W. R. COMINGS.

CLOSURE.

APPLICATION FILED FEB. 6, 1907.

911,380. Patented Feb. 2, 1909.

2 SHEETS—SHEET 1.

Fig. 1

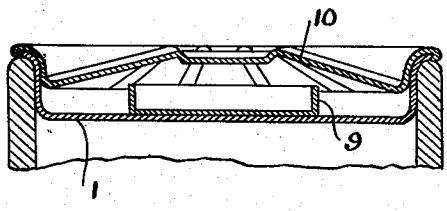


Fig. 3.

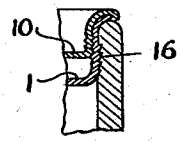


Fig. 2.

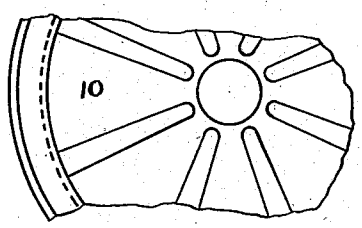
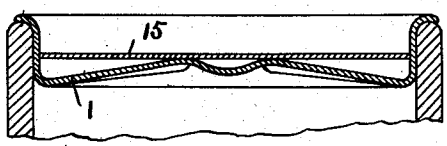


Fig. 4.

Fig. 5.



Witnesses

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2 SHEETS—SHEET 2.

FIG. 6.

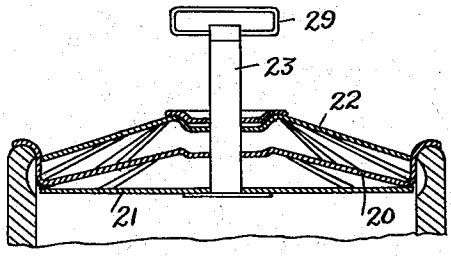


FIG. 8.

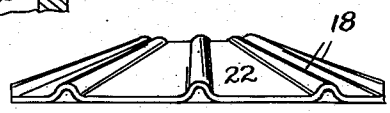


FIG. 7.

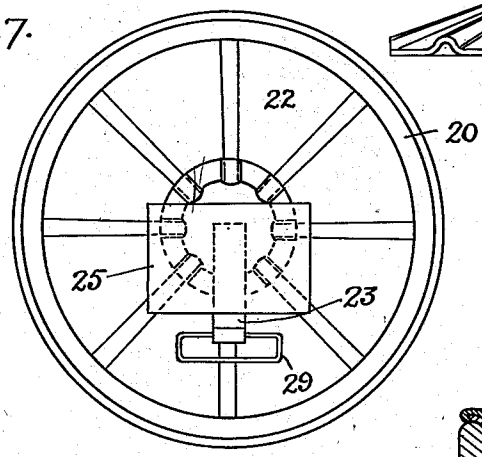


FIG. 10

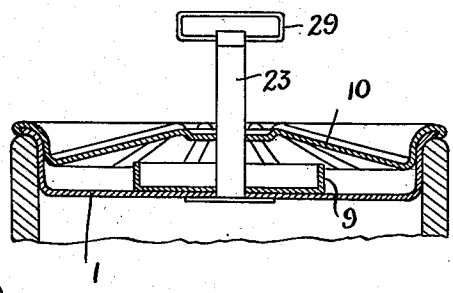
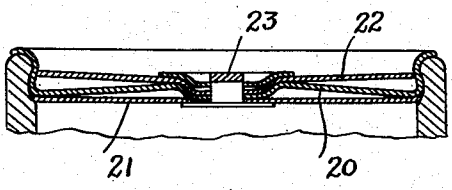


FIG. 9.



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UNITED STATES PATENT OFFICE.

WILLIAM RIGHTER COMINGS, OF WIMBLEDON PARK, ENGLAND.

CLOSURE.

No. 911,380. Specification of Letters Patent. Patented Feb. 2, 1909.

Application filed February 6, 1907. Serial No. 356,082.

To all whom it may concern:

Be it known that I, WILLIAM RIGHTER COMINGS, mechanical engineer, citizen of the United States, residing at Wimbledon Park, in the county of Surrey, England, have invented certain new and useful Improvements in Closures, of which the following is a specification.

My imvention consists in making plug shaped cups out of any suitable sheet material, and in such manner that their surfaces are provided with suitable corrugations or plaits, preferably of the box plait type, adapted to give the article a large capacity for expansion or contraction of an elastic character. These plaits should be of such a character that they meet or nearly meet all the way around, and form a practically unbroken smooth surface where they come in contact with the mouth of the receptacle they are intended to close. This folding of the material into smoothly finished and close meeting plaits enables me to produce from comparatively inelastic material, stoppers, corks, and similar articles that are when finished highly elastic and compressible by the action of these plaits, and therefore very suitable for closing any receptacles or orifices that require a close elastic fitting closure.

In order that my invention may be clearly understood, I will describe the same by reference to the accompanying drawings, in which:—

Figure 1 is a sectional view of an expanding and contracting stopper. Fig. 2 is a plan view of a portion of the same. Fig. 3 is a detail section of a stopper expanded into ridges or serrations inside the mouth of the receptacle. Fig. 4 shows the form of box plaits used in the body of the stoppers. Fig. 5 is a sectional view of another form of expanding stopper. Fig. 6 is a sectional view of an expanding stopper, showing means for locking the same in its expanded position. Fig. 7 is a plan view of the same. Fig. 8 is a side elevation of the distending member used with Fig. 6. Fig. 9 is a sectional view of a stopper similar to Fig. 6, but with the distender forced down and locked. Fig. 10 is a view similar to Fig. 1, showing the locking means applied thereto.

In carrying out my invention I may employ means for closing receptacles which may differ somewhat in form, making the articles very simple or more elaborate according to the end and purpose in view.

It is usually necessary to provide for considerable variations in the mouths of different jars or receptacles made nominally of the same size, and I provide my stoppers with suitable means for expanding or stretching them from the interior until their surfaces are forced out sufficiently to make them fit tightly.

In Fig. 1 the body of the stopper 1 is expanded by a distender 10, a stop 9 being provided to prevent the thrust being excessive, and to direct the thrust where required, said distender being either cemented to the top of said stopper 1, or secured by turning or spinning the edges of said distender over the rim of said stopper.

If desired, the mouth of the receptacle may be provided with a series of ridges or serrations 16, into which the stopper will be expanded, as shown in Fig. 3.

In Fig. 5 the body 1 is made with a conical or dished bottom having elastic folds, a plain disk 15 fitting tightly inside the body, so that when it is pressed down it flattens the conical bottom and thus expands the stopper, the disk being a tight fit preventing the bottom from springing up.

The distender can be made from sheet material by stamping up a disk as shown at 22 into a cone shaped dish, Fig. 8, provided with corrugations or plaits 18, which will, when the point of the cone is sufficiently pressed, allow the material to flatten out into the disk shape again, thus increasing its circumference over that of the base of the cone. As soon as the flattening pressure has been removed the elasticity of the folds will cause the disk to return to its cone shape again. If such a cone shaped disk 22, Fig. 8, is made to just fit inside an elastic cup shaped article 20, Fig. 6, it will, when pressed upon the point, flatten out and distend the cup or stopper, as in Fig. 9. I further provide suitable means for locking the distender so as to hold the device in its expanded position in the mouth of the receptacle. One convenient way of doing this is shown in Fig. 6, wherein a flexible strip of metal or other material 23 is fixed to the center of a plate 21 fixed to the underside of the cup or stopper 20, and then passed through the distender 22, leaving sufficient length above the same to serve as a handle 29. Now when the distender is pressed down, it will not only of itself expand, but will also, by its pressure on the dished cup or stopper 20, cause the latter to

expand of itself, as shown in Fig. 9, thus causing the distender 22 to dish in the opposite direction, which of itself will tend to retain the parts in such expanded position. The metal strip 23 may then be bent down over distender 22 so as to positively lock the parts in their expanded position.

It will be understood that the metal strip 23 may be employed with the form of stopper shown in Fig. 1, wherein the body portion of the stopper is flat, as shown in Fig. 10.

I also provide means when desired so that a suitable seal or label 25, shown in Fig. 7, can be affixed over the locking strip 23, so that it cannot be unlocked without breaking the said seal or label.

When it is desired to affix the stopper very firmly I provide the mouth of the receptacle with one or more grooves 17, Fig. 6, into which the material of the stopper 20 is expanded so firmly that it cannot be withdrawn until the distender has been unlocked.

The stoppers and closers as described above may be made from almost any sheet material, such as paper, leather, rubber, celluloid or metal, or from two or more of such materials in combination.

Where such materials such as paper or leather are used, I generally prefer to coat or impregnate them with waterproofing and germ destroying materials, or other suitable materials adapted to resist the chemical action of the materials packed in the receptacles, and in some cases I apply to the outside of the stopper suitable wax, rubber or similar soft material adapted to pack into any spaces that may be left between the elastic folds, and thus secure an airtight fit.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. In a closure, the combination with a dished body portion formed in radial plaits or folds, of a disk adapted to fit within said body portion and by pressure on said dished body portion adapted to expand the latter.

2. In a closure, the combination with a body portion having an annular upturned edge, of a distender adapted to fit within said body portion and by pressure to expand the latter annularly, and means for locking said parts in the expanded position.

3. In a closure, the combination with a body portion having an annular upturned edge, of a dished distender having radial plaits or folds and adapted to fit within said body portion and by pressure to expand the latter, and means for locking said parts in their expanded position.

4. In a closure, the combination with a body portion having an annular upturned edge, and a distender adapted to fit within said body portion and by pressure to expand the latter annularly, of a flexible strip attached centrally to said body portion and extending loosely through said distender and adapted when said parts are expanded to be bent to retain said parts in their expanded position.

5. In a closure, the combination with an upwardly dished body portion having an annular upturned edge, a flat plate fixed to the underside of said body portion, and a distender adapted to fit within said body portion, of a flexible strip attached centrally to said flat plate and extending loosely through said body portion and distender and adapted when said parts are expanded to be bent to retain said parts in their expanded position.

6. In a closure, the combination with an upwardly dished body portion formed in radial plaits or folds and having an annular upturned edge, a flat plate fixed to the underside of said body portion, and a distender formed in radial plaits or folds and adapted to fit within said body portion, of a flexible strip attached centrally to said flat plate and extending loosely through said body portion and distender and adapted when said parts are expanded to be bent to retain said parts in their expanded position.

7. In a closure, the combination with a body portion having an annular upturned edge, and a dished distender having radial plaits or folds and adapted to fit within said body portion and by pressure to expand the latter, of a flexible strip attached centrally to said body portion and extending loosely through said distender and adapted when said parts are expanded to be bent to retain said parts in their expanded position.

8. A closure, embodying a body portion formed in radial plaits or folds and having an annular upturned edge, said body portion adapted to be expanded radially.

9. A closure, embodying a dished body portion formed in radial plaits or folds and having an annular upturned edge, whereby pressure on said dished portion will cause said body portion to be expanded radially.

10. A closure, embodying a body portion having an annular upturned edge, and a distender adapted to fit within said body portion, one of said parts being formed in radial plaits or folds, and one of said parts being dished whereby pressure on said distender will cause said body portion to be expanded annularly.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM RIGHTER COMINGS.

Witnesses:

H. D. JAMESON,

F. L. RANDS.