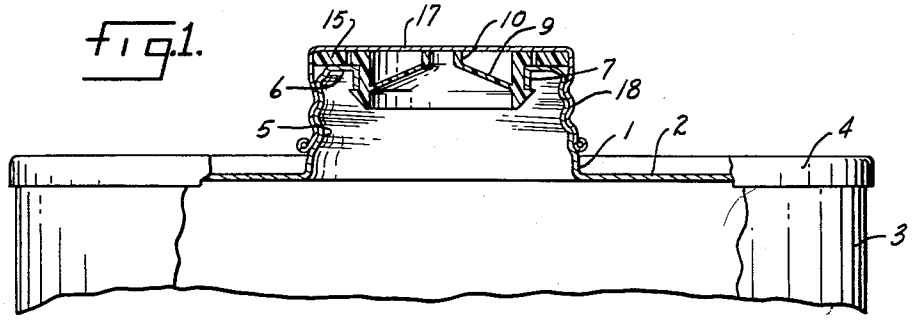
Oct. 31, 1961 A. J. COLLINS 3,006,513

SPOUT AND CAP SEALING MEANS

Filed Nov. 19, 1958

Fig. 1.



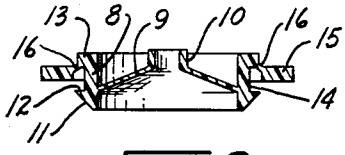




Fig. 2.

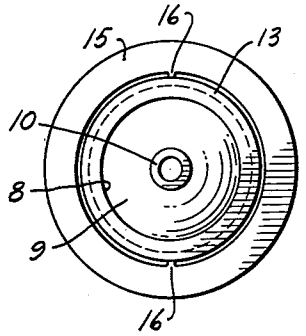



Fig. 3.

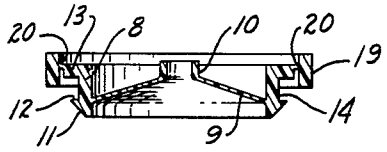



Fig. 5.

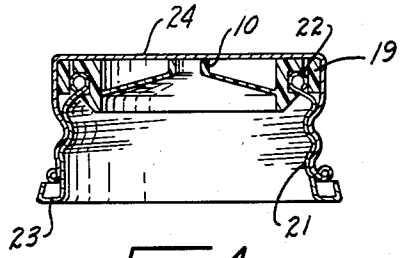



Fig. 4.

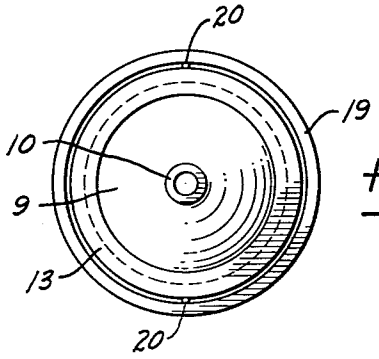



Fig. 6.

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3,006,513

# SPOUT AND CAP SEALING MEANS

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4 Claims. (Cl. 222—542)

This invention relates to a spout and particularly to a spout suitable for a dispensing container which may be a can, a bottle, a jar or any other vessel to which the spout of the invention may be attached. It has for one object to provide a simple structure of a relatively flexible or compressible material which may be inserted into an opening in a container.

Another object is to provide a spout structure which includes also a cap sealing means made integrally with the spout or joined to it so that initially the spout and the cap sealing means may be handled as a unitary device or assembly. It is therefore an object of this invention to provide a combined spout and cap sealing means.

A further object is to provide as a part of a spout assembly a cap sealing means arranged to be "snapped" into a cap and so arranged that when it is "snapped" into the cap it is thereby or thereupon separated from the spout structure and remains fixed in the cap and separate from the spout.

A still further object of the invention is to provide the device described above and to form it with engaging parts so that the spout itself "snaps" or fits automatically into the nozzle or outlet opening of a container and thus both the spout and the cap sealing means are pressed or snapped into place without the need of cementing, fastening or locking members additional to the structure of the seal and the spout.

Other objects will appear from time to time throughout the specification and the claims.

The invention is illustrated more or less diagrammatically in the accompanying drawings wherein:

FIG. 1 is a section through one form of the device showing it in position in the nozzle of a container;

FIG. 2 is a sectional view illustrating one form of the device removed from the container;

FIG. 3 is a plan view of the device shown in FIGS. 1 and 2;

FIG. 4 is a view in section showing a modified form of the device in position in a modified form of spout or outlet opening structure;

FIG. 5 is a section through the device of FIG. 4 separated from the cap and nozzle structure;

FIG. 6 is a plan view of the form of the device shown in FIGS. 4 and 5.

Like parts are designated by like characters throughout the specification and drawings.

In the particular form shown in FIGS. 1, 2 and 3, the spout is inserted in a nozzle **1** which, as shown, is integral with a top or cover portion **2** of a can **3**. The top for the can or can wall **3** may be joined together in any desired manner. They are, however, shown as being crimped over at **4**.

The nozzle **1** is preferably shaped to provide threads **5**. Adjacent its upper end the spout is turned or bent to provide a flat portion **6** and is then inwardly or downwardly bent to provide an integral inwardly directed annular lip **7**.

The spout structure of FIGS. 1, 2 and 3 is preferably formed of elastic and flexible material. While the invention is not limited to any particular material, among those which may be used are polyethylene, nylon, dylon and rubber, natural or synthetic. There are many comparable materials having physical and other properties suitable for use as the spout material.



Whatever material is used it should be substantially inert chemically in the presence of the material which will be contained within the container. It must also have sufficient strength and elasticity to remain tight within the nozzle and tight within the cap.

The spout structure comprises a generally cylindrical section **8**. Within the cylindrical section is an integral and more or less conically disposed web **9**. A perforation is formed in the web **9** and a cylindrical integral section **10** is positioned about the perforation. When the member **9** is not under pressure the upper end of that member extends outwardly or upwardly somewhat beyond the upper portion of the cylinder **8**. Generally it is preferable to have it so made that the upper end of the member **10** is beyond the upper end, edge or surface of the member **8**. However, it might be, for certain purposes, shorter and in that case the upper end of the member **10** might actually be below the upper end of the member **8** or they might terminate on the same plane.

The outside of the member **8** at one end, that which projects into the nozzle, is preferably bevelled as at **11** and shouldered as at **12**.

The upper end of the member **8** is provided with a laterally extending flange **13**. Between the shoulder **12** and the lower surface of the flange **13** is a depression **14** extending around the member **8**.

As shown in FIG. 1, the shoulder or bead **12** seats against the inner end of the portion **7** of the nozzle and the under surface of the flange **15** seats against a portion of the surface **6** of the nozzle. The flexibility and elasticity of the spout structure as a whole or of its parts such as the portion **11**, **12** is such that the spout may be snapped into the nozzle and will retain itself in position thereafter and will be in sealing contact with the nozzle to prevent leakage between it and the nozzle.

As shown particularly in FIG. 2, a cap sealing annular member **15** is joined to the cylindrical portion **8** by one or more thin, or relatively thin, connecting portion **16**. After the parts are assembled, the portions **16** are broken and the annular cap sealing member **15** becomes seated in the cap **17** as shown in FIG. 1.

The cap may be of any desired shape, preferably it is provided with threads suitable for meshing with the threads **5** of the nozzle. Where an unthreaded nozzle is used the cap, of course, will be of such shape and construction as to fit tightly on the nozzle when it is desired to close the container. What ever the shape or details of the cap may be, the cap sealing flange which is provided with the spout will be sheared or severed from the spout upon assembly and will be engaged by and will remain within the cap when the parts are in the closed position. As shown in FIG. 1, the member **15** additionally seals the container.

The form of FIGS. 4, 5 and 6 is generally the same as that shown in the first three figures except that the cap sealing member is formed generally as a cylindrical section with vertical walls and the spout is shown in FIG. 4 as being positioned in a nozzle of somewhat modified construction. Generally, those parts which are identical or substantially identical in the two forms of the device will not be redescribed and in the drawings they carry the same numbers.

As shown in FIG. 5, the member **8** has secured to it a cap sealing member **19** which comprises a more or less cylindrical section and it is held to the portion **8** by connecting members **20**. These members **20** are severed or broken or sheared when the cap sealing section **19** is forced into the cap and thereafter the section **19** remains seated in the cap as shown in FIG. 4.

The nozzle of FIG. 4 includes a threaded section **21** which is provided with a bead **22** formed by rolling or

curling a portion of the upper end of the member **21** first outwardly and then inwardly upon itself. The nozzle **21** may be formed integrally with the container cover portion as shown in FIG. 1 or it may be shaped to provide an annular portion **23** which may be seated upon or engaged with a cover portion.

A threaded cap **24** engages the nozzle **21** when the container is to be closed. Obviously another type of cap might be provided if the nozzle is not of threaded type.

The invention is not limited to any particular type of nozzle and two types are shown merely to illustrate the fact that the invention is adaptable to a variety of nozzle constructions. When the nozzle is shaped as in FIG. 4, the spout construction of FIGS. 4, 5 and 6 is preferable because the upper surface of the bead **22** is of substantially less extent than the upper surface **6** of the form of FIG. 1. The cylindrical arrangement and shape of the sealing member **22** is preferable where the cap is to be used on nozzles of the type shown in FIG. 4. The shape of the cap sealing member **16** is generally preferable where the cap is to be used upon nozzles of the construction of FIG. 1.

The word "nozzle" as applied to the members **1** and **21** is to be broadly understood as referring to that portion of a container into which the spout construction of the invention is inserted and within which it is seated. The neck of a bottle or jug might for this purpose be considered the equivalent of the nozzles **1** and **21**, shown. The structure which fits within the nozzle or container opening is generally referred to as a "spout." It is the structure which defines the actual opening through which discharge takes place. It is also a sealing structure. It seals itself within the opening through the nozzle or neck of a container, and it also seals against the cap or cover which is used removably to close the container. The invention includes this spout structure which, as shown, carries with it initially the sealing ringlike member **15** or **19**. This is a cap sealing member which, when the parts are finally brought together in the fully closed positions of FIGS. 1 and 4, is severed or broken from the actual spout member and remains fixed within the cap whether the cap is seated or not.

Although an operative form of the device has been shown, the invention is not limited to the particular details shown. Many changes may be made in the form, shape and arrangement of parts without departing from the spirit of the invention.

The use and operation of this invention are as follows:

The device comprising the spout and cap sealing member may be formed as a unit. One form is shown in FIGS. 2 and 3 and another form is shown in FIGS. 5 and 6. In each form a spout section or portion is attached to or joined with a cap sealing section or portion. In each case the joining is accomplished by connecting members which are weak and readily broken. Each form of the device may be made by molding but could be made otherwise. Possibly the two parts might be made separately and thereafter joined together to form in effect a unitary device comprising a spout and a cap sealing member.

However formed the device comprises the two separable members mentioned and each in use will be permanently seated in the member which it is designed to seal.

If desired, the cap sealing portion may be positioned within a cap in the following manner:

The device in the form of FIGS. 2 or 5 is forced into a cap; the pressure necessary to do this will not break the connecting member **16** or **20**. When the device is properly related in size to the cap which it is to seal, the fit of the member **15** or **19** within its respective cap is such that the sealing member will fit tightly within its cap. It may be forced in, but by this forcing action the portions **16** or **20** are not broken. Since they are not actually broken at this time later sealing of the cap will break them.

If desired, the device in the forms of FIGS. 2 and 5 may initially be thrust into its respective spout to occupy the position of FIGS. 1 and 4. When that has been done the cap sealing ring may usually remain connected to the spout and until, thereafter, it is forced into and seated within its cap.

In the past generally where spout structures or cap sealing structures have been used the cap sealing structures have been inserted into the caps in a separate operation. Whether by machine or by hand, the insertion of the cap liner has been a separate operation quite independent from the insertion of the spout member in the nozzle or container opening. It is one object of the present invention to avoid the necessity of any separate cap liner or cap sealing ring insertion.

The preferred method of inserting the device of the invention is as follows:

The spout, either in the form of FIG. 1 or FIG. 5, is inserted in a cap far enough so that the edges of the ring **15** or the ring **19** engage the cap. It is not pushed far enough in to break the ring from the cap; that is, it is not pushed far enough to cause breaking or severing of the members **16** or **20**. The cap carrying the ring with the nozzle still joined to it is put into a hopper for application to a container. Generally the containers come down a filling "line" and at the sealing station a cap is applied, usually mechanically, to each nozzle. The cap is fed to the nozzle with the spout and ring in place and is screwed or otherwise forced "home" to the closing and sealing position. When this occurs the spout is forced into the opening in the container and is in effect "snapped" into place, the flange **12** fitting below the bottom edge of the nozzle and snapping into place because of its elasticity and flexibility. As the cap or cover is forced to the fully closed position and the members **16** or **20** break, the ring **15** or **19** is forced "home" fully against the inner surface of the cap or closure and the ring is thus driven into final position in sealing contact with the interior of the cap. In this position the ring serves as a cap liner or cap sealing member. When the cap is withdrawn the ring will stay with the cap and becomes, in effect, a permanent part of it, no matter sow many times it is moved to closed position and later opened.

By the construction of the spout it is unnecessary either to put the cap in the nozzle, as a separate operation, or to put a liner or ring into the cap as a separate operation. The two are put together into the cap and once they are in position within the cap, the cap may be handled as though it were a unit with the spout. It may be handled on conventional cap-applying machines, and it may thus be used in a conventional filling and capping "line."

Thus the spout may be seated in the nozzle in almost any convenient manner. When the seating has been accomplished the spout has been "snapped" into the nozzle and will retain itself therein in sealing contact. The cap sealing member will also have been forced into position within the cap where it will retain itself.

In whatever form the spout may take the spout itself is held by its own shape and material in sealing position within the nozzle. As pointed out above, the upper end of the member **10** generally extends above the upper surface of the portion **13**, which itself defines the upper end of the member **8**. When now the cap is secured or otherwise brought into complete closing position with respect to the nozzle the inner surface of the cap strikes the upper end of the member **10** before it strikes the upper surface of the member **13** and thus a sealing contact is made between the upper end of the member **10** and the inner surface of the cap **17** or **24**. When the cap is in final inward position, closing the nozzle, it will not only have compressed the member **10** but it will have pressed the sealing ring **15** or **19** against the

nozzle. Thus sealing may occur in one manner, as shown in FIG. 1, or in another, as shown in FIG. 4. Thus the spout accomplishes a sealing around its periphery with respect to the nozzle in which it is seated. It also accomplishes a sealing effect with the cap, against the inner surface of which it is compressed. In this compression the elasticity of the portion 9, as well as that of the portion 10, will generally participate. A further sealing effect between the cap and nozzle is accomplished by the sealing ring 15 or the sealing ring 19.

An important advantage of the present invention is that it reduces the labor necessary to complete the sealing operation as compared to previous procedures. It does this without the necessity of new machinery or added tools.

A preferred form of using the device of this invention involves the use of filling and closing machines. The containers will normally be filled by a mechanism which moves them progressively to a point at which caps are applied. Before they reach the cap-applying station the spout, in the forms of FIGS. 2 or 5, is inserted in the cap. With the spout in position in the cap, the cap is moved to the point of cap application and applied to the nozzle. The caps carrying the spouts are put into hoppers and applied mechanically at the proper station in the mechanism and may be handled in the conventional manner. When they are screwed down to the positions of FIGS. 1 or 4 the ring 15 or 19 is broken from its corresponding tubular member 8. As the cap is forced finally to the tightly closed position, the member 15 or 19 is driven tightly into the cap into the position in which it is retained permanently. The cap-positioning and closing operation is carried out by standard mechanism now available and no special means are required to use the device of this invention.

Heretofore the cap sealing ring, such as the member 15 or 19, has been inserted separately into the cap by a separate step or operation before the cap is placed upon the neck of the container and screwed, or otherwise moved to the final closing position. The device of the present invention avoids the necessity of a separate step for seating the ring in the cap, and it avoids a separate and added step for seating the spout in the nozzle. As pointed out above, the ring is finally seated in the cap when the cap is screwed "home" in the normal manner in which it would have been screwed "home" by standard mechanisms. The device of the present invention thus furnishes adequate sealing and obviates the necessity of a separate step in which the cap has applied to it its own sealing ring or other member by a separate step. Economy and efficiency are thus promoted by this invention.



I claim:

1. In combination, a plastic pouring spout and an integral plastic cap-engaging ring, the two being generally circular and concentric, the ring being positioned outwardly of the pouring spout and being secured thereto by readily breakable spaced members, the spout being provided on its exterior with an outwardly extending flange and an outwardly extending shoulder spaced therefrom adapted to frictionally engage an outlet neck of a container, the ring and spout adapted to be pressure engaged within a container cap, the breakable members which connect the ring and spout being of such strength as to be readily severed by relative rotation of the cap with respect to the spout as the cap is screwed into closing position on the neck.

2. The combination of claim 1 further characterized in that said readily breakable members include a plurality of generally equally spaced thin projections.

3. The combination of claim 1 further characterized in that said spout includes a cylindrical portion having a spaced outwardly extending flange and shoulder adapted to sealingly engage the container neck, and a generally conical perforated web extending across said cylindrical portion.

4. In combinaton, a plastic pouring spout and an integral plastic cap-engaging ring, the two being generally circular and concentric, the ring being positioned outwardly of the pouring spout and being secured thereto by readily breakable spaced members, the spout being provided on its exterior with outwardly extending means adapted to frictionally engage an outlet neck of a container, the ring and spout adapted to be pressure engaged within a container cap, the breakable members which connect the ring and spout being of such strength as to be readily severed by relative rotation of the cap with respect to the spout as the cap is screwed into closing position on the neck.

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