April 24, 1928.

J. S. HARDIMAN

1,667,003

SCREW CAP CLOSURE

Filed Oct. 31, 1922

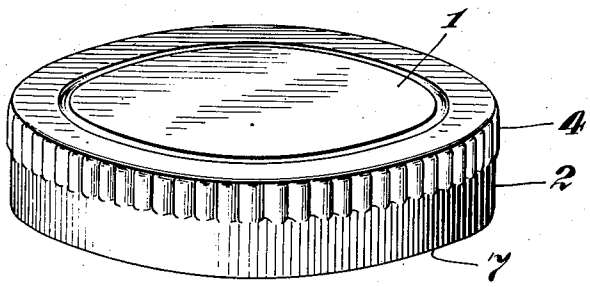


Fig. 1.

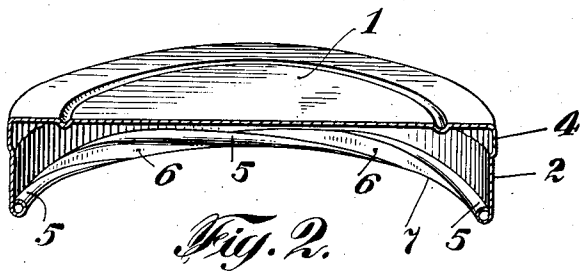


Fig. 2.

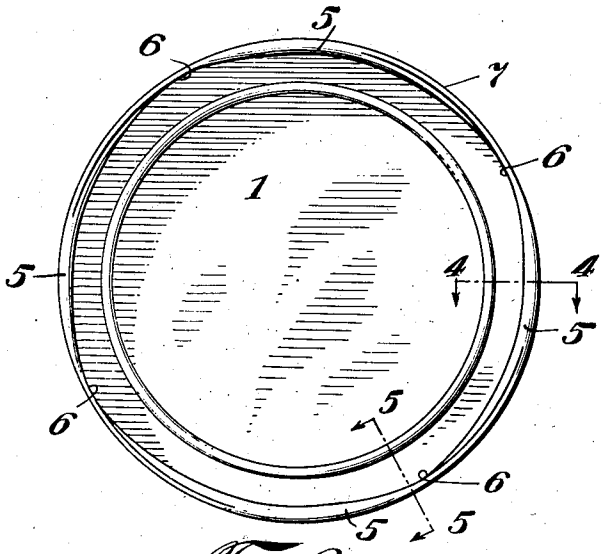


Fig. 3.

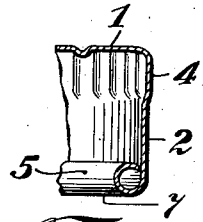


Fig. 4.

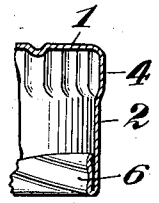


Fig. 5.

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UNITED STATES PATENT OFFICE.

JAMES S. HARDIMAN, OF LONG ISLAND CITY, NEW YORK, ASSIGNOR TO ANCHOR CAP & CLOSURE CORPORATION, OF LONG ISLAND CITY, NEW YORK.

SCREW-CAP CLOSURE.

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This invention relates broadly to closures and more especially to closure caps of the screw thread type.

Heretofore in the art the most common type of screw thread cap has comprised a cap in which the skirt or flange has been provided with embossed screw threads. These screw threads have been constructed in various manners such as a single complete thread or a multiple of parallel threads or lugs, but are in each case formed by embossing inwardly portions of the flange or skirt to provide these screw thread locking projections for engaging suitable threads on the mouth of a receptacle or the like. It is also old in the art to form locking projections by collapsing, or smashing inwardly, the edge of the flange or skirt. Sometimes this edge is left in the raw or unfinished state and in other caps of the prior art the edge is finished by a rolled bead and the bead is then collapsed to drive the side walls inwardly and to form the displaced metal into locking projections. In all of these prior art caps heretofore referred to, the screw thread member has been formed by displacement inwardly of metal from some part of the cap which is visible when the cap is in use. This necessarily means that the design of the cap, as to strength and also as to appearance, must take into consideration the locking projections. In another cap of the prior art the end of the flange is turned inwardly and flattened against the side wall, then the inwardly turned raw edge is pulled inwardly or bent inwardly away from the side wall at suitable intervals so that the raw edge may be utilized for locking projections. In this cap the metal is weakened by the smashing of the edge and the raw edge of the metal forms a starting place for rust. Furthermore, the forming of the projections provides pockets which are liable to collect deleterious material, and the cap is liable to become unsanitary.

The present invention overcomes the difficulties with the known prior art by providing locking projections which are formed from an extra inner wall and without collapsing the edge of the metal at the bottom of the skirt adjacent the locking projections. Furthermore, these projections are adapted to be formed by spinning operations which form grooves between the projections without the grooves or the projections being visible from the exterior of the cap. A cap formed in accordance with the present invention is not only of artistic appearance but is a cap which may be decorated on the skirt or flange prior to manufacture of the cap, and which decoration is not destroyed during the formation of the locking lugs.

In view of the foregoing it would appear that the principal object of the present invention is to provide a screw thread cap having the lower portion of the skirt turned inwardly and provided with locking projections of the relatively long screw thread type formed on the inturned portion without the screw threads being visible from the exterior of the cap.

Another object of the present invention is to provide locking projections on the inward edge of a suitable cap by spinning screw threads in a portion of the edge in such manner that the screw threads are not visible from the exterior of the cap.

Other and further objects of the present invention will in part be obvious and will in part be pointed out hereinafter in the specification following by reference to the accompanying drawings.

Throughout the several figures of the drawings like parts are designated by like characters.

Figure 1 is a perspective view of the exterior of a cap in accordance with the present invention.

Figure 2 is a perspective view showing the cap of Figure 1 cut in half by a vertical plane.

Figure 3 is a plan view looking at the bottom edge of the cap shown in Figure 1.

Figure 4 is a view taken on section 4—4 of Figure 3.

Figure 5 is a view taken on section 5—5 of Figure 3.

The embodiment of the invention disclosed in the drawings comprises a cap having a cover portion 1 and a depending flange or skirt 2. The skirt is preferably, though not necessarily, provided with a knurled portion 4 which provides a hand grip for applying the cap to a suitable container. The lower edge of the cap is turned inwardly by any suitable metal working operation to provide a rolled edge 5. This rolled edge 5 is subjected to screw thread spinning rolls, the internal roll being provided with a screw thread formation and the external roll com-

prising a plain cylinder. This operation spins the hollow rolled edge into a screw threaded member. Preferably the threaded spinning roll is provided with a plurality of threads so that the inner wall is formed into a plurality of thread grooves 6 which leaves the rolled edge 5 of substantially its original diameter so that the hollow rolled edge comprises locking screw thread members. By reference to the drawings it will be noted that the screw thread member 5 is a relatively long member and its tubular formation provides great rigidity and strength so that the cap may be tightly threaded upon a suitable container without danger of the cap stripping or jumping the screw threads on the container. In the present cap the screw threads are arranged in the lower edge of the cap, thereby providing an effective cap with a relatively short skirt or flange and this is largely due to the fact that the screw threads do not stop short of the edge of the cap, but on the other hand each thread runs off of the edge so that the extreme lower portion of the cap is the beginning of the screw thread. Because of the fact that the screw thread is located at the very edge of the cap the entire portion of the engaging members is available for locking the cap in position. This provides a very strong and secure screw threaded lock between the cap and a suitable receptacle. In the present invention the screw threads occur only in the inner wall and therefore the screw threading operation deals only with a single thickness of metal and consequently it does not impose the heavy burden of the threading rolls which is imposed by caps wherein the threads are arranged in a double wall thickness. Furthermore, the lower edge 7 of the cap is substantially smooth and is not broken or collapsed at intervals, and consequently is stronger and more presentable in appearance than the irregular edges of caps wherein locking projections are formed by smashing a bead or lower edge of a cap.

Having thus described my invention, what I claim is:

1. A closure cap having a cover portion, a skirt depending from said cover portion, the metal at the lower edge of said skirt being inturned and forming a hollow part adjacent the lower edge of said skirt, and a thread groove across said hollow portion to form a screw thread lug therein.

2. A closure cap having a cover portion, a skirt depending from said cover portion, the metal at the lower edge of said skirt being inturned and forming a hollow part adjacent the lower edge of said skirt, and a thread groove across said hollow portion to form a screw thread lug therein, said lug being invisible from the exterior of said skirt.

3. A closure cap comprising a cover portion, a skirt depending from said cover portion, a part of said skirt being knurled, a double wall thickness adjacent the lower edge of said skirt, and screw threads impressed in the innner wall only of the double walled portion.

4. A closure cap comprising a cover portion, a skirt depending from said cover portion, a part of said skirt being knurled to stiffen the upper portion of the skirt, a double wall thickness adjacent the lower edge of said skirt, and screw threads impressed in the inner wall only of the double walled portion.

5. A closure cap comprising a cover portion, a skirt depending from said cover portion, a part of said skirt being knurled, a double wall thickness adjacent the lower edge of said skirt to stiffen the lower edge of said skirt, and screw threads impressed in the inner wall only of the double walled portion.

6. A closure cap comprising a cover portion, a skirt depending from said cover portion, a part of said skirt being knurled to stiffen the upper portion of the skirt, a double wall thickness adjacent the lower edge of said skirt to stiffen the lower edge of said skirt, and screw threads impressed in the inner wall only of the double walled portion.

7. A closure cap formed of sheet metal and comprising a cover portion, a skirt depending from said cover portion, the metal adjacent the lower edge of said skirt being inturned to provide a hollow double walled portion with a thread groove crossing the inner wall only of the double wall portion to provide a screw thread locking member.

8. A closure cap formed of sheet metal and comprising a cover portion, a skirt depending from said cover portion, the metal adjacent the lower edge of said skirt being inturned to provide a hollow double walled portion with a thread groove crossing the inner wall only of the double wall portion to provide a screw thread locking member and with the raw edge of the metal being adjacent the inner wall of the skirt.

9. A closure cap formed of sheet metal and comprising a cover portion, a skirt depending at right angles from said cover portion, the entire lower edge of said skirt being inturned and of substantially the same diameter as the upper portion thereof, and locking screw thread members impressed on the interior of said skirt portion and adjacent the lower edge thereof and without displacement of metal from the exterior of said skirt portion.

10. A closure cap formed of sheet metal and comprising a cover portion, a skirt depending at right angles from said cover portion, the lower edge of said skirt being of substantially the same diameter as the upper

portion thereof, and hollow locking screw thread members formed from a continuous uniform ring of metal on the interior of said skirt portion and adjacent the lower edge thereof and without displacement of metal from the exterior of said skirt portion.

11. A closure cap comprising a cover portion, a substantially cylindrical skirt depending from said cover portion, and screw thread members adjacent the lower edge of said skirt, said screw thread members being formed entirely from a continuous uniform ring of metal turned up on the interior of said skirt and in such manner that the location of said screw thread members is not visible from the exterior of said skirt.

12. A cap comprising a cover portion, a skirt depending from said cover portion, and an inturned edge integral with said skirt, said inturned edge comprising hollow screw threads extending through overlapping zones about the circumference of the skirt.

13. A cap comprising a cover portion, a skirt depending from said cover portion, and an inturned edge integral with said skirt, said inturned edge comprising screw threads extending through overlapping zones about the circumference of the skirt and invisible from the exterior of the skirt.

14. A cap comprising a cover portion, a skirt depending from said cover portion, a continuous inturned edge integral with said skirt, said inturned edge comprising hollow screw threads extending through overlapping zones about the circumference of the skirt.

15. A cap comprising a cover portion, a skirt depending from said cover portion, and an inturned edge integral with said skirt, said inturned edge comprising hollow screw threads invisible from the exterior of the skirt and adapted to cooperate with screw threads on a container which are longer than the entrance zone of the container threads with respect to the cap threads.

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