Feb. 20, 1968 M. B. LUCAS 3,369,710

POURING FITMENT

Filed Nov. 1, 1966

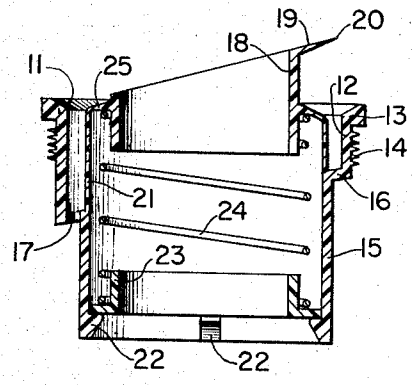


Fig. 1

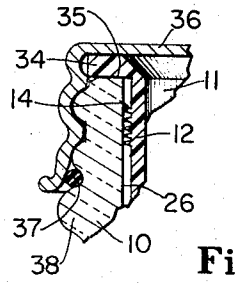


Fig. 4

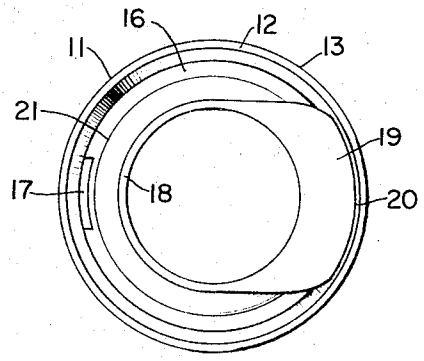
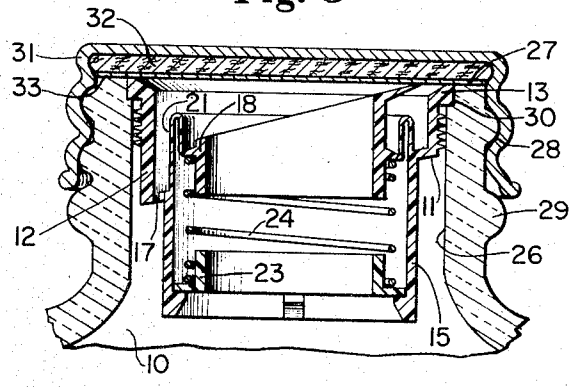


Fig. 2

Fig. 3



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United States Patent Office 3,369,710 Patented Feb. 20, 1968

3,369,710

POURING FITMENT

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Filed Nov. 1, 1966, Ser. No. 591,157
3 Claims. (Cl. 222—109)

ABSTRACT OF THE DISCLOSURE

A pouring fitment for attachment to a fluid container is disclosed which incorporates a thin, readily deformable cylindrical diaphragm connecting its body member to its retractable pouring spout to effect a leakproof seal between the two members. A body member-diaphragm structure incorporating an integral drainage channel and vent opening is also disclosed. The drawings and disclosure should be consulted for details.

This invention relates to pouring fitments of the type adapted for assembly in the pouring outlet of a conventional liquid container.

When pouring liquids, particularly oily liquids such as shortenings, salad oils, and the like, from conventional containers there is a tendency of residual liquid droplets to run down the outside surface of the bottle when pouring is discontinued. Various devices have been designed to overcome this problem. One device for this purpose which has been particularly successful is illustrated and described in U.S. Patent 3,217,935 which was granted to Robert V. Burt on Nov. 16, 1965, the patent being commonly owned by the assignee of the present invention. The use of a pouring fitment, as described in the Burt patent, eliminates surface run-down of oily liquid droplets which had heretofore been an objectionable drawback when pouring from a bottle.

An unforeseen problem was encountered in the use of a pouring fitment, as described in the Burt patent, because of the fact that commercial bottles, as received from glass manufacturers, have substantial variations in the inside diameter of the pouring outlet. In addition, the pouring outlet is commonly and frequently out-of-round. The out-of-round condition causes the pouring fitment to become distorted when assembled in the pouring outlet and this leads to leakage between the sealing surfaces which are in abutment in the fitment described in the Burt patent when it assumes its pouring attitude.

It is an object of the present invention to provide an improved pouring fitment which is unaffected by variations in the pouring outlet diameter and variations in the cross sectional configuration of the pouring outlet.

Another object of the invention is the provision of an improved pouring fitment which has no internal seal surfaces thereby eliminating bypass leakage even when the body of the fitment is grossly distorted as when it is inserted in a pouring outlet which is substantially out-of-round.

The nature and substance of the invention can be summarized briefly as comprising an improved pouring fitment which can be assembled in the pouring outlet of a conventional container filled with liquid product. The pouring fitment comprises a body member and an inner sleeve member which are integrally connected by a thin-walled cylindrical diaphragm which provides a seal to prevent outflow of liquid around the inner spout member. Biasing means are provided to urge the inner spout member to its pouring position. The inner spout member can be pushed downwardly and retracted within the body member when the closure cap is applied to the container.

While the specification concludes with claims particularly pointing out and distinctly claiming the subject matter regarded as forming the present invention, it is believed the invention will be better understood from the following description taken in connection with the accompanying drawing in which:

FIGURE 1 is an elevation in cross section showing the preferred form of the improved pouring fitment of this invention.

FIGURE 2 is a plan view of the fitment shown in FIGURE 1.

FIGURE 3 is a fragmentary elevation in cross section showing the fitment assembled in a conventional container pouring outlet with the cap secured in place and holding the inner spout element in its retracted position.

FIGURE 4 is a fragmentary elevation in cross section showing a modified sealing structure which can be utilized with the invention without affecting its internal structure.

Referring now to the drawings, a description of the invention will be made relating to its preferred embodiment. The pouring fitment of the invention is designed for use with any conventional liquid container which can be made of glass, metal, plastic, or any material normally used to store liquid products. Purely for convenience, a liquid container **10** made from glass is shown in FIGURE 3. The invention has been found to have utility when used with glass containers of the kind commonly provided for packaging and dispensing liquid shortenings, salad oils, and like products. It is to be understood, however, that the material used for the container is not necessarily limited to glass, nor is the use of the improved pouring fitment limited to edible oil products. These specific materials and products are mentioned merely to give a specific example of one very useful application of the invention.

The pouring fitment, as shown in FIGURES 1 and 2, can be molded from polyethylene or like plastics, or any other material that is feasible from a practical and economical standpoint. The fitment comprises an outer body **11**, including an upper sleeve **12** which terminates at its upper end in an outwardly projecting flange **13**. A plurality of narrow circumferential rings of ridges **14** are provided on the outer surface of the sleeve **12** for frictionally engaging the pouring outlet of the glass bottle as will be hereinafter described. A lower sleeve **15** is also provided as part of the body **11**. The upper end of the sleeve **15** is connected to the upper sleeve **12** by means of the rearwardly sloping planar annular wall **16** as best seen in FIGURES 1 and 2. A vent opening **17** is provided at the lowermost portion of the annular wall **16**.

An inner spout member **18** is formed with a pouring lip **19** (see FIGURE 2) which terminates at a sharp cut-off edge **20**. The inner spout member **18** is integrally formed with the outer body **11** by means of the cylindrical thin walled flexible diaphragm **21** which is interposed between the body **11** and inner spout member **18**. The cylindrical diaphragm **21** extends fully around the spout member **18** as shown in FIGURES 1 and 2.

The lower portion of the sleeve **15** is provided with inwardly projecting lugs **22** which are employed to retain a stop member **23** and hold it in proper assembled relationship. A spring **24** is provided, the lower end of which bears against the stop member **23**. The upper end of the spring **24** bears against the upper radial portion **25** of the cylindrical diaphragm **21**. Thus, when the elements are assembled, as shown in FIGURE 1, the bias in the spring **24** causes them to assume their normal pouring attitude.

It will be noted that the vent opening **17** is located on the side opposite the pouring lip **19**. When liquid is poured over the lip **19**, the vent **17** will serve its normal function. When the bottle is returned to its upright posi-

tion, any excess droplets which flow downwardly over the outer surfaces of the inner spout **18** and the diaphragm **21**, will flow by gravity down the annular wall **16** and be returned to the bottle through the vent opening **17**. An examination of FIGURE 1 will also make it apparent that the body **11** can be distorted substantially out of its normal round configuration without affecting flow through the inner spout **18**. When abnormal distortion of this kind is encountered, the diaphragm **21** functions to assure that all outflow of liquid occurs through the inner spout **18**.

The improved pouring fitment is shown assembled in a glass container **10** in FIGURE 3. The container **10** is provided with a conventional bottle finish including a pouring outlet **26**, a sealing surface **27** and a thread **28**. A transfer ring or bead **29** is normally provided on containers of this kind, as will be appreciated by those skilled in the art of manufacturing glass containers. The container **10** is provided with a small annular cut-out **30** at the juncture of the pouring outlet **26** and the sealing surface **27**. The cut-out **30** is of sufficient diameter and depth to seat the flange **13** of the pouring fitment such that the upper surface of the flange **13** is in the same plane or preferably somewhat beneath the plane of the sealing surface **27**.

A closure cap **31** is secured to the thread **28** when the contents of the container are to be sealed. The closure cap **31** includes an internal sealing element consisting of a cork **32** and a liner **33** which can be of aluminum foil or any other suitable material. When the closure cap **31** is firmly screwed down to the position of FIGURE 3, the liner **33** bears against the sealing surface **27** to provide a liquid and gas tight seal. This is particularly important in the packaging of edible oil products and the like since they are subject to deterioration on undue contact with air or oxygen.

The assembly of the cap **31** on the finish of the bottle **10** also causes the inner spout **18** to be moved downwardly to its retracted position inside the body **11** of the pouring fitment. The cylindrical diaphragm **21** is made so that it is quite thin in cross section. It is highly flexible and readily deformable without the application of excessive force and without causing any permanent deformation or damage to the pouring fitment. Thus with the cap **31** in place, the attitude of the several parts of the assembly is shown in FIGURE 3. In the retracted position of FIGURE 3, the portion of the diaphragm **21** integrally fastened to the inner spout member **18** is within the portion of the diaphragm which is integrally fastened to the body member **11**.

An alternative cap and seal arrangement is shown in FIGURE 4. The pouring fitment itself is essentially identical to the structure previously described, except that the flange **34** extends over and is seated on the sealing surface **35** of the bottle. This permits the use of a conventional bottle and cap in which the cap may be used without a liner. The inner surface of the cap **36** bears against the flange **34** to provide a liquid tight seal. However, most plastic materials are sufficiently oxygen permeable such that an additional gas seal may be necessary in order to prevent deterioration of air sensitive products in the bottle. This is accomplished by providing a resilient sealing ring **37**, e.g. a rubber O ring, that is wedged between the transfer bead **38** and the lower portion of the cap **36**, as shown in FIGURE 4.

While particular embodiments of the invention have been illustrated and described it will be obvious to those skilled in the art that various changes and modifications can be made without departing from the spirit and scope of the invention and it is intended to cover in the appended claims all such changes and modifications that are within the scope of this invention.

What is claimed as new is:

1. In a pouring fitment comprising a body and an inner spout member within said body, the upper end of said inner spout member having an outwardly extending pouring lip terminating in a cut-off edge, and biasing means mounted within said body for normally urging said inner spout member into its pouring attitude, the improvement which comprises a thin-walled cylindrical flexible diaphragm within said body member, said diaphragm being integrally connected to said inner spout member at one end and to said body member at its other end, said diaphragm being highly flexible and readily deformable so that when the said spout is in a retracted position the portion of the diaphragm integrally fastened to the inner spout member is within the portion of said diaphragm integrally fastened to said body, said diaphragm preventing leakage around the inner spout member caused by distortion of the pouring fitment when assembled in the pouring outlet of a bottle.

2. An improved pouring fitment as in claim **1** wherein said body comprises an upper sleeve portion, a lower sleeve portion of less diameter than said upper sleeve, a planar annular wall sloping rearwardly which integrally connects said upper and lower sleeve portions and a vent and drain opening at the lowermost portion of said annular wall.

3. An improved pouring fitment as in claim **2** wherein said biasing means includes a coil spring, the upper end of which bears against the upper radial portion of the diaphragm, the lower end of said coil spring being supported on a stop member supported in the lower portion of said body member.

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