US00RE47008E

(19) **United States**

(12) **Reissued Patent**

Kuehn

(10) **Patent Number: US RE47,008 E**

(45) **Date of Reissued Patent: Aug. 28, 2018**

(54) **SPILL CONTAINMENT SYSTEM**

(71) Applicant: **Franklin Fueling Systems, Inc.**, Madison, WI (US)

(72) Inventor: **Justin F. Kuehn**, Sun Prairie, WI (US)

(73) Assignee: **Franklin Fueling Systems, LLC**, Madison, WI (US)

(21) Appl. No.: **14/868,791**

(22) Filed: **Sep. 29, 2015**

Related U.S. Patent Documents

Reissue of:

(64) Patent No.: **8,684,024**
Issued: **Apr. 1, 2014**
Appl. No.: **12/904,530**
Filed: **Oct. 14, 2010**

U.S. Applications:

(60) Provisional application No. 61/252,311, filed on Oct. 16, 2009.

(51) **Int. Cl.**

B65D 21/00	(2006.01)
F16K 51/00	(2006.01)
B65D 90/10	(2006.01)
B65D 90/24	(2006.01)
B65D 90/50	(2006.01)
B67D 7/32	(2010.01)

(52) **U.S. Cl.**

CPC ***B65D 90/105*** (2013.01); ***B65D 90/24*** (2013.01); ***B65D 90/503*** (2013.01); ***B67D 7/3209*** (2013.01); *Y10T 29/49815* (2015.01); *Y10T 29/49817* (2015.01); *Y10T 137/5762* (2015.04)

(58) **Field of Classification Search**

CPC B65D 88/76; B65D 90/24
USPC 137/312; 141/86; 404/25; 405/52
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,655,361	A		4/1987	Clover et al.
4,696,330	A		9/1987	Raudman et al.
4,762,440	A		8/1988	Argandona
4,770,317	A	*	9/1988	Podgers B67D 7/362 141/86
4,793,387	A	*	12/1988	LeBlanc et al. 137/312
4,842,443	A	*	6/1989	Argandona 137/312
4,896,705	A	*	1/1990	Podgers et al. 141/86
5,295,535	A		3/1994	Boles et al.
7,069,965	B2		7/2006	Pendleton et al.
7,144,189	B1		12/2006	Bongiovanni et al.
7,171,994	B1		2/2007	O'Brien

(Continued)

FOREIGN PATENT DOCUMENTS

EP	2 311 774	4/2011

OTHER PUBLICATIONS

Extended Search Report dated May 24, 2011 in corresponding EP Application No. 10 01 3480.

(Continued)

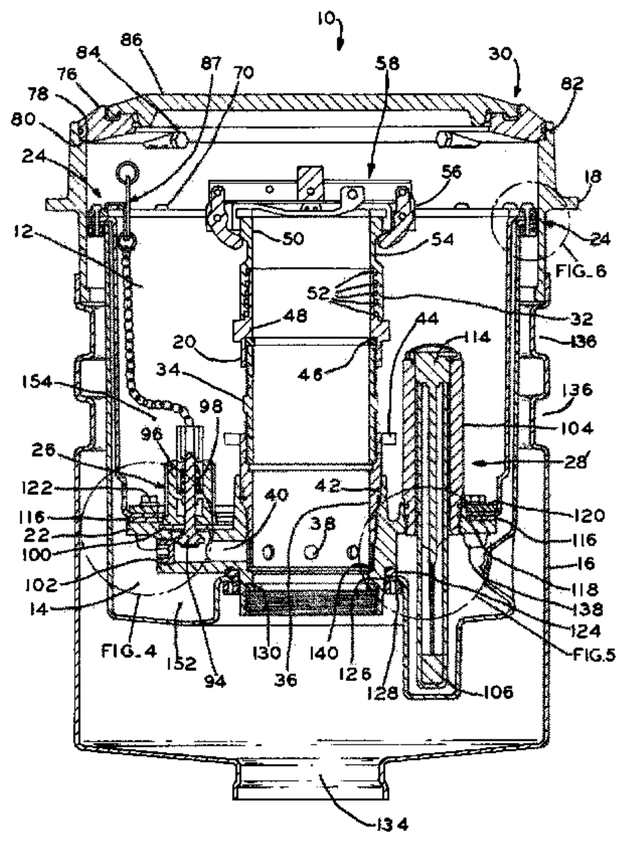
Primary Examiner — Sara Clarke

(74) *Attorney, Agent, or Firm* — Faegre Baker Daniels LLP

(57) **ABSTRACT**

A spill containment system is attachable to a riser pipe with an axially moveable seal. The spill containment system allows access to a drop tube in the riser pipe via a removable liquid communication assembly. The spill containment system includes a sealed interstitial space, which remains sealed during installation, service and use of the system. The spill containment system is protected by a weather resistant cover assembly.

19 Claims, 16 Drawing Sheets



(56) **References Cited**

U.S. PATENT DOCUMENTS

2008/0023075	A1	1/2008	Bravo et al.	
2009/0006026	A1	1/2009	Clover	
2009/0223595	A1	9/2009	Kane et al.	
2010/0116354	A1*	5/2010	Rowe	B65D 90/105 137/312

OTHER PUBLICATIONS

European Search Report dated Feb. 15, 2011 in corresponding EP Application No. 10013480.8.
European Search Report dated May 24, 2011 in corresponding EP Application No. 10013480.

* cited by examiner

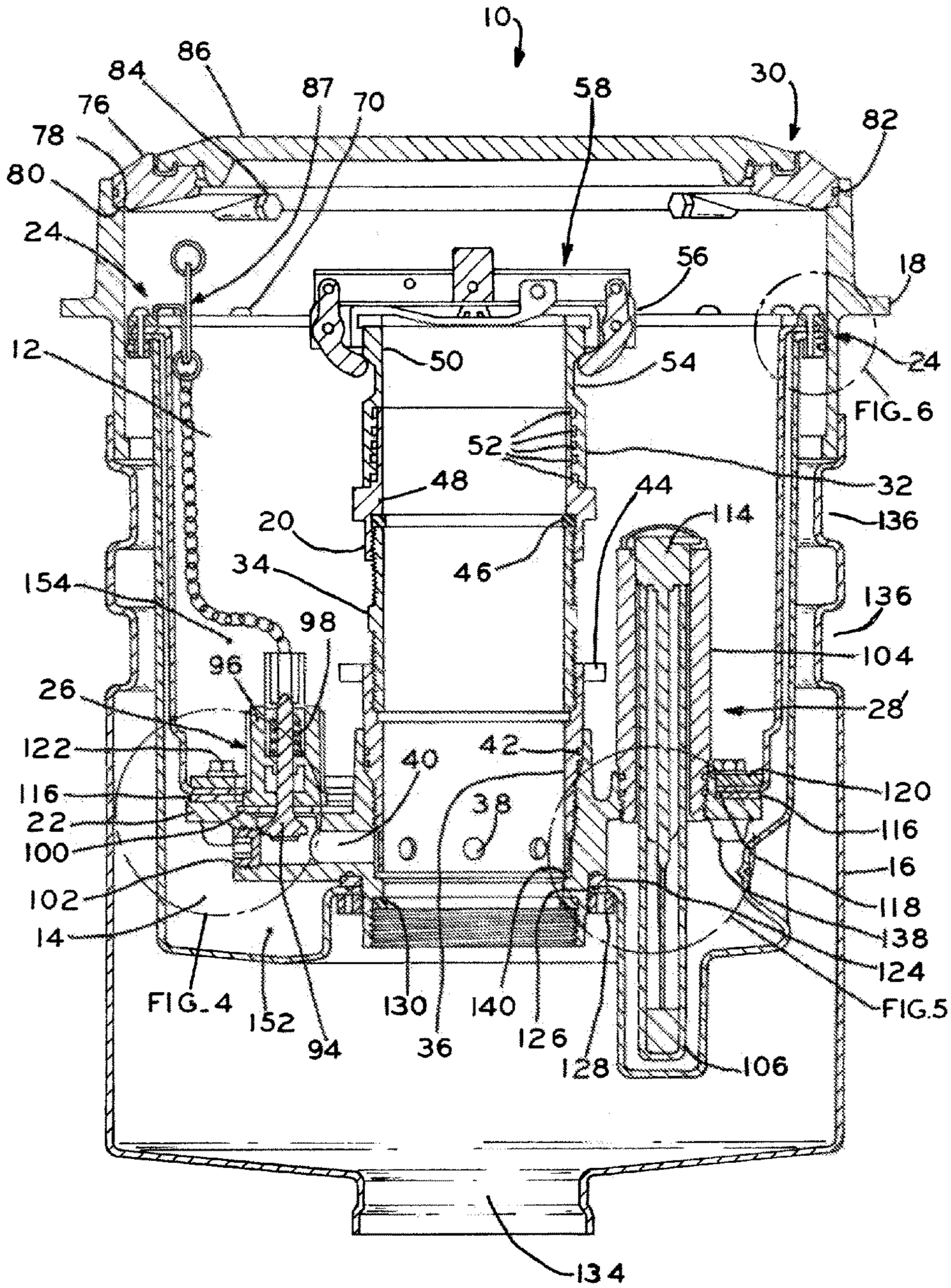

10
86
84
87
70
58
30
76
78
82
80
24
56
18
12
50
54
24
FIG_6
52
32
48
44
114
20
136
46
34
154
136
98
104
96
26
28
122
42
40
120
116
38
22
116
100
16
102
118
14
138
124
FIG_4
152
130
140
FIG.5
94
36
126
128
106
134

FIG.1A

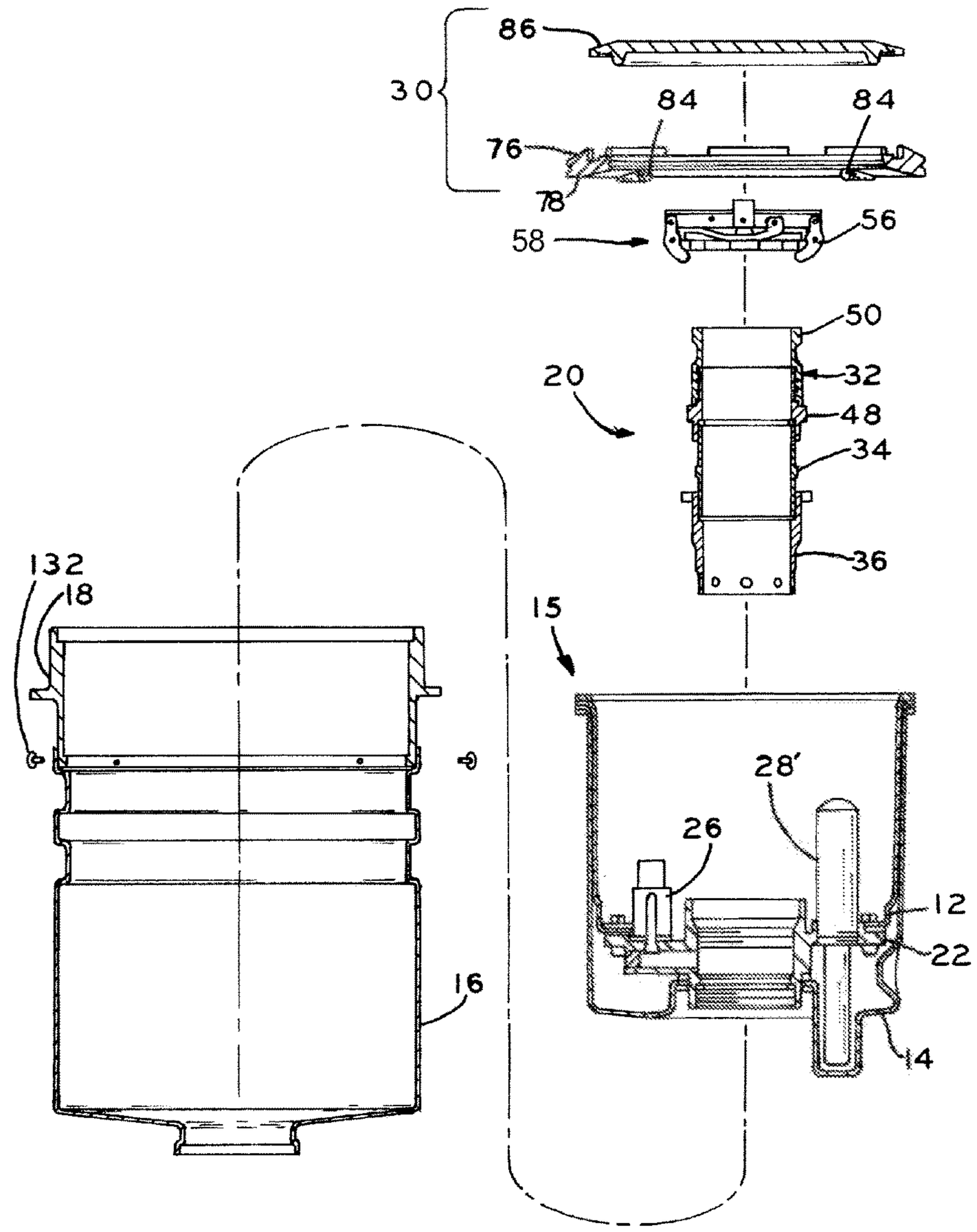


FIG_1B

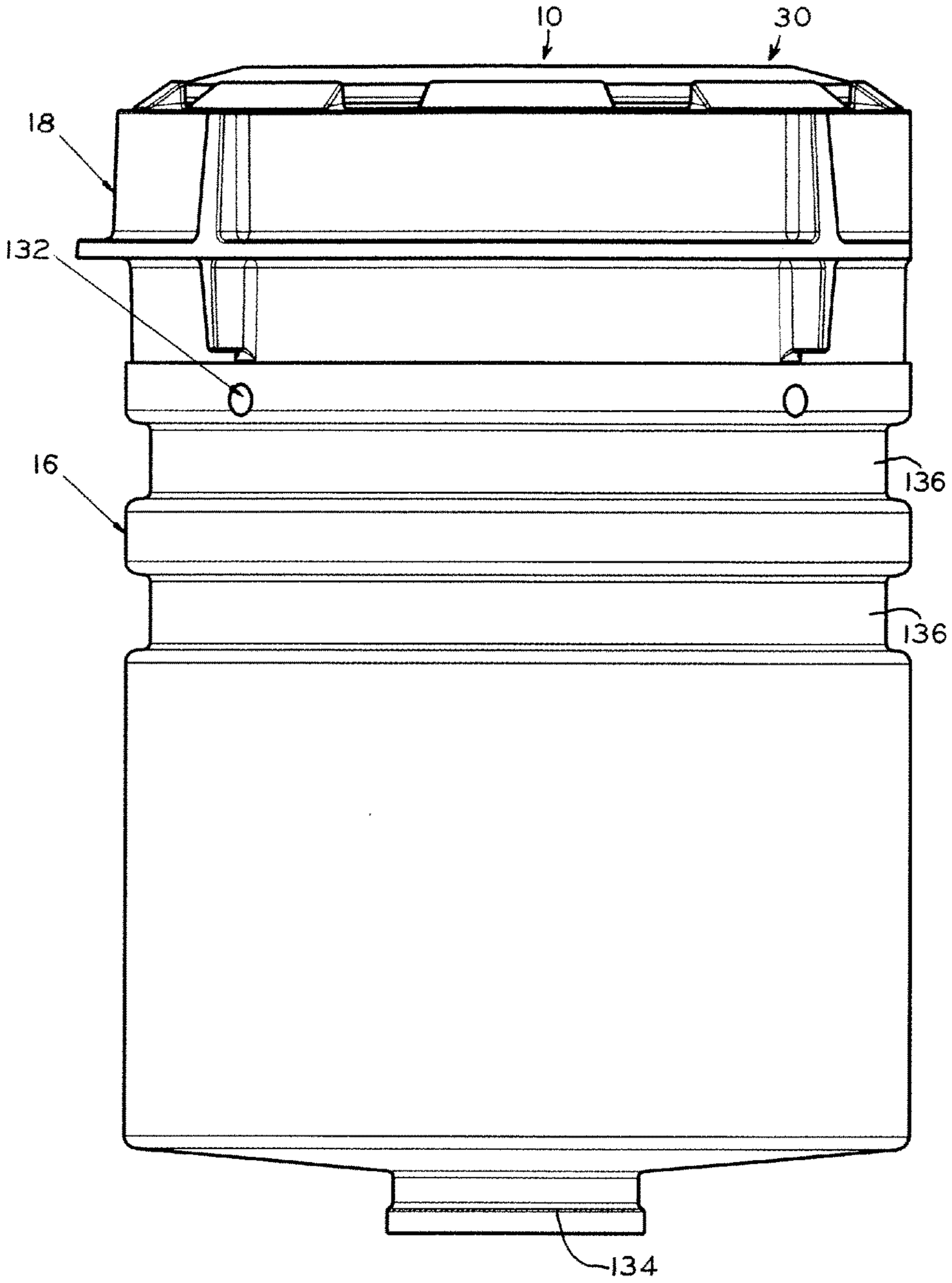


FIG. 2

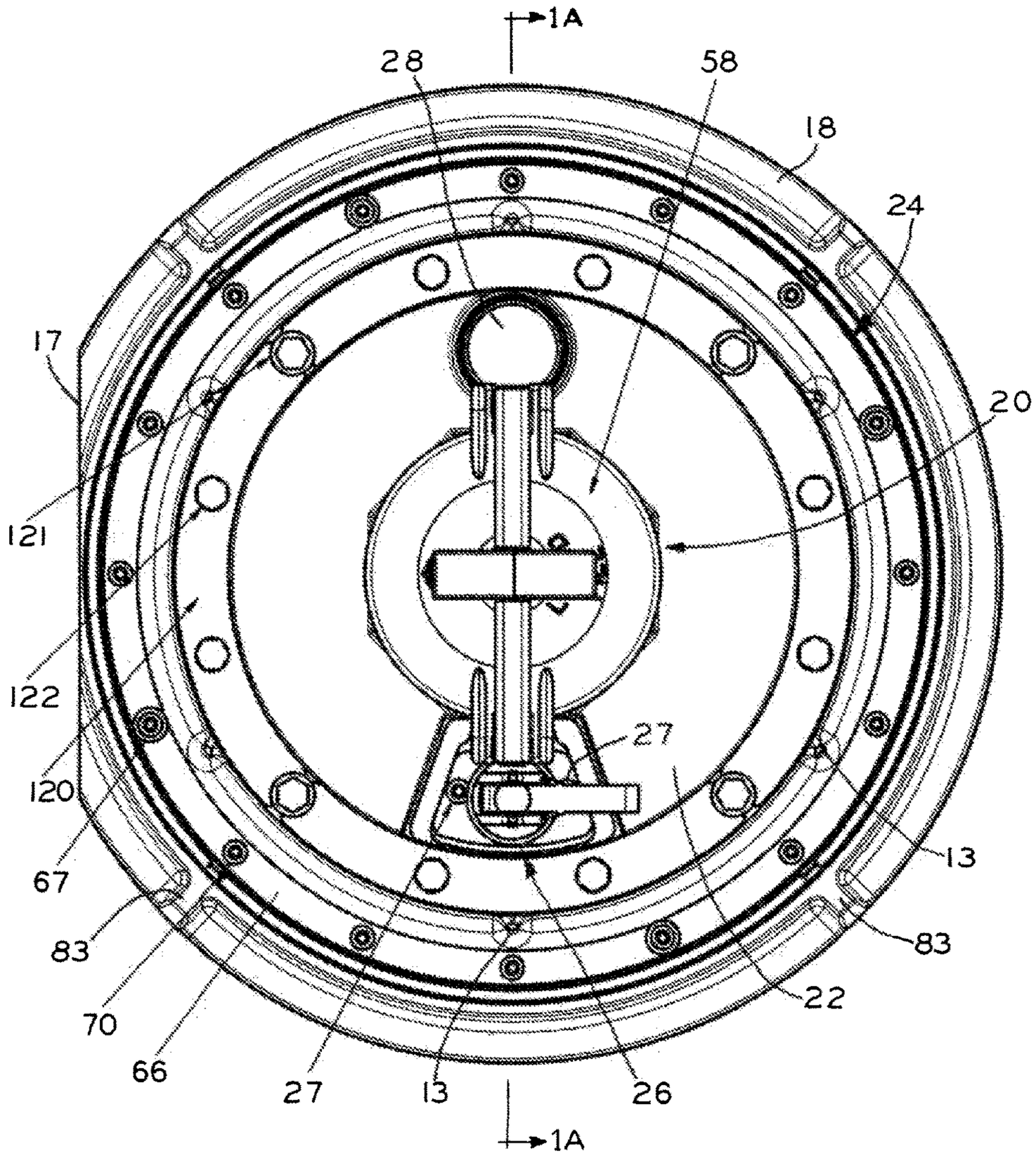


FIG. 3A

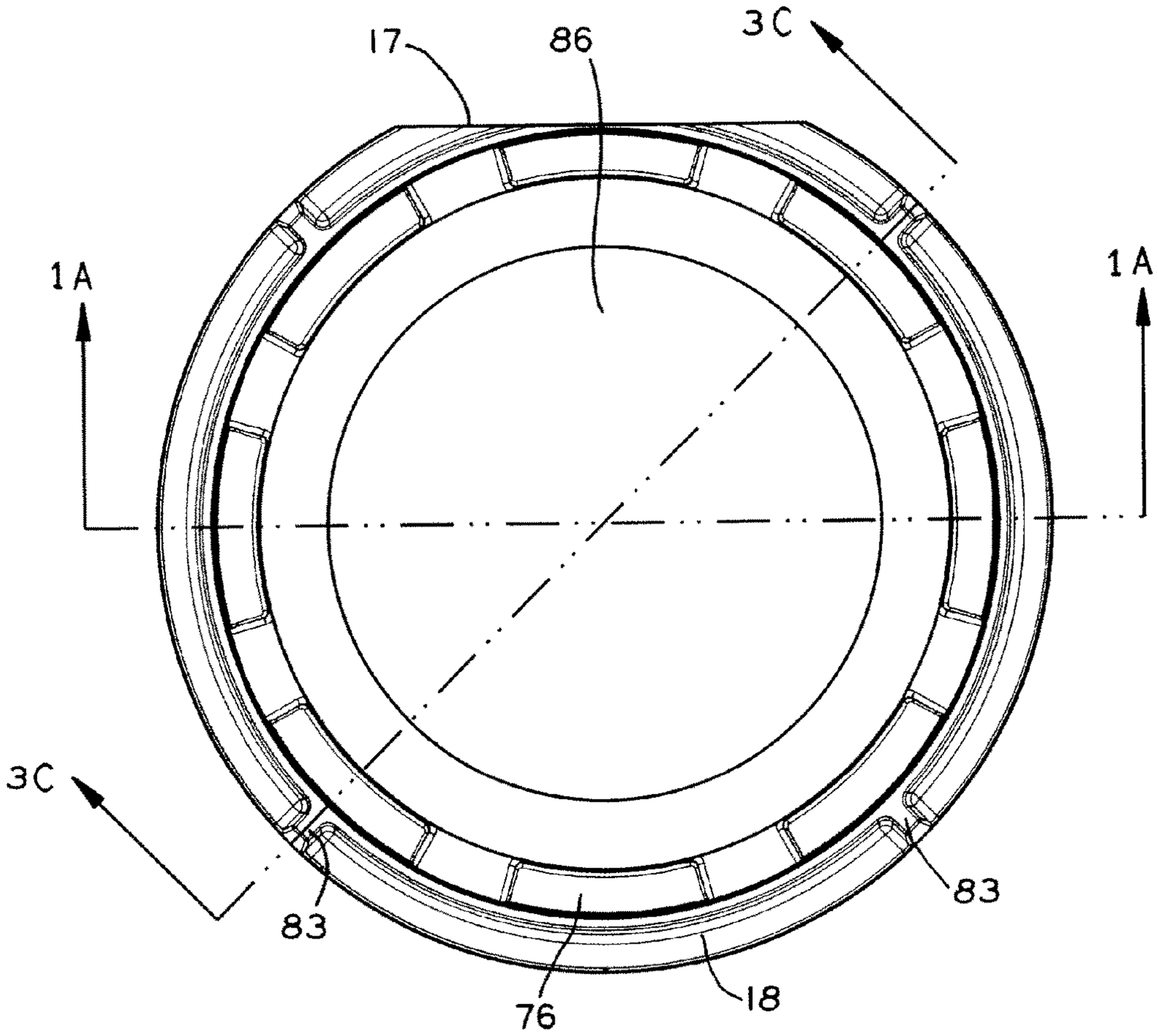


FIG. 3B

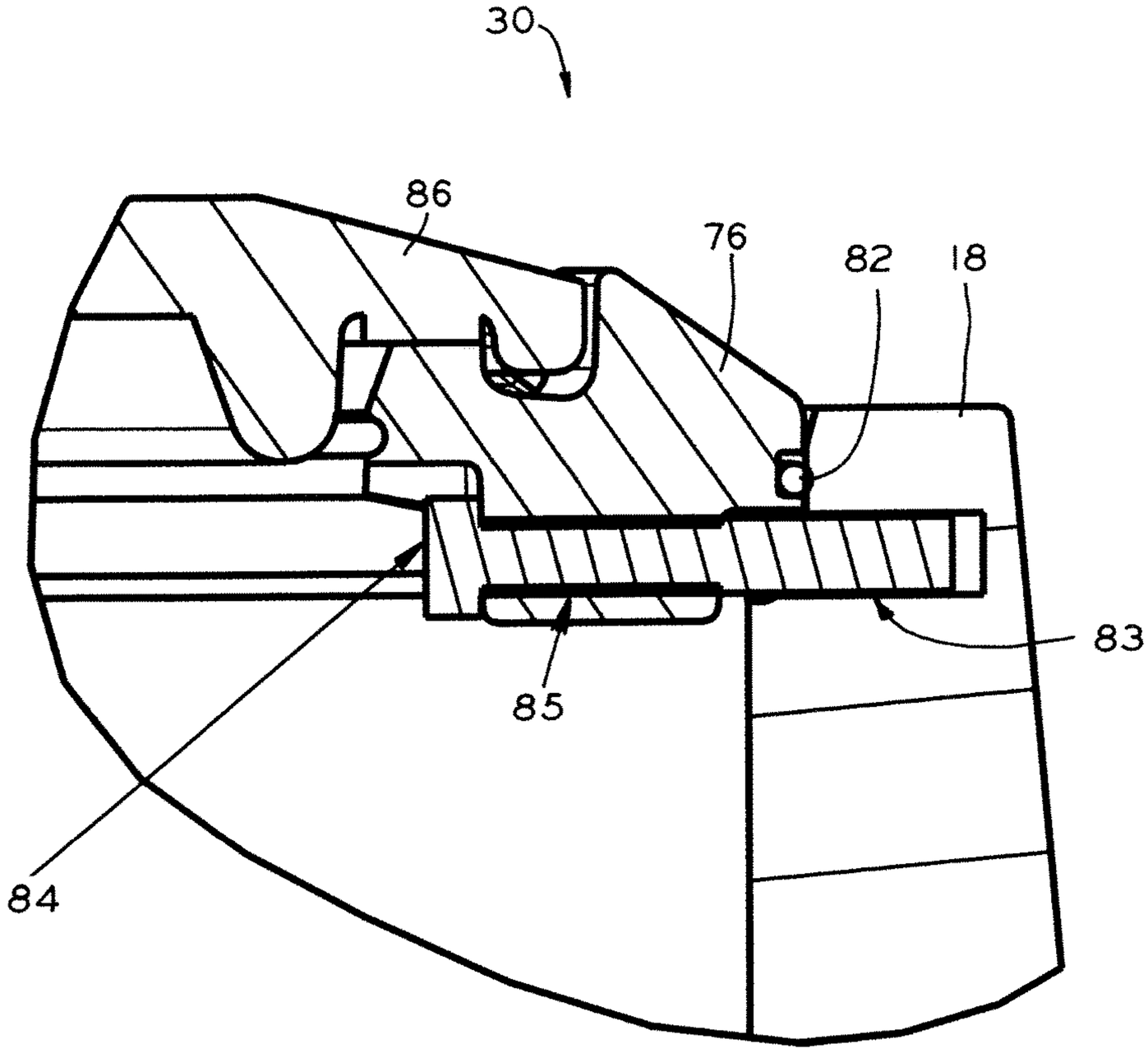


FIG. 3C

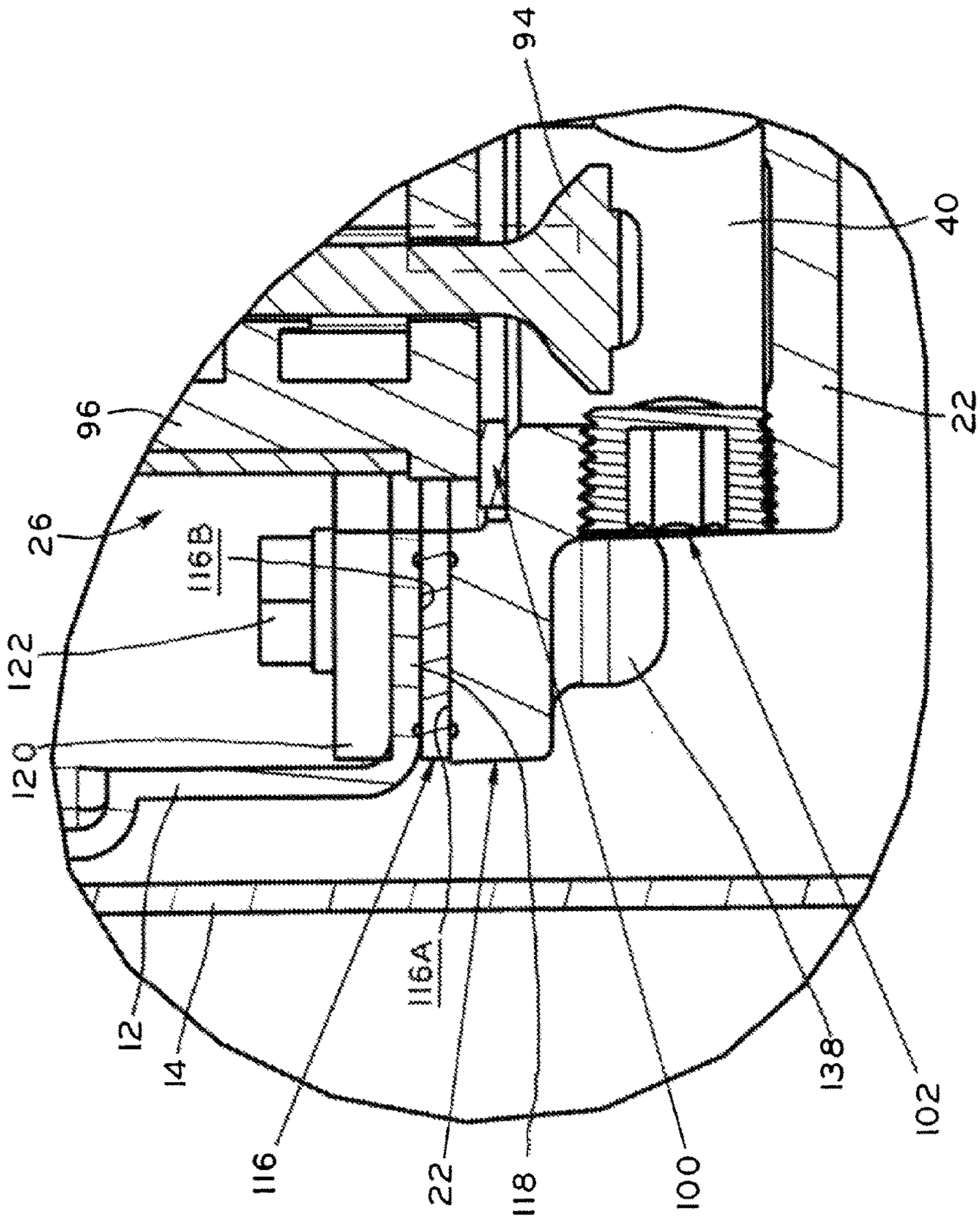


FIG. 4

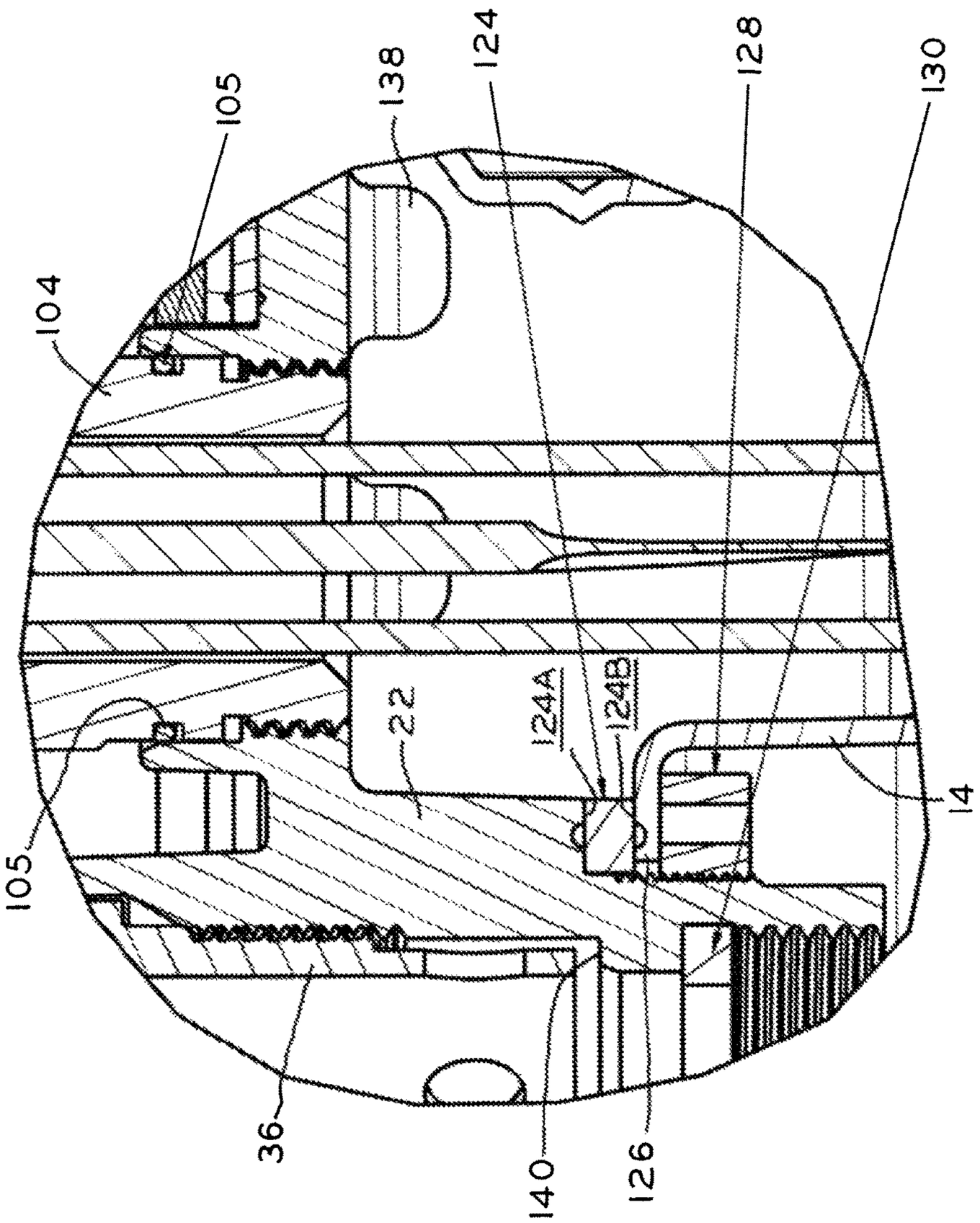


FIG. 5

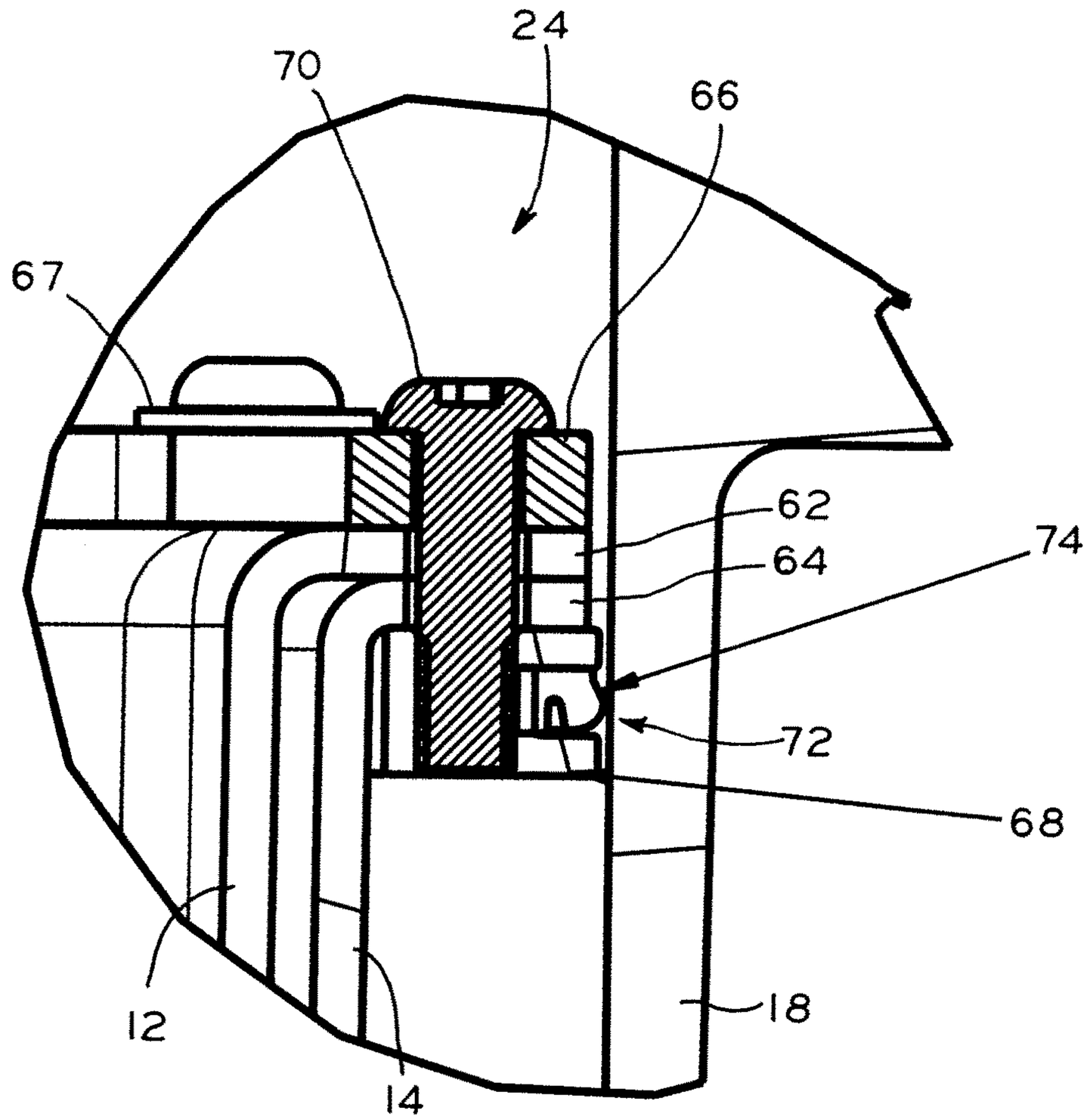


FIG. 6A

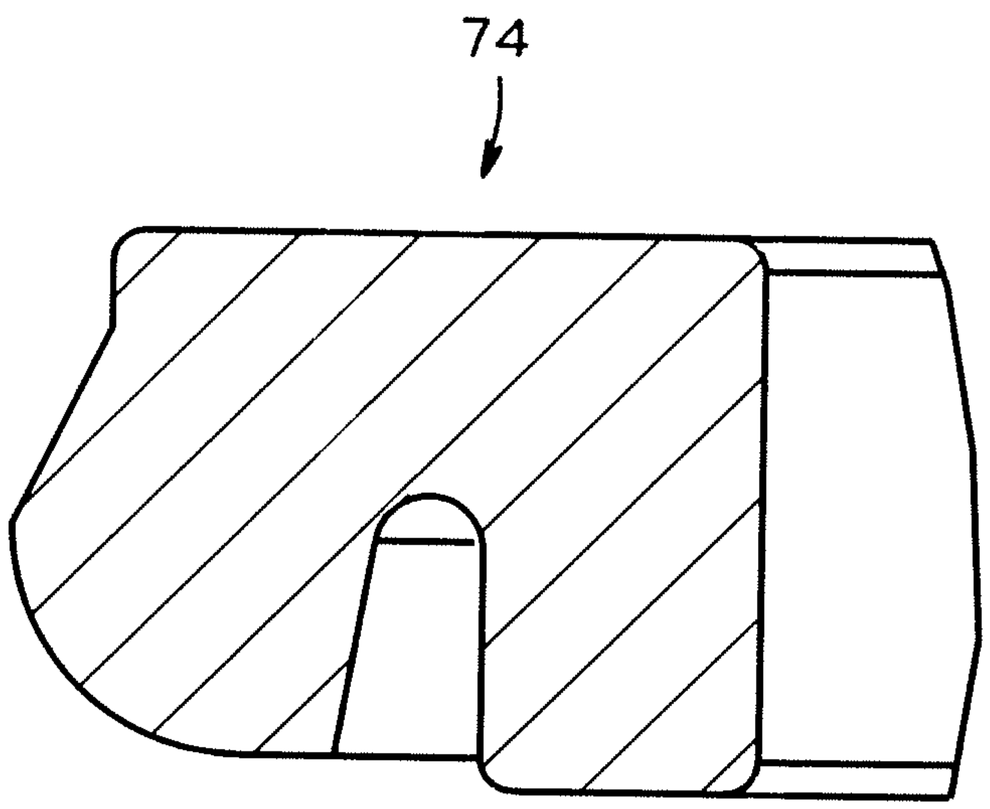


FIG. 6B

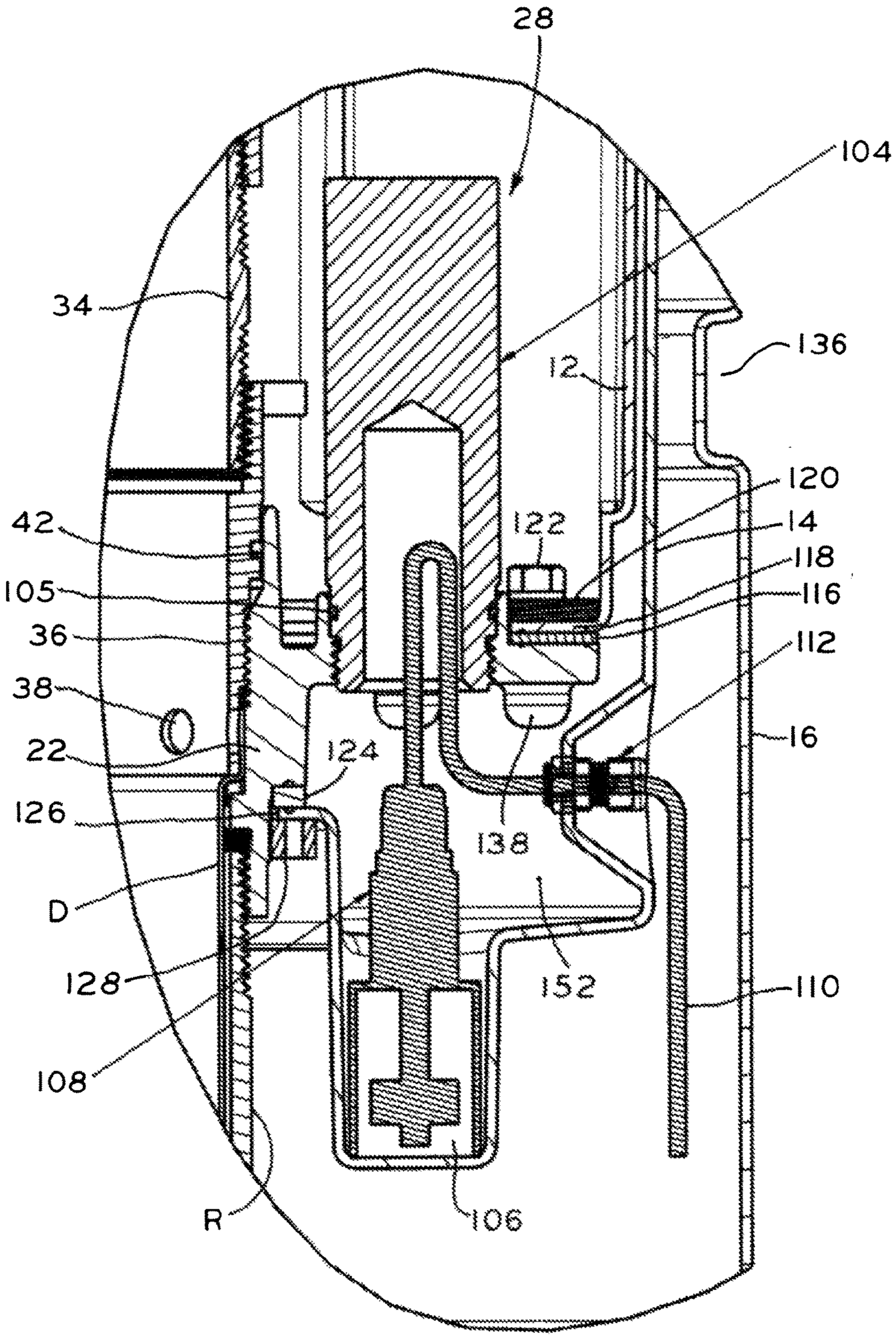

28
104
34
136
12
120
42
122
14
105
118
36
116
38
112
22
124
16
126
138
D
152
128
110
108
R
106

FIG. 7A

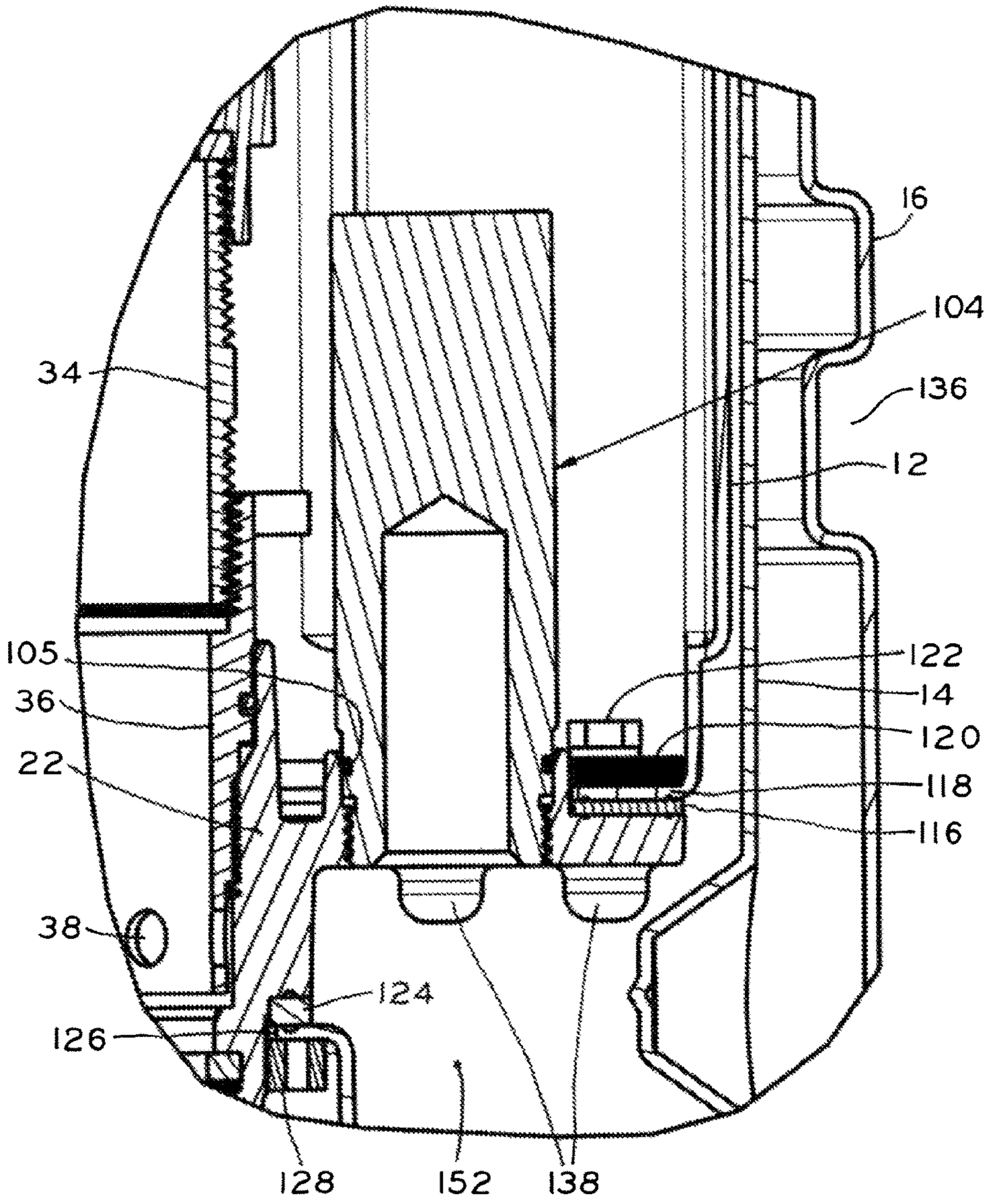

16
104
34
136
12
105
122
36
14
22
120
118
116
38
124
126
128
152
138

FIG. 7B

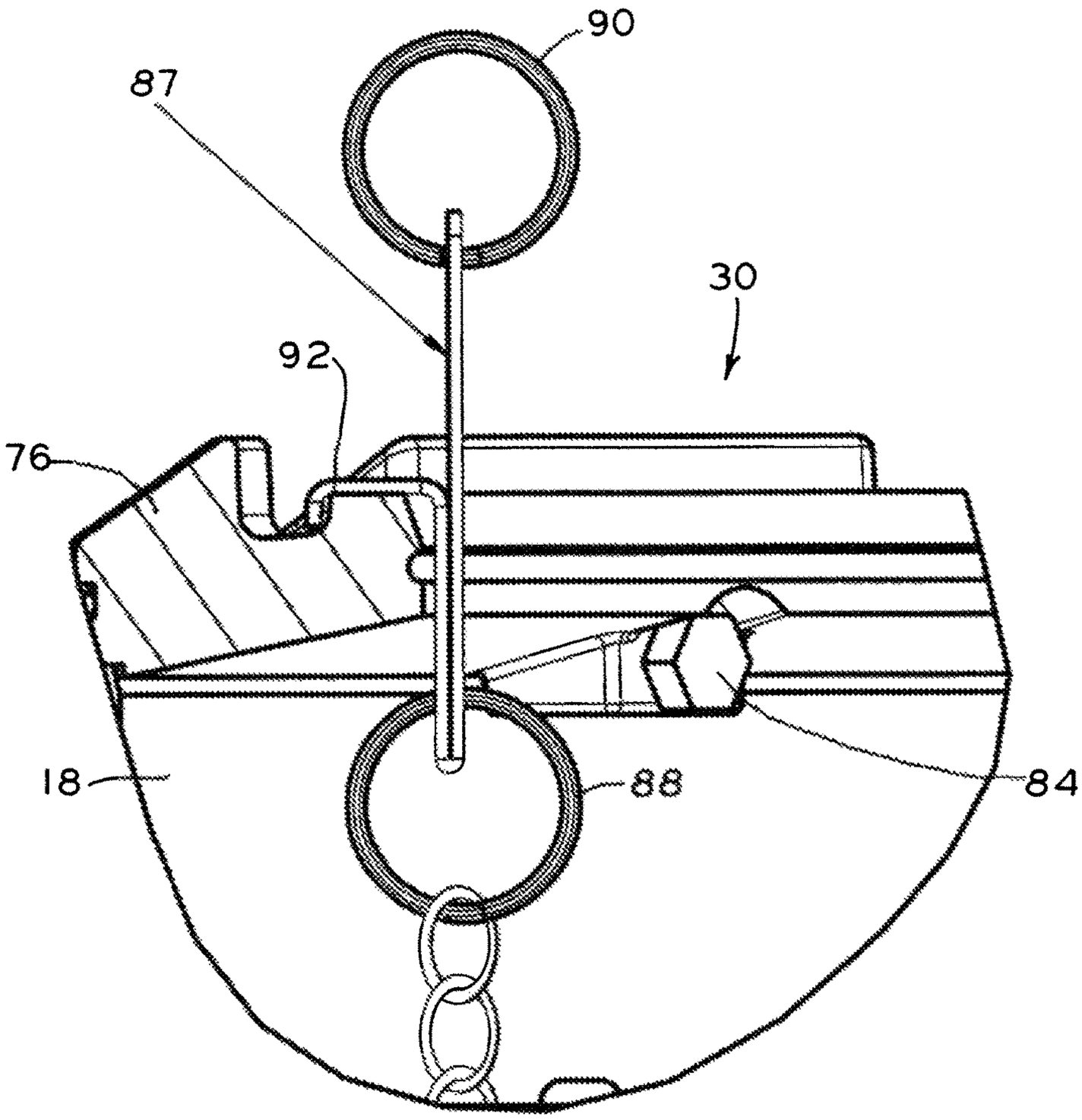


FIG. 8

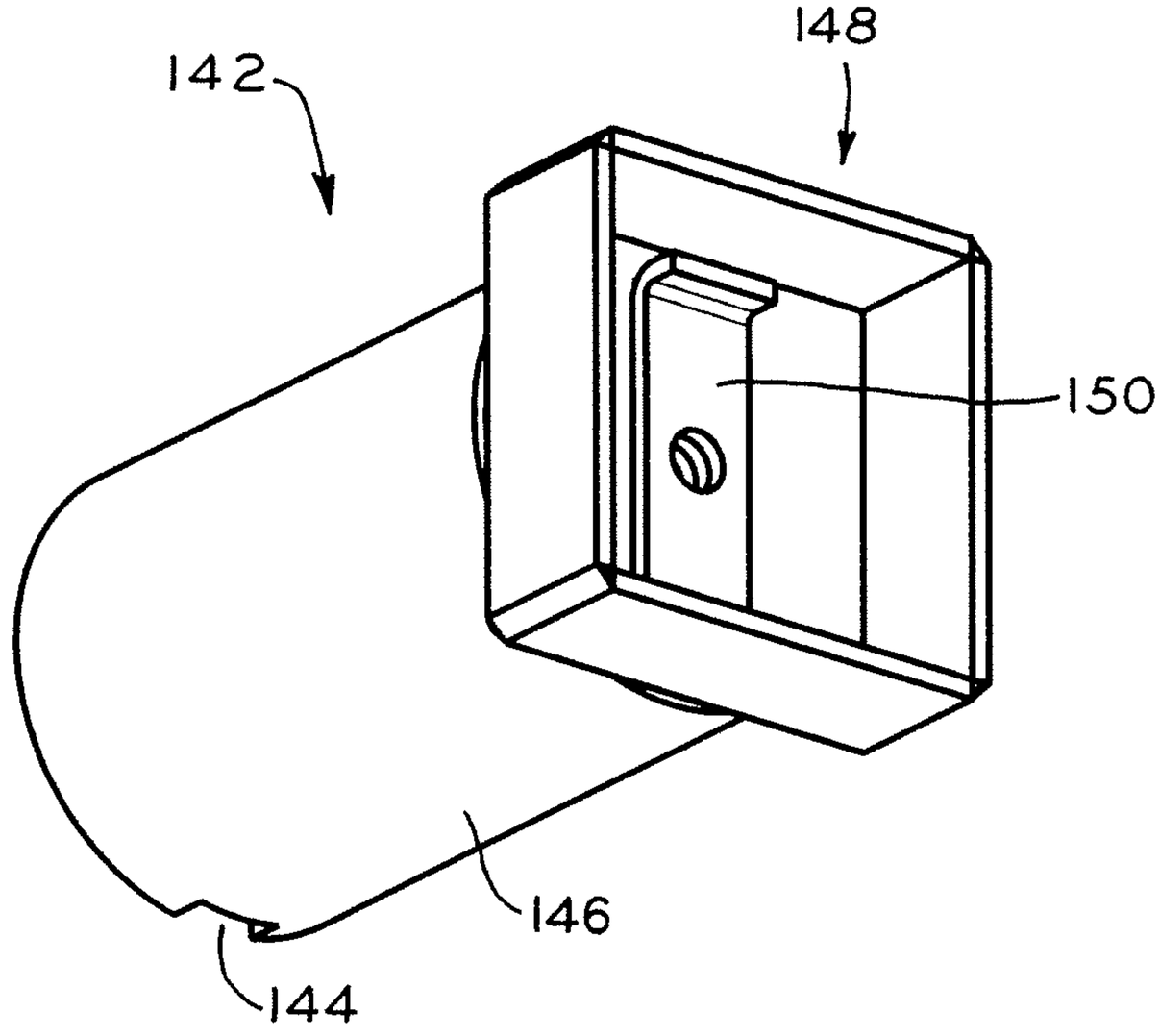


FIG. 9A

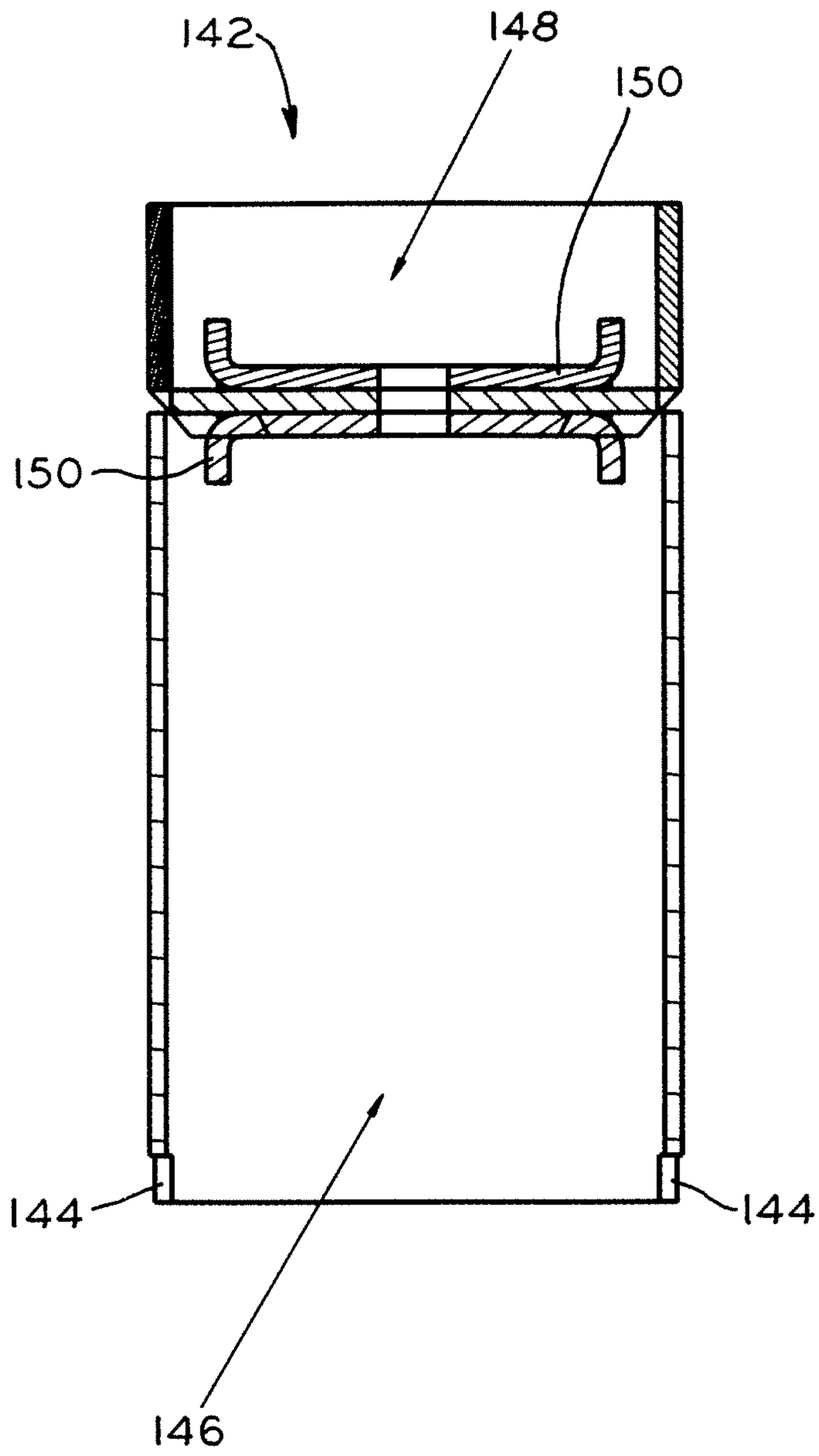


FIG_9B

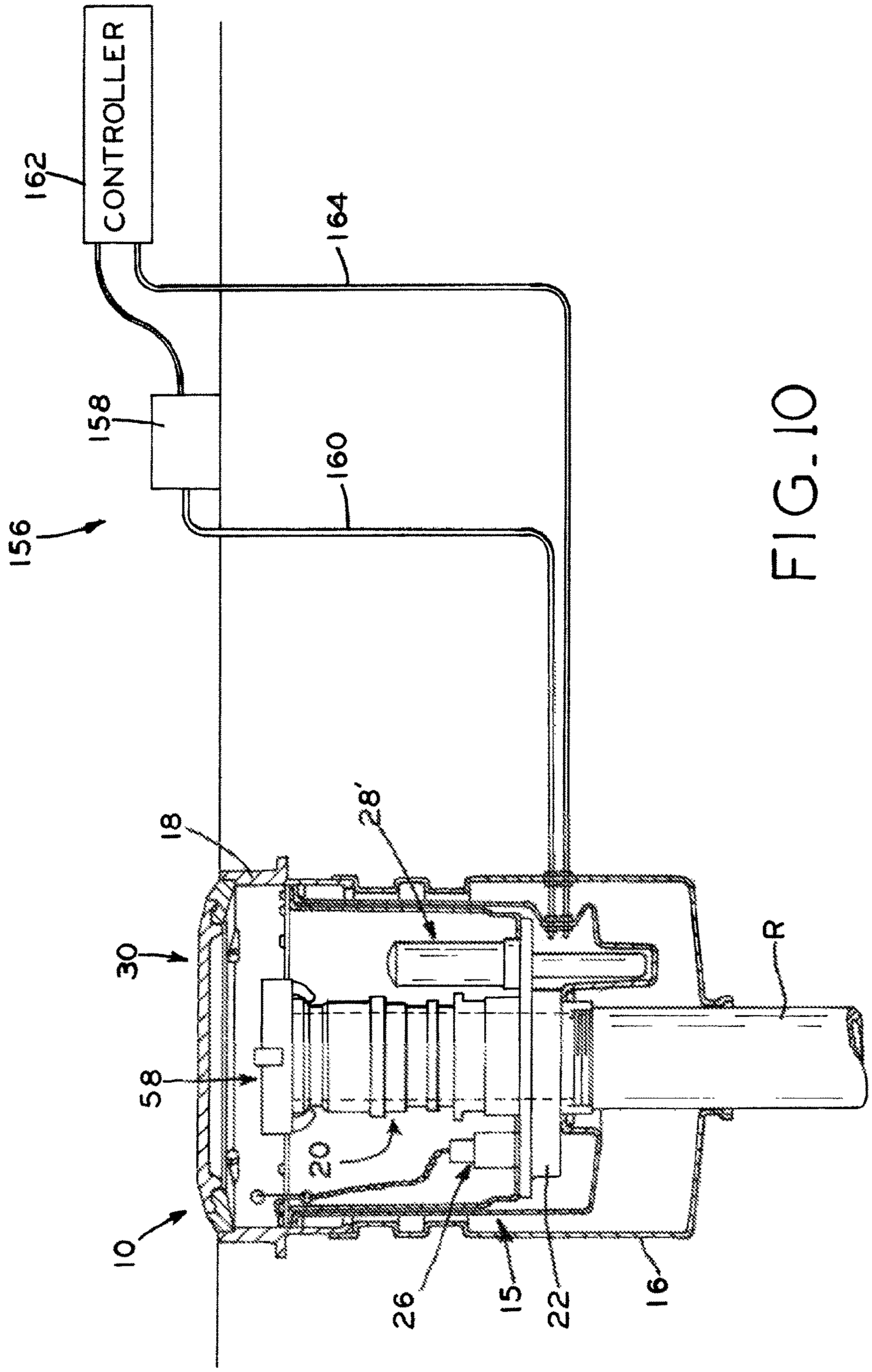


FIG. 10

SPILL CONTAINMENT SYSTEM

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue; a claim printed with strikethrough indicates that the claim was canceled, disclaimed, or held invalid by a prior post-patent action or proceeding.

CROSS-REFERENCE TO RELATED APPLICATIONS

This application [claims] *is a broadening reissue application of and claiming priority to U.S. Pat. No. 8,684,024, entitled "SPILL CONTAINMENT SYSTEM," issued Apr. 1, 2014, which was based upon U.S. patent application Ser. No. 12/904,530, filed Oct. 14, 2010, which claimed* the benefit under Title 35, U.S.C. §119(e) of U.S. Provisional Patent Application Ser. No. 61/252,311, entitled SPILL CONTAINMENT SYSTEM, filed Oct. 16, 2009, the [disclosure] *disclosures* of which [is] *are* expressly incorporated by reference herein in [its entirety] *their entireties*.

BACKGROUND

1. Technical Field

The present disclosure relates to a spill containment system for use with a fill pipe. More particularly, the present relation relates to a spill containment system for use in conjunction with a riser pipe of an underground storage container, such as an underground fuel storage tank, and to a method for using the same.

2. Brief Description of the Related Art

Liquid storage tanks are used for storage and distribution of a variety of liquids, such as reactants, solvents, chemical byproducts and finished materials. Underground liquid storage tanks for storing fuel are in wide spread use at gasoline service stations and fuel storage facilities. These liquid storage tanks are repetitively depleted and refilled via fill pipes or couplings located at the exterior of the storage tank. Spillage may occur during refilling, such as by tank overfilling, weak line connections, drainage from disconnected lines, faulty gaskets, leaky valve seals or the like.

Spillage of hazardous materials, such as fuel or chemicals, into the surrounding environment should be minimized. In addition to wasted liquid material, the hazardous chemicals may leach into the soil causing environmental problems, such as ground water contamination. In recognition of this threat, a variety of local, state and federal laws currently exist to regulate the use of underground liquid storage systems. For example, fill locations at some underground storage tanks are required have an overspill device capable of containing at least five gallons of liquid. Such an overspill device is located proximal a riser pipe extending from the underground storage tank to the ground above. Typically, a hose coupler or other attachment pipe is in fluid communication with the riser pipe, and is used as the port for liquid delivery or extraction. A receptacle or bucket surrounds the attachment pipe and is designed to act as a spill catch, such as for capturing any overfill or spillage resulting from transferring a load of fluid to the underground storage tank. For example, a spill receptacle may be used to catch fuel spillage when filling underground fuel storage tanks from a fuel delivery truck.

Spill containers located around fluid storage tank fill ports may be set in the ground, such as in the concrete drive of a fueling station. Concrete subsidence, or the motion of the concrete surface as it shifts downward relative to a datum, and concrete uplift, or an upward shift relative to the datum, are naturally occurring phenomena resulting from seasonal effects, extraction or dissolution of underground materials, and other causes. Since overspill devices have an opening coincident with grade level, they must accommodate movement due to uplift and subsidence. Further, since the overspill device must form a liquid tight seal between the interior of the spill receptacle and the surrounding area, a liquid tight engagement between the spill device and the riser pipe and any adjacent installation structures must also be capable of movement due to uplift and subsidence.

Given the relatively long service life of underground storage tanks, it is desirable for overspill devices installed to storage tank riser pipes to have a comparatively long service life and/or be easily replaceable. It is also desirable to minimize the effort and time required for routine maintenance tasks. For example, many riser pipes include a drop tube at the upper end of the riser pipe which may include a protection device, such as an overfill prevention device. These drop tube devices may require frequent inspection: in some jurisdictions, for example, a drop-tube mounted overfill prevention device may require monthly inspection. Moreover, the drop tube itself and/or any number of other devices may require periodic inspection. Thus, facilitation of routine maintenance to an overspill containment device should include easy access to the drop tube located in the riser pipe.

Because overspill devices are located in a wide variety of locations and climates, these devices encounter all manner of extreme weather. A cover or a manhole is one method of protecting the fill pipe and overspill containment device from precipitation and environmental degradation. In this harsh service environment, a manhole system is preferably highly weather resistant and capable of withstanding any associated rigors, such as the driving of snowplows over the manhole cover.

SUMMARY

The present disclosure provides a spill containment system attachable to a riser pipe with an axially moveable seal. The spill containment system allows access to a drop tube in the riser pipe via a removable liquid communication assembly. The spill containment system includes a sealed interstitial space, which remains sealed during installation, service and use of the system. The spill containment system is protected by a weather resistant cover assembly.

In one embodiment thereof, the present invention provides a fluid spill collector assembly comprising: a primary receptacle including: an upper primary receptacle end having an upper primary receptacle opening; a lower primary receptacle end having a lower primary receptacle opening; a primary receptacle wall extending between the upper and lower primary receptacle ends, the primary receptacle wall defining a primary receptacle cavity; a secondary receptacle including: an upper secondary receptacle end having an upper secondary receptacle opening; a lower secondary receptacle end having a lower secondary receptacle opening; and a secondary receptacle wall extending between the upper and lower secondary receptacle ends, the secondary receptacle wall defining a secondary receptacle cavity, the primary receptacle received within the secondary receptacle cavity, the upper primary receptacle opening sealingly coupled to the upper secondary receptacle opening to form a sealed upper end of the assembly; and a single, unitary tank

adapter having a base platform with a central aperture extending therethrough, the base platform sealingly coupled to the primary lower receptacle opening and the secondary lower receptacle opening to form a sealed lower end of the assembly, the sealed upper end and lower ends of the assembly cooperating to form a sealed interstitial space between the primary receptacle wall and the secondary receptacle wall, wherein the primary receptacle cavity remains in fluid communication with the upper primary receptacle opening and the central aperture of the tank adapter while the interstitial space is sealed.

In another embodiment thereof, the present invention provides a fluid spill collector assembly comprising: a stationary collar having an inner peripheral surface; and a double-walled spill container assembly comprising: an outer receptacle having a first open upper end, the outer receptacle sized to be receivable within the collar; an inner receptacle having a second open upper end, the inner receptacle coupled to the outer receptacle to create a sealed interstitial space therebetween; and a seal coupled to at least one of the outer receptacle and inner receptacle, the seal slidably engageable with the inner peripheral surface of the collar to create a fluid tight seal between the collar and the spill container assembly, the spill container assembly axially moveable with respect to the stationary collar while the interstitial space remains sealed.

In yet another embodiment thereof, the present invention provides a fluid spill collector assembly comprising: a double-walled spill container assembly comprising: a primary receptacle having a primary open upper end and a primary receptacle cavity; and a secondary receptacle having a secondary open upper end a secondary receptacle cavity, the primary receptacle received within the secondary receptacle cavity via the secondary open upper end to create a sealed interstitial space between the primary receptacle and the secondary receptacle, the primary receptacle cavity remaining accessible while the interstitial space is sealed; and a vacuum system comprising: a vacuum generator operable to create a vacuum pressure; a vacuum conduit in fluid communication with the interstitial space and the vacuum generator; a vacuum monitoring device in fluid communication the interstitial space, the vacuum monitoring device including a processor monitoring the vacuum pressure created by the vacuum generator, the processor operable to determine a rate of change of the vacuum pressure.

In still another embodiment thereof, the present invention provides a cover assembly comprising: a collar including: an upper collar portion; a lower collar portion; and an inner collar peripheral surface extending from the upper portion and the lower portion, the inner collar peripheral surface having at least one radial collar aperture formed therein; a cover ring at least partially received within the collar, the cover ring including: an upper ring portion; a lower ring portion; an inner ring peripheral surface extending between the upper ring portion and the lower ring portion; and an outer ring peripheral surface opposite the inner ring peripheral surface, the cover ring having at least one radial ring aperture extending from the inner ring peripheral surface to the outer ring peripheral surface; a fastener extending radially through the ring aperture and into the collar aperture to fix the cover ring to the collar; and a cover receivable within the cover ring, the cover blocking access to the inner collar peripheral surface and the fastener when the cover is received within the cover ring.

In still another embodiment thereof, the present invention provides a method of using a fluid spill collector assembly, comprising: removing a cover from a cover receiving surface to expose an inner cavity of a spill receptacle; retrieving a drain valve actuator from within the inner cavity; attaching the drain valve actuator to the cover receiving surface to open a drain valve disposed within the inner cavity, the step of attaching the drain valve actuator blocking a portion of the cover receiving surface; wherein the step of attaching the drain valve actuator prevents replacement of the cover upon the receiving surface.

In still another embodiment thereof, the present invention provides a method of inspecting a drop tube of the inlet pipe, the method comprising: providing a double-walled spill container assembly comprising: a primary receptacle having a primary receptacle cavity; a secondary receptacle having a secondary receptacle cavity sized to receive the primary receptacle; and a tank adapter having a base platform coupled to the primary and secondary receptacles to form a sealed interstitial space therebetween, the tank adapter having an aperture in fluid communication with the primary receptacle cavity; accessing a liquid communication assembly received within the primary receptacle cavity, the liquid communication assembly including a drop tube riser clamp at a lower end thereof and a coupler at an upper end thereof, the drop tube riser clamp engaged with the tank adapter at the aperture; decoupling the liquid communication assembly from the tank adapter by disengaging the drop tube riser clamp from the tank adapter, the step of decoupling the liquid communication assembly exposing the aperture of the tank adapter; and removing the drop tube from the spill container assembly by extracting the drop tube through the aperture of the tank adapter.

BRIEF DESCRIPTION OF THE DRAWINGS

The above-mentioned and other features and advantages of this invention, and the manner of attaining them, will become more apparent and the invention itself will be better understood by reference to the following descriptions of embodiments of the invention taken in conjunction with the accompanying drawings, wherein:

FIG. **1**A is an elevation, section view of a spill collection system in accordance with the present disclosure;

FIG. **1**B is an elevation, partial section view of the spill collection system shown in FIG. **1**A, illustrating subassemblies;

FIG. **2** is an elevation view of the spill collection system shown in FIG. **1**A;

FIG. **3**A is a top plan view of the spill collection system shown in FIG. **1**A, shown without a cover;

FIG. **3**B is a top plan view of the spill collection system shown in FIG. **1**A, shown with a cover attached;

FIG. **3**C is an elevation, section view of a portion of the spill collection system shown in FIG. **1**A, illustrating a connection between a collar and a cover ring;

FIG. **4** is a partial section view of the spill collection system shown in FIG. **1**A, illustrating a drain valve and a connection between a primary spill receptacle and a tank adapter;

FIG. **5** is a partial section view of the spill collection system shown in FIG. **1**A, illustrating sealing members and a float sensor;

FIG. **6**A is a partial section view of the spill collection system shown in FIG. **1**A, illustrating an upper gasket assembly with a gasket in accordance with the present disclosure installed within a collar;

FIG. **6**B is a section view of the gasket shown in FIG. **6**A;

FIG. **7**A is a partial section view of the spill collection system shown in FIG. **1**A, illustrating an inspection port assembly with a float sensor;

FIG. **7**B is a partial section view of the inspection port assembly of FIG. **7**A, shown without the float sensor;

FIG. **8** is a partial section view of a cover assembly in accordance with the present disclosure, illustrating a pull ring assembly;

FIG. **9**A is a perspective view of a removal tool for removing a liquid communication assembly or a spill containment subassembly in accordance with the present disclosure;

FIG. **9**B is an elevation, section view of the tool shown in FIG. **9**A; and

FIG. **10** is an elevation, section view of a spill collection system with a vacuum monitoring system in accordance with the present disclosure.

Corresponding reference characters indicate corresponding parts throughout the several views. The exemplifications set out herein illustrate preferred embodiments of the invention and such exemplifications are not to be construed as limiting the scope of the invention in any manner.

DETAILED DESCRIPTION

Referring generally to FIGS. **1**A and **1**B, a spill collection system **10** includes a primary, inner spill receptacle **12** received within a secondary, outer spill receptacle **14**, which in turn is at least partially received by gravel guard or exterior wall **16** at a lower end and concrete ring or collar **18** at an upper end. In the illustrated embodiment, exterior wall **16** and collar **18** are considered to be stationary, in that they are permanently or semi-permanently installed at a subterranean storage tank access point. Primary spill receptacle **12** has a generally cylindrical wall with openings formed at the upper and lower ends thereof, while secondary spill receptacle **14** has a larger (i.e., increased diameter) cylindrical wall also having openings formed at the upper and lower ends of thereof. As discussed below, primary spill receptacle **12** is "nested" within secondary spill receptacle **14**, so that the upper opening of receptacle **12** remains open while the upper opening of receptacle **14** is sealed.

The lower openings are sealed with respect to one another via tank adapter **22**. Referring to FIG. **1**A, liquid communication assembly **20** is sealingly, threadably coupled with a central aperture formed in tank adapter **22**. A base platform of tank adapter **22** extends radially outwardly from the central aperture thereof, and is sealingly coupled to the lower opening of primary spill receptacle **12**. The base platform of tank adapter **22** can present a liquid-tight barrier between the lower openings of receptacles **12**, **14**, thereby forming a sealed lower end of spill collection system **10** as described in detail below.

Upper gasket assembly **24** couples primary and secondary spill receptacles **12**, **14** and provides a liquid-tight seal against a lower portion of collar **18** (FIG. **6**). Spill collection system **10** optionally includes a drain valve assembly **26** for draining fluid contained within primary spill receptacle **12** to liquid communication assembly **20**. Spill collection system **10** also optionally includes inspection port assembly **28** (without a gauge as shown in FIG. **7**A) or **28'** (with a gauge as shown in FIG. **1**A) for monitoring fluid accumulation in secondary spill receptacle **14**.

A cover assembly **30** cooperates with an upper portion of collar **18** to create an enclosed space bounded by the base portion of tank adapter **22** at the bottom, primary spill collector **12** along the lower sides, collar **18** along the upper sides, and cover assembly **30** at the top. This enclosed space is adapted to contain any fluid collecting within cavity **154** of primary spill receptacle **12**, such as seepage from above or fuel spilled from the connection/disconnection of a hose to liquid communication assembly **20**. Primary spill receptacle **12** may optionally include stiffener ribs **13** (FIG. **3**A) for enhanced structural rigidity.

Referring now to FIG. **1**A, liquid communication assembly **20** includes an upper portion connectable to a liquid delivery device, shown as swivel adapter **32**, and a lower portion coupled to the central aperture of tank adapter **22**, shown as DT riser clamp **36**. In the exemplary embodiment illustrated in FIG. **1**A, pipe nipple **34** is disposed between adapter **32** and riser clamp **36** to couple same. DT riser clamp **36** is adapted to sealingly, threadably engage with the central aperture extending through tank adapter **22**. A plurality of apertures **38** are formed in DT riser clamp, and are positioned to be in fluid communication with fluid channel **40** formed in tank adapter **22** when DT riser clamp **36** is assembled to tank adapter **22**, so that fluid channel **40** allows fluid to flow from primary spill receptacle **12** into liquid communication assembly **20** via apertures **38**. O-ring or sealing element **42** may be disposed between DT riser clamp **36** and tank adapter **22** to create a fluid tight seal therebetween. DT riser clamp **36** may include one or more lugs or protuberances **44** to facilitate threaded engagement or disengagement with tank adapter **22**, as described in detail below.

Pipe nipple **34** is threadably engaged with an upper portion of DT riser clamp **36**. In the embodiment of spill collection system **10** illustrated in the figures, pipe nipple **34** constitutes the male threaded portion of the threaded engagement with DT riser clamp **36**, a configuration which inhibits leakage of downwardly flowing fluid through liquid communication assembly **20**. An upper end of pipe nipple **34** is threadably engaged with swivel adapter **32**. On the other hand, since the male threaded portion of pipe nipple **34** is upwardly oriented, a seal or gasket **46** is disposed between pipe nipple **34** and swivel adapter **32** to prevent leakage at that junction.

Swivel adapter **32** includes lower portion **48** and upper portion **50** with one or more seals **52** disposed therebetween, so that upper portion **50** is rotatable with respect to lower portion **48**. Upper portion **50** includes groove **54** around its outer surface configured to engage with a cooperating structure on a fluid hose (not shown) or other fluid delivery device. Groove **54** may also cooperate with retention mechanism **56** of top seal cap **58**. Top seal cap **58** may be disposed at the top or outlet end of liquid communication assembly **20** to prevent contamination from entering liquid communication assembly **20** (and, thus, the underground storage tank to which it is attached), and/or to prevent escape of fluid vapors to the atmosphere via liquid communication assembly **20**. Retention mechanism **56** may, for example, be spring loaded to promote a fluid or vapor tight seal between top seal cap **58** and liquid communication assembly **20**. While swivel adapter **32** is included in the illustrated exemplary embodiment, it is contemplated that any suitable adapter (such as a non-swiveling adapter) may be used to fluidly connect a fluid hose to liquid communication assembly **20**.

Referring now to FIGS. **1**A and **6**A, primary and secondary spill receptacles **12**, **14** include upper flanges **62**, **64** respectively, which bound the upper openings of receptacles **12**, **14**. When primary spill receptacle **12** is fully received within the cavity of secondary spill receptacle **14**, upper flanges **62**, **64** are held adjacent to one another, with a gasket or sealant (not shown) disposed therebetween. Flanges **62**,

64 are "sandwiched" between upper pressure distribution ring 66 and lower pressure distribution ring 68, which operate to distribute the pressure exerted by the connection of flanges 62, 64 to one another. Such connection is effected by a plurality of bolts 70 passing through rings 66, 68 which, when tightened, compress the gasket between flanges 62, 64 to create a fluid-tight seal and fix flange 62 to flange 64. Ring 68 may include a plurality of threaded apertures (not shown) to receive bolts 70. When flanges 62, 64 are sealingly coupled in this way, the upper opening of secondary spill receptacle 14 is effectively sealed from above, leaving only the upper opening of primary spill receptacle 12 accessible. Thus, the upper end of spill collection system 10 is sealed, in that interstitial space 152 (shown in FIG. 1A and described below) is inaccessible from such upper end.

A groove or cavity 72 is formed in the outer portion of ring 68, with a v-shaped gasket or seal 74 received therein (FIG. 6B). V-shaped gasket 74 cooperates with an inner peripheral surface of collar 18 to provide a fluid tight seal isolating the interior of primary spill receptacle 12 from the space outside of secondary spill receptacle 14, as described in detail below. In an exemplary embodiment, ring 66 comprises multiple pieces or sections, such as four sections as shown in FIG. 3A. Washers 67 may be installed at the junctions between sections to aid in dispersing pressure caused by the tightening of bolts 70.

Cover assembly 30 includes cover ring 76 having a lower shoulder 78 sized to cooperate with upper shoulder 80 in the upper portion of collar 18. Cover ring 76 is received within collar 18 and may include a cover ring gasket or O-ring 82 disposed between cover ring 76 and collar 18 to provide a fluid tight seal therebetween. As best seen in FIG. 3C, cover ring 76 has at least one threaded aperture 85 extending between its inner and outer peripheral surfaces. Cover ring aperture 85 is positioned to align with corresponding apertures 83 (FIGS. 3A and 3C) in the inner peripheral surface of collar 18 when cover ring 76 is received within collar 18. Bolts 84 can be threaded through the threaded apertures formed in the inner peripheral surface of cover ring 76, and then received by apertures 83 in collar 18. Thus, with bolts 84 attached to cover ring 76 and protruding in to collar 18, cover ring 76 is fixed to collar 18. Cover 86 can then be received within cover ring 76 to seal or close primary spill receptacle 12 from the above-ground environment. In one embodiment, cover 86 may be a water resistant fiber plastic material resting within cover ring 76. Alternatively, cover 86 may be watertight, with a fiber plastic material fixedly attached by a clip or fastener to cover ring 76 and having a gasket disposed therebetween (not shown). Another watertight alternative is an iron material resting within cover ring 76 under its own weight with a gasket disposed therebetween (not shown).

Advantageously, with bolts 84 of cover ring 76 being under cover 86, a smooth unbroken profile is created between the top surface of collar 18 and the adjacent surface of cover 86. Thus, bolts 84 are not exposed to environmental degradation, such as corrosion or oxidation by contact with rain or snow. Moreover, a snowplow plowing snow from a concrete surface with spill collection system 10 disposed therein can drive a plow across cover ring 76 and cover 86 without snow becoming trapped within any orifice or depression formed thereon. Rain will be similarly prevented from becoming trapped.

Referring now to FIG. 8, cover assembly 30 may optionally include drain clip or pull ring assembly 87, which operates as an actuator for drain valve 26. Drain clip 87 may be used when cover 86 is disengaged from cover ring 76. Lower ring 88 is connected to upper ring 90 by elongate clip portion 92. Lower ring 88 is also connected to a chain or string or other attachment device to drain valve assembly 26 (as discussed below). Upper ring 90 can be pulled upwardly to actuate or open drain valve 26 and allow fluid in primary spill receptacle 12 to drain into liquid communication assembly 20. Clip portion 92 can be hooked onto or otherwise coupled with cover ring 76 to hold drain valve assembly 26 in the open position. Alternatively, upper ring 90 can be manually held in a raised position to hold drain valve assembly 26 in the open position. Advantageously, cover 86 cannot be seated within cover ring 76 when drain clip 87 is clipped or hooked in place on cover ring 76, thereby preventing drain valve assembly 26 from being accidentally left in the open position after use of spill collection system 10. To replace cover 86, pull ring assembly 87 may be hooked to an undersurface of cover 86 (FIG. 1A) or placed anywhere within cavity 154, for example.

Referring now to FIGS. 1A and 4, drain valve assembly 26 may optionally be included with spill collection system 10. Assembly 26 includes valve body 94 which is received within housing 96 and biased in an upward position by compression spring 98 (FIG. 1A). Valve gasket 100 is disposed between housing 96 and a drain valve aperture formed in tank adapter 22, to which housing 96 is attached. Valve gasket 100 prevents leakage or seepage of fluid from primary spill receptacle 12 to fluid channel 40 when drain valve assembly 26 is closed. When drain valve assembly 26 is open, cavity 154 of primary spill receptacle 12 is placed in fluid communication with the central aperture of tank adapter 22, allowing fluid contained within primary spill receptacle 12 to flow out of spill collection system 10 via fluid channel 40 and apertures 38 formed in DT riser clamp 36 FIG. 1A). In the closed position, cavity 154 of primary spill receptacle 12 is fluidly isolated from the central aperture of tank adapter 22.

Optionally, plug 102 may be provided within tank adapter 22 aligned with fluid channel 40 and proximal valve assembly 26 to plug the cross-drilled hole that forms fluid channel 40. Plug 102 may also facilitate access to fluid channel 40, such as for initial installation of valve assembly 26, clearing blockages in channel 40, or the like.

Inspection port assembly 28 facilitates monitoring of a fluid level in secondary spill receptacle 14. Referring now to FIGS. 1A, 7A and 7B, inspection port assembly 28 includes inspection port pipe 104, which is threadably engaged with an inspection port aperture formed in tank adapter 22 such that the aperture is in fluid communication with interstitial space 152 when inspection port assembly 28 is removed. The inspection port aperture is placed to dispose inspection port pipe 104 above a well or a recess 106 formed in secondary spill receptacle 14. Float sensor 108 may be received within well 106 (FIG. 7A). Float sensor 108 has a cable 110 which passes through a hole in secondary spill receptacle 14 (drilled on installation or pre-drilled) via a cord grip 112 and out to a controller or an alarm or the like. Cable 110 may also pass through a hole in exterior wall 16 and be brought to the surface, such as through conduit in the surrounding backfill material. Float sensor 108 detects fluid accumulation in well 106 and outputs a signal via cable 110 when a predetermined level of fluid accumulation has occurred, as discussed in detail below.

Advantageously, float sensor 108 is replaceable. Inspection port pipe 104 may be removed from tank adapter 22 to expose float sensor 108. An excess of cord may be stored within inspection port pipe 104 so that float sensor 108 may be removed from well 106 and subsequently tested, such as

by turning float sensor **108** upside down. If float sensor **108** is found to be malfunctioning, it may be replaced. Alternatively, float sensor **108** may be excluded from spill collection system **10** entirely, as shown in FIG. **7**B, with only a window through inspection port pipe **104** for visual inspection of well **106**. In another alternative, inspection port pipe **104'** may include an aperture therethrough to receive gauge **114** extending from the top of inspection port pipe **104'** to well **106** (FIG. **1**A). Gauge **114** may be visible upon removal of cover **86**, thereby allowing for visual inspection of a fluid level in well **106**. Inspection port seal **105** (FIGS. **7**A and **7**B) may be disposed between tank adapter **22** and inspection port pipe **104** or **104'** to provide a fluid-tight seal therebetween.

In addition to the gasket and seals discussed above, various other gaskets or seals may be utilized between various components to provide a fluid-tight seal therebetween. As best seen in FIG. **4**, for example, primary seal **116** may be disposed between upwardly facing surface **116**A of the base platform of tank adapter **22**, and an adjacent downwardly facing surface **116**B of lower flange **118** of primary spill receptacle **12**. Surfaces **116**A, **116**B in abutting contact with seal **116** may be said to be "primary sealing surfaces," in that they are the surfaces responsible for creating sealing engagement between primary spill receptacle **12** and tank adapter **22**. Flange ring **120** may be installed above lower flange **118** to promote even pressure on primary seal **116** when bolts **122** are used to secure tank adapter **22** to primary spill receptacle **12**. In an exemplary embodiment, flange ring **120** comprises multiple pieces or sections, such as four sections as shown in FIG. **3**A. Washers **121** may be installed at the junctions between sections to aid in dispersing pressure caused by the tightening of bolts **122**.

Referring now to FIG. **5**, secondary seal **124** may be disposed between downwardly-facing sealing surface **124**A of tank adapter **22** and upwardly-facing surface **124**B of lower flange **126** of secondary spill receptacle **14**. Surfaces **124**A, **124**B in abutting contact with seal **124** may be said to be "secondary sealing surfaces," in that they are the surfaces responsible for creating sealing engagement between secondary spill receptacle **14** and tank adapter **22**. Spanner nut **128** may be used to secure lower flange **126** to tank adapter **22**, and to thereby compress secondary seal **124** into a fluid-tight engagement between tank adapter **22** and lower flange **126**.

To create a fluid-tight seal between the central aperture formed through tank adapter **22** and the surrounding structures, additional sealing elements may be used. For example, referring in particular to FIGS. **1**A and **5**, tank adapter seal **130** is disposed between tank adapter **22** and riser pipe R. When tank adapter **22** is threadably engaged with riser pipe R, tank adapter seal **130** is compressed into a fluid tight engagement between tank adapter **22** and riser pipe R (FIG. **7**A) to prevent fluid leakage therebetween.

Assembly, installation and implementation of spill collection system **10** will now be discussed. A hole of appropriate size and shape is cleared around riser pipe R extending upwardly from an underground storage tank. Exterior wall **16** and collar **18** are pre-assembled using rivets **132** (FIG. **2**) to couple an open upper end of exterior wall **16** and a lower end of collar **18**. When so coupled, exterior wall **16** and collar **18** are placed into the hole with exterior wall aperture **134** fitting over the upwardly extending riser pipe R. Backfill or other appropriate filler material is filled in around exterior wall **16** with insets **136** formed in exterior wall **16** to inhibit subsequent axial motion of exterior wall **16** relative to riser pipe R. Concrete or other solid surface material is poured or installed around collar **18** to bring the concrete grade up to the level of the top of collar **18**. Optionally, flat portion **17** (FIGS. **3**A and **3**B) may be provided in exterior wall **16** to allow a pair of spill containment systems **10** to be placed next to one another while maintaining the two liquid communication assemblies **20** in close proximity. In an exemplary embodiment, for example, flat portions **17** on a pair of exterior walls **16** allow for the centers of two respective liquid communication assemblies **20** to be separated by sixteen inches.

With exterior wall **16** and collar **18** installed in the surrounding backfill and/or concrete, spill receptacles **12**, **14** and associated parts are ready to be received within the resulting space. Although primary and secondary spill receptacles **12** and **14** and tank adapter **22** may be installed one by one into exterior wall **16**, these components may advantageously be preassembled in to spill receptacle subassembly **15** (FIG. **1**B) before being lowered into collar **18** and exterior wall **16**.

As shown in FIG. **1**B, subassembly **15** includes primary and secondary spill containers **12**, **14** joined by tank adapter **22** and the components and seals contained therein. To assemble subassembly **15**, tank adapter **22** is first attached to secondary spill receptacle **14**. Secondary spill receptacle **14** includes secondary seal **124** and spanner nut **128** loosely installed thereon. As tank adapter **22** is received by an aperture formed adjacent lower flange **126** of receptacle **14**, tank adapter **22** threadably engages spanner nuts **128**. Upon full engagement with secondary spill receptacle **14**, tank adapter **22** secures and compresses secondary seal **124**. With tank adapter **22** now secured to secondary spill receptacle **14**, primary spill receptacle **12** may then be lowered into secondary spill receptacle **14** and attached to tank adapter **22** at lower flange **118** to form a sealed lower end of subassembly **15**.

Primary spill receptacle **12** is then attached to secondary spill receptacle **14** at upper flanges **62**, **64**, as described above, to form a sealed upper end of subassembly **15**. With the upper and lower ends sealed, interstitial space **152** is sealed. That is to say, once interstitial space **152** is sealed, no ingress of fluid into interstitial space **152** from outside may occur. This sealed arrangement is formed between the walls of primary and secondary spill receptacles **12**, **14** and the base platform of tank adapter **22**, leaving cavity **154** of primary spill receptacle **12** and the central aperture of tank adapter **22** available to collection and/or flow of fluid into and/or through spill collection system **10**.

Tank adapter **22** may include a plurality of protuberances **138** with blind holes threaded therein to receive bolts **122**. Optionally, drain valve assembly **26** and inspection port assembly **28** or **28'** may be installed to primary spill receptacle **12** before lowering the subassembly into exterior wall **16** and collar **18**. Alternatively, drain valve assembly **26** and/or inspection port assembly **28** or **28'** may be installed after the subassembly is installed, or may not be installed at all.

With primary spill receptacle **12**, secondary spill receptacle **14**, tank adapter **22**, associated seals and gaskets of assembly **15**, and any optional assemblies now preassembled, subassembly **15** may be lowered through collar **18** into exterior wall **16**. V-shaped gasket **74** of upper gasket assembly **24** engages a machined surface on the interior of collar **18** to sealingly engage therewith, while also allowing axial movement of subassembly **15** with respect to collar **18** (as described below). The subassembly is rotated to place tank adapter **22** in threaded engagement with corresponding threads of riser pipe R (FIG. **7**A). When riser pipe R is firmly

seated against seal **130**, primary and secondary spill receptacles **12**, **14** are installed and ready to receive liquid communication assembly **20**. Advantageously, riser pipe R may rise or fall, such as from subsidence or uplift at the grade level, without disrupting the slidable, sealing engagement between v-shaped gasket **74** and the interior surface of collar **18**. The interior surface of collar **18** may be machined to a certain depth sufficient to allow a range of motion appropriate to local circumstances, or the entire surface may be machined to maximize the range of motion. In the illustrated embodiment of FIGS. **1**A-**7**, the range of motion is approximately 3½ inches, though other ranges are contemplated within the spirit and scope of the present disclosure. An example of a spill collector assembly with a receptacle that is slidably fitted within a stationary housing can be found in U.S. Pat. No. 4,696,330, filed Aug. 14, 1986 and entitled SPILL COLLECTOR ASSEMBLY FOR LIQUID STORAGE VESSELS, the disclosure of which is hereby expressly incorporated herein by reference in its entirety.

Liquid communication assembly **20** may also be preassembled and installed to tank adapter **22** as an assembly, or may be installed within primary spill receptacle **12** piece by piece. Advantageously, assembling DT riser clamp **36** to pipe nipple **34** and pipe nipple **34** to swivel adapter **32** (as described above) saves time and effort in a field installation of liquid communication assembly **20**. Prior to installation of liquid communication assembly **20** to tank adapter **22**, drop tube D (FIG. **7**A) is lowered in to riser pipe R through tank adapter **22**. Tank adapter **22** includes shoulder **140** sized to cooperate with a lid or flange at the top of drop tube D. Thus, drop tube D may be installed to extend downwardly into riser pipe R (FIG. **7**A) with a lip or flange of drop tube D engaging shoulder **140** to prevent further downward motion and to provide a liquid tight seal between drop tube D and tank adapter **22**. As discussed above, drop tube D may include or receive one or more auxiliary systems such as an overfill protection device or other device. If drop tube D contains an overfill protection device, the liquid tight seal created by the lip of drop tube D advantageously isolates the ullage space of the storage tank from fluid channel **40** and liquid communication assembly **20**. In an exemplary embodiment having a spill containment system attached to a riser pipe of a fuel storage tank, this isolation is particularly useful in light of the increased vapor pressures typically found in fuel storage tanks relative to the pressures within spill containment system **10**.

With drop tube D installed, liquid communication assembly **20** may be lowered into primary spill receptacle **12** and threadably attached to tank adapter **22**. To install or remove liquid communication assembly **20** to or from tank adapter **22**, lugs **44** on DT riser clamp **36** may cooperate with tool **142**, shown in FIGS. **9**A and **9**B. Tool **142** includes notches **144** in a lower portion **146**, with the notches sized to cooperate with lugs **44**. Lower portion **146** is of sufficient height to pass fully over swivel adapter **32** and pipe nipple **34** to engage lugs **44**, so that rotation of tool **142** also rotates DT riser clamp **36**. Upper portion **148** of tool **142** is welded to lower portion **146**, and has a square profile sized to cooperate with an upper central portion of tank adapter **22** (which may, for example, have an octagonal shape), so that rotation of tool **142** also rotates tank adapter **22**. Bracket **150** is fixed to the inside faces of upper portion **148** and lower portion **146**, and is shaped to cooperate with a field wrench to transmit rotational forces to tool **142**.

Liquid communication assembly **20** is fully installed when DT riser clamp **36** impinges upon drop tube D to urge a lip or flange of drop tube D against shoulder **140**. With liquid communication assembly **20** fully installed, top seal cap **58** may be installed on liquid communication assembly **20** and cover assembly **30** may be installed to enclose exterior wall **16** and collar **18**.

Advantageously, maintenance of drop tube D and any systems or components contained therein does not require removal of primary spill receptacle **12** or secondary spill receptacle **14**. Removal of a single unit, i.e., liquid communication assembly **20**, results in access to drop tube D, making maintenance tasks easier and more time efficient. Further, because the subassembly comprising primary and secondary spill receptacles **12**, **14** and tank adapter **22** only engages riser pipe R at its bottom end and collar **18** at its upper end (via upper gasket assembly **24**, FIG. **7**A), the subassembly may be retrofitted into existing gravel guards or exterior walls with existing concrete rings. Once the subassembly is installed, liquid communication assembly **20**, drain valve assembly **26** and inspection port assembly **28** may also be installed to gain the benefits thereof such as ease of installation, operation and maintenance.

Also advantageously, cover ring **76** may be removed, such as for service or inspection of subassembly **15**, without disrupting the sealed interstitial space **152**. As described herein, interstitial space **152** is formed by sealing lower and upper portions of primary and secondary spill containers **12**, **14**, either directly (via upper flanges **62**, **64** at the upper portions) or indirectly (via tank adapter **22** at the lower portions). Cover ring **76** is not a necessary component for establishing or maintaining interstitial space, so cover ring **76** (and cover **86**) can be installed, removed, or replaced while interstitial space **152** remains sealed.

Referring now to FIG. **10**, vacuum system **156** may be provided to create, maintain and monitor vacuum pressure within interstitial space **152**. Vacuum pressure is created by vacuum generator **158**, which is placed in fluid communication with interstitial space **152** by vacuum-creation conduit **160**. This vacuum pressure is monitored continuously (or at regular intervals) for leaks by vacuum monitoring device **162**, which is also in fluid communication with interstitial space **152** via vacuum-monitoring conduit **164**. For example, vacuum conduit **164** may be in fluid communication with interstitial space **152** at a one end, and attached to vacuum monitoring device **162** at the other end so that monitoring device **162** is constantly updated as to the condition of the vacuum pressure within interstitial space **152**. Vacuum monitoring device **162** may be located remotely from subassembly **15**, as shown in FIG. **10**. Optionally, an alarm may be integrated into vacuum monitoring device **162** to indicate an unacceptable loss in vacuum pressure within interstitial space **152**. In an exemplary embodiment, vacuum monitoring device **162** monitors the rate of change of vacuum pressure, as described below. Where vacuum pressure is slowly lost, and the rate of change is not unacceptably high, vacuum monitoring device **162** may not activate an alarm, but instead may activate vacuum generator **158** to replenish the vacuum pressure within interstitial space **152**. Exemplary methods and apparatuses which may be used for monitoring vacuum pressure in interstitial space **152** are disclosed in U.S. Pat. Nos. 7,051,579 and 7,334,456, both entitled METHOD AND APPARATUS FOR CONTINUOUSLY MONITORING INTERSTITIAL REGIONS IN GASOLINE STORAGE FACILITIES AND PIPELINES, which are commonly assigned with the present application, the disclosures of which are hereby expressly incorporated herein by reference in their entireties.

Advantageously, the integrity of the fluid-tight interstitial space **152** may be tested by applying a vacuum pressure with vacuum generator **158**, and then monitoring the vacuum pressure over time. If the vacuum pressure is released too quickly, it may be inferred that a leak has developed between interstitial space **152** and the ambient outside environment. For example, a vacuum pressure test kit may include a vacuum port (not shown) attachable to the threaded hole in tank adapter **22** normally occupied by inspection port assembly **28** or **28'** (FIG. **7**A). Once firmly attached, a vacuum is created in interstitial space **152** via a vacuum generator **158**, which may be in fluid communication with the vacuum port via vacuum-creation conduit **160**. Upon reaching a vacuum pressure sufficiently lower than the ambient atmospheric pressure, vacuum generator **158** is turned off and the vacuum level is monitored over a period of time. If the vacuum pressure approaches atmospheric pressure at an unacceptably high rate of change, an alarm is sounded by vacuum monitoring device **162**, and an operator may then find and fix the leak point. The unacceptably high rate of vacuum decline will vary based on system parameters and user needs.

A unique characteristic of spill collection system **10** is that subassembly **15** is a self-contained unit capable of assembly and quality testing at a remote location, so that on-site installation or removal of subassembly **15** is simplified. Additionally, the unique features of subassembly **15** facilitate effective and efficient production of subassembly **15** while ensuring reliable sealing of interstitial space **152** from the surrounding environment. For example, lower flange **118** of primary spill receptacle **12** and lower flange **126** of secondary spill receptacle **14** are both coupled to a single tank adapter **22**. This single-tank adapter design joins primary and secondary spill receptacles **12**, **14** in a robust manner, while also facilitating proper alignment of seals **116**, **124** with adjacent structures. The single, unitary tank adapter **22** also allows for a simpler assembly and installation procedure by reducing the number of parts in the design, thereby promoting cost efficiency. Moreover, tank adapter **22** provides a single or unitary base to which a number of individual components attach, including spill receptacles **12**, **14**, valve assembly **26**, and/or inspection port assembly **28** or **28'**, thereby providing a versatile and strong foundation for spill containment system **10**.

Advantageously, the use of a single, unitary tank adapter **22** eliminates a possible leak path inherent to spill containment systems having a separate part for primary and secondary spill containers. For example, tank adapter **22** has only one threaded connection between adapter **22** and riser pipe R. Thus, the likelihood of tank adapter **22** developing a leak at the main threaded connection is half that of a system having two container support surfaces with a threaded connection for each.

Once installed, spill collection system **10** provides a double-walled spill collector assembly with interstitial space **152** formed between primary spill receptacle **12** and secondary spill receptacle **14** (FIG. **1**A). Put another way, interstitial space **152** is the remaining space within the cavity of secondary spill receptacle **14** that is not displaced by primary spill receptacle **12**. During normal operation, interstitial space **152** will not have any fluid contained therein. Spills or intrusion of foreign substances such as precipitation will collect in cavity **154** of primary spill receptacle **12**, which may then be pumped out or drained into liquid communication assembly **20** (and, subsequently, into the storage tank) via drain valve assembly **26**.

Any fluid in interstitial space **152** will pool in well **106**, which is the lowest point within secondary spill receptacle **14**. Float sensor **108**, if installed, will then send a signal through cord **110** indicating the fluid accumulation condition. Alternatively, fluid level gauge **114** will register the elevated fluid level condition in well **106** and display or broadcast this information in a conventional manner. Once it is known that fluid is present in well **106**, diagnosis of the cause of the fluid accumulation may commence and appropriate corrective action may then be taken.

Advantageously, the integrity of interstitial space **152** is not compromised by removal or installation of subassembly **15**. Since the creation and maintenance of interstitial space **152** is independent of any interaction between subassembly **15** and outer wall **16** and/or collar **18**, there is no need to expose interstitial space **152** to the surrounding environment when subassembly **15** is installed into, removed from, or moved within outer wall **16** and collar **18**. Advantageously, the fluid-tight seal between interstitial space **152** and the surrounding environment, created upon assembly of subassembly **15**, is maintained during subsequent installation and maintenance.

Yet a further advantage of spill collection system **10** is its ability to allow the axial movement between subassembly **15** and collar **18** via upper gasket assembly **24** without disrupting the sealing engagement between gasket **74** of assembly **24** and the inner peripheral surface of collar **18**. This axial movement may occur naturally as a result of warming or cooling of the subterranean material around spill collection system **10**, such as during a change of seasons. Permitting this axial movement prevents stress from forming in the components of system **10**, while maintenance of the seal between gasket assembly **24** and collar **18** maintains the ability of spill collection system **10** to prevent spilled fluid from seeping into the surrounding environment.

Further, because gasket **74** is located outside of interstitial space **152**, the sealing of interstitial space **152** (described above) will not be compromised by this axial movement, either during installation (which involves axial movement as subassembly is lowered through collar **18**) or as a result of ambient forces while system **10** is in service.

While this invention has been described as having an exemplary design, the present invention can be further modified within the spirit and scope of this disclosure. This application is therefore intended to cover any variations, uses, or adaptations of the invention using its general principles. Further, this application is intended to cover such departures from the present disclosure as come within known or customary practice in the art to which this invention pertains and which fall within the limits of the appended claims.

What is claimed is:

1. A fluid spill collector assembly comprising:

a primary receptacle including:

an upper primary receptacle end having an upper primary receptacle opening;

a lower primary receptacle end having a lower primary receptacle opening;

a primary receptacle wall extending between said upper and lower primary receptacle ends, said primary receptacle wall defining a primary receptacle cavity;

a secondary receptacle including:

an upper secondary receptacle end having an upper secondary receptacle opening;

a lower secondary receptacle end having a lower secondary receptacle opening; and

a secondary receptacle wall extending between said upper and lower secondary receptacle ends, said secondary receptacle wall defining a secondary receptacle cavity,

said primary receptacle received within said secondary receptacle cavity, said upper primary receptacle opening sealingly coupled to said upper secondary receptacle opening to form a sealed upper end of the assembly; and

a single, unitary tank adapter having a base platform with an aperture extending therethrough, said base platform sealingly coupled to said primary lower receptacle opening and said lower secondary receptacle opening to form a sealed lower end of the assembly,

said sealed upper end and lower ends of the assembly cooperating to form a sealed interstitial space between said primary receptacle wall and said secondary receptacle wall,

wherein said primary receptacle cavity remains in fluid communication with said upper primary receptacle opening and said aperture of said tank adapter while said interstitial space is sealed.

2. The fluid spill collector assembly of claim **1**, wherein said base platform of said tank adapter comprises:

a primary sealing surface disposed on an upper surface of said base platform, said primary sealing surface sealingly engaging said lower primary receptacle opening; and

a secondary sealing surface disposed on a lower surface of said base platform, said secondary sealing surface sealingly engaging said lower secondary receptacle opening, whereby said primary sealing surface is spaced from said secondary sealing surface.

3. The fluid spill collector assembly of claim **1**, further comprising a liquid communication assembly disposed within said primary receptacle cavity, said liquid communication assembly comprising:

an upper portion connectable to a liquid delivery device; and

a lower portion coupled to said aperture of said tank adapter.

4. The fluid spill collector assembly of claim **3**, wherein:

said upper portion of said liquid communication assembly comprises an adapter fixed to said lower portion; and

said lower portion of said liquid communication assembly comprises a drop tube riser clamp threadably engaged to said aperture of said tank adapter, said drop tube riser clamp having at least one lug adapted to engage a removal tool,

said liquid communication assembly removable from said tank adapter by using said lug to threadably disengage said drop tube riser clamp from said tank adapter.

5. The fluid spill collector assembly of claim **1**, wherein said base platform of said tank adapter includes a drain valve aperture sized to receive a drain valve assembly, said drain valve aperture in fluid communication with said aperture of said tank adapter.

6. The fluid spill collector assembly of claim **1**, further comprising an inspection port aperture sized to receive an inspection port assembly, said inspection port aperture in fluid communication with said interstitial space.

7. The fluid spill collector assembly of claim **1**, further comprising a cover assembly comprising:

a collar including:

an upper collar portion;

a lower collar portion; and

an inner collar peripheral surface extending from said upper collar portion to said lower collar portion, said inner peripheral surface having at least one radial collar aperture formed therein;

a cover ring at least partially received within said collar, said cover ring including:

an upper ring portion;

a lower ring portion;

an inner ring peripheral surface extending from said upper ring portion to said lower ring portion; and

an outer ring peripheral surface opposite said inner ring peripheral surface, said cover ring having at least one radial ring aperture extending from said inner ring peripheral surface to said outer ring peripheral surface;

a fastener extending radially through said ring aperture and into said radial collar aperture to fix said cover ring to said collar; and

a cover receivable within said cover ring, said cover blocking access to said primary receptacle cavity and said fastener when said cover is received within said cover ring.

8. The fluid spill collector assembly of claim **7**, wherein said cover ring and said cover are removable from said collar while said interstitial space remains sealed.

9. The fluid spill collector assembly of claim **7**, further comprising:

a drain valve received within said primary receptacle cavity, said drain valve moveable between an open position in which said primary receptacle cavity is in fluid communication with said aperture of said tank adapter, and a closed position in which said primary receptacle cavity is fluidly isolated from said aperture of said tank adapter; and

a drain valve actuator removably attachable to said cover ring, said drain valve actuator operably coupled to said drain valve so that said drain valve is in the open position when said drain valve actuator is attached to said cover ring,

said drain valve actuator preventing said cover from being received by said cover ring when said drain valve actuator is attached to said cover ring.

10. The fluid spill collector assembly of claim **1**, further comprising a stationary collar having an upper collar portion, a lower collar portion, and an inner collar peripheral surface extending from said upper collar portion to said lower collar portion, wherein:

said sealed upper end of the assembly sealingly engages said inner collar peripheral surface while also allowing axial movement of said primary and secondary receptacles with respect to said stationary collar.

11. The fluid spill collector assembly of claim **10**, wherein:

said primary receptacle includes a primary flange at said upper primary receptacle end,

said secondary receptacle includes a secondary flange at said upper secondary receptacle end, and

said fluid collector assembly further comprises a gasket coupled to at least one of said primary and secondary flanges, said gasket effecting the sealing engagement between said sealed upper end of the assembly and said inner collar peripheral surface.

12. The fluid spill collector assembly of claim **1**, wherein said primary receptacle includes a primary flange at said upper primary receptacle end and said secondary receptacle

includes a secondary flange at said upper secondary receptacle end, said fluid spill collector assembly further comprising:

a first pressure distribution ring coupled to said primary flange; and

a second pressure distribution ring coupled to said secondary flange,

said primary and secondary flanges sandwiched between said first and second pressure distribution rings when said upper primary receptacle opening is sealingly coupled to said upper secondary receptacle opening to form said sealed upper end of the assembly.

13. The fluid spill collector assembly of claim **12**, further comprising:

a stationary collar having an upper collar portion, a lower collar portion, and an inner collar peripheral surface extending from said upper collar portion to said lower collar portion; and

a gasket received within said second pressure distribution ring, said gasket effecting a sealing engagement between said sealed upper end of the assembly and said inner collar peripheral surface while allowing axial movement of said primary and secondary receptacles with respect to said stationary collar.

14. A fluid spill collector assembly comprising:

a stationary collar having an inner peripheral surface **[**with at least one radial collar aperture formed therein**]**; and

a double-walled spill container assembly comprising:

an outer receptacle having a first open upper end, said outer receptacle sized to be receivable within said collar;

an inner receptacle having a second open upper end, said inner receptacle coupled to said outer receptacle to create a sealed interstitial space therebetween; and

a seal coupled to at least one of said outer receptacle and said inner receptacle, said seal slidably engageable with said inner peripheral surface of said collar to create a fluid tight seal between said collar and said *double-walled* spill **[**collector**]** *container* assembly,

said double-walled spill container assembly axially moveable with respect to said stationary collar while said interstitial space remains sealed.

15. The fluid spill collector assembly of claim **14**, wherein said sealed interstitial space is sealed before said seal of said *double-walled* spill **[**collector**]** *container* assembly is engaged with said inner peripheral surface of said collar.

16. The fluid spill collector assembly of claim **14**, further comprising a gravel guard having an open upper end, said stationary collar coupled with said open upper end of said gravel guard, said double-walled spill container received within said gravel guard when said seal is slidably engaged with said inner peripheral surface of said collar.

17. The fluid spill collector assembly of claim **14**, wherein said outer receptacle includes an outer receptacle flange at said first open upper end, said inner receptacle includes an inner receptacle flange at said second open upper end, said inner and outer receptacle flanges coupled when said inner receptacle is coupled to said outer receptacle, said fluid spill collector assembly further comprising:

a first pressure distribution ring coupled to said inner receptacle flange; and

a second pressure distribution ring coupled to said outer receptacle flange, said seal received within said second pressure distribution ring.

18. The fluid spill collector assembly of claim **14**, *wherein at least one radial collar aperture is formed in said stationary collar,* further comprising a cover assembly comprising:

a cover ring at least partially received within said stationary collar, said cover ring including:

an upper ring portion;

a lower ring portion;

an inner ring peripheral surface extending from said upper ring portion to said lower ring portion; and

an outer ring peripheral surface opposite said inner ring peripheral surface, said cover ring having at least one radial ring aperture extending from said inner ring peripheral surface to said outer ring peripheral surface;

a fastener extending radially through said radial ring aperture and into said radial collar aperture to fix said cover ring to said collar; and

a cover receivable within said cover ring, said cover blocking access to said spill collector assembly and said fastener when said cover is received within said cover ring.

19. The fluid spill collector assembly of claim **18**, further comprising:

a drain valve received within said inner receptacle, said drain valve moveable between an open position and a closed position; and

a drain valve actuator removably attachable to said cover ring, said drain valve actuator operably coupled to said drain valve so that said drain valve is in the open position when said drain valve actuator is attached to said cover ring,

said drain valve actuator preventing said cover from being received by said cover ring when said drain valve actuator is attached to said cover ring.

* * * * *