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(54) **Dual purpose structural lid for use in access chamber**

(57) A structural lid assembly for use within an access chamber (10), including a structural lid (26) having an aperture (26f) therein for an internal stand pipe (22) to pass through and means (28) for supporting the structural lid within the access chamber, the assembly being capable of bearing the weight of at least one operative standing on the structural lid.

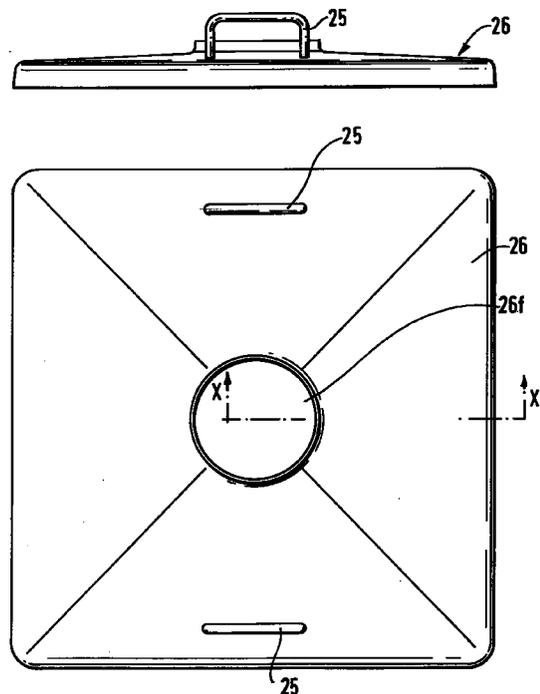


FIG.1.

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Description

The present invention relates to a dual purpose structural lid for use within an access chamber associated with an underground storage tank. These tanks are filled either via a side fill pipe which runs underground and enters the access chamber through a side wall, or via an internal stand pipe which protrudes upwards from the top of the tank, into the access chamber. It is to the latter, internal stand pipe to which the present invention relates.

At the top of the stand pipe is a coupling, to allow the tanker supply pipe to be connected to the stand pipe, in order to fill the underground tank. In order to gain access to this coupling which is generally located between one and two feet below ground level, it would be advantageous to avoid the operative having to reach down this far to operate the coupling.

It is known to provide an access chamber with an internal lid, which sits within the access chamber beneath the man-hole cover, which lid serves to drain any water which falls on it into a collection container or to a drainage system (see for example Applicant's own European Patent Application published under No 0744359). The design of this internal lid is however not such as to be able to withstand the weight of an operative, and it is therefore the aim of the present invention to provide an improved arrangement whereby both functions are achieved simultaneously.

According to a first aspect of the present invention there is provided a structural lid assembly for use within an access chamber, including a structural lid having an aperture therein for an internal stand pipe to pass through and means for supporting the structural lid within the access chamber, the assembly being capable of bearing the weight of at least one operative standing on the structural lid.

Conveniently, the means for supporting the structural lid comprises gutter configured as a generally U-shaped channel which is secured to the access chamber or to an associated corbel unit, the edge of the structural lid being received within and supported by this gutter. In order to provide the necessary strength, the gutter is secured around the interior of the access chamber by a plurality of ties which are embedded in the concrete surrounding the frame and corbel unit. This gutter also serves to collect any water incident on the structural lid, which slopes gently downwards from the aperture towards the edge, into a container or drainage system.

The structural lid itself is preferably a double skin construction comprising upper and lower skins of suitable lightweight but strong material, for example glass fibre/resin composite, with a light-weight filling material, for example polyurethane foam, between the two skins. The filling material may completely fill the void between the two skins, or alternatively it may be present in the form of a series of ribs extending radially outwardly from

the aperture towards the edge, in a manner resembling spokes of a wheel.

Preferably, the upper and lower skins of the structural lid unite at the edge of the aperture and at the outer edge of the structural lid, to provide a thicker, stronger upturned neck and downturned edge lip respectively.

Preferably, the upper surface of the lid includes an anti-slip coating such as aggregate or the like.

Conveniently, the lid includes at least one (preferably two) handles, to assist in lifting the lid.

Conveniently, the assembly also includes a seal for attachment to that part of the stand pipe protruding through the aperture in the structural lid, the seal when so attached extending from said stand pipe generally outwardly to effectively shield said aperture.

Preferably, said seal is engaged by the edge of the aperture in the structural lid as the latter is lifted up and over the stand pipe coupling, the seal being thereby temporarily deformed until clear of the aperture whereupon it resumes its original position, such that the seal may remain in place during removal and replacement of the structural lid.

The seal is conveniently manufactured from a resiliently deformable, petrol resistant material such as EPDM or PVC nitrile. It may comprise a single, suitably shaped piece of such material, or alternatively it may comprise a substantially rigid collar adapted to be secured around the stand pipe and a resiliently deformable deflector (e.g EPDM or PVC nitrile) extending from said collar generally outwardly to effectively shield said aperture.

In the latter case, the collar (preferably cast aluminium) is generally cylindrical and internally threaded, terminating at its uppermost end in a down-turned flange portion. The deflector is conveniently bonded to or supported in use by the collar, and includes an integral or adjacent annular seal which is, in use, trapped between the uppermost edge of the collar and the base of the stand pipe coupling, as will be described in more detail later.

In the former case of a single piece seal, the seal itself comprises a generally cylindrical connection portion which is secured to the outside of the stand pipe by means of a strap fastener or the like, and a deflector portion integral with an upper region of the connection portion, said deflector portion extending generally outwardly in the same manner as described above.

In either case, the deflector is preferably of sufficient length to extend just slightly beyond the edge of the aperture in the internal lid, such that when the lid is lifted off, over the seal assembly, the edge of the deflector will be pushed upwards, temporarily assuming a generally U-shaped configuration, until the edge of the aperture clears the edge of the deflector, whereupon the resilience of the deflector causes it to return to its original position. During subsequent replacement of the lid over the seal assembly the edge of the deflector is pushed downwardly beyond the original position. The

length of the deflector is carefully limited to allow it to clear the edge of the aperture so that once the lid is again in place, the natural resilience of the deflector material causing it to spring back once again into its original position shielding the aperture.

According to a second aspect of the present invention there is provided an access chamber with a structural lid assembly including a structural lid secured within the chamber and having an aperture therein for an internal stand pipe to pass through, the assembly being capable of bearing the weight of at least one operative standing on the structural lid.

According to a third aspect of the present invention there is provided a method of adapting an existing chamber having an internal stand pipe, the method comprising securing within the chamber a structural lid assembly including a structural lid having an aperture therein through which the stand pipe protrudes, the assembly being capable of bearing the weight of at least one operative standing on the structural lid.

Embodiments of the present invention will now be described, by way of example only, with reference to the accompanying drawings in which:-

Figure 1 illustrates in side and plan views the structural lid being part of the structural lid assembly according to the present invention,

Figure 2 is a partial section on line X-X of Figure 1,

Figure 3 illustrates one embodiment of the seal,

Figure 4 illustrates a different embodiment of the seal also shown with the structural lid assembly inside the access chamber, and

Figure 5 is an enlarged drawing of the seal of Figure 4.

Referring to the drawings, an access chamber 10 comprises chamber walls 12, corbel unit 14 and frame 16 within which is received a sealed cover 18. A stand pipe 22 extends generally vertically from the man-way 20 situated on top of the underground tank, terminating in a cam action pipe coupling 24 which allows the supply pipe from the petrol tanker to be coupled to the stand pipe 22.

The access chamber 10 is provided with a lid or structural lid 26 which is sufficiently strong to allow an operative to stand on it whilst coupling and decoupling the supply pipe to the stand pipe. The outer edge of structural lid 26 is received within and supported by a U-shaped channel 28 bonded to the corbel unit 14, this connection being further strengthened by ties 30 embedded in the concrete around the edge of frame 16, which ties bolt together the channel 28 to the corbel unit 14.

As well as providing a standing surface which pref-

erably includes an aggregate coating (not shown) to prevent slipping, the structural lid 26 is gently sloped downwardly towards the channel 28, to allow any water which falls thereon to drain into the channel, where it is either drained directly away to the exterior of the access chamber, or collected into container 32.

The structural lid 26 includes two elongate handles 25, each extending a short distance substantially parallel to the perimeter of the structural lid and being raised sufficiently therefrom to give comfortable hand clearance. The two handles are approximately diametrically opposite each other, to enable the structural lid to be lifted out in a generally horizontal orientation.

The structural lid is manufactured from upper and lower skins 26a, 26b of glass fibre/resin composite material, with polyurethane foam 26c between the two skins which join together to form slightly thicker neck and outer edge portions 26d and 26e respectively (see Figure 2).

The neck portion 26d surrounds and defines a central aperture 26f therein, through which the stand pipe 22 passes with sufficient clearance to allow the structural lid 26 to be lifted up and over the coupler 24, to give access to the interior of the chamber. This clearance is effectively protected against ingress of water or petrol spillage by means of a seal assembly 34 comprising a cast aluminium collar 36 and a petrol resistant rubber (EPDM or PVC nitrile) deflector 38. The collar 36 comprises a first cylindrical portion 36a which is internally threaded to match the external thread on the stand pipe, and a down-turned flange portion 36b. The deflector 38, which includes an integral or separate annular seal 40, is bonded to the flange 36b, or may simply be trapped between the collar and the base of the coupling 24 without the need for bonding, when the collar is screwed on the stand pipe.

To install the seal assembly, the coupling 24 is removed, the existing thread on the stand pipe is simply extended further down the pipe, to allow the collar 36 with its deflector 38 to first of all be screwed onto the pipe a short distance away from the coupling 24, whereupon the coupling 24 is replaced and the collar 36 screwed back upwardly to trap seal 40 between the collar 36 and the coupling 24.

Normally, the deflector 38 assumes the position A shown in solid lines in Figure 5, but when the structural lid 26 is lifted over the deflector 38 the edge of the deflector is flipped inwardly and upwardly by the edge of aperture 26f, momentarily assuming the generally U-shaped configuration B shown in broken lines and returning to the original position A once the aperture has cleared the edge of deflector 38. When the structural lid 26 is replaced, the edge of the aperture pushes the edge of the deflector outwardly and downwardly towards the position C shown in broken lines. Once the structural lid 26 is in place and the edge of deflector 38 is free of the edge of the aperture, the deflector springs back to its original position A.

Thus, the assembly of the present invention provides effective protection of the aperture 26f from ingress of water and any spilt petrol (this will run down the deflector 38 and drip off the end onto the structural lid 26, to be drained away as described above), without hindering removal and replacement of the structural lid 26. This allows the convenience of internal stand pipe filling without the risk of water and/or petrol finding its way into the interior of the chamber.

The same protection is afforded by a simpler version of the seal illustrated in Figure 3, comprising a single piece of EPDM or PVC nitrile 42 shaped into a cylindrical connection portion 42a secured around the stand pipe with a strap fastener 44, and a deflector portion 42b extending generally outwardly from the upper region of the connection portion.

Claims

1. A structural lid assembly for use within an access chamber (10), including a structural lid (26) having an aperture (26f) therein for an internal stand pipe (22) to pass through and means (28) for supporting the structural lid within the access chamber, the assembly being capable of bearing the weight of at least one operative standing on the structural lid.
2. A structural lid assembly according to Claim 1, wherein the means for supporting the structural lid comprises a gutter (28) configured as a generally U-shaped channel which is secured to the access chamber or to an associated corbel unit (14), the edge of the structural lid being received within and supported by this gutter.
3. A structural lid assembly according to Claim 2, wherein the gutter (28) is secured around the interior of the access chamber by a plurality of ties (30) which are embedded in the concrete surrounding the frame and corbel unit.
4. A structural lid assembly according to any of the preceding Claims, wherein the lid (26) is a double skin construction comprising upper and lower skins (26a, 26b) of suitable lightweight but strong material, for example glass fibre/resin composite, with a light-weight filling material (26c), for example polyurethane foam, between the two skins.
5. A structural lid assembly according to Claim 4, wherein the filling material (26c) may completely fill the void between the two skins, or alternatively it may be present in the form of a series of ribs extending radially outwardly from the aperture towards the edge, in a manner resembling spokes of a wheel.
6. A structural lid assembly according to Claim 4 or Claim 5, wherein the upper and lower skins (26a, 26b) of the structural lid unite at the edge of the aperture and at the outer edge of the structural lid, to provide a thicker, stronger upturned neck (26d) and downturned edge lip (26e) respectively.
7. A structural lid assembly according to any of the preceding Claims, wherein the upper surface of the lid includes an anti-slip coating such as aggregate or the like.
8. A structural lid assembly according to any of the preceding Claims, wherein the lid includes at least one handle to assist in lifting the lid.
9. A structural lid assembly according to any of the preceding Claims, wherein there is included a seal (34:42) for attachment to that part of the stand pipe protruding through the aperture in the structural lid, the seal when so attached extending from said stand pipe generally outwardly to effectively shield said aperture.
10. A structural lid assembly according to Claim 9, wherein said seal (38;42b) is engaged by the edge of the aperture in the structural lid as the latter is lifted up and over the stand pipe coupling, the seal being thereby temporarily deformed until clear of the aperture whereupon it resumes its original position, such that the seal may remain in place during removal and replacement of the structural lid.
11. A structural lid assembly according to Claim 9 or Claim 10, wherein the seal (38:42) is manufactured from a resiliently deformable, petrol resistant material such as EPDM or PVC nitrile.
12. A structural lid assembly according to any of Claims 9 to 11, wherein the seal (42) comprises a single, suitably shaped piece of such material.
13. A structural lid assembly according to any of Claims 9 to 11, wherein the seal (34) comprises a substantially rigid collar (36) adapted to be secured around the stand pipe and a resiliently deformable deflector (38) of either EPDM or PVC nitrile extending from said collar generally outwardly to effectively shield said aperture.
14. A structural lid assembly according to any of Claims 9 to 13, wherein the seal (42) or deflector (38) is preferably of sufficient length to extend just slightly beyond the edge of the aperture in the internal lid, such that when the lid is lifted off, over the seal assembly, the edge of the deflector will be pushed upwards, temporarily assuming a generally U-shaped configuration, until the edge of the aperture clears the edge of the deflector, whereupon the

resilience of the deflector causes it to return to its original position, and during subsequent replacement of the lid over the seal assembly the edge of the seal (42) or deflector (38) is pushed downwardly beyond the original position, the length of the deflector being carefully limited to allow it to clear the edge of the aperture so that once the lid is again in place, the natural resilience of the deflector material causing it to spring back once again into its original position shielding the aperture.

15. An access chamber (10) with a structural lid assembly including a structural lid (26) secured within the chamber and having an aperture (26f) therein for an internal stand pipe (22) to pass through, the assembly being capable of bearing the weight of at least one operative standing on the structural lid.

16. A method of adapting an existing access chamber having an internal stand pipe (22), the method comprising securing within the chamber a structural lid assembly including a structural lid (26) having an aperture (26f) therein through which the stand pipe protrudes, the assembly being capable of bearing the weight of at least one operative standing on the structural lid.

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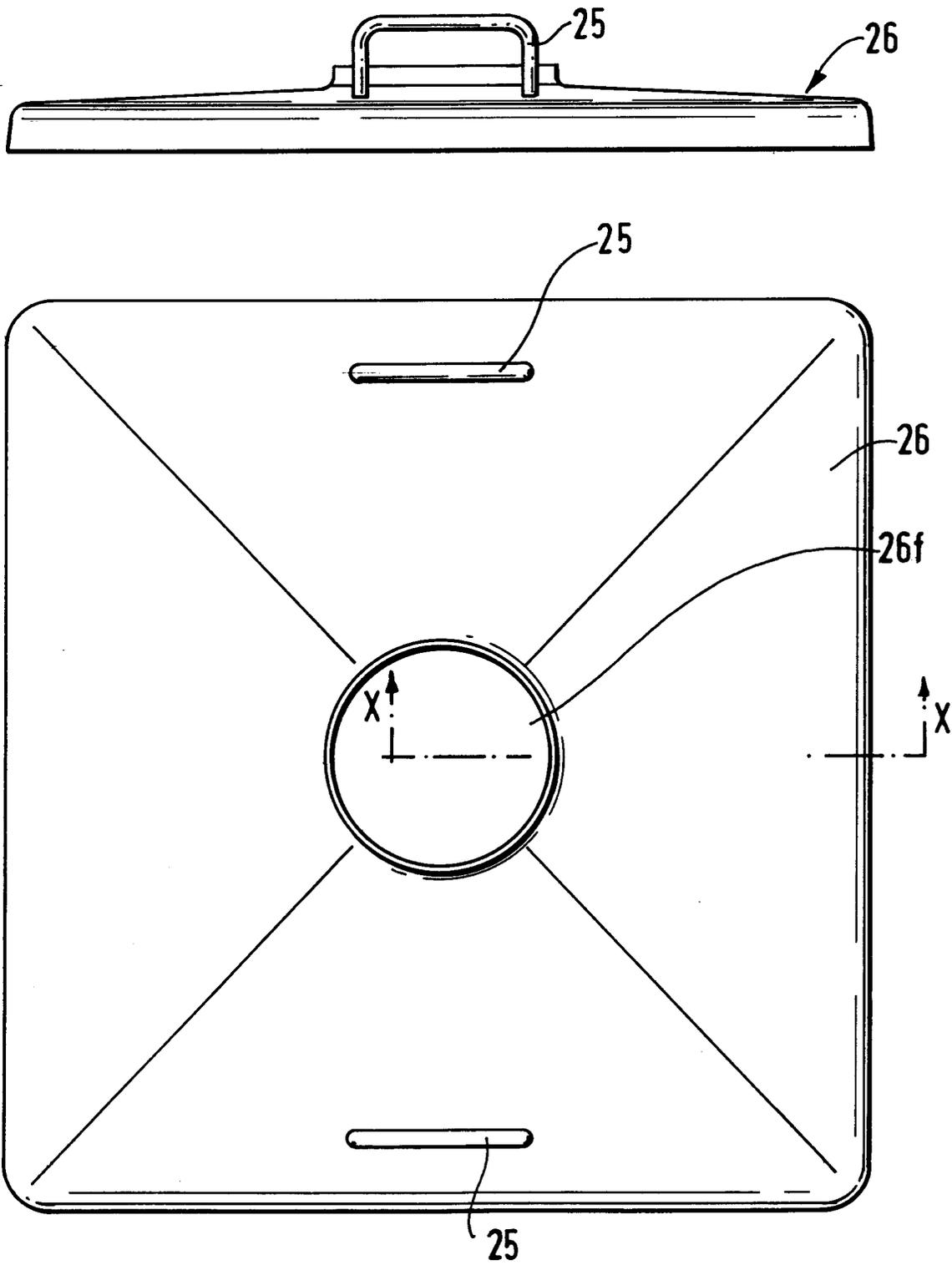
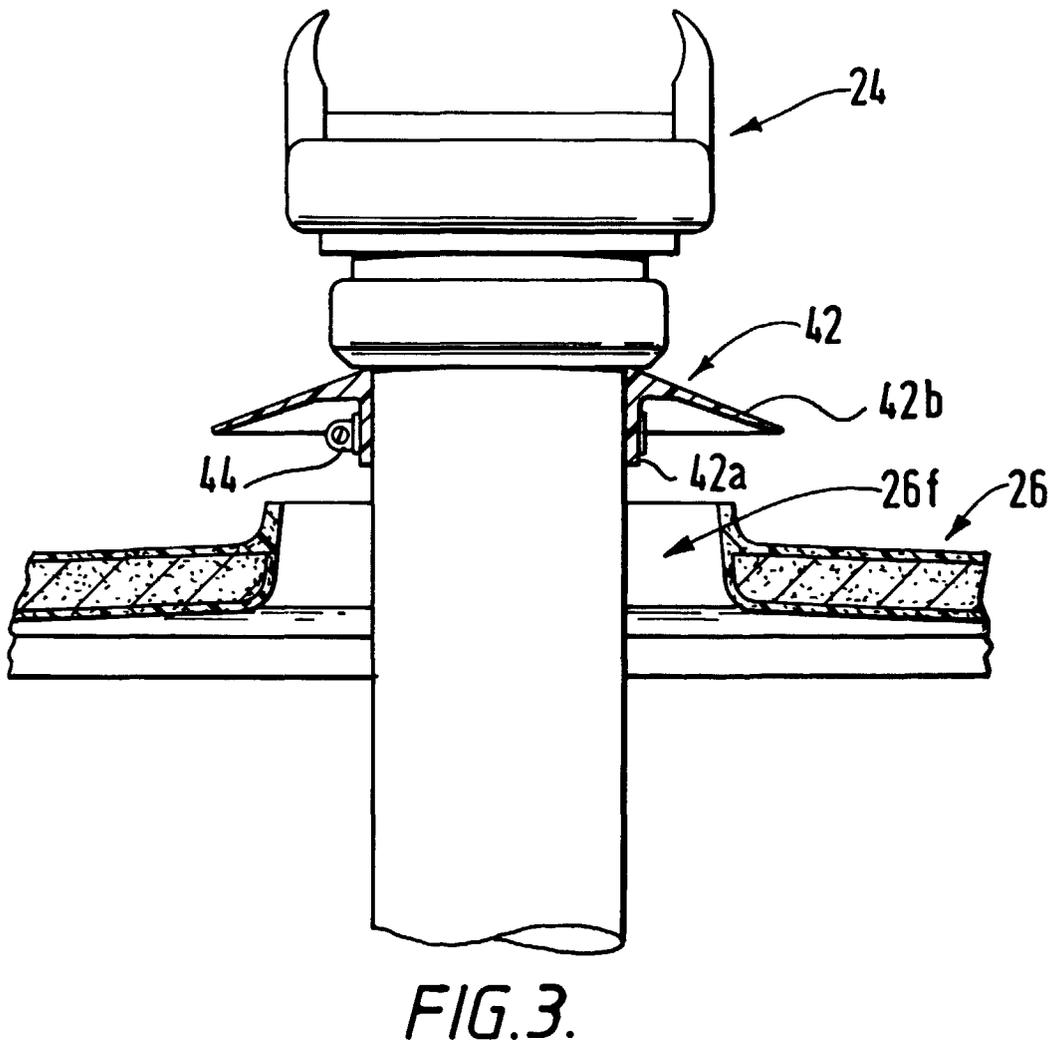
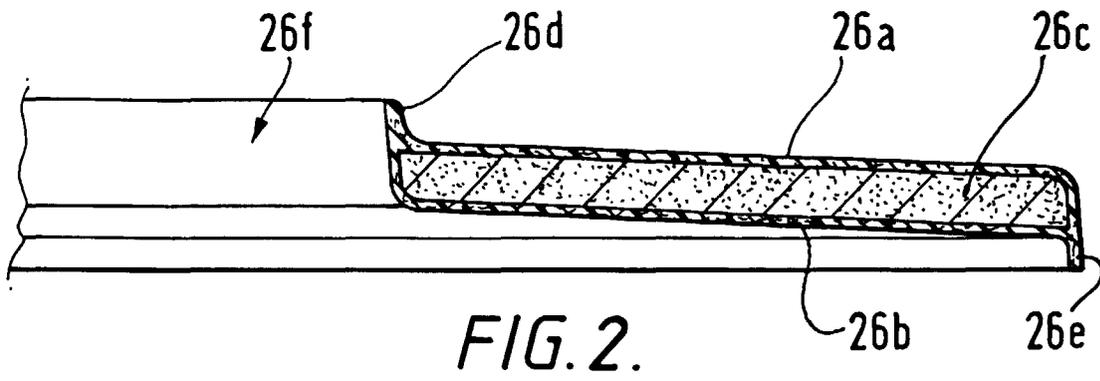


FIG.1.



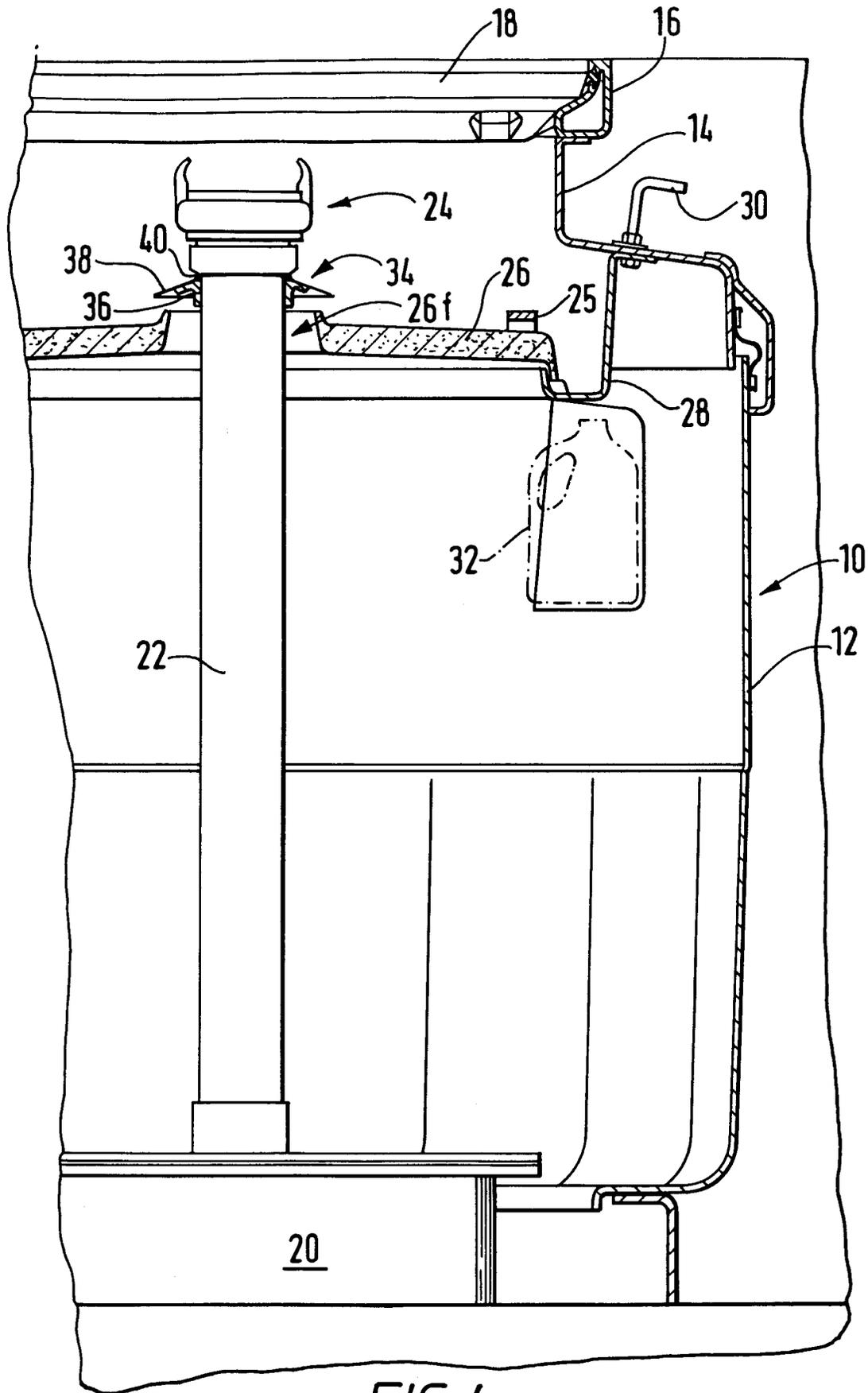


FIG. 4.

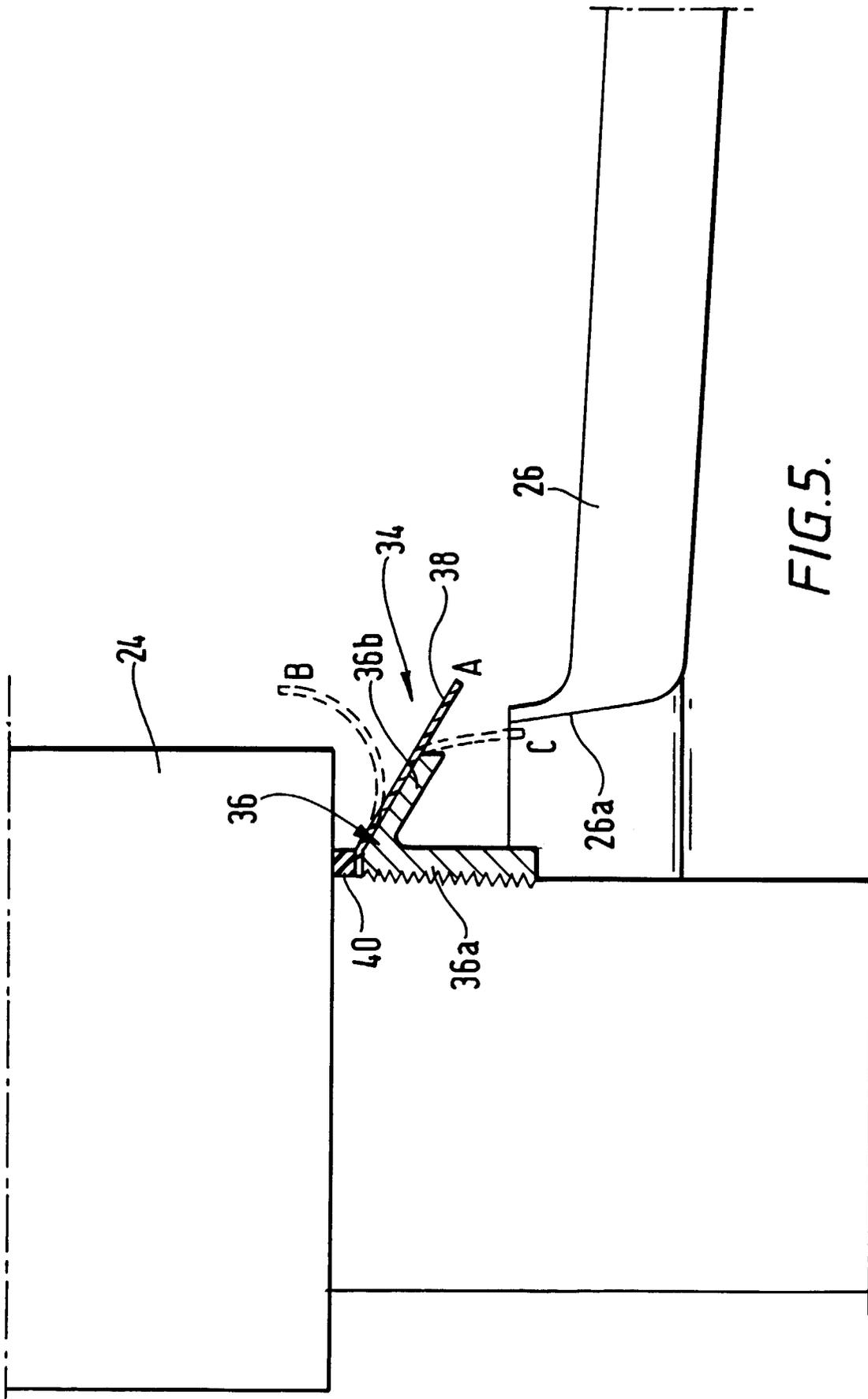


FIG.5.



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EUROPEAN SEARCH REPORT

Application Number
EP 98 20 0672

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
D,A	EP 0 744 359 A (FIBRESEC HOLDINGS) 27 November 1996 * the whole document * ---	1-3,15,16	B65D90/10
A	US 4 763 806 A (PODGERS ET AL.) 16 August 1988 * abstract; figures * ---	1,15,16	TECHNICAL FIELDS SEARCHED (Int.Cl.6) B65D B67D
A	US 5 058 774 A (HARTMAN ET AL.) 22 October 1991 * the whole document * ---	1,9	
A	US 4 659 251 A (PETTER ET AL.) 21 April 1987 * figures * -----	1,15,16	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 10 June 1998	Examiner Gino, C
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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