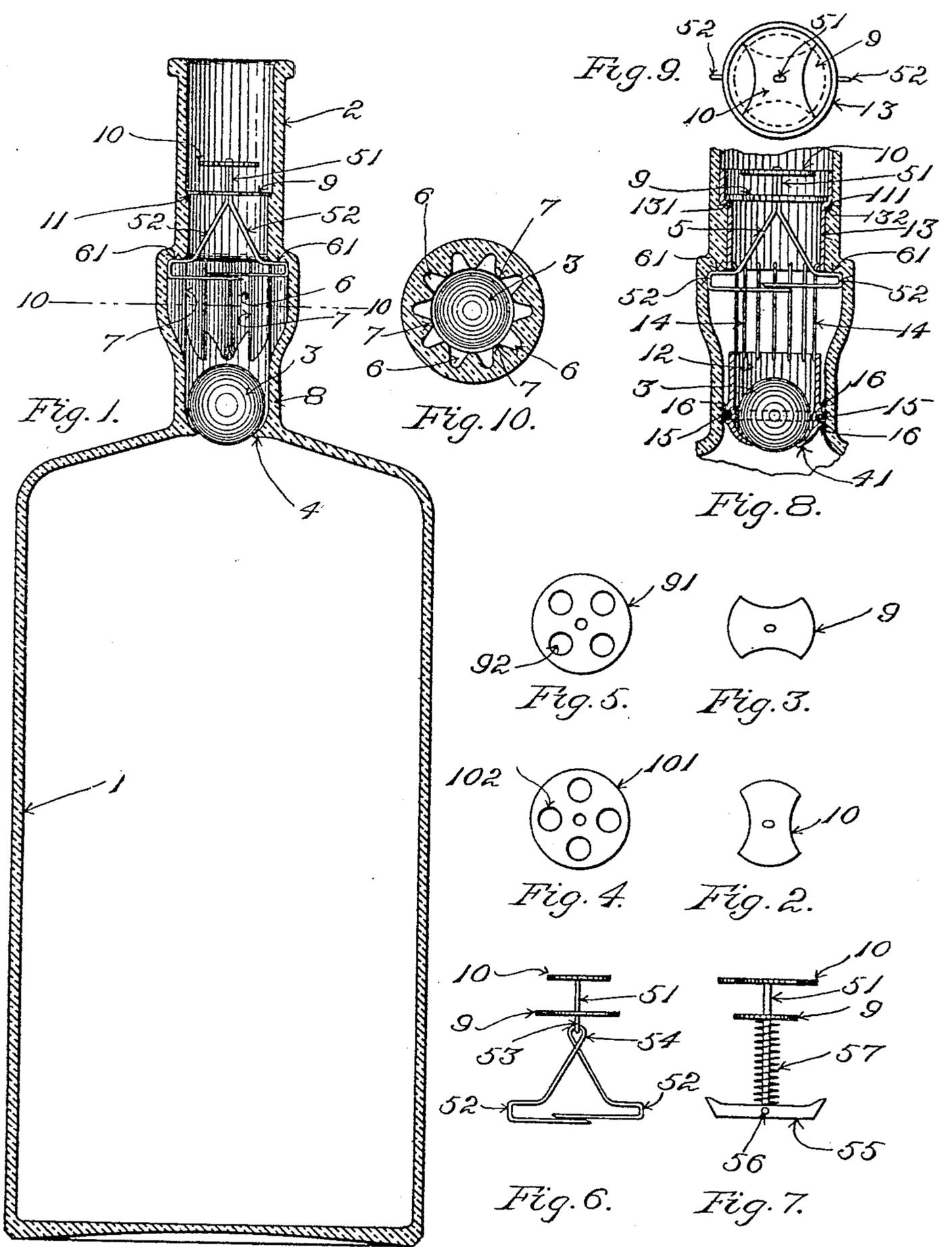


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PATENTED MAY 29, 1906.

D. BRUMMERHOP.
NON-REFILLABLE BOTTLE.
APPLICATION FILED NOV. 8, 1904.



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UNITED STATES PATENT OFFICE.

DIEDRICH BRUMMERHOP, OF BOSTON, MASSACHUSETTS.

NON-REFILLABLE BOTTLE.

No. 822,181.

Specification of Letters Patent.

Patented May 29, 1906.

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To all whom it may concern:

Be it known that I, DIEDRICH BRUMMERHOP, a citizen of the United States, residing at Boston, in the county of Suffolk, State of Massachusetts, have invented a certain new and useful Improvement in Non-Refillable Bottles, of which the following is a specification, reference being had therein to the accompanying drawings.

10 The invention consists in means of novel and improved character for preventing or rendering impracticable the refilling of bottles after having been emptied of their original contents.

15 The principles of the invention are capable of being embodied in various forms, certain of which are shown in the accompanying drawings.

In the drawings, Figure 1 shows one embodiment of the invention and represents a bottle in vertical transverse section. Figs. 2 and 3 are views in plan of the two guards which are employed in connection with the anchor valve-retainer. Figs. 4 and 5 are like views of guards of a modified form. Fig. 6 shows in side elevation a modified form of valve-retainer. Fig. 7 is a similar view of another modified form of valve-retainer. Fig. 8 shows in vertical section a modification employing a separate cage which is adapted for insertion within the neck of a bottle. Fig. 9 shows the said cage in plan. Fig. 10 is a view in cross-section on the dotted line 10 10 in Fig. 1.

35 Having reference to the drawings, a bottle is represented at 1, Fig. 1, it having one embodiment of the invention applied thereto. The neck of the said bottle is designated 2. For the purpose of a seal to prevent the inflow of liquids into the bottle a movable valve, as 3, Fig. 1, is placed within the said neck, the said valve working against a suitable seat, as 4. The form of the said valve may vary in some instances. Preferably a ball is used for the purpose, as in the drawings. The seat 4 is constituted in Fig. 1 of an annular ridge or rim projecting inwardly into the passages through the neck of the bottle, the said ridge or rim being integral with the bottle and produced in the molding of the latter. The fit of the valve and valve-seat to each other is such that when the former is pressed by its own gravity or otherwise against the latter the inflow of liquid into the body portion of the bottle is completely or practically prevented, but without tendency

of the valve to bind in place, so as to prevent the valve from being moved away from the valve-seat by the pressure of the contents of the bottle when the bottle is tilted for the purpose of pouring out the said contents. This fit is secured by forming the valve and the opening of the valve-seat of such relative proportions that diametrically opposite sides of the valve subtend an angle somewhat more obtuse than that subtended by corresponding portions of the valve-seat. Consequently the valve rests upon the valve-seat instead of becoming crowded within the same and is free from liability to wedge or stick in place. The valve 3 is left free to move within the neck of the bottle in the direction of the length of the said neck from the valve-seat toward the mouth of the bottle, and vice versa. The movement of the valve toward the mouth is limited in extent by the valve-retainer 5, which occupies a position within the passage of the neck and is anchored in place therein.

80 When the bottle is tilted from the vertical position, the valve is carried by gravity or the pressure of the contents of the bottle against the valve-retainer. Free escape of the contents past the valve in such position of the latter is provided for by means of grooves or passage-ways 6 6, which in the embodiment of the invention which is shown in Fig. 1 are formed in the interior surface of the neck of the bottle and extend lengthwise of the neck. The ridges or elevations 7 7 intervening between the said grooves or passage-ways and also extending lengthwise of the neck serve to keep the valve central while it is adjacent the valve-retainer. The high portions of the said ridges or elevations constitute straight continuations of the inner surface of the portion 8 of the neck which is adjacent the valve-seat. The said high portions are parallel with one another and with the length of the neck of the bottle, so that the clear space which is surrounded by the series of ridges or elevations and by the portion 8 of the neck of the bottle and which constitutes the race within which the valve is free to move longitudinally of the neck is of uniform diameter throughout the length thereof. There is no enlargement of the said space which when the bottle is turned into a horizontal or inclined position constitutes a depression or pocket within which the valve may lodge and remain while liquid is caused to flow past the same into the bot-

tle. Consequently there is no opportunity for the valve to lodge or catch adjacent the valve-retainer, and should it be attempted to pour liquid into the bottle with the valve in such position the flow of the liquid against the valve would promptly act upon the latter to carry it against its seat, thus closing the bottle against the admission of such liquid.

The valve-retainer is furnished with two or more oppositely-located outwardly-extending projections to engage with shoulders within the passage of the neck of the bottle. By means of such engagement the valve-retainer is anchored and locked against withdrawal. In the case of the illustrated embodiments of the invention the valve-retainer is furnished with two of the said projections engaging with a corresponding number of shoulders, although the precise number of projections is not material. In Fig. 1 the valve-retainer has a stem 51, which is formed of stiffish spring material, the said stem being furnished with opposite arms 52 52, which incline downwardly and away from each other and then are formed with squarely-bent portions, which enter certain of the grooves or passage-ways 6 6 and hook against shoulders 61 61, that are formed at the upper ends of the said grooves or passage-ways. In inserting the valve-retainer into the neck of the bottle the arms of the valve-retainer are pressed toward each other until they will enter the passage of the neck. When the projections of the said arms arrive at the grooves or passage-ways which they are intended to enter, the arms spring outward, carrying the said projections into such grooves or passage-ways.

For the purpose of preventing a wire or the like from being inserted into the passage of the neck of the bottle to engage with the valve, so as to hold it from its seat while liquid is being caused to enter the bottle, guards 9 and 10 are provided. (See Figs. 1, 2, and 3.) The said guards are secured to the stem 51 of the valve-retainer. Each thereof in the said figures corresponds in shape with a disk having opposite-curved segments removed. The length of each guard corresponds with the diameter of the outer portion of the passage of the neck. The spaces which are left by the removal of the said segments leave openings, which permit free outflow of the contents of the bottle past the guards. The lengths of the two guards extend in directions at right angles to each other, so that the ends of the outer guard 10 cover the spaces or openings which exist at opposite sides of guard 9, and vice versa. Briefly stated, the solid portions and openings or notches of the two guards break joints or are staggered with relation to one another. These relative positions are indicated in Figs. 1, 2, and 3. Thereby it is rendered impossible to introduce a wire for the purpose of

either holding the valve away from its seat or disengaging the valve-retainer.

Figs. 4 and 5 show a modified form of guards, which comprises disks 91 101, having holes 92 102 therethrough. The holes of one disk are staggered with relation to those of the other for the purpose stated.

Fig. 6 shows a form of valve-retainer in which the inner portion or anchor is formed in a separate piece from the stem 51, the said inner portion having an eye or loop 54, which is hung upon a hook or pin at the inner end of the stem 51.

Fig. 7 shows a form of valve-retainer in which the stem 51 is longer than in the forms already explained, the inner end thereof having connected therewith by a pivot 56 a cross-bar 55, the opposite extremities of which are designed to engage with the shoulders 61 61 of the neck of the bottle. An expanding spiral spring 57 surrounds the stem 51, it being compressed between guard 9 and the cross-bar 55 and its lower end bearing against the said cross-bar at points on opposite sides of the pivotal axis. In inserting this last form of anchor into the passage of the neck of a bottle the cross-bar 55 is turned upon its pivot 56 into a position somewhat approaching parallelism, with stem 51 compressing the spring somewhat, and then the cross-bar and stem are pushed endwise into the said passage. As soon as the cross-bar has been passed in far enough to enable its ends to swing into the desired grooves or passage-ways 6 6 the said ends are caused to enter the latter by the action of spring 57 in expanding. In the case of all these forms of valve-retainer one of the guards—for instance, the inner guard 9—takes bearing against a shoulder, as 11, Fig. 1, with which the interior surface of the neck of the bottle is furnished and is held thereagainst through the engagement of the anchor with the shoulders 61 61.

Figs. 8 and 9 show an embodiment of the invention in which the valve, anchor, and guards are combined with a cage, forming thus an assemblage which in its entirety is adapted to be inserted into a neck of a bottle. The cage comprises a lower cylinder 12, to contain the valve 3, an upper cylinder 13, and a series of wires or strips 14, joining the two cylinders together. The two cylinders are formed of metal or other suitable material. The lower cylinder 12 contains the valve 3 and is formed with the valve-seat 41. The wires or strips 14 and the spaces between them serve the same purposes as the longitudinal ribs or ridges 7 7 and the grooves 6 6 intermediate the same in Fig. 1. The anchor 5 of Figs. 8 and 9 is similar to that of Fig. 1; its opposite projecting portions 52 52 extending through opposite spaces between wires or strips 14 and engaging with shoulders 61 61, with which the neck of the bottle is furnished, essentially as in the

case of the devices of Fig. 1. Thereby the cage is retained securely in place within the neck of the bottle. The ends of the lower guard 9 rest upon an interior shoulder 131, with which the cylinder 13 is formed, while the said cylinder itself is supported within the passage of the neck of the bottle through the engagement of its external shoulder 132 with the shoulder 111 of the said neck. It will be perceived that the anchor valve-retainer in Figs. 8 and 9 serves to hold the cage from being withdrawn from the passage of the neck of the bottle. For the purpose of preventing flow of liquid through the space intervening between the exterior of the lower cylinder 12 and the adjoining inner surface of the neck of the bottle a packing-ring or gasket 15 is fitted upon the exterior of the said lower cylinder, it being retained in place by annular ridges 16 16, which project at the exterior of the cylinder 13 or in other convenient manner.

It will be understood that at the time the operation of filling a bottle is performed the valve, valve-retainer, &c., are absent from the passage of the neck of the bottle. After the filling has been completed the valve is dropped into place, and the other parts are then introduced and secured in operative position. Thereafter the valve is protected from being tampered with, and the other parts are effectually secured in place.

I claim as my invention—

1. The non-refillable bottle having the movable valve, the valve-seat, the raised guides extending lengthwise of the bottle-neck parallel with one another throughout their length and constituting a race of uniform diameter within which the said valve is confined, and having longitudinal spaces between such guides for the flow of liquid past the valve when the latter is separated from its seat, the retaining-shoulder at the outer ends of the said guides and an adjacent guard-supporting shoulder, and the anchor-retainer having opposite projections engaging with the retaining-shoulder and also having a guard device to preclude access to the interior parts, the said guard device engaging with the said guard-supporting shoulder.

2. The non-refillable bottle having the movable valve, the valve-seat, the raised

guides extending lengthwise of the bottle-neck parallel with one another throughout their length and constituting a race of uniform diameter within which the said valve is confined, and having longitudinal spaces between such guides for the flow of liquid past the valve when the latter is separated from its seat, the retaining-shoulder at the outer ends of the said guides and an adjacent guard-supporting shoulder, and the anchor-retainer having opposite projections engaging with the retaining-shoulder and also having the guards 9 and 10 to preclude access to the interior parts, one of the said guards engaging with the said guard-supporting shoulder.

3. The non-refillable bottle having the movable valve, the valve-seat against which the said valve rests without wedging therein, the raised guides extending lengthwise of the bottle-neck parallel with one another throughout their length and constituting a race of uniform diameter throughout its length within which the said valve is confined, and having longitudinal spaces between such guides for the flow of liquid past the valve when the latter is separated from its seat, the retaining-shoulder at the outer ends of the said guides, the anchor-retainer engaging with the said shoulder, and the guard device.

4. The non-refillable bottle having the movable valve, the valve-seat, the guides extending lengthwise of the bottle-neck and equidistant throughout their length diametrically of the bottle-neck to constitute a race of uniform diameter within which the said valve is confined, and having intervening spaces between such guides to form passages through which the contents of the bottle may flow around the valve when the latter is separated from its seat, the retaining-shoulder at the outer ends of the said guides, an adjacent guard-supporting shoulder, the anchor-retainer having opposite projections engaging with the retaining-shoulder, and the guard device.

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

DIEDRICH BRUMMERHOP.

Witnesses:

CHAS. F. RANDALL,
EDITH J. ANDERSON.