This invention relates to spouts, particularly those of elastic material adapted for use in filling large collapsible shipping containers of the general type shown in the United States Patent No. 2,612,924, having a discharge opening in the center of one end and a filling opening in the other end.

Containers of this type are generally laced with powdered materials and pressurized with air or some inert gas, such as nitrogen, to expand the container to its full size so that it can be easily handled by rolling. A pressure of 1 to 5 pounds per square inch is common.

In filling, the container is held under a fixed dispensing hopper by suspending it from an overhead cable with the container bottom sitting on the floor. A short sleeve-like spout connects the container to the dispenser for passage of the materials between them. As the container becomes filled, it rises toward the fixed hopper reducing the distance between them. Naturally, to accommodate, the spout must decrease in length. At the present time the spout is made of flexible fabric, which although gas impermeous, decreases its length only by folding or inwardly collapsing of its wall. This creates a restriction in the sleeve passage that can have undesirable, costly results in that the pressure may break the sleeve connection and permit the valuable material to escape.

Accordingly, it is the intent of this invention to provide a spout adapted for use between delivering and receiving receptacles that will adjust itself to variations in distance between them without any restriction of its flow passage. It is also an object of this invention to provide ends to a spout that make it readily connectible or disconnectible to container fittings or other similar spouts.

These aims are achieved by making a spout of elastic material with longitudinally embedded, flexible, non-extensible cords that are secured to rings at the ends of the spout. The rings are enclosed in folds made by doubling back the ends of the spout wall (the elastic material and cords). This construction provides a spout with a wall that is capable of bending axially outwardly between the rings when the material is passing through it under pressure and the rings are moved relatively towards each other as is the case when the distance between the receiving receptacle and the delivering receptacle is reduced.

Further details and advantages of the present invention will become apparent from the following description when read in conjunction with the accompanying drawings, wherein:

Fig. 1 is an elevational view showing the spout of this invention connected to a collapsible container that is about to be filled with powdered material but yet unpressurized; Fig. 2 is similar to Fig. 1 but shows the container pressurized and substantially filled; Fig. 3 shows the spout in section with a broken away part having one end connected to the fixture of a container and its other end connected to a similar spout end; and Fig. 4 is similar to Fig. 3 but also shows the spout expanded outwardly.
2,984,508

spout depending on to what the spout is being connected (Fig. 4). The deformed ring being of resilient material springs back to its original circular shape and being of the same diameter as the rim R or the ring on the other spout, it cannot be pulled past it.

Disconnecting is accomplished in the reverse order. Where a spout is connected to a non-deformable fitting, paste the fitting 5 into the container, turning it at right angles to the opening of the fitting and forcing it outwardly.

It should be observed that in the connection of the spout to a container fitting 5, the fitting has only one rib, R, which prevents pulling the spout out of the fitting. This is the usual tendency against which provision must be made. Though the ends of the spout move together when a container rises, as in filling, the spout will not disconnect by being forced through the fitting 5 into the container, because the tendency is for the pressure to bellow the spout and force its wall over the outside surface of the fitting. Very little friction between the spout end and the inside surface of the fitting will achieve this result.

Only one type of joint or connection has been shown and described. Nevertheless, it is possible, to utilize the spout effectively with other joining means, such as a bayonet or screw sleeve secured to the ends of the spout which can be connected to a complementary fitting on a container or receptacle.

Thus, the invention provides a simple means of decreasing the effective length of the spout without restricting a flow passage. The construction of the spout is relatively simple and inexpensive, and because of the elastic material and flexibility of the cords no difficulty is encountered in stretching the spout radially so as to decrease practically 80% of its entire length.

Having thus described my invention, what I claim and desire to protect by Letters Patent is:

1. An adjustable spout for use under internal pressure comprising a tube open at each end, said tube being formed of longitudinally extending closely spaced cords bonded together and coated with elastic rubber and being free of non-extendible circumferential elements whereby said tube, because of the longitudinal displacement of the cords and the elasticity of the rubber, will bellow outwardly under internal pressure when the ends of said tube are moved relatively toward each other.

2. A spout as defined in claim 1 in which each end of the tube is provided with a resilient ring around which the cords are wrapped and anchored.

3. An adjustable spout for use under internal pressure comprising, in combination, a tube open at each end, said tube being formed of longitudinally extending closely spaced cords bonded together and coated with elastic rubber and being free of non-extendible circumferential elements, at least one resilient ring around which the ends of the cords of said tube are wrapped and anchored, and at least one mating annular fitting, some part of the bore of said fitting being of smaller diameter than the outside diameter of said ring, said ring and said fitting forming a joint which is prevented from disconnecting under pressure by the bellowing of said tube over the shoulder formed by the small diameter part of the bore of said fitting on the side opposite to that against which said ring is abutted.

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