(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 461 959 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
03.04.2019 Bulletin 2019/14

(51) Int Cl.:
E03C 1/232 *(2006.01)*

(21) Application number: **18196592.2**

(22) Date of filing: **25.09.2018**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **26.09.2017 SE 1751196**
10.07.2018 SE 1850878

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(54) **OVERFLOW DEVICE**

(57) An overflow device (10) comprises a ring-shaped mounting portion (20) adapted to the mounted below the drain of a washbasin; and a rigid pipe (30) connecting to the ring-shaped mounting portion at a first end (34) of the rigid pipe (30). By providing a flexible extension pipe (40) connecting to the rigid pipe, wherein one of the rigid pipe (30) and the flexible extension pipe (40) has a knee portion (32), an overflow device which is inexpensive to manufacture, which is easy to assemble to the washbasin and which has good flow properties is obtained.

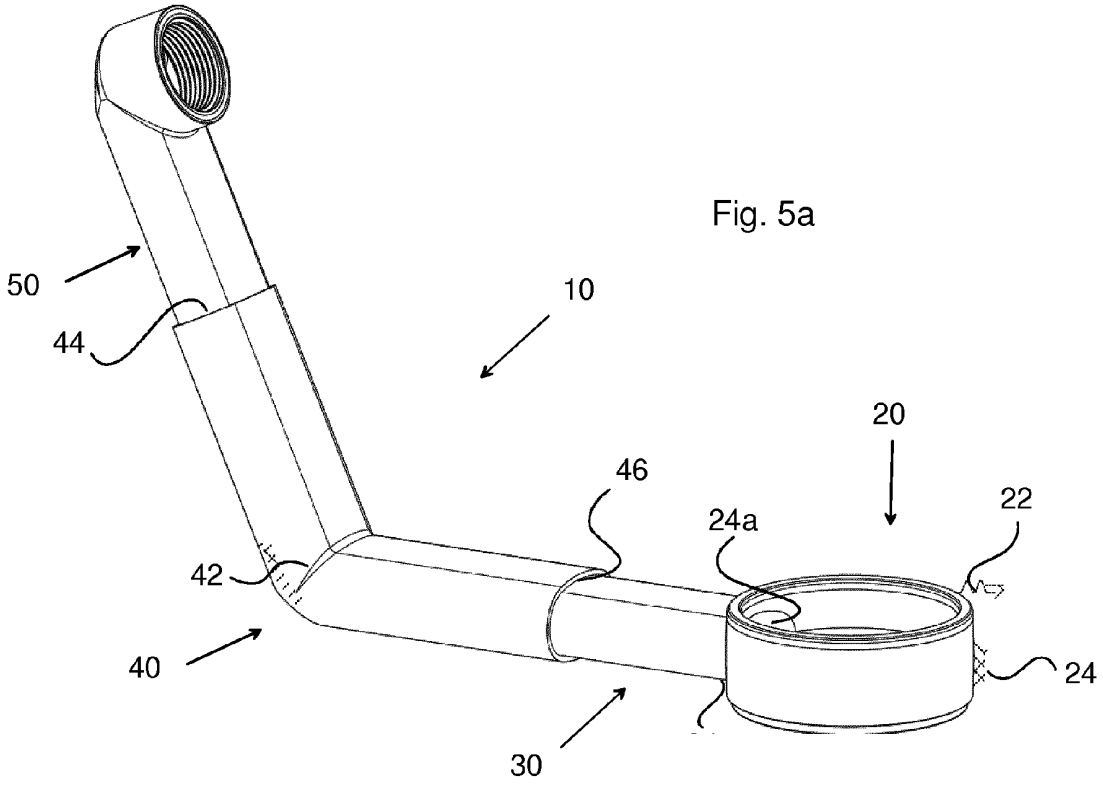

Fig. 5a

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Description

Technical field

[0001] The present invention relates generally to washbasins and more particularly to an overflow device for use with washbasins.

Background art

[0002] There are two general types of washbasins or sinks: those with integrated overflow channel and those with an external overflow channel. The former kind is often made of china, where it is possible to manufacture the washbasin with internal channels. The latter kind of washbasin may be of other materials, such as marble, wherein it is impossible or at least very difficult to form internal channels in the goods.

[0003] Common to the two kinds of washbasins is that the overflow channel has an inlet in the upper portion of the washbasin and an outlet downstream of the outlet plug in the bottom of the washbasin. The function of the overflow channel is to ensure that no water flows over the edges of the washbasin should the outlet plug be closed and the water be flowing unattended.

[0004] External overflow devices having a pipe interconnecting the inlet and the outlet of the overflow channel constitute an additional part, adding cost and space to the washbasin. Also, it is important that the overflow channel has sufficient capacity to divert water from the washbasin at least at the same rate as water is added to the washbasin from the water tap.

Summary of invention

[0005] An object of the present invention is to provide an external overflow device which addresses the above mentioned problems and which is inexpensive to manufacture, which is easy to assemble to the washbasin and which has good flow properties.

[0006] According to the invention, there is provided an overflow device comprising a ring-shaped mounting portion adapted to the mounted below a washbasin outlet; and a rigid pipe connecting to the ring-shaped mounting portion at a first end of the rigid pipe; the device being characterized by a flexible extension pipe connecting to the rigid pipe, wherein one of the rigid pipe and the flexible extension pipe has a knee portion.

[0007] In a preferred embodiment, the ring-shaped mounting portion comprises a circular wall, from which a flange extends at the lower end portion thereof.

[0008] In a preferred embodiment, the ring-shaped mounting portion and the rigid pipe are made of a rigid material, preferably rigid polypropylene.

[0009] In a preferred embodiment, the ring-shaped seal and the flexible extension pipe are made of a flexible material, preferably flexible thermoplastic polymer.

[0010] In a preferred embodiment, the knee portion is angled to that an end of the rigid flexible extension pipe faces upward at an angle from horizontal. The angle is preferably in the range of 20 - 90 degrees, more preferably 40 - 60 degrees.

[0011] In a preferred embodiment, the inner and outer surfaces of the flexible extension pipe are smooth.

[0012] In a preferred embodiment, the cross-sectional shape of the rigid pipe is oval.

[0013] In a preferred embodiment, the flexible extension pipe is integral with the rigid pipe. In another preferred embodiment, the flexible extension pipe is a separate part connected to the rigid pipe by means of press fitting.

Brief description of drawings

[0014] The invention is now described, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a sectional view of part of a washbasin with an external overflow device according to the invention;

Fig 2 shows the attachment of the overflow device shown in Fig. 1 to the drain of the washbasin;

Fig. 3 is an overall view of the external overflow device shown in Figs. 1 and 2;

Fig. 4 is a sectional view though the external overflow device shown in Figs. 1 and 2; and

Figs. 5a and 5b show a second embodiment of an overflow device in an extended and a retracted position, respectively.

Description of embodiments

[0015] In the following, a detailed description of an overflow device according to the invention and a method of its manufacturing will be given. In this description, when references are made to direction, such as "up" or "down", these directions correspond to directions during normal use, i.e., when the overflow device is mounted to a washbasin.

[0016] Also, part of this invention is based on the manufacturing technology known as "2K" injection moulding technology, wherein 2K or 'two-shot' injection moulding consists of processing two different polymers or two different colours of one polymer into an end product by means of one injection moulding process. When the term "integral" is used in this description, this means that two portions have been produced with 2K moulding, forming one single "integral" part.

[0017] The term "washbasin" is used throughout this description but it will be appreciated that the inventive idea is applicable to all household basins, both in kitchens

and in bathrooms or the like, such as laundry rooms.

[0018] Fig. 1 is a sectional view of part of a washbasin 1 with an external overflow device according to the invention, generally designated 10. The overflow device 10 is attached to the drain of the washbasin 1 between a drain cup 3 and a drain pipe 5. A plug or stopper 7 is provided in the drain cup 3 and adapted for vertical movement between an upper position, wherein water is allowed to flow into the drain, and a lower position, wherein the plug prevents water from leaving the washbasin. Although a traditional plug is shown in the figures, it will be appreciated that a plug of the so-called pop-up type can be used as well.

[0019] Fig. 2 is a perspective view showing the interconnection between the drain cup 3, the drain pipe 5 and the overflow device 10. It is here seen that a ring-shaped mounting portion 20 of the overflow device 10 is situated with the drain cup 3 partly extending into a central hole of the ring-shaped mounting portion 20. This ring-shaped mounting portion 20 abuts a corresponding circular portion 5a of the drain pipe 5.

[0020] A rigid pipe 30 of the overflow device 20 is in fluid connection with the central hole of the ring-shaped mounting portion 20, see Fig.1. This means that fluid entering from this rigid pipe 30 will be directed into the drain pipe 5, without passing the washbasin 1 itself. The other end of the rigid pipe is integral with a flexible extension pipe 40, as will be explained in detail below.

[0021] To ensure a tight connection between the different parts, the ring-shaped mounting portion 30 is provided with an integral ring-shaped seal 22, which preferably abuts both the underside of the washbasin 1 and the outside of the drain cup 3. Correspondingly, the circular portion 5a of the drain pipe 5 is provided with a ring-shaped seal 5b which seals the interface between the ring-shaped mounting portion 20 of the overflow device 10 and the drain pipe 5. Also this ring-shaped seal 5b is preferably integral with the drain pipe 5.

[0022] The overflow device 10 will now be described in detail with reference to Figs. 3 and 4. The overflow device 10 comprises three main portions: the ring-shaped mounting portion 20, the rigid pipe 30 and the extension pipe 40. The ring-shaped mounting portion 20 comprises a circular wall 24, from which a flange 26 extends at the lower end portion thereof. This flange 26 is adapted to rest against the ring-shaped seal 5b of the drain pipe, as explained above with reference to Fig. 1. The integral ring-shaped seal 22 is provided on the upper end portion of the circular wall 24 and is adapted to seal against the washbasin 1 and the drain cup 3, as explained before. There is an opening 24a in the circular wall 24, where the rigid pipe 30 connects to the circular wall 24. The ring-shaped mounting portion 20 is made of a rigid material, such as rigid polypropylene, except for the ring-shaped seal 22, which is made of a flexible material, such as flexible thermoplastic polymer (TPP). One condition on the materials of the different portions is that they allow two-shot injection moulding, so that the overflow device 10 can be made as one single part for assembly.

[0023] The rigid pipe 30 is in fluid connection with the ring-shaped mounting portion 20. It is preferred that the same material is used for these two portions and that they are made as one single piece during manufacturing, i.e., in one shot. The cross-sectional shape of the rigid pipe 30 is preferably oval or elliptic, which gives the same cross-sectional flow area but with lower height. A first end 34 of the rigid pipe 30 connects to the opening 24a of the ring-shaped mounting portion 20 and with a fixed height of the circular wall 24, a bigger flow area is achieved with an oval or elliptic cross-sectional shape. The rigid pipe 30 is provided with a knee portion 32, which makes the second end 36 of the rigid pipe 30 opposite the first end 34 face upward at an angle from horizontal. This angle, denoted α in Fig. 4, is in a preferred embodiment in the range of 20 - 90 degrees, more preferably 40 - 60 degrees.

[0024] Finally, the overflow device 10 comprises the flexible extension pipe 40, which is at the lower end 42 thereof integral with the second end 36 of the rigid pipe 30. The material of the flexible extension pipe 40 may be the same as the material of the ring-shaped seal 22, allowing for two-shot injection moulding with two different materials, such as rigid polypropylene and flexible TPP.

[0025] The cross-sectional shape of the flexible extension pipe 40 may be circular or elliptical or oval, depending on the requirements. With a circular cross-sectional shape, the risk of creating a stop in the pipe by bending is minimal. In this embodiment, the second end 36 of the rigid pipe would also have circular cross-sectional shape while the first end 34 thereof would have elliptical or oval cross-sectional shape.

[0026] The upper end 44 of the flexible extension tube 40 is adapted to be connected to an overflow connection 50, see Fig. 3. This overflow connection 50, shown in an exploded view in the figure, is adapted to be mounted to the overflow inlet in the upper portion of the washbasin (not shown in the figures). The connection between the upper end 44 of the flexible extension pipe 40 and the overflow connection 50 may be though press fitting, for example.

[0027] When connecting the upper end 44 of the flexible extension pipe 40 and the overflow connection 50, the flexible extension pipe 40 may be cut to a suitable length by means of a knife, for example. It will be appreciated that the original length of the flexible connection pipe 40 should be long enough for all foreseeable applications. Also, the flexible extension pipe 40 may be bent, preferably up to 20 degrees, during assembly due to the flexible nature thereof. This allows for a very simple assembly with a one-piece overflow device 10 which easily can be adapted to different washbasins due to the flexible extension pipe which can be cut in place to a suitable length.

[0028] As mentioned, the inventive overflow device is made by means of two-shot moulding. Thus, in a first moulding step, the ring-shaped mounting portion 20, ex-

cluding the flexible ring-shaped seal 22, and the rigid pipe 30 are moulded. In a second moulding step, the flexible ring-shaped seal 22 and the flexible extension pipe 40 are moulded onto the upper portion of the circular wall 24 of the ring-shaped mounting portion 20 and the second end 36 of the rigid pipe 30, respectively. It is preferred that the material of the first step is rigid polypropylene while the material of the second step is flexible TPP.

[0029] A second embodiment of an overflow device according to the invention is shown in Figs. 5a and 5b. In this embodiment, which has an overall design similar to the one of the first embodiment, the knee portion is comprised in a flexible part. Thus, the overflow device 10 comprises three main portions: the ring-shaped mounting portion 20, the rigid pipe 30 and the extension pipe 40. The ring-shaped mounting portion 20 comprises a circular wall 24. The integral ring-shaped seal 22 is provided on the upper end portion of the circular wall 24 and is adapted to seal against the washbasin 1 and the drain cup 3, as explained before. There is an opening 24a in the circular wall 24, where the rigid pipe 30 connects to the circular wall 24. The ring-shaped mounting portion 20 is made of a rigid material, such as rigid polypropylene, except for the ring-shaped seal 22, which is made of a flexible material, such as flexible thermoplastic polymer (TPP). One condition on the materials of the different portions is that they allow two-shot injection moulding, so that the overflow device 10 can be made as one single part for assembly.

[0030] The rigid pipe 30 is in fluid connection with the ring-shaped mounting portion 20. It is preferred that the same material is used for these two portions and that they are made as one single piece during manufacturing, i.e., in one shot. The cross-sectional shape of the rigid pipe 30 is preferably oval or elliptic, which gives the same cross-sectional flow area but with lower height. A first end 34 of the rigid pipe 30 connects to the opening 24a of the ring-shaped mounting portion 20 and with a fixed height of the circular wall 24, a bigger flow area is achieved with an oval or elliptic cross-sectional shape.

[0031] The rigid pipe 30 connects at a second end 36 opposite to the first end to the flexible extension pipe 40. This connection is preferably made by press fit, providing a tight connection. The connection may be adjusted by adjusting the extent to which the rigid pipe 30 is inserted into the extension pipe 40, providing a telescoping function. Thus, in Fig. 5a an extended position is shown while in Fig. 5b a retracted position is shown.

[0032] The flexible extension pipe is provided with a knee portion 42. Thus, the second end 44 of the extension pipe 40 opposite to the first end 46 connecting to the rigid pipe 30 thus face upward at an angle from horizontal. This angle, corresponding to the angle α in Fig. 4, is in a preferred embodiment in the range of 20 - 90 degrees, more preferably 40 - 60 degrees.

[0033] The material of the flexible extension pipe 40 may be the same as the material of the ring-shaped seal 22, i.e., flexible TPP.

[0034] The cross-sectional shape of the flexible extension pipe 40 may be circular but is preferably elliptical or oval. The outside of the extension pipe 40 may be provided with ribs (not shown) in the knee area thereof, reducing the risk of creating a stop in the pipe by bending.

[0035] The upper end 44 of the flexible extension tube 40 is adapted to be connected to an overflow connection 50, as described above with reference to Fig. 3. The connection between the upper end 44 of the flexible extension pipe 40 and the overflow connection 50 is preferably though press fitting, so as to achieve a telescopic function, facilitating the mounting operation.

[0036] When connecting the upper end 44 of the flexible extension pipe 40 and the overflow connection 50, the flexible extension pipe 40 may be cut to a suitable length by means of a knife, for example. However, the telescopic function will in most cases make this superfluous.

[0037] As mentioned before, the inventive overflow device is made by means of two-shot moulding. Thus, in a first moulding step, the ring-shaped mounting portion 20, excluding the flexible ring-shaped seal 22, and the rigid pipe 30 are moulded. In a second moulding step, the flexible ring-shaped seal 22 is moulded onto the upper portion of the circular wall 24 of the ring-shaped mounting portion 20. the flexible extension pipe 40 is in this embodiment manufactured as a separate component.

[0038] Preferred embodiments of an overflow device according to the invention and a method of its manufacturing have been described. It will be realized that these may be varied within the scope of the appended claims. As shown in the figures, the inner and outer surfaces of the flexible extension pipe 40 are preferably smooth, allowing for better flow conditions. In combination with the knee of the rigid pipe 30, only slight bending of the flexible extension pipe 40 will be required.

Claims

1. An overflow device (10), comprising:

   a ring-shaped mounting portion (20) adapted to the mounted below a washbasin outlet; and
   a rigid pipe (30) connecting to the ring-shaped mounting portion at a first end (34) of the rigid pipe (30);
   characterized by
   a flexible extension pipe (40) connecting to the rigid pipe, and
   wherein one of the rigid pipe (30) and the flexible extension pipe (40) has a knee portion (32).

2. An overflow device according to claim 1, wherein the ring-shaped mounting portion (20) comprises a circular wall (24), from which a flange (26) extends at the lower end portion thereof.

3. An overflow device according to claim 1 or 2, wherein the ring-shaped mounting portion (20) and the rigid pipe (30) are made of a rigid material, preferably rigid polypropylene.

4. An overflow device according to any one of claims 1-3, wherein the ring-shaped seal (22) and the flexible extension pipe (40) are made of a flexible material, preferably flexible thermoplastic polymer.

5. An overflow device according to any one of claims 1-4, wherein the knee portion (32) is angled to that an end (44) of the flexible extension pipe (30) faces upward at an angle (α) from horizontal.

6. An overflow device according to claim 5, wherein the angle (α) is in the range of 20 - 90 degrees, more preferably 40 - 60 degrees.

7. An overflow device according to any one of claims 1-6, wherein the inner and outer surfaces of the flexible extension pipe (40) are smooth.

8. An overflow device according to any one of claims 1-7, wherein the cross-sectional shape of the rigid pipe (30) is oval.

9. An overflow device according to any one of claims 1-8, wherein the flexible extension pipe (40) is integral with the rigid pipe (30).

10. An overflow device according to any one of claims 1-8, wherein the flexible extension pipe (40) is a separate part connected to the rigid pipe (30) by means of press fitting.

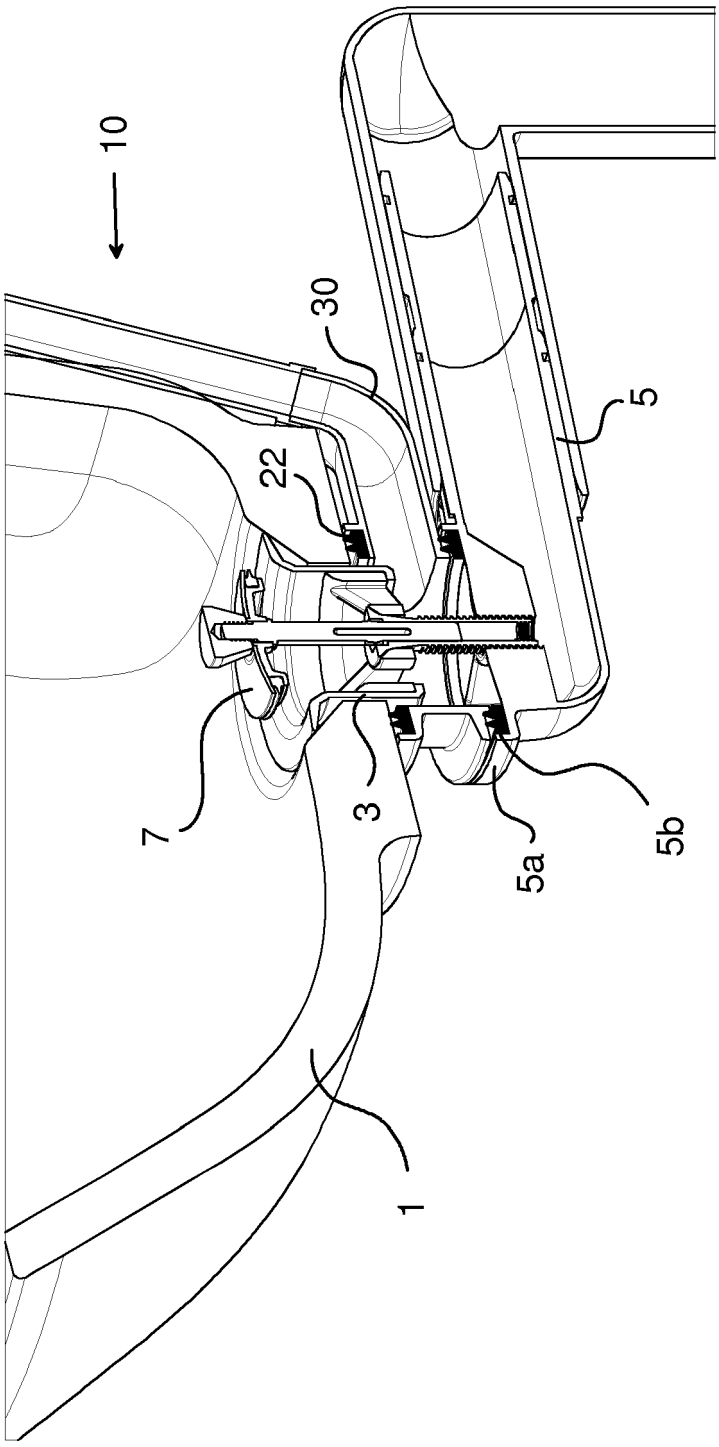

Fig. 1

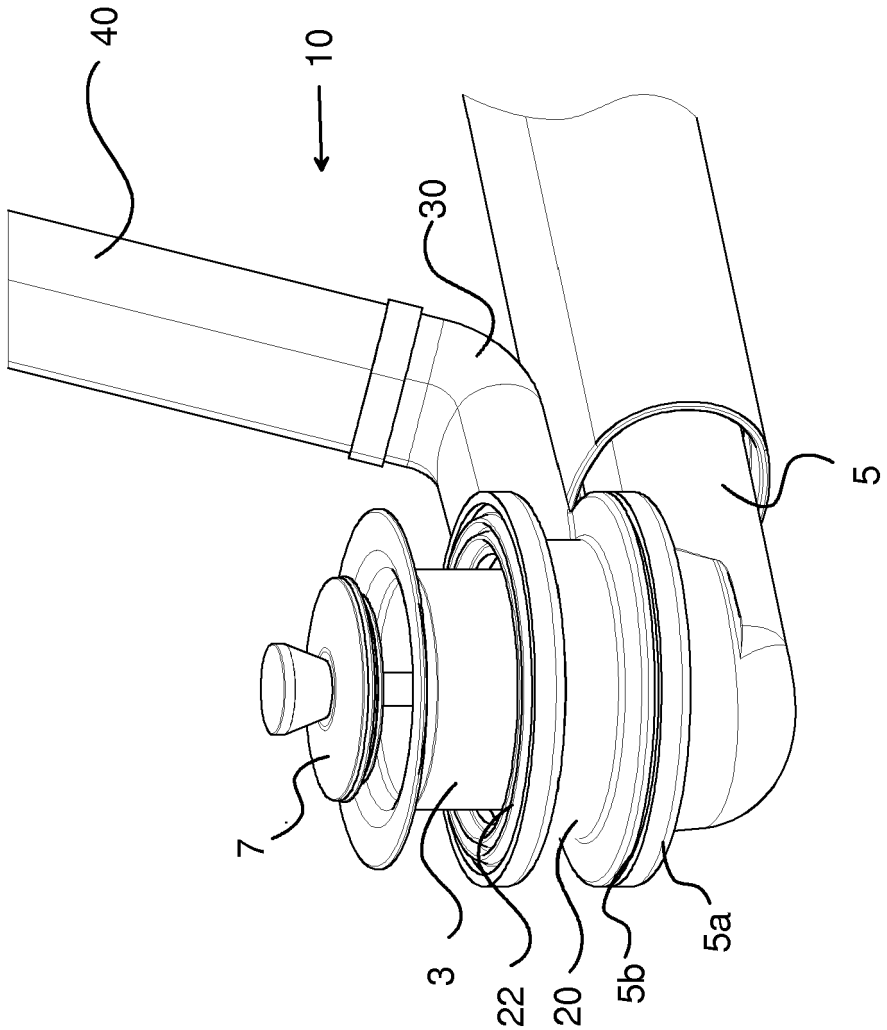

Fig. 2

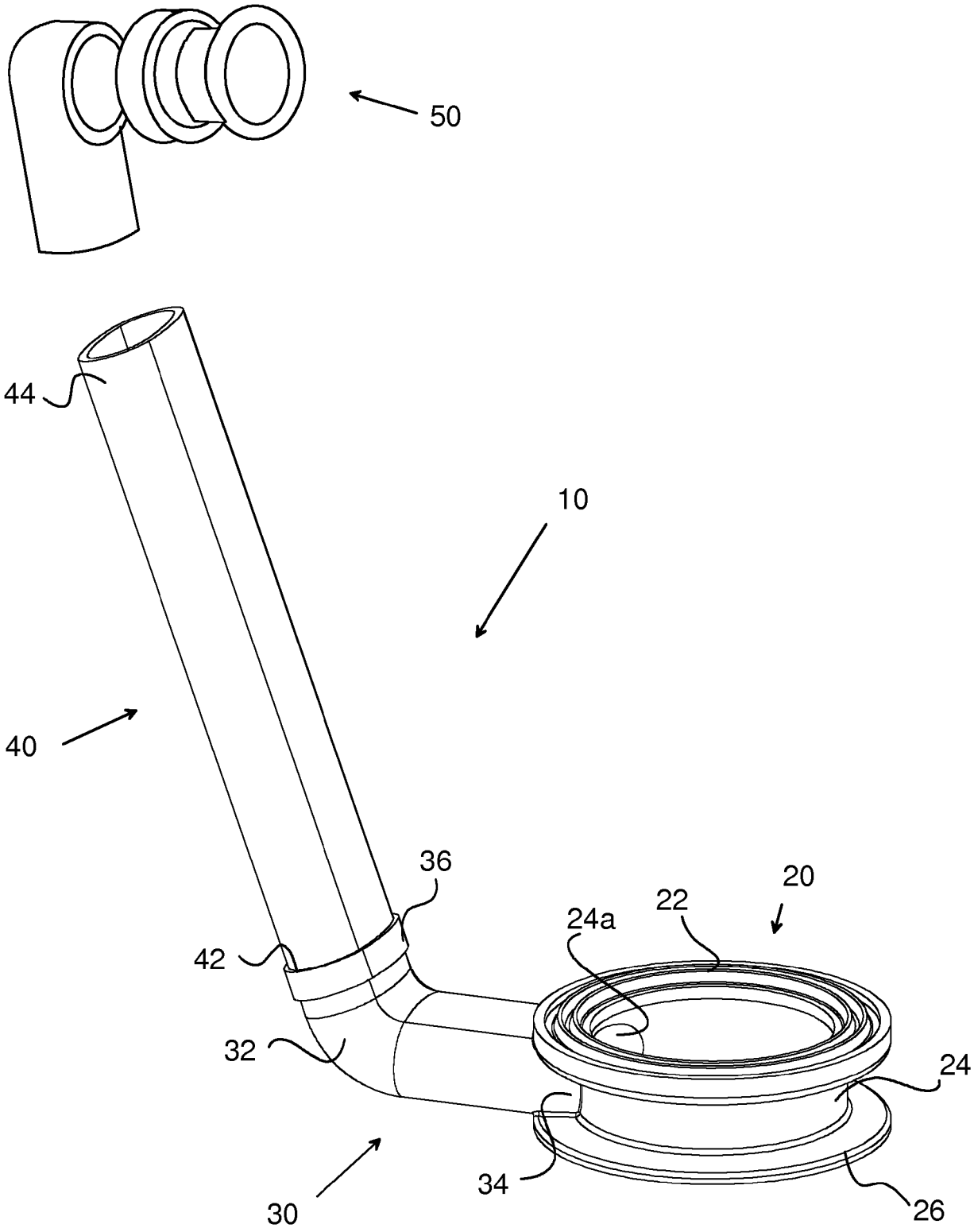

Fig. 3

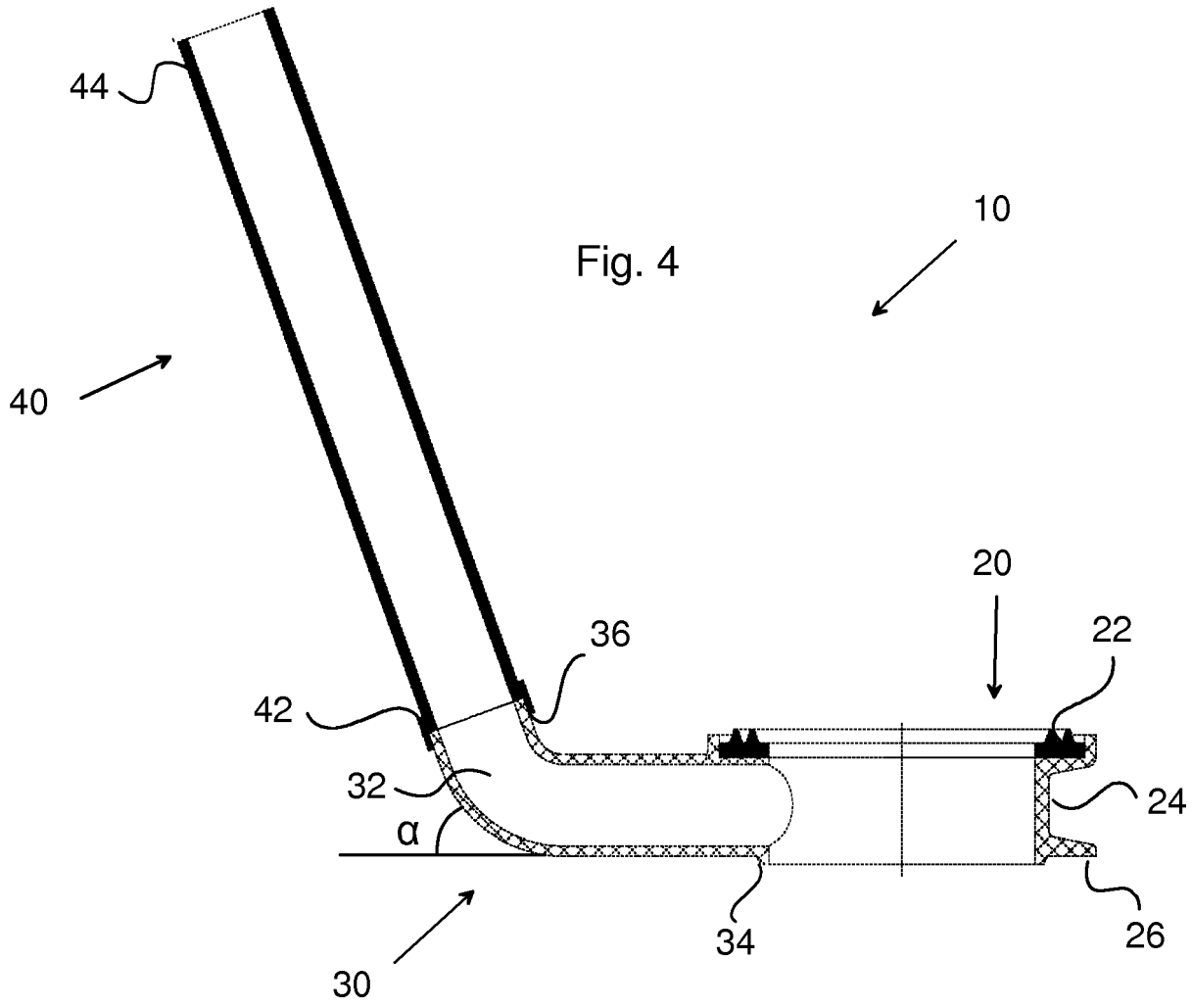

Fig. 4

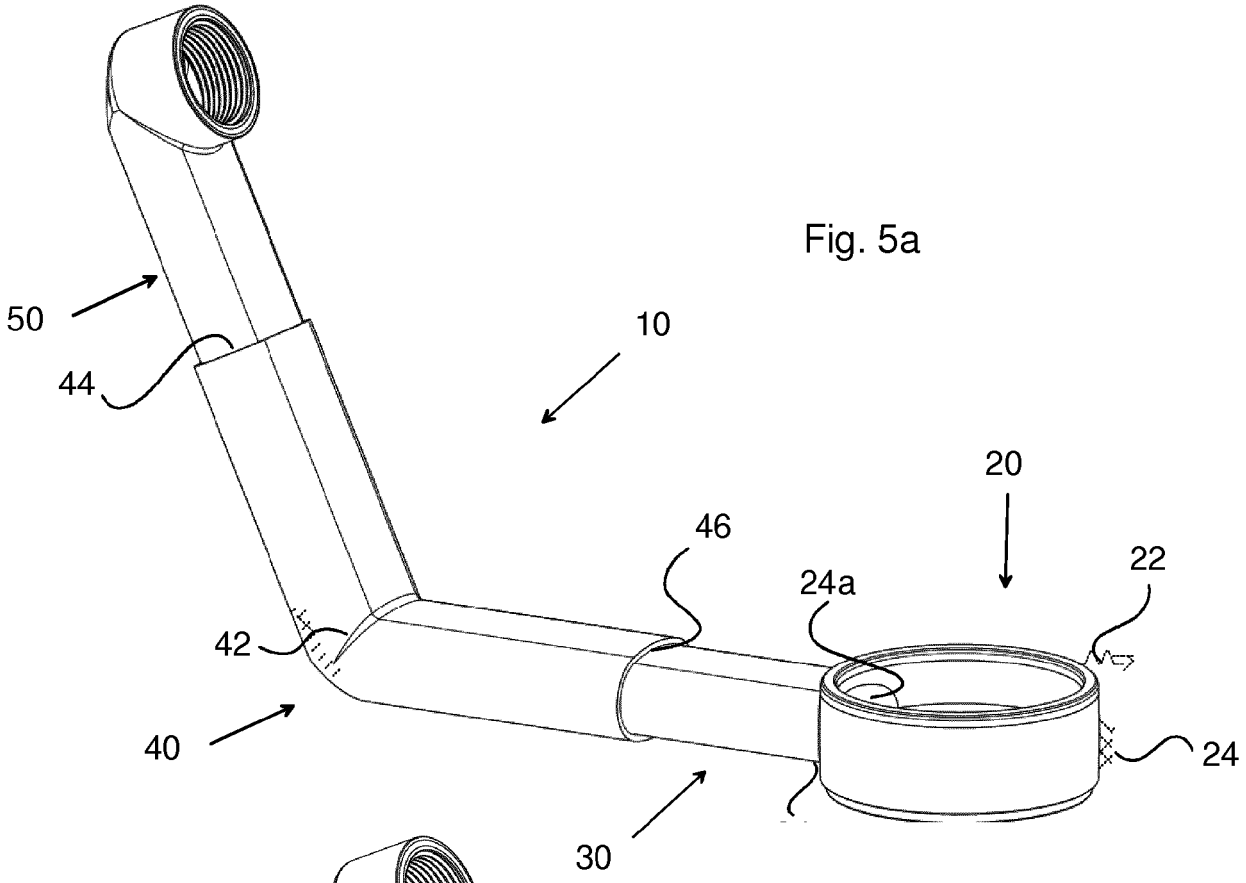

Fig. 5a

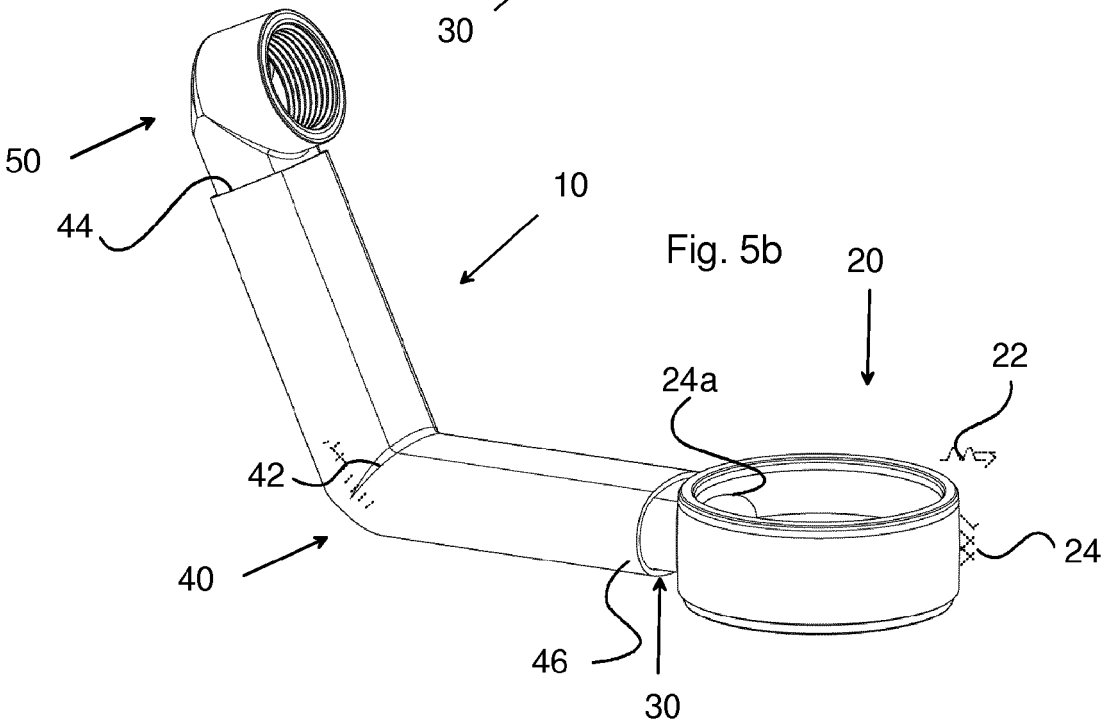

Fig. 5b

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EUROPEAN SEARCH REPORT

Application Number
EP 18 19 6592

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	CA 1 141 105 A (WALTEC INC) 15 February 1983 (1983-02-15) * page 3 - page 5; figure 1 *	1-10 8	INV. E03C1/232
X Y	US 2006/085907 A1 (BALL WILLIAM T [US]) 27 April 2006 (2006-04-27) * paragraph [0014] - paragraph [0021]; figures 3,4 *	1-10 8	
X	EP 1 826 324 A1 (CRS SPA [IT]) 29 August 2007 (2007-08-29) * figure 1 *	1	
Y	EP 2 660 398 A1 (OBERDIN S R L [IT]) 6 November 2013 (2013-11-06) * figure 1 *	8	
			TECHNICAL FIELDS SEARCHED (IPC) E03C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	19 February 2019	Horst, Werner

CATEGORY OF CITED DOCUMENTS

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