Nov. 17, 1931. A. C. BOWEN 1,831,991

BOTTLE CAP

Filed July 9, 1927

FIG. I.

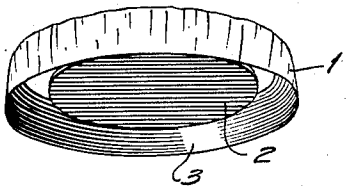


FIG. III.

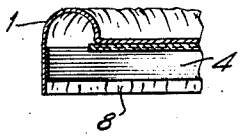


FIG. II.

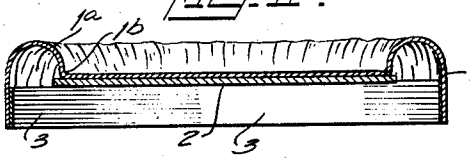
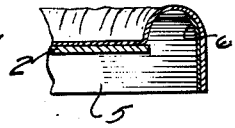


FIG. IV.



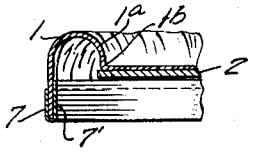


FIG. V.

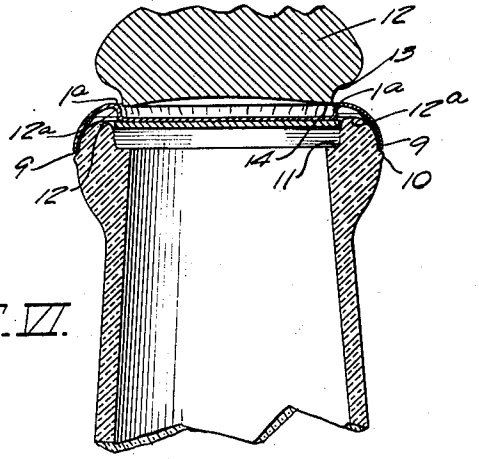
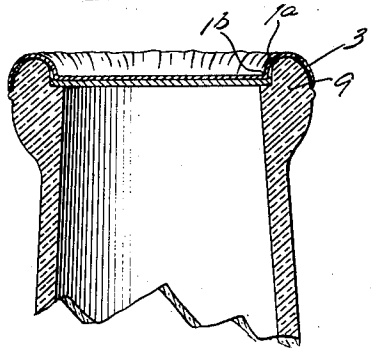


FIG. VI.

FIG. VII.



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ATTORNEY

Patented Nov. 17, 1931 1,831,991

UNITED STATES PATENT OFFICE

ANNA C. BOWEN, OF NEW YORK, N. Y., ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF TWO-THIRDS TO BLOSSOM M. DUNBAR AND ONE-THIRD TO ANNA C. BOWEN, BOTH OF NEW YORK, N. Y.

BOTTLE CAP

Application filed July 9, 1927. Serial No. 204,452.

This invention relates to closures for bottles, and in particular to the convering and protecting of such bottles as are used for milk, cream, and the like.

Its particular objects are to provide, in conjunction with the capping and closing of the bottle, particularly advantageous means for protecting the lip of the bottle, so made as to cooperate with the other parts of the closure in the effective ways hereinafter more particularly described.

Essentially, this invention relates to the construction and formation of the lip-hood, so that the edge of the hood forms a seal with the outer surface of the lip, and is so constructed in conjunction with a disc-stopper in order that the hood automatically positions itself while permitting the disc to be seated in the effective sealing manner, without injury to the hood, or without impairing the perfect functioning of the hood, and also the hood-and-disc stopper as a unit.

The invention will be more particularly understood by reference to the accompanying drawings, in which,

Fig. I is a perspective view of a complete unit cap-and-cover, embodying the invention;

Fig. II is a cross section of same, double size;

Fig. III is a cross section of a modified form, fragmental view, showing band arrangement;

Fig. IV is a cross section of another modified form, fragmental view;

Fig. V is a cross section of another modified form, fragmental view;

Fig. VI is a cross section of a bottle-top with a cap-cover unit in initial position ready for application; and,

Fig. VII is a cross section of a bottle-top with a unit cap-cover applied and in operative position.

The complete unit, as shown in Fig. I, has the closure disc 2, on top of which is secured the hood member having a skirt 1 adapted to fit over the lip of the bottle when the disc is forced into its sealing position.

The hood or skirt 1 may be formed as shown, by pressing paper or other like material into the desired shape, and in the form indicated the formation of the paper results in small crimps or folds accommodating the surplus material at the rim portion of maximum deformation, which may cause a fluted or like rim structure on the edge of the hood, —and it is in that particular respect that this invention serves to provide the material advantages as herein claimed.

Thus, the hood 1 has secured on its inner surface at the lower edge a band 3, which is formed of inextensible material, such as a straight strip of suitable tough paper, united with the edge or overhanging rim of the hood. This may be united as by pasting the band securely on the edge on the inside of the hood-skirt 1, so that in use, when the disc is forced into a milk bottle-neck, the band takes the strain due to being forced onto the flaring outer surface of the lip of the bottle, and resisting that strain, thus providing and maintaining a closed dustproof and sanitary seal with the bottle bead.

In the modification, the band 4 is made longer, and while still serving to resist expansion strain in application, it leaves a margin 8 of the material of the hood which may cover the flash 10, which is usually formed on the outside near the maximum diameter of the bead in the manufacture of such bottles, while the edge 8 also serves as a ready means of tearing the hood loose when removing the cap from the bottle.

In the form with band 5, the width of the band is extended from the edge a greater degree, and is united at the inwardly curved portion of the hood at 6, in order to stiffen the outer rim of the hood so as to meet the particular conditions where such advantages are desired, in particular forms of bottle.

The modification showing band 7′ involves a folded inextensible circular band with the portion 7 engaging the outside of the hood-skirt 1, so that the band so folded and secured provides a rounded edge, and still more secure means for preventing strain from expanding the hood when applied to the bottle.

The band is so formed and of such material that essentially it provides a smooth

inner edge, so that it forms a nice fit with the surface of the glass on the outside of the bead, and as desired, more or less of the inner surface of the hood-edge may form the contact with the glass to effectually provide a sanitary closure. Care is provided that the inner surface is of such a character that while forming a non-sticking seal it will not adhere to the glass, which I prefer to do by paraffining the material,—so that when voluntary removal is desired, a finger-nail readily releases the edge of the hood, and with slight movement lifts the hood, due to the flexible upper portion of the paper, and permits tearing the entire unit closure with its sealing disc from the top of the bottle.

While tough paper is most adaptable, I may in some cases use for additional strength and security of structure, a fabric reinforced paper, or the like.

As more particularly shown in Figs. II and V, it will be seen that the hood portion where attached to the disc 2 is bent or creased at 1^b into a sharp angle very close to the periphery of the disc 2 in order that a capping tool may press the unit closure into position without mutilating or tearing the hood material.

Furthermore, the material of the hood at 1^a, while creased or otherwise, is so formed that it will yield without being torn, so that when the edge of the hood 9 engages with its predetermined size the outer surface of the lip to a close sealing fit, then the material at 1^a yields sufficiently to permit the entire disc 2 to be pressed down to the absolute sealing of the bottle by the disc which holds the milk or other contents in the bottle.

This yielding feature of the hood is more particularly indicated by reference to Figs. VI and VII,—the former showing the initial unit closure loosely set on top of the bottle, and a sealing plug 12 in initial engagement with the top surface of the hood middle portion, having its rim 14 of a size slightly smaller than the opening in the neck of the bottle in order that the sealing plug, when forced home, will press the disc 2 against the shoulder 11. As the plug 12 is forced down, either by hand or machine, its contour at 13, being curved, engages the high point 1^a of the hood, and simultaneous with driving the disc home to its seat the plug gradually presses the hood toward the upper edge 12^a of the lip of the bottle bead. While this application is being made the edge of the hood 9 has engaged the outer surface of the bottle bead, and being inexpansible it can move no further, so that the yielding portion of the hood at 1^a permits the disc 2 to move to its seat, and completely effect the closure of the bottle without tearing or in any way mutilating the hood contiguous with the disc, and thus serves to cover effectually the lip of the bottle, which is the portion desired to be protected for sanitary reasons.

In Fig. VII it is seen that the closure has been applied while the hood edge has maintained its intended contact with the outer surface of the bead forming thereby the double seal without injury to the unit closure and without in any way interfering with the proper seating and sealing functions of the disc.

As shown in these latter figures, 10 indicates a slight ridge around the maximum diameter of the bead of the bottle, known as a flash, in the forming of the glass. This flash is so located that I prefer to have the length of the skirt on hood such as to reach just to this position, and with the reinforcing of the edge of the skirt such as will engage the smooth surface of the bottle-lip above the flash, thereby insuring a tight and complete contact between the outer portion of the hood and the glass. In whichever form the band is provided, it will be noted that the crimped edge of the hood is held by the band against expansions, but more particularly the band being of such form and material as to resist all the strain of application of the closure, also holds the crimped edge, such as in a paper hood, to prevent fluffing or spreading of the crimped paper when wetted, and thereby maintains the shape of the protecting hood at exactly that part of the structure where its integrity insures the perfect functioning of the entire structure.

As to the material in the production of my cap, I prefer for the hood portion a suitable grade of paper which while tough and resisting all of the wear and tear in use, also provides the necessary flexibility in every respect above described. The band is preferably of thin paper, adapted for its particular functions, and is secured firmly by any desired adhesive with pressure to provide uniformity of the product, smoothness of inner surface and edge, and all desired permanency of the finished structure.

This invention is particularly designed to constitute a further improvement on bottle closures of the prior art type in which the cap structure comprises a hood member, the outer skirt, or peripheral portion 9, of which has been formed by crimping in proper dies the peripheral portion of an originally flat disc of paper, and naturally retains a latent tendency to expand toward its original form, which tendency is increased by the expansion resulting from the absorption of moisture, either from the atmosphere or other source, while in use. This difficulty is further aggravated by the fact that any dampening of the fibre of this hood member decreases its power of resistance to any such expansion producing forces or other deforming tendencies. As a result, the dampened hood with consequent loose or projecting skirt

edges ceases to form an effective protection for the lip 12ª of the bottle head, and also becomes unsightly. The outer seal (as distinguished from the main, inner or holding seal formed by closure disc 2) then becomes broken.

My invention overcomes this difficulty by attaching to the expansible hood skirt a substantially inexpansible band 3, which, also, when placed on the inside of the skirt, as here shown in the preferred form, affords a smooth engaging surface that will actually form a perfect and permanent seal with the outer periphery of the bottle bead. Such band is substantially continuous, i. e., if not seamless, its abutting ends are fastened together so that it cannot be stretched appreciably without rupture.

Also, in addition to overcoming the deteriorating effects of moisture, as above pointed out, my invention produces a bottle-capping device which is initially and inherently stronger mechanically than is the capping portion of the structure of the said prior art type above referred to, as the relatively fragile fluted hood-edge 9 is rendered fairly rigid, as well as non-expansible, by the additional reinforcement of the continuous band 3, cemented or otherwise fastened thereto around its entire circumference, thus producing a cover that may be pressed to its place over and around the bottle neck and snugly down upon the bead, or flash 10, thereon, without injury to its structure or impairment of its strength.

Various modifications may be made in the material used and the exact dimensions, which, however, will be selected to suit the particular size and formation of the bottle-tops for which they are intended,—but what I claim and desire to secure by Letters Patent is:

1. In a milk bottle capping device having an inner closure disc adapted to fit tightly in the interior of the bottle mouth, and an outer hood member of more flexible material fastened to said disc and having its peripheral portion bent over and crimped down around the lip of the bottle head, the combination with the above recited structure, of a substantially continuous annular band of non-extensible material fastened to the inner surface of said downwardly crimped portion of said hood member, thereby affording a smooth engaging surface that will form a perfect seal with said bottle lip, said annular band having a fixed interior circumference substantially equal to the outer circumference of the upper portion of said lip of the bottle head, and being so located relatively to said inner closure disc as to bear upon said outer lip surface when said disc is seated in said bottle mouth.

2. A combination such as defined in claim 1, in which the inner surface of said band is faced with a waterproofing non-adhesive material.

3. A milk bottle capping device comprising the combination of a circular hood member of paper having its peripheral portion bent upwardly, outwardly and downwardly to form an annular recess of semi-circular cross section adapted to fit over the lip of a milk bottle mouth, and an inner lining of circumferentially continuous, non-extensible fabric permanently attached to the downwardly crimped portion of said hood member, whereby there is produced a cover that may be pressed to its place over the bottle neck and down to the bead thereon, without injury to said cover structure or impairment of its strength.

In testimony whereof, I have signed my name to this application, this 6th day of July. 1927.

ANNA C. BOWEN.