Jan. 20, 1931. J. J. LOZOWSKY 1,789,684

BOTTLE STERILIZING APPARATUS

Filed May 15, 1926

Fig. 1.

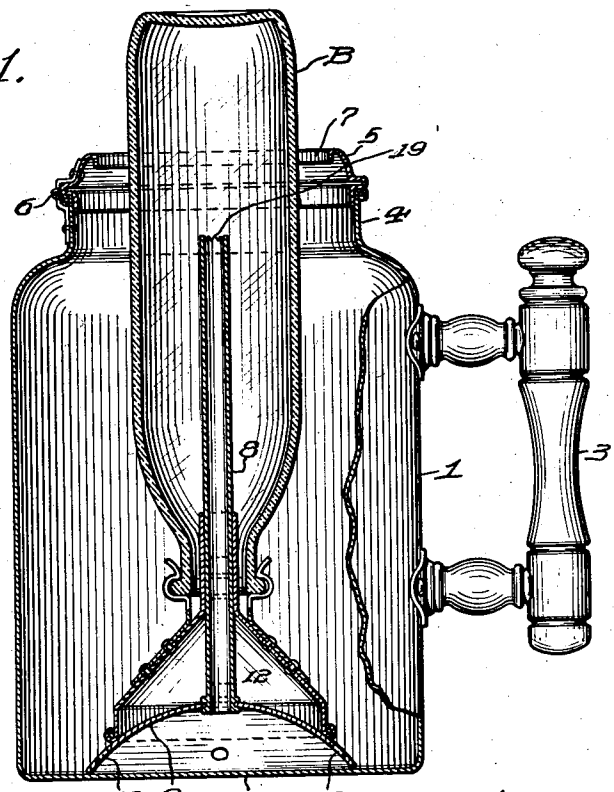
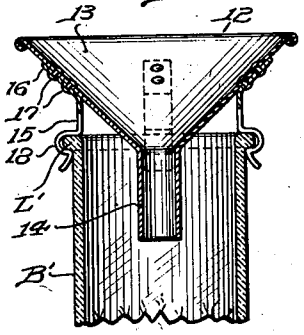


Fig. 3.



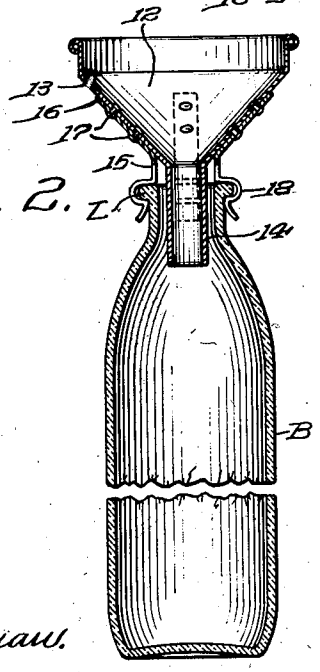


Fig. 2.

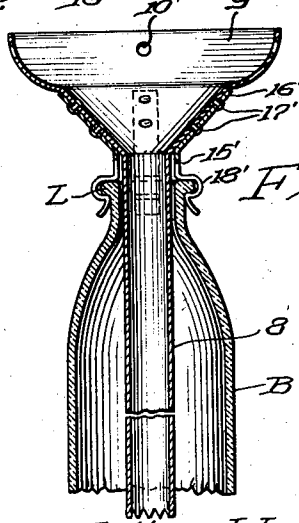


Fig. 4.

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UNITED STATES PATENT OFFICE

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BOTTLE-STERILIZING APPARATUS

Application filed May 15, 1926. Serial No. 109,263.

A principal object of my invention is to provide a simple, portable, relatively inexpensive device for sterilizing and cleansing nursing and other bottles of like character which is so designed and constructed that after the sterilization is completed the bottle may be filled with a maximum of convenience and in such manner as to avoid the possibility of contamination either of the bottle itself or of the contents as they are poured thereinto.

Further objects of my invention are to provide a sterilizing device of the character aforesaid which may be used in connection with an ordinary kitchen stove or other source of heat thus facilitating the employment of the device either at home or while traveling; which may be readily cleaned; which embodies but a small number of parts of a relatively simple character whereby the device may be manufactured and sold at a compartively low price; and which includes as one of its operative parts a funnel-like element which acts as a support for the bottle during the sterilizing operation and at the completion of the same and while, like the bottle, in sterile condition and attached thereto, is employed to facilitate the filling of the bottle so that the contents of the bottle are introduced through a sterile element supported from and adjacent the neck of the bottle thus avoiding any necessity for touching the neck or upper part of the bottle during the filling operation or utilizing a separate, and possibly unsterile, funnel or like device to assist in the introduction of the contents.

My invention further includes other objects and novel features of design, construction and arrangement to which reference is hereinafter more specifically made or which will be apparent from the following description of certain embodiments of my invention as illustrated in the accompanying drawing.

In the said drawing Fig. 1 is a central vertical section of a preferred embodiment of the invention with a bottle in position for sterilization therein, the handle and a portion of the adjacent wall of the container being shown in elevation; Fig. 2 is a central vertical section of the bottle and funnel after removal from the container following the completion of the sterilizing operation and preparatory to the bottle being filled; Fig. 3 is a fragmentary view similar to Fig. 2 but showing a bottle of somewhat different form and a funnel suitably modified for use therewith, and Fig. 4 is still another view of like character but illustrating a modified form of the invention. The same symbols are used to designate corresponding parts in the different figures.

Referring now more particularly to the form of the invention shown in Figs. 1 and 2, the same comprises a generally cylindrical container 1 having a bottom 2 adapted to rest on top of a stove or the like and provided with a handle 3 of any suitable form. This container is preferably made of metal such as aluminum or tin and may be slightly constricted at its upper end to form a neck 4 which is closed by a cover 5 which may be hinged to the neck at 6 if desired. This cover is provided with a central circular opening 7 which is preferably of suitable diameter to permit the passage of the funnel hereinafter more specifically described so that the latter, when operatively attached to the bottle B may be inserted into the container through the opening or withdrawn therefrom without the necessity of opening the cover.

Disposed within the container is an element which, for convenience, I term the circulating element and which comprises a tube 8 one end of which is firmly secured to a base 9 preferably at the center thereof; this base is of upwardly dished or generally conical shape and is adapted to rest in inverted position on the bottom 2 of the container so that the tube 8 will extend upwardly in the container and terminate preferably near the upper end thereof. For permitting a circulation of water or other fluid from the interior of the container to the interior of the base, the latter is provided with a plurality of holes 10 located near its marginal edge, and I deem it ordinarily preferable that the circulating element be unsecured to the container so that it may be readily withdrawn from the latter by opening the cover to facilitate the cleansing of the parts.

During the sterilizing operation the bottle is supported from the circulating element in inverted position over the tube 8 preferably through the medium of a funnel, generally designated as 12, which may comprise the usual generally conical hopper 13 and a short tube 14 extending from the center thereof and adapted to freely enter the neck of the bottle. The funnel is, however, provided with means for effecting a connection with the bottle of such character as to firmly yet removably hold the bottle in inverted substantially vertical position when the funnel is seated on the base 9 during the sterilizing operation and to maintain the funnel above and spaced from the mouth of the bottle with the funnel tube projecting into its neck after the sterilizing operation is completed and preparatory to and during the filling of the bottle with milk or other desired contents. While the said means may partake of any suitable form, I prefer to employ for the purpose a plurality of spring clips 15, conveniently four in number, disposed symmetrically about and spaced from the exterior of the funnel tube 14 and attached to the hopper of the funnel in any suitable way; conveniently by providing each clip with an angularly disposed extension 16 adapted to lie against the exterior of the hopper and to be secured thereto by rivets 17 or in any other suitable way. The opposite or free end 18 of each clip may be suitably curved to receive the peripheral lip L at the end of the neck of the bottle and thence flared slightly outwardly to facilitate the insertion of the lip between the clips by pushing the funnel downwardly onto the bottle so as to cause the clips to spring apart and then engage over the lip after it is aligned with the curved portion of the clips. The specific form and arrangement of the clips, however, is a matter of choice so long as the same are effective to detachably support the funnel in axial relation with the bottle and with the lower part of the hopper funnel spaced slightly from the extremity of the neck so as to permit the ready passage of fluid in and out of the neck between the exterior of the funnel and the interior and end of the neck.

When employing the device for the sterilizing of a bottle, the circulating element is first disposed in the container which has been partially filled with water or other sterilizing medium so that the tube 8 will extend upwardly therein and preferably substantially axially thereof. The bottle with the funnel previously attached to its neck through the medium of the clips or other attaching and supporting device is then inverted and the funnel passed through the opening in the cover of the container and over the projecting end of the tube of the circulating element, the exterior diameter of which is slightly less than the interior diameter of the funnel tube so as to allow the latter to readily slip over the former. The operator, holding the bottle near its bottom end, then lowers the bottle and funnel until the latter seats on the upper surface of the base of the circulating element so as to support the bottle in upright inverted position substantially as shown in Fig. 1. Heat is now applied to the bottom of the container so as to cause the water therein to boil, with the result that an active circulation of water is set up within the container and the circulating element whereby the boiling water is caused to issue from the upper end of the tube 8 into the interior of the bottle with considerable force, thus thoroughly cleansing and sterilizing the interior of the bottle while the exterior thereof is also cleansed and sterilized by the steam which ascends from the body of boiling water within the container, the funnel being likewise thoroughly cleansed and sterilized by the boiling water and steam with which it is surrounded or immersed. While this circulation is in progress the water and steam which pass from the interior of the base of the circulating element up through the tube and thence to the interior of the bottle are constantly replaced with water which is drawn into the base through holes 10 or equivalent openings from the main body of water in the container while the water from the interior of the bottle flows downwardly therefrom through the neck which, as stated, is spaced from the body of the funnel and thence returns to the main body in the container. It is desirable that the upper end of the tube of the circulating element terminate more or less adjacent the bottom of the bottle and I therefore prefer to provide the end of the tube with serrations 19 so that if a bottle be inserted in the apparatus which is so much shorter than the bottles which it is particularly designed to accommodate that the bottom of the bottle comes into contact with the end of the tube, the circulation of the sterilizing medium from the tube into the bottle may still take place through the openings afforded by the serrations.

After the circulation has been maintained for a sufficient period to thoroughly cleanse and sterilize the bottle, the apparatus is preferably removed from the source of heat and the bottle and funnel lifted out as a unit by grasping the projecting bottom portion of the bottle, and the latter then turned to upright position and rested upon a suitable supporting surface. The bottle may now be filled by pouring the milk or other desired contents into the hopper of the funnel and when the filling operation is complete the funnel may be removed by taking hold of the lower part of the bottle with one hand and pulling the funnel upwardly with the other by grasping the upper edge of the funnel hopper.

It will thus be observed that both the funnel and the bottle are thoroughly cleansed

and sterile when removed from the container and that it is entirely unnecessary either when removing the bottle or when it is being filled or even when the funnel is being removed from the bottle after the filling operation to bring the hands into contact with or in fact even near the mouth of the bottle, so that all liability of contaminating the sterile bottle from that source is avoided as well as the necessity of using an unsterile or separate funnel or the like to assist in filling the bottle and which, when so used, frequently results in the contamination of the contents of a bottle even though the latter is in itself initially thoroughly sterile.

In the form of bottle shown in Figs. 1, 2 and 4 which is of a type in common use, the neck is of considerably smaller diameter than the body in consequence of which the spring clips in an apparatus intended for sterilizing bottles of this general character will be arranged rather closely together and preferably quite near the juncture of the tube and hopper of the funnel so as to properly engage and support the lip and neck of the bottle. Recently, however, a somewhat different form of nursing bottle which is of the same diameter throughout its length has attained considerable popularity and the mouth portion of a bottle B′ of this character is shown in Fig. 3. Similarly to the bottle shown in the other figures, this bottle is also provided with a lip L′ over which the nipple engages when positioned on the bottle, but by reason of the relatively large diameter of the bottle at this point it is requisite to suitably arrange the means by which the funnel and bottle are operatively connected so that the lip of the bottle may be readily received therein. This result can be readily accomplished by disposing the spring clips or other supporting means relatively far apart as shown in Fig 3, it being of course desirable to so proportion and arrange the parts that the end of the funnel tube will project into the bottle for a short distance when the funnel is operatively attached thereto.

While I have illustrated two different forms of bottles and arrangements of spring clips respectively suitable therefor, it will of course be understood that if other forms of bottles are to be employed in connection with the apparatus, the spring clips or other equivalent means for connecting the funnel to the bottle will be arranged in accordance with the particular conformation of the neck and lip of the latter.

In Fig. 4 I have shown a somewhat modified form of the invention in which the funnel is entirely omitted and the spring clips or other bottle supporting means attached directly to the exterior of the base 9′ of the circulating element which in this case may desirably be more generally of hopper-like form and is provided with a central circulating tube 8′ corresponding to the tube 8. When using an apparatus constructed in accordance with this embodiment of the invention, the circulating element is secured directly to the bottle through the medium of the spring clips 15′ and the bottle then inverted and the base of the element seated on the bottom of the container. Then after the sterilization of the bottle has been effected in the manner hitherto described, the bottle with the circulating element still attached thereto is removed from the container and inverted and the base of the container utilized as a hopper for the reception of the contents of the bottle during the filling operation after which the circulating element is separated from the bottle. The modified form of the invention is equally as effective insofar as the sterilization of the bottle and prevention of contamination of the contents is concerned as is the preferred embodiment thereof, but is considered by me as slightly less desirable by reason of the fact that if the tube of the circulating element be made long enough to terminate adjacent the bottom of the bottle when the latter is inverted thereover to thereby assure an adequate and effective circulation of the sterilizing medium within the bottle, difficulty is experienced in filling the bottle entirely full when using the circulating element as a filling device. For this reason I therefore under ordinary conditions prefer to utilize the form of the invention shown in Figs 1, 2 and 3.

While I have herein described and illustrated certain forms of my invention with considerable particularity I do not thereby desire or intend to specifically limit myself thereto nor to any precise details of form, construction or arrangement of the various parts as the same are capable of considerable modification from the particular embodiments to which I have referred, and the invention may be readily utilized for the sterilization of bottles other than nursing bottles, without departing from the spirit and scope of the invention as defined in the appended claims.

Having thus described my invention, I claim and desire to protect by Letters Patent of the United States:

1. A bottle sterilizing device comprising a fluid container, a circulating element adapted for disposition in the container and having a dished base and a tube extending upwardly therefrom and communicating with the interior thereof, and means for supporting a bottle in inverted position over the tube and in spaced relation with the base comprising a funnel having a hopper whose rim is adapted to rest on the surface of the base and a tube adapted to surround said first mentioned tube and means for remov-

ably securing the funnel to the neck of the bottle.

2. A bottle sterilizing device comprising a fluid container, a circulating element adapted for disposition in the container and having a dished base and a tube extending upwardly therefrom and communicating with the interior thereof, and means attachable to and movable with a bottle for supporting the bottle in inverted position over the tube comprising a funnel adapted to rest in inverted position on the surface of the base and having a plurality of spring clips adapted to engage the neck of the bottle.

3. A bottle sterilizing device comprising a fluid container, a circulating element disposed in the container having a perforated base and a tube extending upwardly therefrom, and means attachable to and movable with a bottle for supporting the bottle in inverted position over the tube comprising a funnel having a tube adapted to enter the neck of the bottle, a hopper portion adapted to rest on the surface of the base and means for detachably connecting the funnel to the bottle so as to maintain the hopper of the funnel in spaced relation with the end of the bottle neck.

4. A bottle sterilizing device comprising a container for containing a sterilizing fluid, a circulating element disposed in the container and having a hollow base and a tube communicating with the interior thereof and extending upwardly therefrom, a funnel adapted to be slid over said tube from the top of the container to rest on the surface of the base and comprising means for detachably connecting the funnel to the neck of a bottle whereby when said funnel is disposed in inverted position on the base said tube will extend upwardly within the bottle, said funnel being withdrawable from the container with the bottle.

5. A bottle sterilizing device comprising a container for containing a sterilizing fluid, a circulating element disposed in the container and having a perforated upwardly dished hollow base and a tube communicating with the interior thereof and extending upwardly therefrom the upper end of the tube being serrated, a funnel adapted to be slid over said tube from the top of the container to rest on the surface of the base and comprising spring clips for detachably connecting the funnel to the neck of the bottle whereby when said funnel is disposed in inverted position on the base said tube will extend upwardly within the bottle, said funnel being withdrawable from the container with the bottle.

6. As an article of manufacture, a fluid circulating element adapted for disposition in a fluid receptacle and comprising a hollow base and a tube extending therefrom and communicating with the interior thereof, and a funnel adapted to be slid over the tube in inverted position to rest on the base and provided with means for supporting a bottle in inverted position over the tube.

7. A bottle sterilizing device comprising a container, a circulating element adapted for disposition in the container and comprising an upwardly dished, perforated base and a tube extending vertically upward therefrom and communicating with the interior thereof, and means removably secured to the neck of the bottle and cooperative with the base for operatively supporting a bottle in inverted position over the tube with the end of its neck spaced from the base of the circulating element.

In witness whereof, I have hereunto set my hand this 12th day of May, 1926.

JULIUS J. LOZOWSKY.