March 19, 1940. R. M. ROBERTS ET AL 2,194,099

COMBINED CAN PERFORATOR AND CLOSURE DEVICE

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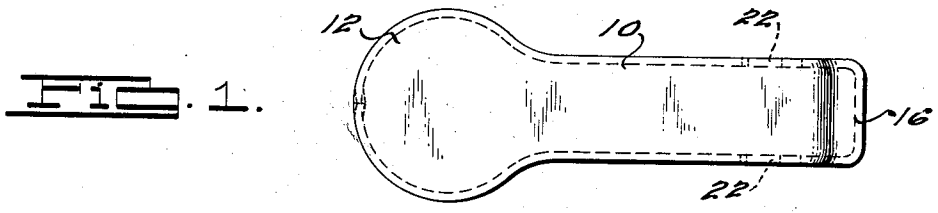


FIG. 1.

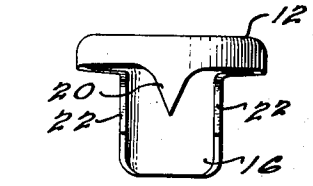


FIG. 3.

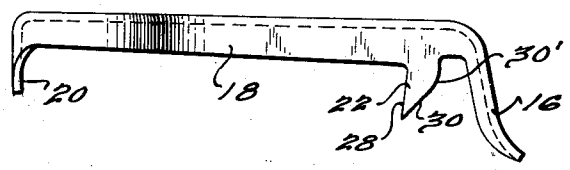


FIG. 2.

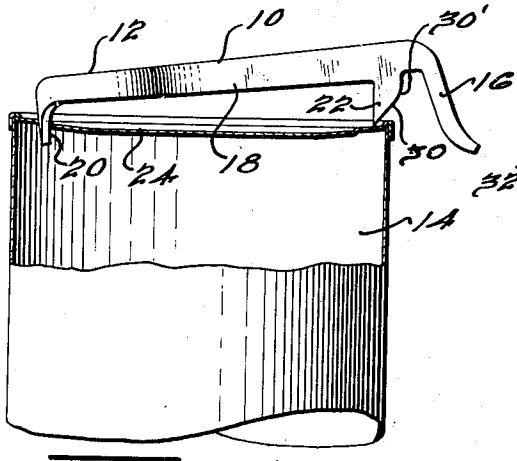


FIG. 4.

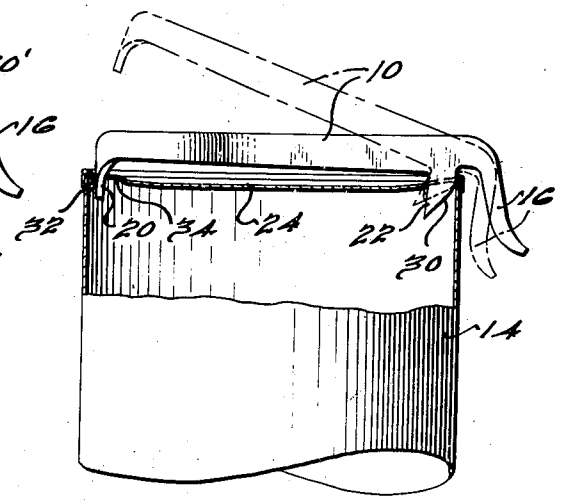


FIG. 5.

INVENTORS.
Russell M. Roberts,
BY Arthur B. Christopher.
Harness, Dickey & Pierce.
ATTORNEYS.

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COMBINED CAN PERFORATOR AND CLOSURE DEVICE

Russell M. Roberts and Arthur B. Christopher, Detroit, Mich.; said Christopher assignor to said Roberts

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2 Claims. (Cl. 220—51)

This invention relates to devices for perforating cans, and particularly relates to devices which perforate a can at spaced points so that the liquid contents thereof may be readily poured out.

Objects of the invention are to provide a device which perforates opposed openings in the top of the can in which the pouring opening is relatively wide; to provide a device having a broad end for contact with the palm of a hand whereby the perforation may be easily made in a can; to provide a device having forward and rear spaced points in which the rear point is angled so that, as it engages the side edge of the can and is moved downwardly into the can, it acts as a cam to force the front point forwardly so as to enlarge the pouring opening; to provide a flange around the edge of the device with the points formed as continuations of or integral with the flange so that the article is relatively inexpensive to manufacture and is of a rigid construction; to provide a device in which the rear points are in a plane approximately radially of the can top to which the article is applied and the front point in a plane circumferential of the can top so as to get a wide pouring stream; to provide a device of the type described in which the piercing points are of special configuration aiding in the ease of operation of the device; and to provide a simplified article of the class described which is inexpensive to manufacture.

Other objects of the invention will become apparent from the following specification, the drawing relating thereto and from the claims hereinafter set forth.

In the drawing in which like numerals are used to designate like parts in the several views throughout:

Figure 1 is a top plan view of the perforator embodying features of the present invention;

Fig. 2 is a side elevational view of the structure illustrated in Fig. 1;

Fig. 3 is an end elevational view of the structure illustrated in Fig. 2;

Fig. 4 is a fragmentary side elevational view with parts broken away of a can showing the perforator of the present invention applied thereto; and

Fig. 5 is a view similar to Fig. 4, illustrating the perforator in a different position.

Referring to the drawing, the perforator there illustrated consists of an elongated strip metal member 10 which is formed at its forward end 12 to provide an enlarged top surface against which pressure may be readily applied by the palm of the hand. The member 10 is of such length that it is adapted to extend across the top of a can 14; and the rear end 16 is bent down at an angle to the plane of the member 10 so that when the member 10 is applied to the can 14 the portion 16 forms a trigger which diverges outwardly beyond the sides of the can leaving a space within which the operator's finger may be placed to remove the perforator 10 from the can, or by depressing the trigger the front of the perforator is raised to expose the pouring opening.

The perforator 10 is formed with a downwardly extending flange 18 completely therearound, preferably increasing in depth toward the rear or trigger end, which serves to give rigidity to the perforator and to provide an economical manner of fabricating the same. Formed integral with, as continuations of, and depending from the bottom edge of the flange 18 are a pointed punch 20 adjacent the front of the member 10 and a pair of pointed punches 22 adjacent the rear thereof. The punch 20 is so formed that the plane of its greatest width lies substantially circumferentially of the top 24 of the can 14 and it will be noted from an inspection of the side view in Fig. 2 that the point or punch 20 is inclined downwardly and rearwardly, preferably at an arc struck centrally of a line joining the points of intersection of the forward edges of the points or punches 22 with the flange 18, or at an angle approximating such arc. The purpose of this feature is to facilitate the entrance of the point 20 into and removal of it from the top of a can. The greatest widths of the punches 22 lie in planes which are substantially parallel to the diameter of the can top 24. The edges 28 of the punches 22 are at a slight angle, for example about five degrees, so that when the edge 28 engages through the can top 24, the slight incline of the edge facilitates penetration of the punches 22 while they are being driven forwardly under the cam action of the rear edges. One of the important aspects of the present invention is that the rear edges of the punches 22 are inclined at 30 at such an angle that they serve as cam surfaces which may be caused to bear against the outer reinforced peripheral edge of the can top, thus forcing the punch 20 bodily forwardly when the points are forced into a can top. The surfaces 30 each merge into a corresponding curved edge or edge surface 30' whose center lies approximately at the point of intersection of the forward edge 28 of the corresponding point 22 with the flange 18. The curved surfaces 30' permit the device to pivot on a can top to which it

has been applied about a line joining said points of intersection without causing any binding of the points in the corresponding openings in the can top and, coupled with the angularity or arc of the front point 20 previously described, results in a device that operates smoothly and efficiently.

In applying the perforator to the can top it is applied diametrically across the top with the points 22 placed in contact with the top of the can and preferably closely adjacent the corresponding edge of the top. By then applying a pressure to the enlarged surface 12, the point 20 is caused to pierce through the top of the can. Since the greatest width of the punch 20 lies in the circumference of the can top, it is evident that the perforation made by the point 20 is relatively wide. By then applying pressure to the top of the perforator immediately above the punches 22, the cam edges 30 engage the reinforced peripheral edge of the can top, and as the punches 22 move downwardly through and into the can, the punch 20 is forced forwardly towards the opposite edge of the can top, pushing back the metal indicated at 32 and providing a relatively large pouring opening 34. While the point 20 does not then completely fill the opening 34 so as to provide an air seal, the relatively wide portion 12 serves to cover the top of the can over the opening 34 and prevents the inclusion of dirt into the can. The perforator 10 may be left in position on the can, and when it is desired to pour contents therefrom the front of the perforator may be raised as indicated by the broken lines in Fig. 4 merely by depressing the trigger 16 so that the pouring opening is free and the contents may be poured from the can. As previously mentioned, the device is thus being moved to raised position will pivot about a line joining the points of intersection of the forward edges 28 of the points 22 and the flange 18, the curvature or inclination of the point 20 and the provision of the curved edges 30' on the points 22 preventing any binding of the device on the can during this pivoting movement.

In fabrication, the entire article may be manufactured by a single stamping operation in which the flange 18 and the perforators 20 and 22 with the trigger 16 are formed as a unit. The construction and arrangement of the punches 20 and 22 relative to each other and the arrangement of the cam edges 30 relative to the punch 20 serve to provide a simplified device by which a relatively large pouring opening may be readily formed in the top of a can.

Formal changes may be made in the specific embodiment of the invention described without departing from the spirit and substance of the invention, the scope of which is commensurate with the appended claims.

What is claimed is:

1. A can perforator comprising a strip metal member adapted to extend transversely of a can top, said member having a pointed punch depending from and integral with the strip adjacent one end thereof, said punch being of greatest width in the direction of the circumference of the can top, said member having another pointed punch depending from and integral with the strip adjacent the opposite end thereof, said last-named punch having its greatest width in a plane at an angle to the width surface of the first named punch with its edge remote from said first named punch formed to provide a cam surface so constructed and arranged as to engage the edge of the can top as the last-named punch is pressed therethrough and thereby force said first-named punch transversely to provide a sizable pouring opening.

2. A can perforator including a body portion comprising a strip of metal adapted to be positioned diametrically of a can top, a pointed punch depending from and integral with said body portion adjacent one end thereof, another pointed punch depending from and integral with said body portion adjacent the opposite end thereof, the outermost surface of one of said punches being shaped to approximate an arc having a center located approximately at the point of intersection of an inner edge of the other of said punches and said body portion, and said other of said punches having a portion of its outermost surface adjacent said body shaped to approximate an arc about said same center with the remaining portion forming a point with the inner surface of said other of said punches.

RUSSELL M. ROBERTS.
ARTHUR B. CHRISTOPHER.