

(12) STANDARD PATENT
(19) AUSTRALIAN PATENT OFFICE

(11) Application No. **AU 2010201234 B2**

(54) Title
Tapping armature having an armature housing made from plastic for a transport and storage container for liquids, and method for producing the electrically earthed connection flange for attaching the tapping armature to the drain port of the inner container of the transport and storage container description

(51) International Patent Classification(s)
B67D 7/32 (2010.01) **B67D 7/06** (2010.01)

(21) Application No: **2010201234** (22) Date of Filing: **2010.03.26**

(30) Priority Data

(31) Number	(32) Date	(33) Country
10 2009 016 451.0	2009.04.04	DE

(43) Publication Date: **2010.10.21**

(43) Publication Journal Date: **2010.10.21**

(44) Accepted Journal Date: **2013.04.04**

(71) Applicant(s)
Protechna S.A.

(72) Inventor(s)
Schuetz, Udo

(74) Agent / Attorney
Phillips Ormonde Fitzpatrick, 367 Collins Street, Melbourne, VIC, 3000

(56) Related Art
EP 2008946
US 7762528

ABSTRACT

The object of the invention is a tapping armature (13) having an armature housing (18) made from plastic for liquid transport and storage containers, which are equipped with a plastic inner container (2) having a filling port and a drain port (12) for connection of the tapping armature (13), an outer casing made from metal mesh or sheet metal, and a pallet-like base made from metal. The tapping armature (13) with the filling port (20) of the armature housing (18) is screwed to a connecting flange (21) designed as a threaded flange and made from an electrically non-conductive plastic material, which is welded to the drain port (12) of the inner container (2). The connecting flange (21) of the armature housing (18) is connected to the base of the outer casing of the transport and storage container via an earthing lead made from an electrically conductive plastic material. The connecting flange (21) and the earthing lead are produced in two production steps with an injection moulding machine according to 2K technology.

In a further embodiment of the tapping armature, the connecting flange and the earthing cable are injection moulded as a single part from an electrically conductive plastic, and the earthing cable is connected to the flange ring of the connecting flange by a tear-off film.

2010201234 26 Mar 2010

AUSTRALIA

Patents Act

**COMPLETE SPECIFICATION
(ORIGINAL)**

Class Int. Class

Application Number:
Lodged:

Complete Specification Lodged:
Accepted:
Published:

Priority

Related Art:

Name of Applicant:

Protechna S.A.

Actual Inventor(s):

Udo Schuetz

Address for Service and Correspondence:

PHILLIPS ORMONDE FITZPATRICK
Patent and Trade Mark Attorneys
367 Collins Street
Melbourne 3000 AUSTRALIA

Invention Title:

TAPPING ARMATURE HAVING AN ARMATURE HOUSING MADE FROM PLASTIC FOR A
TRANSPORT AND STORAGE CONTAINER FOR LIQUIDS, AND METHOD FOR PRODUCING
THE ELECTRICALLY EARTHED CONNECTION FLANGE FOR ATTACHING THE TAPPING
ARMATURE TO THE DRAIN PORT OF THE INNER CONTAINER OF THE TRANSPORT AND
STORAGE CONTAINER DESCRIPTION

Our Ref : 882033
POF Code: 20412/106282

The following statement is a full description of this invention, including the best method of
performing it known to applicant(s):

TAPPING ARMATURE HAVING AN ARMATURE HOUSING MADE FROM
PLASTIC FOR A TRANSPORT AND STORAGE CONTAINER FOR LIQUIDS,
AND METHOD FOR PRODUCING THE ELECTRICALLY EARTHED
CONNECTION FLANGE FOR ATTACHING THE TAPPING ARMATURE TO THE
DRAIN PORT OF THE INNER CONTAINER OF THE TRANSPORT AND
STORAGE CONTAINER

This application claims priority from German Application No.10 2009 016 451.0 filed on 4 April 2009, the contents of which are to be taken as incorporated herein by this reference.

DESCRIPTION

The invention relates to a tapping armature.

The following discussion of the background to the invention is intended to facilitate an understanding of the invention. However, it should be appreciated that the discussion is not an acknowledgement or admission that any of the material referred to was published, known or part of the common general knowledge as at the priority date of the application.

German Patent No. DE 198 15 082 A1 describes a transport and storage container for liquids in which an earthing element is arranged in the species-related tapping armature attached to the drain port of the inner container, and which is constructed as a curved metal sheet or small plate, extending over a portion of the inner hole of the tapping armature and connected to the base of the container via a fixing screw and an earthing lead.

This tapping armature has the following disadvantages:

The fixing screw that is screwed through the housing wall to attach the sheet or small plate, which is made of metal, in the armature housing, which is made from plastic, does not ensure that the armature is leak-proof. In transport and storage containers for certain liquid foods, the use of metal parts is not permitted, and consequently containers equipped with this armature cannot be used for such liquid

foods. Finally, there is a risk with the known liquid containers that when aggressive liquids are transported or stored, the earthing element may be damaged by the liquid to such an extent that electrical earthing is no longer assured.

The Applicant is aware of certain tapping armatures for liquid containers having a housing that is equipped with antistatic means, but these are too expensive to be produced for a mass market.

It is therefore desirable to improve the species-related tapping armature for liquid transport and storage containers so as to provide safe, complete earthing for dissipating electrical charges that are created by liquid friction when the container is filled with or drained of liquids, and to suggest an inexpensive method for production of such.

The tapping armatures according to the invention, the housing of which is equipped with a plastic connection flange for welding the housing to the drain port of the plastic inner container of a liquid transport and storage container having an outer casing made from metal mesh or sheet steel and having a pallet-like base made from electrically conductive plastic, enable safe electrical earthing of the liquid that flows out of the inner container when it is emptied, via an electrical earthing lead, which in a first embodiment of the tapping armature connects a portion of the inner wall of the connecting flange made from non-conductive material to the pallet-like base or the outer casing via an electrically conductive ring segment, and in a second embodiment of the tapping armature connects the connecting flange made from electrically conductive plastic to the base or the outer casing. The tapping armature having the connecting flange made from non-conductive material and with earthing of a portion of the inner wall of the connecting flange via an earthing lead of an electrically conductive plastic that is integrated in the flange ring of the connecting flange and

is connected to the pallet-like base or the outer casing of the transport and storage container, and the tapping armature having an connecting flange made from electrically conductive plastic that is connected to the base or the outer casing of the transport and storage container via an earthing lead. Both are significantly less expensive than the tapping armatures according to the prior art, in which the entire plastic housing is equipped to combat static buildup.

It is also desirable to provide a method for producing the connection flange for attaching the tapping armature to the drain port of the inner container of the transport and storage container.

The present invention provides a tapping armature having an armature housing made from plastic, particularly a flap valve or butterfly valve, for liquid transport and storage containers, which are equipped with a plastic inner container having a closable filling port and a drain port for connection of the tapping armature, an outer casing made from metal mesh or sheet metal, and a pallet-like base made from metal or a plastic material that is at least partially electrically conductive for supporting the inner container, including a connecting flange made from non-conductive plastic, to which the armature housing with the filling port is screwed, and with which the armature housing is welded to the drain port of the inner container, and an electrical earthing element of the tapping armature, by an integrally constructed earthing lead made from an electrically conductive plastic, which has as least one ring segment integrated in the inner wall of the connecting flange, a connecting bridge recessed into the flange ring of the connecting flange of the armature housing, and a flexible cable for electrically connecting the connecting flange of the armature housing to the base or the outer casing of the transport and storage container.

The present invention further provides a method for manufacturing the connecting flange and the earthing lead for the armature housing of the tapping armature wherein ring segments integrated in the inner wall of the connecting flange and the fixing lug on the free end of the cable of the earthing lead of the connecting flange of the tapping armature are overmoulded and then peeled off to improve electrical conductivity.

The invention will be explained in the following with reference to the figures of the drawing, in which:

Figure 1 is a perspective view of a transport and storage container for liquids,

Figure 2 is a perspective, enlarged and partial cutaway view of the connecting flange that is welded to the drain port of the inner container of the transport and storage container,

Figure 3 is a perspective, enlarged view of a connecting flange of the tapping armature in the first stage produced by injection moulding according to 2K technology,

Figure 4 is a perspective, enlarged view of a connecting flange of the tapping armature produced with an

earthing lead in the second stage by injection moulding according to 2K technology,

Figure 5 is a front face view of the connecting flange of the tapping armature from figure 4,

Figure 6 is a perspective, enlarged view of the drain area of the transport and storage container with the tapping armature,

Figure 7 is a perspective view of a connecting flange that is injection moulded from an electrically conductive plastic material as a single part with an earthing lead, and,

Figure 8 is a front face of the connecting flange of figure 7.

The single use and reusable liquid transport and storage container 1 shown in figure 1 has as the main components thereof a replaceable, cuboid inner container 2 made from plastic and having a front face 3, a rear wall 4, and two side walls 5,6, a base 7 designed as a drainage base, and an upper base 8, a filling port 9 conformed thereon and closable with a cap 10, and a tapping port 12 conformed on a concavity 11 in the lower section of front face 3 of the inner container, the drain port being produced integrally with inner container 2 by blow moulding, for attachment of a tapping armature 13, particularly a ball or flap valve, also an outer casing 14 in the form of a mesh casing with intersecting horizontal and vertical wire bars 15,16 for supporting inner container 2, and a pallet-like base 17 with European standard length and width dimensions for supporting inner container 2.

Armature housing 18 of armature 13 is injection moulded from a high-density polyethylene (PE-HD) and is screwed with filling port 20 having an internal thread 19 onto a connecting flange 21 having a corresponding external thread 22, and sealed off therefrom, and connecting flange 21 is attached together with the screwed on tapping armature 13 to drain port 12 of inner container 2, preferably by mirror-imaged welding. Connecting flange 21 is manufactured

2010201234 26 Mar 2010

as an injection moulded part from a non-conducting plastic, for example polyethylene (figure 2).

Tapping armature 13 is equipped with an electrical earthing element, represented in figures 3 to 5 by an earthing lead 23 constructed as a single part from an electrically conductive plastic, for example polyethylene with nanoparticles, which has a ring segment 25 integrated in inner wall 24 of connecting flange 21, a connecting bridge 27 recessed into flange ring 26 of the connecting flange, and a flexible cable 28 for electrically connecting the connecting flange 21 of armature housing 18 to base 17 or outer casing 14 of transport and storage container 1.

According to figure 6, earthing lead 23 of connecting flange 21 of armature housing 18 is screwed securely to sheet metal base 31 in base 17 of transport and storage container 1 via a lug 30 conformed on free end 29 of cable 28 with a screw 32 and a nut 33.

Connecting flange 21 shown in figures 3 to 5 and earthing lead 23 conformed integrally therewith are both produced with an injection moulding machine according to 2K technology.

In a first method step, connecting flange 21 is injection moulded from an electrically non-conductive plastic, for example high-density polyethylene (PE-HD), with a recess 34 in inner wall 24 thereof for ring segment 25 of earthing lead 23, a groove 35 in flange ring 26 of connecting flange 21 for connecting bridge 27 of earthing lead 23, and a recess 36 in the form of a ring segment, and grooves 37 adjoining this in outer rim 38 of flange ring 26 for a retaining ring 39 with retaining ribs 40 and tear off tips 41 for cable 28 of earthing lead 23 (figure 3). Then, in a second method step with the same injection moulding machine, an electrically conductive plastic, for example polyethylene with nanoparticles is moulded on the prefabricated connecting flange 21 to produce the earthing lead with ring segment 25, connecting bridge 27, and cable 28 (figures 4 and 5). After connecting flange 21 with

2010201234 26 Mar 2010

2010201234 26 Mar 2010

armature housing 18 screwed thereto has been welded onto drain port 12 of inner container 2 of transport and storage container 1, flexible cable 28 of earthing lead 23 is detached by tear-off tips 41 of retaining ribs 40 of retaining ring 39 on the outer rim 38 of flange ring 26 of connecting flange 21.

The ring segment 25 that is integrated in inner wall 24 of connecting flange 21, and the fixing lug 30 on free end 29 of cable 28 of earthing lead 23 are overmoulded during the injection moulding process and then peeled off to improve their electrical conductivity.

Armature housing 18 and connecting flange 21 are connected to each other via a tamper-resistant seal formed by a circlip 42, which connects a lug 43 that is injection moulded on flange ring 26 of connecting flange 21 to a corresponding lug (not shown) on armature housing 18 (figures 3 and 6).

A further connecting flange 44, which is shown in figures 7 and 8 as a threaded flange, to which armature housing 18 is screwed with filling port 20 as shown in figure 2, and with which armature housing 18 is welded to drain port 12 of inner container 2, is injection moulded from an electrically conductive plastic, for example a high-density polyethylene (PE-HD) with nanoparticles, as a single part with a semi-rigid earthing lead 45.

The one end 46 of earthing cable 45 is attached via a bridge 47 to flange ring 26 of connecting flange 44, and the other end 48 of earthing cable 45 has a fixing lug 49 for attaching to the base 17 of our outer casing 14 of transport and storage container 1.

Cable section 50 between bridge 47 and fixing lug 49 is connected to flange ring 26 of connecting flange 44 by a tear-off film 51 in such manner that, after connecting flange 44 with tapping armature 13 has been welded to drain port 12 of inner container 2, the cable section 50 of earthing cable 45 between bridge 47 and fixing lug 49 on base 17 or outer casing 14 of transport and storage

container 1 may be detached from flange ring 26 of connecting flange 44.

A cylindrical section 52 of inner wall 24 of connecting flange 21 is peeled off to improve the electrical conductivity of the connecting flange.

2010201234 26 Mar 2010

2010201234 26 Mar 2010

Legend

- 1 Transport and storage container
- 2 Inner container
- 3 Front face of 2
- 4 Rear wall of 2
- 5 Side wall of 2
- 6 Side wall of 2
- 7 Lower floor of 2
- 8 Upper floor of 2
- 9 Filling port on 8
- 10 Cap of 9
- 11 Concavity in 3
- 12 Drain port of 2
- 13 Tapping armature
- 14 Outer casing
- 15 Horizontal mesh rod
- 16 Vertical mesh rod
- 17 Base
- 18 Armature housing of 13
- 19 Internal thread of 20
- 20 Filling port of 18
- 21 Connecting flange of 18
- 22 External thread on 21
- 23 Earthing lead
- 24 Inner wall of 21, 44
- 25 Ring segment of 23
- 26 Flange ring of 21
- 27 Connecting bridge of 23
- 28 Cable of 23
- 29 Free end of 28
- 30 Lug on 29
- 31 Sheet metal base of 17
- 32 Screw
- 33 Nut
- 34 Recess in 24 for 25
- 35 Groove in 26 for 27

2010201234 26 Mar 2010

- 36 Recess in 36 for 37
- 37 Groove in 38 for 40
- 38 Outer rim of 26
- 39 Retaining ring for 28
- 40 Retaining rib on 39
- 41 Tear-off tip on 40 for 28
- 42 Circlip
- 43 Lug on 26
- 44 Connecting flange (figures 7 and 8)
- 45 Earthing cable
- 46 End of 45
- 47 Bridge
- 48 End of 45
- 49 Fixing lug on 48
- 50 Cable section between 47 and 49
- 51 Tear-off film
- 52 Cylindrical section of 24

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A tapping armature having an armature housing made from plastic, particularly a flap valve or butterfly valve, for liquid transport and storage containers, which are equipped with a plastic inner container having a closable filling port and a drain port for connection of the tapping armature, an outer casing made from metal mesh or sheet metal, and a pallet-like base made from metal or a plastic material that is at least partially electrically conductive for supporting the inner container, including a connecting flange made from non-conductive plastic, to which the armature housing with the filling port is screwed, and with which the armature housing is welded to the drain port of the inner container, and an electrical earthing element of the tapping armature, by an integrally constructed earthing lead made from an electrically conductive plastic, which has as least one ring segment integrated in the inner wall of the connecting flange, a connecting bridge recessed into the flange ring of the connecting flange of the armature housing, and a flexible cable for electrically connecting the connecting flange of the armature housing to the base or the outer casing of the transport and storage container.
2. The tapping armature as recited in claim 1, including a lug conformed on the free end of the cable of the earthing lead of the connecting flange of the armature housing for securing the earthing lead to the base or the outer casing of the transport and storage container.
3. The tapping armature as recited in either of claims 1 or 2, wherein the earthing lead of the connecting

flange is made from a high-density polyethylene (PE-HD) with nanoparticles.

4. A method for manufacturing the connecting flange and the earthing lead for the armature housing of the tapping armature as recited in any one of claims 1 to 3, wherein using 2K technology with an injection moulding machine, in a first method step connecting flange is injection moulded from an electrically non-conductive plastic, with at least one recess in the inner wall thereof for ring segment of earthing lead, a groove in flange ring of connecting flange for connecting bridge of earthing lead, and a recess in the form of a ring segment, and axial grooves adjoining this in outer rim of flange ring of the connecting flange for a retaining ring with retaining ribs and tear off tips for cable of earthing lead, and then, in a second method step with the same injection moulding machine, an electrically conductive plastic is moulded on the prefabricated connecting flange to produce the earthing lead with ring segment, connecting bridge, and cable.
5. The method as recited in claim 4, wherein ring segments integrated in the inner wall of the connecting flange and the fixing lug on the free end of the cable of the earthing lead of the connecting flange of the tapping armature are overmoulded and then peeled off to improve electrical conductivity.
6. A tapping armature having an armature housing made from plastic, particularly a flap valve or butterfly valve, for liquid transport and storage containers, which are equipped with a plastic inner container having a closable filling port and a drain port for connection of the tapping armature, a closable filling port and a drain port for connection of the tapping

armature, an outer casing made from metal mesh or sheet metal, and a pallet-like base made from metal or a plastic material that is at least partially electrically conductive for supporting the inner container, including a connecting flange constructed as a threaded flange made from an electrically conductive plastic material, to which the armature housing is screwed with the filling port, and with which the armature housing is welded to the drain port of inner container, and a flexible electrical earthing lead constructed integrally with the connecting flange by injection moulding, one end of which earthing lead is connected to the flange ring of the connecting flange via a bridge, and the other end of which has a fixing lug for attaching to the base or outer casing of the transport and storage container, wherein the cable section between the bridge and the fixing lug is connected to the flange ring of the connecting flange by a tear-off film in such manner that after the connecting flange with tapping armature has been welded to drain port of inner container, the cable section of earthing cable between bridge and fixing lug on base or outer casing of transport and storage container may be detached from flange ring of connecting flange.

7. A tapping armature according to any one of the embodiments substantially as herein described with reference to any one of the accompanying drawings.

Fig. 1

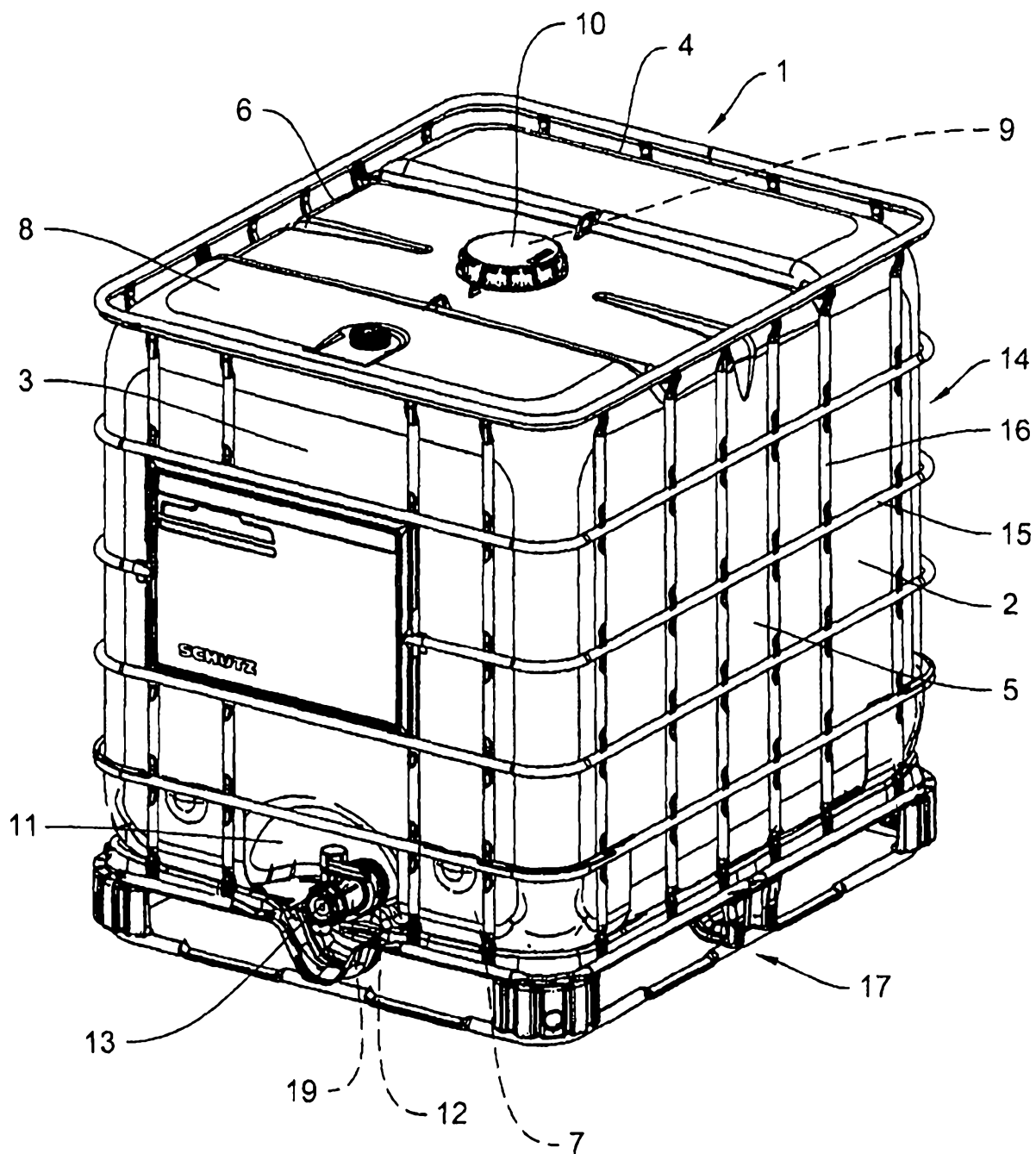


Fig. 2

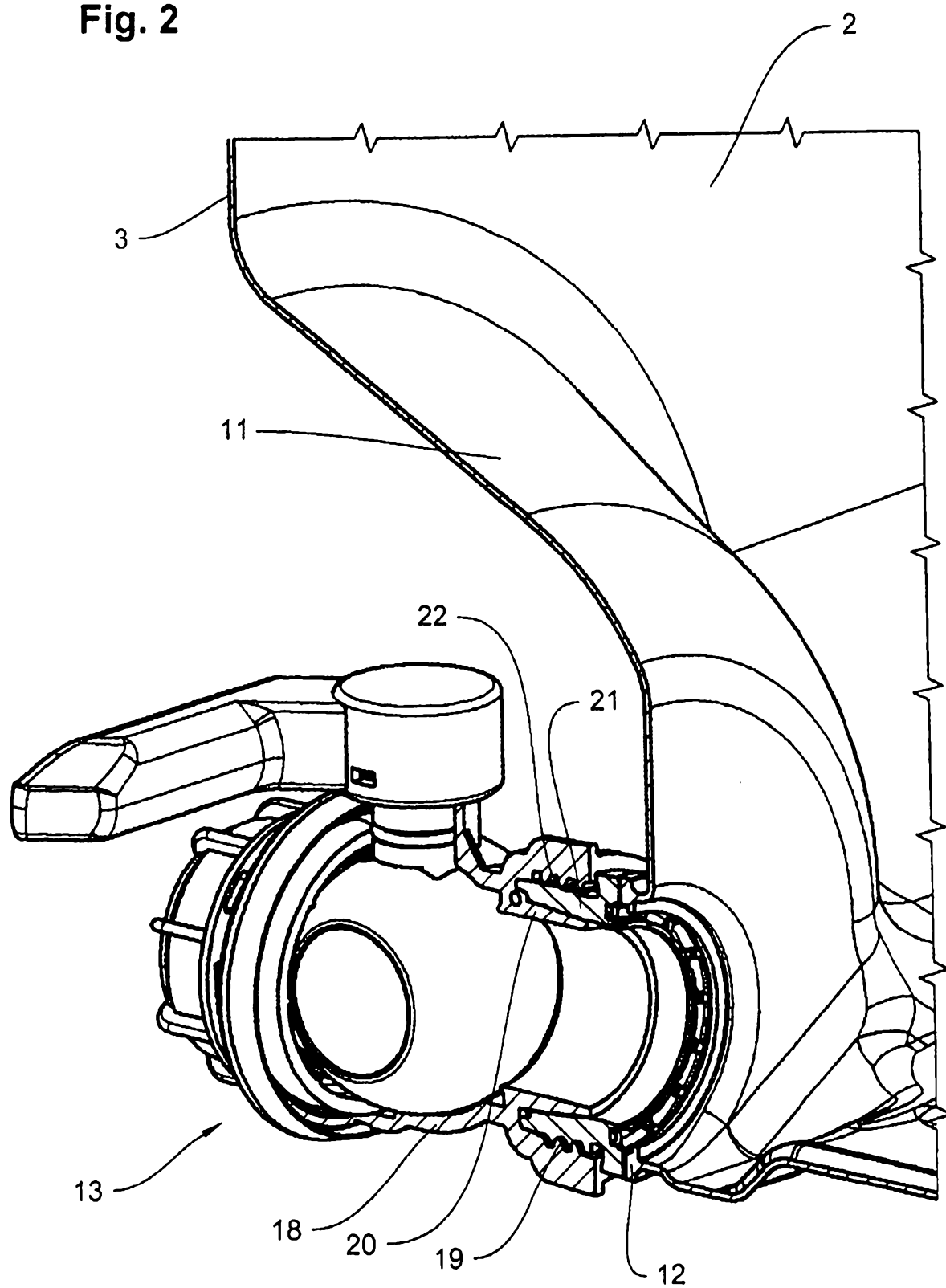


Fig. 4

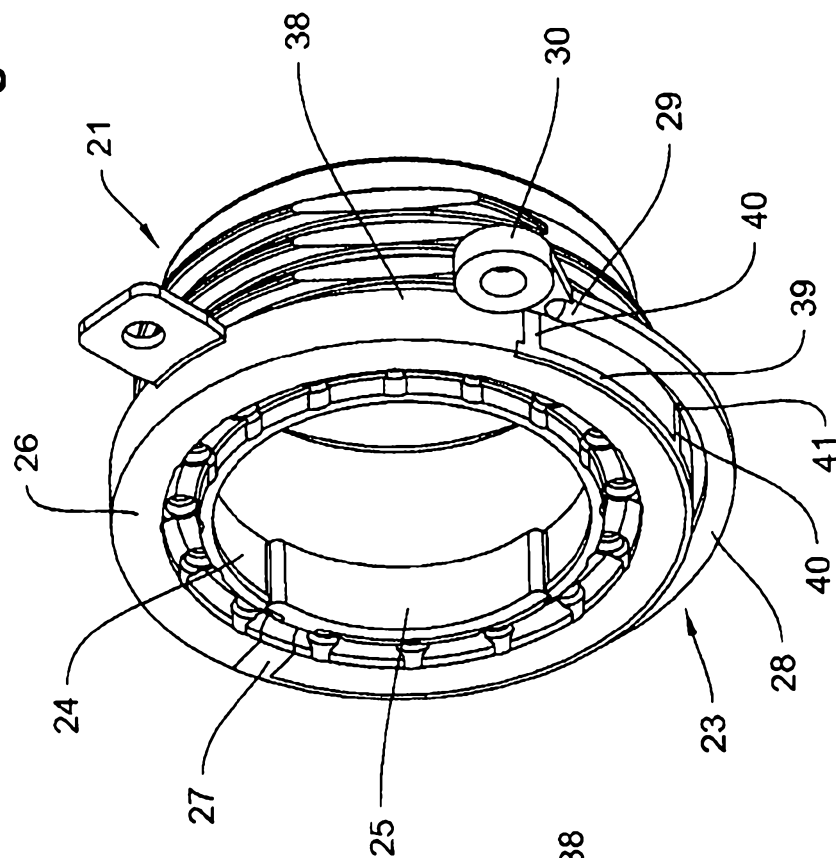


Fig. 3

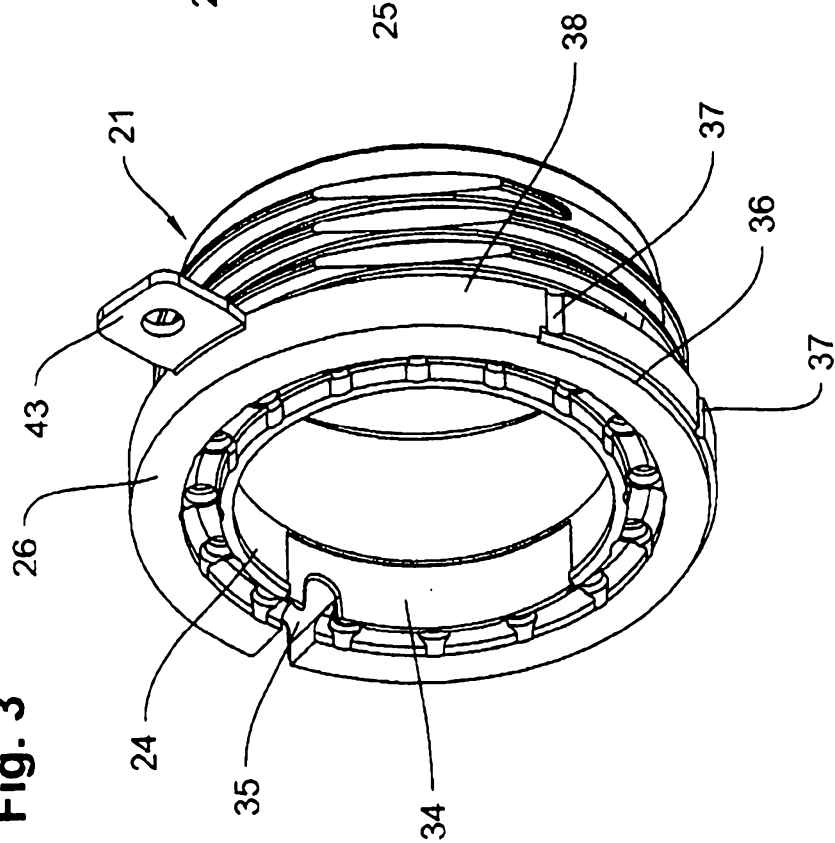


Fig. 5

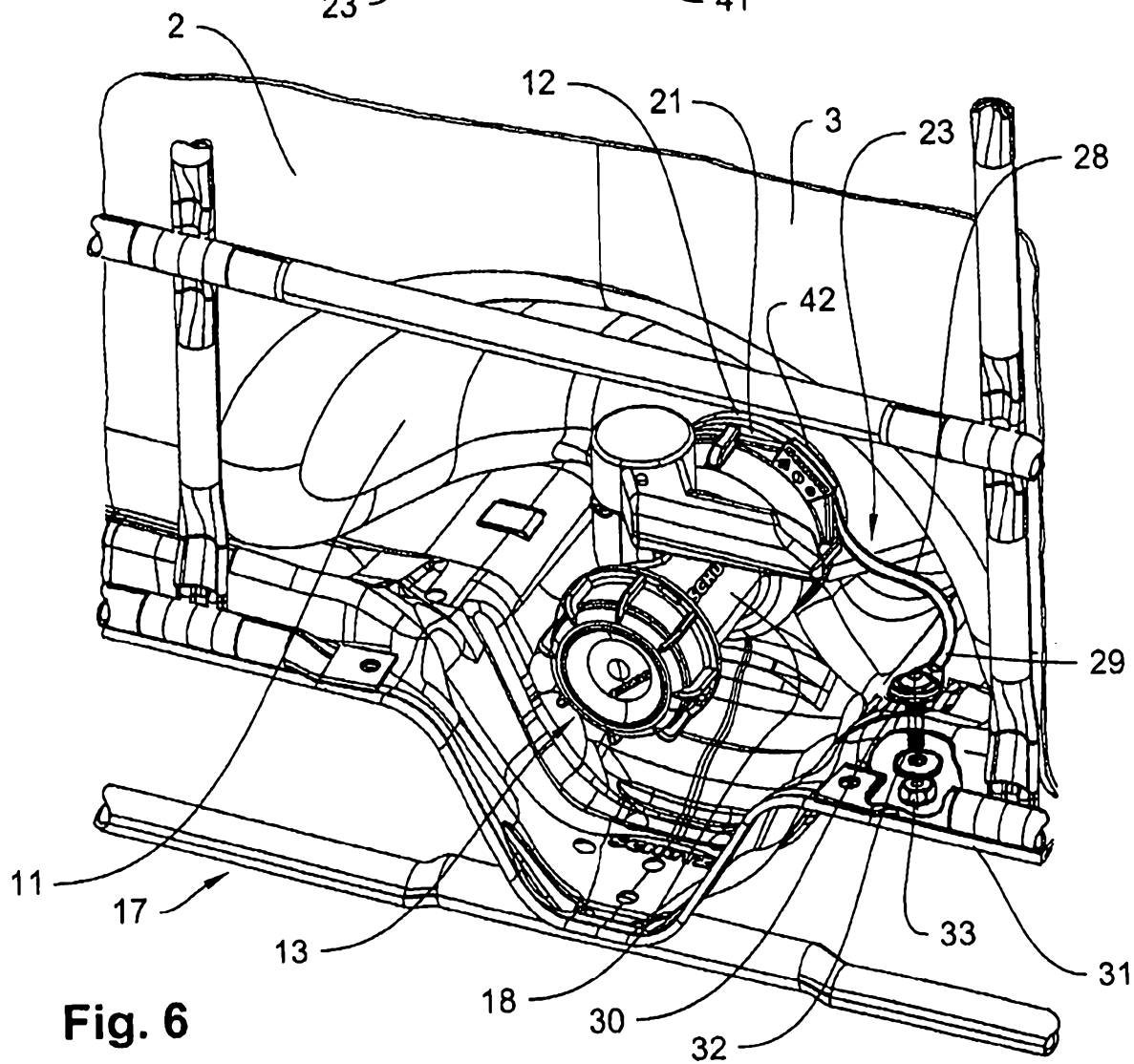
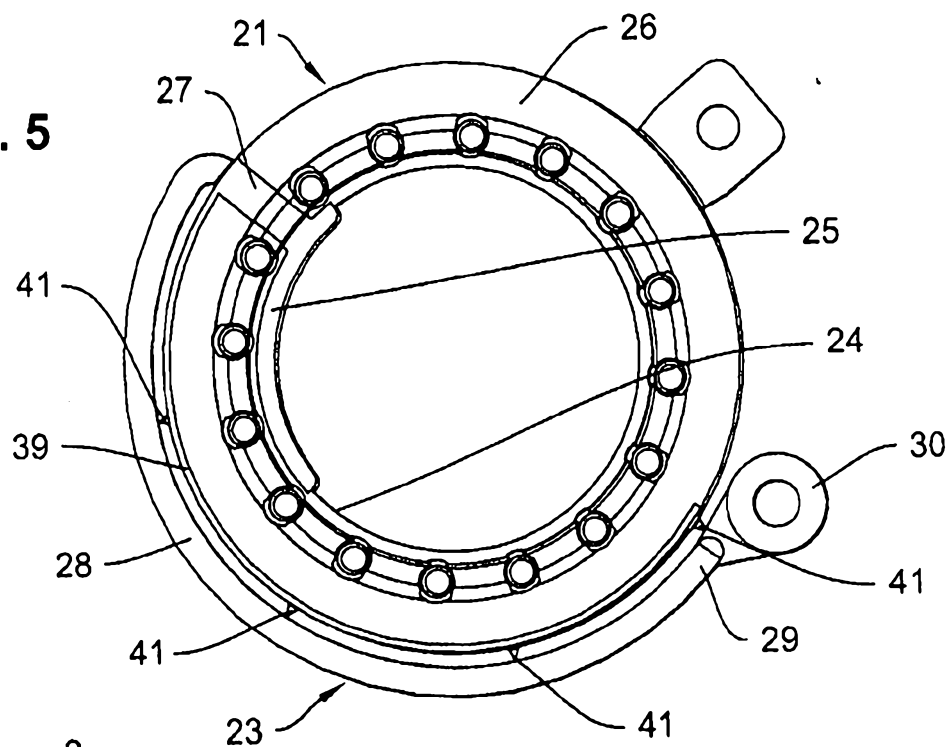


Fig. 6

Fig. 7

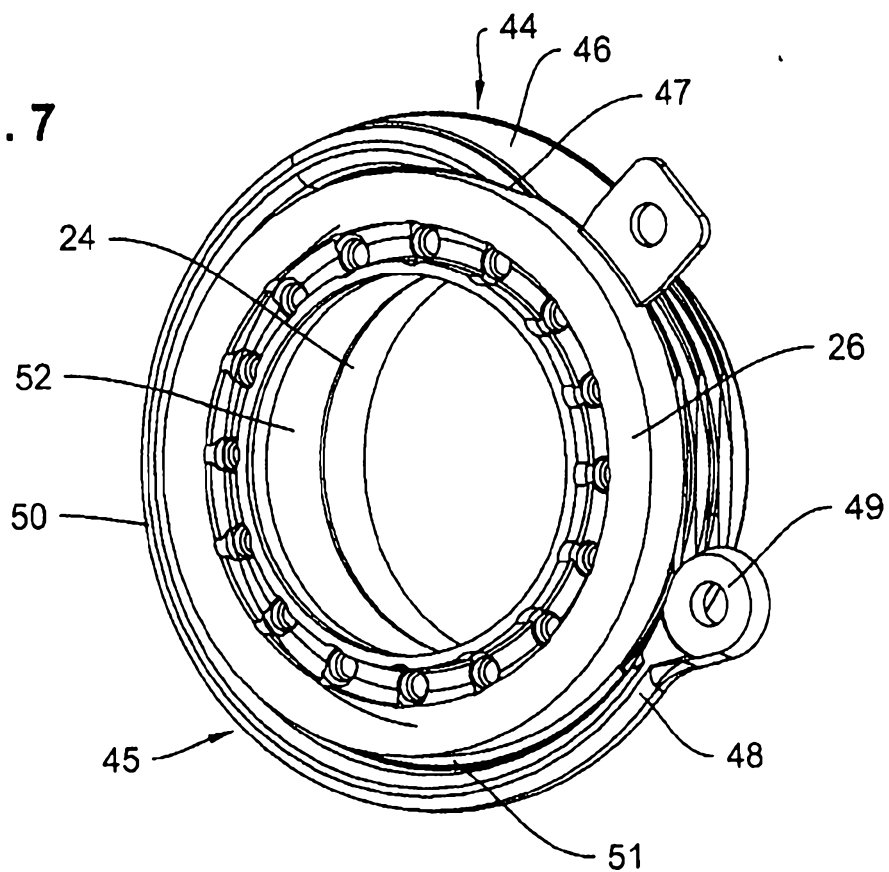


Fig. 8

