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OUTLET FITTING FOR PLASTIC PARENTERAL SOLUTION CONTAINER

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FIG. 1

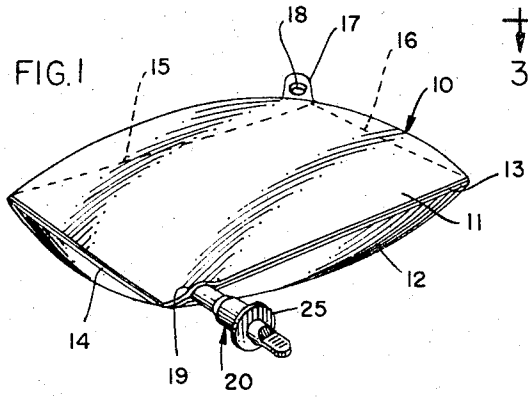


FIG. 2

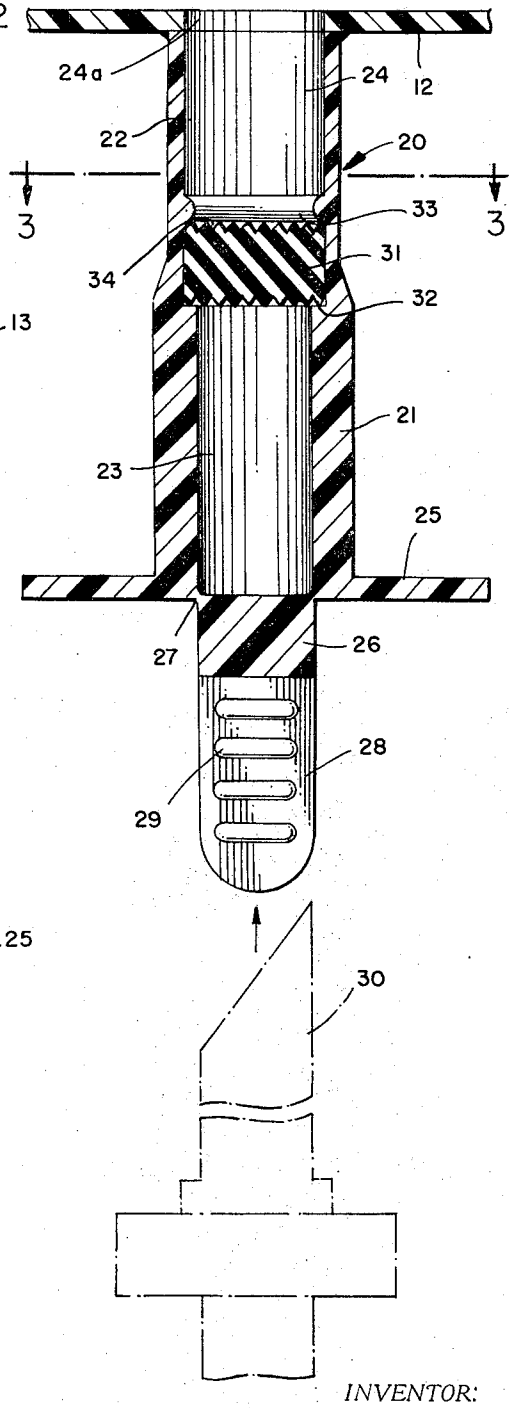
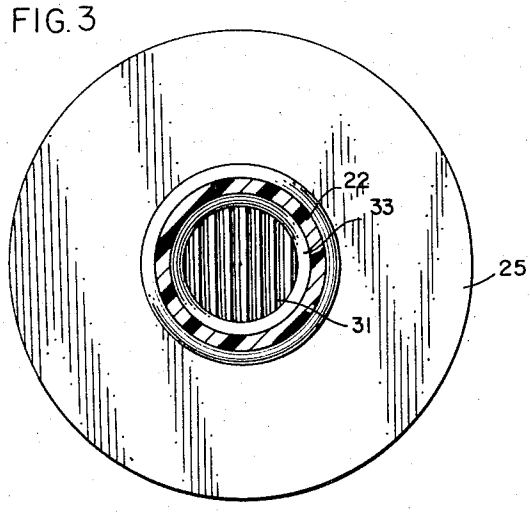


FIG. 3



INVENTOR:
THEODORE H. GEWECKE
BY
Dawson, Tilton, Fallon, Lungmus & Alexander
ATT'YS

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OUTLET FITTING FOR PLASTIC PARENTERAL SOLUTION CONTAINER

Theodore H. Gewecke, Milledgeville, Ga. 31061

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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 therethrough. 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 upsettably 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 parenterial 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 a patient. A number of requirements 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 are fittings have 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 drawing, 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 illustration 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 severence 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 righthand 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 **30** 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 reseal itself after being punctured by a cannula. In the course of parenteral therapy, it is often advantageous to use the parenteral solution as a vehicle for supplemental medication such as an 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 fitting 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 unimpeded 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 further 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 upwardly 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 **24***a* 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 thereupon 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 resealable 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 whihc 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 unitary 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 upsettably 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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DALTON L. TRULUCK, *Primary Examiner.*