

①② **EUROPEAN PATENT APPLICATION**

②① Application number: 83201224.9

⑤① Int. Cl.³: **B 65 B 39/00**
B 65 B 59/04

②② Date of filing: 25.08.83

③① Priority: 27.08.82 JP 149739/82

④③ Date of publication of application:
14.03.84 Bulletin 84/11

⑧④ Designated Contracting States:
DE FR GB NL SE

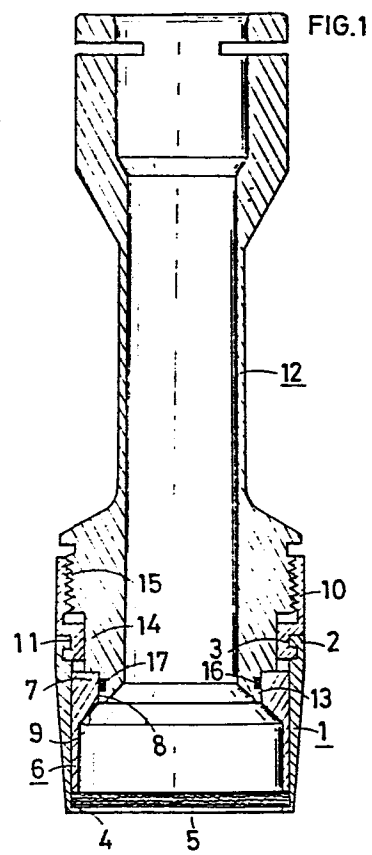
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⑤④ Liquid filling nozzle having rectangular end portion.

⑤⑦ A liquid filling nozzle comprising a rectangular tubular member having an inward projection on each of opposite sides of its upper end, a strainer held in the interior of the rectangular tubular member at the lower end thereof, a strainer holder provided on the strainer and having a circular aperture in its upper portion, an internally threaded member formed in each of opposite sides of its lower end with an outwardly open groove having the projection fitted therein, and a hollow cylindrical nozzle main body having an externally threaded portion screwed in the internally threaded member and a projecting edge fitting in the circular aperture. Preferably the rectangular tubular member has an inner periphery and an outer periphery which are square in horizontal section. Further preferably, the outer periphery of the tubular member is slightly tapered.



LIQUID FILLING NOZZLE HAVING RECTANGULAR END PORTION

The present invention relates to a liquid filling nozzle having a rectangular end portion.

5 Throughout the specification, the upper-lower relation is determined with reference to Fig. 1. Thus the upper portion of the nozzle is positioned upwardly of the drawing, and the lower portion of the nozzle is positioned downwardly of the drawing.

In filling containers with a beverage of like liquid and then
10 sealing the openings of the containers with use of a filling apparatus, it is required to carry out the operation quickly. Accordingly it is desirable to inject the liquid at a high flow speed, but in this case, the liquid is likely to overflow the container to vary the amount of contents from container to container and wet the opening portion to result in incomplete
15 sealing. Further depending on the kind of liquid, the liquid bubbles up to cause various troubles. The flow rate of the liquid to be filled is therefore limited to a predetermined value. In view of the above problems, it appears useful to increase the effective filling area of the nozzle. In this case, the nozzle end is inserted into the container, and the container
20 is filled, with a small distance maintained between the nozzle and the level of the liquid being injected. While many containers have a rectangular opening, it is desirable to use for such containers a nozzle having a rectangular nozzle end and thereby adapted to have an increased effective area.

With nozzles incorporating a strainer in the forward end, there is
25 a need to replace or clean the strainer when the nozzle is to be used for

a different kind of liquid. For this purpose, it is desired that the strainer be easy to remove and install, while the strainer mount portion should be free of leaks.

A first object of the present invention, which has been accomplished in view of the foregoing problems, is to provide a nozzle having a rectangular end and thereby given an increased effective area.

A second object of the invention is to provide a nozzle including a strainer which is easy to mount and remove and which is mounted in place without any likelihood of leakage from the mount portion.

To fulfill these objects, the present invention provides a nozzle comprising a rectangular tubular member having an inward projection on each of opposite sides of its upper end, a strainer held in the interior of the rectangular tubular member at the lower end thereof, a strainer holder provided on the strainer and having a circular aperture in its upper portion, an internally threaded member formed in each of opposite sides of its lower end with an outwardly open groove having the projection fitted therein, and a hollow cylindrical nozzle main body having an externally threaded portion screwed in the internally threaded member and a projecting edge fitting in the circular aperture.

Preferably the rectangular tubular member has an inner periphery and an outer periphery which are square in horizontal section.

Further preferably, the outer periphery of the tubular member is slightly tapered.

An embodiment of the present invention will be described below in detail with reference to the drawings.

Fig. 1 is a view in vertical section showing a nozzle; and

Fig. 2 is a perspective view showing the nozzle as disassembled.

With reference to Fig. 1 and Fig. 2, a nozzle embodying the invention has a rectangular forward end portion which is in the form of a rectangular tubular member 1. The member 1 has an inner periphery and an outer periphery which are square in horizontal section. The outer periphery is slightly tapered toward its lower end. A pair of opposed upper extensions 2 is formed on opposite sides of the upper end of the tubular member 1. A pair of horizontal inward projections 3 is formed on the inner opposed surfaces of the pair of upper extensions 2 at their upper ends. An

inward bent edge 4 is formed at the lower end of the tubular member 1 inside thereof. By the inward bent edge 4, a strainer 5 comprising a plurality of sheets is horizontally retained in the interior of the rectangular tubular member 1 at its lower end. The strainer 5 is held in place by an inverted box-shaped strainer holder 6, which is formed with a circular aperture 8 in the center of its top wall 7. The holder has an inner conical surface extending from the top wall 7 downward with an increasing diameter. An internally threaded member 10 has an outer periphery square in horizontal section and having the same size as the upper end of the outer periphery of the rectangular tubular member 1. The member 10 is formed in each of opposite sides of its lower end with an outwardly open horizontal groove 11. The internally threaded member 10 has a circular inner periphery at its lower portion. The pair of inward projections 3 is fitted in the pair of grooves 11, whereby the internally threaded member 10 is attached to the rectangular tubular member 1. A hollow cylindrical nozzle main body 12 is provided at its lower end with a projecting edge 13 of reduced outside diameter. The main body 12 has an intermediate portion 14 of larger outside diameter on the upper side of the edge 13, and an externally threaded portion 15 on the upper side of the portion 14. The projecting edge 13 is formed in its outer periphery with an annular groove 16 having an O-ring 17 fitted therein. The projecting edge 13 is fitted in the circular aperture 8, and the intermediate portion 14 in the lower portion of the internally threaded member 10, with the externally threaded portion 15 screwed in the internally threaded member 10. Thus the nozzle of the present invention is constructed. The projecting edge 13 fitting in the circular aperture 8 serves as a stopper for preventing the projections 3 from slidingly moving relative to the grooved portions 11. When replacing or cleaning the strainer 5, the nozzle main body 12 is removed from the internally threaded member 10 first, the tubular member 1 is then removed from the threaded member 10, and the strainer 5 is removed from the tubular member 1.

Since the nozzle of the invention has a rectangular end portion, containers having a rectangular opening can be filled with a liquid quickly within a shortened period of time by inserting the nozzle end portion into the container. Moreover, the strainer is easily removable from the nozzle

main body for replacement or cleaning, while the nozzle mount portion is made completely liquid-tight against leakage.

The figures used in the claims are only meant to explain more clearly the intention of the invention and are not supposed to be any restriction concerning the interpretation of the invention.

CLAIMS

1. A nozzle comprising a rectangular tubular member (1) having an inward projection (3) on each of opposite sides of its upper end, a strainer
5 (5) held in the interior of the rectangular tubular member (1) at the lower
end thereof, a strainer holder (6) provided on the strainer (5) and having
a circular aperture (8) in its upper portion, an internally threaded member
(10) formed in each of opposite sides of its lower end with an outwardly
open groove (11) having the projection (3) fitted therein, and a hollow
10 cylindrical nozzle main body (12) having an externally threaded portion (15)
screwed in the internally threaded member (10) and a projecting edge (13)
fitting in the circular aperture (8).

2. A nozzle as defined in claim 1 wherein the rectangular tubular
member (1) has an inner periphery and an outer periphery which are square
15 in horizontal section.

3. A nozzle as defined in claim 1 or 2 wherein the rectangular
tubular member (1) has a slightly tapered outer periphery.

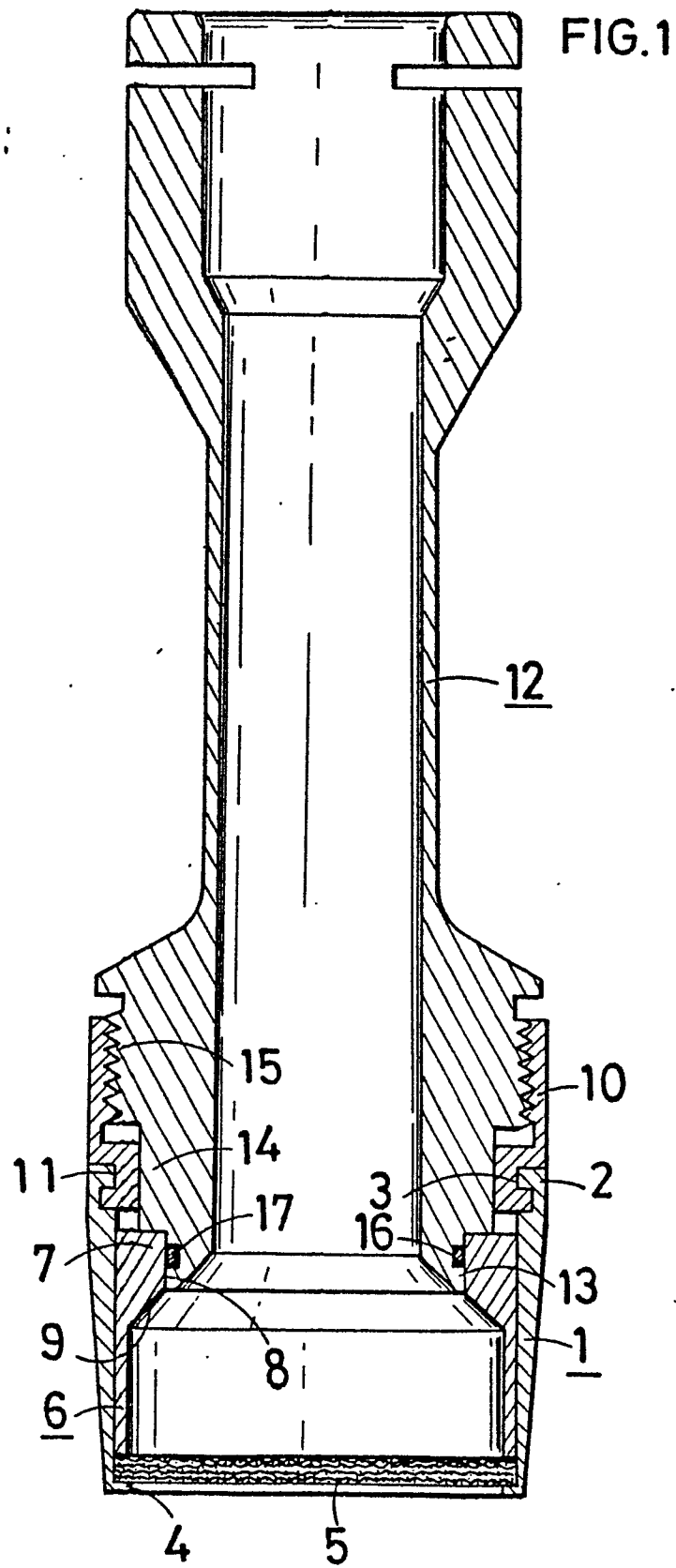
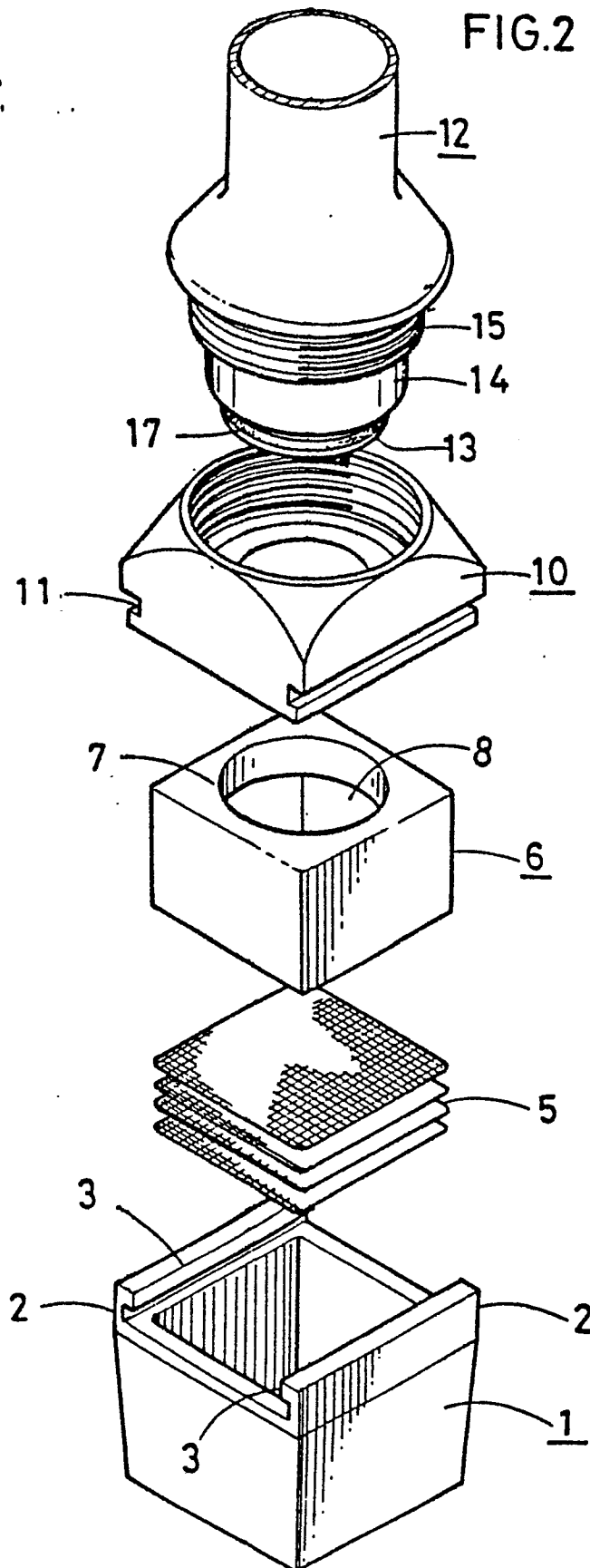


FIG.2





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. ³)
A	FR-A-2 098 782 (GRAFFIN) * Page 2, lines 10-26; figures 1,2 *	1	B 65 B 39/00 B 65 B 59/04
A	US-A-2 874 736 (HUGHES) * Column 3, line 20 - column 4, line 25; figures 1-4 *	2,3	
			TECHNICAL FIELDS SEARCHED (Int. Cl. ³)
			B 65 B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 05-12-1983	Examiner CLAEYS H.C.M.
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			