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(54) **CONNECTOR FOR BATHTUB TAILPIPE TO DRAIN PIPE**

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F16L 17/025	(2006.01)
E03C 1/22	(2006.01)
E03F 5/04	(2006.01)

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

CPC ***E03C 1/22*** (2013.01); ***E03F 5/0407*** (2013.01); ***F16L 17/025*** (2013.01)

(58) **Field of Classification Search**

CPC F16L 17/025; E03C 1/22; E03F 5/0407
USPC 4/686, 287, 288
See application file for complete search history.

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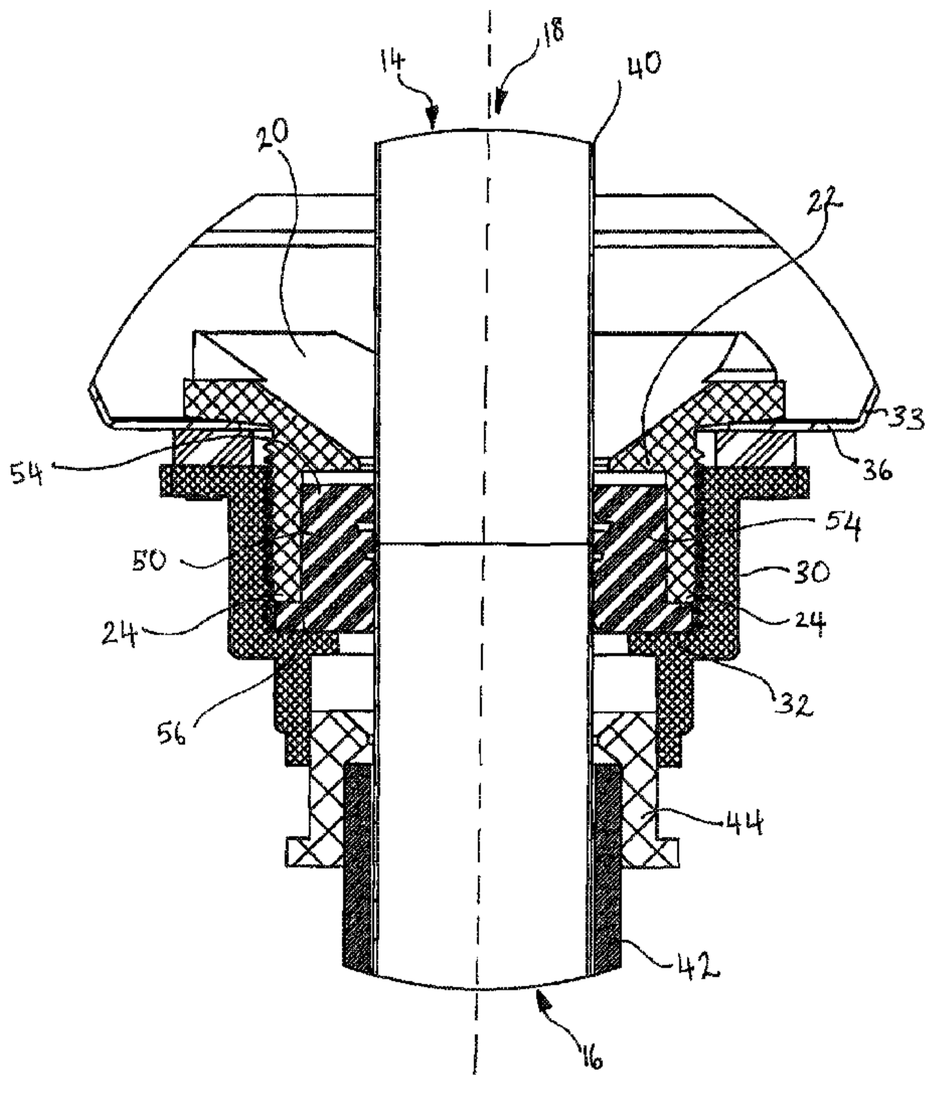
(57) **ABSTRACT**

A seal for a connector is provided for connecting a bathtub tailpipe to a drain pipe. The connector has an inlet end to receive the tailpipe and an outlet end that is mountable to the drain pipe, and has a passage extending therebetween. A seal extends about the passage for slidably engaging the tailpipe in a fluid sealing manner.

15 Claims, 5 Drawing Sheets



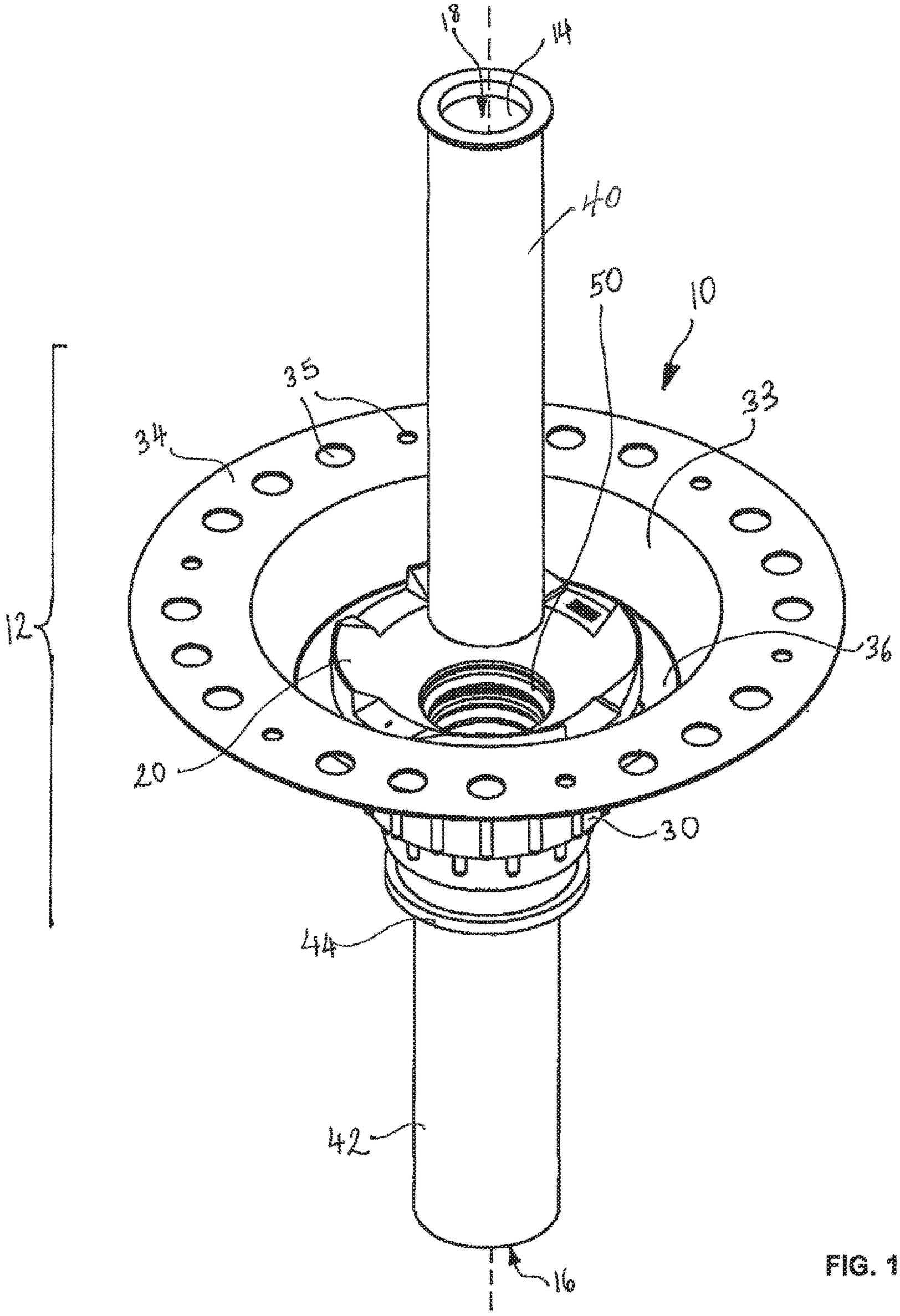


FIG. 1

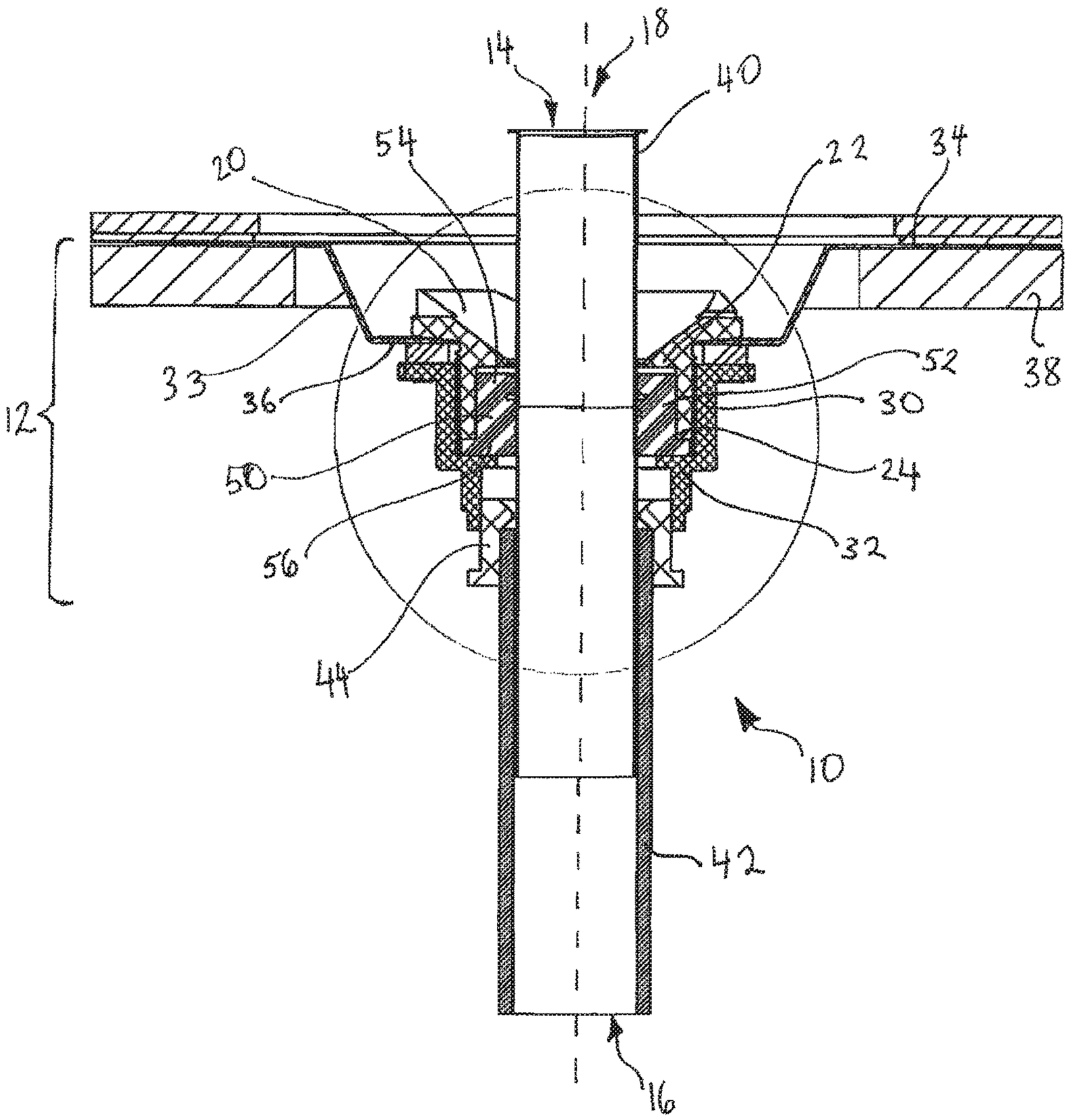


FIG. 2

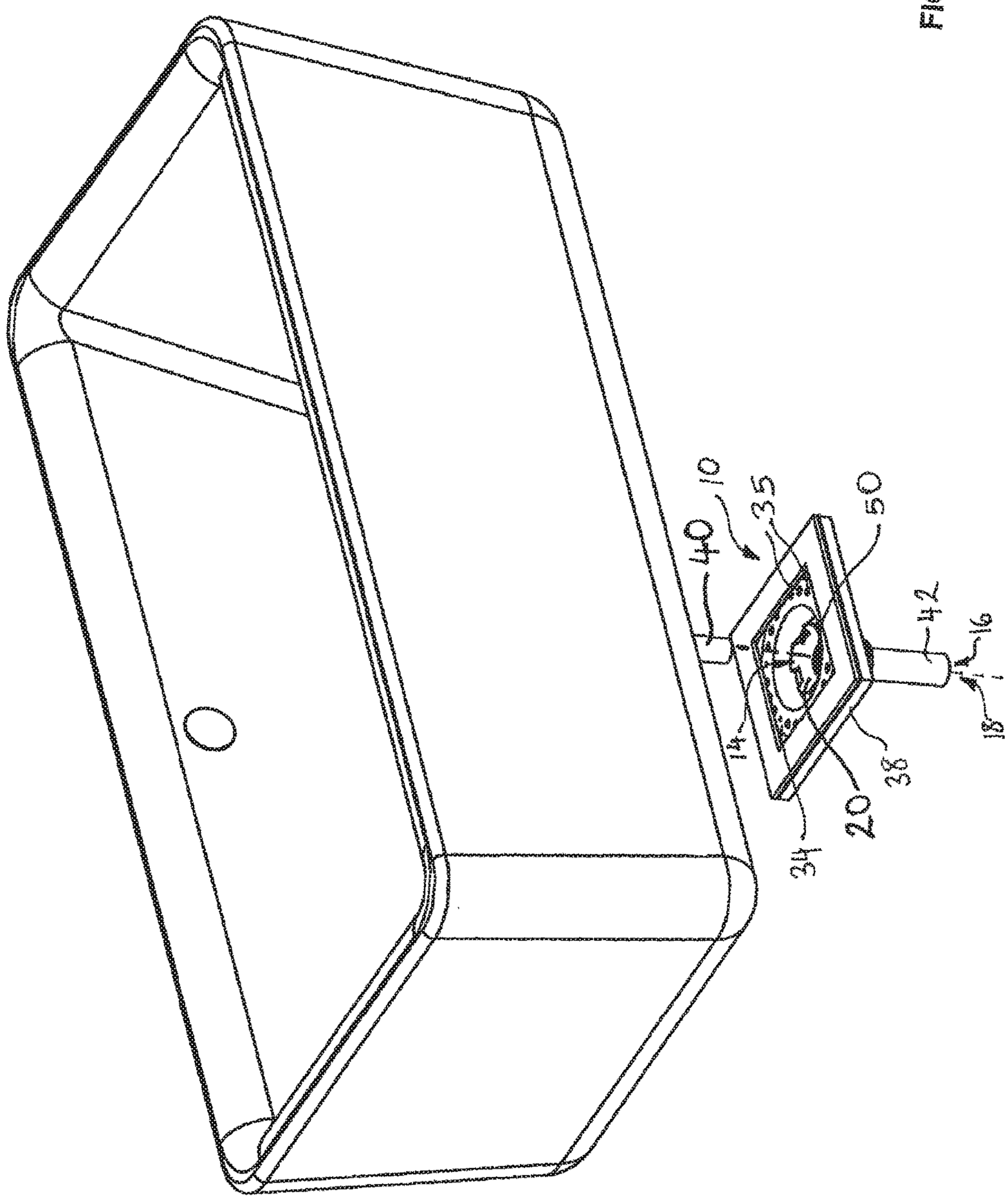


FIG. 3

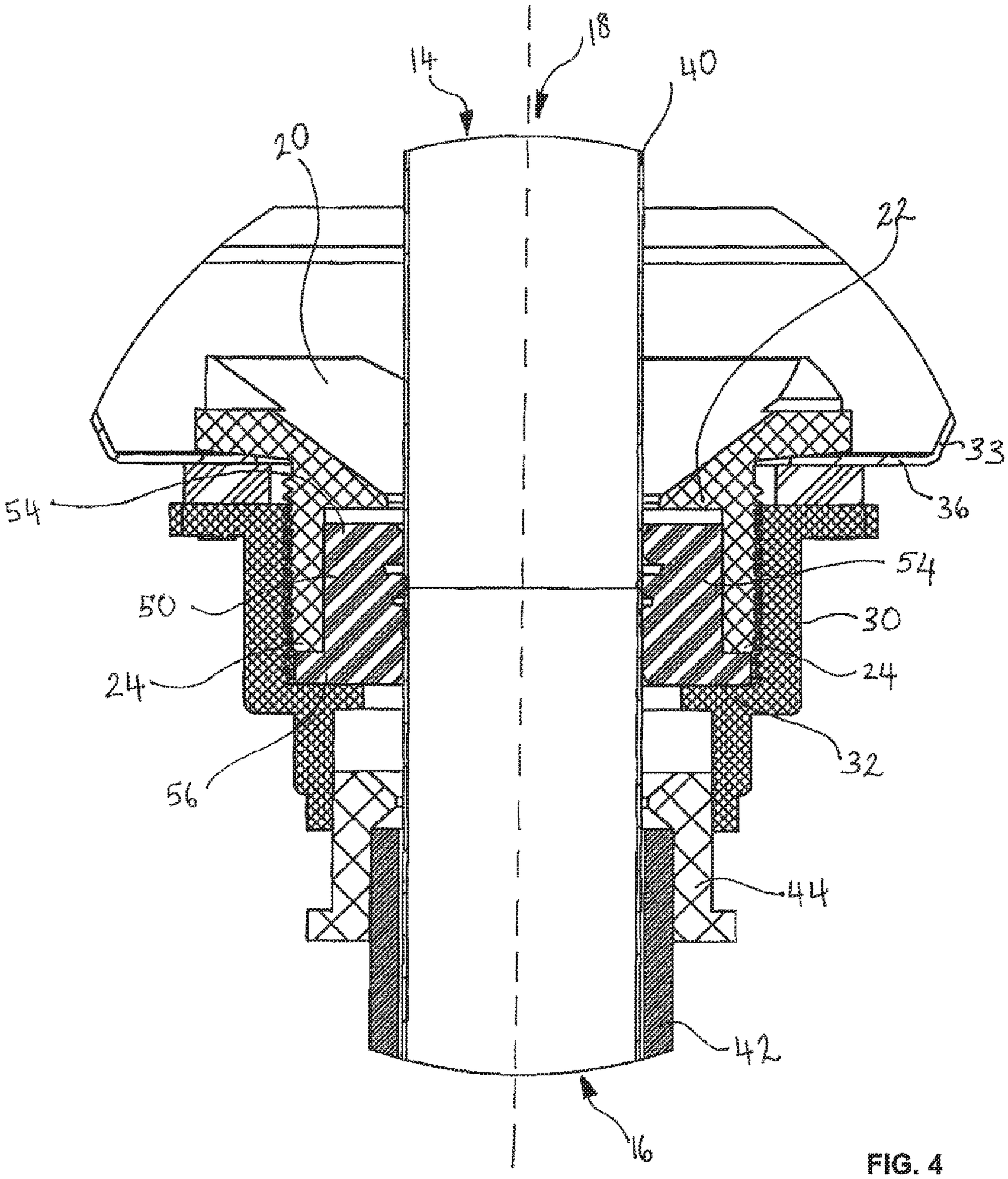


FIG. 4

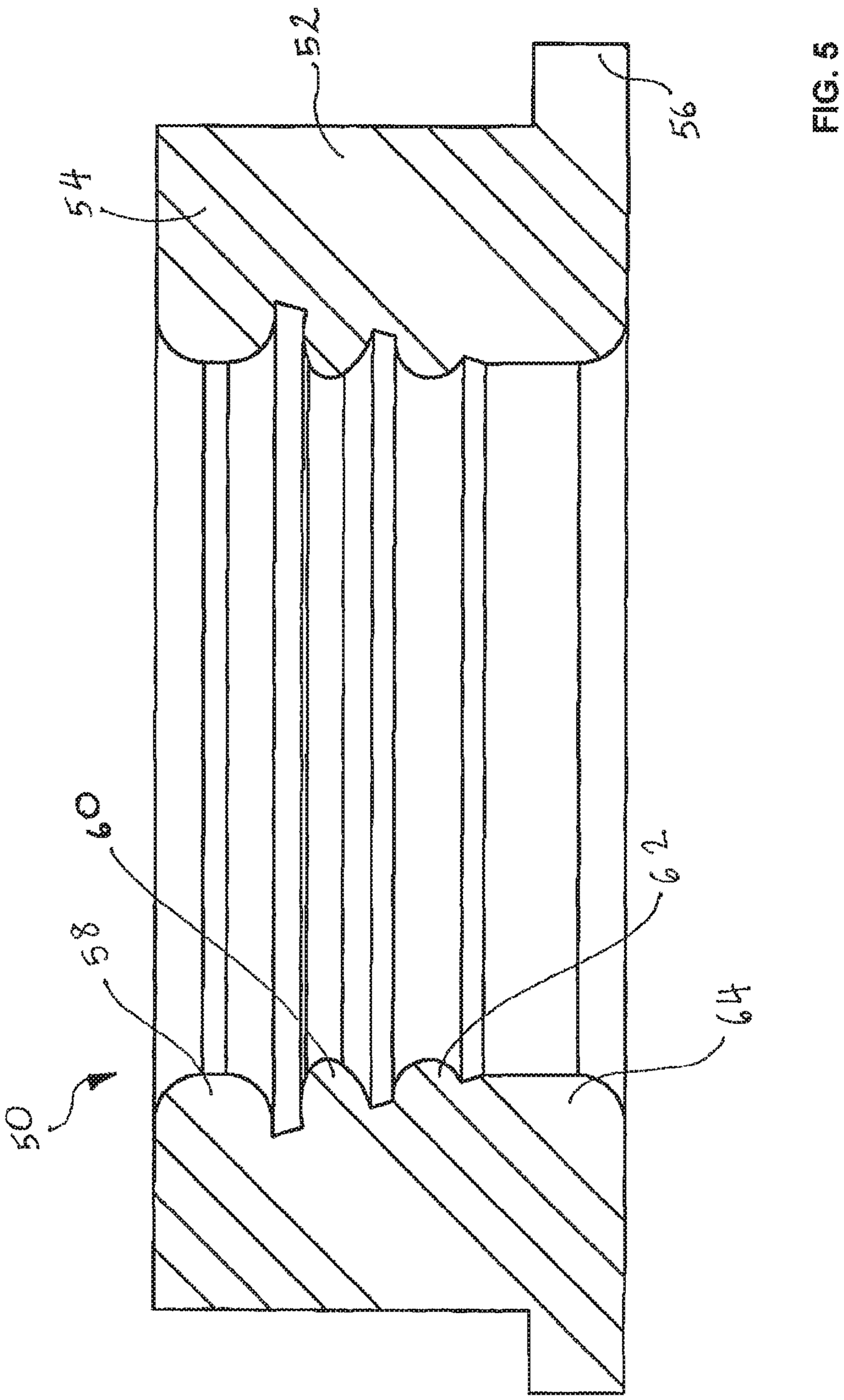


FIG. 5

CONNECTOR FOR BATHTUB TAILPIPE TO DRAIN PIPE

CROSS-REFERENCE TO RELATED APPLICATION

This application is a Divisional application of U.S. application Ser. No. 13/833,791 filed on Mar. 15, 2013. The entire disclosure of the above application is incorporated herein by reference.

FIELD OF INVENTION

This invention relates generally to bathtub drain pipe connectors and more particularly to connectors for sealingly connecting tailpipes of free standing bathtubs to drain pipes.

BACKGROUND OF THE INVENTION

The drainage system for an island bathtub is supplied beneath the bath in the floor. Generally, no lateral access is provided necessitating connection of the bathtub to the drain pipe either from above or below the floor. In an existing building, connection from above the floor requires destruction of the existing floor. Destruction creates new challenges including refinishing the floor around a bathtub and providing proper support for the bathtub.

In the construction process for a new building, access from below the floor requires the bathtub be installed prior to finishing the ceiling of the room beneath the bath. This early installation of the bath subjects the bathtub to damage for the duration of the construction process.

SUMMARY OF THE INVENTION

The present invention provides a connector for sealingly connecting a bathtub tailpipe to a drain pipe. The connector comprises a seal and a body wherein the body has an inlet end opposite an outlet end with a passage extending therebetween. The outlet end is mountable to one end of the drain pipe, and the inlet end receives the tailpipe. The seal extends about the passage for slidably engaging the tailpipe in a fluid sealing manner.

The connector may further comprise a first part extendably retained to a second part wherein the first part and second part are relatively axially moveable. The first part defines the inlet end and receives the tailpipe, and the second part defines the outlet end, and is mountable to one end of the drain pipe.

The seal extending about the passage may have a generally annular body and comprise a first end opposite a flanged end. The first end and the annular body are insertable into one of the two parts of the connector, and the flanged end interfaces with both the first part and the second part.

The first part of the connector may have an interior flange for receiving the first end of the seal. The first part of the connector may have an end opposite the interior flange that engages the flanged end of the seal. The first part of the connector and the second part of the connector may threadedly engage. The second part of the connector may have an inner flange that registers with the flanged end of the seal. The flanged end on the seal may be compressed between the end of the first part and the inner flange of the second part in response to the first part and the second part being urged towards each other through the threaded engagement.

The connector may further comprise a spacer having an external flange for engaging a floor and an internal flange for engaging the first part of the connector to limit lateral movement of the connector.

The external flange may be integral with the first part of the connector.

The connector may further comprise an adapter extending between the outlet end of the passage and the drain pipe to adapt the connector to fit over the drain pipe.

A seal is also provided for sealing against a bathtub tailpipe wherein the seal forms part of a connector having a first part and a second part for connecting the bathtub tailpipe to a drain pipe. The seal comprises an annular body having a first end opposite a flanged end with a passage extending therebetween. The interior of the annular body has at least one radially inwardly projecting rib for sealingly engaging the tailpipe. The first end and the annular body are insertable into one of the two parts of the connector. The flanged end of the seal interfaces with the first part and the second part of the connector.

BRIEF DESCRIPTION OF THE DRAWINGS

Preferred embodiments of the present invention are described below with reference to the accompanying illustrations in which:

FIG. **1** is a perspective view of a connector for connecting a bathtub tailpipe to a drain pipe;

FIG. **2** is a cross-section view of the connector in FIG. **1**;

FIG. **3** is a perspective view of the connector preparing to receive a bathtub tailpipe;

FIG. **4** is an enlarged view of the encircled area in FIG. **2**;

FIG. **5** is a cross-section view of a seal.

DETAILED DESCRIPTION

A connector **10** sealingly connects a bathtub tailpipe **40** to a drain pipe **42** as indicated in the accompanying illustrations. The connector **10** has a body **12** having an inlet end **14** opposite an outlet end **16** with a passage **18** extending therebetween. The inlet end **14** receives the bathtub tailpipe **40**, the outlet end **16** is mountable to the drain pipe **42**. In this way, the connector **10** connects the bathtub tailpipe **40** to the drain pipe **42**. The passage **18** permits fluid such as bathwater to flow from the bathtub tailpipe **40** to the drain pipe **42**. To sealingly connect the bathtub tailpipe **40** to the drain pipe **42**, a seal **50** extends about the passage **18** that slidably engages the tailpipe **40** in a fluid sealing manner. The seal **50** inhibits the fluid such as bathwater from flowing out of the passage **18** and into the periphery.

The connector **10** further comprises a first part **20** defining the inlet end **14**, and a second part **30** defining the outlet end **16**. The first part **20** and the second part **30** are extendably retained to each other and are relatively axially moveable. In one embodiment, the first part **20** and the second part **30** may threadedly engage. The seal **50** extending about the passage **18** has a generally annular body **52** having a first end **54** and a flanged end **56**. The first end **54** and the annular body **52** are insertable into one of the two parts of the connector **10**. A portion of the flanged end **56** extends between the first part **20** and second part **30**. The first part **20** and the second part **30** are urged toward each other, and the flanged end **56** interfaces with (sandwiched between) both the first part **20** and the second part **30**. This causes compression of the seal **50** between the first part **20** and the second part **30** to effect the sealing therebetween.

In one embodiment, the first end **54** and the annular body **52** of the seal are insertable into the first part **20** of the connector. The first part **20** has an interior flange **22** for receiving the first end **54** of the seal. The first part has an end **24** opposite the interior flange **22** that engages the flanged end **56** of the seal preventing it from inserting into the first part **20**. The second part **30** has an inner flange **32** that registers with the flanged end **56**. Because the first part **20** and the second part **30** are urged toward each other when threadedly engaged, the flanged end **56** of the seal is compressed between the first part **20** and the second part **30**, that is, between the end **24** and the inner flange **32**. This compression of the seal **50** between the first part **20** and the second part **30** effects the sealing feature of the connector **10**.

In an alternative embodiment, the first end **54** and the annular body **52** may be insertable into the second part **30** rather than the first part **20**. The flanged end **56** would still be compressed between the first part **20** and the second part **30** effecting the sealing function.

The connector **10** further comprises a spacer **33** having an external flange **34** for engaging a floor **38** and an internal flange **36** for engaging the first part of the connector **20** to limit lateral movement of the connector **10**. In one embodiment, this external flange **34** and internal flange **36** may form part of an annular plate as shown in FIG. **2**. This annular plate may be externally round, square, or any other suitable shape. The external flange **34** of the spacer **33** engages the floor **38** to limit lateral movement, whereas the internal flange **36** is held in place between the first part **20** and the second part **30**. By being held in place and having the external flange **34** engage the floor, the internal flange **36** limits the lateral movement of the connector **10**. The external flange **34** may be fixed to the floor which may be wood. FIGS. **1** and **2** shows the external flange **34** with apertures **35** for receiving fasteners such as screws. In other embodiments, the external flange **34** may be secured using glue or other adhesive agents. Alternatively, the external flange **34** could be secured by fitting into pre-cut recesses in the floor. Fixing the external flange **34** to the floor **38** provides a secured connector **10** to which the remaining plumbing can be attached. The depth of the spacer **33** is determined by the height of the first part **20**. The spacer **33** must be deep enough to ensure the first part **20** does not protrude above the floor **38** in order to provide clearance for the bathtub drain fitting underlying and fixed to the bath that is placed upon the floor **38**.

The external flange **34** may alternatively be integral with the first part **20** obviating the need for an internal flange. In this embodiment, the external flange **34** would be located on the first part **20** such that sufficient clearance is provided for the bathtub when placed on the floor **38**.

The connector **10** may further comprise an adapter **44** extending between the outlet end **16** of the passage **18** and the drain pipe **42** to adapt the connector **10** to fit over the drain pipe **42**. In one embodiment, this adapter **44** may increase the external diameter of the drain pipe **42** so that the drain pipe **42** and the connector **10** fit more closely together. Alternatively, this adapter **44** may decrease the internal diameter of the outlet end **16** to enable a more snug fit between the connector **10** and the drain pipe **42**. In other embodiments, the adapter **44** may otherwise increase or decrease the external or internal diameters of the drain pipe **42** or outlet end **18** to enable a close fit. Adhesive agents may be placed between the various elements to secure them in place.

Alternatively, an adapter **44** may be unnecessary and the drain pipe **42** could fit directly within the second part **30**. In these cases, the drain pipe **42** may register directly with part of the seal **50** or may instead register with the inner flange **32** of the second part **30**. In still other embodiments, the drain pipe **42** may have a larger diameter than the outlet end **16** of the connector **10**. In these cases, the outer circumference of the second part **30** may be modified to accommodate the attachment of a larger diameter drain pipe **42**.

As mentioned above, the seal **50** has an annular body **52** having a first upper end **54** opposite a flanged lower end **56**. The interior of the annular body **52** has at least one radially inwardly projecting rib **58** for sealingly engaging the tailpipe. Additional ribs such as the second rib **60**, third rib **62**, and fourth rib **64** may also be provided. As can be seen best in FIG. **5**, at least two of the ribs extend into the interior of annular body **52** by a different amount. For example, rib **58** defines a wider opening for receiving the tailpipe **40** than rib **60**. Similarly, rib **60** defines a wider opening than rib **62**. In other words, ribs **58**, **60** and **62** progressively extend an increasing distance into the interior of the annular body **52**. On the other hand, the bottommost rib **64** extends a lesser distance into the interior of annular body **52** than its immediately adjacent rib **62**. This arrangement is designed to readily accept the tailpipe **40** at the upper end of the seal yet provide a reliable seal.

The scope of the claims should not be limited by the embodiments set forth in the examples, but should be given the broadest interpretation consistent with the description as a whole.

PARTS LIST

10	connector
12	body
14	inlet end
16	outlet end
18	passage
20	first part
22	interior flange
24	end
30	second part
32	inner flange
33	spacer
34	external flange
35	apertures
36	internal flange
38	floor
40	bathtub tailpipe
42	drain pipe
44	adapter
50	seal
52	annular body
54	first end
56	flanged end
58	radially projecting inward rib
60	second rib
62	third rib
64	fourth rib

What is claimed is:

1. A seal for sealing against a bathtub tailpipe wherein the seal forms part of a connector having a first part and a second part for connecting the bathtub tailpipe to a drain pipe, the seal comprising:

an annular elastomeric body having a first end opposite a flanged end with a passage extending therebetween wherein:

the interior of the annular body has at least two radially inwardly projecting ribs for sealingly engaging the tailpipe in an adjustable manner;

the first end and the annular body are insertable into one of the two parts of the connector; and

the flanged end is configured to interface with both the first part and second part of the connector.

2. The seal for sealing against a bathtub tailpipe of claim **1** wherein the at least two radially inwardly projecting ribs extend radially inwardly by different distances.

3. The seal for sealing against a bathtub tailpipe of claim **1** wherein:

the at least two radially inwardly projecting ribs comprising an upper radially inwardly extending rib and a lower radially inwardly extending rib, said upper rib defining a larger opening in the annular body than the lower rib.

4. The seal for sealing against a bathtub tailpipe of claim **1** wherein:

the at least two radially inwardly projecting ribs comprising at least three radially inwardly extending ribs that progressively extend an increasing distance into the interior of the annular body.

5. The seal for sealing against a bathtub tailpipe of claim **1** wherein:

the flanged end is interfaced by being configured to be sandwiched between a portion of the first part and a radially inwardly extending flange of the second part.

6. A seal for sealing against a bathtub tailpipe, the seal comprising:

an elastomeric annular body having an interior passage extending from a top end to a bottom end;

the bottom end having a radially outwardly extending flange configured to be sandwiched between two parts of a connector for connecting the bathtub tailpipe to a drain pipe; and

the interior of the annular body has at least two radially inwardly projecting rib for sealingly engaging the tailpipe in an adjustable manner.

7. The seal for sealing against a bathtub tailpipe of claim **6** wherein the at least two radially inwardly projecting ribs extend radially inwardly by different distances.

8. The seal for sealing against a bathtub tailpipe of claim **6** further comprising an upper radially inwardly extending rib and a lower radially inwardly extending rib, said upper rib defining a larger opening in the annular body than the lower rib.

9. The seal for sealing against a bathtub tailpipe of claim **6** further comprising at least three radially inwardly extending ribs that progressively extend an increasing distance into the interior of the annular body.

10. The seal for sealing against a bathtub tailpipe of claim **6** wherein:

the radially outwardly extending flange is sandwiched between a portion of the first part of the connector and a radially inwardly extending flange of the second part of the connector.

11. A seal for a connector for connecting a bathtub tailpipe to a drain pipe, the connector including a tailpipe having an upper end configured to be connected to a bottom portion of the bathtub and a lower end of the tailpipe being configured to be placed through at least a portion of a connector, with the seal serving to seal fluid flow from the tailpipe to the drain pipe the tailpipe; the seal comprising:

an elastomeric annular body having an interior passage extending from a top end to a bottom end;

the bottom end having a radially outwardly extending flange configured to be sandwiched between two parts of the connector; and

the interior of the annular body has at least two radially inwardly projecting rib configured to sealingly engage the tailpipe in an adjustable manner.

12. The seal for sealing against a bathtub tailpipe of claim **11** wherein the at least two radially inwardly projecting ribs extend radially inwardly by different distances.

13. The seal for sealing against a bathtub tailpipe of claim **11** wherein the at least two radially inwardly projecting ribs comprising an upper radially inwardly extending rib and a lower radially inwardly extending rib, said upper rib defining a larger opening in the annular body than the lower rib.

14. The seal for sealing against a bathtub tailpipe of claim **11** wherein:

the at least two radially inwardly projecting ribs comprising at least three radially inwardly extending ribs that progressively extend an increasing distance into the interior of the annular body.

15. The seal for sealing against a bathtub tailpipe of claim **11** wherein:

the flange is configured to be sandwiched between a portion of the first part of the connector and a radially inwardly extending flange of the second part of the connector.

* * * * *