Office de la Propriété Intellectuelle du Canada
Un organisme d'Industrie Canada

Canadian Intellectual Property Office
An agency of Industry Canada

CA 2898976 C 2017/03/21

(11)(21) 2 898 976

(12) BREVET CANADIEN
CANADIAN PATENT

(13) C

(22) Date de dépôt/Filing Date: 2015/07/30

(41) Mise à la disp. pub./Open to Public Insp.: 2015/12/15

(45) Date de délivrance/Issue Date: 2017/03/21

(30) Priorité/Priority: 2015/06/08 (CA2894037)

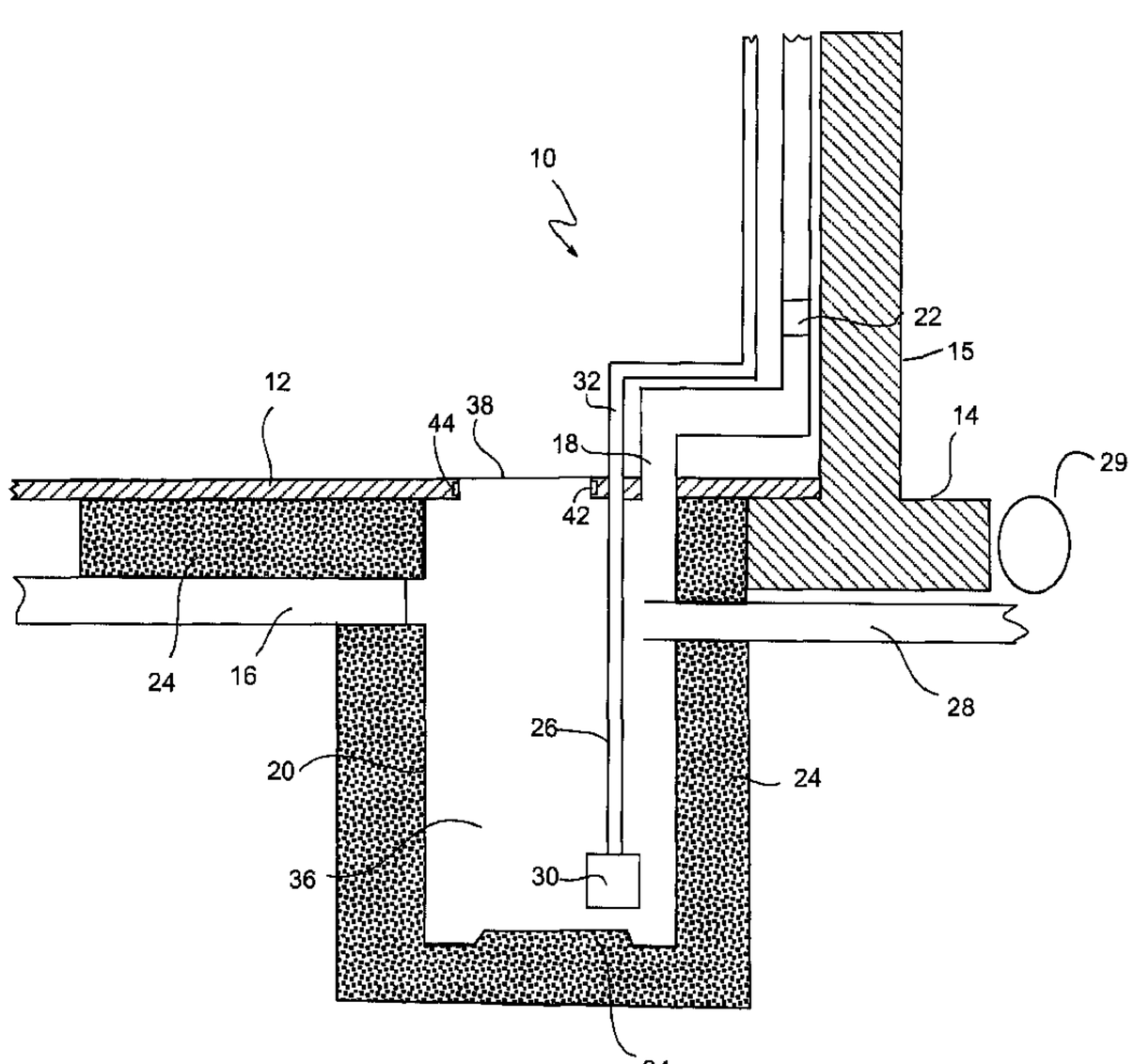
(51) Cl.Int./Int.Cl. *B08B 15/00* (2006.01), *C02F 1/20* (2006.01), *E02D 31/00* (2006.01)

(72) Inventeur/Inventor:
ELMS, TREVOR R., CA

(73) Propriétaire/Owner:
ELMS, TREVOR R., CA

(74) Agent: LAMBERT, ANTHONY R.

(54) Titre : SYSTEME DE PUISARD ET D'ELIMINATION DES GAZ SOUS LA DALLE
(54) Title: BELOW SLAB GAS REMOVAL AND SUMP SYSTEM



(57) Abrégé/Abstract:
A radon removal system includes a slab forming part of a foundation of a building, a perforated pipe extending under the foundation, the perforated pipe being connected to a vent through a sealed system (for example a sump with water inlet, sump pump and water outlet) to a blower for generating a negative pressure in the perforated pipe and the blower being connected to the vent. The perforated pipe extends under the foundation to a central area of the foundation.

ABSTRACT OF THE DISCLOSURE

A radon removal system includes a slab forming part of a foundation of a building, a perforated pipe extending under the foundation, the perforated pipe being connected to a vent through a sealed system (for example a sump with water inlet, sump pump and water outlet) to a blower for generating a negative pressure in the perforated pipe and the blower being connected to the vent. The perforated pipe extends under the foundation to a central area of the foundation.

BELOW SLAB GAS REMOVAL AND SUMP SYSTEM

TECHNICAL FIELD

[0001] Building construction.

BACKGROUND

[0002] Radon gas has been identified as a hazardous material that occurs naturally within the ground and that may enter buildings through their foundations due to buildup of radon gas pressure. Some building codes, such as the National Building Code of Canada, require that in new building construction measures be taken to prevent radon from entering the envelope of a building. When constructing a new home, builders may use a range of approaches, including installing an air barrier under the foundation slab and an air tight cover for the sump pit to prevent the entry of radon, and a rough-in for a possible future subfloor depressurization system, should radon problems emerge. To reduce radon gas pressure under a foundation slab, a published recommendation suggests a vent extending upward through the centre of the slab from below to above the slab, such a vent being connected to a pipe that extends laterally below the slab, or a pipe that extends from the centre of the slab underneath the slab to a vent elsewhere. In each case, radon gas pressure is thereby reduced under the slab.

SUMMARY

[0003] In an embodiment, there is provided a radon removal system for a building, where the building has a slab forming part of a foundation of the building. The system includes a perforated pipe, for example that is perforated, the pipe extending under the slab, the perforated pipe being connected to a vent through a sealed system with a blower for generating a negative pressure in the pipe. The blower may be situated within a pipe that provides the vent.

[0004] In an embodiment, there is provided a radon removal system comprising a pipe connected to a vent through a sealed system having a blower for generating a negative

pressure in the pipe, the sealed system comprising a sump having an inlet for water and a sump pump connected to a water outlet

[0005] In various embodiments, there may be included any one or more of the following features: the pipe being perforated, the pipe extends under the foundation to a central area of the foundation; the sealed system comprises a sump; the sump comprising a water inlet, sump pump and water outlet; the sump having an interior and window for allowing viewing of the interior of the sump; the sump comprising a neck that may be embedded in concrete with a gasket around the neck between the neck and the concrete; the pipe comprising weeping tile; and the pipe comprising hard plastic.

[0006] These and other aspects of the device and method are set out in the claims, which are incorporated here by reference.

BRIEF DESCRIPTION OF THE FIGURES

[0007] Embodiments will now be described with reference to the figures, in which like reference characters denote like elements, by way of example, and in which:

[0008] Fig. 1 is a section through a radon removal system showing a sump with pump and vent system, wherein the sump provides a sealed unit for evacuating radon from underneath a slab and venting the gas to atmosphere; and

[0009] Fig. 2 is a top view of the sump with the ground broken away to show an inlet perforated pipe for drawing radon gas from under the foundation, as well as the inlet water pipe for drawing water into the sump from the weeping tile normally found around a foundation.

DETAILED DESCRIPTION

[0010] Immaterial modifications may be made to the embodiments described here without departing from what is covered by the claims. In the claims, the word "comprising" is used in its inclusive sense and does not exclude other elements being present. The indefinite articles "a" and "an" before a claim feature do not exclude more than one of the feature being present. Each one of the individual features described here may be used in one

or more embodiments and is not, by virtue only of being described here, to be construed as essential to all embodiments as defined by the claims.

[0011] As shown in Fig. 1, a radon removal system 10 is provided and works in conjunction with a slab 12 forming part of a foundation of a building that includes a footing 14 and wall 15. The slab 12, footing 14 and wall 15 are all conventional and may have various configurations depending on the building structure. In an embodiment, a pipe 16, such as a perforated PVC pipe, extends under the slab 12, to the center of the slab 12, or such other location as permitted by local building regulations. A sealed container 20 is provided under the slab 12 or in another suitable location. For example, the sealed container 20 may be provided outside of the foundation or within the building. The pipe 16 is connected via a sealed connection to the container 20. A vent or vent line 18 is provided for the sealed container 20 that extends to the roof of the building or other suitable location for the disposal of radon gas. A blower or fan 22 is provided inline in the vent line 18 to provide a negative pressure on the interior of the container 20. Operation of the blower or fan 22 draws gas from the pipe 16 into the sealed container 20 and up into the vent 18. Depending on the strength of the blower 22, the container 20 and the related system components need only be sufficiently sealed to allow the system to function, and this is what is meant by sealed. A functioning system draws gas from under the slab and vents to a safe place, such as to the exterior of the building from a roof of the building. The blower or fan 22 may be any of various commercially available fans.

[0012] The perforated pipe 16 thus connects to the vent 18 through a sealed system to the blower 22 for generating a negative pressure in the perforated pipe 16. The vent 18 may be a pipe such as a PVC pipe. Radon gas may be collected in the perforated pipe 16 and be pulled by the negative pressure from the blower 22 through the sealed system 2 to the vent 18, to release the radon gas outside the building. The radon gas may be released through the roof of the building.

[0013] The perforated pipe 16 may extend under the foundation 14 to a central area of the foundation 14 for the collection of radon gas. Permeable material 24, for example washed rock of a type and thickness depending on local code requirements, may underlay the slab 12 and provide a path for radon gas to reach the pipe 16. Permeable material 24 may

also surround the sealed system 20 and lie beneath the entire floor of the building. The perforated pipe 16 may comprise for example weeping tile or hard plastic, such as PVC. Hard here means sufficiently hard that in normal use the plastic retains its shape, for example when the pipe is made of PVC. In another embodiment, the pipe 16 is not perforated, but is sealed and extends to underneath the center of the slab.

[0014] The container or sealed system 20 may comprise a sump 26, provided under or above the slab 12. The sump may comprise a water inlet 28 connected to a suitable fitting on the sump, sump pump 30 and water outlet 32. The water inlet 28 may be for example a tee pipe 28 which leads out to weeping tile 29, or other water collection material permitted by local code requirements. Water collecting around the foundation flows into weeping tile 29, and then flows into the tee 28 and into the container 20, where it collects on the bottom of the sump 26. The water outlet 32 may be a pipe which extends from the sump pump 30 through the floor of the building. Depending on the local code requirements, the outlet 32 may dispose of water outside onto or into ground surrounding the building or into a municipal water disposal system. The container 20 may have a raised bottom 34. The sump 26 may operate in the normal manner of a sump, such that the pump 30 periodically turns on to pump water out of the sump 26, for example when a high water level is reached. Conventional sump pumps may be used for the pump.

[0015] The sump 26 may be provided with a clear lid 38 forming a window for viewing the interior 36 of the sump. As shown in Fig. 2, the vent 18 for releasing radon may extend from the sealed system 20, and similarly the water outlet 32 for the sump 26 may extend from the sealed system 20, in close proximity to the viewing window 38. An electrical connection 40 for the pump 30 and blower 22 may also extend from the sealed system 20 near the window 38. The pump 30 and blower 22 may be connected via the electrical connection to a power source (not shown) for example the conventional electrical supply for the building through a conventional plug in. The fan 22 may be allowed to run continuously.

[0016] As shown in Fig. 1, when the container 20, here sump 26, is provided underneath the slab 12, the container 20 or sump 26 may comprise a neck 42 embedded in concrete, such as for example the floor of the building, with a gasket 44 around the neck 42

and the concrete to maintain a seal between the sump 26 and slab 12 and prevent gas from entering the building around the container 20. If the slab 12 is made of concrete, the neck 42 may be embedded in the slab 12. The gasket 44 may be made of rubber. Various sizes of components may be used. In some embodiments, the washed rock may be 100 mm washed rock, the pipe 16 may be 4" pipe, the tee 28 may be 4" pipe, and the vent 18 may be made from 4" pipe, such as PVC plastic.

CLAIMS

1. A radon removal system, comprising:

a slab forming part of a foundation of a building;

a pipe extending under the slab;

the pipe being connected to a vent through a sump defined by a container; and

the container having a neck embedded in the slab, the neck extending vertically with a gasket around the neck between the neck and the slab.

2. The radon removal system of claim 1 in which the vent has a blower for generating a negative pressure in the pipe

3. The radon removal system of claim 2 in which the vent comprises a vent pipe extending from the sump to outside the building and the blower is within the vent pipe.

4. The radon removal system of claim 1, 2 or 3 in which the pipe is perforated pipe.

5. The radon removal system of claim 1, 2, 3 or 4 in which the pipe extends under the foundation to a central area of the foundation.

6. The radon removal system of claim 1, 2, 3 or 4 in which the sump comprises a water inlet, sump pump and water outlet.

7. The radon removal system of any of claims 1 to 6 in which the sump has an interior and window for allowing viewing of the interior of the sump.

8. The radon removal system of any one of claims 1 to 6 in which the pipe comprises weeping tile.

9. The radon removal system of any one of claims 1 to 6 in which the pipe comprises hard plastic.

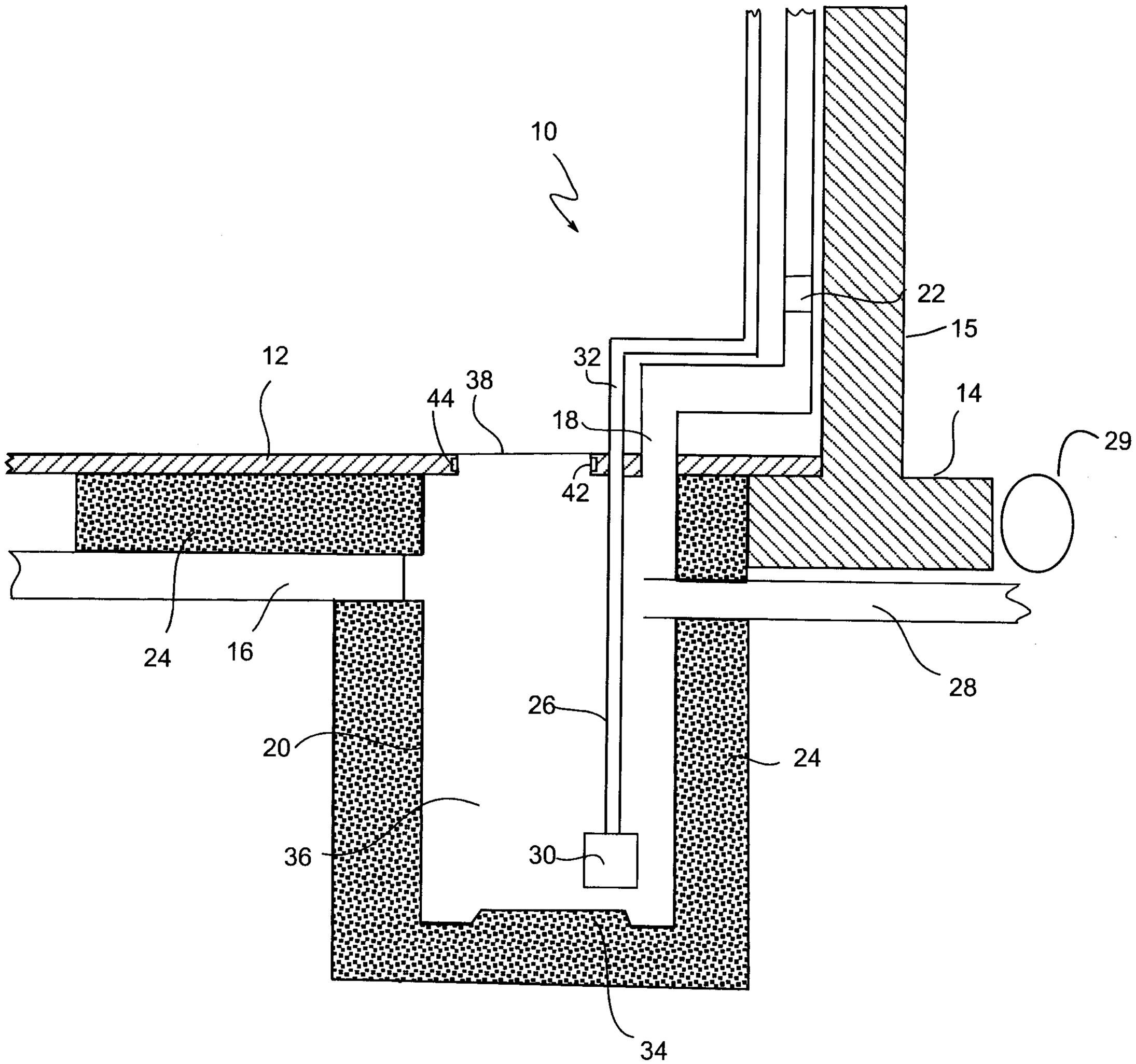


Fig. 1

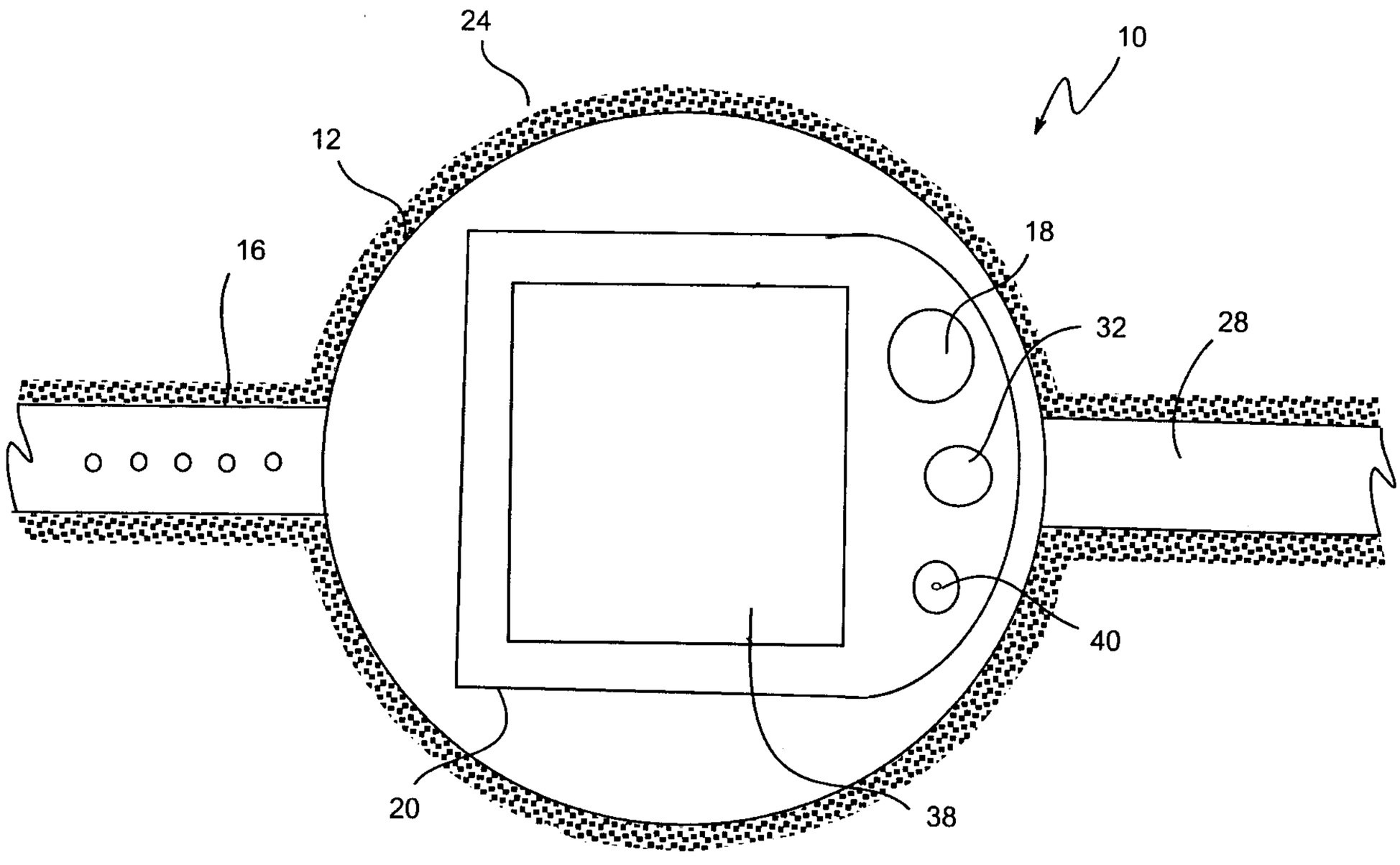
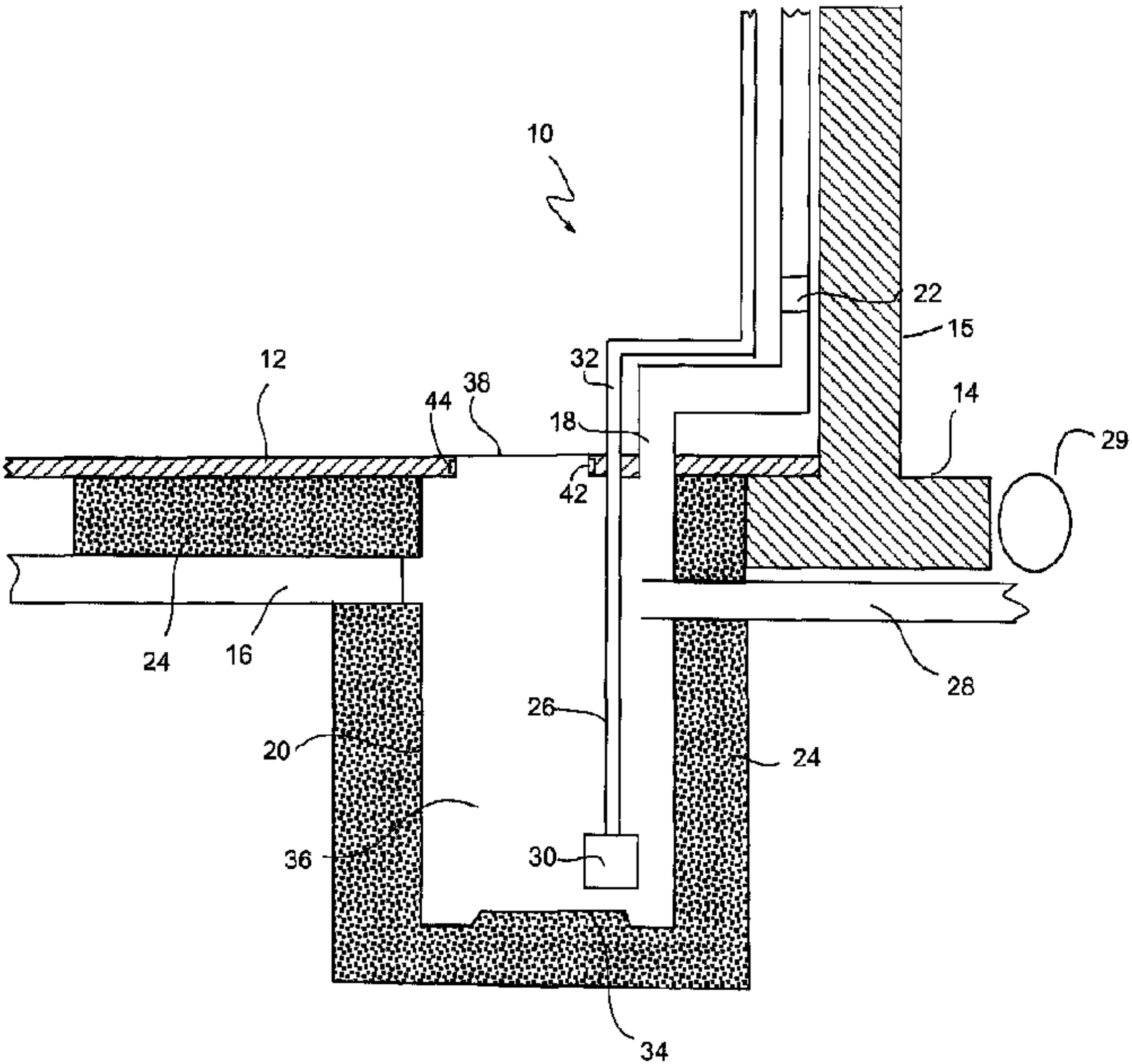


Fig. 2


10
12
44
38
32
18
42
22
15
14
29
24
16
28
26
20
24
36
30
34