OUTLET FITTING FOR PLASTIC PARENTERAL SOLUTION CONTAINER

4 Claims. (Cl. 128—272)

ABSTRACT OF THE DISCLOSURE

An outlet fitting for a plastic container. The fitting comprises a unitary tube having a fluid entry end and a fluid discharge end with a flow passage extending therefrom. The flow passage portion at the discharge end has a smaller bore than that of the passage portion at the entry end, and the different sized bores cooperate to define an annular shoulder. A disc-like plug is mounted in the larger bore between the annular shoulder and an annular inwardly extending rib in the larger bore portion, the rib and shoulder cooperating to upsettingly confine the plug.

Background of the invention

This invention relates to an outlet fitting for a plastic container, and, more particularly, for a flexible, bag-like container used in the dispensing of parenteral fluids.

One of the obstacles in providing parenteral fluids, i.e., glucose, saline, etc., in plastic bags is the absence of a suitable outlet fitting. Such a fitting must be arranged to receive the plug-in connector portion of an administration set, so as to couple the interior of the bag to the body of the patient. A number of configurations exist relative to the fitting that receives the plug-in connector. First, it must be convenient to install and use, so as to supplant the heretofore widely used rubber stoppers employed in connection with glass bottles. Also, it must be sterile, mechanically safe, tamperproof and amenable to the introduction of supplemental medication. The prior art has failed to meet these requirements and it is, therefore, a principal object of this invention to provide a fitting that does meet these requirements.

Another object of the invention is to provide a novel fitting adapted to be readily incorporated as part of a plastic bag-like container used for the dispensing of parenteral fluids, the fitting being so arranged and constructed so as to facilitate attachment to the container in a safe and sterile fashion.

Other objects and advantages of the invention may be seen in the details of construction and operation set down in this specification.

The invention is described in conjunction with an illustrated embodiment in the accompanying drawings, in which—

FIG. 1 is a perspective view of a parenteral solution bag constructed according to the teachings of this invention;

FIG. 2 is an enlarged longitudinal sectional view, in fragmentary form of the bag portion equipped with the inventive fitting; and

FIG. 3 is a sectional view taken along the sight line 3—3 applied to FIG. 2.

In the drawing, given and with particular reference to FIG. 1, the numeral 10 designates generally a plastic parenteral solution bag which is advantageously constructed of thermoplastic material such as polyvinyl chloride. Essentially, the bag prior to filling is rectangular in outline, being constructed of two sheets of material arranged in lay-flat condition to provide the upper wall 11 and the lower wall 12. The pillow-shaped arrangement is developed by filling the same with parenteral fluid and the wall-providing sheets 11 and 12 are parametrically united as at 13, 14, 15 and 16 to define edges or seams. Additionally, the bag 10 is equipped with an integral hanger tab 17 equipped with an eyelet or opening 18 for suspension of the bag on a standard (not shown).

The seam 13 is interrupted as at 19 to support the inventive fitting generally designated 20. Advantageously, the fitting 20 is constructed of like thermoplastic material, i.e., polyvinyl chloride, so that the fitting 20 may be heat sealed, i.e., fusingly united, to the wall-providing sheets 11 and 12. Prior to such union, the fitting 20 is advantageously developed by molding wherein the outer portion 21 (see FIG. 2) is of greater wall thickness than the inner portion 22 (the portions 21 and 22 being designated relative to their proximity to the wall-providing sheet 12). Further, the outer portion 21 is characterized by a smaller tubular bore 23 than is the inner portion 22 as at 24. Adjacent the fluid discharge end of the tubular flow fitting 20, an integral flange 25 is provided and the bore 23 is closed by an integral cap portion 26. The cap portion 26 is united to the outer portion 21 by means of a relatively thin annular web 27. Depending from the cap portion 26 is a finger tab 28 suitably embossed with finger gripping ribs 29. In the operation of the cap portion 26, the finger tab 28 is grasped between the thumb and forefinger and pulled whereupon a line of severance occurs in the area of the integral web 27. Thereafter, a plug-in connector as at 30 (see the phantom line showing in the lower right hand portion of the drawing) may be inserted in the direction of the arrow applied thereto for the purpose of coupling an administration set (not shown) to a patient under a regimen of parenteral therapy. The plug-in connector is sized so as to upset a self-sealing plug 31 mounted intermediate the end of the fitting 20.

The plug 31 is advantageously constructed of rubber or like material which is adapted to resell itself after being punctured by a cannula. In the course of parenteral therapy, it is often advantageous to use a parenteral solution as a vehicle for supplemental medication, e.g., anesthetic, hypnotic, etc. When such is the case, and after the cap portion 26 has been removed, the cannula portion of a hypodermic syringe is passed through the plug 31 to inject the supplemental medication into the bag 10. The presence of the plug 31 permits the injection to be achieved with the bag being suspended, i.e., with the flow extending downwardly. Were the plug 31 absent, each connection would have to be achieved with the bag mounted upright and then only with difficulty since the fluid within the bag 10 would be impeded from flowing outwardly through the fitting 20. In like fashion, the plug 31 serves as a closure for the bag 10 until being upsettably removed by the insertion of the plug-in connector 30. Here, it will be appreciated that the plug-in connector 30 is sized relative to the bore 23 so as to be in press fitting relationship therewith, thereby affording a seal against outflow of the liquid contents of the bag 10.

For the purpose of removably mounting the plug 31, the fitting 20 is equipped with an annular shoulder as at 32 which is developed by the difference in bores at the inner and outer ends, i.e., as at 24 and 23, respectively. The shoulder 32 thereby restrains the plug 31 from outward movement and this is increasingly reinforced by the fact that the outer portion 21 of the fitting 20 is essentially more rigid than the inner portion 22. As seen in FIG. 2, the inner portion 22 of the fitting 20 is equipped with an annular rib 33 positioned immediately above the plug 31. The rib 33 in combination with the relatively flexible inner tubular portion 22 permits the plug 31 to be moved outwardly under the force applied by the plug-in connector 30 so as to open the flow passage made up of the bores 24 and 23. When the plug 31 is removed from the
flow passage, it is possible for the plug to rest across the mouth 24a of the passage 24. This could temporarily block the flow of parenteral fluid and at a critical time in the administration thereof to a patient. To avoid such an undesirable emergency, I equipped the upper and lower surfaces of the disc-like plug 31 with a plurality of serrations as at 34. The serrations 34 develop a plurality of minor passages when butted against any surface so as to permit the necessary flow of parenteral fluid.

In the construction of the device, I have found it advantageous to mount the fitting on a mandrel interposed between the wall-forming sheets 11 and 12. The sheets 11 and 12 are theretofore heat sealed together and about the fitting 20, this prior to the introduction of fluid into the bag 10 ultimately developed by further heat seal as at 14, 15 and 16. During this initial heat sealing procedure which provides only the seam 13, the fitting-supporting mandrel (not shown) is advantageously equipped with an annular groove to provide the rib 33.

It is believed that the invention can be better appreciated from a consideration of a specific embodiment thereof and for that purpose, the following dimensions and physical specifications are set down. The outer portion 21 of the fitting 20 is constructed so as to have a circular bore 23 of the order of 0.175–0.200" with the wall thickness in this portion of the order of 0.040–0.060". In contrast to this, the inner portion 22 has a wall thickness of the order of 0.005–0.015" which proximates the thickness of the wall providing sheets 11 and 12—often specified as about 0.010" polyvinyl chloride. The bore 24 is at least about 0.250" and here it will be appreciated that the bore may be even greater to facilitate easy removal of the plug 31. The plug 31 ordinarily will have a thickness of 0.125–0.250" so as to be readily rescalable upon insertion by a cannula. Optimally, the thickness of the plug 31 is such as to accommodate the bevel of the cannula defining the lumen to which the supplemental medication flows.

While in the foregoing specification a detailed description of an embodiment of the invention has been set down in detail for the purpose of explanation, many variations in the details herein given may be made by those skilled in the art without departing from the spirit and scope of the invention.

I claim:

1. A flow fitting adapted to be mounted on a plastic bag-like container comprising a unilary tube of flexible thermoplastic material and having a flow passage extending therethrough from a fluid entry end to a fluid discharge end, the passage portion at said discharge end having a smaller bore than the bore of said entry end whereby said bores cooperate to define an annular shoulder intermediate said ends, a disc-like plug of rubber material mounted in said larger bore in contact with said shoulder, said tube being equipped with an integral annular inwardly extending rib in the larger bore portion, said rib and shoulder cooperating to upsettingly confine said disc.

2. The structure of claim 1 in which said plug is equipped with serrations on the faces thereof whereby inadvertent seating of the upset plug on the fluid entry end of said bore does not impede flow of fluid through said fitting.

3. The structure of claim 1 in combination with a parenteral solution bag, said bag being constructed of thermoplastic material and having a seam along one edge thereof, said fitting at the larger bore portion having a smaller wall thickness with said smaller wall thickness united with said bag in said seam.

4. The structure of claim 1 in which said fitting at said flow discharge end is equipped with an integral cap portion detachably connected thereto, said cap portion being further equipped with an outwardly extending finger manipulating tab for detaching said cap portion from the remainder of said flow fitting.

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