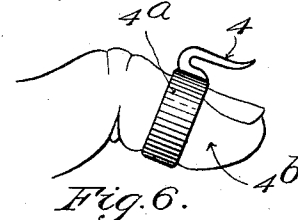
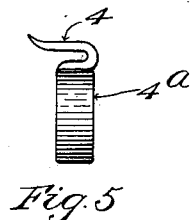
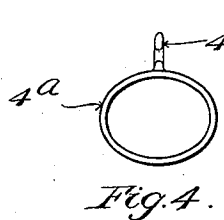
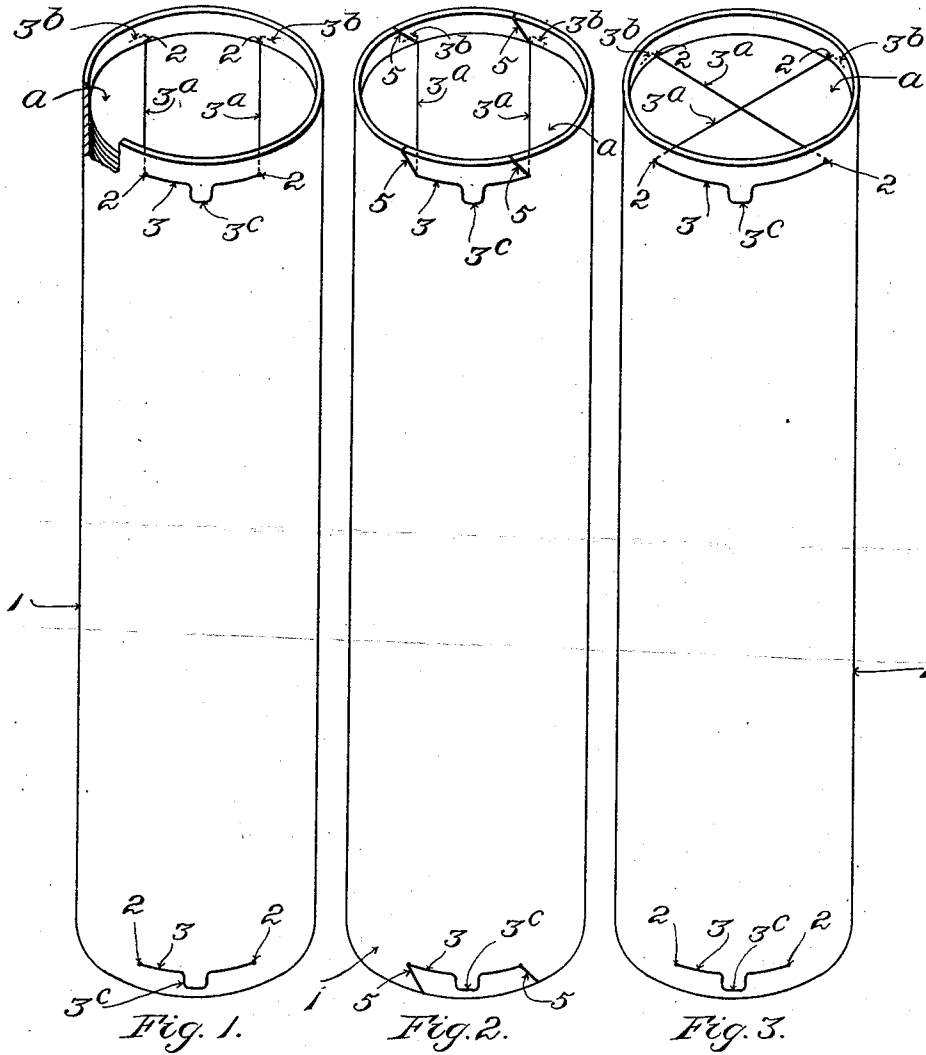


F. K. PLYMPTON.
 TUBE PACKAGE OF BOTTLE CAPS, &c.
 APPLICATION FILED JUNE 3, 1910.

1,000,970.

Patented Aug. 15, 1911.



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UNITED STATES PATENT OFFICE.

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TUBE PACKAGE OF BOTTLE-CAPS, &c.

1,000,970.

Specification of Letters Patent. Patented Aug. 15, 1911.

Application filed June 3, 1910. Serial No. 564,733.

To all whom it may concern:

Be it known that I, FREDERIC K. PLYMPTON, a citizen of the United States, residing at Wellesley, in the county of Norfolk, State of Massachusetts, have invented a certain new and useful Improvement in Tube Packages of Bottle-Caps, &c., of which the following is a specification, reference being had therein to the accompanying drawings.

In some cases, caps and stoppers for milk bottles and the like are stacked in tubes, in readiness for being placed in the magazines or feed tubes of the capping machines by which they are applied to bottles. After being packaged in the tubes they are shipped therein. The tubes are composed of paper material, and heretofore in practice, for the purpose of retaining the caps or stoppers therein, the end-portions of a tube have been bent or crimped in against the endmost caps or stoppers. The crimping is similar to that which is effected in the case of cartridges. This mode of sealing or retaining in place within the tube the caps or stoppers (hereinafter termed simply caps) has the disadvantage that it entails a material reduction in the number of caps which a sealed tube will contain. From one half of an inch to an inch of the length of a tube is crimped or turned in at each end of the latter, and as the portion thus crimped or turned-in extends a corresponding distance within the remaining portion of the tube, there is a loss of from one to two inches at each end of the tube, making a loss of from two to four inches, altogether, of the holding capacity of the tube. The opening of the tube at the capping machine is effected by taking a knife and cutting off an end of the tube at a point adjacent the crimped or turned-in part. This necessarily takes some time, and also care in order that the caps may not escape from the tube during the operation and in placing them in the capping machine. As the caps contained in the tubes are used in large quantities in the dairy business for the sealing of milk bottles and the like, which business requires the most economical methods, it is obvious that if the portion of the holding capacity of the tube which now is wasted as a result of crimping or turning-in the ends could be saved, and if a sealing or retaining device of inexpensive character capable of being quickly applied and instantly removed could

be provided, or one capable of being readily removed from a filled tube after introduction of the latter into a capping machine, much of the time heretofore required to be expended in handling the tubed caps, unsealing the tubes, and placing the caps in a capping machine, would be saved, with a corresponding increase in the speed with which the work of capping may be performed, and a correspondingly important reduction in labor cost.

The general object of the invention is to provide a retaining device for a tube containing caps as aforesaid which shall be of an inexpensive character, capable of being so used as to permit practically the entire holding capacity of the tube to be utilized, by filling the tube with caps almost to its extreme ends. Also, to provide a retaining device which shall be capable of being quickly applied as well as capable of quick and easy removal without cutting the tube, and without danger of spilling any of the caps.

A further object is to provide a retainer which will enable a filled tube to be applied to the magazine of a capping machine and the retainer then removed, so as to permit the caps to be at once utilized in the machine without the removal of the tube or any portion of the same, until the tube has become exhausted of its contents, when it may be replaced by a filled one.

The invention consists in the combination, with a tube containing caps which are stacked therein, of a removable retaining means temporarily secured at the end of such tube, bridging the interior space of the tube and holding the caps out of such end of the tube, removable by withdrawing movement transversely, and having an accessible pull-portion at one side of the tube which may be engaged or taken hold of to pull the retainer from its place. Also, in a retaining means comprising one or more lengths of material passing transversely across the tube, preferably through holes or slits in the shell of the tube at opposite sides, and lying across the outer end of the contents of the tube with the free ends temporarily secured by clenching them at the exterior of the tube, the said length or lengths removable by a pull drawing the same outward through the said holes or slits.

Inasmuch as the one or more strips or

lengths constituting the retaining means takes up but little room and admits of being applied to or immediately adjacent an end of the tube, it is made possible to utilize practically the entire holding capacity of the tube for the reception of caps.

The invention may be embodied in different forms, certain of which are shown in the drawings.

10 In the latter,—Figure 1 shows a tube filled with caps and having applied to its opposite ends retaining means of one of the said forms with a small portion of the tube removed to show the caps which are contained
15 therein. Fig. 2 is a view of a filled tube having applied to its ends retaining means of another of the said forms. Fig. 3 is a view of a tube having applied to its ends still another of the said forms. Figs. 4, 5
20 and 6 show a hand implement for use in removing the retaining devices of Figs. 1, 2 and 3.

In the different figures, 1 designates a tube, and *a* designates caps contained therein and stacked as previously described. The sealing or retaining means of each of Figs. 1, 2 and 3 is formed of wire. To each end of the tube in the said figures is applied a wire cap-retainer composed of a single piece
30 of wire, the latter being passed through holes 2, 2, Figs. 1 and 3, or slits 5, 5, Fig. 2 in the shell of the tube, with its intermediate portion 3 at the exterior of the tube at one side of the latter. The oppositely located portions or lengths 3^a, 3^a, of the said piece of
35 wire bridge the interior space of the tube, and the ends 3^b, 3^b, of such portions are bent against the exterior of the tube at the opposite side thereof so as to clench them, and thereby guard against accidental withdrawal of one or both ends and the escape of the caps from the tube. This form of
40 retainer is removed easily by taking hold of the exposed intermediate portion or back 3 and pulling thereon. A pull of moderate force will suffice to cause the clenched ends 3^b, 3^b, to straighten out, so as to draw through the holes 2, 2, or slits 5, 5 or, if the wire is fairly stiff, the said ends 3^b, 3^b, may
45 be straightened by the application of a convenient tool, so as thereby to facilitate the withdrawal of the retainer.

The withdrawal may be accomplished after a filled tube has been placed in a capping machine, within a receptacle therefor in conjunction with the cap-feeding devices of such machine, provided the said receptacle is so constructed or constituted as to expose the portion 3 of the retainer at the bottom or leading end of the filled tube, and permit the pull to take place.

The implement shown in Figs. 4, 5 and 6 consists of a hook 4 furnished with a ring 4^a which may be slipped upon the thumb (or finger) 4^b of the operator. The portion

3 of a retainer applied to a tube may be engaged by this hook and then on pulling thereon the withdrawal may be effected. To facilitate engaging the hook with the retainer, the said portion 3 of the latter may be formed with a loop 3^c into which the hook may be inserted. The said loop insures that the pulling strain shall be applied at the middle of the back of the retainer. Thereby the hook is prevented from slipping to one side or the other so as to pull out one side-portion only of the retainer, leaving the other side-portion in place.

The slits 5, 5, within which the retainer is applied in Fig. 2 are made in opposite portions of the shell of the tube 1 and lead from the edge of the shell in oblique or diagonal directions. The obliquity of the slits safe-guards against accidental disconnection of the retainer.

In Fig. 3 the retainer has its portions 3^a, 3^a, crossed with each other.

In some cases it will suffice if a retaining device embodying the invention is applied at one end, only, of a tube, and some other form of retaining device or closure may be applied to the other end. It will of course be advisable to employ at the latter end a device or closure which does not materially reduce the holding capacity of the tube.

The invention is not necessarily restricted to use in connection with caps. It may be utilized in securing the retention of other articles within tubes or the like.

As will be perceived from the foregoing, the invention is capable of being embodied in a great many forms and manners.

I claim as my invention:—

1. The combination, with a tube containing caps which are stacked therein, of a retaining means at the end of such tube, bridging the interior space thereof and engaging with the contents of the tube at such end to keep the caps from movement out of the tube at such end, removable by movement transversely, and having a pull-portion accessible at one side of the tube which may be engaged or taken hold of to pull the retainer from its place.

2. The combination with a tube containing caps which are stacked therein, of a retaining means for said caps comprising one or more lengths of material passing transversely entirely across the tube through the shell of the tube at opposite sides, lying across the outer end of the contents of the tube with the free ends temporarily secured by clenching, and removable by a pull drawing the same outward.

3. The combination with a tube containing caps which are stacked therein, of a retaining means for said caps comprising a plurality of lengths of material passing transversely across the tube at the outer end

of the contents of the tube, through the shell of the tube, with the said lengths connected together outside the tube at one side thereof and having free ends at the opposite side of the tube secured by clenching them separately at the exterior of the tube, the said retaining means removable by taking hold of the external connecting portion and pulling thereon.

4. The combination with a tube containing caps which are stacked therein, of a retaining means for said caps comprising a plurality of lengths of material passing transversely across the tube at the outer end of the contents of the tube, through the shell of the tube, with the said lengths connected together outside the tube at one side thereof and the connecting portion formed with a loop for engagement by a hook or other implement, and having their ends secured at the opposite side of the tube, the said retaining means removable by taking hold of the external connecting portions and pulling thereon.

In testimony whereof I affix my signature in presence of two witnesses.

FREDERIC K. PLYMPTON.

Witnesses:

CHAS. F. RANDALL,
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."