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(54) Closing device, with funnel function, for containers of liquid

(57) Closing device (10) for a container of liquids (13), provided with at least an inlet hole (14) to allow the outlet or inlet of the liquids. The closing device (10) comprises a first element (11) of a substantially tubular shape inserted into the inlet hole (14) and a second cup-like element (12) mounted coaxial and outside the first element (11). The first element (11) comprises a first closed end (15) and a second open end (16). The second cup-like element (12) slides coaxially with respect to the first element (11) in order to cooperate selectively with the first closed end (15), so as to define a first configuration as a stopper, and respectively with the second open end (16), so as to define a second configuration as a funnel. The first element (11) is inserted selectively into the inlet hole (14) with the first end (15) facing towards the outside in the first configuration, and with the first end (15) facing towards the inside in the second configuration.

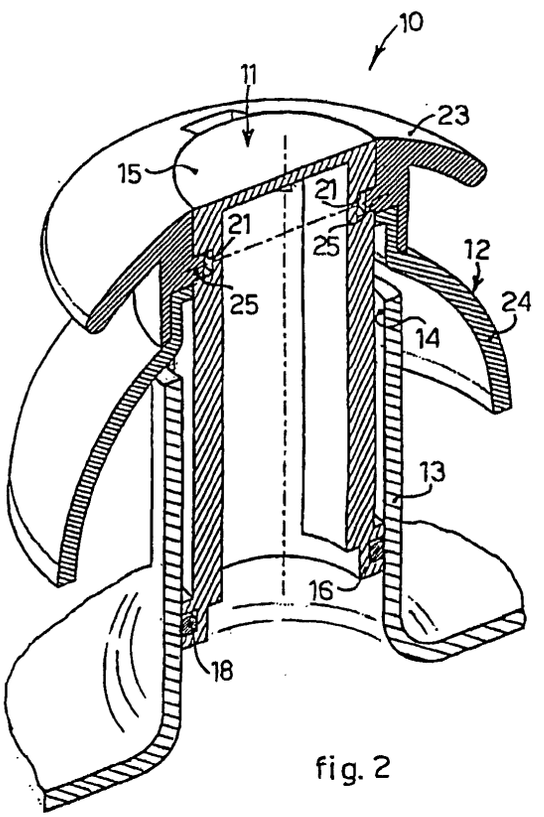

fig. 2

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Description

FIELD OF THE INVENTION

[0001] The present invention concerns a closing device for a container of a liquid that can be configured in a first position, wherein it has a stopper function to prevent the liquid contained in the container from coming out, or in a second position, wherein it has a funnel function to facilitate operations to fill the container. To be more exact, the closing element according to the invention comprises a hollow stem on which a cup-like element can slide axially, so as to define the first and second position.

BACKGROUND OF THE INVENTION

[0002] It is known that in order to close containers, such as tanks or suchlike, for containing a liquid, stoppers are normally used with degrees of hermetical seal or watertight seal that vary according to the type of liquid contained.

[0003] Such stoppers, however, only have the function of preventing the liquid contained from exiting from the container, or preventing external elements from entering inside the container.

[0004] It is also known that, in order to facilitate operations to fill or top up such containers, funnel-type elements are usually used, to prevent the liquid poured from dripping, or flowing onto the outside surface of the container.

[0005] However, such funnel elements do not guarantee any closing of the container.

[0006] One of the main disadvantages of known systems is that, in order to perform an operation to top up a container, a user must necessarily be provided with an autonomous funnel with respect to the stopper of the container.

[0007] Moreover, in the event that the liquid contained has to be poured into another container, it is necessary to arrange a spout that, associated with the neck of the container, prevents the liquid being poured from flowing along the outer surface of the container itself.

[0008] In the state of the art, it is therefore necessary to use two or more elements in order to perform a simple operation like topping up a container, or pouring the contents inside another container.

[0009] The Applicant has devised and embodied the present invention to overcome these shortcomings of the state of the art and to obtain other advantages.

SUMMARY OF THE INVENTION

[0010] The present invention is set forth and characterized in the main claim, while the dependent claims describe other innovative characteristics of the invention.

[0011] One purpose of the present invention is to obtain a single closing device for a container of liquid provided with at least an inlet hole for the inlet and outlet of the liquid, which can be used both as a stopper and also as a funnel.

[0012] In accordance with such purpose, the closing device according to the present invention comprises a first element of a substantially tubular shape, able to be inserted into the inlet hole of the container and having a first closed end and a second open end, and a second, cup-shaped element, mounted coaxial with the first element, able to slide coaxially with respect thereto in order to cooperate selectively with the first closed end or with the second open end.

[0013] In this way, the two elements define respectively a first configuration as a stopper, wherein the first element is inserted into the inlet hole with the first end facing towards the outside and the second cup-like element cooperates with such first end, and a second configuration as a funnel, wherein the first element is inserted into the inlet hole with the first end facing towards the inside and the second cup-like element cooperates with the second end.

[0014] In proximity with the first end of the first element, an aperture is made that, in the first configuration, is obstructed by the second cup-like element, while in the second configuration it allows the liquid to pass from the outside to the inside of the container, and vice versa.

[0015] The closing device according to the present invention can therefore be used both as a stopper and as a funnel , selectively putting into cooperation the second cup-like element with one or the other of the two ends of the first element, in a rapid and simple manner.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] These and other characteristics of the present invention will become apparent from the following description of a preferential form of embodiment, given as a non-restrictive example, with reference to the attached drawings wherein:

- fig. 1 is a three-dimensional view of a closing device for a container of a liquid according to the present invention, in a first operating configuration;
- fig. 2 shows a transverse section of the device in fig. 1;
- fig. 3 is a three-dimensional view of the device in fig. 1, in a second operating configuration;
- fig. 4 shows a cross section of the device in fig. 3.

DETAILED DESCRIPTION OF A PREFERENTIAL FORM EMBODIMENT OF THE INVENTION

[0017] With reference to the attached figures, a closing device 10 according to the present invention for a container 13, able to contain any liquid whatsoever, comprises a first tubular element 11 and a second, cup-shaped element 12 arranged coaxial to said tubular el-

ement 11, and able to slide with respect to the latter. The elements 11 and 12 are able to define a first configuration as a stopper, as shown in figs. 1 and 2, and a second configuration as a funnel, as shown in figs. 3 and 4.

[0018] The tubular element 11 comprises a first closed end 15 and an opposite open end 16, and is able to be inserted, in one direction or the other, into a mating inlet hole 14 of the container 13.

[0019] In proximity with the closed end 15, on the circular outer surface of the tubular element 11, a through hole 17 is made, in order to put its tubular cavity into communication with the inside of the container 13 when the device 10 is in its second configuration as a funnel.

[0020] In proximity with the open end 16, on the circular outer surface of the tubular element 11, an annular packing 18 is arranged in order to guarantee the wet seal of the two elements 11 and 12 in the second configuration as a funnel.

[0021] On the circular outer surface of the tubular element 11, two sliding seatings 20 (figs. 3 and 4) are also made longitudinally and diametrically opposite, inside which mating sliding elements 25 slide, made radially on the cup-like element 12.

[0022] At the ends of the two sliding seatings 20, and contiguous thereto, clamping recesses 21 and 22 are made radially, respectively towards the first end 15 and towards the second end 16, inside which the sliding elements 25 are positioned with a bayonet-like movement, so as to temporarily and reciprocally clamp the tubular element 11 with the cup-like element 12 in order to define either the first configuration or the second configuration of the closing device 10.

[0023] The cup-like element 12 comprises a first disk 23 and a second disk 24, coaxial to each other and able to slide along the first element 11, instead.

[0024] The first disk is shaped substantially like a mushroom, it comprises the sliding elements 25 in a single piece and functions as a gripper element for the closing device 10 when the latter is in its first configuration as a stopper, whereas it has the function of retaining possible excess liquid when the closing device 10 is in its second configuration as a funnel.

[0025] The second disk 24 is made solid with a part of the first disk 23, and is shaped substantially like a dome, so as to partly surround the top of the container 13 when the closing device 10 is in its configuration as a stopper, and to function as a conveyor for the liquid, whether this is entering or leaving the container 13, when the closing device 10 is in its configuration as a funnel.

[0026] The fact that the second disk 24 is shaped like a dome is not essential for the purposes of the present invention. In fact, the disk 24 can be of any shape, provided that it performs its funnel function.

[0027] The closing device 10 as described heretofore functions as follows.

[0028] Under normal conditions of use (figs . 1 and 2), the closing device 10 is in its first configuration, with the cup-like element 12 in cooperation with the first end of the tubular element 11, and the latter inserted into the container 13 with its second end 16.

[0029] In such first configuration the first disk 23 completely obstructs the aperture 17, thus preventing the liquid contained in the container 13 from emerging, and the second disk 24 cooperates with the outer surface of the container 13, so as to prevent external agents, such as dust, liquids or otherwise, from inadvertently penetrating inside.

[0030] To pass from the configuration as a stopper to the configuration as a funnel, the closing device 10 is removed from the container 13, gripping the first disk 23. The cup-like element 12 is then rotated with respect to the tubular element 11, so that the sliding elements 25 emerge from the clamping recesses 21 and can slide along the sliding seatings 20. The cup-like element 12 is made to slide along the sliding seatings 20 until it is taken into cooperation with the second end 16 of the tubular element 11.

[0031] In this position, the aperture 17 (figs. 3 and 4) is open and downwards, and the annular packing 18 cooperates with a circular surface of the second disk 24, so as to create a watertight coupling.

[0032] The cup-like element 12 is temporarily clamped in such position with a bayonet-type movement, which allows to displace the sliding elements 25 from the respective guides 20, towards the clamping recesses 22.

[0033] In this way, by inserting the tubular element 11 into the hole 14 of the container 13, with its first end 15 inside, the closing device 10 is positioned in its configuration as a funnel.

[0034] In fact, the second disk 24 has its convexity facing towards the outside of the container 13, thus functioning as a conveyor for a liquid, towards the open end 16 of the tubular element 11. In this way the liquid poured is conveyed inside the tubular element 11 and enters into the container 13 through the aperture 17.

[0035] In the same way, when the liquid is poured into another container, the second disk 24 also has a drip-catcher function, to prevent such liquid from inadvertently flowing along the outer surface of the container 13.

[0036] It is clear, however, that modifications and/or additions of parts may be made to the closing device 10 as described heretofore, without departing from the field and scope of the present invention.

[0037] It is also clear that, although the present invention has been described with reference to specific examples, a skilled person in the art shall certainly be able to achieve many other forms of closing device with a funnel function for containers of liquids, all of which shall come within the field and scope of the present invention.

Claims

1. Closing device for a container (13) of liquids, pro-

vided with at least an inlet hole (14) to allow the outlet or inlet of said liquids, **characterized in that** it comprises a first element (11) of a substantially tubular shape able to be inserted into said inlet hole (14) and a second cup-like element (12) mounted coaxial and outside said first element (11), said first element (11) comprising a first closed end (15) and a second open end (16), said second cup-like element (12) being able to slide coaxially with respect to said first element (11) in order to cooperate selectively with said first closed end (15) , so as to define a first configuration as a stopper, and respectively with said second open end (16), so as to define a second configuration as a funnel, said first element (11) being able to be inserted selectively into said inlet hole (14) with said first end (15) facing towards the outside, in said first configuration, and with said first end (15) facing towards the inside in said second configuration.

2. Closing device as in claim 1, **characterized in that** said first element (11) comprises on its outer surface guide means (20, 21, 22, 25) able to allow said second cup-like element (12) to slide coaxially with respect to said first element (11).

3. Closing device as in claim 1, **characterized in that** said second cup-like element (12) comprises a first part (23) able to function as a grip in said first configuration as a stopper, and to retain possible excess liquid in said second configuration as a funnel.

4. Closing device as in claim 3, **characterized in that** said second cup-like element (12) also comprises a second part (24), associated coaxially with said first part (23) and able, in said first configuration as a stopper, to at least partly surround said container (13), and to function as a conveyor for said liquids in said second configuration as a funnel.

5. Closing device as in claim 3, **characterized in that** said first part (23) has a substantially annular shape.

6. Closing device as in claim 4, **characterized in that** said second part (24) has a substantially dome-like shape.

7. Closing device as in claim 1, **characterized in that**, in proximity with said first closed end (15), said first element (11) comprises an aperture (17) able to allow said liquids to enter said container (13) when said second cup-like element (12) cooperates with said second end (16).

8. Closing device as in claim 2, **characterized in that** said guide means comprise at least a sliding guide (20) made longitudinally on the outer surface of said first element (11), and two clamping recesses (21, 22) arranged at the ends and contiguous with said sliding guide (20).

9. Closing device as in claim 8, **characterized in that** said second element (12) comprises at least a sliding element (25) able to slide in said sliding guide (20) and to be housed in said clamping recesses (21, 22).

10. Closing device as in claim 9, **characterized in that** the cooperation between said sliding element (25) and any one of said clamping recesses (21, 22) determines the temporary clamping of said second element (12) with respect to said first element (11), either in said first configuration or in said second configuration.

11. Closing device as in claim 1, **characterized in that** said first element (11) comprises annular sealing means (18) arranged in proximity with said second end (16), so as to guarantee the watertight seal of said second configuration as a funnel.

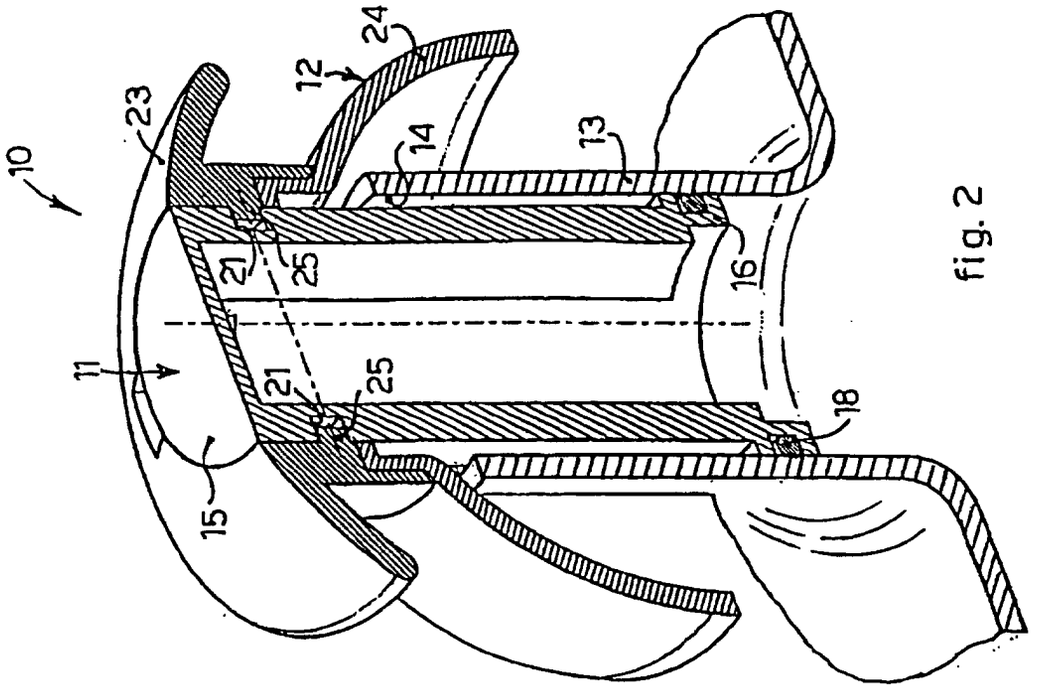

fig. 2

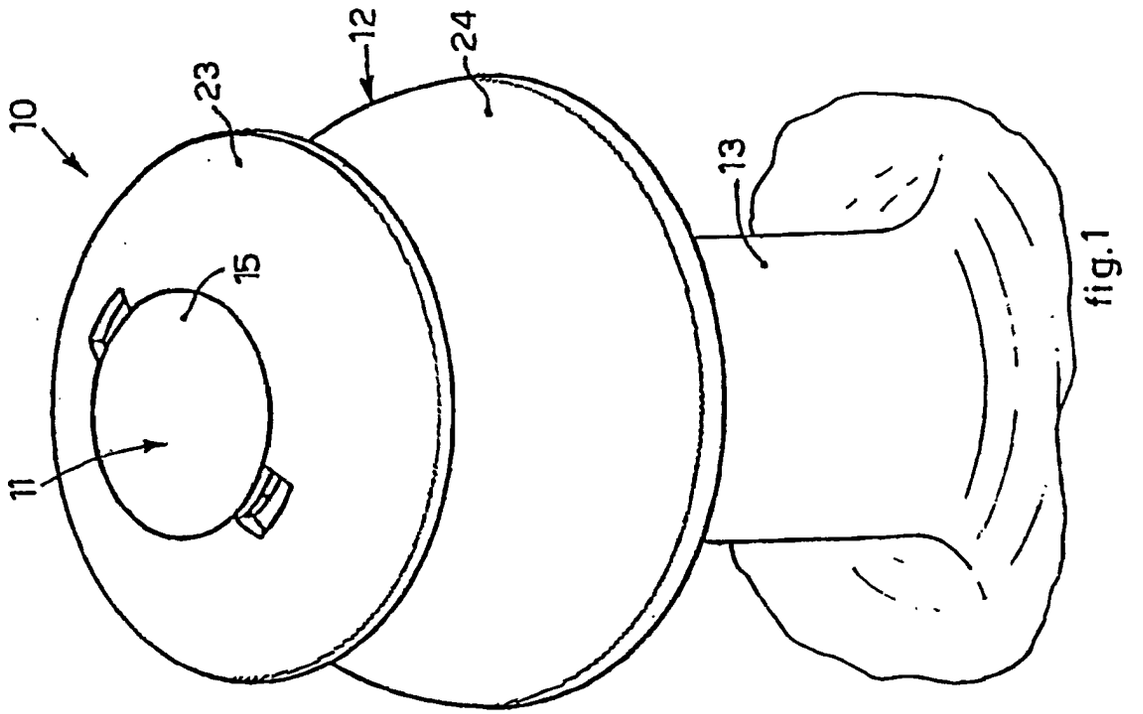

fig.1

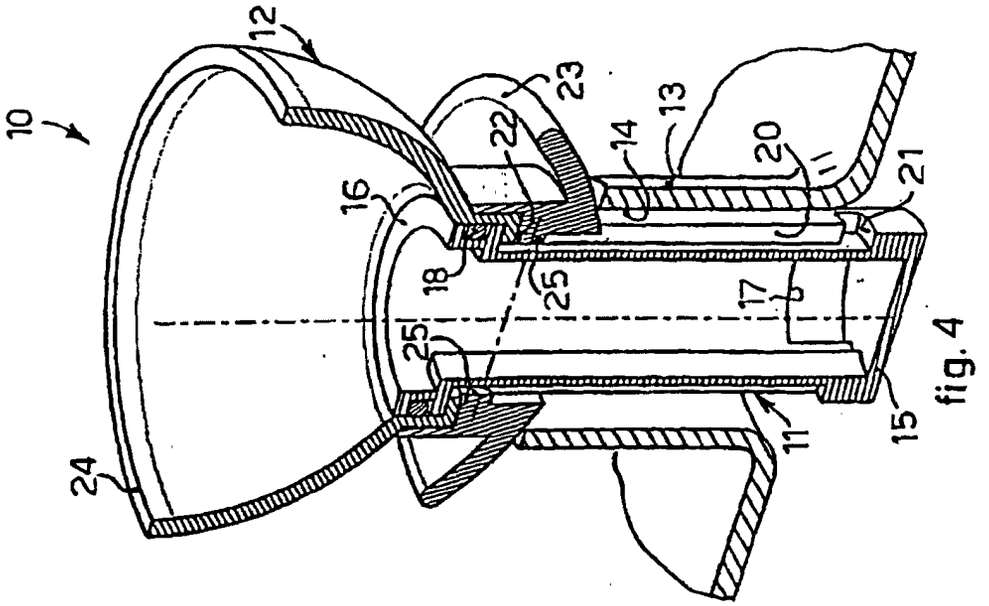
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fig. 4

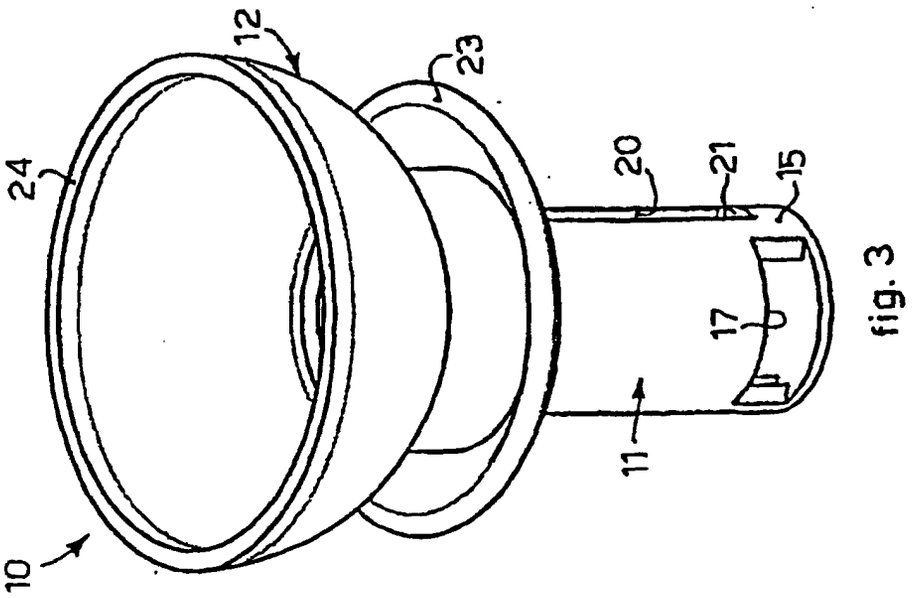
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fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 03 10 3672

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	15 January 2004	Rodriguez Gombau, F

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