

Nov. 1, 1932.

P. BERMAN

1,885,218

NOZZLE FOR ASEPTIC DISCHARGE OF LIQUIDS

Filed April 19, 1932

Fig. 1

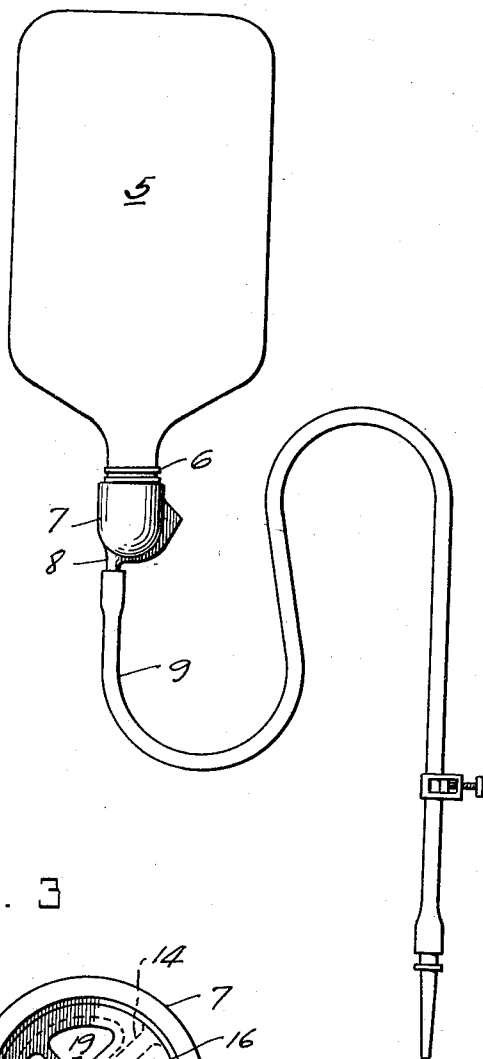


Fig. 2

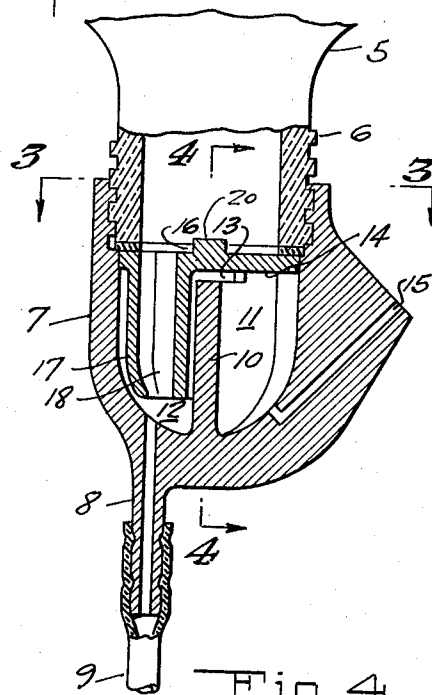


Fig. 3

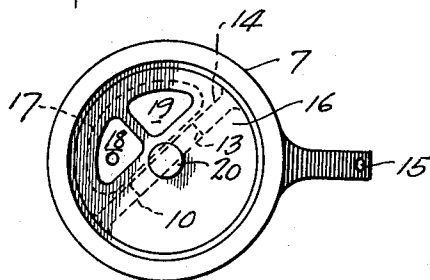
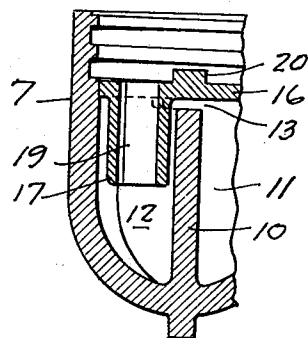


Fig. 4



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NOZZLE FOR ASEPTIC DISCHARGE OF LIQUIDS

Application filed April 19, 1932. Serial No. 606,157.

This invention relates to a nozzle adapted to fit over the neck of a bottle or flask and adapted for connection thereto of tubing whereby liquid may be withdrawn from the bottle when the latter is inverted. In inverted position the bottle serves as a fountain and it is a requisite that an air vent be provided to relieve the pressure below atmospheric in the bottle so that a steady flow of liquid may be obtained. Fountains are used for the purpose of irrigations and clysters. It is common practice in hospitals and in clinics to direct liquid medicaments under pressure to the body of a patient for hypodermiclysis, protoclysis, intravenous injections and the like. It is the current practice to place sterilized liquid in containers and when desired for use transfer the liquid to a fountain container. Such use is subject to many objections well known to the medical profession. The liquid may become septic due to contact with unasepticized air. It is advantageous to deliver the liquid direct from the original container and to wash air which may come in contact therewith. It is also desirable to provide a device in which bubbles of air will not be entrained by the liquid being delivered. The present invention has for its objects the provision of a nozzle meeting the above requirements and which may be substituted for the sealing cap of the original bottle and whereby the latter when in inverted position will serve as a fountain.

These objects together with other objects and corresponding accomplishments are obtained by means of the embodiment of my invention illustrated in the accompanying drawing, in which:—

Fig. 1 is an elevation showing my improved nozzle cap attached to a bottle and having a hose; Fig. 2 is a longitudinal section through the nozzle cap and a fragment of the bottle on an enlarged scale; and Figs. 3 and 4 are sections as seen on the lines correspondingly numbered in Fig. 2.

Referring with more particularity to the drawing, a bottle or flask 5, such as is suitable for containing sterilized liquid used as a medicament, has a thread 6 for receiving a cap to seal the bottle. This cap may be of a

standard type and is for use when the bottle is in an upright position.

When it is desired to withdraw liquid from the bottle the sealing cap is removed and the nozzle cap embodying my invention is substituted. The bottle is then inverted as shown in Fig. 1, and serves as a fountain container delivering liquid through a hose. The nozzle cap comprises a shell 7 internally threaded at its neck for engagement with the thread 6 on the bottle. The cap is of dome form and at the crown has a hollow stem 8 serving as a delivery outlet to which the hose 9 may be attached. Extending across the shell is a web 10 dividing the chamber at the dome into an air washing well 11 and a vent well 12. The top edge of the web is recessed as indicated by 13. A ledge 14 extends around the shell above the web and serves as a seat for a disk. At the side of the shell is an enlargement with a passage 15 opening to the bottom of the air washing well and extending upwardly to the outside of the shell opening at a level substantially that of the web. The opening in stem 8 communicates with the bottom of the vent well.

Detachably mounted in the shell is a disk 16 which rests on ledge 14 so that recess 13 serves as a port for communication of the wells. Depending from the disk 16 is a core 17 which loosely fits within the vent well. A delivery passage 18 extends from the top of the disk to the bottom of the core for direct communication with the bore of stem 8. Parallel in the delivery passage is a vent passage 19 which communicates with the space above the disk and with the vent well at a level above the bottom of the latter. There is a boss 20 on the upper side of the disk at its center to serve as a convenience in obtaining a hold on the disk for the purpose of inserting and removing it from the shell.

In the operation of the device, the bottle is inverted and tilted with the air washing well 11 on the lower side so that sterilized liquid may enter the air washing well. If the hose 9 is open for withdrawal of liquid, the latter will drain from the bottle 5 passing downwardly through the delivery passage 18 to the hose. Air will be drawn through the

air passage 15 and bubble up through the liquid in the air washing well 11, where it is relieved of gross impurities and foreign matter. The washed air then passes through port 13 into the vent well 12 and thence downwardly to the lower end of the vent passage 19 and up into the bottle, thereby relieving pressure. Since the incoming air does not reach the delivery passage, no air will be entrained. Such air as enters the bottle will be free of gross impurities.

What I claim is:—

1. A nozzle cap of the character described comprising a shell having at one end a neck adapted to fit upon the neck of an inverted bottle and a chamber at the other end, a longitudinally extending web in said chamber dividing the latter into an air washing well and a vent well, an outlet for liquid at the bottom of said vent well having a stem for connection with a tube, an air passage extending upwardly from the bottom of said air washing well and opening to the exterior of said shell, a wall extending transversely across said shell and covering said wells, there being a port at the upper edge of said web placing said wells in communication, a delivery duct extending from above said wall to said outlet whereby liquid may pass from said bottle to said outlet, and a vent duct extending from above said wall to a level above the bottom of said vent well.

2. A nozzle cap of the character described comprising a shell having at one end a neck adapted to fit upon the neck of an inverted bottle and a chamber at the other, a longitudinally extending web in said chamber dividing the latter into an air washing well and a vent well, an outlet for liquid at the bottom of said vent well having a stem for connection with a tube, an air passage extending upwardly from the bottom of said air washing well and opening to the exterior of said shell, a wall extending transversely across said shell and covering said wells, there being a port at the upper end of said web placing said wells in communication at their upper ends, a core depending from said well and fitted in said vent chamber with a delivery passage extending therethrough to said outlet whereby liquid may pass from said bottle to said outlet, said core having a vent passage extending therethrough contiguous to said delivery passage and being stepped at its lower end so that said vent passage opens above the bottom of said vent well.

3. A nozzle cap of the character described comprising a shell having at one end a neck adapted to fit upon the neck of an inverted bottle and a chamber at the other end, a longitudinally extending web in said chamber dividing the latter into an air washing well and a vent well, an outlet for liquid at the bottom of said vent well having a stem for connection with a delivery tube, an air passage in

the wall of said shell extending upwardly from the bottom of said air washing well and opening to the exterior of said shell, a seat in said shell above said wells, a disk member resting on said seat covering said wells and spaced from the upper edge of said web to enable communication of said wells, said disk member having a core fitted in said vent chamber with a delivery passage extending therethrough to said outlet whereby liquid may pass from said bottle to said outlet, said core having a vent passage extending therethrough contiguous to said delivery passage and being stepped at its lower end so that said vent passage opens above the bottom of said vent well.

4. A nozzle cap of the character described comprising a dome like shell having a neck adapted to fit upon the neck of an inverted bottle and a chamber in the dome, a longitudinally extending web in said chamber dividing the latter into an air washing well and a vent well, and having a depressed portion at its upper edge, an outlet for liquid extending into said vent well at the crown of said shell and having a stem for connection with a tube, an enlargement on the wall of said shell having an air passage extending therethrough upwardly from the bottom of said air washing well and opening to the exterior of said shell, a seat in said shell, a disk member resting on said seat and covering said wells with said depression serving as a port therebetween, said disk member having a core fitted in said vent chamber with a delivery passage extending therethrough to said outlet whereby liquid may pass from said bottle to said outlet, said core having a vent passage extending therethrough contiguous to said delivery passage, said core being stepped at its lower end so that said vent passage opens above the bottom of said vent well.

In witness that I claim the foregoing I have hereunto subscribed my name this 15th day of April, 1932.

PHOEBUS BERMAN.