Jan. 3, 1967 T. E. WEICHSELBAUM 3,295,523

DISPOSABLE SYRINGE WITH NOVEL REBOUNDING SQUEEZE BULB

Filed Oct. 17, 1963

FIG. 1.

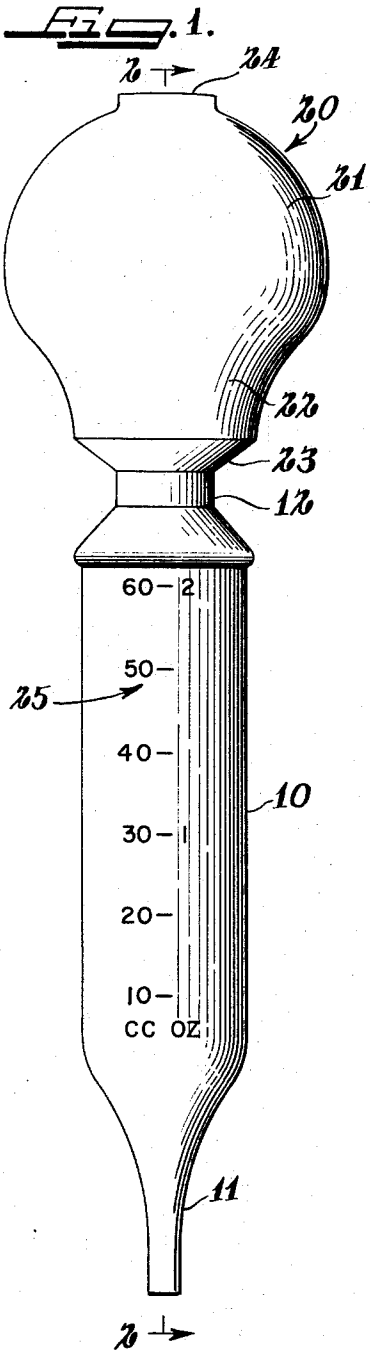
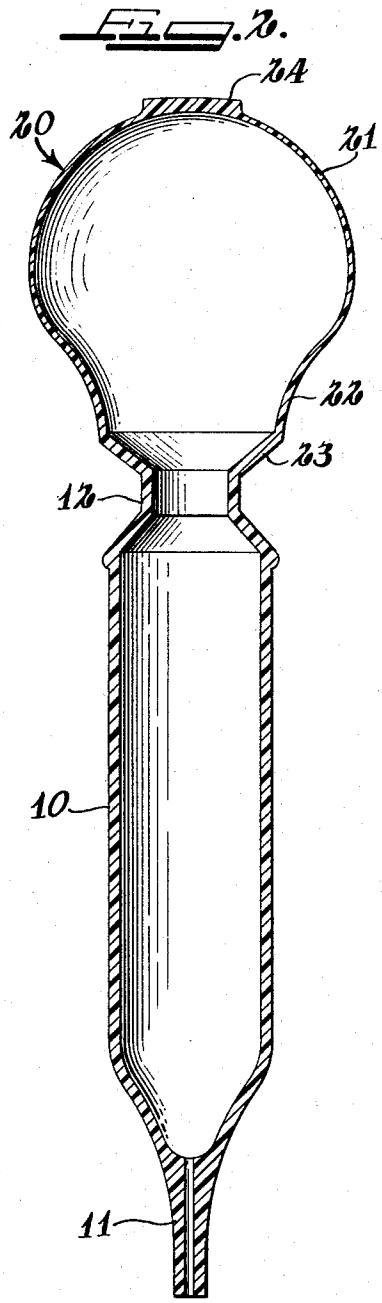


FIG. 2.



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United States Patent Office

3,295,523

Patented Jan. 3, 1967

3,295,523

DISPOSABLE SYRINGE WITH NOVEL REBOUNDING SQUEEZE BULB

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Filed Oct. 17, 1963, Ser. No. 316,885

1 Claim. (Cl. 128—232)

This invention relates to disposable syringes and more particularly to a one-piece plastic syringe.

Syringes which are equipped with a manually compressible bulb at one end are presently utilized for many uses, particularly in the medical arts. These syringes have often been constructed of a glass body and nozzle with a rubber bulb attached thereto. Other syringes have utilized plastic parts to reduce the manufacturing costs of the syringe.

The present invention reduces the cost of a syringe having a manually compressible bulb by not only utilizing inexpensive plastics for the body, nozzle, and manually compressible bulb, but also by making it of a single-piece plastic structure which is sufficiently inexpensive that it can be used once and then disposed of at a cost which is less than the labor to wash and sterilize syringes previously utilized in the medical arts.

Accordingly, an object of the present invention is to provide a new and improved syringe.

Another object is to provide a one-piece plastic syringe having a resiliently compressible hollow bulb formed as an integral part thereof.

A further object is to provide a one-piece plastic sypringe having a hollow tubular body tapering into an extended nozzle at one end and tapering into a neck at the other end and having a hollow resiliently compressible bulb integrally formed with the neck.

A principal object is to provide a one-piece plastic syringe having a tubular body, an extended nozzle at one end of the tubular body, a hollow resiliently compressible bulb at the other end of the body and integrally formed structure with said bulb which prevents it from maintaining a permanently compressed shape after all compressible force has been removed.

Further objects and advantages will become apparent from the following detailed description taken in connection with the accompanying drawings, in which:

FIGURE 1 is an elevational view of an embodiment of the present invention; and

FIGURE 2 is a sectional view of the embodiment of the invention illustrated in FIGURE 1 taken along the line 2—2.

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail, an embodiment of the invention with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiment illustrated. The scope of the invention will be pointed out in the appended claim.

With the rising cost of labor in the medical technician field, the cost of a single syringe, including utilization, sterilization and providing sterilized storage, has steadily increased. The present invention provides a syringe which, by being disposable and economical in original manufacturing costs, has a cost for each utilization which is less than that of previously known syringe structures.

Referring to the figures, a one-piece plastic disposable syringe is illustrated which may be composed of any one of a number of plastic materials and produced by any one of a number of molding methods well known to those skilled in the art. Although many materials and molding methods may be utilized to produce the syringe illustrated

in the figures, a preferred material for the syringe is acrylic ethylene copolymer, and a preferred method of molding the syringe is by the use of a blow extrusion process.

The one-piece plastic syringe is composed of a hollow tubular body **10** which tapers into an extended nozzle **11** at one end and tapers into a neck **12** at the other end. Integrally formed with these portions is a hollow resiliently compressible bulb generally indicated at **20** which is comprised of a semi-spherical portion **21**, an externally longitudinally concave portion **22** adjoining the spherical portion, a conical tapering portion **23** adjoining the concave portion **22** and also the neck **12**, and a flat disc portion **24** adjoining the semi-spherical portion **21**. The walls of the syringe are translucent and the volumetric content of the syringe may be measured by a set of volumetric indices, generally indicated at **25**, when the syringe is held in an upright position with the nozzle **11** extending downwardly.

The wall thickness of the syringe decreases from the conical portion **23** through the concave portion **22** and the semispherical portion **21**, as illustrated in FIGURE 2. The thickness of the wall of the conical portion **23** and of the disc portion **24** is substantially thicker than the wall thickness throughout the externally concave portion **22** and the semispherical portion **21**. The thinness of the wall structure in the semispherical portion **21** and the concave portion **22** allows these portions of the bulb to be particularly resilient and easily manually compressed. While these portions of the bulb **20** are being manually compressed, the conical tapering portion **23** and the disc portion **24**, having relatively thick walls, will not be compressed, but will substantially retain the form illustrated in the figures. Previous resilient compressible bulbs, which were of substantially constant wall thickness, would often remain in a compressed position with half of their semispherical structure being folded inside the other half after they had been laterally squeezed together. When the bulb **20** is laterally compressed, one side of it cannot be folded tightly enough inside the other side that it remains in such a position when the lateral compressive forces are removed because the conical portion **23** and the disc portion **24** will not be folded in half.

In addition to being vulnerable to being permanently deformed by lateral compressive forces, previous syringe bulbs were often deformed by excessive longitudinally compressive forces that folded the top side of the bulb inside a lower portion of the bulb. The bulb **20** resists being compressed by a longitudinally compressible force to the point that it will not immediately return to its original shape illustrated in the figures when all longitudinal force is removed. The externally concave portion **22** limits the distance which the semispherical portion and the disc portion **24** can be forced downwardly into it. Thus, it is substantially impossible for either a laterally compressible force or a longitudinally compressible force to cause the bulb **20** to assume a position from which it will not immediately return to its original shape when all compressive forces are removed.

Those experienced in the art will recognize that either the conical portion **23** or the disc portion **24** alone tends to cause the bulb **20** to return to its original shape after the application of a compressive force, and would do so even if the other portion were not present. Those skilled in the art will also recognize that the combination of the externally concave portion **22**, without either, or with one of the portions **23** and **24**, results in a novel bulb structure which resists permanent deformation. Therefore, all combinations of the deformation resisting portions **22**, **23** and **24** are within the scope of the present invention. In addition, those skilled in the art will recognize that the bulb portion **20** could be joined directly to

the hollow tubular body **10** without the utilization of a neck **12** and with or without the conical portion **23** to produce embodiments of the invention which will exhibit many of the desired features of the invention, but which will be somewhat simpler in construction. All such modified embodiments of the present invention are considered to be within the true scope of the invention as pointed out in the appended claim.

I claim:

A one-piece plastic syringe comprising a hollow tubular body tapering into an extended nozzle at one end and tapering into a neck portion at the other end and a hollow resiliently compressible bulb including a semispherical portion, an externally longitudinally concave portion adjoining said semispherical portion, a conical tapering portion adjoining said concave portion and said neck portion, and a flat disc portion adjoining said semispherical portion opposite to said concave portion, said conical tapering portion and said flat disc portion having a wall thickness substantially greater than said semispherical portion, and said externally longitudinally concave portion gradually

varying in thickness from the thicker conical tapering portion to the thinner semispherical portion.

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