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Remarks:

In accordance with Article 14(2), second sentence EPC the applicant has filed a text with which it is intended to bring the translation into conformity with the original text of the application.

(54) **A DEVICE FOR A WASHING MACHINE FOR SUPPLY OF WATER TO TRAYS OF THE WASHING MACHINE CONTAINING DETERGENTS**

(57) The device (1) for a washing machine, for supply of water to an underlying group of trays containing detergents, comprises: a shower group (2) which comprises a perforated base (28) from which a plurality of lateral walls (20) and internal walls (25) extend, which define water storage chambers (3) and channels (4) for conveying the water to the storage chambers (3), the shower group (2) being installable in the washing machine so that the perforated base (28) is arranged above the trays and faces the trays in order to enable water supply contained in the storage chambers (3); a closing cover (5)

able to couple with the upper ends (200) of the lateral walls (20) and the internal walls (25) of the shower group (2) which define the storage chambers (3) and the conveying channels (4); a plurality of assembly channels (6) defined, in a coupling configuration (Z), by the closing cover (5) and the upper ends (200) of the lateral walls (20) and the internal walls (25) of the shower group (2); the assembly channels (6) having plastic material (7) injected therein, by means of injection moulding, so as to isolate and delimit the storage chambers (3) of the water and conveying channels (4) of the water.

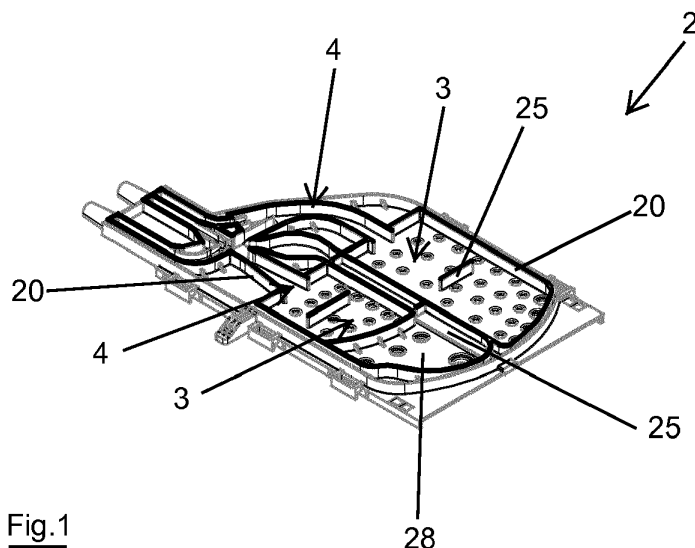


Fig.1

Description

[0001] The present invention relates to the technical sector of devices and apparatus for washing machines, for example devices installable in washing machines, with particular reference to devices for a washing machine for supply of water to the trays of the washing machines containing detergents in powder, granular, liquid form, etc.

[0002] Devices for washing machines for supply of water to an underlying group of trays containing detergents are known, comprising:

- a shower group which comprises a perforated base from which lateral walls and internal walls extend, which define water storage chambers and channels for conveying the water to the storage chambers, the shower group being installable in the washing machine so that the perforated base is arranged above the trays and faces the trays in order to enable water supply contained in the storage chambers;
- a closing cover that couples with the upper edges of the lateral walls and the internal walls of the shower group, so as to delimit and isolate the storage chambers of the water and conveying channels of the water.

[0003] Generally the shower group and the corresponding cover are obtained separately by moulding of plastic materials and are then assembled to one another by vibration, hot knife or spot welding.

[0004] The assembly process by welding is extremely long and laborious and can lead to the creation of burring and/or machining residues which can obstruct the conveying channels and/or the storage chambers of the shower group.

[0005] Document WO 2006/008773A describes a device for a washing machine, for supply of water to an underlying group of trays containing detergents, according to the preamble of claim 1.

[0006] An aim of the present invention is to obviate the above-described drawbacks by providing a device for a washing machine for supply of water to the trays of the washing machine containing detergents, which device enables a rapid and simple assembly of the constituent parts.

[0007] A further aim of the invention is to provide a device for a washing machine for supply of water that is free of burring and/or machining residues which might obstruct and/or deviate the water pathway.

[0008] A further aim of the invention is to provide a method for realising a device for a washing machine for supply of water to an underlying group of trays containing detergents, which enables carrying out assembly steps of the constituent parts that are extremely rapid and intuitive.

[0009] The aims of the invention are attained by a device for realising a washing machine for supply of water

to the trays containing detergents, comprising: a shower group which comprises a perforated base from which a plurality of lateral walls and internal walls extend, which define water storage chambers and channels for conveying the water to the storage chambers, the shower group (2) being installable in the washing machine so that the perforated base is arranged above the trays and faces the trays in order to enable water supply contained in the storage chambers; a closing cover able to couple with the upper ends of the lateral walls and the internal walls of the shower group which define the storage chambers and the conveying channels; a plurality of assembly channels defined, in the coupling configuration, by the closing cover and the upper ends of the lateral walls and the internal walls of the shower group; the assembly channels having plastic material injected therein, by means of injection moulding, so as to isolate and delimit the storage chambers of the water and conveying channels of the water.

[0010] In particular embodiments, the device for a washing machine for supply of water to the trays of the washing machine containing detergents comprises one or more of the following characteristics, considered singly or in combination:

- the assembly channels can be defined by first grooves realised in the closing cover, with the upper ends of the lateral walls and the internal walls of the shower group being faced to the first grooves in a coupling configuration;
- the assembly channels can be further defined by second grooves realised in the upper ends of the lateral walls and the internal walls of the shower group; the first grooves facing the second grooves in a coupling configuration;
- the assembly channels can be further defined by projections realised in the upper ends of the lateral walls and the internal walls of the shower group; the projections facing the first grooves in a coupling configuration.
- The assembly channels are substantially closed and provided with a plurality of sections for injection of plastic material;
- the closing cover has a complementary profile with respect to the storage chambers and the conveying channels of the shower group.

[0011] The aims of the invention are further attained by a method for realising a device for a washing machine for supply of water to an underlying group of trays containing detergents, comprising: providing a shower group which comprises a perforated base from which a plurality of lateral walls and internal walls extend which define water storage chambers and channels for conveying the water to the storage chambers, the shower group being installable in the washing machine so that the perforated base is arranged above the trays and faces the trays in order to enable water supply contained in the storage

chambers; providing a closing cover able to couple with the upper ends of the lateral walls and the internal walls of the shower group which define the storage chambers and the conveying channels; providing a mould containing the shower group and the closing cover in a coupling configuration, so as to identify a plurality of assembly channels defined by the closing cover and the upper ends of the lateral walls and the internal walls of the shower group; injection of plastic material internally of the assembly channels, so as to isolate and delimit the storage chambers of the water and the conveying channels of the water.

[0012] In particular embodiments, the method for realising a device for a washing machine for supply of water to the trays of the washing machine containing detergents comprises one or more of the following characteristics, considered singly or in combination:

- providing a mould containing the shower group and the closing cover in a coupling configuration comprises: providing a first matrix containing the shower group and providing a second matrix containing the closing cover; a mutual positioning of the first matrix and the second matrix so as to arrange the shower group and the closing cover in the coupling configuration;
- the mutual positioning of the first matrix and the second matrix comprises a translation and/or rotation movement;
- the injection of plastic material internally of the assembly channels comprises injection internally of the first grooves realised in the closing cover with the upper ends of the lateral walls and the internal walls of the shower group being faced to the first grooves in the coupling configuration;
- the injection of plastic material internally of the assembly channels further comprises injection internally of the second grooves realised in the upper ends of the lateral walls and the internal walls of the shower group, the first grooves facing the second grooves in a coupling configuration, so as to define the assembly channels.

[0013] The characteristics of the invention are specified in the following with particular reference to some preferred, but not exclusive, embodiments, with reference to the accompanying tables of drawings, in which:

- figures 1, 2 are perspective views of the single parts constituting the device of the invention, for a washing machine for supply of water;
- figure 3 is a plan view of the device of the invention for a washing machine for supply of water, in an assembled configuration;
- figure 3A is a view along section A-A indicated in figure 3;
- figure 4 is a larger-scale view of detail Y, indicated in figure 3A in a preferred embodiment;

- figures 4A, 4B illustrate the same detail Y indicated in figure 4, in respective assembled and exploded configurations;
- figure 5 is a larger-scale view of detail Y, indicated in figure 3A in a further embodiment;
- figures 5A, 5B illustrate the same detail Y indicated in figure 5, in respective assembled and exploded configurations;
- figure 6 is a larger-scale view of detail Y, indicated in figure 3A in a further embodiment;
- figures 6A, 6B illustrate the same detail Y indicated in figure 6, in respective assembled and exploded configurations.

[0014] With reference to the above tables of drawings, reference numeral 1 denotes in its entirety the device for a washing machine for supply of water to the trays (not illustrated) of the washing machine, containing detergents, for example in powder, granular, liquid form, etc.

[0015] In known ways described in the preamble, the present device (1) for a washing machine, for supply of water, comprises:

- a shower group (2) which comprises a perforated base (28) from which a plurality of lateral walls (20) and internal walls (25) extend, which define water storage chambers (3) and channels (4) for conveying the water to the storage chambers (3);
- a closing cover (5) able to couple with the upper ends (200) of the lateral walls (20) and the internal walls (25) of the shower group (2) which define the storage chambers (3) and the conveying channels (4).

[0016] The shower group (2) is installable in the washing machine so that the perforated base (28) is arranged above the trays and faces the trays in order to enable water supply contained in the storage chambers (3).

[0017] In a novel way, the device (1) for a washing machine for supply of water comprises a plurality of assembly channels (6) defined, in a coupling configuration (Z), by the closing cover (5) and the upper ends (200) of the lateral walls (20) and the internal walls (25) of the shower group (2).

[0018] The assembly channels (6) advantageously have plastic material (7) (for example thermoplastic, heat-hardening plastic, etc.) injected therein, by means of injection moulding, so as to isolate and delimit the storage chambers (3) of the water and the conveying channels (4) of the water.

[0019] In a first embodiment, illustrated in figures 5, 5A and 5B, the assembly channels (6) are defined by first grooves (50) realised in the closing cover (5) with the upper ends (200) of the lateral walls (20) and the internal walls (25) of the shower group (2) being faced to the first grooves (50) in the coupling configuration (Z).

[0020] In a second embodiment, illustrated in figures 4, 4A and 4B, the assembly channels (6) are further defined by second grooves (250) realised in the upper ends

(200) of the lateral walls (20) and the internal walls (25) of the shower group (2).

[0021] In the coupling configuration, the second grooves (250) face the first grooves (50), so as to define the assembly channels (6).

[0022] In a third embodiment, illustrated in figures 6, 6A and 6B, the assembly channels (6) can be defined by projections (350) which extend from the upper ends (200) of the lateral walls (20) and of the internal walls (25) of the shower group (2).

[0023] In the coupling configuration (Z), the projections (350) face the first grooves (50), so as to define the assembly channels (6).

[0024] The assembly channels (6) are substantially closed and provided with a plurality of sections (8) for injection of plastic material (figures 4-4B, 6-6B).

[0025] The closing cover (5) can be complementarily profiled with respect to the storage chambers (3) and the conveying channels (4) of the shower group (2). Concerning the method for realising the device (1) of the invention for a washing machine for supply of water into the trays of the washing machine containing detergents, in known ways as described in the preamble, it comprises:

- providing a shower group (2) which comprises a perforated base (28) from which a plurality of lateral walls (20) and internal walls (25) extend which define water storage chambers (3) and channels (4) for conveying the water to the storage chambers (3), the shower group (2) being installable in the washing machine so that the perforated base (28) is arranged above the trays and faces the trays in order to enable water supply contained in the storage chambers (3);
- providing a closing cover (5) able to couple with the upper ends (200) of the lateral walls (20) and the internal walls (25) of the shower group (2) which define the storage chambers (3) and the conveying channels (4) (figures 4B, 5B).

[0026] In a novel way, the method for realising the device (1) of the invention for a washing machine for supply of water into the trays of the washing machine containing detergents further comprises following operating steps:

- providing a mould containing the shower group (2) and the closing cover (5) in a coupling configuration (Z), so as to identify a plurality of assembly channels (6) defined by the closing cover (5) and the upper ends (200) of the lateral walls (20) and the internal walls (25) of the shower group (2) (figures 4A, 5A);
- injection of plastic material (7) internally of the assembly channels (6), so as to isolate and delimit the storage chambers (3) of the water and conveying channels (4) of the water (figures 4, 5).

[0027] By way of example, providing a mould containing the shower group (2) and the closing cover (5) in a

coupling configuration (Z) comprises:

- providing a first matrix containing the shower group (2) and providing a second matrix containing the closing cover (5);
- mutual positioning of the first matrix and the second matrix so as to arrange the shower group (2) and the closing cover (5) in the coupling configuration (Z).

[0028] In particular, the mutual positioning of the first matrix and the second matrix can comprise a translation and/or rotation movement.

[0029] By way of example, translation of the second matrix containing the closing cover (5) can be included so as to face the closing cover (5) to the shower group (2) contained in the first matrix, to define the coupling configuration (Z).

[0030] Alternatively the first matrix containing the shower group (2) can be translated so as to face the shower group (2) to the closing cover (5) contained in the second matrix.

[0031] A further possibility is to rotate the second matrix containing the closing cover (5) so as to face the closing cover (5) to the shower group (2) contained in the first matrix, or alternatively to rotate the first matrix containing the shower group (2) so as to face the shower group (2) to the closing cover (5) contained in the second matrix.

[0032] The mutual positioning of the first matrix and the second matrix might include a combined translation and rotation movements.

[0033] In a first mode of actuation, the injection of plastic material (7) internally of the assembly channels (6) comprises an injection internally of the first grooves (50) realised in the closing cover (5) with the upper ends (200) of the lateral walls (20) and the internal walls (25) of the shower group (2) being faced to the first grooves (50) in a coupling configuration (Z) (figures 5, 5A, 5B).

[0034] In a second embodiment, the injection of plastic material (7) internally of the assembly channels (6) further comprises the injection internally of the second grooves (250) realised in the upper ends (200) of the lateral walls (20) and the internal walls (25) of the shower group (2) (figures 4, 4A, 4B).

[0035] In this case the first grooves (50) facing the second grooves (250) in a coupling configuration (Z), define the assembly channels (6) (figure 4A).

[0036] On the basis of the preceding description it is very clear that the proposed device for a washing machine for supply of water to the trays of the washing machine containing detergents enables a rapid and simple assembly of the shower group and the closing cover.

[0037] This is fundamentally owed to the realisation of a plurality of assembly channels defined, in the coupling configuration, by the closing cover and the upper ends of the lateral walls and the internal walls of the shower group; the assembly channels having plastic material (7) injected therein by means of injection moulding (e.g. ther-

moplastic, heat-hardening, etc.).

[0038] The proposed device for a washing machine for supply of water is consequently free of burring and/or machining residues which might obstruct and/or deviate the water pathway, as occurs in the devices of the prior art in which the coupling of the shower group and the closing cover is done by welding (vibration, hot-knife, spot) with extremely long working times.

[0039] The proposed method for realising the device for a washing machine for supply of water of the invention is able to ensure assembly steps of the shower group and the closing cover that are extremely rapid and intuitive.

Claims

1. A device for a washing machine, for supply of water to an underlying group of trays containing detergents, comprising:

- a shower group (2) which comprises a perforated base (28) from which a plurality of lateral walls (20) and internal walls (25) extend, which define water storage chambers (3) and channels (4) for conveying the water to the storage chambers (3), the shower group (2) being installable in the washing machine so that the perforated base (28) is arranged above the trays and faces the trays in order to enable water supply contained in the storage chambers (3);
- a closing cover (5) able to couple with the upper ends (200) of the lateral walls (20) and the internal walls (25) of the shower group (2) which define the storage chambers (3) and the conveying channels (4);

the device (1) being **characterised in that** it comprises a plurality of assembly channels (6) defined, in a coupling configuration (Z), by the closing cover (5) and the upper ends (200) of the lateral walls (20) and the internal walls (25) of the shower group (2); the assembly channels (6) having plastic material (7) injected therein, by means of injection moulding, so as to isolate and delimit the storage chambers (3) of the water and conveying channels (4) of the water.

2. The device of claim 1, **characterised in that** the assembly channels (6) are defined by first grooves (50) realised in the closing cover (5), with the upper ends (200) of the lateral walls (20) and the internal walls (25) of the shower group (2) being faced to the first grooves (50) in a coupling configuration (Z).
3. The device of claim 2, **characterised in that** the assembly channels (6) are further defined by second grooves (250) realised in the upper ends (200) of the lateral walls (20) and the internal walls (25) of the

shower group (2); the first grooves (50) facing the second grooves (250) in a coupling configuration (Z).

4. The device of claim 2, **characterised in that** the assembly channels (6) are further defined by projections (350) which extend from the upper ends (200) of the lateral walls (20) and of the internal walls (25) of the shower group (2); the projections (350) facing the first grooves (50) in a coupling configuration (Z).
5. The device of one of claims 1 to 4, **characterised in that** the assembly channels (6) are substantially closed and provided with a plurality of sections (8) for injection of plastic material.
6. The device of any one of claims 1 to 5, **characterised in that** the closing cover (5) has a complementary profile with respect to the storage chambers (3) and the conveying channels (4) of the shower group (2).
7. A method for realising a device for a washing machine for supply of water to an underlying group of trays containing detergents, comprising:

- providing a shower group (2) which comprises a perforated base (28) from which a plurality of lateral walls (20) and internal walls (25) extend which define water storage chambers (3) and channels (4) for conveying the water to the storage chambers (3), the shower group (2) being installable in the washing machine so that the perforated base (28) is arranged above the trays and faces the trays in order to enable water supply contained in the storage chambers (3);
- providing a closing cover (5) able to couple with the upper ends (200) of the lateral walls (20) and the internal walls (25) of the shower group (2) which define the storage chambers (3) and the conveying channels (4);

the method being **characterised in that** it further comprises following operating steps:

- providing a mould containing the shower group (2) and the closing cover (5) in a coupling configuration (Z), so as to identify a plurality of assembly channels (6) defined by the closing cover (5) and the upper ends (200) of the lateral walls (20) and the internal walls (25) of the shower group (2);
- injection of plastic material (7) internally of the assembly channels (6), so as to isolate and delimit the storage chambers (3) of the water and conveying channels (4) of the water.

8. The method of claim 7, **characterised in that** providing a mould containing the shower group (2) and the closing cover (5) in a coupling configuration (Z)

comprises:

- providing a first matrix containing the shower group (2) and providing a second matrix containing the closing cover (5); 5
- mutual positioning of the first matrix and the second matrix so as to arrange the shower group (2) and the closing cover (5) in the coupling configuration (Z). 10

9. The method of claim 8, **characterised in that** the mutual positioning of the first matrix and the second matrix comprises a translation and/or rotation movement. 15
10. The method of any one of claims 7 to 9, **characterised in that** the injection of plastic material (7) internally of the assembly channels (6) comprises injection internally of the first grooves (50) realised in the closing cover (5) with the upper ends (200) of the lateral walls (20) and the internal walls (25) of the shower group (2) being faced to the first grooves (50) in a coupling configuration (Z). 20
11. The method of claim 10, **characterised in that** the injection of plastic material (7) internally of the assembly channels (6) further comprises the injection internally of the second grooves (250) realised in the upper ends (200) of the lateral walls (20) and the internal walls (25) of the shower group (2); the first grooves 50 facing the second grooves (250) in a coupling configuration (Z), so as to define the assembly channels (6). 25 30

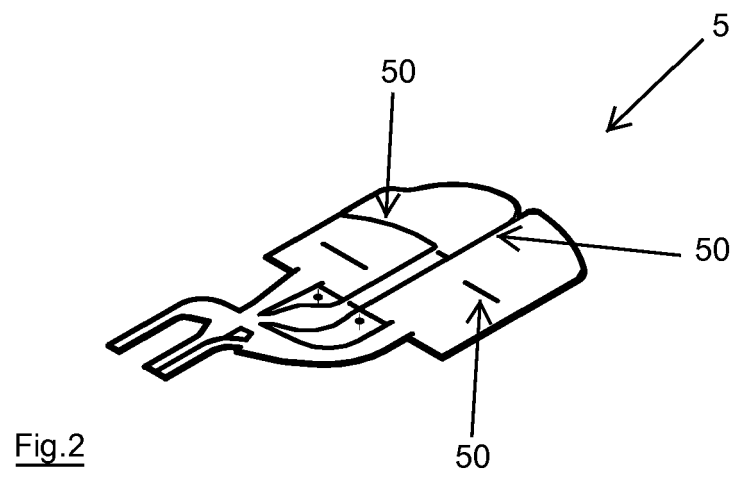
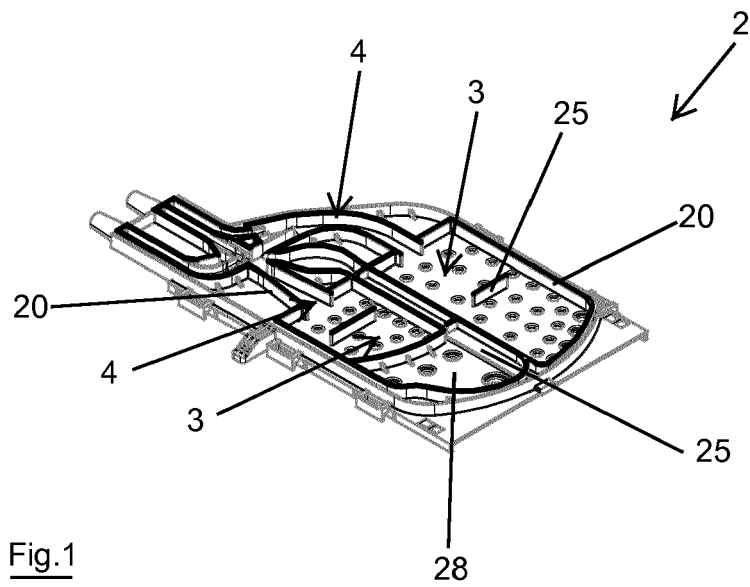
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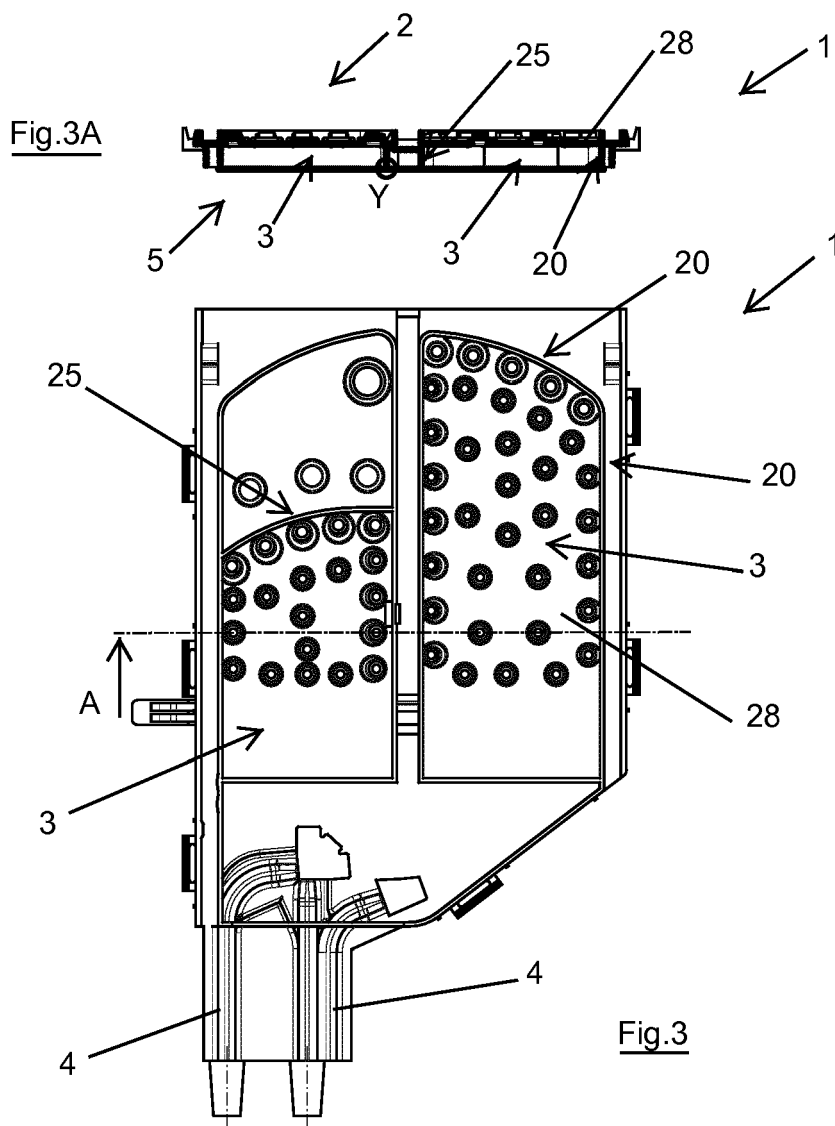
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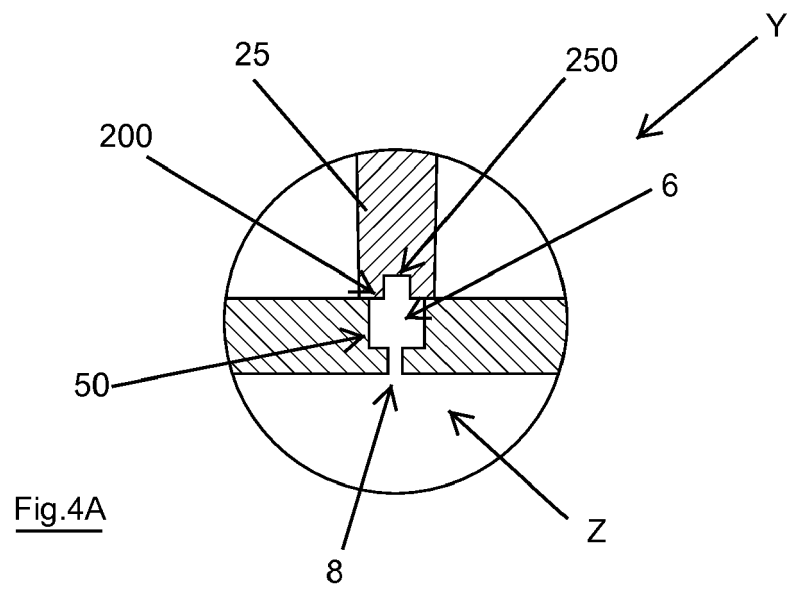
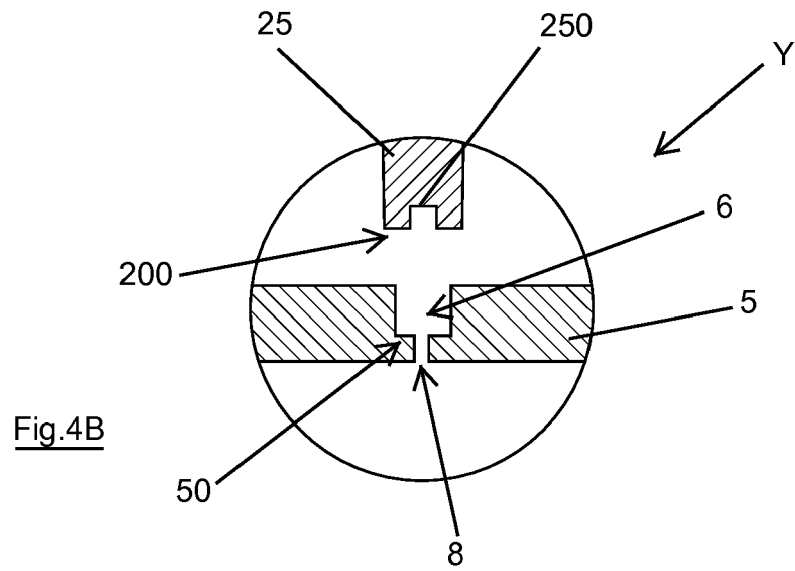
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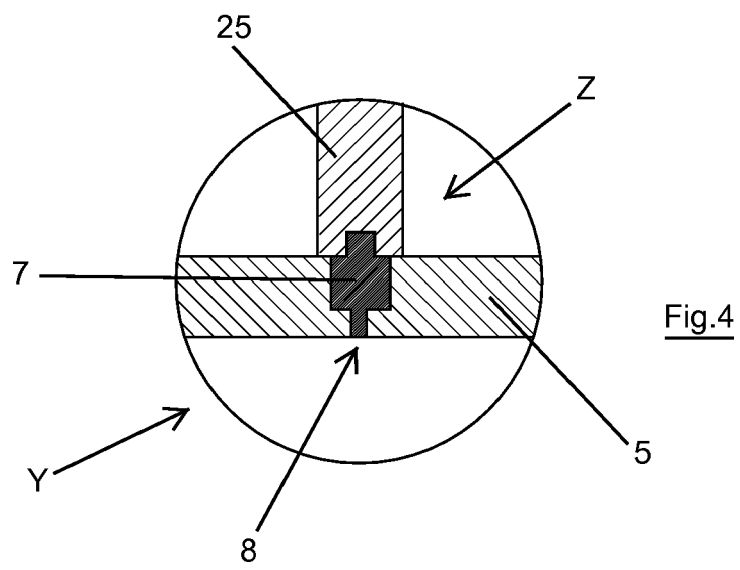
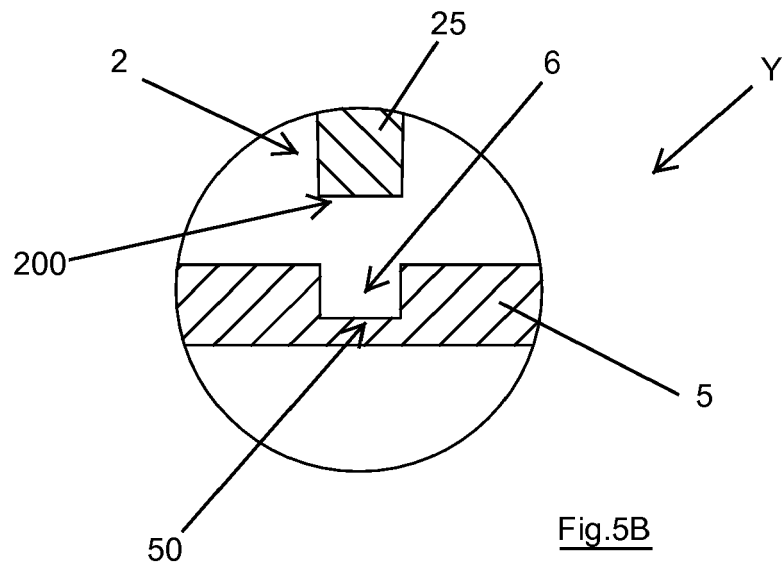
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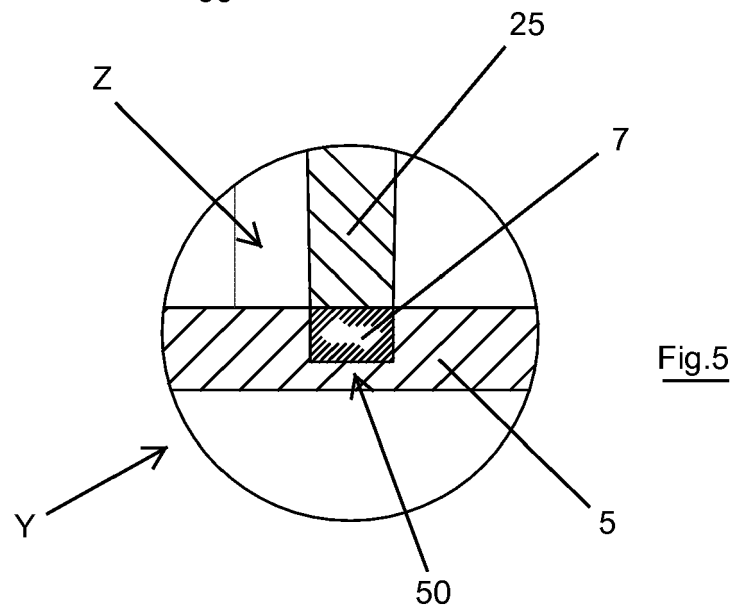
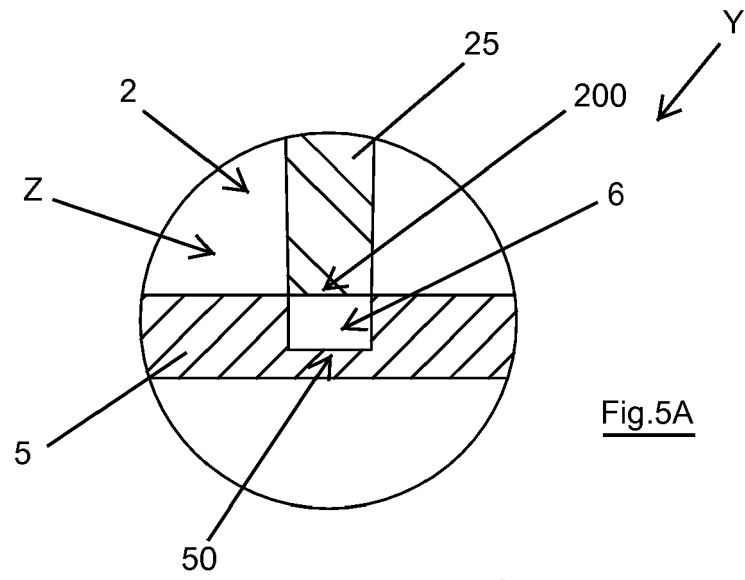
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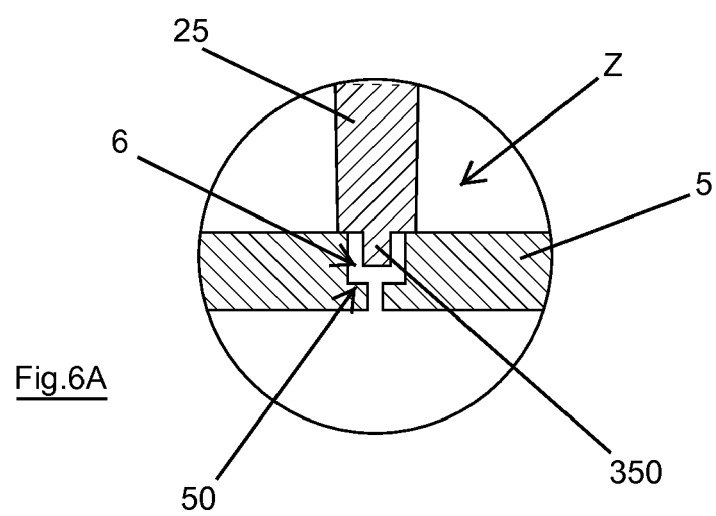
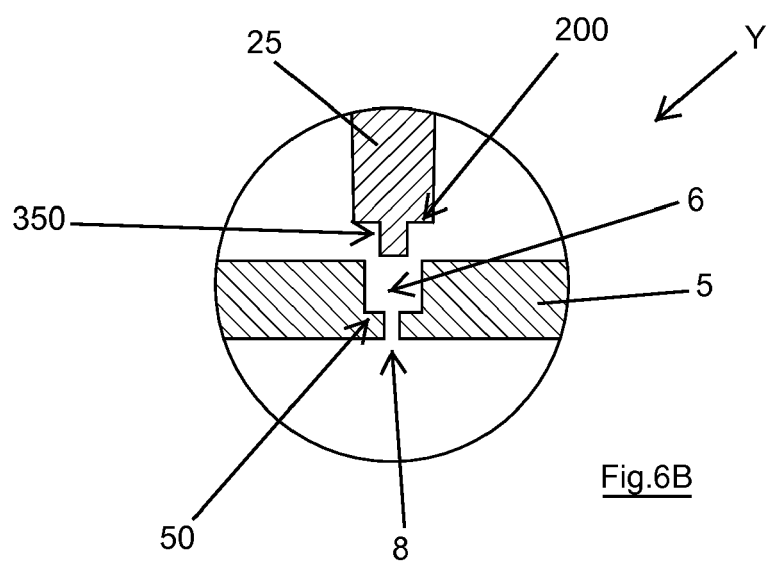


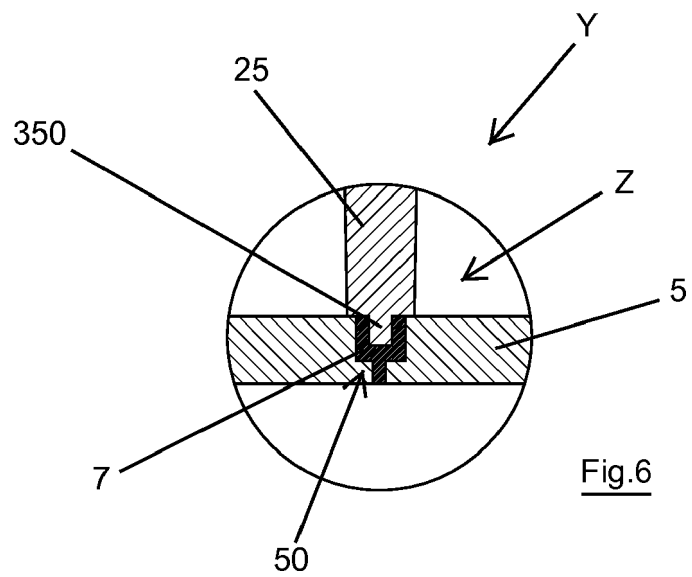














EUROPEAN SEARCH REPORT

Application Number
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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2006/008773 A1 (ACROPLASTICA S R L [IT]; IAVARONE VINCENZO [IT]) 26 January 2006 (2006-01-26) * page 5, line 8 - page 7, line 26; figures *	1-11	INV. D06F39/02
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			TECHNICAL FIELDS SEARCHED (IPC)
			D06F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 6 July 2018	Examiner Stroppa, Giovanni
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 18 17 1985

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