Jan. 29, 1957 S. M. CROCE 2,779,628

ATOMIZER CONSTRUCTION

Filed Oct. 19, 1954 3 Sheets-Sheet 1

Fig. 1.

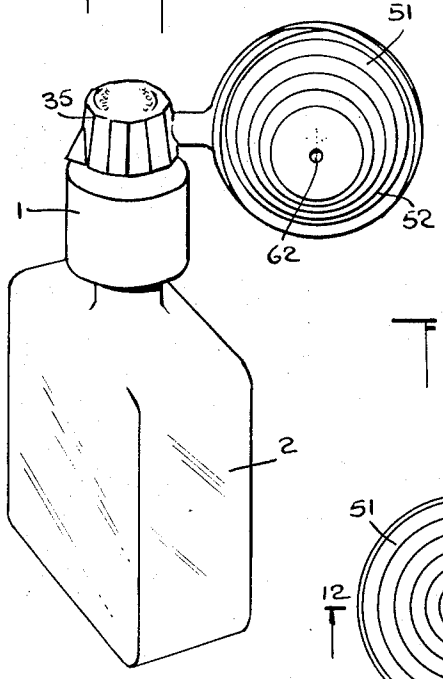


Fig. 3.

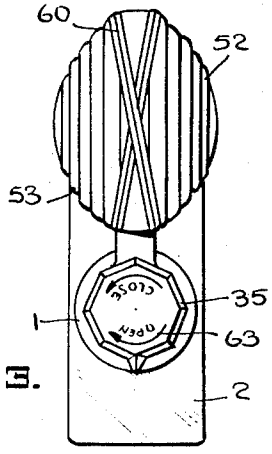


Fig. 2.

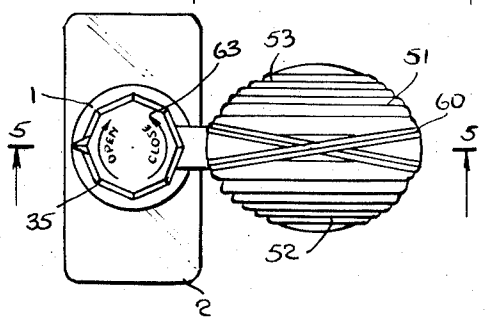


Fig. 4.

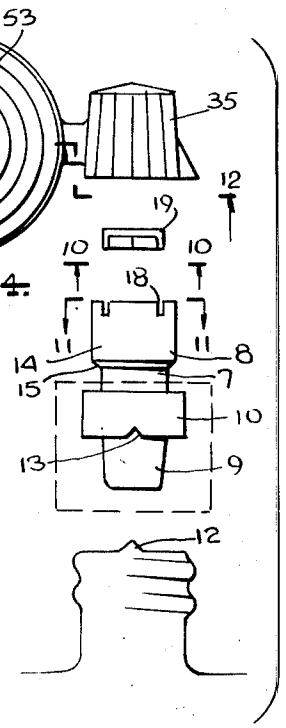
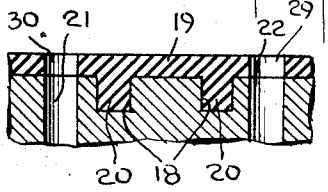


Fig. 5.



INVENTOR.

Sarty M. Croce

BY

R. Negren Parker

ATTORNEY

Jan. 29, 1957 S. M. CROCE 2,779,628

ATOMIZER CONSTRUCTION

Filed Oct. 19, 1954 3 Sheets-Sheet 2

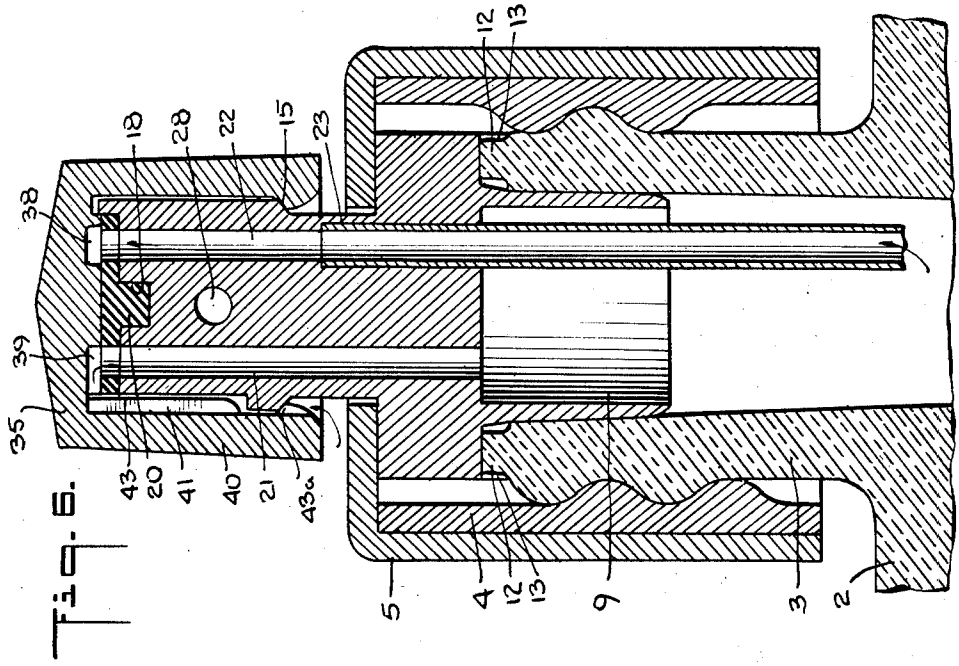


Fig. 6.

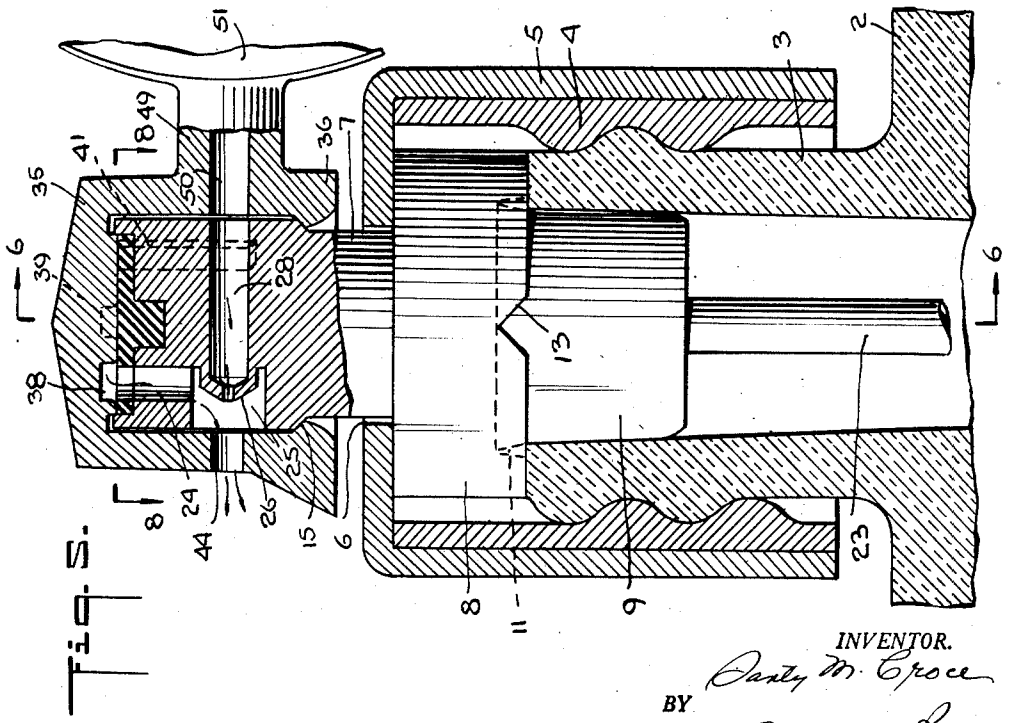


Fig. 5.

INVENTOR.
Stanley M. Croce
BY
R. Alpen Baker
ATTORNEY

Jan. 29, 1957 S. M. CROCE 2,779,628

ATOMIZER CONSTRUCTION

Filed Oct. 19, 1954 3 Sheets-Sheet 3

Fig. 12.

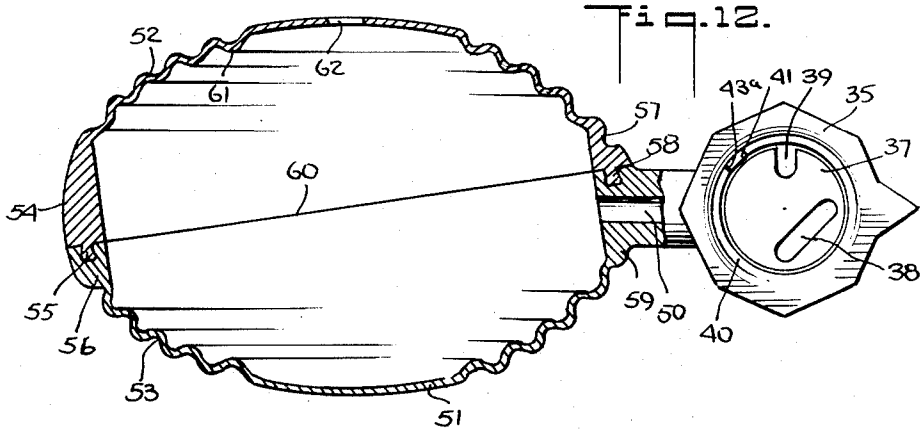


Fig. 8.

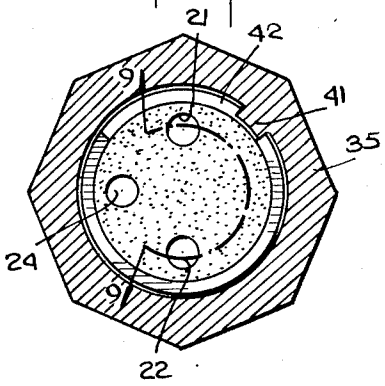


Fig. 11.

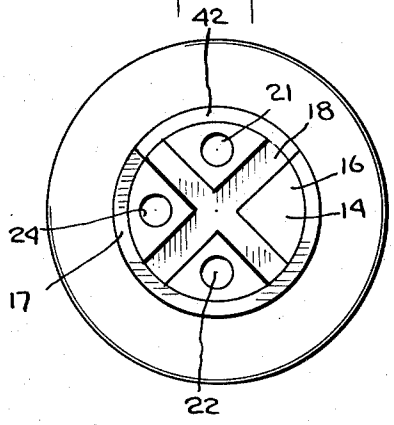


Fig. 7.

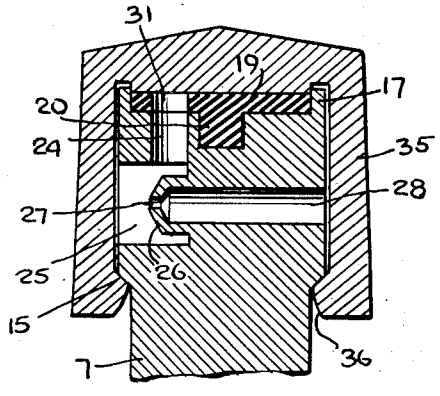
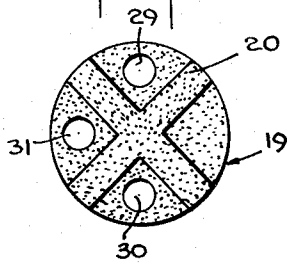


Fig. 10.



INVENTOR.

Sanly M. Croce

BY

A. Alpheus Baker

ATTORNEY

United States Patent Office 2,779,628
Patented Jan. 29, 1957

2,779,628

ATOMIZER CONSTRUCTION

Santy M. Croce, Hauppauge, N. Y., assignor to Coty, Inc., New York, N. Y., a corporation of Delaware

Application October 19, 1954, Serial No. 463,299

6 Claims. (Cl. 299—88)

This invention relates to perfume atomizers and is a continuation in part of my application Serial No. 370,097, filed July 24, 1953, now Patent No. 2,755,132.

The atomizer of this application constitutes an improvement over my prior structure in that the construction is considerably simplified so as to reduce expenses of manufacture, in addition to which, assembling and operating advantages are provided. Specifically, the atomizer, is for the most part, substantially a two-piece structure, such a structure being novel and offering considerable manufacturing advantages. In actuality, the atomizer also includes a separate gasket and a two-piece bulb but these features are not considered to derogate from the essentially two-piece nature and the simplicity of the device.

In addition to the improvement in the construction of the atomizer passage elements as will hereinafter be shown, the invention discloses an integral form of dispensing bulb which is molded of deformable plastic material and integrally connected to the atomizer head. The bulb is so molded that it does not interfere with the simultaneous molding of atomizer passages in the atomizer head.

The invention will further be understood from the following description and drawings in which:

Figure 1 is a perspective view of a bottle with the atomizer connected thereto and showing the apparatus in an operative or open position;

Figure 2 is a top plan view thereof;

Figure 3 is a top plan view but illustrating the atomizer as turned to the closed position;

Figure 4 is an exploded view of the atomizer elements;

Figure 5 is an enlarged cross-sectional view as taken along the lines 5—5 of Figure 2;

Figure 6 is a cross-sectional view as taken along the line 6—6 of Figure 5;

Figure 7 is a cross-sectional view of the atomizer structure in the closed position;

Figure 8 is a cross-sectional view as taken along the line 8—8 of Figure 5;

Figure 9 is a cross-sectional view as taken along the line 9—9 of Figure 8;

Figure 10 is an enlarged view as taken along the line 10—10 of Figure 4;

Figure 11 is an enlarged view as taken along the line 11—11 of Figure 4; and

Figure 12 is a view as taken along the line 12—12 of Figure 4.

The sealing and atomizing unit referred to collectively as 1 is applied to a bottle 2 containing perfume. The bottle 2 has a threaded neck 3 (Figure 5) which is engaged by the cap insert or liner 4, said liner 4 being press-fitted into the metallic outer shell 5. The liner 4 may be of plastic or cardboard as is conventional.

The outer cap 5 has a central opening 6 formed in the top wall thereof and extending through said opening is the neck 7 of the bottle stopper 8. Stopper 8 is an elongated member as illustrated in Figure 4 and it comprises varying formations along its length to accomplish the required purposes. Thus, the base of stopper 8 is a hollow plug 9 which enters and plugs up the bottle. This is followed by a diametrically enlarged disk portion 10. Between the under side of disk 10 and the upper portion of plug 9 is an annular undercut 11 which permits some shifting of the plug 9 relative to disk 10. It will be understood that stopper 8 is of somewhat resilient plastic such as nylon or polyethylene. Thus, the recesses 11 permit the plug 9 and disk 10 to shift relatively in accordance with slight variations in the form of bottle necks or any similar irregularities which might interfere with a proper seal. As will be noted in Figure 4, the top of bottle neck 3 is formed with a projection 12. These are designed to fit into the notches 13 in disk 10 so as to locate or correctly orient the stopper 8 within the bottle neck.

The disk 10 is followed by the neck 7 which includes the enlarged upper neck portion 14. Upper neck portion 14 has an annular bevel 15 on its lower end so as to engage the atomizer head as will be hereinafter explained. The top face of portion 14 is formed by an annular depression 16 defined or bounded by an arcuate rim 17 which extends around 320° of a circle as illustrated in Figure 11. The top face 16 of portion 14 is formed with crossed, depressed grooves 18 which serve to seat the gasket 19. Gasket 19 may be of rubber or resilient plastic material. It is formed with crossed ribs 20 which fit into the depressions 18, the depressions 18 and ribs 20 providing four quadrants at the top face of the portion 14.

Stopper 8 is formed with parallel, elongated, vertical passages 21 and 22. Within passage 22 is fitted a flexible plastic tube 23 which is submerged in the perfume and tends to draw the perfume up into passage 22 when the atomizer is operated thus functioning somewhat as a wick. Passage 21 is an air vent passage and both said passages communicate at their lower ends with the interior of the bottle. The upper ends of the passages terminate on the top face 16 of portion 14 as illustrated in Figure 11.

Portion 14 is further formed with a third passage 24 which communicates with a discharge chamber 25. Within chamber 25 is formed a discharge nozzle 26 having an opening 27. The discharge nozzle is integral with the portion 14 and has a transverse longitudinal passageway 28 which is adapted to register with the bulb passage as will be hereinafter described.

The ribs 20 of the gasket 19 are press-fitted into the grooves 18 of the top face 16 of portion 14 and the gasket is thus maintained in place by the grooves 18 and the arcuate rim 17. Gasket 19 has three openings 29, 30 and 31. Gasket opening 29 registers with passage 22, opening 30 registers with passage 21, and opening 31 registers with passage 24. The top face of gasket 19 is planar apart from the three openings.

The upper neck portion 14 frictionally supports the atomizer head 35. Head 35 is formed with a lower inwardly directed annular rib 36 which engages neck portion 14 by snapping under the annular bevel 15 thereof. The top wall 37 of head 35 is formed on its underside with an elongated, centrally offset, horizontal groove or passageway 38, and a laterally disposed groove or passageway 39.

The inner wall of the depending skirt 40 of head 35 is formed with a key 41 which is adapted to rotate within a 90° discontinuity 42 defined by the ends of arcuate rim 17. In this manner, the head 35 is permitted to rotate relative to stopper 8, such rotation producing either the open or closed positions of the atomizer.

In the open position of the atomizer, the passage 21 registers with groove 39 and, through a passageway formed by spaces 43 and 43*a*, provides air venting to the bottle for the usual reasons. At the same time, passage 22 registers with one end of elongated groove or passage-

way 38. The other end groove of slot 38, as shown in Figure 5, then registers with passage 24 of upper neck portion 14 which, as above stated, communicates with discharge chamber 25. Thus, passageway 38 spans and thus connects passage 24 with passage 22 and serves as a discharge passageway.

In the open position of the atomizer as shown in Figure 5, discharge chamber 25 registers with discharge outlet 44 which is formed through the depending skirt of head 35. Accordingly, perfume may be actuated by the atomizer structure up through tube 23, passage 22, across elongated groove 38, into passageway 24, discharge chamber 25, and discharge outlet 44. Such perfume will be atomized when discharged or dispensed as will hereinafter be made clear.

When the head 35 is rotated so that the key 41 is at the opposite end of quadrant 42, one end of groove 38 no longer registers with passage 24 as illustrated in Figure 7. Likewise, the air vent groove 39 no longer registers with passage 21.

Head 35 is further provided with an air duct 49 having a passage which is in transverse alignment with discharge outlet 44 and is further adapted to be in transverse alignment with passage 28 of upper neck portion 14. When the atomizer is in the open position as illustrated in Figure 5, passage 50 registers with passage 28 and with discharge outlet 44. At the same time, since the passage 38 registers with passage 24, the conditions are set up for dispensing and atomizing perfume. Accordingly, deformation of bulb 51 produces an air flow through the transverse passage 50 and 28. This air flow, travelling through discharge nozzle 27, draws perfume through the passages 22 and 24 and dispenses it by a Venturi action through discharge outlet 44. When, however, head 35 is turned to the closed position, not only are the head grooves out of registry but the passage 50 does not communicate with transverse passage 28 so that deformation of the bulb cannot produce any perfume discharge.

The construction of the air actuating bulb 51 is of importance. It is preferably, but not necessarily, formed from nylon or other plastic material of a thinness so as to be resilient. As noted, it comprises two half shells 52 and 53 having thickened end portions. Thus, thickened end portion 54 of shell section 52 is formed with a key or dovetail 55, while thickened end portion 56 of shell 51 is formed with a slot into which the dovetail 55 snap fits.

On the inner side of the bulb 53 thickened end portion 57 of shell 52 is formed with dovetail 58 while thickened end portion 59 is formed with a corresponding slot. Air duct passage 50 further extends through end portion 59.

It will be observed that the shells 52 and 53 meet along a mold or part line 60 which lies in an inclined plane. Thus, the shell 52 is shallower at the thickened end portion 57 than it is at its outer thickened end portion 54. The other shell 53 is oppositely formed in this respect. The shell 53 is integral with the head 35, the shell 52 being snap fitted thereto. The shell 53 and head 35 are molded in one piece. It will be observed that passage 50, if extended outwardly toward thickened end portion 56, will not traverse said thickened end portion. This makes it possible to mold the shell 53 and head 35 in a molding machine while employing a pin which forms passage 50. Inasmuch as the end portion 56 of shell 51 is on one side of and does not reach to the level of passage 50, the pin of the molding machine may be withdrawn from opening 50 so as to make such molding possible. Thereafter, the shell half 52 is snapped into position, it being noted that one end connection is on one side of the passage 50 while the other or inner end connection is on the other side.

It will further be observed that the shell 53 is formed with concentric corrugations 61 as well as the conventional air vent opening 62. The purpose of corrugations 61 is to provide a spring action in the finished bulb which will tend to restore it to normal, inflated position after it is compressed or deformed to expel air through passage 50 for atomizing purposes as above set forth.

The atomizer will generally be packed in the position shown in Figure 3 where the bulb 51 and bottle 2 are in the same plane and the atomizer is in closed position. When the user desires to dispense the perfume, she will swing the bulb 51 together with integral head 35 to the position shown in Figure 2. In this action, she may be guided by the indicia 63. This will bring the dispensing and vent passages into communication and further provide the required air flow from the bulb. Accordingly, perfume will be dispensed in atomized form.

What is claimed is:

1. An atomizer for dispensing liquid from a bottle having a neck, said atomizer comprising a deformable air actuating element, an air duct connected to said deformable element so as to produce an air flow therethrough when said element is actuated, a head to which said duct is connected, said duct having an opening extending through a wall of said head, an elongated stopper member having a plurality of passages formed therein, said stopper member comprising a lowermost hollow plug adapted to enter the bottle neck, said stopper member further comprising an integral neck formed above said plug, a discharge nozzle formed integrally within said neck, said head engaging said neck and being rotatable thereon, said head being formed with passageways adapted to register with passages of said neck when said head is rotated to an open atomizer position relative to said stopper neck, said stopper neck being formed with a discharge chamber which communicates with said discharge nozzle and said head being formed with a discharge passageway adapted to register with said discharge chamber in said open atomizer position.

2. An atomizer according to claim 1 and wherein said stopper member is formed with two elongated parallel passages, one of said elongated passages being an air vent passage and the other being a perfume flow passage, said stopper neck being formed with a third passage which communicates with said discharge chamber, and said head discharge passageway being elongated and adapted to connect said perfume flow passage with said third passage in said open atomizer position.

3. An atomizer for dispensing liquid from a bottle having a neck, said atomizer comprising a deformable air actuating element, an air duct connected to said deformable element so as to produce an air flow therethrough when said element is actuated, a head to which said duct is connected, said duct having an opening extending through a wall of said head, an elongated stopper member having a plurality of passages formed therein, said stopper member comprising a lowermost hollow plug adapted to enter the bottle neck, said stopper member further comprising an integral neck formed above said plug, said passages extending to the top face of said neck, said head engaging said neck and being rotatable thereon, said head being formed with an elongated horizontal passageway adapted to span and thus connect two of said stopper member passages when said head is rotated to an open atomizer position relative to said stopper neck, a discharge outlet path communicating with the connected stopper member passages, said air flow being directed through said discharge outlet path, an integral enlargement on said stopper neck, said enlargement being formed directly above said plug and being adapted to rest upon the top of the bottle neck, said enlargement being of disk shape and being formed with an annular recess where it is connected to the top of said plug whereby said plug may have shifting movement relative thereto, and a gasket member disposed on said top face of said stopper member neck, said gasket member having openings communicating with the passages of said stopper neck.

4. An atomizer according to claim 3 and including an

arcuate rim on said top face, said rim being 320° in circumference, and a key formed on said head, said head being disposed within the 90° discontinuity of said arcuate rim and being rotatable in said continuity to either the open or closed positions of the atomizer.

5. An atomizer according to claim 4 and wherein said top face of said neck is formed with depressions, and projections integrally formed on the underside of said gasket for engaging said recesses.

6. An atomizer according to claim 5 and including a bevel formed on said neck, said head having a lowermost annular rim projecting inwardly and engaging said bevel in a rotatable snap fit.

References Cited in the file of this patent

UNITED STATES PATENTS

932,604	De Vilbiss	Aug. 31, 1909
2,283,341	Schmitt	May 19, 1942
2,578,463	Croce	Dec. 11, 1951

FOREIGN PATENTS

207,698	Germany	Mar. 8, 1909