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METHOD OF PRESERVING FOODS AND CLOSURE CAP UTILIZED THEREIN

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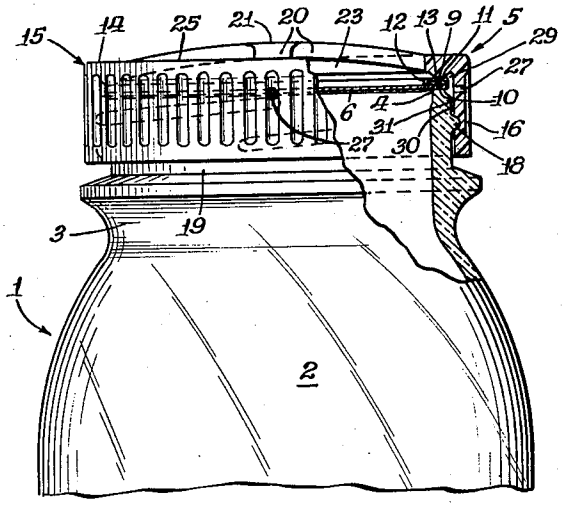


Fig. 1.

Fig. 2.

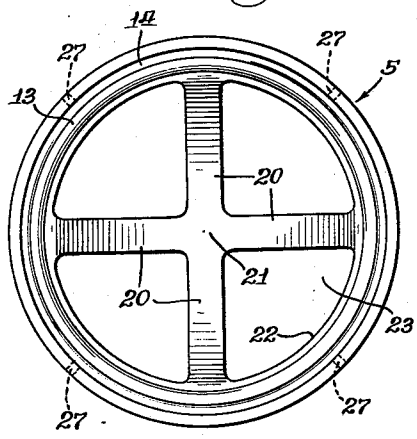


Fig. 3.

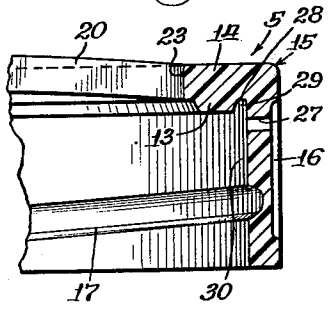


Fig. 4.

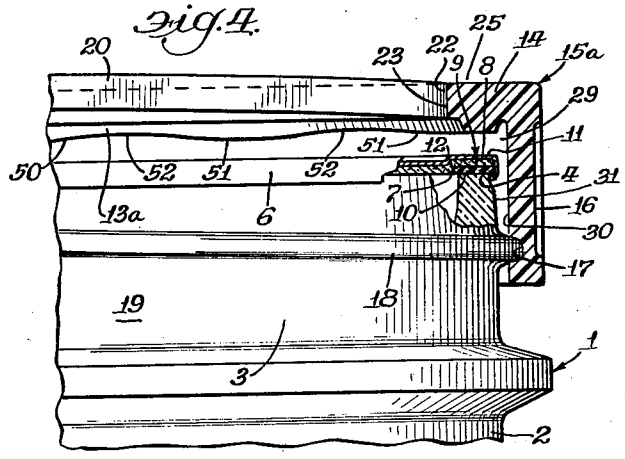


Fig. 5.

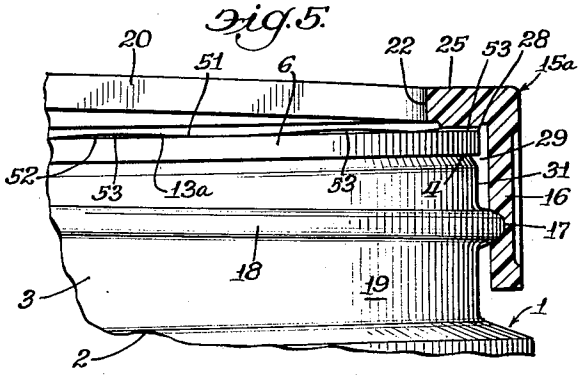
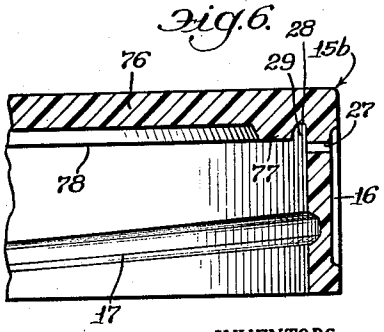


Fig. 6.



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METHOD OF PRESERVING FOODS AND CLOSURE CAP UTILIZED THEREIN

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This invention relates to the art of preserving foods and more specifically to a novel means and method of canning.

The conventional practice is to fill jars with liquid and prepared foods such as fruits, vegetables and the like. The jars are normally loosely capped to allow steam to escape from the jars during cooking of the food in the jars or heating the jars in a caldron to boiling point to steam and displace the air. The jars are then removed from the boiler and while hot are tightly capped so that upon cooling the vapor condenses and the food is sealed in a vacuum. The handling of the hot jars is not only hazardous and tedious and inconvenient but because of precautions necessitated of the canner to prevent burns and scalding, the activity is time consuming and exhausting.

When vacuum seal covers or bands are used with new bottles some inconvenience is avoided and spoilage is minimized. However, when older bottles are used and the lip sealing edge is slightly impaired, or chipped, the spoilage is excessively increased.

We have developed a novel method and structure which substantially eliminates the foregoing disadvantages of canning and which insures proper and adequate sealing under all conditions.

It is a general object of this invention to provide a novel means and method of sealing a preservative container.

The invention contemplates the provision of a thermoplastic sealing member preferably in the form of a cap which is made of polyethylene or the like and which is adapted to be secured tightly on the container preparatory to heating.

The invention provides a novel method of sealing a preservative container with a thermoplastic closure member which is elastic and expansible at approximately the boiling temperature of water, subjecting the container and member to such temperature to unseal the container to accommodate the escape of steam vapor from the container and then, if the sealing edge of the container is imperfect adjusting the closure member toward the container surface to obtain close conformance of the closure assembly with the surface and then in either event allowing the container and sealing member to cool whereby the member contracts and rigidifies and snugly engages the sealing assembly with the sealing surface of the container.

These and other objects and advantages inherent in and encompassed by the invention will become more readily apparent from the specification and the drawings wherein:

FIGURE 1 is a side elevational view of a preservative container with the novel sealing assembly shown partially in section in sealing position;

FIGURE 2 is a bottom plan view of the sealing member;

FIGURE 3 is a fragmentary enlarged view comparable to FIGURE 1 with the parts in separated position;

FIGURE 4 is a fragmentary side elevational view partially in section of the container and sealing member illustrating a different embodiment of closure member, the cover being unsealed;

FIGURE 5 illustrates the embodiment of FIGURE 4 with the cap tightened;

FIGURE 5 being a sealed position partially in section, and

FIGURE 6 is a further embodiment axial section.

Describing the invention in detail and having particular reference to the drawings, there is shown a preservative vessel generally designated 1 including a glass jar 2 having an upper end neck portion 3 which has an annular sealing lip 4.

A closure structure generally designated 5 fits on the neck 3 and comprises an annular plate or lid 6 with a peripheral indention or groove 7 within which is contained a deformable sealing compound of elastomer material 8 such as partially cured rubber or the like as is well known to those skilled in the art. The elastomer substance 8 which has a putty-like characteristic forms a ring 9 which fills the groove 7 and opposes the lip or sealing edge 4 and is disposed coaxially therewith. The lip 4 engages the side 10 of the ring 9 which deforms to the contour of the lip edge 4 attendant to the upper side 11 of the groove embossment 12 being engaged by the opposing coaxially disposed continuously depending bead or ring 13 formed on the underside of the inturned peripheral rim or flange 14 of the cap or closure member generally indicated 15.

The cap is formed of a thermoplastic substance which becomes elastic and readily expands and softens at approximately the boiling point of water namely 212° F. One outstanding such substance or elastic plastic is polyethylene, sometimes termed polythene, although it is understood that other similar substances such as polyvinyl chloride polyvinyl acetate and polyvinyl chloride acetate may be substituted with the foregoing characteristics.

The cap 15 is an integral molded structure and in addition to the flange 14 has an integral side wall or skirt 16 with an interior having a thread 17 which threads over a mating thread 18 on the side wall 19 of the neck 3 of the bottle 2.

To control radial elongation or deformation of the cap we prefer to provide a plurality of interconnecting braces or ribs 20 which may interconnect centrally of the cap as at 21 and join at their radially outer extremities with spaced areas of the inner edge 22 of the flange 14 of the cap, the flange defining an opening 23 in the top 25 of the cap.

We have observed that with the novel cap herein described, that the container can be filled with foods to be preserved and preparatory to heating the container and food, the sealing element can be positioned upon the lip and the cap screwed down tight so that a good seal is obtained between the ring 9 and edge 4. The container may then be boiled or heated to vaporize the fluid therein and the cap which is polyethylene becomes soft and allows the sealing lid 6 to unseat sufficiently to permit vapor to pass between the ring 9 and the upper edge 4 without shifting the plate so that the mating contours of the sealing substance and the lip edge are axially aligned when the plate reseats upon the lip. The vapors are exhausted through small radial apertures 27 in the side wall 16 of the cap slightly below the lower edge 28 of the flange 14, the openings 27 communicating with the annular space 29 between the interior surface 30 of the side wall and the opposing surface 31 of the neck portion 3 above the threads thereof.

It will be readily appreciated that the bottles may be tightly closed prior to heating and that the heating unseals the closure structure which upon cooling reseals the container. If it is desired to further tighten the cap, this may be readily done while the cap is hot since it readily deforms and being highly slick (having a low coefficient of friction) may be turned without unduly disturbing the position of the sealing plate.

FIGURES 4 and 5 illustrate a further embodiment of the invention and since most parts are identical with the

previous embodiment the same reference numerals will apply to corresponding parts.

The difference in this modification resides in that the cap 15*a*, the bead or ring structure 13*a* has a lower undulant generally sinusoidal edge 50 which has a shallow profile providing alternating crests 51 and intervening valleys 52. The crests 51 engage the upper edge of the lid at a plurality of points and the valleys provide steam escape passages 53 (FIGURE 5) over the top of the cap communicating with the space 29. The function of the passages 53 is the same as that of openings 27 except that passages 53 exhaust to the atmosphere through the center opening 23 of the cap.

The embodiment of FIGURE 6 features a polyethylene cap 15*b* with an integral solid central portion 76 which forms a closure member for the jar, the portion 76 having a peripheral continuous ring 77 which has a smooth planar or straight lower edge 78 adapted to engage the upper edge 4 of the bottle directly for sealing contact therewith. In the present instance the side wall 16 of the cap is provided with the vapor escape passages 27 similar to the apertures 27 in the embodiment of FIGURES 1–3.

It will be appreciated that with each of these embodiments, the canning process consists of sealing the container and then heating it to plasticize or soften the cap, which in each instance is of the substances heretofore mentioned, to allow it to be easily expanded to unseat the sealing means and allow the escape of steam, and then if necessary additionally tightening the cap while in distortable state and then permitting the container and cap to cool to room temperature to reseal the container through contraction and natural reshaping of the plastic substance.

Having thus described several preferred forms of the invention, it will be readily understood that other forms of the invention will become readily apparent to those skilled in the art within the scope of the appended claims.

What is claimed is:

1. In a process of preserving foods in a container filled with food, said container having an opening closed by a closure structure including a member formed of thermoplastic material which softens in boiling water and hardens at natural atmospheric temperatures comprising the steps of tightly engaging said closure structure with the container, then subjecting said container to a heating medium sufficient to boil the liquid to provide a vapor and to soften said member to deflect the same by the vapor pressure and temporarily unseal the container, then cooling the container and member simultaneously to rigidify the member to reestablish a seal and condense the vapor in the container to provide a vacuum.

2. In a process of preserving liquidized foods in a container having a filling and discharging opening comprising the steps of filling the container with an edible at least part of which is liquid, then closing the opening by a sealing structure including a cap made of polyethylene by

tightly threading the cap onto the container, then heating the container and cap to vaporize the liquid and soften the cap sufficiently to develop pressure within the container distorting the cap and unsealing said structure to permit the escape of the vapor from the container and then cooling the cap and container to condense the vapor to form a vacuum and rigidifying the cap to hold said sealing structure tightly on the container.

3. In the art of canning liquid immersed foods within a packaging unit comprising a container having an opening, the steps of filling the container with a food at least part of which is liquid, then closing the opening by a sealing means including a cap of thermoplastic material which softens in boiling water by tightly threading the cap onto the container, then heating the container and cap to a point vaporizing the liquid and softening the cap so that the vapor distorts the cap and unseals said means whereby the vapor is free to exhaust from the container, then cooling said container and liquid to condense the vapor and substantially simultaneously therewith and while the cap is at least partially soft additionally tightening the cap, and then cooling the entire packaging unit to room temperature.

4. A closure for a container having a cylindrical neck terminating in an annular lip substantially normal to the axis thereof, and closure being made of thermoplastic material which is softenable in boiling water and having a side portion including means for affixing the closure to the neck of the container and having a top, said top having an annular ring portion therebeneath axially alignable with the lip, said ring portion having vapor exhaust passages therein providing an undulant surface in axial alignment with said lip and said passages having radially inwardly exhausting outlet ends, and a lid within the closure having lip-sealing means in axial alignment with said undulant surface and said passages.

5. A canning cap of thermoplastic material which is softenable in boiling water and hardened at room temperature having a threaded side wall for threading onto a canning container and a top portion with an internal annular sealing ring adjacent to the side wall for overlying the lip of a canning container, said cap having vent passages immediately adjacent to the ring and spaced from the threads to exhaust liquid entrained food particles and vapors from an associated container to the atmosphere without contaminating the threads.

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