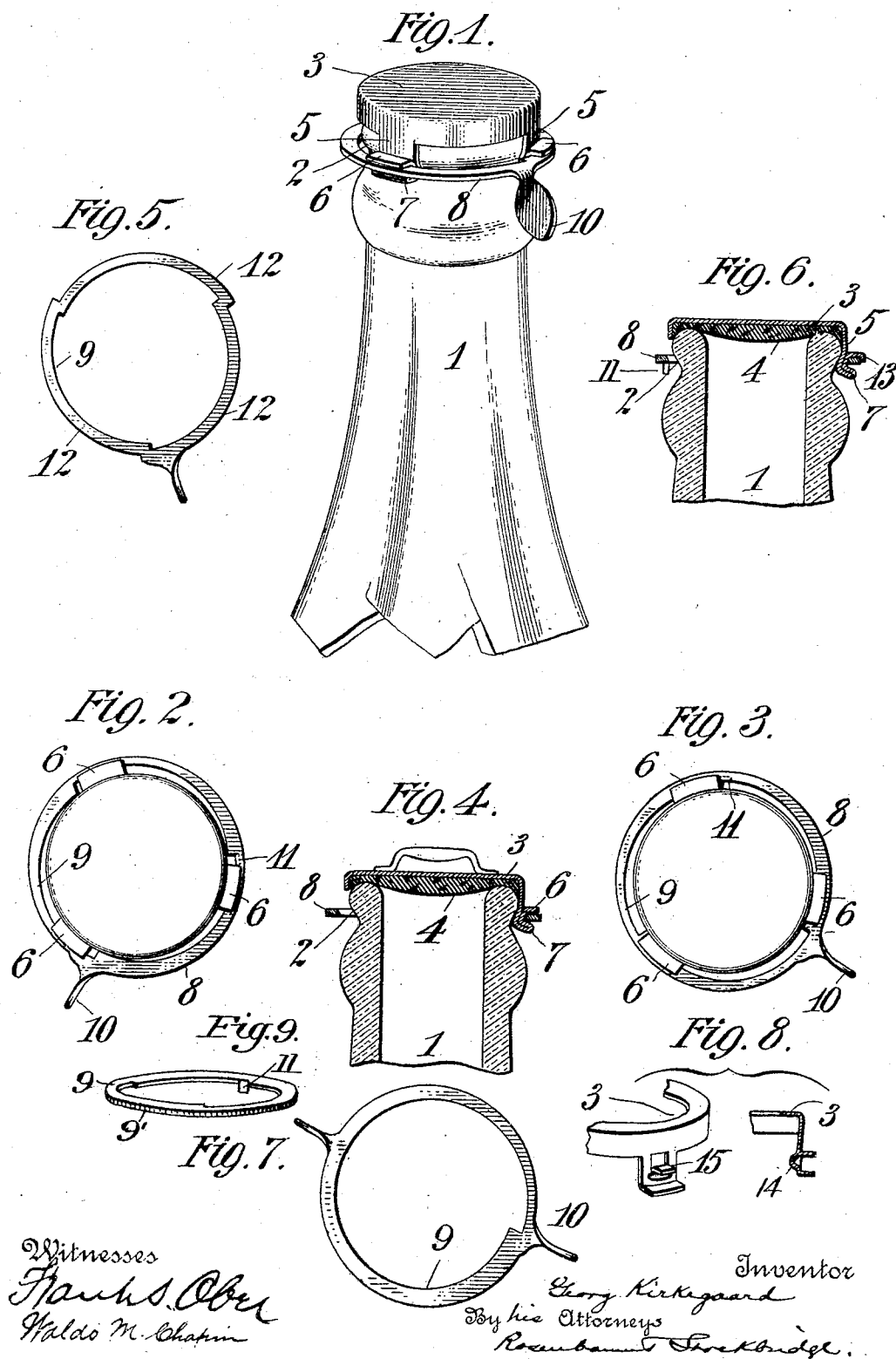


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PATENTED AUG. 8, 1905.

G. KIRKEGAARD.
BOTTLE STOPPER.
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Witnesses
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BOTTLE-STOPPER.

No. 796,734.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORG KIRKEGAARD, a citizen of the United States, residing at the city of New York, in the borough of Brooklyn and State of New York, have invented certain new and useful Improvements in Bottle-Stoppers, of which the following is a full, clear, and exact description.

This invention relates to bottle and jar stoppers of that particular class in which a cap containing a disk of packing material is applied over the mouth of the bottle and drawn downward and held by means of suitable devices acting upon the depending edge of the cap.

The object of the invention is to provide a simple and cheap construction of this general style of stopper which can be readily applied to and removed from the bottle, which is self-contained, requiring no attachments upon the bottle itself, which can be easily and quickly operated to seal and unseal the bottle, and which can be used an indefinite number of times, thus permitting the bottle to be re-corked after portions of its contents have been removed.

In carrying out my invention I provide a cap, preferably of metal, having a plurality of depending fingers. Inside of the cap is placed a disk of cork or other suitable packing material, which is to be pressed against the mouth of the bottle in order to effect the seal. In external engagement with the fingers of the cap is a closed rigid ring having on its inner edge circumferentially-arranged cam or inclined surfaces. By twisting or rotating this ring with respect to the cap the cam-surfaces gradually press the fingers inward against the external surface of the bottle. The bottle is provided exteriorly below its mouth with a downwardly and inwardly inclined annular shoulder opposite which the ends of the fingers on the cap stand when the cap is applied to the bottle. Thus when the ring is rotated and the cam-surfaces thereof press the ends of the fingers inward the latter are carried against this annular shoulder of the bottle and are thereby caused to travel downward to an extent depending upon the turning or rotating of the ring. This drawing downward of the cap compresses the internal packing-disk against the mouth of the bottle and effectually seals it. To release or unseal the bottle, the ring is rotated

in the opposite direction, allowing the fingers to spread outward or positively drawing them outward, whereupon the cap lifts slightly and then being free may be readily removed from the bottle.

The invention will be described more in detail in connection with the accompanying drawings, wherein—

Figure 1 is a perspective view of the neck of a bottle having my improved stopper applied thereto. Fig. 2 is a plan of the stopper shown in its open or unsealed condition. Fig. 3 is a similar plan showing the stopper in its closed or sealed condition. Fig. 4 is a section through the stopper and upper end of the bottle. Fig. 5 is a plan of a double-acting clamping-ring. Fig. 6 is a sectional view of the upper end of a bottle and a stopper of a form adapted to operate in connection with the ring shown in Fig. 5. Fig. 7 is a plan of a clamping-ring having only one cam or inclined surface, and Fig. 8 is a modification of the cap-fingers. Fig. 9 shows a slightly-modified form of clamping-ring.

Referring to the drawings, 1 indicates the neck of the bottle, which for the purposes of this invention is provided externally and immediately below its mouth with an inwardly and downwardly inclined annular shoulder or surface 2.

3 is a cap, preferably of spring metal. It may be a complete cap, or its middle portion may be removed, so that it becomes only a ring composed of a horizontal and a vertical flange, as illustrated in Fig. 8. Inside of this cap is placed a disk 4, of cork or other suitable packing material, preferably extending across the full diameter of the cap. From the edges of the cap a number of fingers 5 depend. These are preferably formed integrally with the metal of the cap. For bottles of the average size I prefer to use three of these fingers; but for large-mouthed bottles and jars it may be desirable to use four or even six of such fingers. These fingers are sufficiently long to be folded at their lower ends to form a retaining-seat for the clamping-ring and to furnish a thickness at their extremities for a purpose hereinafter mentioned. This fold is made by bending the extremity of the finger back upon itself and then outward, the folded part then being shaped to provide two outward projections 6 and 7, between which is the space or seat for

the ring. When thus folded, the extremities of the fingers stand opposite and approximately in contact with the inclined surface 2 on the bottle when the stopper is applied thereto. The clamping-ring is indicated by 8 and consists, preferably, of a stamped steel ring having on its inner edge one or more circumferentially-arranged cam or eccentric surfaces 9. When the cap is provided with three of the fingers 5, I preferably employ three of the eccentric surfaces 9, one for engagement with each of the fingers. The ring is to be inserted in or connected with the cap during the formation of the projections 6 7, and it is then seated between the projections on each finger, so as to be permanently attached to the cap. For the purpose of conveniently rotating the ring to cause it to slide circumferentially upon the fingers of the cap the outer edge of the ring may be roughened or milled, as at 9' in Fig. 9; but I prefer to attach to the ring a wing or thumb-piece 10, projecting downwardly and outwardly, against which the thumb can be applied to push the ring around. If desired, two of these wings may be used and placed at diametrical opposite points, as shown in Fig. 7; but this is not essential or desirable.

Before the stopper is applied to the bottle the ring should be so positioned with respect to the fingers that the latter will be allowed to stand out to the fullest extent. In other words, that portion of the cam-surfaces most distant from the center of the ring should be in engagement with the fingers. In this way the stopper is easily slipped over the mouth of the bottle. When properly placed thereon, the ring is rotated either by twisting it between the thumb and fingers or by pressing with the thumb against the wing 10, the motion being continued until the opposite ends of each eccentric surface on the ring engages the respective fingers. In making this motion the eccentric surfaces gradually force the ends of the fingers radially inward against the inclined annular shoulder 2 on the bottle, which deflects them downward until the rotation of the ring ceases, thus creating a compression of the packing-disk 4 against the mouth of the bottle and perfecting the seal. The extent of the rotation of the ring may be positively limited by a small projection 11 on the ring itself, which at each end of the traverse of the ring will strike against the edge of one of the fingers and prevent the ring from being carried too far. To release the stopper or unseal the bottle, the ring is rotated in the opposite direction by the same means as before, whereupon the ends of the fingers are loosened or freed, and they spring outward sufficiently to enable the cap to be lifted from the bottle.

If metal with sufficient spring or elasticity in it to open the fingers when they are released by the ring cannot be obtained or if

for any reason it is desirable to positively open the fingers, the outer edge of the ring 8 may be provided with eccentric surfaces reversely arranged to those inside, as indicated at 12 in Fig. 5, and for engagement with these surfaces the ends of the fingers 5 may be bent or shaped so as to embrace the outer edge of the ring, as shown at 13 in Fig. 6. Thus when the bottle is to be unsealed the movement of the ring causes it to act positively upon the part 13 of the fingers and force them outward.

It is obviously not essential that the ends of the fingers shall be folded in the particular manner hereinbefore described. By thus folding them, however, a reinforcement is provided at the ends of the fingers, and the device is more durable; but the main reason for thickening the extremities of the fingers is so that they will fill up the space between the eccentric surfaces of the ring and the inclined shoulder 2 when the stopper is first applied to the bottle. It will be seen that the smallest diameter of the ring must be able to pass over the bead at the mouth of the bottle, with the cap-fingers intervening. The fingers themselves will yield in passing over the bead, and when they have cleared it they should spring inward against the inclined shoulder and then be thick enough to be engaged by the compressing portions of the eccentric surfaces of the ring. This thickening may be obtained in various ways. In Fig. 8 it is obtained by embossing a projection on the inside of the fingers, as seen at 14. This also furnishes a smooth round surface to bear against the bottle. In this figure also lugs 15 are used to hold the ring in place. The invention at all events includes any means for enabling a ring of the character described to engage the ends of the fingers and force them inward or outward for effective coöperation with the inclined shoulder 2. Fig. 4 shows a handle 15 on the cap, which would sometimes be useful on stoppers of large diameter to prevent the cap from turning when the ring is turned.

In Fig. 7 there is illustrated a ring having only one eccentric surface. Such a ring would engage with a plurality of the fingers and would serve to press them all inward, as the action of the eccentric surface on one finger would react upon the other fingers, causing all of them to be moved inward together.

For sealing jars and large-mouth bottles it may be desirable to use a glass cover-disk and to place the packing between the edge of said disk and the mouth of the jar. In that case the cap of the improved stopper would rest upon the glass disk and would serve to press it against the packing, the stopper otherwise acting as hereinbefore described.

Having described my invention, I claim—

1. A bottle or jar stopper comprising a cap having depending fingers and provided with

an internal packing-disk in combination with a ring embracing said fingers and provided with eccentric or cam surfaces, whereby when said ring is rotated with respect to the fingers the latter are pressed inward against the bottle.

2. A bottle or jar stopper comprising a cap having depending fingers and provided with an internal packing-disk in combination with a ring permanently embracing said fingers and provided with eccentric or cam surfaces, whereby when said ring is rotated with respect to the fingers the latter are pressed inward against the bottle.

3. A bottle or jar stopper comprising a cap having depending fingers and adapted to be placed over the mouth of the bottle in combination with a ring embracing said fingers and means whereby the rotation of the ring with respect to the cap will cause said fingers to be moved inward against the bottle.

4. A bottle or jar stopper comprising a cap having depending fingers and adapted to be placed over the mouth of the bottle in combination with a ring permanently embracing said fingers and means whereby the rotation of the ring with respect to the cap will cause said fingers to be moved inward against the bottle.

5. The combination with a bottle or jar having an exterior annular inclined surface near its mouth, of a stopper comprising a cap adapted to fit over the mouth of the bottle or jar and having depending fingers terminating opposite said annular surface, a ring embracing said fingers, means for rotating said ring with respect to the fingers and means whereby such rotation will cause the fingers to move inward against said annular surface for the purpose set forth.

6. A bottle or jar stopper comprising a cap having depending fingers, a ring embracing said fingers, a wing or thumb-piece attached to said ring by which the same can be rotated and eccentric or cam surfaces on the ring engaging said fingers.

7. A bottle or jar stopper comprising a cap

having depending fingers, a ring permanently engaging said fingers and having eccentric or cam surfaces corresponding respectively therewith.

8. In a bottle or jar stopper comprising a cap having depending fingers, a ring embracing said fingers and itself embraced by the fingers, said ring having internal and external eccentric surfaces and means for rotating the ring with respect to the fingers.

9. A bottle or jar stopper comprising a cap having depending fingers in combination with a ring embracing said fingers, and means whereby the rotation of said ring with respect to the fingers will cause the latter to be forced inward or outward in accordance with the direction of rotation.

10. In a bottle or jar stopper the combination of a cap having depending fingers, an eccentric or cam rotatable ring embracing said fingers, and a stop limiting the extent of rotation of the ring.

11. The combination with a bottle or jar having an exterior annular inclined surface near its mouth, of a stopper comprising a cap adapted to fit over the mouth of the bottle or jar and having depending fingers terminating opposite said annular surface, the extremities of said fingers being thickened, a ring embracing said fingers, means for rotating said ring with respect to the fingers and means whereby such rotation will cause the fingers to move inward against said annular surface for the purpose set forth.

12. A bottle or jar stopper comprising a cap having depending fingers, a ring engaging said fingers and having eccentric or cam surfaces corresponding respectively therewith, said fingers having lugs between which the ring is confined.

In witness whereof I subscribe my signature in the presence of two witnesses.

GEORG KIRKEGAARD.

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WALDO M. CHAPIN.