

Aug. 19, 1952

R. SONNENBERG

2,607,504

BOTTLE CLOSURE

Filed Sept. 19, 1947

Fig. 1

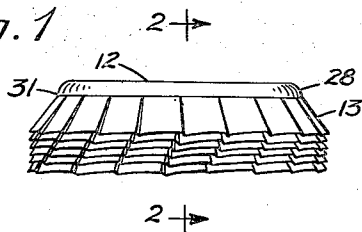


Fig. 7

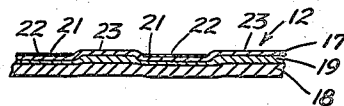


Fig. 8

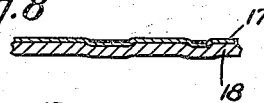


Fig. 2

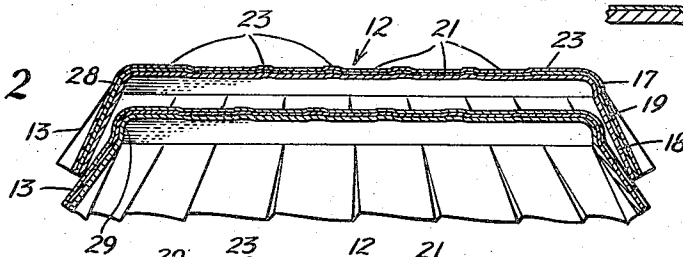


Fig. 3

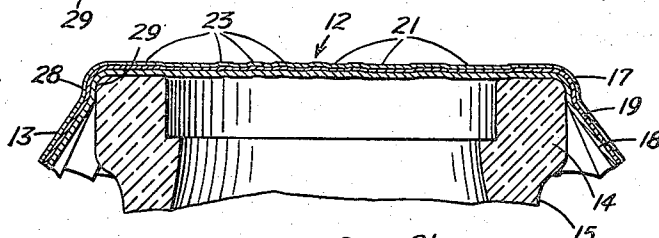


Fig. 4

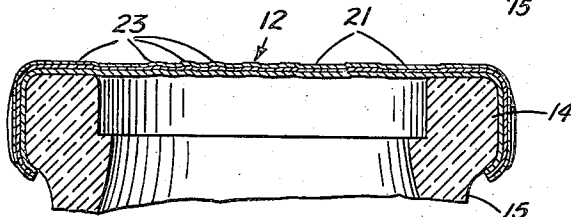


Fig. 5

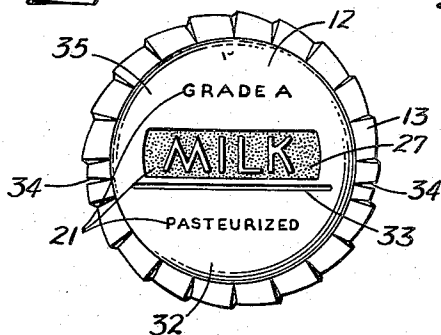
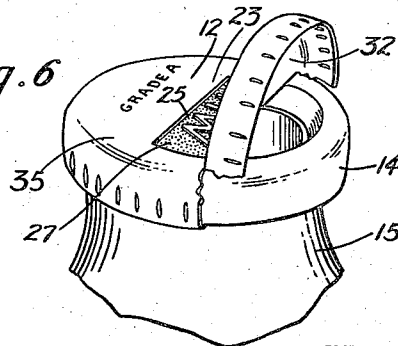


Fig. 6



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Fig. 1

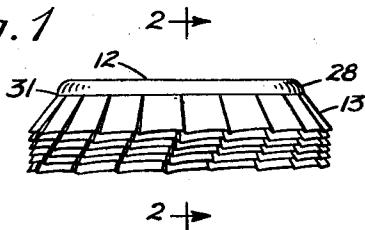


Fig. 7

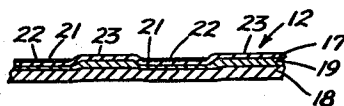


Fig. 2

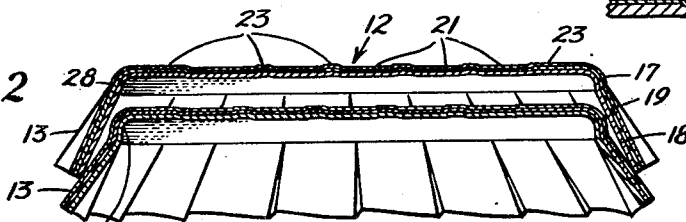


Fig. 8

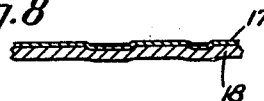


Fig. 3

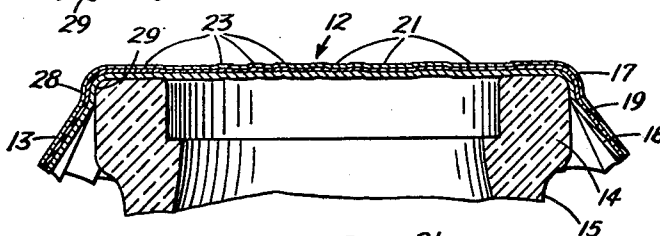


Fig. 4

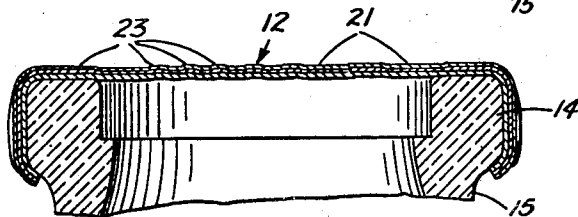


Fig. 5

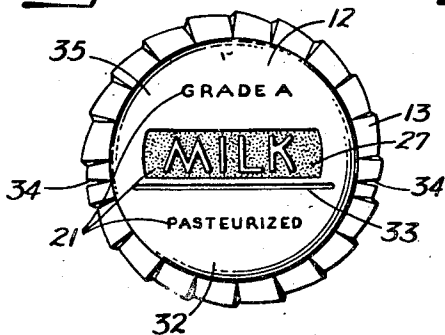
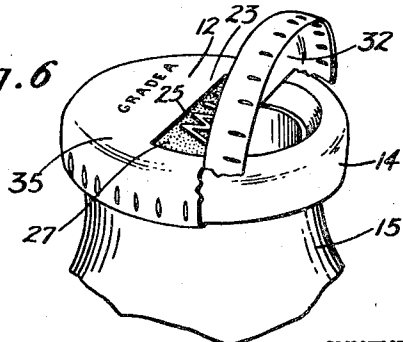


Fig. 6



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UNITED STATES PATENT OFFICE

2,607,504

BOTTLE CLOSURE

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Application September 19, 1947, Serial No. 774,937

2 Claims. (Cl. 215—39)

1

This invention relates to bottle closures and more particularly to hood type metal foil bottle caps for dairy bottles.

It is an object of the present invention to provide an improved bottle cap of the above character which is durable and which is inexpensive to manufacture.

Another object of the invention is to provide a bottle cap of the above character having improved marking thereon in various colors if desired for utilitarian and decorative purposes.

A still further object of the invention is the provision of a cap of the above character which has a colored or printed surface of ornamental appearance in which the ornamentation is protected against abrasions, erasures, obliterations, or smearing.

Another object of the invention is to provide a hood type bottle cap for dairy bottles wherein a barrier is formed when the cap is seated on a head of a bottle which prevents the liquid contents of the bottle from passing or leaking out around the skirt by capillary action.

Yet another object of the invention is the provision in a bottle cap of the above character wherein a part of the cap can readily be folded back to uncover a portion of the mouth of a bottle and which also readily permits the return of the folded back part of the cap to closed position so that the bottle can be recovered.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings, in which—

Figure 1 is an elevational view of a plurality of hood caps, embodying my invention arranged in a nested relation;

Fig. 2 is an enlarged sectional view taken along the line 2—2 of Figure 1;

Fig. 3 is a sectional view of one of the caps in a presealed position on a bottle;

Fig. 4 is a sectional view similar to Fig. 3 with the cap in a sealed position on the bottle;

Fig. 5 is a top view of a bottle cap similar to Fig. 2 embodying a modification of my invention;

Fig. 6 is a perspective view of the embodiment of Fig. 5 showing a portion of the cap folded back into pouring position;

Fig. 7 is an enlarged fragmentary sectional view through a portion of a cap wherein a layer of wax is used as a laminant, and

Fig. 8 is a view similar to Fig. 7 wherein the wax layer is eliminated or reduced in thickness sufficient to serve only as an adhesive.

The invention is shown embodied in a bottle

2

closure in the form of a hood type bottle cap of the general type disclosed and claimed in my copending application Serial No. 651,741, filed March 4, 1946. The cap is formed as a unitary structure and comprises a circular mouth-spanning portion 12 and an annular pleated skirt 13 arranged to fit around the head 14 of a dairy bottle 15 for sealing the cap to the bottle. As shown in Figs. 2, 3, 4 and 7, the cap is formed as a laminated structure. Thus it comprises a layer of metal foil 17, a layer of paper 18, and a layer of plastic material such as micro-crystalline wax 19 of appreciable thickness, or other analogous adhesive interposed between the layer of foil 17 and the layer of paper 18. Under certain limited conditions of use either the layer of micro-crystalline wax, or the layer of micro-crystalline wax and the layer of paper may be omitted. In the latter case, it is evident that the cap will be constructed solely from metal foil.

One phase of my invention pertains to the provision of metal foil cap having ornamental and informative characters or designs which are neat and attractive in appearance, and wherein the characters are protected against smearing, erasing, and the like. Moreover, it is concerned with a cap having such ornamentation that is relatively inexpensive to manufacture. This is accomplished by providing a cap having an intaglio character or characters 21 impressed or recessed into the outer surface of the mouth-spanning portion 12 of the metal foil cap and having the recessed or intaglio portions 21 of the characters colored by ink as desired.

Referring in particular to Figs. 2, 3 and 4, it will be seen that the caps there illustrated are formed with a plurality of recessed characters or designs 21 such as shown in Fig. 5. Each of these characters is recessed below the top surface of the mouth-spanning portion 12 of the cap a sufficient depth so that when the depressed portion 21 is covered with a layer of ink 22 (see Fig. 7), the upper surface of the layer of ink will be disposed below the unrecessed portions 23 of the mouth-spanning portion 12 of the cap.

It is evident that an object, such as another bottle cap or the like moved across the top surface 12 of the cap will normally be prevented from coming into contact with the unrecessed portions 23 on the top of the cap. Thus, the unrecessed portions or ridge 23 surrounding the depressed characters 21 provide a protection for the inked characters and prevent the latter from becoming smeared or obliterated while the ink is

3

wet and protect the characters from abrasion when the cap is in use.

Any design may be formed on the mouth-spanning portion of the cap as long as there is an unrecessed portion 23 on the mouth-spanning portion 12 of the cap surrounding the design. Designs, characters, or the like may include the smallest size type (see Figs. 5 and 6) or may be of larger size and shape substantially equal to the diameter of the mouth-spanning portion 12 of the cap, since the unrecessed portions 23 of the cap will in either case protect the characters. It is evident that the background surrounding the design or letters may be recessed and colored if desired. The top 25 (see Fig. 6) of these characters, however, will be in the same plane as the remaining unrecessed portions 23 of the mouth-spanning portion 12. An example of both recessing letters with the background unrecessed and recessing the background with the letters unrecessed is shown in Figs. 5 and 6. The letters of the word "Grade A" at the top of the cap and the letters of the word "Pasteurized" at the bottom of the cap are recessed and the adjacent surrounding background is unrecessed. Intermediate these words is a rectangular character 27 recessed and forming a background for the letters of the word "Milk," these letters being unrecessed. When the background is recessed such as in this latter case, the letters aid in preventing the ink from being smeared in the same manner as the other unrecessed portions 23 of the cap.

Since it has heretofore been considered impractical to print directly on metal foil by ordinary printing methods, one phase of the invention relates to the ink employed to produce the inked portions. One example of a suitable ink is as follows:

	Per cent
Varnish about.....	46
Titanium dioxide white about.....	39
Reducer about.....	5
Drier about.....	6
Anti-oxidant about.....	.2
Compound about.....	4

The varnish may properly comprise equal parts of China-wood oil and hydrogenated rosin ester. The reducer may be any compatible solvent for reducing the viscosity of the ink. The drier may be a conventional cobalt drier containing about three and one-half percent cobalt, and the anti-oxidant may be any good semi-volatile anti-oxidant. Any of the usual materials used in printing inks to improve the laying and sharp printing qualities may be used as the compound.

The composition will vary somewhat for different colors due largely to variance in the oil absorption characteristics of the various pigments used in very much the same manner as the proportions vary in ordinary linseed oil inks. This variation is largely in the ratio of varnish to pigment.

It will be understood that the various printed portions of the designs may be printed in different colors and the ingenuity of the artist may be employed in devising different designs, characters and colors to produce highly ornamental and decorative results.

Another aspect of my invention is directed to fashioning the cap so as to prevent leakage under adverse conditions. To this end I provide a depending annular flange 28 between the mouth-spanning portion 12 and the pleated skirt 13,

4

preferably produced by drawing of the material in this area. The flange 28 is formed with a smooth under surface 29 and is arranged to fit smoothly on the upper portion of the bead 14 of the bottle 15 adjacent the mouth as shown in Fig. 3. The skirt 13 flares outwardly and downwardly with respect to the flange 28 and forms in effect a continuation thereof. The flange 28 is produced by a mild forming operation and is arranged to provide a well defined line of demarcation 31 (see Figure 1) between the flange 28 and the skirt 13 and the creases in the folds of the skirt do not extend beyond the juncture between the flange and the latter member. It will be evident that when the cap is in sealed position the smooth surface 29 of the flange 28 seats on the smooth surface of the bead 14 so as to form a liquid tight seal or barrier. Furthermore, the creases in the folds of the pleated skirt 13 are separated from the mouth of the bottle by the width of this seal.

In many instances a milk consumer does not utilize all the contents of the bottle at one time, and as a result, recapping the bottle is necessary so that the contents may be stored away in an enclosed and sanitary condition for future use. One phase of the invention is directed to the provision of means which permits readily folding back a part 32 of the cap to uncover a portion of the mouth of the bottle for pouring out the contents thereof and which readily permits the return of the folded back portion 32 of the cap approximately to its original position so as to recover the bottle.

For this purpose I provide an elongated indentation 33 (see Fig. 5) extending transversely across the mouth-spanning portion of the cap and provide slits 34 in the pleated skirt 13 extending the length of the skirt. As shown in Fig. 5, the indentation 33 is positioned intermediate the bead engaging portions of the cap on opposite sides thereof and at one side of the diameter of the mouth-spanning portion of the cap. Preferably, the slits 34 are aligned with the respective ends of the indentation 33. When it is desired to open the bottle, the portion 32 of the cap may be readily folded back along the indentation 33. By positioning the indentation at one side of the diameter of the cap, the cap is divided into a small portion 32 and a large portion 35 (see Figs. 5 and 6). Preferably the smaller portion 32 of the cap should be folded back on the larger portion 35 since the larger portion will be more securely sealed or held in position on the bead of the bottle. In effect, the indentation 33 forms a hinge about which either portion of the cap may be swung in opening the bottle. During the folding back operation the annular flange 28 of the cap will tear from the ends of the slits 34 up to the mouth-spanning portion 12 on either or both sides of the cap a sufficient amount to permit the cap to be freely folded back. The bottle can be resealed by simply swinging the portion 32 back over the mouth of the bottle and pressing the skirt portion of the cap against the bead 14 of the bottle 15.

For service under diverse conditions the cap is preferably formed of a laminated structure as shown in detail in Fig. 7, utilizing a layer of paper 18, a layer of thin foil 17, and an intermediate layer of micro-crystalline wax or the like 19, the latter serving as an adhesive to hold the foil and paper together. This layer of wax serves several other purposes in the combination. One of these purposes is to facilitate the printing operation.

5

As will be seen from Fig. 7, it provides a plastic layer of material which is displaced under the pressure of the type so as to give a better and deeper recession of the printed matter and give a cleaner type impression, and consequently better protection of the ink in service. The layer of wax also assists in producing a better seal between the cap and the bottle, since it will plastically deform under the capping pressure to cause the paper layer to follow and fit minor irregularities in the bottle surface. Both the wax and the paper serve the additional function of retarding obliteration of the design in service by acting as a backing to prevent the characters in the relatively thin foil from losing shape due to stretching or other plastic deformation of the relatively ductile metal.

Where service conditions are not severe, the cap may be made from two laminations as shown in Fig. 8, comprising only the paper and foil, using conventional adhesive in only sufficient quantity to adhere the parts together, and under certain conditions the cap may be formed only from metal foil without lamination.

I claim:

1. A partially preformed hood type bottle cap of laminated form, comprising an outer layer of thin metal foil, the outer surface of which is free from ink adherent means, an inner layer of paper, and an intermediate layer of moisture-resistant plastic adhesive wax adherent to said inner and outer layers, said hood being formed with a bottle-mouth-spanning portion and a skirt extending around the periphery of the mouth-spanning portion and depending therefrom, said metal foil layer being formed at the mouth-spanning portion with indicia depressed into its outer surface, the metal foil layer being displaced inwardly at said indicia to form a bottom disposed inwardly of the unrecessed portion of the outer surface of the metal foil layer and inwardly extending side walls, the adhesive wax contiguous with the depressed portion of the metal foil layer being displaced transversely of the inward extent of said indicia to surround the inwardly extending side walls which define said indicia and forming a backing to retain the shape of said indicia, and a layer of ink disposed in the bottom of said indicia and positioned inwardly of the unrecessed portion of the outer surface of the mouth-spanning portion of the metal foil layer.

2. A partially preformed hood type bottle cap of laminated form, comprising an outer layer of thin metal foil, the outer surface of which is free from

6

ink adherent means, an inner layer of paper, and an intermediate layer of plastic micro-crystalline wax co-extensive with and adherent to said inner and outer layers, said hood being formed with a flat, bottle-mouth-spanning portion and a skirt extending around the periphery of the mouth-spanning portion and depending therefrom, said metal foil layer being formed at the mouth-spanning portion with indicia depressed into its outer surface, the metal foil layer being displaced inwardly at said indicia to form an inwardly disposed bottom and inwardly extending side walls, the wax contiguous with the indicia formation being plastically deformed and displaced transversely of the inward extent of said indicia to surround the side walls thereof and forming a backing to retain the shape of said indicia, and a layer of ink disposed in the bottom of said indicia and positioned inwardly of the unrecessed portion of the outer surface of the mouth-spanning portion of the metal foil layer, the layer of wax at the skirt of said hood and at the juncture between the skirt and the mouth-spanning portion being plastically deformable under pressure to bear against the contiguous portion of the paper layer and urge the same into close contact with the adjacent bottle surface.

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