Nov. 18, 1924. 1,516,046

N. LEE

CLOSURE

Filed April 26, 1922

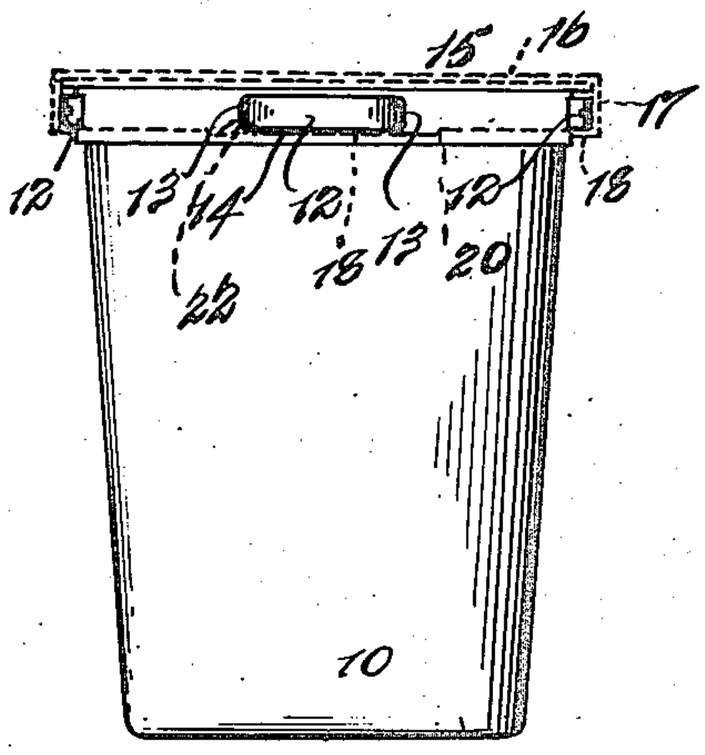

Fig. 1.

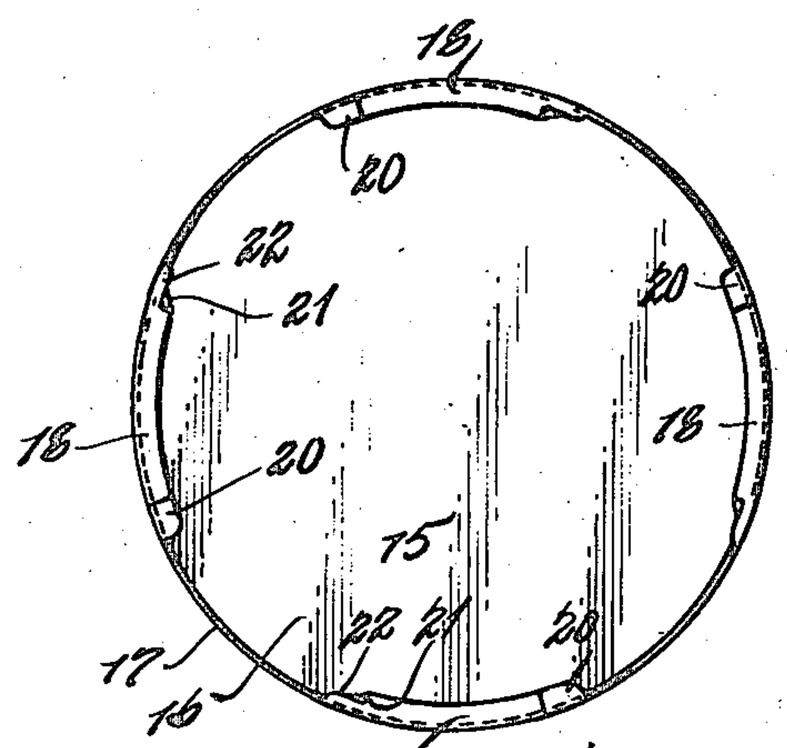

Fig. 2.

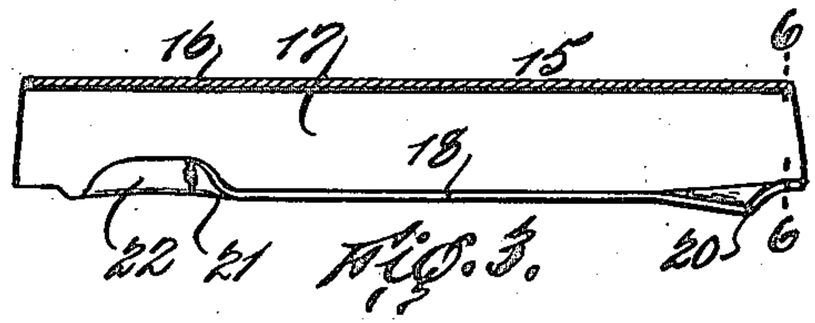

Fig. 3.

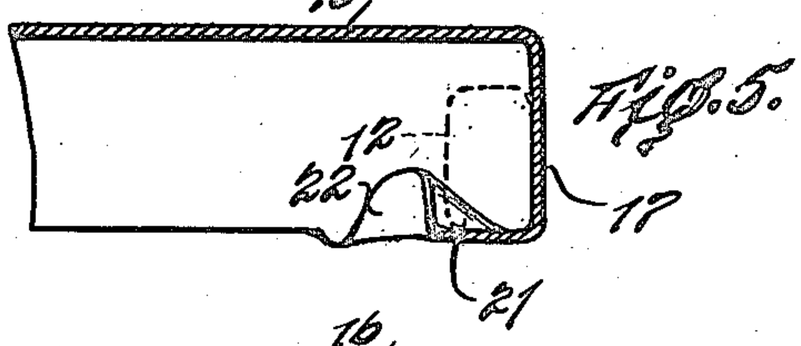

Fig. 5.

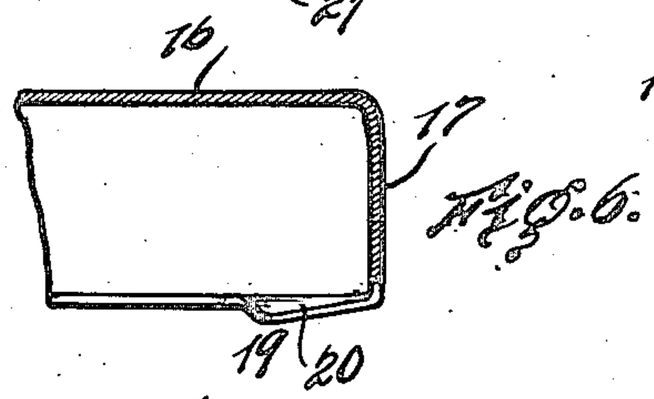

Fig. 6.

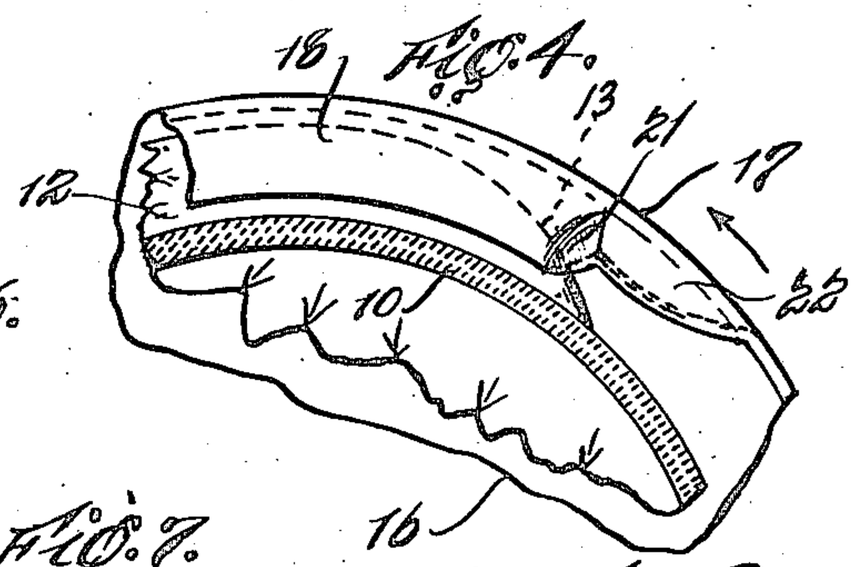

Fig. 4.

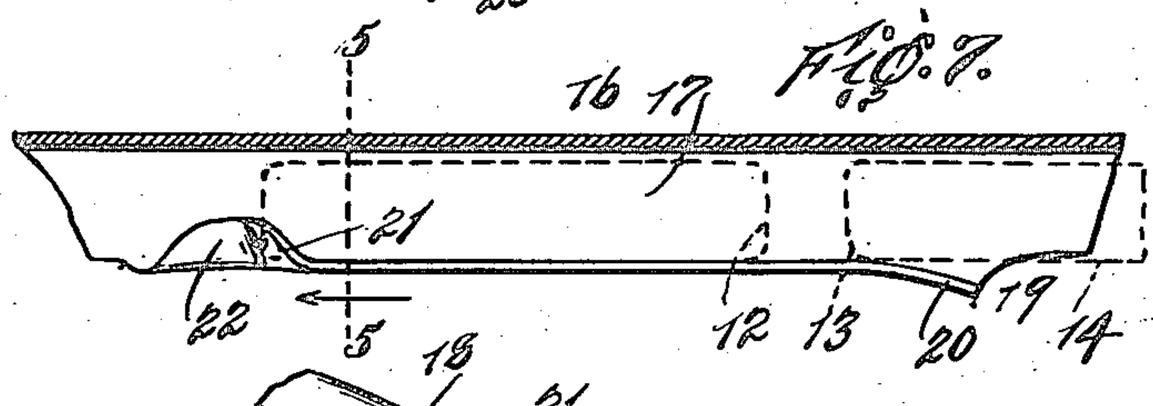

Fig. 7.

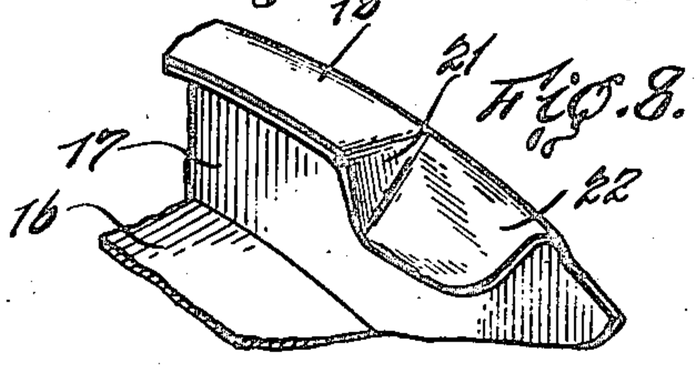

Fig. 8.

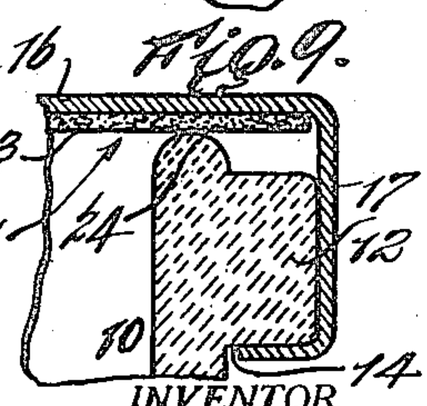

Fig. 9.

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UNITED STATES PATENT OFFICE.

NIXON LEE, OF BROOKLYN, NEW YORK, ASSIGNOR TO NATIONAL SEAL COMPANY, INC., OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK.

CLOSURE.

Application filed April 26, 1922. Serial No. 556,691.

To all whom it may concern:

Be it known that I, NIXON LEE, a citizen of the United States, and a resident of the borough of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Closures, of which the following is a specification, reference being made to the accompanying drawings, forming a part thereof.

My invention relates to closures used for sealing the openings in containers, jars or bottles in which the closure is adapted to be repeatedly applied to and removed from the container, and furthermore to tightly seal the container when the closure is affixed and locked in sealing position, even after repeated applications and removals.

The objects of my invention are, among other things, to provide an improved closure structure of this type of container and closure whereby a more perfect seal and re-seal is secured for such improved closure; to provide a closure with a depending skirt portion and a plurality of inwardly extending lips to engage with radially projecting lugs on the container in which the leading edges of the lip portions shall be formed to engage with progressively increasing pressure the under surfaces of the lugs to draw down the closure upon the rim of the container openings. Furthermore I also provide a novel stop end for each of the lips to coact with the lugs to limit the rotation of the closure in the seating direction which stop end at the same time tends to draw down the cap of the closure upon the rim of the container opening with a distributed, substantially uniform pressure, thereby furnishing an effective closure seal which can be repeatedly used for resealing the container opening after the closure has been initially removed.

With the above and other objects in view, my invention comprises the novel construction, combination and arrangement of parts to be hereinafter specifically described and then particularly pointed out in the appended claims.

I attain the foregoing advantages by the closure shown in the accompanying drawings in which—

Fig. 1 is a side elevation of the glass container showing a preferred embodiment of my improved closure cap in dotted lines;

Fig. 2 is an enlarged bottom plan view of the closure;

Fig. 3 is an enlarged detail view;

Fig. 4 is an enlarged fragmentary bottom plan view showing the stop end of the locking flange engaging a lug on the container;

Figs. 5 and 6 are detail sectional views taken on the lines 5—5 and 6—6 respectively to show the structure of the two ends of the inturned lips;

Fig. 7 is an enlarged fragmentary view showing the lip and lug engagement, the lug being illustrated by dotted lines, the right-hand view showing the initial engagement between the lug and leading edge of the lip just after the closure has been moved in the direction of locking and sealing the closure;

Fig. 8 is an enlarged perspective view showing in detail the construction of the stop end of the closure; and

Fig. 9 is an enlarged vertical sectional view showing the closure locked on the container mouth.

Similar numerals refer to similar parts throughout the several figures.

Referring more particularly to Figs. 1 and 2, the container 10 preferably formed of glass or other friable material, is of any preferred shape or form, and has formed immediately below the mouth 11 on the exterior walls of the container a plurality of radially-projecting equally spaced-apart lugs 12, the number varying according to the size of the container. These lugs 12 have rounded ends 13 and a substantially flat horizontally disposed under-surface 14 as shown in Figs. 1 and 9 to form the locking means for the closure with the container; each rounded end 13 therefore provides a progressively projecting under edge to coact with the stop end of the inturned lips as will hereinafter be described.

The closure 15 proper is preferably formed of a resilient sheet-metal and comprises the circular top or cap 16 from which depends the annular skirt portion 17 which is usually knurled. The skirt 17 has spaced-apart inturned lips 18 integral with the skirts and segmental in shape as shown in Fig. 2, and somewhat longer than the lugs

12. The leading end 19 of each of the lips 18 is substantially square and bent downwardly to form the inclined depressed portion 20 which is adapted to initially engage the rounded ends 13 of the lugs when the closure 15 is preliminarily rotated toward locking position as shown in Fig. 7.

The stop end of the lips 18 is formed as shown in detail in Fig. 8 by bending the lip end to form the inclined face 21 and diagonally disposed brace 22, the face 21 being adapted to engage with the under outer edge of the rounded end 13 of the lug 12 to stop the rotating movement of the closure 15 and at the same time spread outwardly or slightly expand the skirt 17 on all sides (in the present embodiment four), by which the cap 16 with its lining or pack 23 made of slightly compressible material as cardboard for example, is firmly pressed against the rounded rim 24 of the container 10 as shown in Fig. 9. The integral brace portions 22 provide additional strength to these stop faces 21 when pressed against the under corners of the lug ends 13, the edges of which are progressively projecting as shown in Fig. 4.

The operation of my improved closure is substantially as follows: The closure 15 is set on the container mouth 11 so that the lugs 12 are disposed between the several lips 18 with the lining or pack 23 resting on the circular rim 24. Then this closure is twisted or horizontally rotated on the container mouth 11 so that the depressed ends 20 engage the leading ends 13 of the lugs 12 and guide the lips 18 to slide along the under surfaces 14, as shown in the right-hand end of Fig. 7. Then the continued rotation of the cap causes the several lips 18 to ride along the under surfaces 14 of the lugs 12 until the face 21 engages the under corner of the end 13 which stops the closure rotation. Then a final twist given to the closure 15 will cause the faces 21 to slide into firm locking engagement with the under outer edges of the lugs 12 tending to slightly spread the skirt 17 outwardly as shown in Figs. 4 and 5. The tension in the skirt 17 resists such spreading and effectually prevents further rotation of the cap. The effect of such complementary spring action between the cap 16 and expanding skirt 17 is that the lining or pack 23 is firmly forced down and compressed on the rim 24 from points equally spaced apart on the circumference of the closure, and provides a hermetic seal of uniform tightness throughout the annular seating of the closure.

It is manifest that my improved closure may be readily removed and afterwards replaced on the container to attain resealing, and that I have embodied in my container closure structural features which add to the effectiveness of the seal under different conditions of usage.

I claim as my invention:

1. In combination with a container having a lug, a closure having a lip to engage said lug upon rotation of the closure in one direction, said lip having its leading end bent to guide same into engagement with said lug.

2. In combination with a container having a lug, a closure having a lip to engage said lug upon rotation of the closure in one direction, said lip having its leading end bent downwardly to guide same into engagement with said lug.

3. In combination with a container having a lug, a closure having a lip to engage said lug upon rotation of the closure in one direction, said lip having its leading end bent to guide same with progressively increasing pressure into engagement with said lug.

4. In combination with a container having a lug, a closure having a lip to engage said lug upon rotation of the closure in one direction, said lip having its leading end bent downwardly to guide same with progressively increasing pressure into engagement with said lug.

5. In combination with a container having a lug, a closure having a lip to engage said lug upon rotation of the closure in one direction, said lip having its leading end rectangularly formed and bent to guide same into engagement with said lug.

6. In combination with a container having a lug, a closure having a lip to engage said lug upon rotation of the closure in one direction, said lip having its leading end rectangularly formed and bent downwardly to guide same into engagement with said lug.

7. In combination with a container having a lug with its leading end formed with a progressively projecting under edge, a closure having a lip to engage said lug upon rotation of the closure in one direction, said lip having its following end formed with an inclined face to lock with the under outer edge of said lug as a closure stop.

8. In combination with a container having a lug with its leading end formed with a progressively projecting under edge, a closure having a lip to engage said lug upon rotation of the closure in one direction, said lip having its following end formed with an inclined face and an integral brace diagonally disposed thereto to lock with the under outer edge of said lug as a closure stop.

9. In combination with a container having a plurality of spaced-apart lugs about its mouth, said lugs having their leading ends formed with a progressively projecting under edge, a rotatable closure cap hav-

ing an annular depending skirt with a like plurality of inturned lips to engage said lugs, said lips having their following ends formed with flat inclined faces to lock with the under outer edges of each lug to spread the skirt and prevent rotation of said cap.

10. In combination with a container having a plurality of spaced-apart lugs about its mouth, said lugs having their leading ends formed with a progressively projecting under edge, a rotatable closure cap having an annular depending skirt with a like plurality of inturned lips to engage said lugs, said lips having their following ends formed with flat inclined faces and integral braces diagonally disposed thereto to lock with the under outer edges of each lug to spread the skirt and prevent rotation of said cap.

11. In combination with a container having a plurality of spaced-apart lugs about its mouth, said lugs having their leading ends formed with a progressively projecting under edge, a rotatable closure cap having an annular depending skirt with a like plurality of inturned lips to engage said lugs, said lips having their following ends formed with flat inclined faces to slidingly engage with the under outer edges of the leading ends of said lugs to spread the skirt and prevent rotation of said cap.

12. In combination with a container having a plurality of spaced-apart lugs about its mouth, said lugs having their leading ends formed with a progressively projecting under edge, a rotatable closure cap having an annular depending skirt with a like plurality of inturned lips to engage said lugs, said lips having their following ends formed with flat inclined faces and diagonally disposed braces to slidingly engage with the under outer edges of the leading ends of said lugs to spread the skirt and prevent rotation of said cap.

13. In combination with a container having a lug, a closure having a lip to engage said lug upon rotation of the closure in one direction, said lip having its leading end bent to guide same into engagement with said lug and its following end formed with an inclined face to lock with said lug as a closure stop.

14. In combination with a container having a lug, a closure having a lip to engage said lug upon rotation of the closure in one direction, said lip having its leading end bent downwardly to guide same into engagement with said lug and its following end formed with an inclined face and a diagonally disposed brace to lock with said lug as a closure stop.

15. In combination with a container having a plurality of spaced-apart lugs about its mouth, a rotatable closure cap having an annular depending skirt with a like plurality of inturned lips to engage said lugs, each of said lips having its leading end bent downwardly to guide same into engagement with said lug and its following end formed with an inclined face to lock with said lug as a closure stop.

16. In combination with a container having a plurality of spaced-apart lugs about its mouth, a rotatable closure cap having an annular depending skirt with a like plurality of inturned lips to engage said lugs, each of said lips having its leading end bent downwardly to guide same into engagement with said lug and its following end formed with an inclined face and a diagonally disposed brace to lock with said lug as a closure stop.

17. In combination with a container having a plurality of spaced-apart lugs about its mouth, a rotatable closure cap having an annular depending skirt with a like plurality of inturned lips to engage said lugs, each of said lips having its leading end bent downwardly to guide same into engagement with said lug and its following end formed with an inclined face to lock with the under corners of said lug as a closure stop.

18. In combination with a container having a plurality of spaced-apart lugs about its mouth, a rotatable closure cap having an annular depending skirt with a like plurality of inturned lips to engage said lugs, each of said lips having its leading end bent downwardly to guide same into engagement with said lug and its following end formed with an inclined face and a diagonally disposed brace to lock with the under corners of said lug as a closure stop.

NIXON LEE.