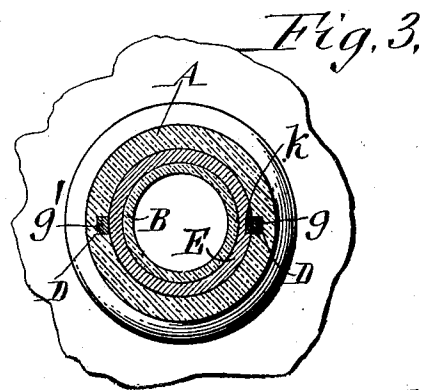
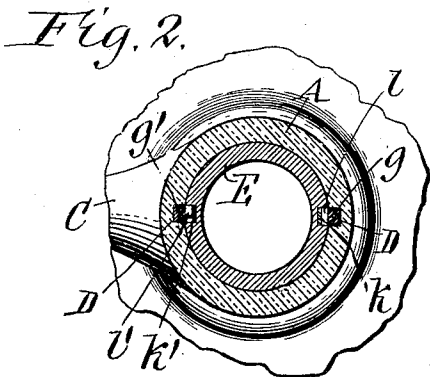
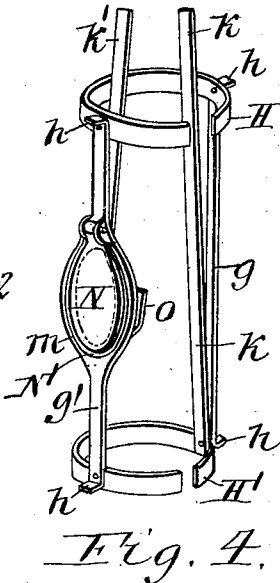
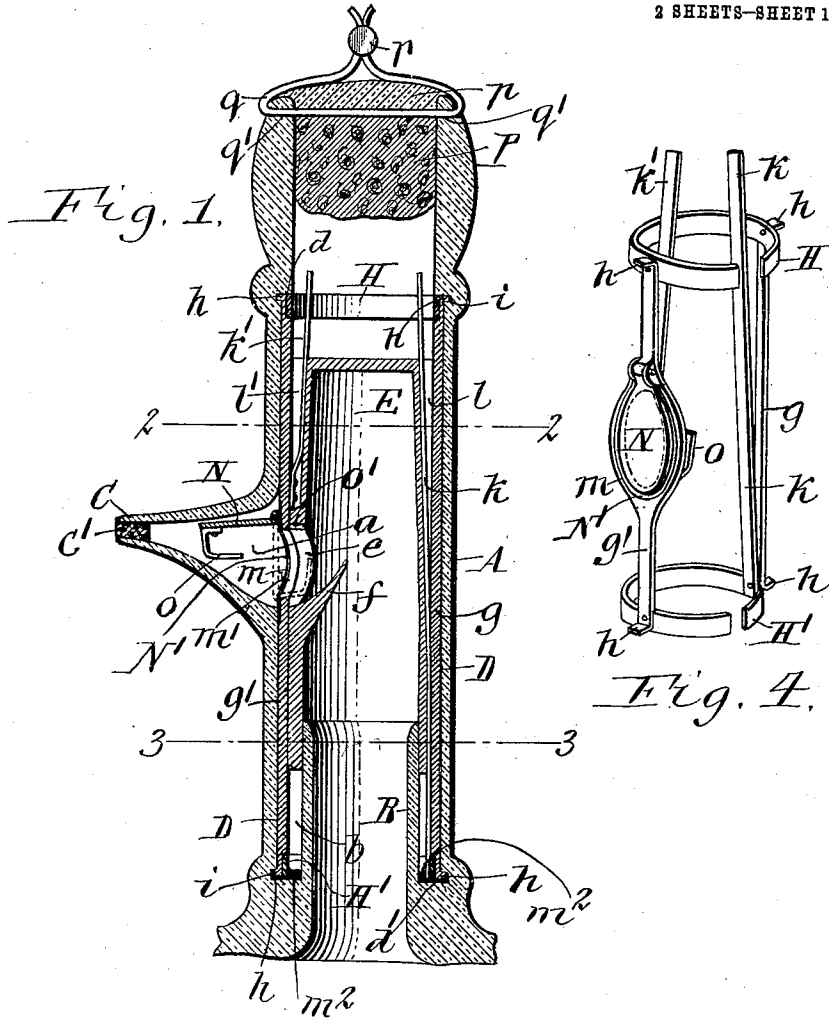


G. COLUCCI.  
 BOTTLE STOPPER.  
 APPLICATION FILED JULY 8, 1910.

977,167.

Patented Nov. 29, 1910.

2 SHEETS—SHEET 1.



Witnesses:  
 Alfred Bockenhagen.  
 Richard Sommer

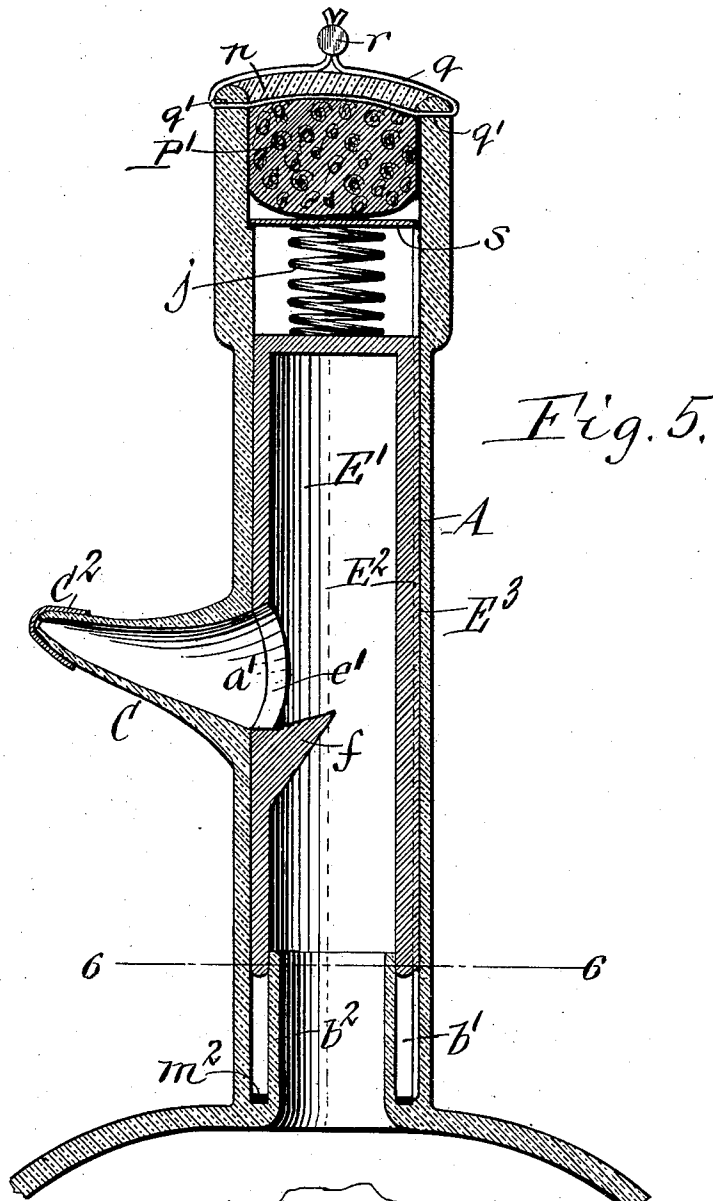
Inventor  
 Giuseppe Colucci  
 by Geipert & Topp  
 Attorneys.

G. COLUCCI.  
 BOTTLE STOPPER.  
 APPLICATION FILED JULY 8, 1910.

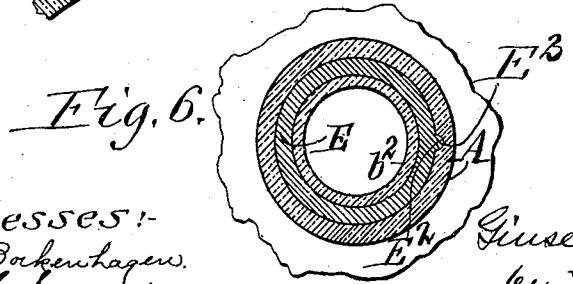
977,167.

Patented Nov. 29, 1910.

2 SHEETS-SHEET 2.



*Fig. 5.*



*Fig. 6.*

Witnesses:-  
 Alfred Barkenhagen,  
 Richard Sommer

Inventor  
 Giuseppe Colucci  
 by Super & Topp  
 Attorneys

# UNITED STATES PATENT OFFICE.

GIUSEPPE COLUCCI, OF BUFFALO, NEW YORK.

BOTTLE-STOPPER.

977,167.

Specification of Letters Patent. Patented Nov. 29, 1910.

Application filed July 8, 1910. Serial No. 571,035.

To all whom it may concern:

Be it known that I, GIUSEPPE COLUCCI, a subject of the King of Italy, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Bottle-Stoppers, of which the following is a specification.

This invention relates to a bottle stopper of that class which permits of discharging or pouring out the contents of the bottle but which renders it practically impossible to again refill the bottle through the opening from which the contents are discharged.

It is the object of this invention to provide a bottle stopper of this character which is efficient in operation and can be produced at comparatively low cost.

In the accompanying drawings consisting of 2 sheets: Figure 1 is a longitudinal section of the neck of a bottle provided with one form of my improved stopper. Figs. 2 and 3 are horizontal sections in the correspondingly numbered lines in Fig. 1. Fig. 4 is a detached perspective view of the cage or frame arranged within the neck of the bottle and provided with the springs for holding the main valve yieldingly in its closed position and also provided with the auxiliary valve. Fig. 5 is a longitudinal section showing a modification of my invention. Fig. 6 is a horizontal section in line 6-6, Fig. 5.

Similar letters of reference indicate corresponding parts throughout the several views.

Referring to Figs. 1-4, A represents the neck of the bottle which is generally of tubular or cylindrical form and provided internally at its inner end with a concentric collar or annular flange B, thereby forming an annular outwardly opening pocket *b* between the bore of the neck and the collar. About midway of the length of the neck the same is provided with an outlet port *a* which preferably opens into a nozzle or discharge nipple C which projects laterally from the side of the neck and through which the liquid is discharged from the bottle. The bore of the neck is provided with one or more longitudinal grooves D, two of such grooves being shown in the drawings. At opposite ends of these longitudinal grooves the bore of the neck is also provided with inner and outer annular or circumferential grooves *d*, *d*<sup>1</sup> which form shoulders for purposes which will presently appear.

E represents a main valve which is preferably constructed in the form of a cap or inverted cup and which is slidable lengthwise within the neck of the bottle and is arranged at its inner edge in the pocket *b*. This main valve is provided about midway of its length with an outlet port or passage *e* which is movable into and out of register with the port *a* of the neck. When the bottle is in an upright position the weight of the main valve causes the same to descend and bring its port below and out of register with the port of the neck, thereby cutting off communication between the exterior and the interior of the bottle and preventing not only evaporation of the contents of the bottle but also preventing the introduction of any liquid from the exterior to the interior of the bottle while the main valve is in this position.

For the purpose of rendering it practically impossible to pass a tube through the ports of the neck and main valve and into the body of the bottle, for the purpose of introducing liquid in the same, a baffle *f* is provided which projects from the lower edge of the port of the main valve upwardly and inwardly in an inclined position, thereby forming a sharp turn within the main valve around which it is exceedingly difficult, if not impossible, to pass any tube, wire or other instrument from the exterior of the bottle to the interior thereof for tampering with the same.

The inner edge of the main valve fits comparatively tight in the pocket *b* and thereby practically prevents any liquid from leaking through the joint between the periphery of the main valve and the bore of the neck to the port of the latter.

The main stopper is yieldingly held in a closed position by means which are preferably constructed as follows: Between the neck of the bottle and the main valve is arranged a skeleton frame or cage which preferably comprises two longitudinal bars *g*, *g*<sup>1</sup> adapted to be seated in the longitudinal grooves in the bore of the neck and two split transverse spring rings H, H<sup>1</sup>, the outer one H, of which connects the outer ends of the bars *g*, *g*<sup>1</sup> and is seated in the annular groove *d* formed in the bore of the neck at the outer end of the longitudinal groove and the other one H<sup>1</sup> of which connects the inner ends of said bars and is seated in the annular groove *d*<sup>1</sup> formed in

the bore of the neck at the inner ends of the longitudinal grooves. This cage or skeleton frame is introduced through the outer end of the bottle neck while the same is opened  
 5 and while the rings of the frame or cage are pressed together or contracted sufficiently to permit the introduction of the same into the neck of the bottle. When this cage has  
 10 been slipped inwardly into the neck of the bottle so that its longitudinal bars are in line with the longitudinal grooves of the neck and the rings are opposite the circumferential grooves thereof, the resilience of the spring rings causes them to expand and  
 15 engage with the circumferential grooves and also carry the longitudinal bars into the longitudinal grooves of the neck. When thus expanded the cage is held both against longitudinal and circumferential displacement in the neck of the bottle. If desired  
 20 each of the cage bars may be provided at its opposite ends with outwardly turned lips  $h$  which are adapted to engage with recesses  $i$  at the ends of the longitudinal grooves and thus operate as anchors for additionally  
 25 holding the cage against longitudinal displacement.

$k$ ,  $k^1$  represent two longitudinal leaf springs the rear one  $k$  of which is comparatively long and arranged between the rear  
 30 side of the stopper and the neck of the bottle while the front one  $k^1$  is comparatively short and arranged lengthwise between the outer parts of the main valve and the neck  
 35 on the front side of these parts. The rear spring  $k$  is secured at its inner end to the inner part of the cage preferably at the junction of the inner ring and the rear bar while the front spring is secured to the  
 40 front cage bar at a point above the port of the neck. These springs converge outwardly and engage with longitudinal grooves  $l$ ,  $l^1$  in the periphery of the main valve, the bottoms of these grooves converging outwardly. By this means these  
 45 springs serve not only to yieldingly hold the main valve in its closed position but also operate as a spline or key for holding the main valve against turning, thereby preventing its port from becoming displaced  
 50 circumferentially relatively to the port of the neck.

As an additional means for preventing the introduction of liquids into the bottle  
 55 through the outlet thereof, an auxiliary valve mechanism is provided which is preferably constructed as follows:  $m$  represents a valve seat formed around the outer side of a port  $m^1$  in the enlarged central part of the front cage bar  $k^1$  which port is in line  
 60 with the port of the neck of the bottle, and also the port of the main valve when the latter is open. On the outer side of the valve seat  $m$  is arranged an auxiliary valve  $N$   
 65 which is movable toward and from the seat

$m$ . This auxiliary valve is preferably constructed in the form of a disk and is pivoted at its upper end to the outer side of the front bar  $k^1$  so as to be capable of swinging  
 70 vertically. In the upright position of the bottle the auxiliary valve drops by gravity into engagement with the valve seat  $m$  and closes the port in the cage, as shown by dotted lines in Fig. 1. For producing a  
 75 tight joint below the valve  $N$  and the seat  $m$  the latter is provided with a facing of rubber  $N^1$  or similar material, as shown in Figs. 1 and 4. Upon tipping the bottle with its discharge nozzle down for the purpose of discharging the liquid therefrom,  
 80 the auxiliary valve swings away from the port  $m^1$  in the cage, as shown by full lines in Fig. 1, thereby permitting the free escape of the liquid from the bottle. While the auxiliary valve is closed, it operates as a  
 85 baffle to prevent the introduction of any tools into the bottle for manipulating the same in such a way as will permit the introduction of liquids into the same through the discharge nozzle. In order to prevent  
 90 the main valve  $E$ , which is preferably made of glass from breaking when the same closes, the bottom of the pocket  $b$  is provided with a cushion  $B^1$  of rubber or other elastic material for the lower edge of the  
 95 valve  $E$  to engage with as it drops into its closed position.

In order to positively lock the auxiliary valve in its closed position when the bottle is upright, this valve is provided on its inner  
 100 side with an upwardly projecting hook  $o$  which is adapted to swing through the port of the cage and the port of the main stopper and to be engaged by the upper edge of the main valve port, as represented by dotted  
 105 lines in Fig. 1, thereby locking the auxiliary valve in its closed position. Upon tipping the bottle so that its discharge nozzle points downwardly, the pressure of the fluid against the main valve first moves the same  
 110 outwardly lengthwise of the neck, thereby releasing the upper edge of the main valve port from the hook of the auxiliary valve and then the latter is free to swing outwardly by gravity and the pressure of the  
 115 liquid against the same from the position shown by dotted lines in Fig. 1 to the position shown in full lines therein, whereby the hook  $o$  is moved out of the ports of the main valve and cage and the liquid is free to  
 120 escape. The upper edge of the port in the main valve is preferably provided with a notch  $o^1$  which receives the hook  $o$  and thus permits the main valve to shut tight when lowered.  
 125

The liquid is originally introduced into the bottle through the outer or the upper end of the neck in the usual manner, this end of the neck being open at this time for  
 130 this purpose. After the bottle has been

filled the cage and the main and auxiliary valves are inserted into the neck through the open upper end thereof and then this end of the neck is closed by a cork P. To prevent tampering with the cork without the fact becoming known, a seal  $p$  of wax or similar material is applied to the top of the cork and a wire  $q$  is passed over the top of the cork and through openings  $q^1$  in the side of the neck and the ends of the wire are brought together and united by means of a soft metal seal  $r$ .

In the construction shown in Figs. 5 and 6 only a main valve  $E^1$  of cup-shaped form is employed which slides lengthwise in the bore of the bottle neck and the same engages at its inner edge with a pocket  $b^1$  which is formed between the bore of the neck and a concentric collar  $b^2$  arranged within the inner part of the neck. This main valve also has a port  $e^1$  in its side which moves into and out of register with a port  $a^1$  in the side of the bottle neck.

In this modified construction the main valve is held yieldingly in its closed position by means of a spring  $j$  interposed between the upper end of the main valve and a plate  $s$  bearing against the underside of the cork  $P^1$ .

In the normal or upright position of the bottle the main valve  $E^1$  drops by gravity aided by the pressure of the spring  $j$ , whereby the port of the main valve is moved downwardly out of register with the port of the neck, thereby closing the bottle. Upon tilting the bottle with its nozzle pointing downwardly the pressure of the liquid moves the main valve outwardly against the resistance of the spring  $j$  thereby bringing the port of the main valve into register with the port of the neck and permitting the escape of the liquid to the nozzle.

The valve  $E^1$  is free to slide lengthwise for opening or closing the same but is prevented from turning by means of a spline  $E^2$  arranged lengthwise of the valve and engaging with a groove  $E^3$  in the neck of the bottle, thereby preventing displacement of the ports  $e^1$ ,  $a^1$ .

When shipping the bottles the nozzles C may be closed by a small cork  $C^1$ , as shown in Fig. 1, by a cap  $C^2$ , as shown in Fig. 5, or by any other suitable means to prevent spilling the contents of the bottles.

My improved bottle stopper is efficient in operation and can be produced at comparatively low cost, thereby rendering the same well suited for that class of trade in which it is desirable to prevent the refilling of the bottles after the original contents have been removed therefrom.

I claim as my invention:

1. The combination of a bottle having a neck provided in its side with a port, and a cup-shaped valve slidable lengthwise in the

neck and provided in its side with a port which is adapted to register with the port of the neck and also provided at the inner edge of its port with an inwardly projecting baffle.

2. The combination of a bottle provided with a neck having a port in its side and also provided in its bore with longitudinal grooves and annular grooves at the inner and outer ends of the longitudinal grooves, a cage comprising longitudinal bars arranged in said longitudinal grooves and split rings connecting the inner and outer ends of said bars and seat in said annular grooves, longitudinal leaf springs secured at their inner ends to said cage and converging outwardly, and a cup-shaped valve slidable lengthwise with said neck and cage and having a port in its side adapted to register with the neck port and also provided on its outer side with longitudinal grooves which receive said springs.

3. The combination of a bottle provided with a neck having a port in its side and also provided in its bore with longitudinal grooves and annular grooves at the inner and outer ends of the longitudinal grooves, a cage comprising longitudinal bars arranged in said longitudinal grooves and split rings connecting the inner and outer ends of said bars and seat in said annular grooves, longitudinal leaf springs secured at their inner ends to said cage and converging outwardly, a cup-shaped valve slidable lengthwise with said neck and cage and having a port in its side adapted to register with the neck port and also provided on its outer side with longitudinal grooves which receive said springs, said cage having one of its bars provided with a port in line with the port of the neck, and an auxiliary valve pivoted on said cage and adapted to close the port of said cage bar.

4. The combination of a bottle provided with a neck having a port in its side and also provided in its bore with longitudinal grooves and annular grooves at the inner and outer ends of the longitudinal grooves, a cage comprising longitudinal bars arranged in said longitudinal grooves and split rings connecting the inner and outer ends of said bars and seat in said annular grooves, longitudinal leaf springs secured at their inner ends to said cage and converging outwardly, a cup-shaped valve slidable lengthwise with said neck and cage and having a port in its side adapted to register with the neck port and also provided on its outer side with longitudinal grooves which receive said springs, said cage having one of its bars provided with a port in line with the port of the neck, and an auxiliary valve pivoted on said cage and adapted to close the port of said cage bar and provided on its inner side with a hook which is adapted to be engaged by

the upper edge of the main valve port in the closed position of said valves.

5 The combination of a bottle having a neck provided in its side with a port, a main valve slidable lengthwise in the neck and provided in its side with a port adapted to register with the port of the neck, a cage arranged between the neck and main valve and having a port in line with the neck port, 10 and an auxiliary valve adapted to close the port of the cage.

6. The combination of a bottle having a neck provided in its side with a port, a main valve slidable lengthwise in the neck and 15 provided in its side with a port adapted to

register with the port of the neck, a cage arranged between the neck and main valve and having a port in line with the neck port, and an auxiliary valve pivoted on the cage and adapted to close the port of the cage and 20 provided on its inner side with an upwardly turned hook which is adapted to be engaged by the upper edge of the port of the main valve in the closed position of the valves.

Witness my hand this 5th day of July, 25 1910.

GIUSEPPE COLUCCI.

Witnesses:

D. J. CHRISTIANO,

THEO. L. POPP.