The present invention relates to fibre containers for the packaging and delivery of liquids, such as milk, fruit juices and other liquids and has particular reference to a container dispensing top assembly having a protective sanitary shield and a method of securing the assembly to a container.

In the manufacture of flat top, rectangular shaped fibre milk containers of the type disclosed in United States Patent 2,085,979 issued July 6, 1937 to John M. Hothersall, the top end member or disc closure is secured to the container by an interfolding of a flange portion of the body, under and over the outer marginal edge portions of the closure. In one corner, the closure contains a filling and dispensing opening and is also provided with a hinged friction plug which is closed under sterile conditions in the container making plant and is opened just before filling the container and again closed after the container is filled. The entire container including the plug closure is coated with paraffin or other coating material to render it sterile and leakproof.

For the convenience of dairies which do not care to be bothered with container making or container finishing operations and prefer to be furnished with a fully constructed container ready for filling, fibre milk containers of this type are completely finished in the container making factory and are temporarily sealed during the paraffining or coating operation so that their interiors are kept in sterile sanitary condition right up to the time when the closure plug is lifted and the milk is filled into the filling opening at the dairy.

In some cases it is desirable to include a triangular protective sanitary shield attached to the top disc closure around the dispensing opening and crimped over the other closures for filling includes to protect the pouring surfaces against contamination, as disclosed in United States Patent 2,321,011 issued June 8, 1943 to H. F. Cox, Jr. et al. However such a sanitary shield is difficult to attach to the container after the filling operation and because it must be larger than the top disc closure itself it has heretofore been exceedingly difficult to attach this additional element to the container even in the container making plant.

It is an object of the instant invention to overcome these difficulties by providing a dispensing top closure assembly including a protective shield and a method of applying the assembly to a container wherein the protective shield is partially secured to the top closure and the shield temporarily folded into compact form inwardly of the seam edges of the closure so that the closure may be readily assembled with the container and secured in place in the usual manner without interference on the part of the shield.

Another object is the provision of such a dispensing top closure assembly and method of attaching it to a container wherein the protective shield is made an integral part of the container so that the container as shipped to the dairies for filling includes the protective shield, thereby making it unnecessary for the dairies to have special machinery for attaching the shield separately after the container is filled.

Another object is the provision of such a dispensing top closure assembly and method of attaching it to a container wherein attachment of the protective shield to the assembly is under the control of the container manufacturer so that proper attachment is insured and existing machinery can be utilized to attach the closure assembly to the container.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a perspective view of a complete, sealed container as it leaves the container factory and embodying the instant invention;

Fig. 2 is an exploded perspective view of the several dispensing top closure assembly parts included in the container shown in Fig. 1, the parts of the assembly being shown in superposed position;

Fig. 3 is a perspective view of the top closure assembly, the various parts as shown in Fig. 2 being joined to provide a unitary structure;

Fig. 4 is a view similar to Fig. 3, the view showing the base corners of the protective shield folded temporarily inwardly preparatory to and as a step in applying the top closure assembly to a container;

Fig. 5 is a perspective view of the top closure assembly with the base corners of the protective shield folded temporarily inwardly and the shield and the plug raised into a vertical position to clear the outer marginal seam edges of the closure disc for unobstructed assembly with a container;

Fig. 6 is a top plan view of the assembly shown in Fig. 5;

Fig. 7 is a transverse sectional view of the upper end of a container, the view being taken substantially along a diagonal line across the top of the container with the top closure assembly as shown in Figs. 5 and 6 initially applied to the container as an incident to securing the assembly in place;

Fig. 8 is an enlarged fragmentary sectional view illustrating how a flange top portion on the container is folded around the outer marginal edges of the closure disc to produce an end seal while the folded protective shield is held out of range;

Fig. 9 is a view similar to Fig. 8 showing the protective shield unfolded and overlapping the newly formed end seal for crimping under the seal; and

Figs. 10 and 11 are enlarged fragmentary sectional views taken substantially along planes indicated by the lines 10—10, 11—11 in Fig. 1.

As a preferred or exemplary embodiment of the invention Figs. 1, 2, 3, 10 and 11 of the drawings illustrate a fibre dispensing top closure assembly for attachment to a fibre rectangular milk container 20 (Fig. 1) of the type disclosed in the above mentioned Hothersall and Cox patents. The closure assembly comprises a flat rectangular shaped closure disc or top end member 21 (Fig. 2) made of fibre and having in one corner thereof a circumferential filling and dispensing opening 22. Superimposed upon the disc 21 is a fibre substantially triangular shaped protective shield 23 which extends over the corner of the closure disc containing the opening 22 to protect the outer face of the portion of the closure around the dispensing opening from contamination.

The triangular shield 23 is made large enough to extend beyond two of the edges and three of the corners of the closure 21 adjacent the opening 22 to overhang these edges and corners of the container and along its
2,784,892

3. base line to extend back away from the opening to a point slightly beyond a diagonal line drawn between the two opposed corners of the closure on either side of the opening, so that slightly more than one half of the outer face of the closure is covered by the shield. This purpose is served by the shield 23 is formed with a curved apex 25 (Fig. 2) which overhangs the corner of the closure disc 21 containing the opening 22, and two straight edges 26, 27 which diverge from the apex 25 and overhang and extend along the outer edges of the closure adjacent the opening 22 for the full length of the closure edge. For this purpose the terminal ends of these closure edges, the shield 23 is formed with slightly rounded corner portions 28 which overhang the two opposing diagonal corners of the closure. These two corner portions 28 of the shield merge into two short convergent edges 29 which overhang and extend for a short distance along the two edges of the closure opposite the opening 22. The terminal ends of these short edges 29 are connected by a base edge 30 which extends diagonally across the top of the closure. The curved apex 25 and edges 26, 27, 28, 29 and 30 define the substantially triangular shaped shield 23.

Specifically from and extending parallel with its base edge 30, the protective shield 23 is formed with a score or hinge line 32 which serves as a pin to provide a hinge for the shield. In a similar manner, the shield inwardly of its corner edges 28 is formed with a pair of scores or hinge lines 33 and 34 normal to the base edge 30 of the shield and start well within the boundaries of the closure 21 and extend outwardly into the diverging edges 26, 27 of the shield. Between the fold lines 33, the portion of the shield between its base edge 30 and its hinge line 32 is adhesively secured to the closure disc 21 to provide a unitary structure of closure and shield.

The fold lines 33 in the shield set off triangular shaped side wing or corner portions 35 which are foldable inwardly within the boundaries of the closure disc 21 to facilitate attaching the closure assembly to the container. These wing portions 35 adjacent their base edge 30 carry a suitable adhesive 36 (Fig. 4) for securing the wings to the container subsequent to attachment of the closure to the container in the factory.

A friction plug 37 is provided to close the filling and dispensing opening 22 in the closure disc 21. This plug may be an integral part of the shield 23 or may be a separate part attached to the shield, as desired. The drawings show the plug 37 as a separate part, formed with a surrounding flange 38 and a tab or tongue extension 39. The plug preferably is carried in the closure disc 21 in alignment with the opening 22 in the closure disc 21. The flange 38 and the tab extension 39 of the plug are secured by adhesive 42 to the shield as indicated in Fig. 2. Thus the closure assembly comprises the closure disc 21, the shield 23 and the plug 37.

When attached to the container, the dispensing top closure assembly is disposed within the upper marginal edge portion of the container body, the outer marginal edge portions of the closure 21 resting upon and being supported on a substantially continuous horizontal peripheral ledge 45 (Figs. 10 and 11) provided in a neck 46 of the container. The peripheral ledge 45, a peripheral or marginal flange portion 47 of the body extends upwardly around the outer edges of the closure and is bent down against and overlaps the top of the closure around the entire periphery of the closure to provide a continuous surrounding or annular end seal 48 which from the end of the closure 21, the body flange 47 and the body ledge 45 together.

The protective shield 23 of the closure assembly extends over the end seal 48 adjacent the dispensing opening 22 in the closure disc 21 to protect these surfaces over which the contents are poured as shown in Figs. 1, 10 and 11. The marginal edge portions 26, 27 and the apex 25 and corners 28 of the shield are cramped under the ledges 45 of the end seal 48 to hold the shield in place. No adhesive is used to hold these edges in place. Along its base edge 30 the wing portions 35 of the shield overlap the end seal 48 and are ultimately adhesively secured in place. For this purpose the outer short edges 29 of the wings are cramped under the shield. The tab extension 39 of the friction plug 37 along with its adjacent side edge of the container is cramped under the end seal 48 with the protective shield, but at the corner or apex 25 of the shield the tab extension stops short and merely overhangs the ends of the closure edges. The tab extension 39 of the protective shield 23 is cramped under the end seal 48. Only the underlying apex 25 of the shield is cramped under the end seal 48. The plug 37 preferably is expanded within the dispensing opening 22 after the filling operation to hold the plug and the surrounding portion of the shield in place.

In this manner the entire pouring surfaces of the closure disc 21 and the end seal 48 are protected by the shield 23 against contamination. Opening of the container is effected by merely lifting the apex 25 of the shield 23. This unclutches the shield from under the end seal 48. Continued lifting of the shield withdraws the non-secured friction plug 37 from the dispensing opening 22 and thus permits of aching the shield open to uncover an uncontaminated surface of the top closure disc 21 over which the contents of the container may be poured during the dispensing operation.

Figures 5, 6 and 7 illustrate a method of attaching the described two-part dispensing top closure assembly to a container. The side wings 35 of the substantially triangular protective shield 23 first are folded inwardly along their respective fold lines 33 to a position lying against and overlapping the shield as shown in Fig. 4. With the wings 35 in this position, the shield is lifted or turned upwardly on its rear hinge line 32 into a substantially vertical position so that the folded shield is disposed substantially normal to the plane of the top end closure 21 as shown in Figs. 5 and 6. The entire closure assembly is then inserted into the open top end of the container 20 so that the marginal edge portions of the top end closure disc 21 rest on and are supported by the peripheral ledge 45 of the container body as shown in Fig. 7, the flange 47 of the body extending vertically around the thus confined end closure 21.

While the closure assembly is held in place in the end of the container 20 as shown in Fig. 7 with the wings 35 of the shield 23 still in their inwardly folded overlapping relation so that they are clear of the marginal edge portions of the disc closure 21, the upstanding shield 23 is disposed in the body of the container and compressed against the marginal edge portions of the composite closure disc 21 to produce the end seal 48 which unites the closure 21 to the body, as shown in Fig. 8. The adhesive 49 is usually provided on the closure 21 to bond the ledge 45 and folded flange 47 to the closure disc.

After securing the closure 21 in place on the container by producing the end seal 48 as described, the protective shield 23 is hinged down flat against the top of the container, with the friction plug 37 snugly inserted in the dispensing opening 22 of the closure 21. The side wings 35 of the shield 23 are then unfolded and laid down flat against the top of the container. In this position of the shield, its outer marginal edge portions along the apex 25, diverging edges 26, 27, corner edges 28 and short convergent edges 29, overlap and project outwardly beyond the end seal 48 as best shown in Fig. 9. The container usually is left in this condition until it is filled.

After filling the container and with the shield in this flat position, the overhanging edge portions are cramped downwardly over and inwardly under the end seal 48 as shown in Fig. 10. Simultaneously with this crimping operation the side edges of the tab extension 39 of the friction plug 37 are cramped over and under the
seam, together with the adjacent underlying edge portions of the shield 23 and the plug is expanded to secure it within place in the dispensing opening 22 of the container 21.

During this crimping operation the portion of the wings 35 of the shield 23 adjacent the base edge 30 of the shield are adhesively secured by the adhesive 36 on the wings, to the top of the closure 21 and the overlapped and crimped under portions of the end seam 48 to provide the base edges of the wings in place. This completes the procedure of attaching the dispensing top closure assembly to the container body 20, with the result that a flat top is provided for the container with all surfaces including the end seam, adjacent and around the dispensing opening 22 fully protected against contamination by the triangular shield 23 as shown in Fig. 1. By providing laterally opposed foldable wing marginal portions on the protective shield, the portions of the shield which extend beyond the container top can be readily folded upwardly out of the way along the score lines 33 in order to produce the end seam, and said wings are thereafter unfolded to hang over the formed seam for protection of the latter as well as the closure against contamination.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts and that changes may be made in the steps of the method described and their order of accomplishment without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:
1. A top closure assembly for securement to a container for holding a liquid, comprising an end member having a liquid dispensing opening therein and having marginal portions for securing said end member to peripheral flanges of said container in an end seam, means for sealing said opening, and a protective shield secured to said end member for covering the surface thereof surrounding said opening to maintain said surface in a sterile condition, a pair of space 35/configuring portions of said shield projecting laterally beyond said end member, marginal portions to cover and protect the end seam of said container after securement of said end member thereto to maintain the covered portions of said seam and end member surrounding said opening in sterile condition, said shield having a pair of spaced score lines thereof setting off certain of said shield marginal portions for bending the latter upwardly and inwardly against an intermediate portion of said shield to partially fold the shield and expose certain of said covered end member marginal portions, said shield having a further score line disposed at an angle to and intersecting said spaced score lines for hinging said partially folded shield upwardly along said further score line to expose the remainder of said covered end member marginal portions, thereby facilitating securing said end member marginal portions of the top closure assembly to said container flanges in said end seam.

2. A top closure assembly as defined in claim 1, wherein said protective shield carries a friction plug insertable in the dispensing opening of said end member for sealing said opening.

3. A dispensing top closure assembly for a container for liquids, comprising a flat rectangular shaped fibre closure disc having a dispensing opening in one corner thereof and having peripheral edge portions for incorporation into a container end seam for securing the disc to a container, means for sealing said dispensing opening, and a removable substantially triangular and flexible protective shield superimposed upon said disc and covering the surface thereof surrounding said opening, said shield covering substantially the entire dispensing opening corner of said disc to maintain the covered disc surface in a sterile condition, said shield having a base edge extending diagonally across said disc inwardly of said covered corner, a portion of said base edge intermediate its ends being adhesively secured to said disc to provide a composite structure, the ends of said base edge being free of said disc for subsequent adhesive attachment thereto, edge portions of said shield including its said base ends projecting laterally beyond the opposed edges of said closure disc for covering a portion of the end seam of the container after attachment of said disc thereto to maintain said covered disc and seam portions in a sterile condition, said shield having opposed wing portions including said base ends bendable along predetermined lines of fold into position within the marginal confines of said closure disc and clear of the peripheral edge thereof to facilitate the formation of said end seam when said top closure assembly is secured to the container.

4. A method of attaching a dispensing top closure assembly to a container, said assembly including a closure member and a protective shield secured thereto and adapted to project beyond the outer edges of the container, said method comprising the steps of folding said projecting portions of the protective shield inwardly in different directions along angularly disposed lines of fold to position such portions within the outer boundaries of the closure member and position the shield clear of the marginal portions of the closure member to be secured to the container, inserting said closure assembly into the open end of the container, attaching the closure member to the container by incorporating said marginal portions of the closure member and the surrounding end portion of the container in a folded end seam, out of contact with said shield, unfolding the shield to project over the closure member and adjacent portions of the end seam to protect these surfaces against contamination, and crimping the projecting edge portions of said shield around and under said end seam to hold said shield in place.

5. A method of attaching to a container a dispensing top closure assembly including a closure member and a protective shield adapted to project beyond the outer edges of the container, which comprises the steps of securing said disc to said closure member within the outer boundaries of said member while leaving unsecured immediately adjacent portions of said disc projecting beyond the outer boundaries of said member, folding the projecting unsecured portions of the protective shield inwardly within the outer boundaries of the closure member to position the shield clear of the outer edges of the closure member to be attached to the container, attaching the closure member to the container by incorporating marginal edge portions of the closure member and the container in a uniting end seam, unfolding the shield to project over the outer portion of the closure member and over adjacent portions of the end seam to protect these surfaces against contamination, and securing the unsecured portions of said shield to said end seam to hold said shield in place.

6. A method of securing a composite liquid dispensing closure assembly to a container, said closure assembly including a top end member and a flexible protective shield therefor secured thereto, portions of said shield being designed to extend beyond the marginal confines of said end member after assembly on the container, said method comprising the steps of folding the extensible portions of said flexible shield inwardly in different directions along angularly disposed lines of fold to position such portions within the marginal confines of said end member, inserting said end member including said folded shield into the open end of said container, incorporating the end wall portions of the container and the peripheral portion of said end member into a folded end seam, and thereafter unfolding the shield to project said extensible portions
7. A method of securing a composite liquid dispensing closure assembly to a rectangular container, said closure assembly including a substantially flat end member and a flexible protective shield therefor secured thereto, portions of said shield being designed to extend beyond the marginal confines of said end member after assembly on the container, said method comprising the steps of folding the extensible portions of said flexible shield inwardly in opposite directions along laterally spaced lines of fold to dispose such portions within the marginal confines of said end member, inserting said end member including said folded shield into the open end of said container, folding the end wall portions of the container inwardly over the marginal edges of said end member and securing the same thereto to constitute an end seam for the completed container, unfolding the shield to project said extensible portions thereof outwardly beyond the marginal confines of said end member, and finally crimping the extremities of said extensible shield portions over and beneath said seam to protect said end member and seam against contamination.

References Cited in the file of this patent

UNITED STATES PATENTS

2,200,276 Hothersall, et al. May 14, 1940
2,221,011 Cox, et al. June 8, 1943
2,321,042 Preis June 8, 1943
2,676,744 Baselt Apr. 27, 1954