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(54) **FLOOR DRAIN INSERT**

(57) The invention relates to a floor drain insert, which comprises a cup part (21), which has a sewer connection (22), which extends outwards from the cup part (21) and inwards from the cup part (21) and to the inwards extending part of the sewer connection(22) a ring part is fastenable, the ring part has an opening (44), which substantially corresponds to an opening (24) of the sewer connection (22) and the opening (24) is upwards from its lower edge partially covered by a barrier part (45) to increase dam height.

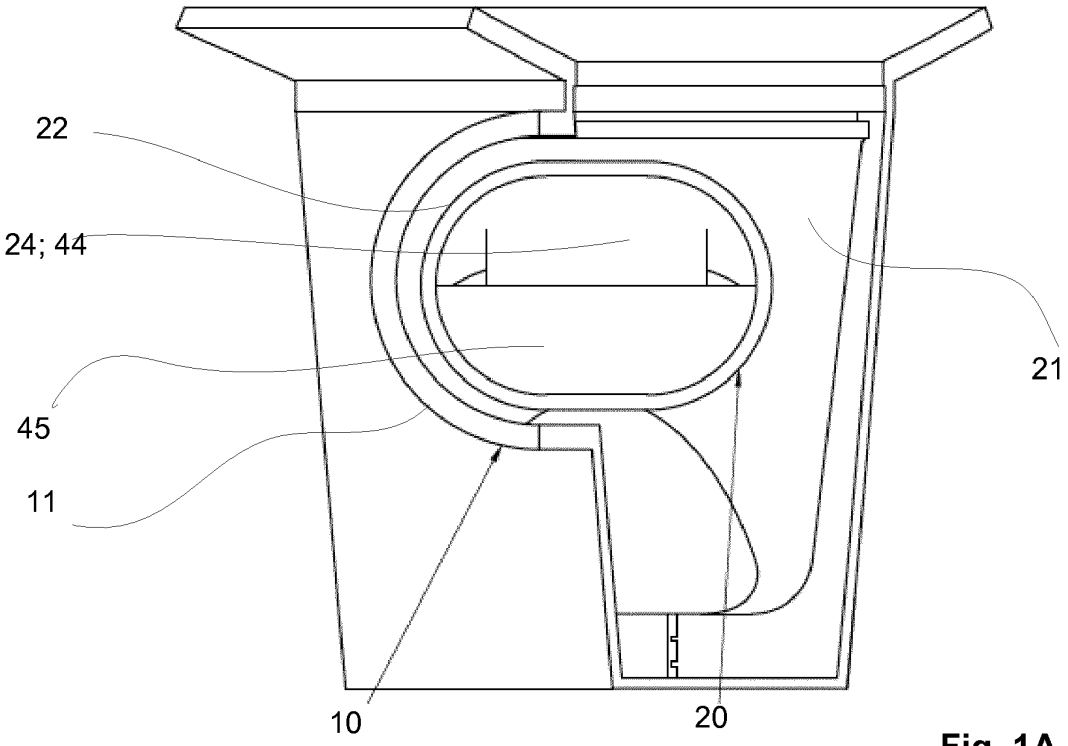

Fig. 1A

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Description

[0001] The invention relates to a floor drain insert. More specially the invention relates to a floor drain insert in accordance with the preamble part of the independent patent claim.

[0002] The sewer pipe systems of estates are to be renovated to due defects and/or damages or preventively due to their estimated lifetime coming near to closing. The renovation can be done by a so-called traditional pipe renovation, in which parts of the sewer system are in full replaced by new parts, or by so called non-destructive methods, such as coating or lining. When the lining method is used, a liner is provided inside the sewer pipe, which liner is typically impregnated with a hardening matrix material, for example with epoxy resin. After hardening of the matrix material the liner forms inside the old sewer pipe a new durable surface. As advantages of the lining method are speed and very low need to break structures and compared to full replacing of pipe system substantially less disturbances to residents of the apartments.

[0003] In connection with renovation of the sewer pipe systems of estates also other parts of the sewer systems are renovated, of which one key need of renovation are floor drains. An old floor drain can be removed and replaced with a new one, or recoated. The removal of the floor drain requires partial breaking of the surrounding structure, due to which water isolation of floor is damaged. Replacement of a floor drain thus lead to wider renovation measures. In renovation of an old floor drain by coating onto inner walls of the floor drain epoxy resin layer is applied or sprayed, which layer is let to harden, but to provide a coating result that corresponds to that of the renovated pipeline of the sewer pipe system is difficult.

[0004] It is known from prior art that in connection with renovation of a floor drain instead of full removal or of coating, a floor drain insert is used, whereby from the floor drain to be renovated a rebate plate forming a drain trap is removed, and inside the floor drain an insert is mounted, which insert in connection with the lining is connected to the corresponding pipe line with by same liner, from which liner inside the insert remaining part "a tail of the liner", is removed by cutting along an end surface of the pipe. Thus, the floor drain insert in a way forms a new floor drain inside the at its place remaining old floor drain.

[0005] In FI utility model publication 10292 is disclosed a floor drain insert, in which is into an old floor drain a cup part of acid steel and inside it mounted drain trap is located. Attachment means of the drain trap is formed in the center of the drain trap and of the cup part located metallic gripping part, which has internal thread and to that corresponding metallic fastening bolt, by help of which the drain trap is pressed against to the cup part by a separate support part.

[0006] In FI patent publication 125389 is disclosed a floor drain insert, which has a cup part adaptable to a floor drain, which cup part has a bottom, a side wall and a sewer connection, and which cup part is of metallic material, advantageously stainless or acid-proof steel. The insert comprises a releasably to the cup part attachable drain trap and attachment means for fastening the drain trap.

[0007] In FI application publication20165066 is in turn disclosed a floor drain insert, which has a cup part adaptable to a floor drain, which cup part has a bottom, a side wall and a sewer connection, a releasably to the cup part attachable drain trap and attachment means for fastening the drain trap to a side wall of the cup part, which has a substantially cylindrical part and in which the attachment means comprise a flexible and compressible attachment ring adapted around the wall of the drain trap, which attachment ring is adapted to set in the in place to the cup part mounted drain trap tightly between the attachment part of the cup part and the wall of the drain trap.

[0008] In FI utility model publication 11078 is disclosed a floor drain renovation insert, which comprises a cup part of a floor drain and a drain trap inside the cup part, in which at edge of the cup part is a ring and on an inner surface of the ring a thread, and the drain trap is formed of an open pipe and in one edge of the pipe located flange, on outer edge of which flange is a thread to join to the thread inside the ring of the cup part. The outer surface of the ring of the cup part can comprise a sealing of support the ring against the inner surface of the old floor drain. According to one example the renovation insert consists of the cup part, thereto by a threading connection joined drain trap, and between them adapted sealing and a sealing to support the ring against the inner surface of the old floor drain.

[0009] A problem in connection with floor drain inserts known from prior art is to adapt size of the insert to size of an old floor drain such, that a functioning new floor drain is provided, which floor drain has dam height fulfilling regulations. By the dam height of the floor drain is meant height from lowest point of the floor drain to lowest point of an opening of a sewer connection joining to the from the floor drain leading sewer pipe at the leaving point, see figure 6. According to the regulations the dam height of the floor drain is 50 mm. Space provided for the insert by the old floor drain is limited and it can be even so small that achievable dam height of inserts known from the prior art is not high enough.

[0010] A disadvantage in connection with the inserts known from prior art is that in connection with cutting the inside the insert remaining part of the liner, easily also the inner surface of the insert is damaged.

[0011] An object of the invention is to achieve an improved floor drain insert, in which the problems and disadvantages of the solutions known from the prior art are eliminated or at least minimized.

[0012] A particular object of the invention is to create a floor drain insert, in which the problems and disadvantages of the solutions known from the prior art, especially relating to achieving high enough dam height, are elim-

inated or at least minimized.

[0013] Another particular object of the invention is to create a floor drain insert, in which the problems and disadvantages of the solutions known from the prior art, especially relating to the cutting of the lining remaining inside the insert, are eliminated or at least minimized.

[0014] To achieve the above mentioned and later upcoming objects the floor drain insert according to the invention is mainly characterized by features disclosed in the characterizing part of the independent claim. Advantageous additional features are defined in the dependent claims.

[0015] The floor drain insert according to the invention comprises a cup part, which has a sewer connection, which extends out-wards from the cup part and inwards from the cup part and to the inwards extending part of the sewer connection a ring part is fastenable, which ring part has an opening, which substantially corresponds to an opening of the sewer connection and the opening is upwards from its lower edge partially covered by a barrier part to increase dam height.

[0016] According to the invention the ring part has a protrusion, which has a fastening protrusion and the inwards extending part of the sewer part has a fastening groove, to which the fastening protrusion is adapted to attach to fasten the ring part to the cup part.

[0017] According to an advantageous feature of the invention the cup part comprises at its front side, below the sewer connection an inclined part.

[0018] According to an advantageous feature of the invention the insert further comprises an inner part, which has a collar and a pipe part, in which the inner part is by the collar fastened to an upper edge of the cup part and the pipe part, when the inner part is mounted at its place in the cup part, extends towards bottom of the cup part to a distance from the bottom of the cup part.

[0019] According to an advantageous feature of the invention the ring part is configured to a post-mounting sleeve.

[0020] According to an advantageous feature of the invention the ring part comprises a curved pipe part joining to the ring part and a from the curved pipe part extending straight pipe part, in which the straight pipe part extends to a distance from the inner bottom surface of the cup part.

[0021] According to an advantageous feature of the invention the floor drain insert is adapted to be mounted to an existing floor drain in connection with sewer renovation.

[0022] The invention can be used in connection with renovation of various different types and different sizes of floor drains and by the invention many advantages are achieved. In the floor drain insert according to the invention and its advantageous additional features dam height is adjustable, whereby it is well suitable to be used in floor drains of different types and different sizes, as the dam height can be adjusted to the height required without increasing the size of the insert. Additionally, due to the inside the cup part extending sewer connection after lining inside the insert remaining part of the liner can be cut against the sewer connection part, whereby the insert is not is danger to be damaged, as the cutting is not done against the inner surface of the cup part.

[0023] In the following the invention is described in more detail by reference to the figures of the attached drawing, to details of which the invention is not meant to be tightly limited.

[0024] In figures 1A-1B is schematically shown an advantageous example of a floor drain insert according to the invention mounted in an old floor drain. In figure 1A is schematically shown a partial cut-away view and in figure 1B is schematically shown a three-dimensional partial cut-away view, in which part of the old floor drain is removed to show inner structure.

[0025] In figures 2A-2D is schematically shown an advantageous example of a cup part of a floor drain insert according to the invention. In figure 2A is schematically show a view from front i.e. viewed from side of a sewer connection, in figure 2B viewed from side, in figure 2C is shown a three-dimensional view and in figure 2D viewed from above.

[0026] In figures 3A-3E is schematically shown an advantageous example of an inner part of an advantageous example of an insert embodiment according to the invention. In figure 3A is schematically shown a view viewed from front, in figure 3B a three-dimensional view viewed inclined from above and side, in figure 3C is shown a view from above, in figure 3D a three-dimensional view viewed inclined from below and in figure 3E a view viewed from side.

[0027] In figures 4A-4C is schematically shown an advantageous example of a post-mounting sleeve of an advantageous example of an insert embodiment according to the invention. In figure 4A is schematically shown a view viewed from side, in figure 4B from front and in figure 4C a three-dimensional view.

[0028] In figures 5A-5C is schematically shown another advantageous example of an insert embodiment according to the invention. In figure 5A is schematically shown a three-dimensional view, in figure 5B a view viewed from front and in figure 5C viewed from side.

[0029] In figure 6 is schematically shown defining of dam height.

[0030] In the following description relating to figures 1A-6 by corresponding reference numerals and signs is indicated corresponding elements, parts, partial assemblies, unless otherwise noted and it should be understood that examples are modifiable for different embodiments and situations. In some figures some repetitive reference signs may have been omitted for clarity reasons. In the following description, even though certain features are explained in certain connection and embodiment, the features are applicable in other connection and embodiment irrespective, whether mentioned and many modifications and variations are thus possible.

[0031] In the figures 1A-1B schematically shown an

example is a into an old floor drain 10 mounted floor drain insert 20, which comprises a cup part 21 to be fastened inside an old floor drain 10, which cup part has a sewer connection 22, which sets in connection with a sewer connection 11 of the old floor drain 10 such, that opening of the sewer connection 22 of the cup part 21 sets at the sewer connection 11 of the old floor drain 10, and the sewer part 22 of the cup part 21 of the insert 20 of the floor drain 10 extends upwards from the cup part 21 and inwards from the cup part 21 and unites to the sewer drain 11 of the old floor drain 10. The cup part 20 has also a bottom and a side wall. To the part of the sewer part 22 of the cup part 21 of the insert 20 extending inwards a ring part 46; 56 is fastenable, which ring part 46; 56 has an opening 44; 54 that substantially corresponds to the opening 24 of the sewer part 22 and thus also the opening of the sewer connection 11 of the old floor drain 10 to the sewer pipe 61. The opening 24 of the cup part 21 of the insert 20 is upwards beginning from its lower edge partially covered by a barrier part 45; 55 to increase dam height.

[0032] In figures 2A-2D is schematically shown a cup part 21 of the floor drain insert 20, which is located inside an old floor drain 10 (Fig. 1) such, that support legs 23 extending downwards from the bottom surface of the cup part 21 lean on inner bottom of the old floor drain. Simultaneously, the support legs 23 function as further gripping in fastening of the cup part 21 to the old floor drain 10. Typically, the cup part 21 is fastened inside the old floor drain 10 by attaching the cup part 21 by epoxy resin or corresponding attachment substance to inner surfaces of the old floor drain 10. The cup part 21 comprises a sewer connection 22, that is fitted to the out-going sewer pipe 61 (Fig. 6) and at the sewer connection 11 of the old floor drain 10. The sewer connection 22 is substantially cylindrical extending a distance inside and outside of the cup part 21 from the wall of the cup part 21. At the sewer connection 22 the cup part 21 has an opening 24, through which the sewage is led to the sewer pipe 61. The cup part 21 is substantially cup-like, tapering off towards the bottom surface and comprises at its front, below the sewer connection 21 an inclined part 25, at which part the diameter of the cup part 21 decreases more than at other parts of the cup part 21 so, that it adapts to form of the old floor drain, that is inclined at the same part. A gripping protrusion 26 is provided behind the cup part 21. The sewer connection 22 comprises a fastening groove 27, to which a corresponding fastening protrusion 47 of a post-mounting sleeve 40 (Fig. 4) is fastened at its place to fasten the post-mounting sleeve 40 to the cup part 21. The sewer connection 22 extends inside the cup part 21 and after the lining extra liner can be cut against its end, whereby the insert is not damaged.

[0033] In figures 3A-3E is schematically shown an example of an inner part 30 of the floor drain insert 20, which inner part comprises a collar 31, which is annular, and which comprises a pipe part 32, which extends downwards from the collar 31. The inner part 30 also comprises supports 33, which are fitted to set on the upwards protruding part of the sewer part 22 of the cup part 22 to secure the stay at its place of the post-mounting sleeve 40. The collar 31 of the inner part 30 sets at its outer edge in connection to upper edge of the cup part 21 fastening the inner part 30 at its place into the cup part 21, for example at the outer edge of the collar 31 and the upper edge of the cup part 21, which surfaces tighten opposed to each other by a separately added sealing. The sewage flows through the pipe part 32 of the inner part 30 to the cup part 21. Mounted at its place lower edge of the pipe part 32 remains at a distance from the bottom surface of the cup part 21.

[0034] In figures 4A-4C i schematically shown an example of a post-mounting sleeve 40 of a floor drain insert, which post-mounting sleeve 20 is mounted in connection with the sewer connection 22 of the cup part 21. The post-mounting sleeve 40 is annular comprising an opening 44, to which a barrier part 45 with desired height is formed, which barrier part 45 covers the opening 44 at desired height to increase the dam height. An annular ring part 46 of the post-mounting sleeve 40 comprises a protrusion 43, which has a fastening protrusion 47 to attach the post-mounting sleeve 40 in connection to the sewer connection 22 of the cup part 21 to the corresponding fastening groove 27.

[0035] In figures 5A-5C is schematically shown an example of an inner pipe 50 of a floor drain insert 20, where a sewer connection 51 comprises a ring part 56 and a protrusion 53 formed thereto, which has a fastening protrusion 58 to fasten to the fastening groove 27 to fasten the inner pipe 50 to the cup part 21. The sewer connection 51 is annular comprising an opening 54, to which is formed a barrier part 55 with desired height, which barrier part 55 covers the opening 54 at desired height to increase the dam height. From the sewer connection 51 a curved pipe part 52 extends inside the cup part 21, by which curved pipe part 52 a straight part 57 of the inner pipe 50 is turned to pass towards the bottom of the cup part 21. When mounted in place the lower edge of the straight pipe part 57 extends to a distance from the inner bottom surface of the cup part 21. When the straight pipe part 57 is mounted at its place, lower edge of the straight pipe part extends to a distance from inner bottom surface of the cup part 21.

[0036] As shown in figure 6 dam height L of a floor drain i.e. in a renovation case dam height of the cup part 21 of the floor drain insert 20 is height directional distance from the lowest point of the outlet pipe of the inner part 32 of the insert 20 to the lowest height directional point of the out-leading sewer pipe 61 i.e. to the lowest height directional point of the opening 44, 54.

[0037] In accordance with the examples shown in the figures the sewer connection 21 of the insert 20 of the floor drain 10 extends outwards from the cup part 21 and inwards from the cup part 21 and joins to the sewer connection 11 of the old floor drain 10. To the inwards extending part of the sewer connection 22 of the cup part

21 of the insert 20 is fastenable a ring part 46; 56, which ring part 46; 56 has an opening 44; 54, that substantially corresponds to the opening 24 of the sewer connection 22 and thus also to the opening of the sewer connection 11 of the old floor drain 10 to the sewer pipe 61. The opening 24 of the cup part 21 of the insert 20 is upwards beginning at its lower edge partially covered by the barrier part 45; 55 to increase the dam height. The ring part 46; 56 has the protrusion 43; 53, which has the fastening protrusion 47, 57 and the inwards extending part of the sewer connection 22 has the fastening groove, to which the fastening protrusion 47; 57 is fitted to be attached to fasten the ring part 46; 56 to the cup part 21. The insert 20 further comprises the inner part 30, which has the collar 31 and the pipe part 32. The inner part 30 is at the collar 31 fastened to the upper edge of the cup part 21 and the pipe part 32, when the inner part 30 is mounted at its place to the cup part 21, extends towards the bottom of the cup part 21 to a distance from the bottom of the cup part 21. The insert 20 of the floor drain 10 is adapted to be mounted to the existing floor drain 10 in connection with sewer renovation. Typically, from the old floor drain 10 the rebate plate is first removed, where after the cup part 21 of the insert 20 is preliminary fastened inside the old floor drain 10 for example by epoxy resin and thereafter the lining of the pipe system is performed through the insert 20 and the extra part of the liner inside the cup part 21 is cut against the inwards to the cup part 21 extending part of the sewer connection 22 and at the end the insert is further attached by further epoxy resin to the old floor drain 10 and the other parts 30, 40; 50 of the insert are mounted at their places.

Reference signs used in the drawing:

[0038]

10 old floor drain
11 sewer connection of the old floor drain
20 insert
21 cup part
22 sewer connection
23 support leg
24 opening
25 inclined part
26 gripping part
27 fastening groove
30 inner part
31 collar
32 pipe part
33 support
40 post-mounting sleeve
43 protrusion
44 opening
45 barrier part
46 ring part
47 fastening protrusion
50 inner pipe
51 sewer connection
52 curved pipe part
53 protrusion
54 opening
55 barrier part
56 ring part
57 straght pipe part
58 fastening protrusion
61 sewer pipe
L dam height

Claims

1. Floor drain insert, which comprises a cup part (21), which has a sewer connection (22), which extends outwards from the cup part (21) and to which sewer connection (22) a ring part (46; 56) is fastenable, which ring part (46; 56) has an opening (44; 54), which substantially corresponds to an opening (24) of the sewer connection (22), and the opening (24) is upwards beginning from its lower edge partially covered by a barrier part (45; 55) to increase dam height, **characterized in that** the sewer connection (22) of the cup part (21) extends inwards from the cup part (21) and that the ring part (46; 56) is fastenable to the inwards extending part of the sewer connection (22) and that the ring part (46; 56) has a protrusion (43; 53), which has a fastening protrusion (47, 57) and that the inwards extending part of the sewer part (22) has a fastening groove (27), to which the fastening protrusion (47; 57) is adapted to attach to fasten the ring part (46; 56) to the cup part (21).

2. Floor drain insert according to claim 1, **characterized in that** the cup part (21) comprises at its front side, below the sewer connection (22) an inclined part (25).

3. Floor drain insert according to claim 1 or 2, **characterized in that** the insert (20) further comprises an inner part (30), which has a collar (31) and a pipe part (32), that the inner part (30) is by the collar (31) fastened to an upper edge of the cup part (21) and that the pipe part (32), when the inner part (30) is mounted at its place in the cup part (21), extends towards bottom of the cup part (21) to a distance from the bottom of the cup part (21).

4. Floor drain insert according to any of claims claim 1 - 3, **characterized in that** the ring part (46) is configured to a post-mounting sleeve (40).

5. Floor drain insert according to claim 1 or 2, **characterized in that** the ring part (56) comprises a curved pipe part (52) joining to the ring part (56) and a from the curved pipe part extending straight pipe part (57), that the straight pipe part (57) extends to a distance

from the inner bottom surface of the cup part (21).

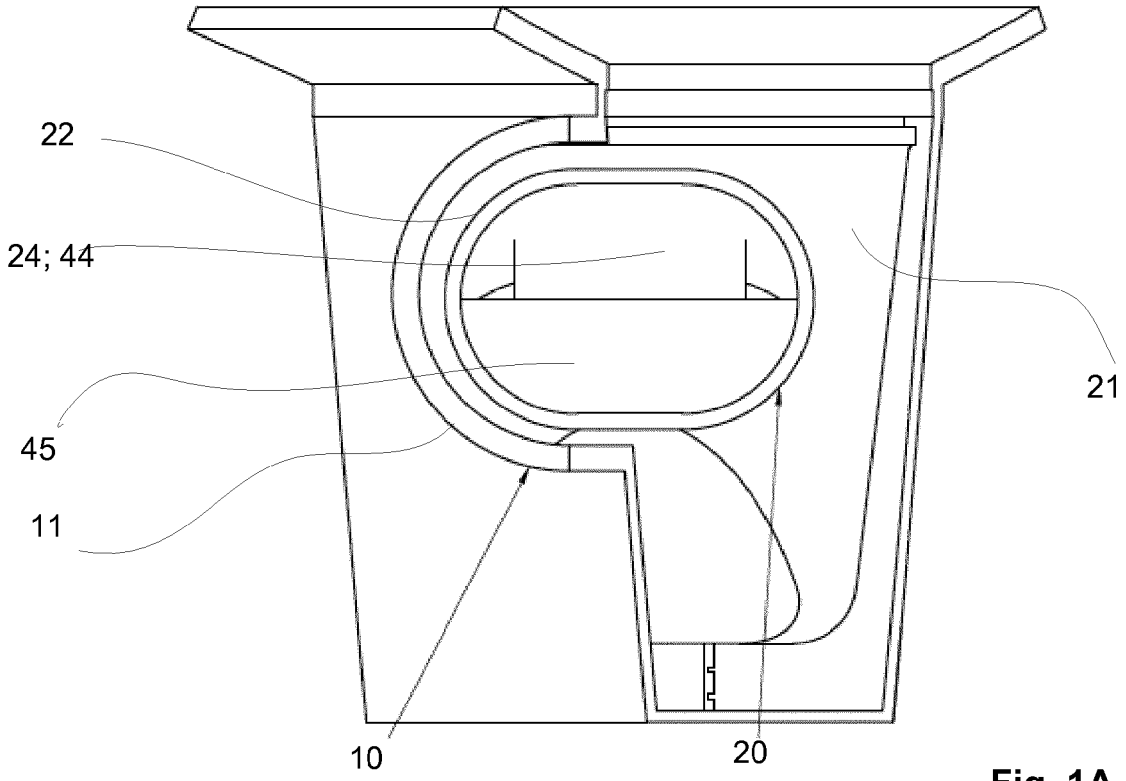

Fig. 1A

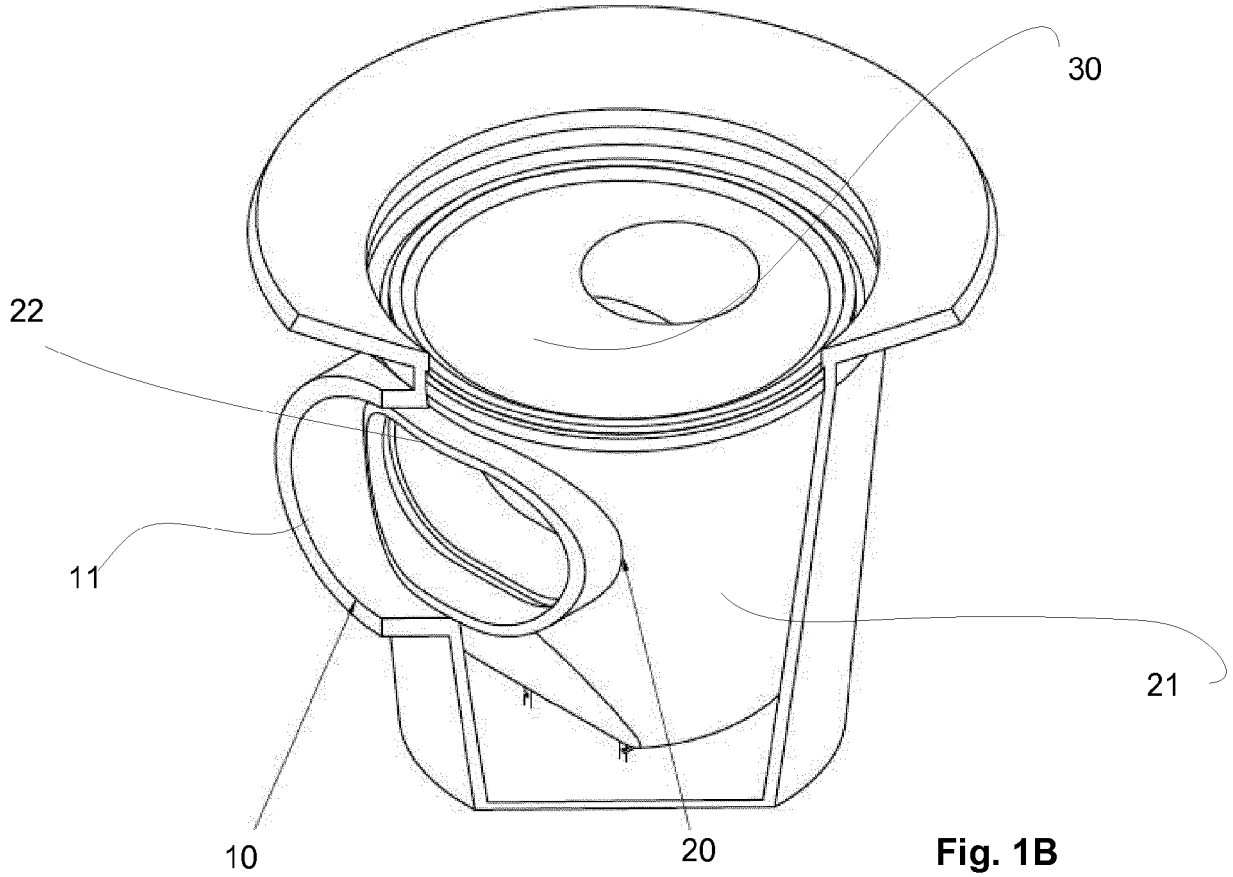

Fig. 1B

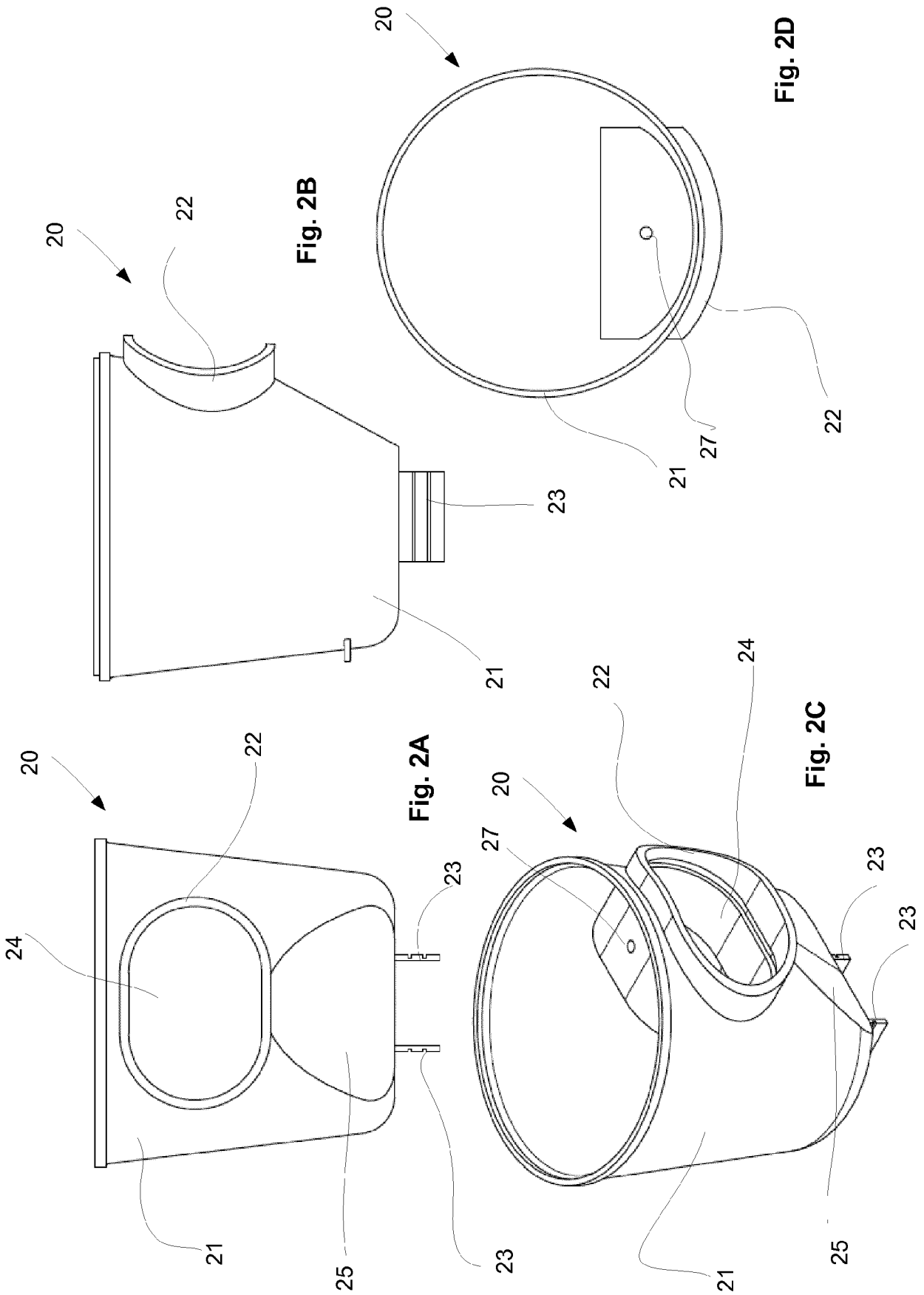

Fig. 2A

Fig. 2B

Fig. 2C

Fig. 2D

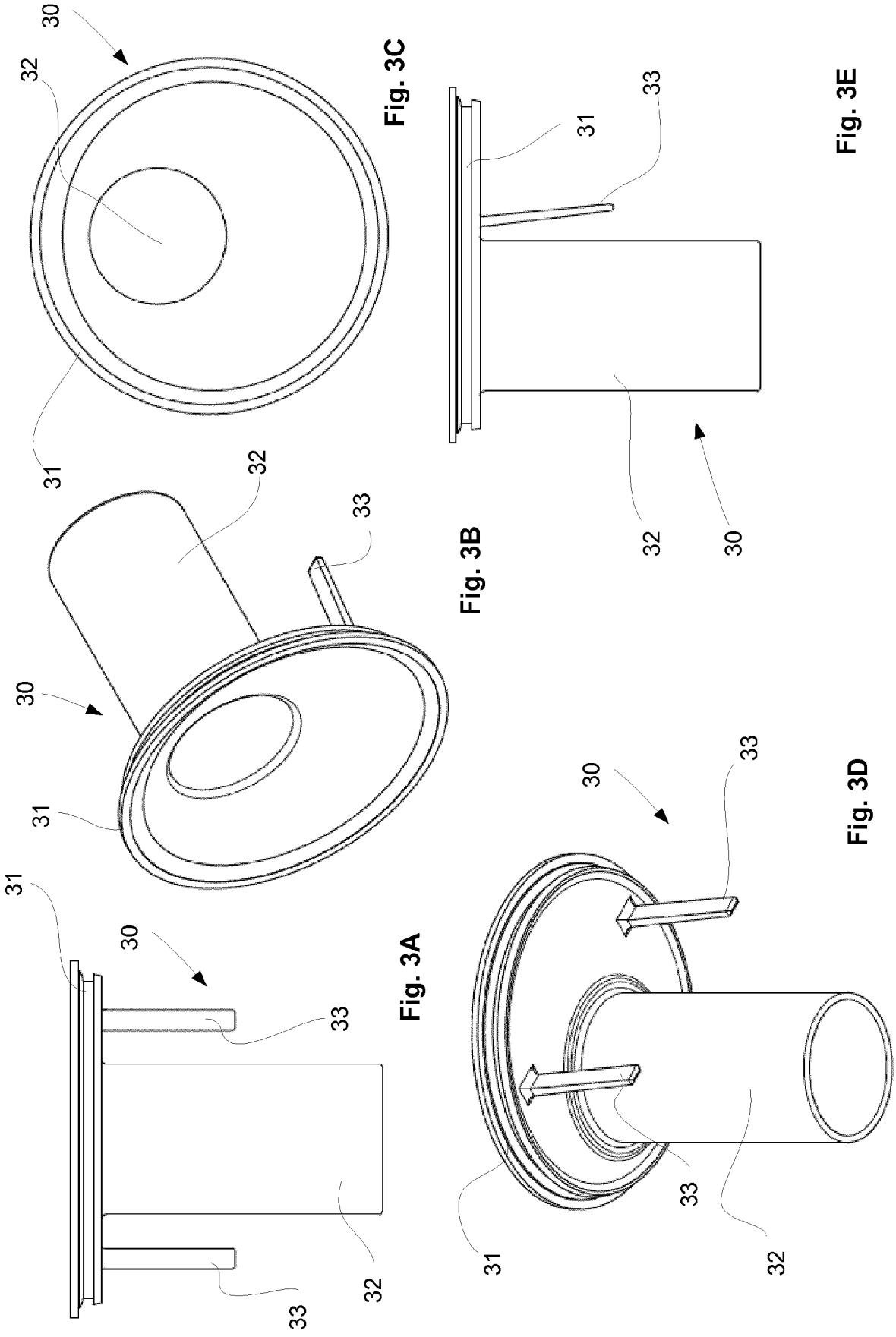

Fig. 3A

Fig. 3B

Fig. 3C

Fig. 3D

Fig. 3E

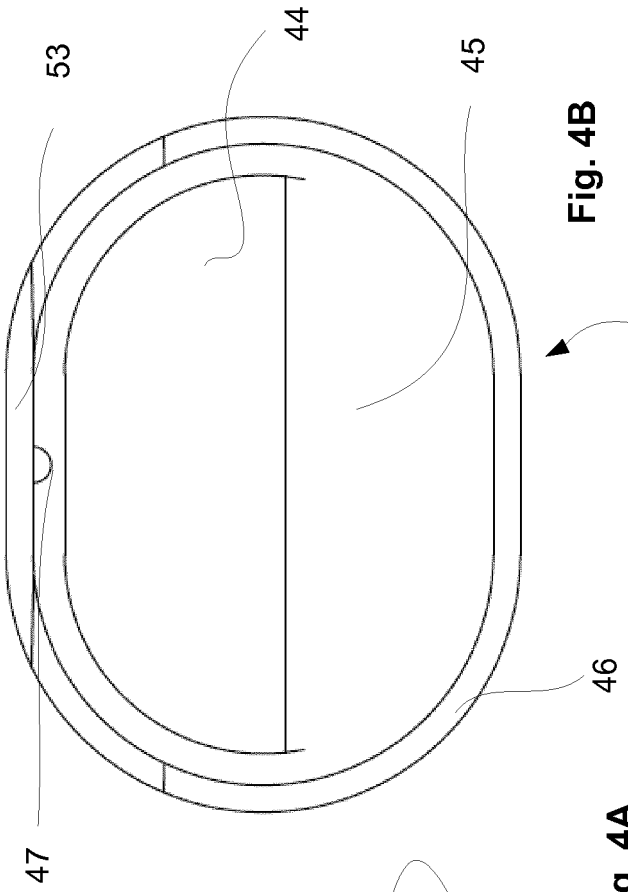

Fig. 4B

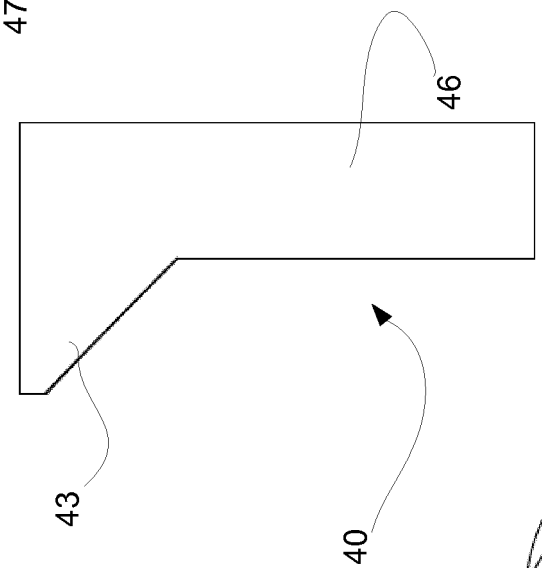

Fig. 4A

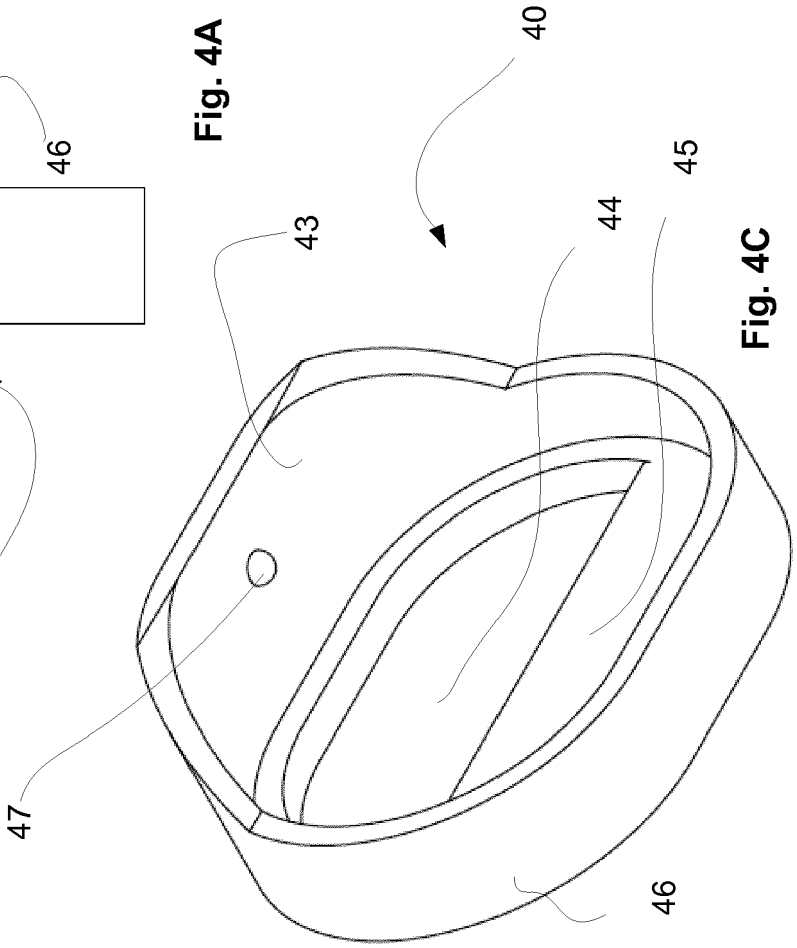

Fig. 4C

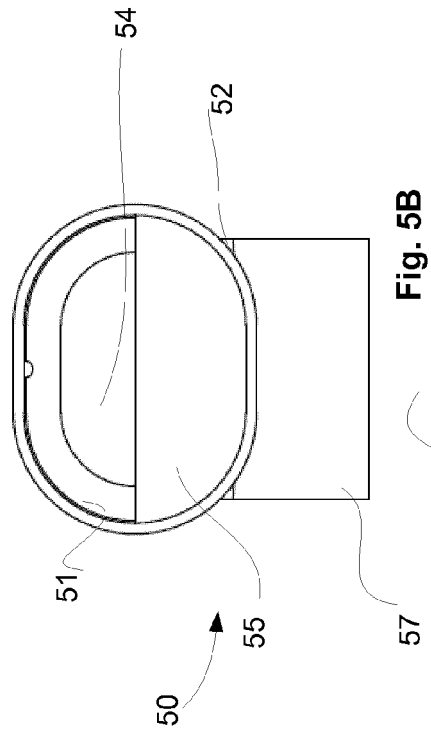

Fig. 5B

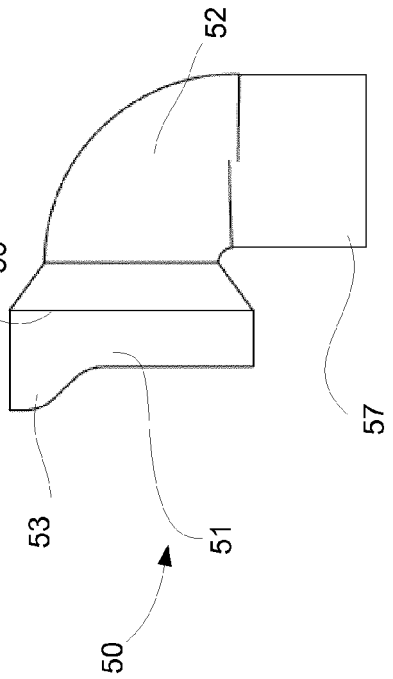

Fig. 5C

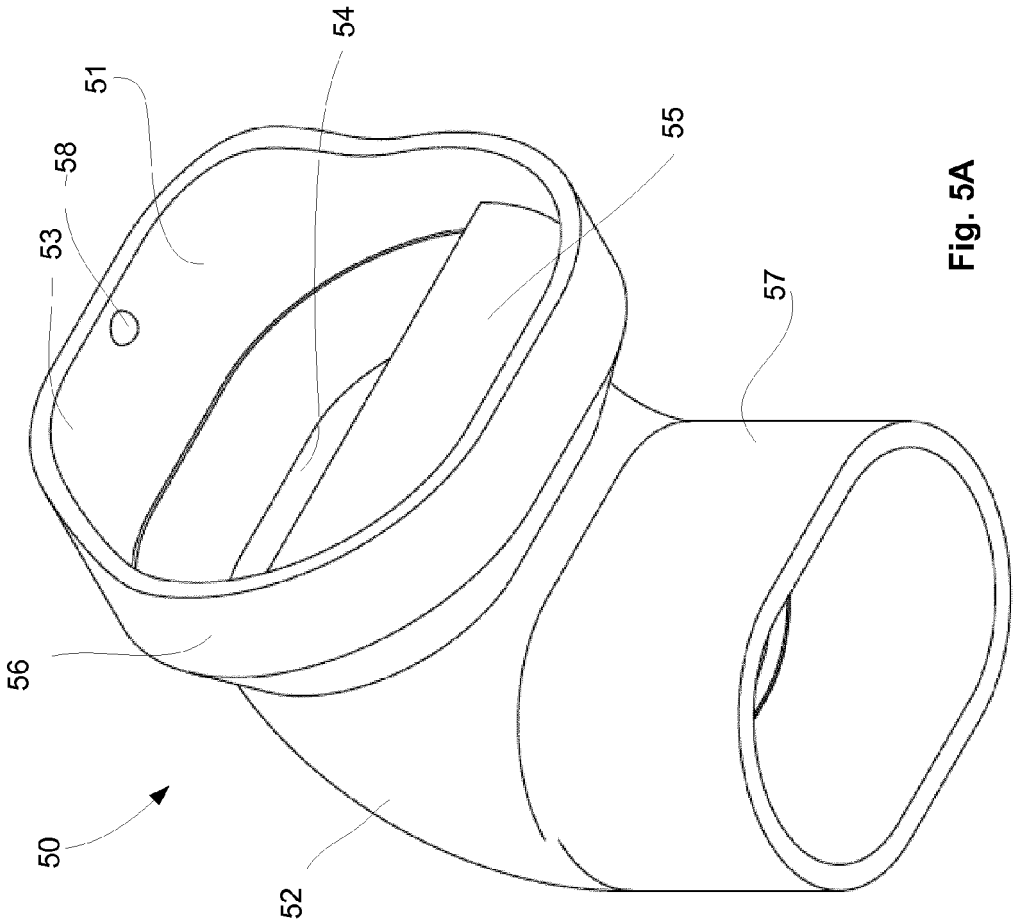

Fig. 5A

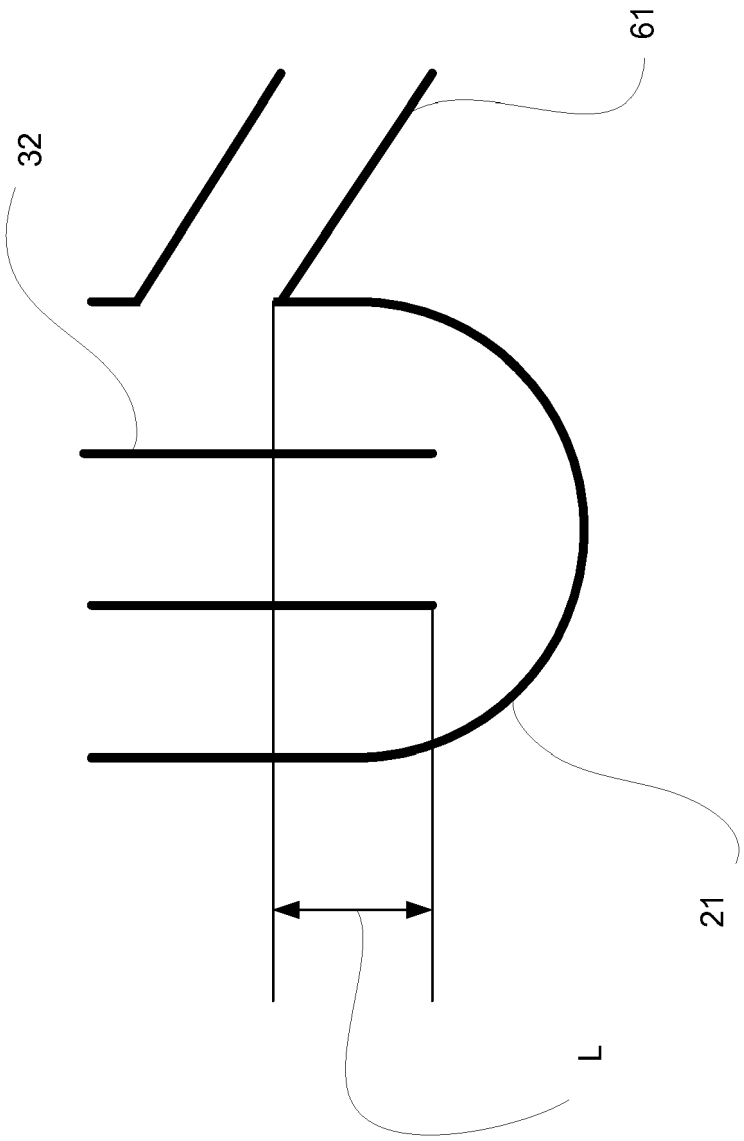

Fig. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 19 18 4850

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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X	DE 30 29 414 A1 (HEINR MEIER EISENGIESSEREI [DE]) 25 February 1982 (1982-02-25) * figure 1 * -----	1-5	
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A	* figure 1 * -----	3-5	
A	DE 91 16 788 U1 (ULM EDELSTAHL TECH [DE]) 18 November 1993 (1993-11-18) * figure 1 * -----	1-5	
			TECHNICAL FIELDS SEARCHED (IPC)
			E03F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	26 November 2019	Dauvergne, Bertrand

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

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26-11-2019

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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- FI 125389 **[0006]**
- FI 20165066 **[0007]**
- FI 11078 **[0008]**