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(54) **Cover for a storage container for liquid.**

(57) Cover (3) for closing an opening in a storage container (1) for a liquid, in particular beer, which liquid is stored in a bag (6), preferably made of plastic material, said bag (6) being located inside the storage container (1) and being provided with a spout (7), in which cover (3) there is present a feed-through pipe (5) for the liquid for effecting a liquid-tight connection of the interior of the bag (6) to a pipe located outside the container, for supplying or discharging the liquid.

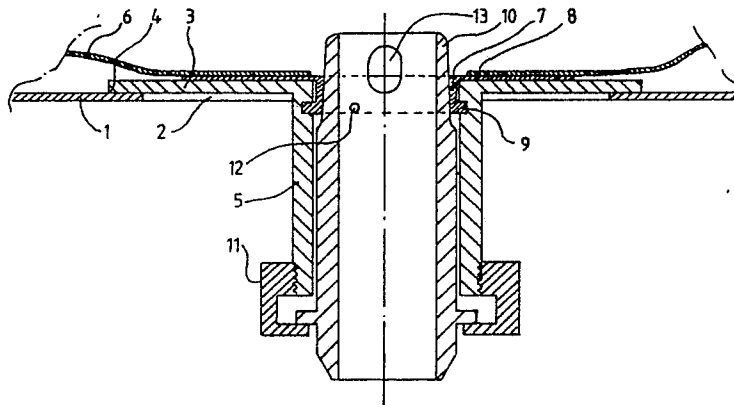


FIG. 1

**EP 0 250 042 A1**

### Cover for a storage container for liquid.

The invention relates to a cover for closing an opening in a storage container for a liquid, in particular beer, said liquid being stored in a bag located inside the storage container. The invention also relates to such a storage container and to a method for providing the cover.

Storage containers for liquids may have the most diverse shapes and be provided with supply and discharge pipes for the liquid. For liquids which are intended for consumption, in particular beer, relative small barrels, up to approximately 50 litres, were used of old, which barrels had to be exchanged all the time. Said exchanging of the barrels was not only a heavy but also a very time-consuming occupation, i.a. because the required connections with the tap pipes had to be made. Besides it was not possible to draw off during exchanging unless use was made of installations having more than one barrel, which is only possible in large catering establishments. The last few years large and medium-sized catering establishments have therefore switched over to containers having a fixed arrangement on the premises of the catering establishment. Said storage containers are not exchanged but filled from a tank lorry via coupling pipes suitable for that purpose. The capacity of such storage containers having a fixed arrangement, also called storage tanks, may be chosen between 200 and 1000 litres, according to the size of the catering establishment. The arrangement of such storage containers is relatively free and therefore both horizontally and vertically arranged containers are used.

Although the invention is not restricted to use with liquids suitable for consumption, e.g. for beer, use with said liquids is of special importance indeed. This is connected with the fact that a particularly great deal of attention needs to be paid to hygiene, i.a. because statutory regulations require so. It is e.g. necessary to clean the storage containers and the pipes connected thereto regularly by rinsing, so that no bacterial or fungal growth can occur. Said cleaning is of course a time-consuming activity and therefore a switch-over to the use of storage containers has been made since a few years, in particular for the storage of beer, whereby the liquid cannot come into contact with the actual wall of the container, which usually consists of metal, e.g. stainless steel or aluminium. This is especially important for the storage of beer, because beer is a liquid which is very sensitive to impurities. The solution of the problem described above was found by providing a bag, in which the beer is stored, in the storage container. This bag must be flexible, of course, so that by applying

pressure, e.g. carbonic acid pressure, on the outer wall of the bag the beer can be pressed out of the bag. Preferably the bag consists of thin-walled, flexible plastic material, therefore. When the stock of beer is renewed the old plastic bag is completely removed and disposed. Subsequently a new bag is provided in the tank, the tank is closed and beer is put into the bag from a tank lorry via a supply pipe.

Of course it is essential that there is an absolutely liquid-tight connection between the interior of the bag and the tap pipe and also the temporarily provided supply pipe of beer from the tank lorry. For that purpose a feed-through pipe was fixed to the wall, usually of metal, of the storage container up to now and the plastic bag was provided with a relatively narrow spout, which was fixed liquid-tight around or inside the end of the feed-through pipe in the interior of the storage container. It stands to reason that it is necessary thereby to provide an opening somewhere in the tank through which the plastic bag, in more or less folded condition, can be put in and the spout can be slid inside or around the supply pipe. The opening through which the bag has been put in is of course closed with a cover afterwards. Said hole must be provided at such a location, however, and have such a size that there is sufficient space for sliding the spout around or inside the end of the feed-through pipe by hand or with an auxiliary means, e.g. a stick. All this requires a special dexterity and is time-consuming, especially because there has to be absolute certainty that the connection of the interior of the plastic bag to the feed-through pipe is tight. The purpose of the invention is to avoid this disadvantage and to obtain other advantages, which will be explained hereinafter.

In many cases the storage container will be provided with means for keeping the contents cool. For that purpose use is often made of an insulation layer, in particular polyurethane foam, to be provided around the wall, preferably of metal, of the storage container. As this layer cannot be very thin the disadvantages summed up hereinabove are even magnified.

A cover according to the invention for closing an opening in a storage container for a liquid, in particular beer, which liquid is stored in a bag, preferably made of plastic material, said bag being located inside the storage container and being provided with a spout, is characterized in that in the cover there is present a feed-through pipe for the

liquid for effecting a liquid-tight connection, via the spout of the bag, of the interior of the bag to a pipe, located outside the container, for supplying, discharging the liquid respectively.

As the feed-through pipe according to the invention is located in the cover with which the opening through which the bag can be put into the storage container can be closed, it is possible to effect the connection between the bag, in particular via the spout of the bag, and the feed-through pipe before the bag is provided in the interior of the storage container. The spout of the bag can therefore be easily provided in the correct place, without any auxiliary means and it is possible to check immediately whether the liquid-tightness can be guaranteed. With a special embodiment of the present invention the spout of the bag is provided in the interior of the feed-through pipe and the final closing is obtained by inserting a tubular part into the interior of the spout from the outside of the cover, said part having an outside diameter so much smaller than the interior of the outer part along a certain length that the spout present in the bag can be clamped liquid-tight between the two parts. Said part of the inner pipe may be somewhat conical at the side turned into the bag, whereby the smaller diameter is located at the side of the bag. The spout may have a thickening at the outermost edge, said thickening fitting into a groove present in the outer feed-through pipe. This is of particular importance when the material of the bag and of the spout is not very thick. Possibly one or more protrusions may be provided in the groove with this embodiment, said protrusions pointing inside and co-operating with recesses in the thickened edge of the spout. By this embodiment the position of the bag is fixed relative to the position of the feed-through pipe, which may be of importance under certain circumstances, e.g. when the bag has an asymmetric shape.

With regard to the manufacture of the bag it may be advantageous when the spout is not directly formed together with the enclosure of the bag. This applies in particular when the spout is provided with recesses. It is possible then to make a separate forming piece, consisting of a spout with a flange. Said flange may be connected, by glueing or welding, to the enclosure of the bag which is of course provided with a feed-through opening at the spot of the spout.

The closing of the cover on the storage tank may be effected in various manners. It has proved to be advantageous, however, for a cover according to the invention to have such a shape that it can be put into the container through the opening and the closing of the opening is effected at the inside of the container e.g. by rotating the cover. This manner of closing is known by itself for a tank

not having an inner bag. By pulling the cover against the inner side of the storage container via a bow construction closing becomes complete. For this construction it has proved to be advantageous, for manufacturing reasons, for the lid to have an oval shape.

Closing with a cover at the inside of the storage container is of particular importance when the storage container is surrounded by an insulation layer, e.g. of polyurethane foam. Said layer is namely not sufficiently hard for providing a lid at the outside closing the container tightly. If the lid thereby consists of a flat plate it will be desirable to increase the heat insulation at the location of the cover. This might be done by providing a separate inserted piece of an insulation material, e.g. polyurethane foam, but according to a particularly advantageous embodiment of the invention the cover is constructed as a closed hollow box with a supply pipe leading therethrough. This prevents a separate operation for providing insulation at the spot of the cover. For realising the closing the box is provided with a protruding collar at the side turned to the interior of the storage container. The closing is obtained between the wall of the storage container and said collar part. Possibly a sealing ring may be provided between the collar and the wall of the container. If the lid is a flat plate, has no box construction therefore, it will also be possible to use such a sealing ring.

The invention will now be explained with reference to a drawing illustrating two embodiments of a cover according to the invention. In the drawing;

fig 1 is a cross-section of a cover with a flat plate;

fig 2 is a side view of a box-shaped cover and

fig 3 is a bottom view of fig 2.

In figure 1 reference numeral 1 indicates a part of the wall of a storage container in which the opening 2 is located. 3 Indicates a cover according to the invention, joining the inner side of the wall 1 at 4. Fixed to said cover part 3 is a pipe 5 which protrudes outwardly. 6 Indicates a bag of plastic material in which the liquid, in particular beer, is to be stored. Connected to said bag 6 is a spout 7 which is provided with a flange 8. The spout 7 has a thickened edge 9 at the side turned outwardly. Said edge fits into the groove which is provided in the pipe 5. The flange 8 is fixed to the bag 6 e.g. by glueing or welding. Because the spout and also the bag are flexible it will be possible, with suitably chosen dimensions of the thickened edge and the groove, to slip the thickened edge into the groove. The inner part 10 of the feed-through pipe has not yet been provided at the place indicated in the drawing then. Said part 10 is only slid into the feed-through pipe from below after the spout and

the bag have been placed. The lid 3 is not yet present at the spot indicated in the drawing then, but is completely outside the storage container. This has precisely the advantage that the spout can easily be provided in the groove.

The final closing between the pipe 5 and the spout 7 takes place by means of the inner pipe 10 which is somewhat conical at the end located at the upper side. The pipe 10 is slid into the outer pipe 5 from below and fixed with a follower nut 11 before or after providing the cover in the storage container. Said follower nut 11 is tightened so fast that the closing between the spout 7 and the pipes 5 and 10 is complete. At the bottom side the pipe 10 may now be connected either to a discharge pipe or to a supply pipe for the liquid, in particular the beer. The connection of said pipe may be effected in a manner known, not shown here. 12 indicates a protrusion pointing inwardly which is provided in the groove of the pipe 5. Said protrusion fits into a recess of the thickened edge 9 and as a result fixes the position of the spout 7 and the bag 6 connected thereto. 13 indicates an opening in the upper end of the pipe 10 for increasing the through-flow possibility.

Several of such openings may be present. The cover 3 is shaped in such a manner that it can be put into the container through the opening 2, after the bag 6 has been fixed to the pipe 5 via the spout 7. It is e.g. very advantageous to make the opening 2 and also the cover 3 oval. Said oval cover can easily be slid inside then and close the opening 2 after having been rotated.

Fig 2 illustrates an oval cover according to the invention, said cover being box-shaped. At the upper side said box has a protruding collar 14, which will rest on the wall 15 of the storage container.

Except for the opening in which the cover is placed the storage container is entirely surrounded by a thick insulating layer 16, e.g. consisting of polyurethane foam. 17 indicates a feed-through pipe which runs through the centre of the cover and is not in communication with the space inside the cover. Said pipe 17 corresponds with the pipe 5 of fig 1. Otherwise closing takes place in entirely the same manner as explained with reference to fig 1. 18 indicates hooks which serve to pull, by means of a bow construction, the cover tightly against the wall 15 at the inside.

## Claims

1. Cover for closing an opening in a storage container for a liquid, in particular beer, which liquid is stored in a bag, preferably made of plastic material, said bag being located inside the storage container and being provided with a spout, char-

acterized in that in the cover there is present a feed-through pipe for the liquid for effecting a liquid-tight connection, via the spout of the bag, of the interior of the bag to a pipe, located outside the container, for supplying, discharging the liquid respectively.

2. Cover according to claim 1, characterized in that it is shaped in such a manner that it can be put into the container through the opening and, e.g. by rotating the cover, closing of the opening can be effected at the inside of the container.

3. Cover according to claims 1 or 2, characterized in that it is oval.

4. Cover according to claims 1, 2 and 3 for closing an opening in a storage container surrounded by an insulating layer, characterized in that the cover is a closed box provided with a collar at the side turned to the interior of the container.

5. Cover according to claims 1, 2, 3 or 4, characterized in that the feed-through pipe consists of two coaxial tubular parts fitting into each other, whose exterior part forms one whole with the cover and whose interior part has a diameter so much smaller than the interior of the outer part along a certain length that the spout present in the bag can be clamped liquid-tight between the two parts.

6. Cover according to claim 5, characterized in that that part of the inner tube with which the clamping takes place is slightly conical, whereby the smaller diameter is located at the side of the bag.

7. Cover according to claims 5 or 6, characterized in that the outer part of the feed-through pipe, at the spot of the clamping, has a groove at the inner side into which fits a thickened outer edge present in the spout of the bag.

8. Cover according to claim 7, characterized in that there is at least one protrusion, pointing inside, present in the groove, said protrusion fitting into a recess present in the thickened edge of the spout of the bag.

9. Storage container for a liquid, in particular beer, provided with an opening which can be closed by a cover according to any one or more of the preceding claims.

10. Method for setting into operation a storage container for a liquid, in particular beer, according to claim 9, characterized in that the spout of the bag for storing the liquid is placed in the outer part of the feed-through pipe of the cover and subsequently the cover with the bag connected thereto is placed in the storage container.

11. Method according to claim 10, characterized in that after the cover with the bag connected thereto has been placed in the storage container, the spout of the bag is clamped liquid-tight by

inserting from outside an inner part of the supply pipe between the inner part and the outer part of the supply pipe.

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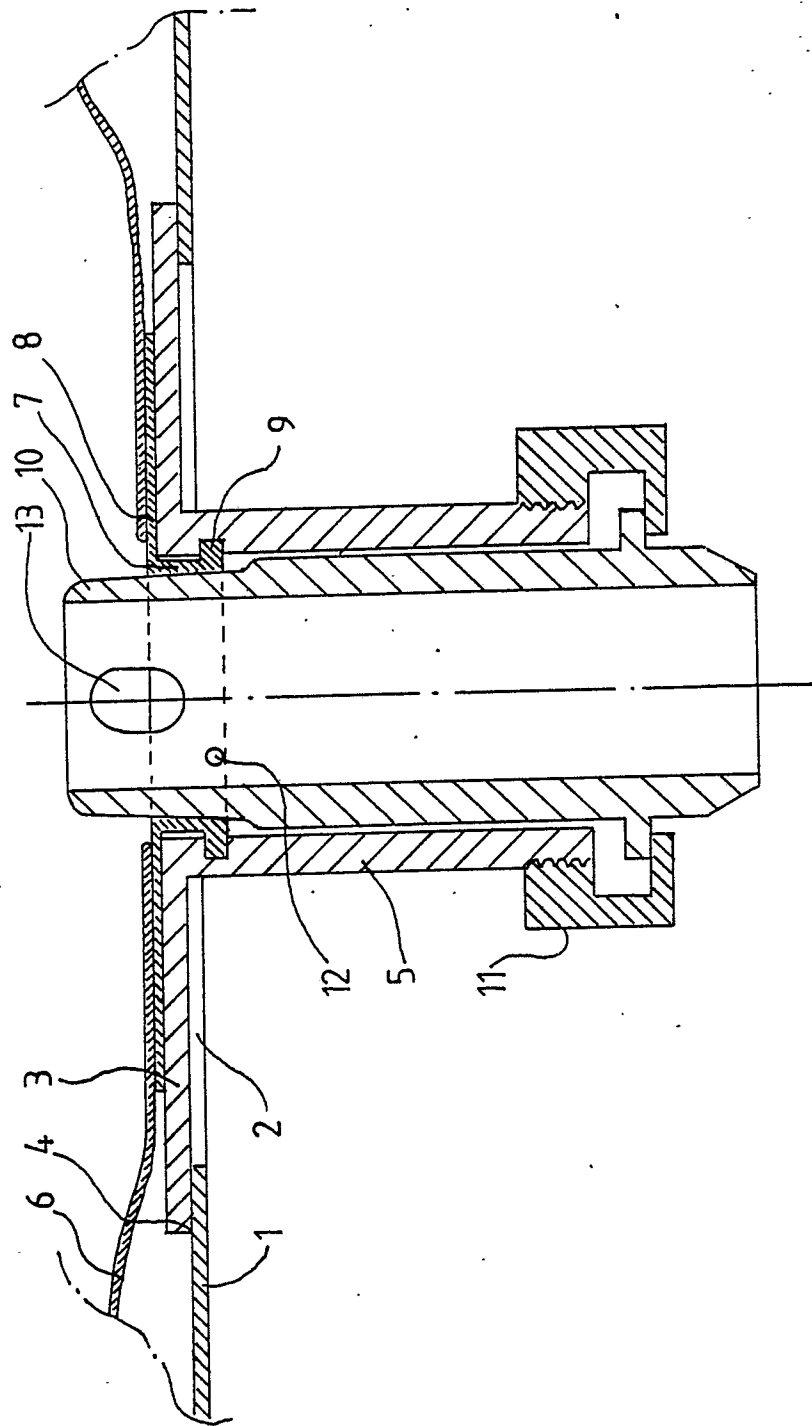
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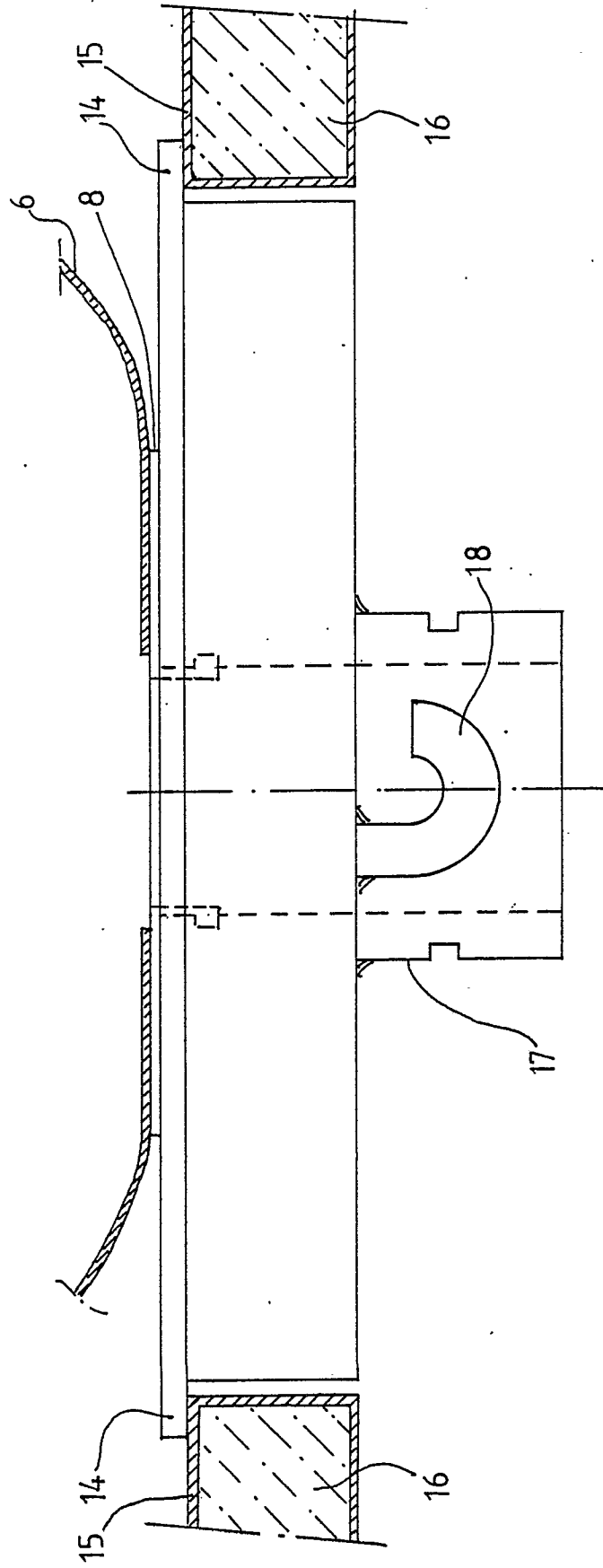
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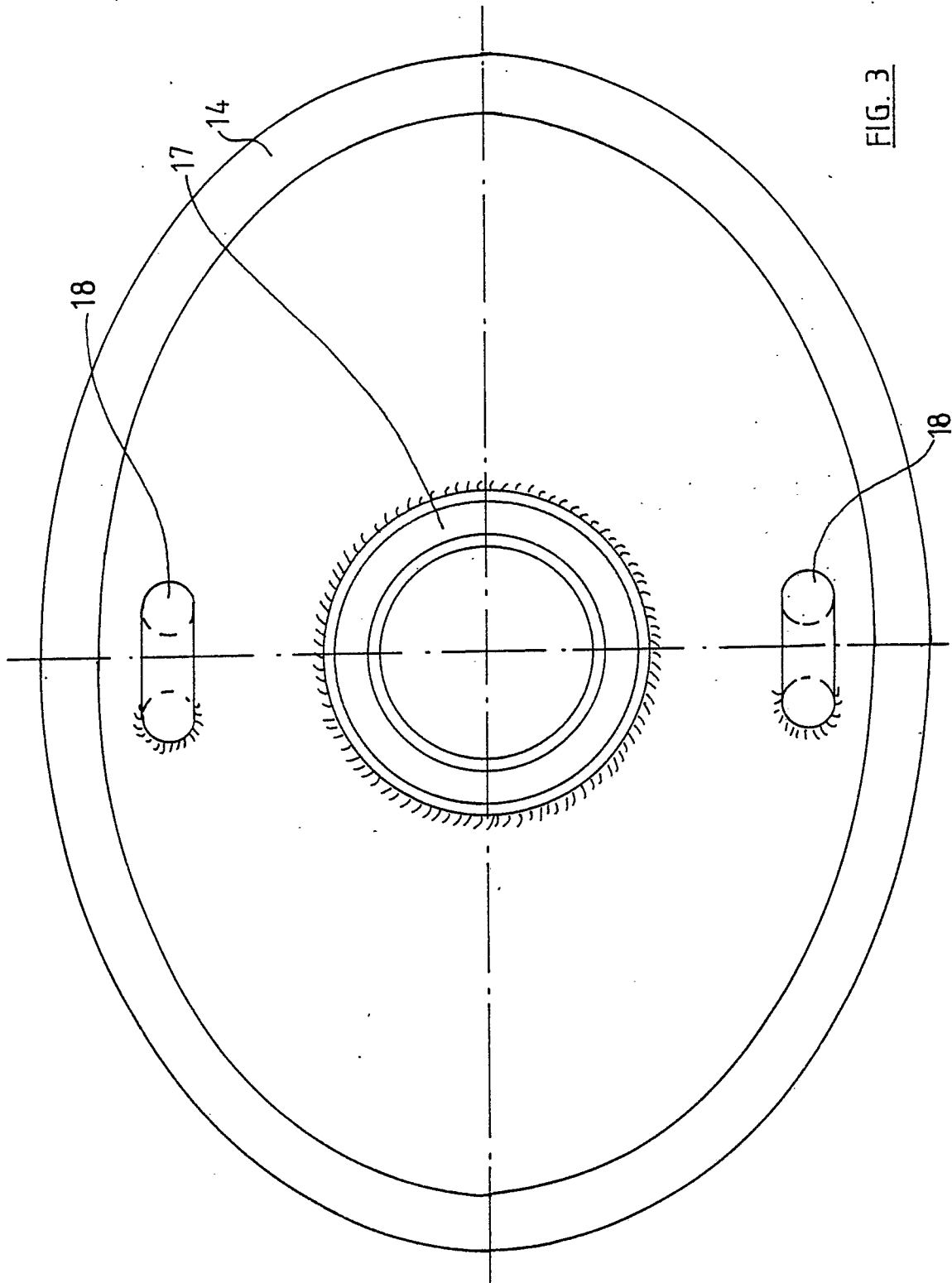


FIG. 3



| 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.4) |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | GB-A- 648 863 (VAN LEER)<br>* Page 6, lines 50-58; page 6, line 71 - page 7, line 19; figures 1-7 * | 1                                              | B 65 D 77/06<br>B 65 D 88/62<br>B 65 D 25/16  |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ---<br>EP-A-0 098 322 (BIER-DRIVE AG)<br>* Page 10, lines 1-22; figure 11 *                         | 1                                              |                                               |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ---<br>GB-A- 426 446 (MURRAY CORP.)<br>* Page 2, lines 25-41; figures 2-8 *                         | 4                                              |                                               |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ---<br>GB-A- 704 430 (VAN LEER)<br>* Page 2, lines 58-65; figures 1-5 *                             | 5                                              |                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                     |                                                | TECHNICAL FIELDS SEARCHED (Int. Cl.4)         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                     |                                                | B 65 D<br>B 67 D                              |
| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                     |                                                |                                               |
| Place of search<br>THE HAGUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                     | Date of completion of the search<br>10-09-1987 | Examiner<br>BERRINGTON N.M.                   |
| <p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone<br/>Y : particularly relevant if combined with another document of the same category<br/>A : technological background<br/>O : non-written disclosure<br/>P : intermediate document</p> <p>T : theory or principle underlying the invention<br/>E : earlier patent document, but published on, or after the filing date<br/>D : document cited in the application<br/>L : document cited for other reasons<br/>&amp; : member of the same patent family, corresponding document</p> |                                                                                                     |                                                |                                               |