July 5, 1949. O. R. SELL 2,475,407

METHOD OF STERILIZING CONTAINERS

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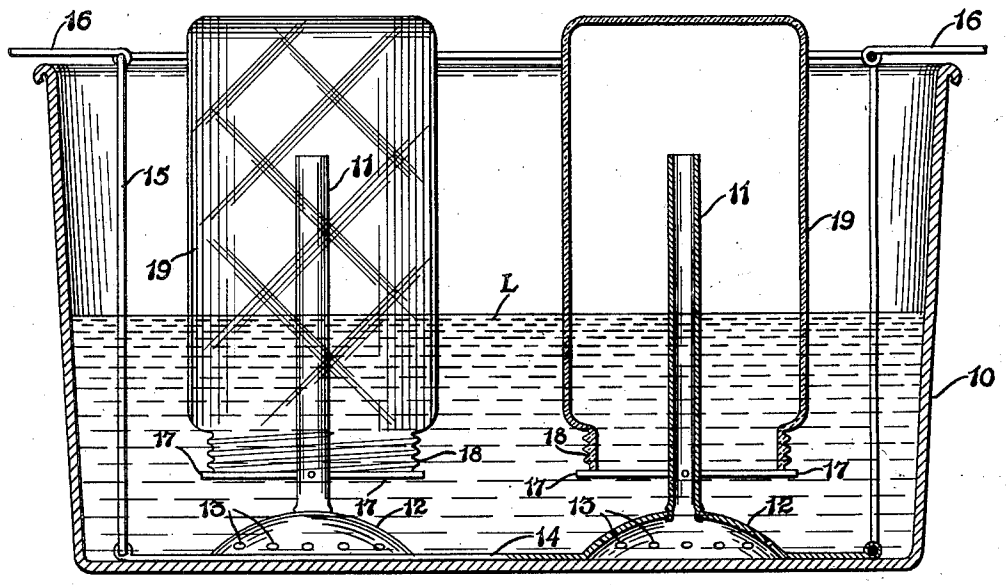


Fig. 1

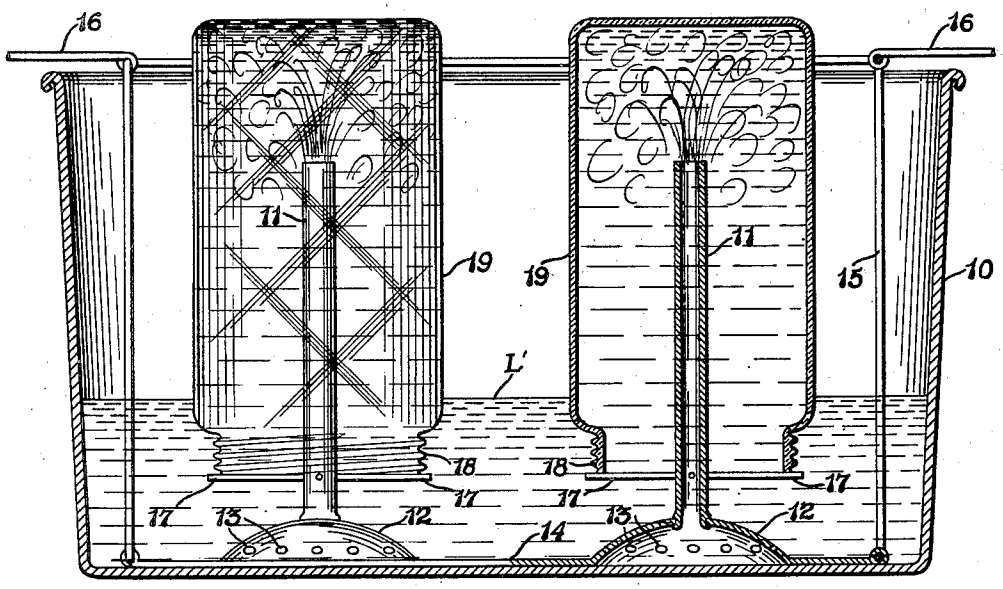


Fig. 2

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METHOD OF STERILIZING CONTAINERS

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2 Claims. (Cl. 134—22)

1

The invention relates to the cleansing and sterilizing of jars, cans, bottles and the like, and more particularly to an improved method for quickly, easily and thoroughly cleansing and sterilizing containers or receptacles of the character referred to.

The object of the invention is a novel method of operating apparatus whereby the inverted containers being cleansed and sterilized will be entirely filled with vigorously boiling water so that the hot water will come into direct contact with every portion of the interior surfaces of the jars or bottles so as to efficiently cleanse and sterilize the same.

A further object is the provision of a novel method of operating apparatus, which consists in raising the water in a receptacle to the boiling point so that steam and hot water will be discharged from fountain tubes located on the bottom of the receptacle into the interiors of jars or bottles supported in inverted position thereover with their mouths below the water level, then lowering the temperature of the water below the boiling point which causes the jars or bottles to be filled with water from the receptacle, and again raising the temperature of the water in the receptacle to the boiling point which will cause the water within the interiors of the jars or bottles to boil vigorously in direct contact with the inner surfaces thereof for a period of time, after which the boiling water will recede from the jars or bottles and the original water level in the receptacle and within the lower portions of the inverted jars or bottles will be resumed.

The above objects, together with others which will be apparent from the drawing and following description, or which may be later referred to, may be attained by operating the improved sterilizer in the manner hereinafter described in detail and disclosed in the accompanying drawing, in which:

Figure 1 is a vertical, sectional view through a sterilizing apparatus embodying the invention showing the same in the condition when jars or bottles are placed therein for sterilizing; and,

Fig. 2 a similar view illustrating the manner in which the hot water is forced up into the interiors of the jars or bottles entirely filling the same so as to contact every portion of the interior surfaces and thoroughly cleanse and sterilize the same.

Referring more particularly to the apparatus disclosed in the drawing, a receptacle for hot water as indicated generally at 10 may be in the form of a kettle, sauce pan or similar cooking

2

utensil of any usual and ordinary cross sectional size and shape and of sufficient depth to accomplish the purpose of the invention as will be later described.

A plurality of vertical fountain tubes indicated at 11 may be located upon the bottom of the receptacle 10, each of these fountain tubes being of substantially the construction of the ordinary percolator inset and having a perforate, hollow dome base 12 provided with a plurality of apertures 13 in its lower portion, the upright fountain tube 11 being centrally supported upon this hollow dome base and communicating with the interior thereof.

Any desired number of these fountain tubes may be provided, depending upon the size of the hot water receptacle 10 and the number of jars or bottles desired to be sterilized with each operation of the apparatus.

For the purpose of providing means whereby the plurality of fountain tubes may be inserted into or removed from the hot water receptacle 10, as a unit, the plurality of dome bases 12 may be formed integrally with, or attached to, a bottom plate 14 adapted to rest upon the bottom of the hot water receptacle 10 when the apparatus is in use, and this bottom plate may be connected to a wire rack indicated generally at 15 and provided with hinged handles or bails 16 by means of which the entire frame with the jars or bottles supported thereon may be easily and readily inserted into or removed from the hot water receptacle.

Each fountain tube is provided near its lower end with support means for supporting a jar or bottle in inverted position with the mouth thereof below the water lever L in the hot water receptacle 10, this support means being preferably in the form of a plurality of radially disposed horizontally located rods or fingers 17 located well below the water level in the receptacle 10 and adapted to support the mouths 18 of the inverted jars or bottles 19, to be sterilized, in inverted position over the fountain tubes 11 and considerably below the water level in the receptacle as illustrated in the drawing.

In the operation of the apparatus above described, to carry out the improved method of cleansing and sterilizing the containers, the receptacle 10 is filled with water to substantially the level indicated at L in Fig. 1 and the fountain insets with jars or bottles supported thereover in inverted position, as indicated at 19, are placed upon the bottom of the receptacle as shown in said figure with the open mouths of the inverted

jars or bottles located well below the water level L. The water level within the jars or bottles will be at the same height as the water level in the receptacle 10, outside of the jars or bottles, as indicated in Fig. 1, since at this time the atmospheric pressure on the water inside of the jars or bottles and the atmospheric pressure on the water outside of the jars or bottles are equal. The water is brought to boiling temperature and maintained at this temperature for a period of time during which jets of hot water and steam are discharged into the interiors of the jars or bottles through the fountain insets 11 creating steam pressure within the inverted jars or bottles above the water level therein, this steam pressure within the inverted bottles or jars causing the water level therein to be lowered until it reaches the mouths of the inverted jars or bottles, the increased steam pressure within the jars or bottles forcing some of the air therefrom which is replaced by steam.

After this action has been permitted to continue for some time, the temperature of the water in the receptacle 10 is lowered, preferably to just below the boiling point, by either turning down the burner, or removing the receptacle 10 therefrom, or by adding a little cold water to the hot water in the receptacle. As the jars or bottles and their contents are thus cooled this causes condensation of the steam which is trapped within the jars or bottles reducing the pressure inside of the jars or bottles so as to induce a flow of liquid from outside to equalize the outside and inside pressure.

This results in the water from the receptacle 10 being forced upward into the jars or bottles 19, completely filling the same with water as shown in Fig. 2 and lowering the water level in the receptacles 10 as indicated at L'.

The temperature of the water is again raised to or above the boiling point by turning up the burner, or placing the receptacle 10 back upon the burner, as the case may be, causing the water in the jars or bottles to boil vigorously in contact with the entire inner surfaces of the jars or bottles thoroughly cleansing and sterilizing the same.

After this action has continued for some time the water will recede from the jars or bottles and return to the level as indicated at L in Fig. 1 and the rack containing the sterilized and cleansed bottles may then be removed from the receptacle and the sterilized containers are ready for use for receiving food stuffs or the like.

From the above it will be obvious that a simple, inexpensive and easily operated method is provided for quickly, efficiently and thoroughly cleansing and sterilizing the entire inner surfaces of the jars, bottles or similar containers.

I claim:

1. The method of sterilizing and cleansing containers which consists in immersing an inverted container in boiling water with the open mouth of the container below the water level and discharging jets of the hot water and steam into the interior of the inverted container so as to replace part of the air in the container with steam which increases the pressure within the container and lowers the water level therein to the open mouth thereof, then lowering the temperature of the water so as to cool the container and its contents causing condensation of the steam and reduction of pressure within the container so that water flows into the container filling the same, and then raising the temperature of the water causing it to boil within the container.

2. The method of sterilizing and cleansing containers which consists in immersing an inverted container in boiling water over a fountain tube with the open mouth of the container below the water level and discharging jets of the hot water and steam into the interior of the inverted container so as to replace part of the air in the container with steam which increases the pressure within the container and lowers the water level therein to the open mouth thereof, then lowering the temperature of the water so as to cool the container and its contents causing condensation of the steam and reduction of pressure within the container so that water flows into the container filling the same, and then raising the temperature of the water causing it to boil within the container.

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