised in that** it comprises second means for deviating a second one of said sub-flows from a direction of entry to a direction of exit.

8. Apparatus as claimed in claim 7, **characterised in that** said second means comprise inner walls (5a) of the filling valve assembly.

9. Filling valve assembly, **characterised in that** it comprises a flow distributor apparatus (1) according to any of the previous claims.

Claims

1. Flow distributor apparatus (1), in particular for a filling valve assembly, **characterised in that** it comprises:

at least a deflector element (2) so shaped as to continuously deviate a flow of product from a direction of entry (A) to a direction of exit (B); and means (3) for reducing the turbulence of the flow, directing it towards a dispensing mouth (4) of the filling valve assembly (5).

2. Apparatus as claimed in claim 1, **characterised in that** said means (3) for reducing the turbulence of the flow comprise at least a discoidal element (6) having a plurality of recesses (6a) arranged peripherally thereto and intercepting the flow itself.

3. Apparatus as claimed in claim 1, **characterised in that** the deflector element (2) has semi-annular development and is concave with substantially constant radius of curvature.

4. Apparatus as claimed in claim 1, **characterised in that** it comprises means for slitting the flow of product into at least two sub-flows before deviating it.

5. Apparatus as claimed in claim 4, **characterised in that** the means for dividing the flow into at least two sub-flows coincide with the deflector element (2).

6. Apparatus as claimed in claim 5, **characterised in that** said deflector element (2) is operatively active on a first of said sub-flows.

FIG. 1

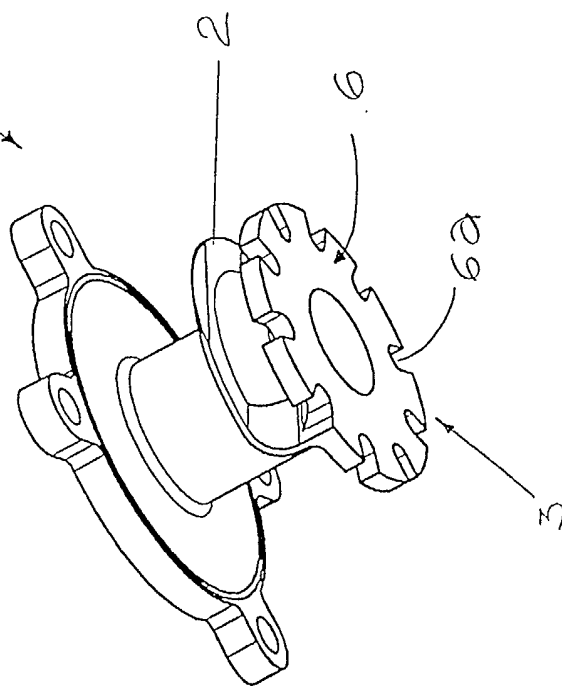


FIG. 2

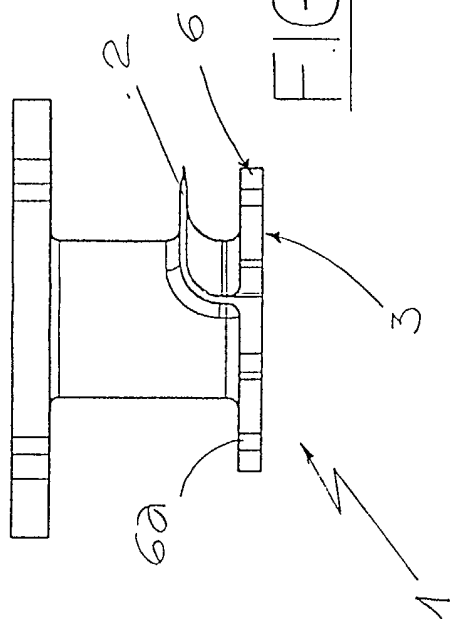


FIG. 3

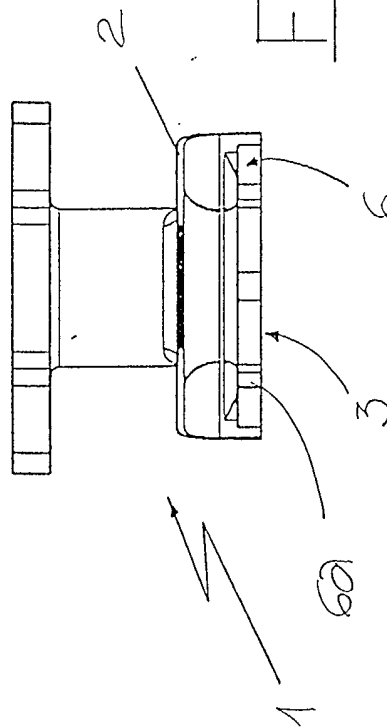
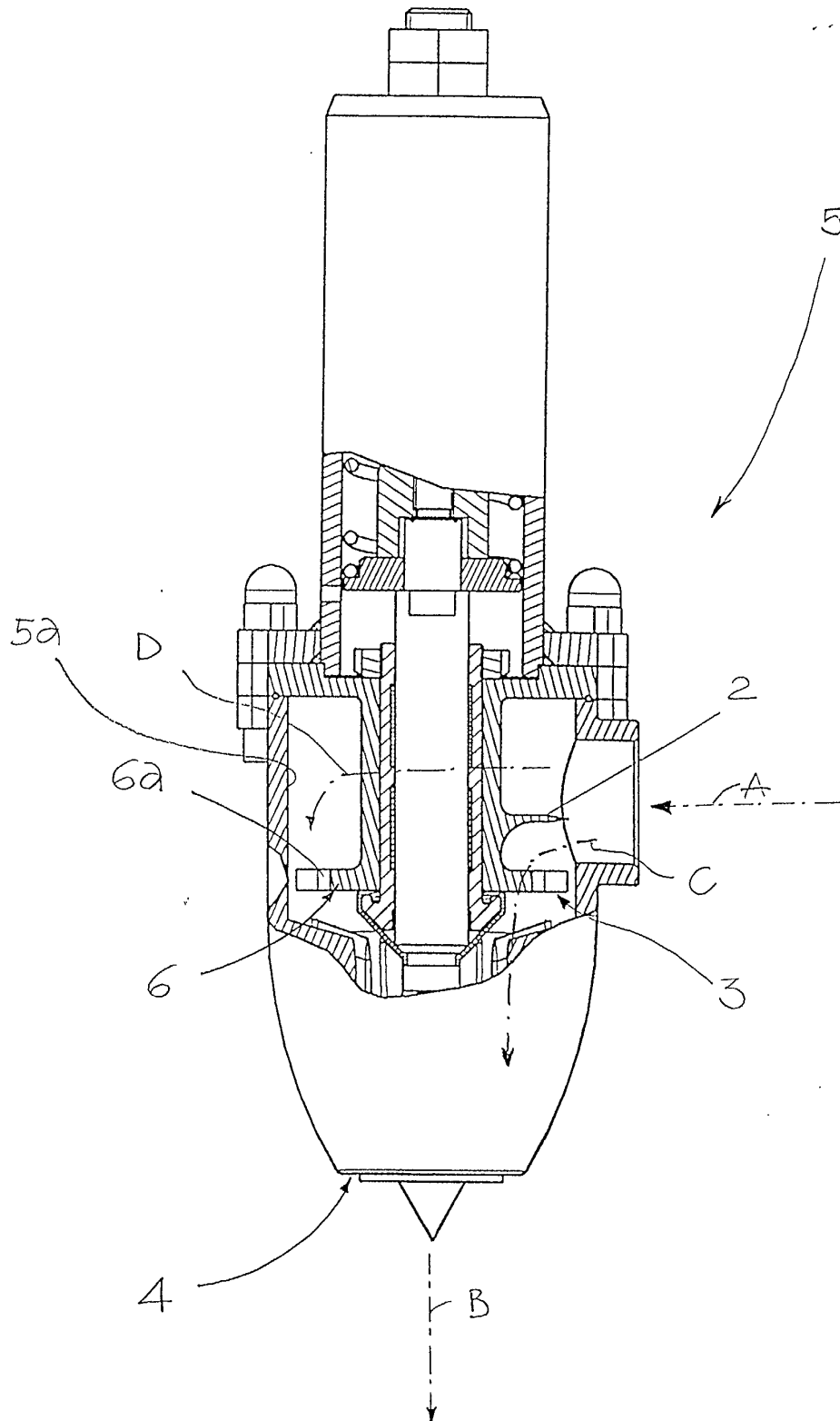


FIG. 4





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EUROPEAN SEARCH REPORT

Application Number
EP 02 42 5647

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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 30 January 2003	Examiner Martínez Navarro, A.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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