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Szellemi Tulajdon Nemzeti Hivatala**EURÓPAI SZABADALOM**  
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**Egykaros emelőpatron**

Az európai szabadalom ellen, megadásának az Európai Szabadalmi Közlönyben való meghirdetésétől számított kilenc hónapon belül, felszólalást lehet benyújtani az Európai Szabadalmi Hivatalnál. (Európai Szabadalmi Egyezmény 99. cikk(1))

A fordítást a szabadalmas az 1995. évi XXXIII. törvény 84/H. §-a szerint nyújtotta be. A fordítás tartalmi helyességét a Szellemi Tulajdon Nemzeti Hivatala nem vizsgálta.

Single hand lever cartridge

The invention concerns a valve fitting having a cartridge holder which incorporates a valve seat and into which a single-hand lever cartridge is fitted, in accordance  
5 with the characterising clause of patent claim 1.

In bathroom fittings single-hand lever cartridges constructed as mixer cartridges are often used in which a disk-type control system is arranged which has a control disk and a passage disk and which is operated by a single lever in such a way that  
10 both the quantity and temperature of the water are controlled by one single lever. Such replaceable cartridges as described in, for example, US 2011/0308652 A1 or DE 693 15 681 T2 can be fitted in valve fitting housings of different designs.

In the housings for bathroom fittings there is an increasing requirement for compactness of design. For this reason, the mixer cartridges are also required to be  
15 small and compact even though they are still required to produce a copious flow of water. As a rule, mixer cartridges are assembled of plastic mouldings, the thickness of whose material is very low in places because of their small size and the necessity for a generously dimensioned opening to allow the desired amount of  
20 water to pass through. The mixer cartridges must be clamped hard against a valve seat in the fitting housing to guarantee the necessary sealing tightness. Clamping force is regularly applied by means of a fastening ring arranged at an end of the top member of the mixer cartridge opposite the valve seat and fitted into the valve fitting housing, so achieving preloading.

The disadvantage of the already-known mixer cartridge is that the preloading causes the mixer cartridge bottom member, which is regularly made from plastic, to deform and so possibly impair the seal between the mixer cartridge and the  
25 valve seat.

The purpose of the invention is to remedy this disadvantage. The invention is based on the problem of making available a valve fitting with a cartridge holder incorporating a valve seat into which a single-hand lever cartridge is fitted in which deformation of the bottom member in its clamped-in condition is prevented. Ac-  
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According to the invention this problem is solved by designing the end portion of the top member that receives the bottom member in such a way that it lies at least partly at least level with the bottom surface of the bottom member that faces away from the control disk.

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In the invention a single-hand lever cartridge is created where deformation of the bottom member in its clamped-in condition is prevented. By designing the top member in such a way that the end portion of the top member that receives the bottom member lies at least partly at least level with the bottom surface of the bottom member that faces away from the control disk or preferably at least partly projects over this bottom surface this end portion is made to rest on the valve seat. The clamping forces are transmitted direct onto the valve seat by way of the top member, so preventing the bottom member, which is made from plastic, from settling. For consistent transmission of the clamping forces onto the valve seat of a fitting it is especially preferable for the end portion to project completely over the bottom surface of the bottom member, so making recesses for fastening shoulders of the bottom member to engage with so as to fix the bottom member to prevent it from rotating unnecessary. What is important is that at no point does the bottom member project over the end portion of the top member.

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In a further development of the invention the bottom member receives one or more seals for sealing against a valve seat of a valve fitting that projects over the end portion of the top member. This enables the seal to deform by a defined amount, so achieving a reliable sealing effect. In this way damage to the seal from excessive clamping force is prevented.

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In a further embodiment of the invention the lateral surface of the bottom member is partly formed by a portion of a seal. This enables the component parts of the bottom member to be made small.

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In a further development of the invention the bottom member is constructed so that the centre of the bottom member lies in the plane of its bottom surface and is not formed by a seal. This enables impairment of the seal and/or the seal seat by production tolerances of the valve seat that are caused, for example, by the centring point of the drill during manufacture to be prevented.

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In a further embodiment of the invention the valve top is designed as a lateral outlet valve. When designing valve fittings, a lateral water outlet is often required.

Such a lateral water outlet is constructed by designing the bottom of the mixer cartridge so that the outflowing water can flow out between the bottom portion of the cartridge and the bottom of the valve fitting holder and can be conducted through a lateral outlet of the valve fitting.

Other developments and embodiments of the invention are set out in the remaining subclaims. Practical embodiments of the invention are shown in the drawings and are described in detail below. The following are shown in the drawings:

Figure 1 schematic diagram of a single-hand lever mixer cartridge

- a) viewed from below;
- b) partially in longitudinal section;
- c) in side view;
- d) in plan view;

Figure 2 schematic diagram of the top member of the mixer cartridge shown in Fig. 1

- a) in longitudinal section;
- b) in partial section in side view, rotated by 90°;
- c) in cross-section (section A-A);
- d) in cross-section (section B-B);

Figure 3 schematic diagram of the spindle seat of the mixer cartridge shown in Fig. 1

- a) in plan view;
- b) in side view;
- c) in longitudinal section (section A-A);
- d) viewed from below;

Figure 4 the spindle of the mixer cartridge shown in Fig. 1

- a) in side view;
- b) in partial section in side view, rotated by 90°;
- c) in plan view;
- d) in longitudinal section (section B-B);

e) in cross-section (section A-A);

Figure 5 the pivoting axis of the spindle of the mixer cartridge shown in Fig. 1;

5 Figure 6 the fastening ring of the mixer cartridge shown in Fig. 1

a) in longitudinal section;

b) in plan view;

10 Figure 7 the schematic diagram of the sliding part of the mixer cartridge shown in Fig. 1

a) viewed from below;

b) in cross section;

c) in plan view;

d) in side view;

15 Figure 8 diagram of the control disk of the mixer cartridge shown in Fig. 1

a) viewed from below;

b) in cross-section (section A-A);

c) in plan view;

20 d) in cross-section (section B-B);

Figure 9 diagram of the passage disk of the mixer cartridge shown in Fig. 1

a) viewed from below;

25 b) in cross section;

c) in plan view;

Figure 10 diagram of the bottom member of the mixer cartridge shown in Fig. 1

a) viewed from below;

30 b) in side view;

c) in plan view;

d) in partial section;

e) in cross-section (section A-A);

f) in cross-section (section B-B);

35 Figure 11 diagram of the moulded lip seal of the mixer cartridge shown in Fig. 1

a) in plan view;

b) in longitudinal section (section A-A);

- c) in longitudinal section (section B-B);
- d) in longitudinal section (section C-C);

Figure 12 a schematic view of a single-hand mixer cartridge in a further embodiment for a valve fitting with lateral outlet

- a) viewed from below;
- b) in longitudinal section;
- c) in side view;
- d) in plan view;

Figure 13 schematic diagram of the top member of the mixer cartridge shown in Fig. 12

- a) in longitudinal section;
- b) in partial section in side view, rotated by 90°;
- c) in cross-section (section A-A);
- d) in cross-section (section B-B);

Figure 14 the fastening ring of the mixer cartridge shown in Fig. 12

- a) in longitudinal section;
- b) in plan view;

Figure 15 diagram of the bottom member of the mixer cartridge shown in Fig. 12

- a) viewed from below;
- b) in partial section;
- c) in side view;
- d) in side view, rotated by 90°;
- e) in plan view;
- f) in cross-section (section A-A);
- g) in cross-section (section B-B);
- h) in cross-section (section C-C);
- i) in cross-section (section D-D);

Figure 16 diagram of the moulded lip seal of the mixer cartridge shown in Fig. 12

- a) in partly cut-away side view;
- b) in plan view;

Figure 17 diagram of the mixer cartridge mounted in a valve assembly shown in Fig. 1

- a) in longitudinal section;
- b) in a detailed view of detail "X".

5 The single-hand lever mixer cartridge chosen as the example embodiment of the invention consists mainly of a top member 1 into which a spindle 2 projects axially, which is mounted to pivot in a rotatable spindle seat 3 and engages in a sliding part 4 which itself is connected to a control disk 5 which corresponds to a passage disk 6 to which a bottom member 8 to receive a moulded seal 7 is connected..

10 The top member 1 is formed like a sleeve and in the example embodiment is manufactured as a turned brass part. Arranged diametrically opposite each other in the top member 1 on its end portion 10 facing the bottom member 8 are two rectangular recesses 101 by means of which two curved webs 11 are formed, on the inner side of which a catch groove 111 is provided. At its end opposite the webs  
15 11 the top member 1 incorporates a reduced-diameter portion 15 on which a raised portion 151 is formed. Formed in the reduced-diameter portion 15 are two diametrically opposed recesses 152 each of which forms two radial stops 153. The stops 153 serve to delimit the rotation of the spindle seat 3. Formed on the inside of the top member 1 underneath the diameter-reduced portion 15 is a shoulder 14.

20 A fastening ring 16 is also pushed onto the reduced-diameter portion 15 of the top member 1. On the outside of the fastening ring 16 there is a circumferential thread 161 by means of which it is screwed into a fitting 1001. Above the outside screw thread 161 the fastening ring 16 is provided with an external hexagonal portion  
25 166. Underneath the external hexagonal portion 166 a shoulder 165 has been formed in the interior of the fastening ring 16. At the end opposite the external hexagonal portion 166 there is also a raised portion 167 formed on the inside of the fastening ring.

30 In the example embodiment, the spindle 2 is essentially rectangular in shape. A circular coaxial feature 21 is formed at approximately the centre of the spindle 2 for the attachment of an operating part (not shown). Provided above the formed feature 21 is a slot 25 made in the spindle 2 and running as far as the formed fea-  
35 ture 21. Beneath this formed feature 21 the spindle 2 has a hole 22 for receiving an axle pin 23. A control head 24 in the form of a spherical disk is formed at the

end of the spindle 2, which control head is flattened at the side facing the sliding part 4.

5 The spindle seat 3 is a plastic moulding which is essentially cylindrical in shape. At the end of the spindle seat 3 facing the sliding part 4 a two-stage shoulder 31 is formed whose contour corresponds to the inner contour of the two-stage shoulder 14 of the top member 1 against which it lies. Above the two-stage shoulder 31 there is a radial hole 32 through the spindle seat 3 to hold the axle pin 23 for the spindle 2. An axial duct 33 is formed through the spindle seat 3 for the spindle 2  
10 which has lateral stops 34 by means of which the pivoting radius of the spindle 2 around the axle pin 23 is limited. The guideway 33 leads into an essentially cube-shaped seat 35 for the sliding part 4. Arranged in the spindle seat 3 at a distance from the seat 35 is an essentially oval indentation 36 to receive the guide pin 44 of the sliding part 4.

15 The sliding part 4 is a plastic moulding formed essentially as a circular disk on which a essentially rectangular shape 41 is formed. This moulded part 41 is designed in such a way that it can be moved lengthwise and is guided crosswise within the seat 35 of the spindle seat 3. A slot 42 for receiving the control head 24 of the spindle 2 is made axially through the sliding part 4 and through the formed part 41. Formed on one side of the moulded part 41 is a guide pin 44 to engage in the indentation 36 of the spindle seat 3. Two axial webs 43 for receiving the control disk 5 are formed outside on the sliding part 4 on opposing sides of the underside which faces the moulded part 41. Furthermore, formed on the underside is a  
20 fixing pin 45 to engage in the fitting hole 53 in the control disk 5, thereby enabling the control disk 5 to be correctly positioned when fitting.

30 The control disk 5 is oval in shape and made of ceramic material. On the side facing the passage disk 6 the control disk has an oval indentation 51 arranged at its centre. On the outside upper side of the control disk 5 opposite the indentation 51 and arranged diametrically opposite each other there are two recesses 52 for receiving the webs 23 of the sliding part 4. Furthermore, provided in the control disk 5 on its side facing the sliding part 4 is a fitting hole 53. The control disk 5 is positively fitted to the sliding part 4 by way of the recesses 52 and the fitting hole 53.



The passage disk 6 is also made of ceramic material. Two inlet ducts 61 for hot and cold water as well as an outlet duct 62 for the mixed water which is larger with reference to these are formed through the passage disk 6. The inlet ducts 61 and the outlet duct 62 pass through the passage disk 6 at an oblique angle to it. At the side of the passage disk 6 in offset positions to one another three recesses 63 are provided for positive connection to the bottom member 8.

In the example embodiment of the invention the moulded seal 7 is made of rubber. It is formed essentially of three rings 71, each of which is formed on the other two rings 71, thereby producing a clover-leaf contour. On each of the rings 71 of the moulded seal 7 sealing lips 72 are formed on the upper side and the underside. To keep them stable in shape, each of the rings 71 has a support ring 73 which is arranged between the sealing lips 72 of the rings 71.

The bottom member 8 is essentially cylindrical in shape. Provided in the middle of the bottom member 8 is a clover-leaf-shaped seat for the moulded seal 7. Three webs 82 are formed around the seat 81 at a distance from one another to receive the passage disk 6 and lock it in position so that it cannot turn. These webs 82 engage the recesses 63 of the passage disk 6. To improve the positive fit, raised portions 821 are formed on two webs 82 which engage with corresponding recesses 63 in the passage disk 6. On the side of the bottom member 8, two shoulders 83 are formed diametrically opposite each other to engage with the recesses 101 of the end portion 10 of the top member 1. Further formed on the underside of the bottom member 8 and opposite to the webs 82 are two axial positioning pins 84. The positioning pins 84 serve to position the single-hand lever cartridge in a valve fitting (not shown) that is provided with corresponding positioning holes for this purpose. Formed all the way round the bottom member 8 are spring catches 85 that enable a catch connection between the bottom member 8 and the top member 1. The spring catches engage with the catch groove 111 of the curved webs 11 of the top member 1.

In the fitted condition the shoulders 83 of the bottom member 8 engage in the recesses 101 of the top member 1. The curved webs 11 on the end portion 10 of the top member 1 project over the bottom surface 80 of the bottom member 8 by 0.3

millimetre. Projecting from the bottom surface 80 are the two positioning pins 84 for positioning a valve fitting (not shown).

5 The mixer cartridge is, as shown in figure 17, connected to the valve fitting 1001 by the fastening ring 16 and clamped against the valve seat 1003 of the cartridge holder 1002 of the valve fitting. The pretensioning forces set up by this are transmitted onto the valve seat 1003 through the top member by way of the end portion 10 that projects over the bottom surface 80 of the bottom member 8.

10 The fastening ring 16 is pushed over the reduced-diameter portion 15 of the top member 1 thereby forcing the raised portion 151 elastically inwards when it passes over the raised portion 167 of the fastening ring 16. After passing over the raised portion 167 of the fastening ring 16, the raised portion 151 of the reduced-diameter portion 15 of the top member 1 re-assumes its original position. The fastening ring 16 is thereby retained unlosably on the top member 1. The fastening ring 16 is screwed into valve assembly 1001 by means of the exterior hexagonal portion 166.

20 In the embodiment shown in figure 12 the single-hand lever cartridge is designed for valve fittings with a lateral water outlet. Arranged on the top member 1 here is a circumferential, reduced-diameter shoulder 13 into the middle of which a circumferential groove 131 is formed to receive an O-ring 17. Arranged above the shoulder 14 is a reduced-diameter portion 15 on the end of which a raised portion 151 is formed. Formed diametrically opposed in the reduced-diameter portion 15 are likewise two recesses 152, by each of which are formed two radial stops 153 which serve to delimit the rotation of the spindle seat 3. Formed on opposite sides on the end portion 10 in the top member 1 are two recesses 101 by which curved webs 11 are formed. The recesses 101 are formed rectangular and are of different widths but of an identical height.

30 Placed over the reduced-diameter portion 15 of the top member 1 is a fastening ring 16 that has all the way around its outside a first external screw thread 161 for screwing into a valve fitting (not shown). Above the first external screw thread 161 is a reduced-diameter shoulder 62 provided with a second external screw thread 163. At the end a portion 164 with a reduced diameter is formed on the fastening

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ring 16, by means of which a shoulder 165 is formed. On its exterior the reduced-diameter portion 164 has also an exterior hexagon 166. At the end opposite the reduced-diameter portion 164 there is also a circumferential raised portion 167 formed on the inside of the fastening ring 16.

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The bottom member 9 is essentially cylindrical in shape. Provided in the bottom member 9 are two inlet holes 91 and an outlet hole 92, the central axes of which form an isosceles triangle. The outlet hole 92 leads into a hollow portion 93 that extends beyond the outer casing 90 of the bottom member 9. The hollow portion 10 93 enables sufficient water inflow for a lateral outlet duct of a valve fitting (not shown). The two inlet holes 91 are surrounded by a spectacle-shaped groove 94 that serves to receive a moulded seal 941. The groove 94 is positioned in such a way that the limiting edge running around this runs through the centre of the bottom surface 901 of the bottom member 9. Formed on the bottom member on either side of and opposite the hollow portion 93 are three axial positioning pins. 15

In the example embodiment of the invention the moulded seal 941 is made of rubber. It is essentially formed by two rings 942 that are formed one next to the other to form a spectacle-shaped contour. Formed on the outside of the moulded seal 20 are fitting lugs 943 that fit into the breaks 940 at the side of the groove 94. The outer contour of the fitting lugs 943 is formed in such a way that it fits into the contour of the outer casing 90 of the bottom member 9.

Formed diametrically opposed on the sides of the bottom member 9 are two 25 shoulders 96 that correspond with and engage in the recesses 101 in the top member 1. Provided above the shoulders 96 is a circumferential groove 97 to receive an O ring 971 for sealing the bottom member 8 off from the top member 1. The bottom member 9 incorporates on its upper side opposite the groove 94 a clover-leaf-shaped seat 98 for the moulded seal 7. Three webs 99 are formed 30 around the seat 98 at an equal distance from one another to receive the passage disk 6 and lock it in position so that it cannot turn. These webs 99 in turn engage in the recesses 63 of the passage disk 6. To improve the positive fit, raised portions 991 are in turn formed on two webs which engage in corresponding recesses 63 in the passage disk 6.

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The so-designed single-hand lever cartridge is fitted into a valve fitting (not shown) with a cartridge holder at the open end of which an internal thread is provided for screwing in the fastening ring 16 of the top member 1. Leading into the cartridge holder of this valve fitting (not shown) in a valve seat at the bottom are two water inlet connections that are sealed against the inlet holes 91 by means of the moulded seal 941, where a level stop surface for the end portion 10 of the top member 1 to rest on is arranged around the inlet holes 91. The top member 1 is clamped against the stop surface of the valve seat by means of the fastening ring 16 screwed into the valve fitting (not shown), the clamping forces being transmitted direct onto the stop surface by way of the top member 1. Furthermore, a lateral water outlet connection is arranged. The mixed water runs through the outlet hole 92 by way of the hollow portion 93 into the interior of the cartridge holder and by way of this into the lateral water outlet connection.

Because of the design of the bottom member in accordance with the invention, over which the curved webs 11 of the end portion 10 of the top member 1 project, a very compact construction is enabled for this single-hand lever cartridge designed for the lateral outlet. The two breaks 940 in the groove 94 in which the fitting lugs 943 of the moulded seal 941 engage enable the bottom member 9 to be designed space-savingsly. A continuous groove to receive the moulded seal 941 is not required in the present case, because in the area of the breaks 940 groove limitation is formed by the curved webs 11 of the top member 1.

## SZABADALMI IGÉNYPONTOK

## EGYKAROS EMELŐPATRON

1. Szerelvény egy szelepelekkel ellátott patronfogalathoz, amelybe egy egykaros emelőpatron van beillesztve, amely egy hüvelyszerűen kialakított fejrész (1) foglal magába, amelyet egy alaprész (8, 9) fogad be, valamint egy tárcsavezérlést egy vezérlőtárcsával (5) amely egy forgathatóan és/vagy billenthetően rögzített orsón (2) keresztül egy, a hozzá tartozó áteresztő tárcsához (6) képest forgathatóan és/vagy billenthetően van elrendezve, amelyen az áteresztő tárcsára (6) az alaprész (8, 9) csatlakozik, ahol a fejrész (1) egy, a fejrész (1) kívülről körbefogó rögzítő gyűrűvel a szelepeleknek van feszítve,

azzal jellemezve, hogy a fejrésznek (1) az alaprész (8, 9) által befogadott végoldali szakasza (10) úgy van kialakítva, hogy az alaprésznek (8, 9) a vezérlőtárcsával (5) határos alapfala (80, 901) legalább részben kinyúlik, és az alaprész (8, 9) semmilyen állásban nem nyúlik túl ezen a szakaszon (10), ahol a szelepelek egy sík ütközőfelületet tartalmaz, amelyen a fejrész a végoldali szakaszán úgy fekszik fel, hogy a függőlegesen ható feszítőerők fejrészen (1) át közvetlenül a az ütközőfelületre legyenek átadva.

2. Az 1. igénypont szerinti szerelvény, azzal jellemezve, hogy az alaprész (8) legalább egy tömítést fogad be egy szerelvény egy szelepelekével szemben történő tömítésére, amely a fejrész (1) végoldali szakaszán (10) kiemelkedik.

3. A 2. igénypont szerinti szerelvény, azzal jellemezve, hogy az alaprész (9) palástfelülete (90) a tömítés egy részéből áll.

4. Az előző igénypontok egyike szerinti szerelvény, azzal jellemezve, hogy a tömítést egy tömítő formaelem (7, 941) alkotja, amely legalább két kör alakú áteresztést tartalmaz.

5. A 2-4. igénypontok egyike szerinti szerelvény, azzal jellemezve, hogy az alaprész (8, 9) úgy van kialakítva, hogy az alaprész (8, 9) középpontja az alapfelületének (80, 901) síkjában fekszik, és nem egy tömítés által van kialakítva.

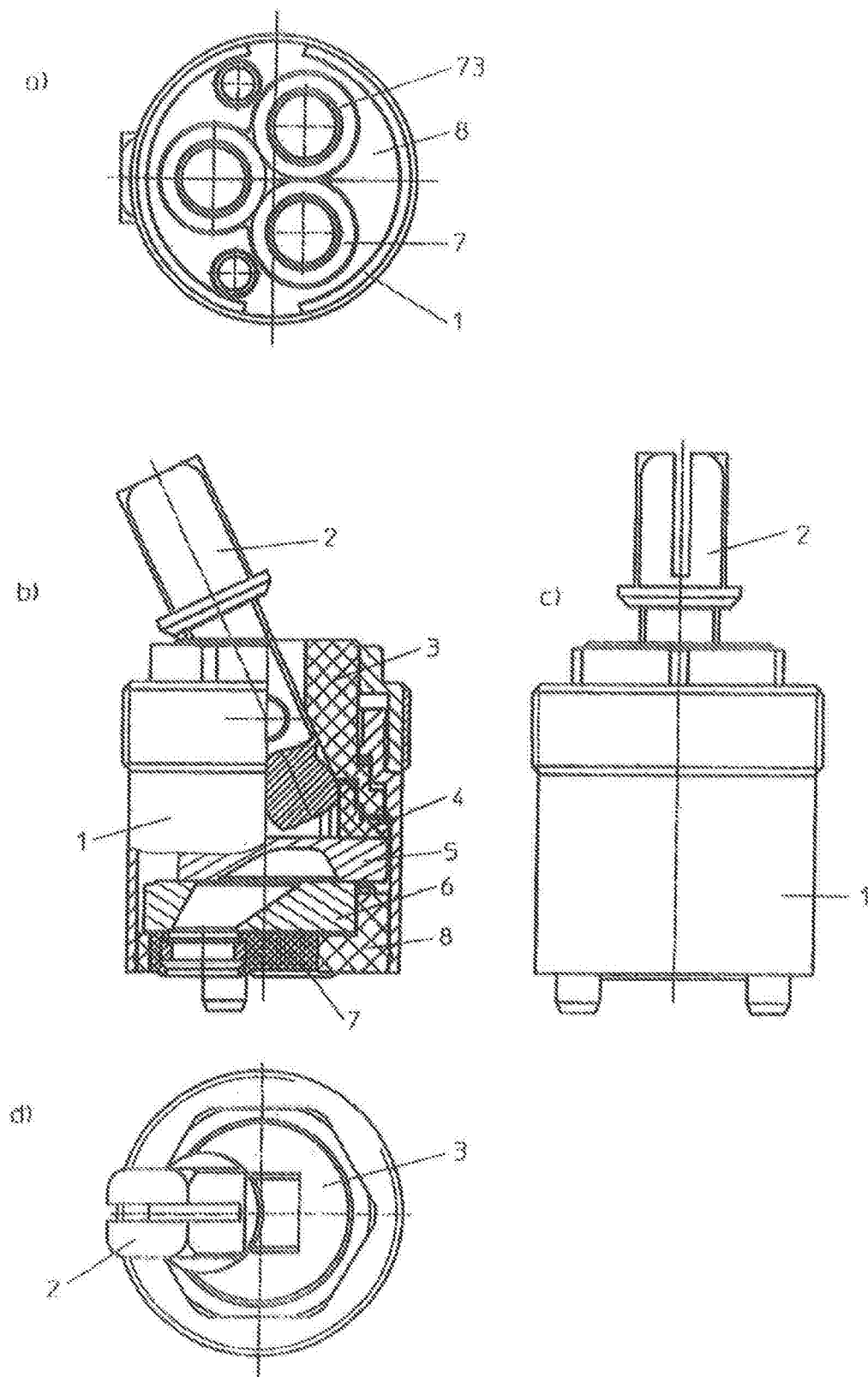
6. Az előző igénypontok egyike szerinti szerelvény, azzal jellemezve, hogy a keverőbetét oldalkimeneti szelepként van kialakítva.

7. Az előző igénypontok egyike szerinti szerelvény, azzal jellemezve, hogy a fejrész (1) sárgaréz forgástestként van kialakítva.



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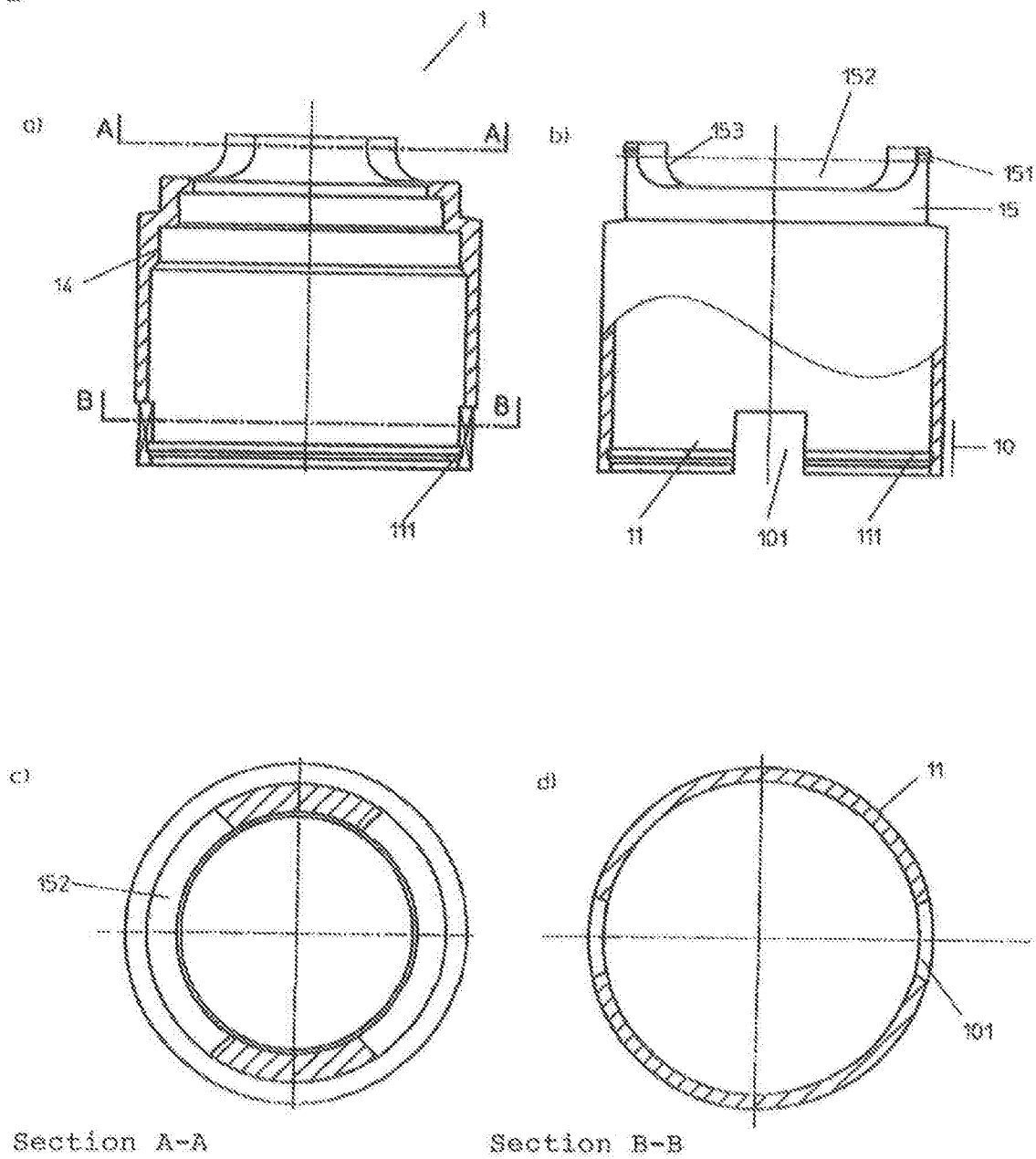
Fig. 1



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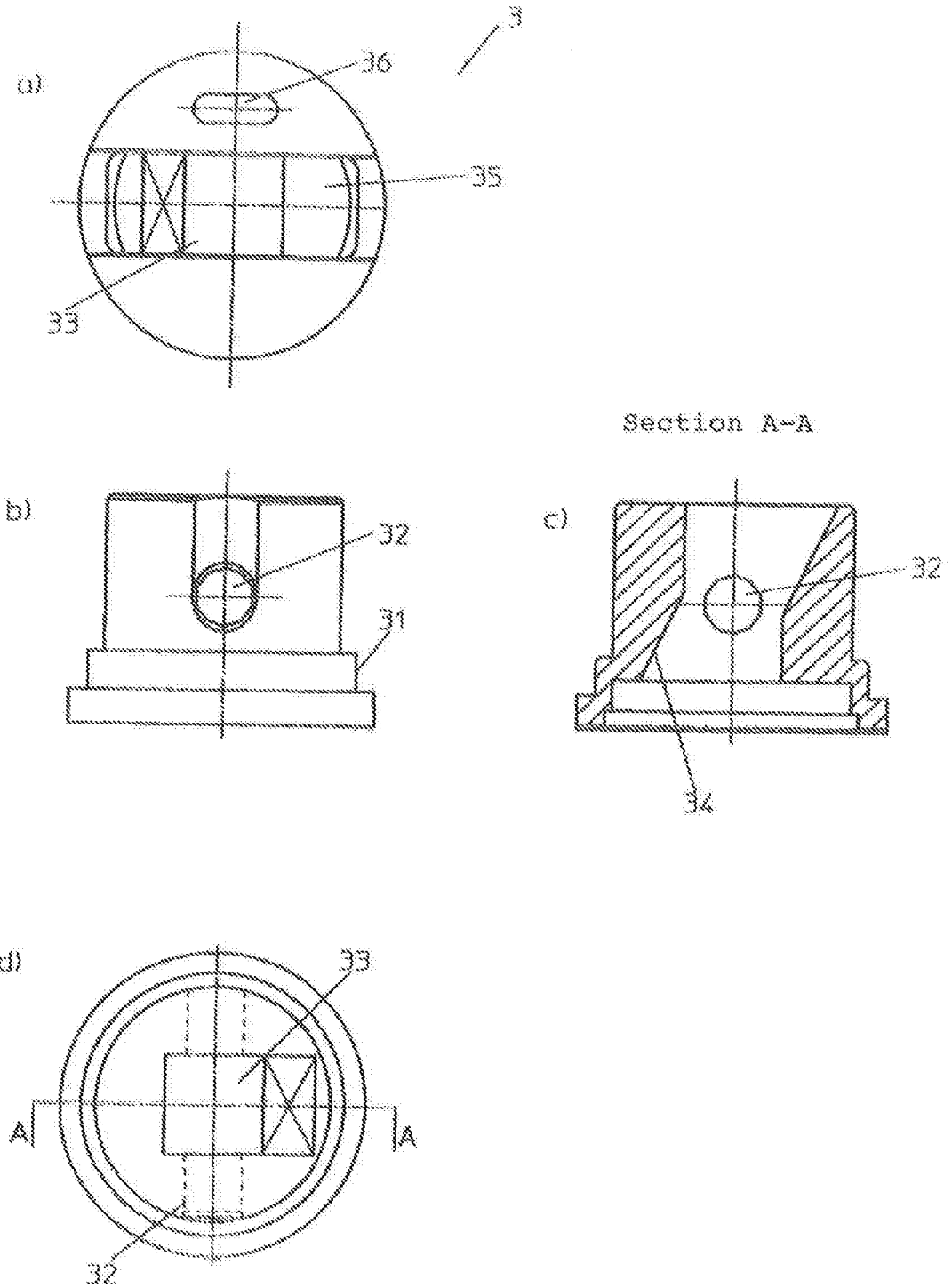
Fig. 2



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Fig. 3

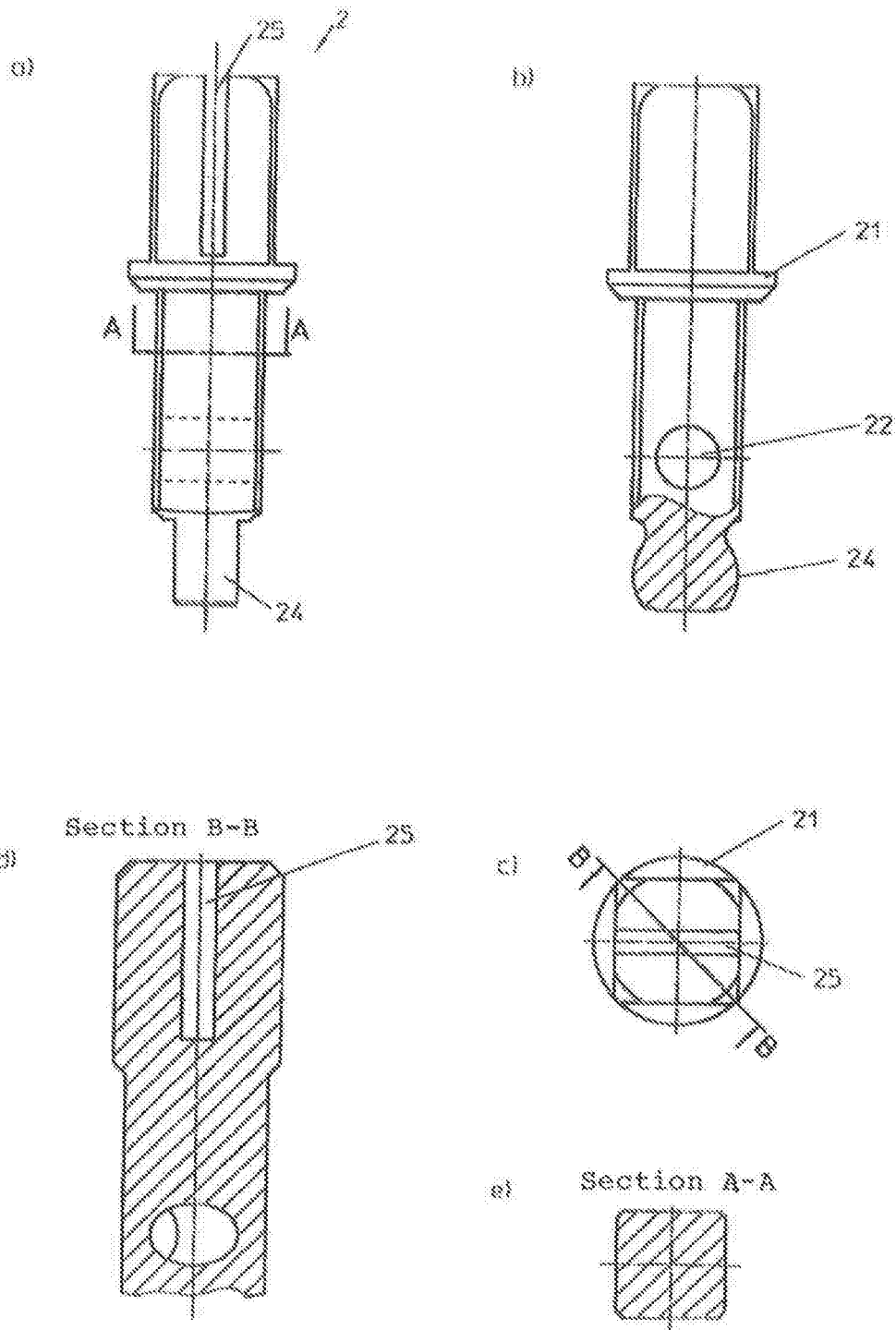




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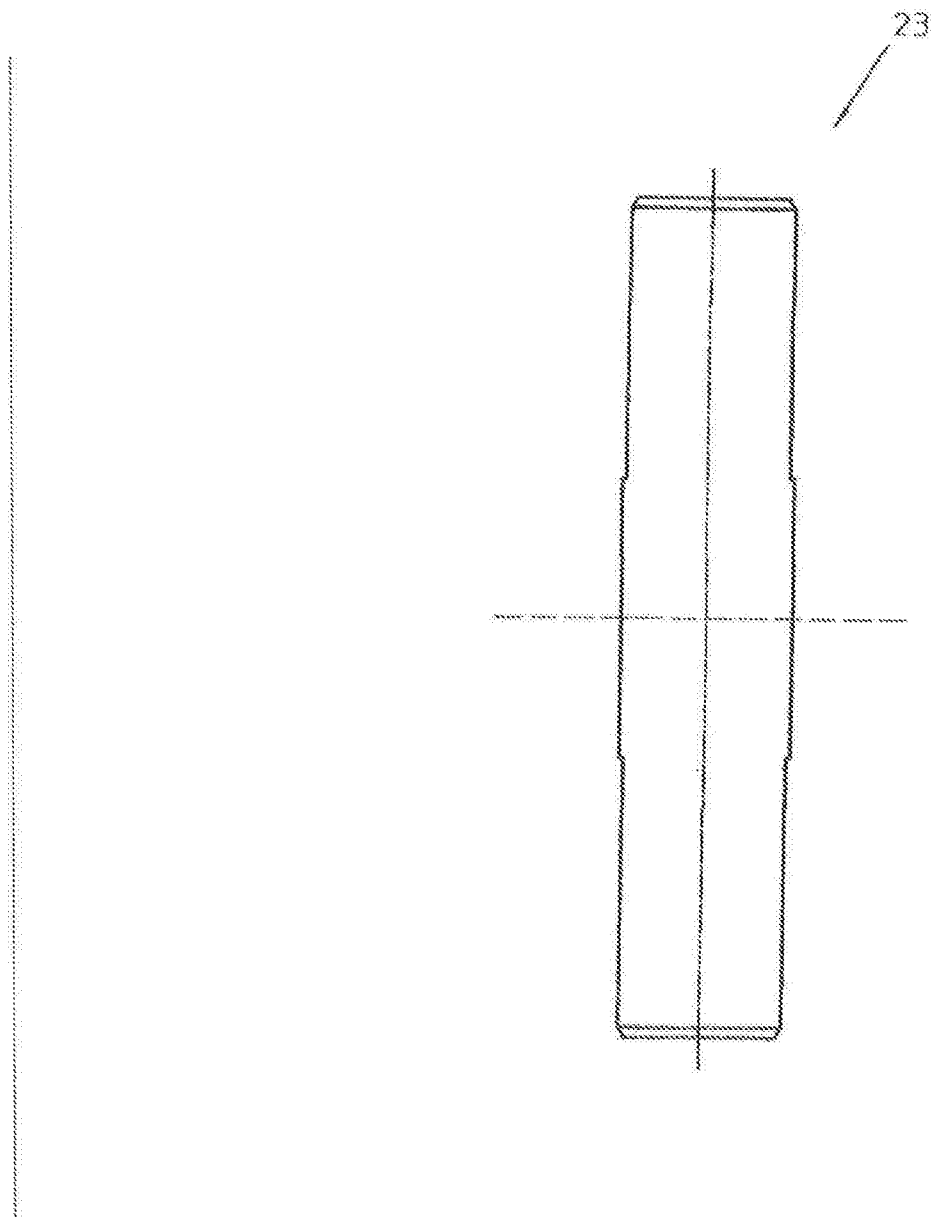
Fig. 4



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Fig. 5



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Fig. 6

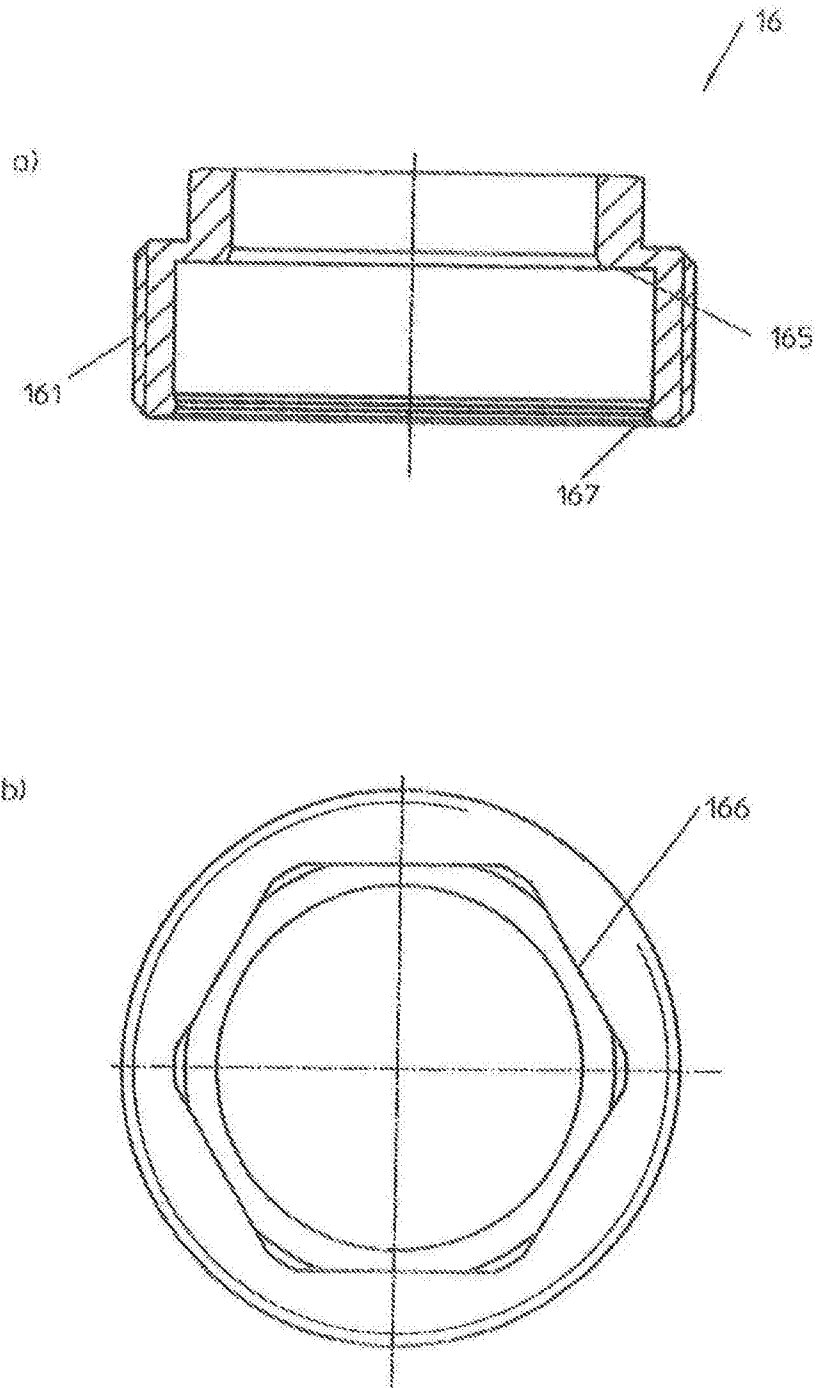
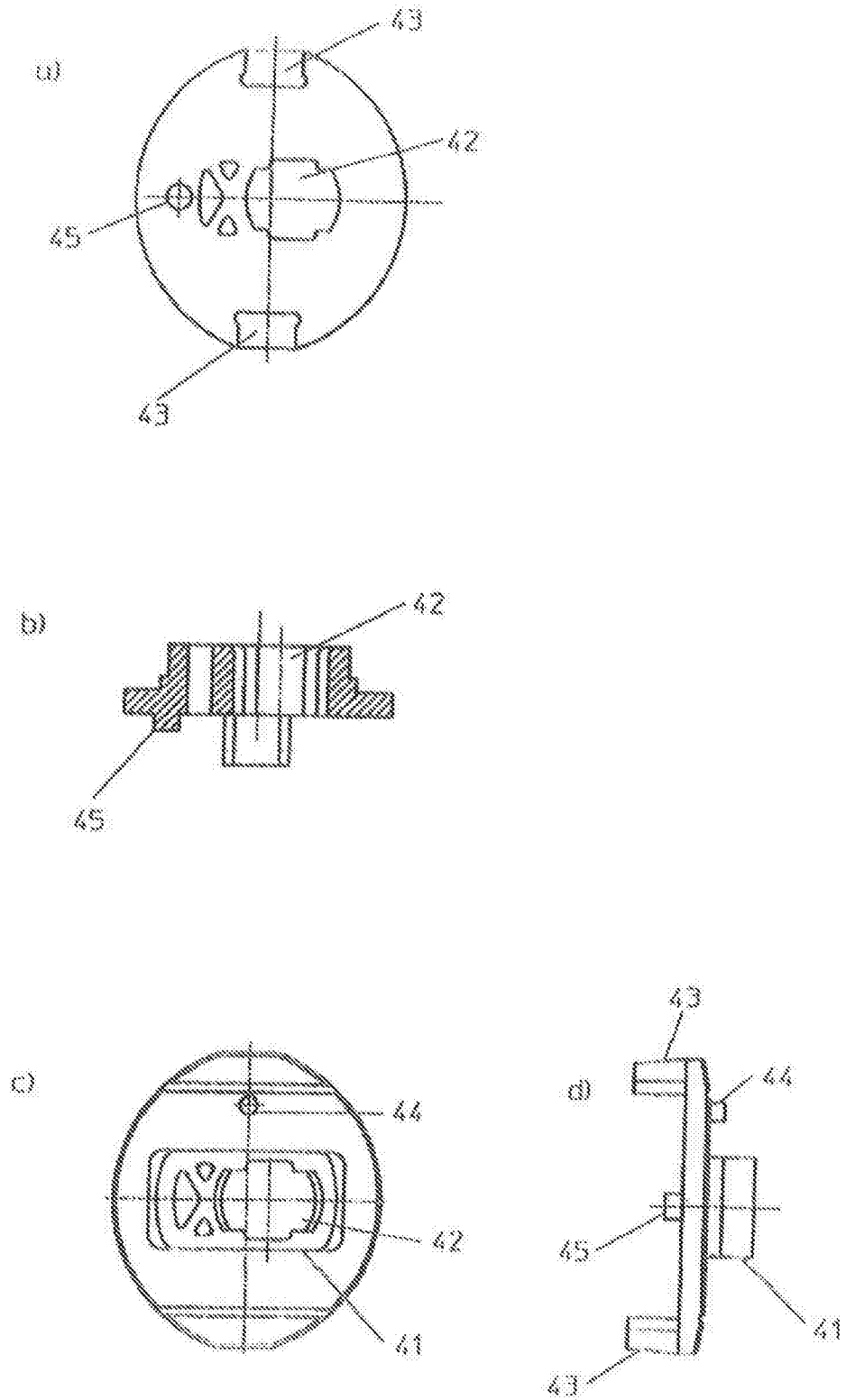


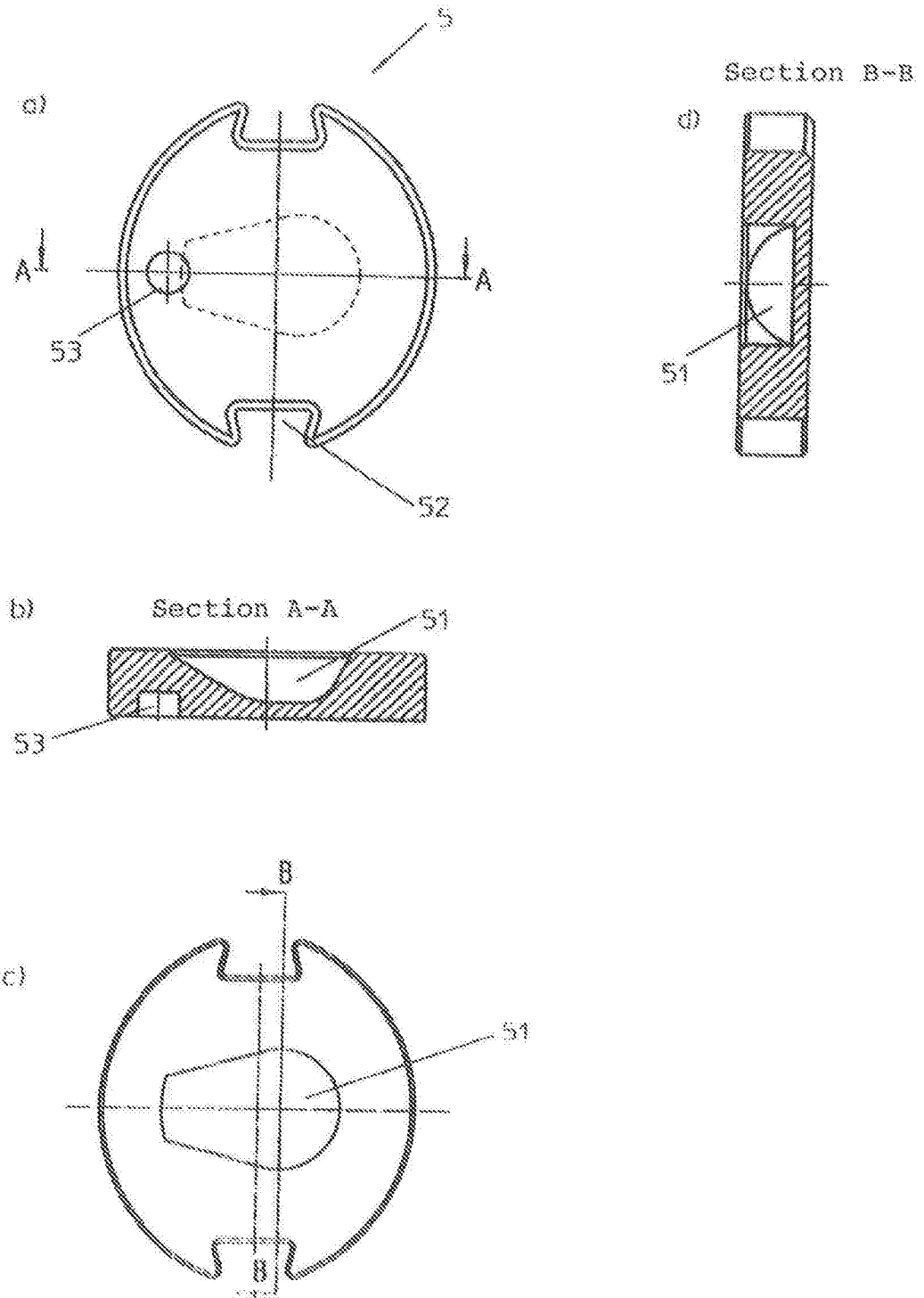
Fig. 7



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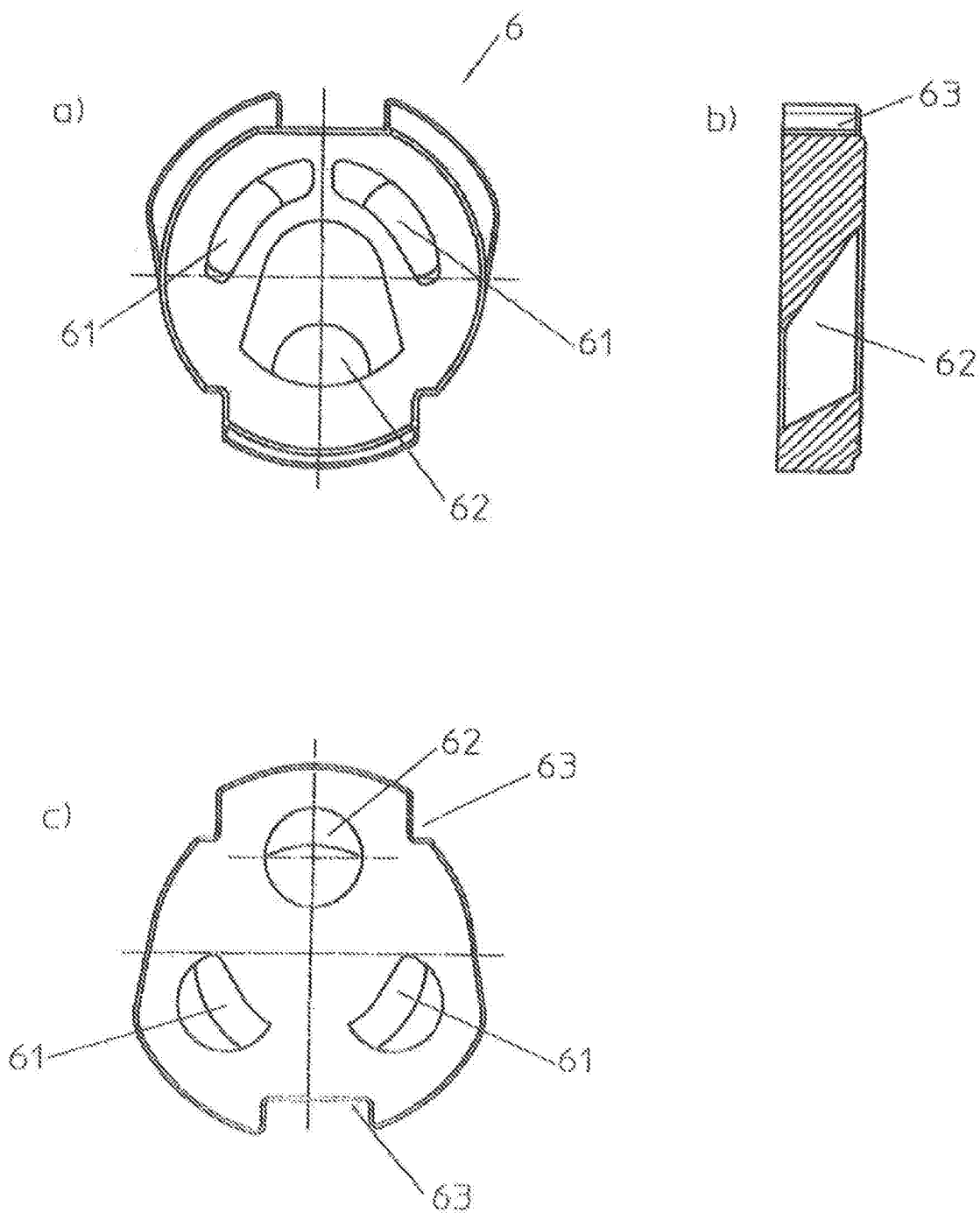
Fig. 8



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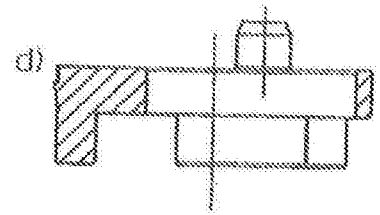
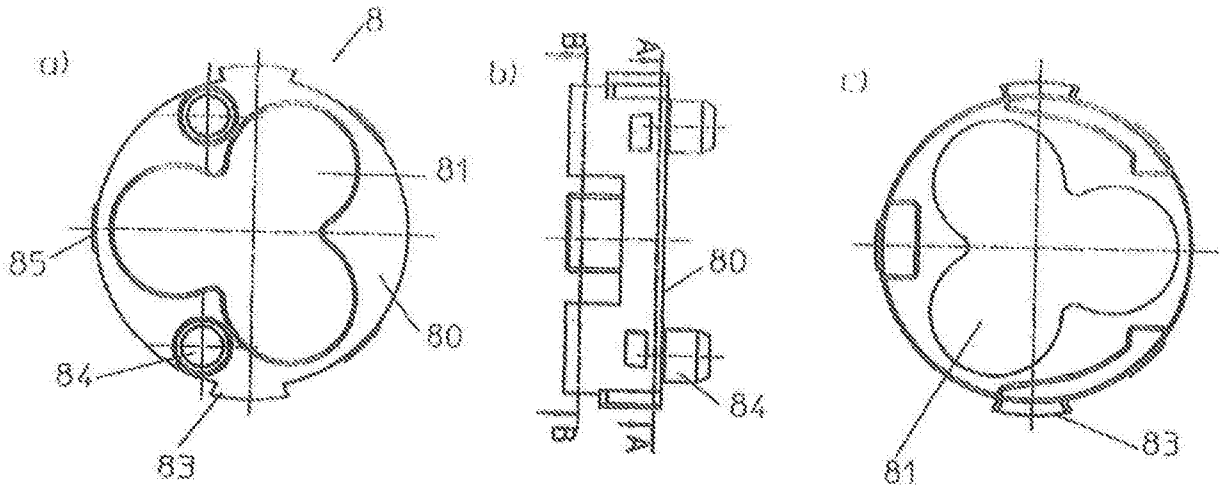
Fig. 9



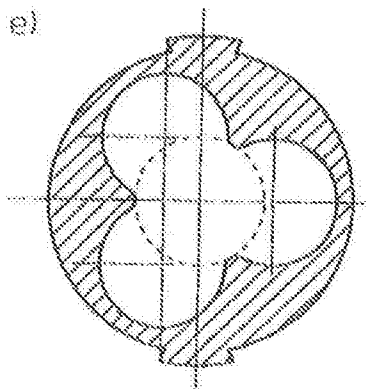
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Fig. 10



Section A-A



Section B-B

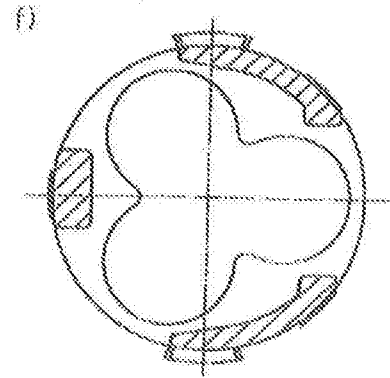


Fig. 11

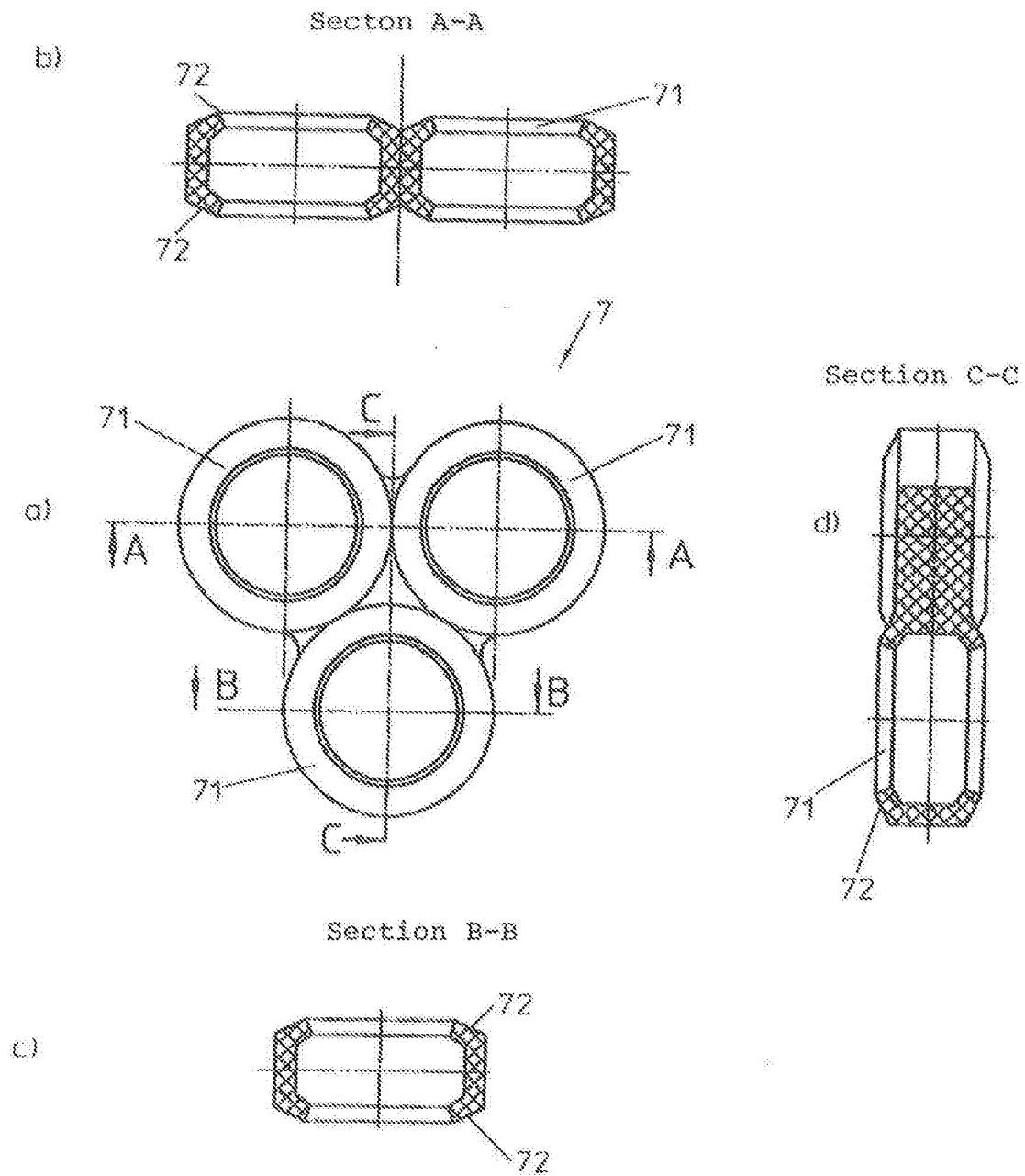
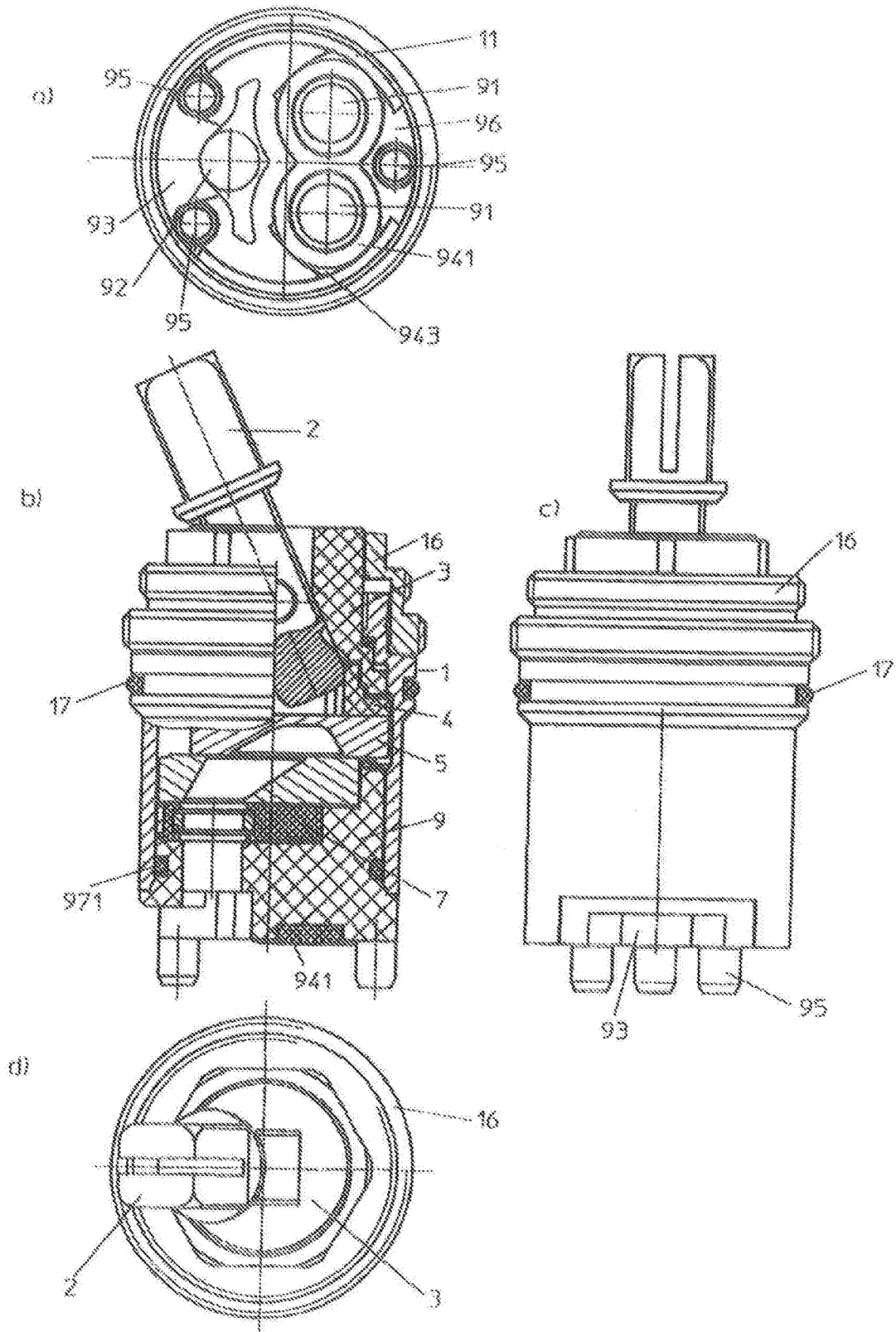




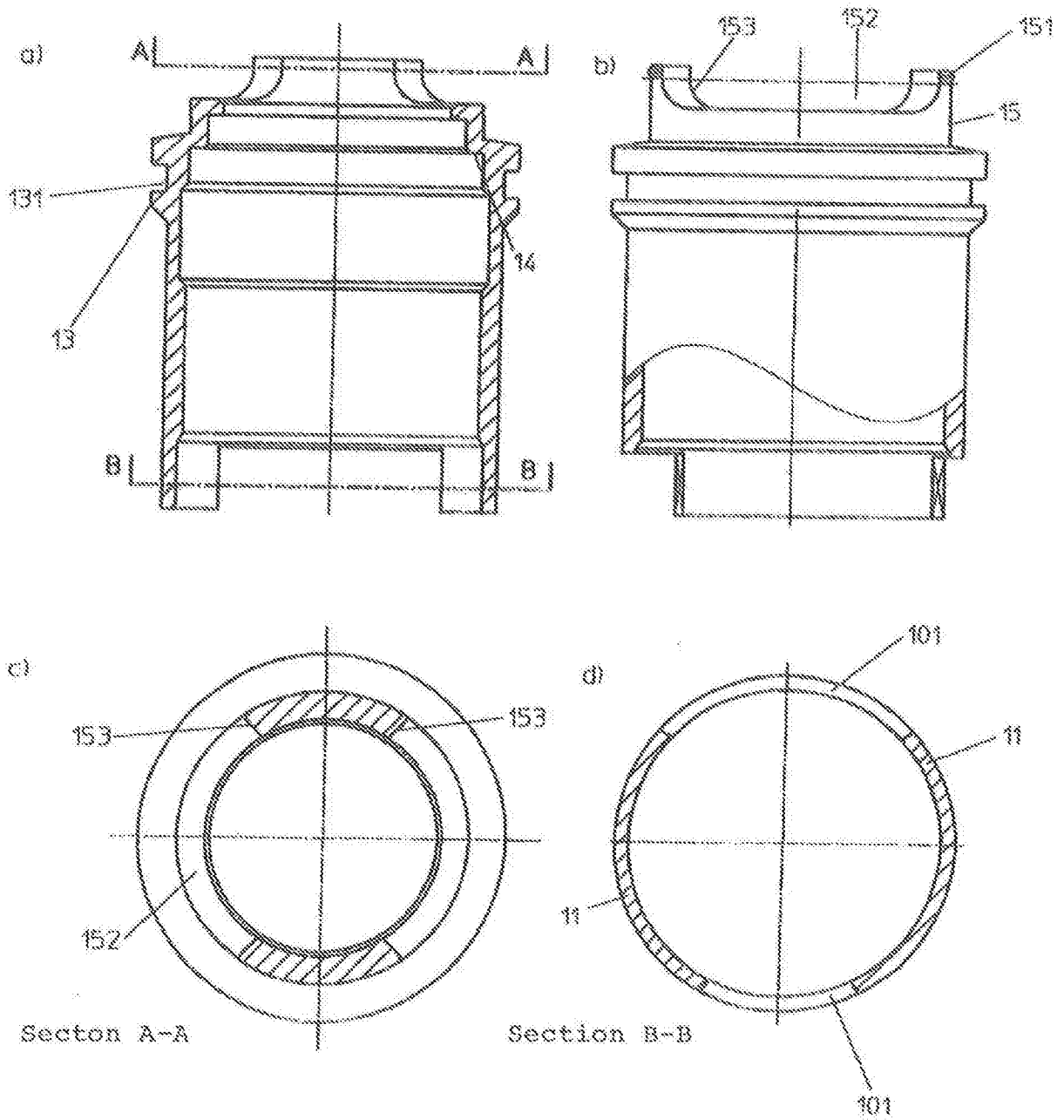
Fig. 12



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Fig. 13



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Fig. 14

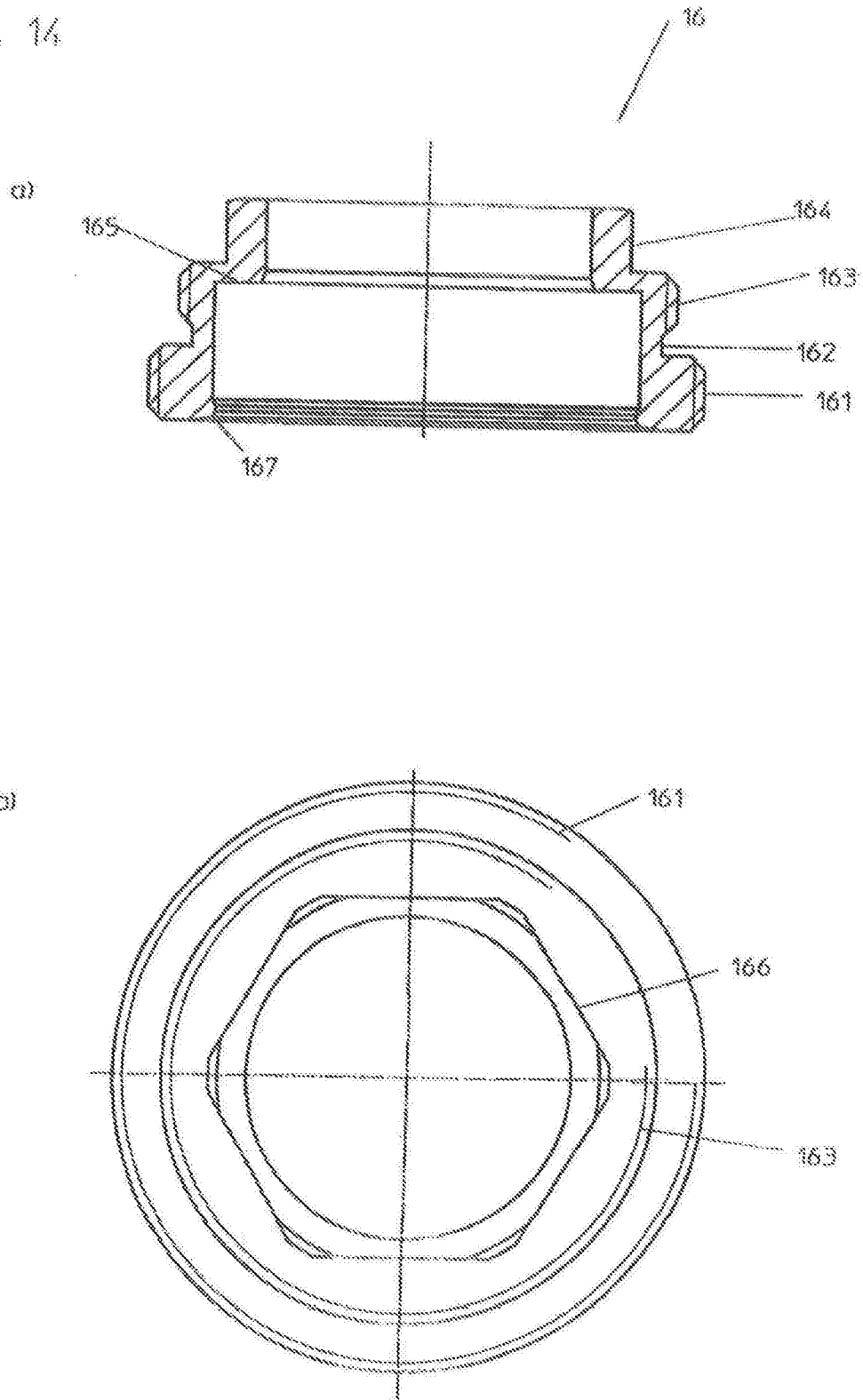


Fig. 15

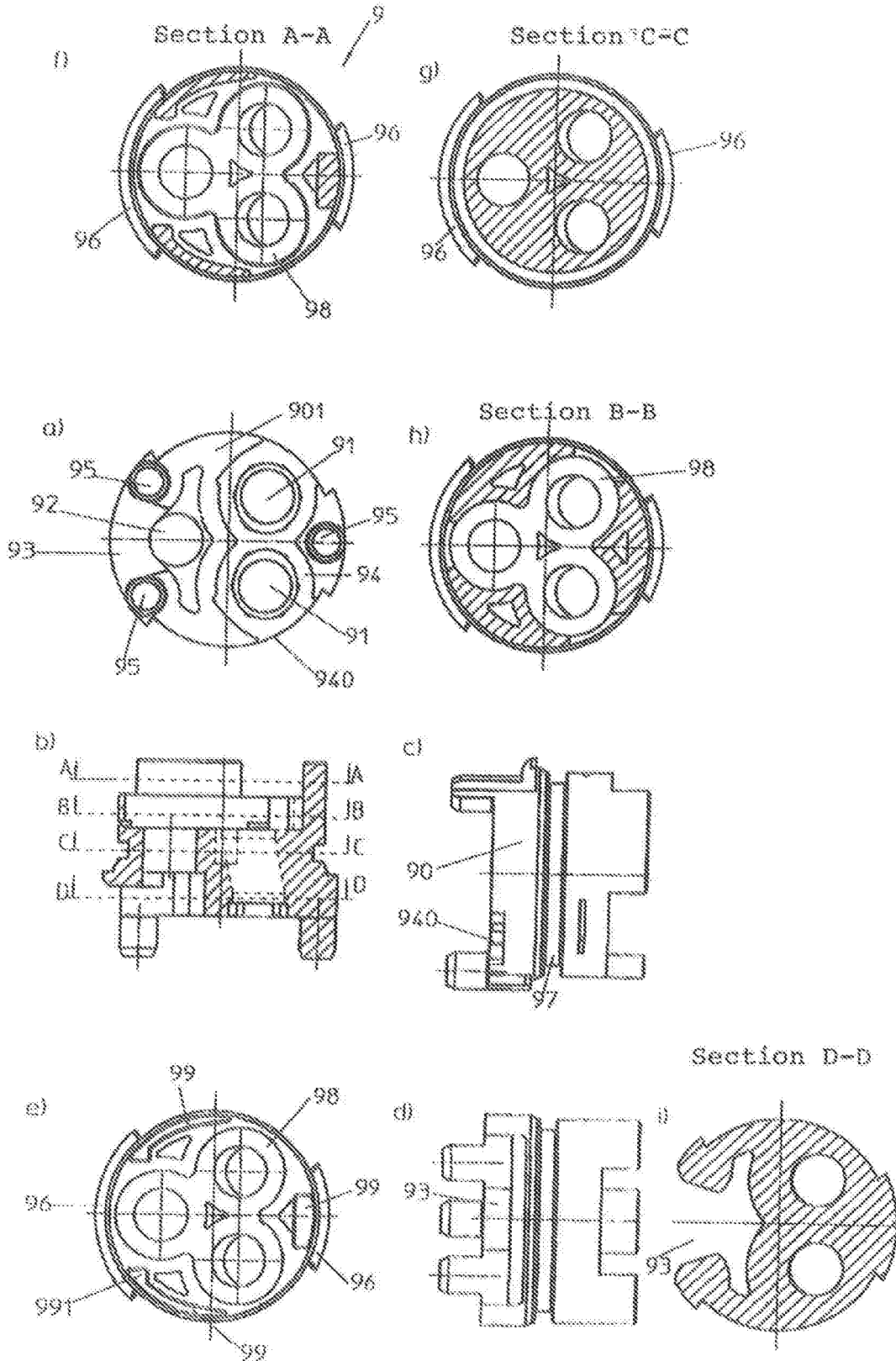


Fig. 16

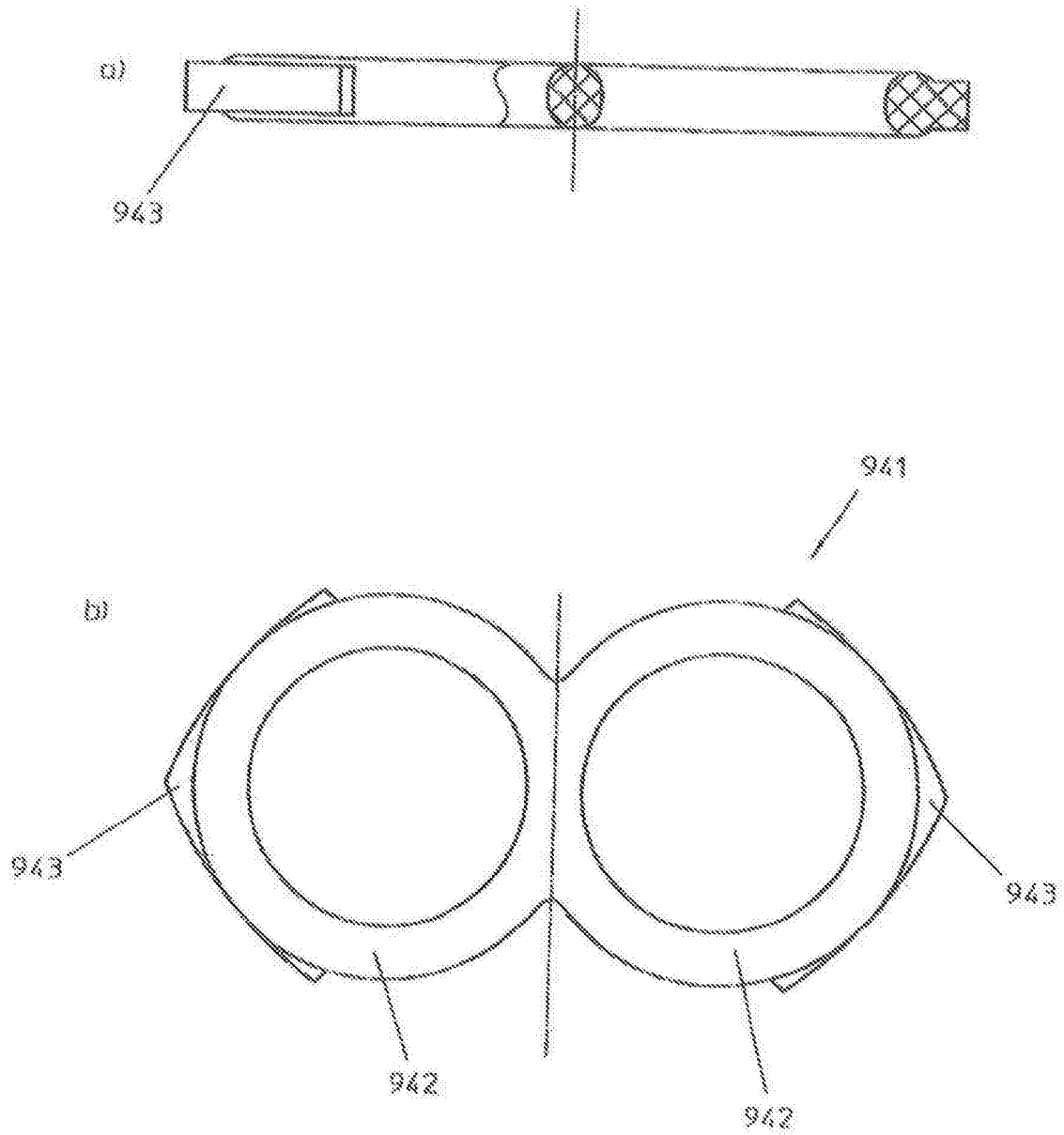


Fig. 17

