

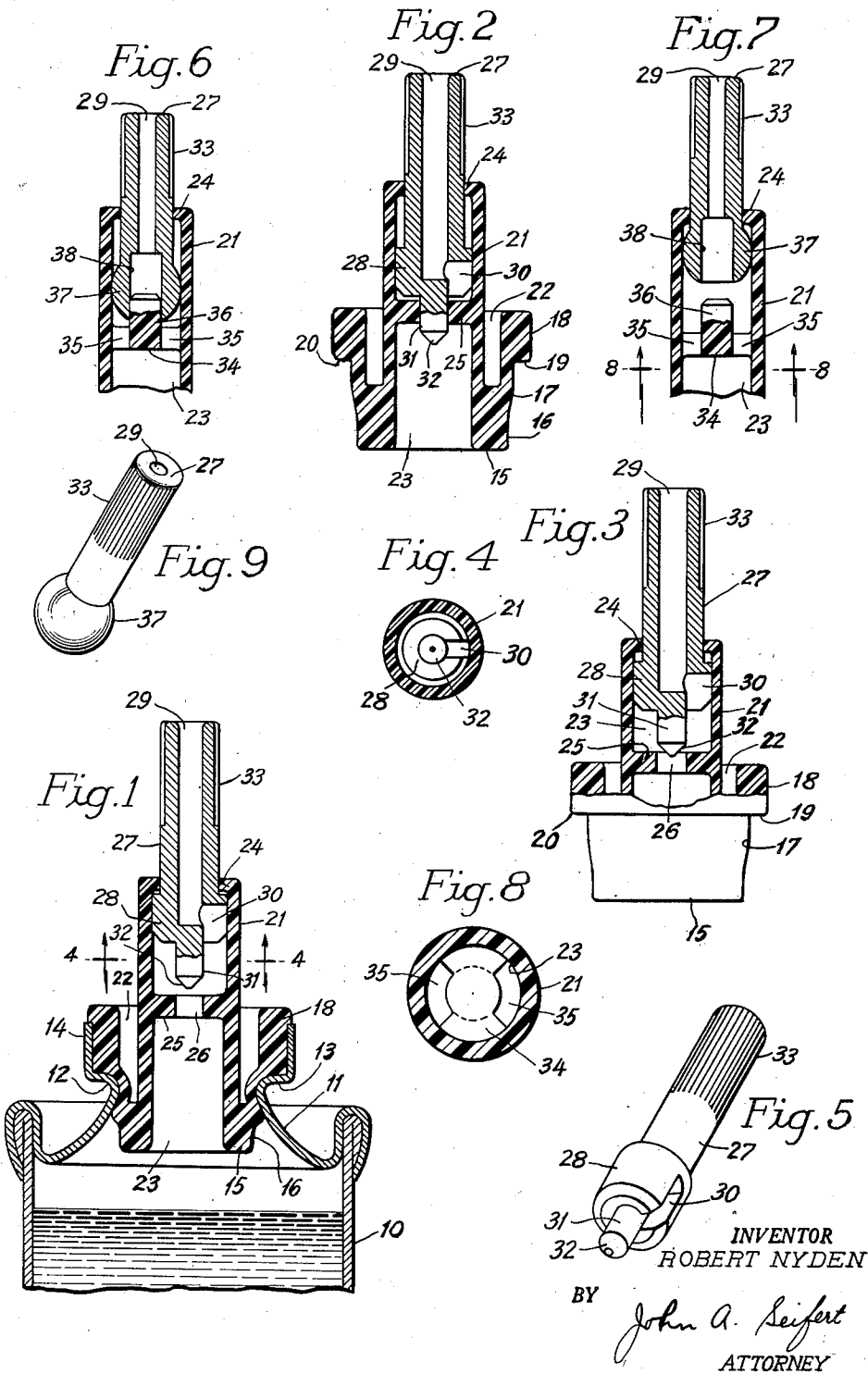
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R. NYDEN

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SPOUTS FOR CONTAINERS

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SPOUTS FOR CONTAINERS

Robert Nyden, Manhasset, N. Y.

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7 Claims. (Cl. 222—525)

This invention relates to a valve controlled spout for a container wherein the contents of the container are sealed against discharge when the spout is in one position and is dischargeable through the spout in another position of the spout.

It is an object of the invention to provide a spout of this character whereby the material of the spout and the arrangement of the parts of the spout eliminate the use of gaskets or sealing compounds to provide a liquid-tight spout.

It is another object of the invention to provide a two-piece spout which is readily assembled and permanently attached to the container.

It is a further object of the invention to provide an arrangement of parts whereby there is always a liquid-tight seal between said parts in either of the open or close position of the spout.

The invention comprises a mounting member permanently attached to a container and having a cylindrical portion extending from one end of the mounting member and a discharge passage extending axially through the mounting member and the cylindrical portion, said cylindrical portion being arranged with a valve seat in an intermediate portion of the discharge passage and an annular intumed lip at the outer end of the cylindrical portion to constrict the outer end of the discharge passage, and a valve-spout member having a tubular portion slidable in the constricted end of the discharge passage and an enlarged portion at the inner end of the tubular portion slidable in the discharge passage above the valve seat and arranged to engage the valve seat and close the discharge passage, the tubular portion of the valve-spout member having an axial bore and the enlarged portion of the valve-spout member being arranged with a port opening to said bore and forming a communication between the bore and the discharge passage, whereby the outward movement of the valve-spout member opens the discharge passage and permits the discharge of the contents of the container, and the inward movement of the valve-spout member closes the discharge passage and seals the container.

In the drawing accompanying and forming a part of this application:

Figure 1 is an elevational-sectional view of the spout showing the mounting member permanently attached to a metal container and the valve-spout member actuated to open position;

Figure 2 is an elevational-sectional view of the spout unattached and the valve-spout member actuated to close position;

Figure 3 is a view similar to Figure 2 with the valve-spout member actuated to partially open position and showing part of the mounting member in full view;

Figure 4 is a cross-sectional view taken on the line 4—4 of Figure 1 looking in the direction of the arrows to show the arrangement of the port in the enlarged portion of the valve-spout member;

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Figure 5 is a perspective view of the valve-spout member shown in Figures 1 to 4, inclusive;

Figure 6 is an elevational-sectional view of the upper or discharge part of the spout showing a modified form of valve seat in the cylindrical portion of the mounting member and a modified form of enlarged portion of the valve-spout member with the valve-spout member in closing position;

Figure 7 is a view similar to Figure 6 showing the valve-spout member in open position;

Figure 8 is a cross-sectional view, on an enlarged scale, taken on the line 8—8 of Figure 7 looking in the direction of the arrows to show the structure of the modified form of valve seat in the cylindrical portion of the mounting member; and

Figure 9 is a perspective view of the valve-spout member shown in Figures 6 and 7.

The invention is shown in Figure 1 as being secured in a metal container including a body 10 having the top end wall arranged with a discharge neck consisting of a tapering base portion 11, a constricted throat portion 12 at the top of the base portion 11, an annular shoulder portion 13 extending outwardly from the constricted throat portion 12 and a vertical wall 14 extending upwardly from the annular shoulder 13. The annular shoulder 13 and the vertical wall 14 constitute a top shoulder portion in the container neck. The bottom of the container body 10 is permanently closed by a rigid wall, not shown.

The embodiment of the invention comprises two members, one member being a mounting member of resilient material softer than the material of the container and its neck, such as polyethylene. Said mounting member comprises a cup-shaped base portion having a bottom section 15 of a diameter slightly smaller than the inner diameter of the constricted throat portion 12 of the container discharge neck. To facilitate passage of the bottom section 15 through the constricted throat portion 12, the bottom section 15 is arranged with a vertical outer wall 16. The outer surface of an intermediate section adjacent to the bottom section 15 of the base portion is of bulbous form, as shown at 17 in Figures 2 and 3, and its minimum outer diameter is larger than the inner diameter of the constricted throat portion 12. Above the bulbous section 17, the diameter of the base portion is enlarged to form a top shoulder section having a vertical outer wall 18 and a horizontal wall 19 connecting the outer wall 18 with the bulbous section 17. The outer diameter of the vertical wall 18 is slightly greater than the inner diameter of the vertical wall 14 of the container neck, so that when the shoulder section 18, 19 is engaged in the shoulder portion 13, 14, the shoulder section 18, 19 is compressed, as shown in Figure 1. In the fully assembled position of the mounting member in the container neck, the horizontal wall 19 of the base portion will abut the horizontal wall 13 of the container neck. To facilitate the engagement of the shoulder section 18, 19 in the container neck shoulder portion 13, 14, the juncture between the vertical wall 18 and the horizontal wall 19 is rounded, as shown at 20 in Figures 2 and 3. The wall of the bulbous section 17 is approximately half the thickness of the walls of the bottom section 15 and of the top section wall 18, and the thickness of the walls of the bottom section 15 and the top section 18 are approximately the same, so that the bulbous section 17 is readily flexed. Integral with the bottom section 15 of the base portion, there is provided a cylindrical portion 21 having an outer diameter less than the inner diameter of the cup-shaped base and extended upwardly from the bottom section 15 and through the open end of the base portion for any desired distance. The inner faces of the base portions 15, 17 and 18 are straight and form with the cylindrical portion 21, an annular well 22 in the base por-

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tion. The bore of the tubular portion 21 is extended through the bottom section 15 to form a discharge passage 23 for the contents of the container 10. The outer or upper end of the cylindrical portion 21 is provided with an annular intumed lip 24 to constrict the outer or upper end of the passage 23. An intermediate portion of the discharge passage 23 is provided with a valve seat integral with the cylindrical portion 21. In Figures 1, 2 and 3, the valve seat is formed by a wall 25 extending transversely of the discharge passage and having an axial opening 26 therethrough.

The mounting member is permanently secured in the container neck by engaging the bottom section 15 in the constricted throat portion 12 with the bulbous section 17 abutting said throat portion. Then a downward pressure is applied simultaneously to the upper end of the spout shoulder section wall 18 and to the upper end of the bottom section 15, which is the bottom wall of the well 22, whereby the bulbous section 17 is flexed around the constricted throat portion 12 of the container neck. The well 22 will permit the flexing of the bulbous section 17 around the constricted throat portion 12. Due to the inherent characteristic of the material of the mounting member, such as polyethylene, to assume its original condition, the bulbous section 17 will tightly engage around the constricted throat portion 12 and wedge the mounting member in the container neck to form a liquid-tight and tamper-proof seal. The downward pressure applied to the bottom section 15 and to the top section 18 will also compress the shoulder section 18, 19 into the shoulder portion 13, 14 to form a second liquid-tight seal between the container neck and the mounting member. Flexing of the cylindrical portion 21 in a lateral direction will not loosen the mounting member in the container neck, but will have a tendency to place a tension on the lower part of the bulbous section 17 against the lower part of the constricted throat portion 12. Downward pressure on the cylindrical portion 21 will not loosen the mounting member in the container neck, but will have a tendency to tighten the engagement between the walls 13 and 19 and urge the bulbous section 17 against the constricted throat portion 12. An upward pull on the cylindrical portion 21 will not remove the mounting member from the container neck as said pull flexes the bottom section 15 outwardly against the tapering base portion 11 of the container neck. The top section wall 18 is of greater length than the neck wall 14 and during the compression of the top section 18, 19 into the shoulder portion 13, 14, the upper part of the top section wall 18 will expand laterally over the top edge of the shoulder portion wall 14 whereby it is not possible to insert an instrument between the top section wall 18 and the shoulder portion wall 14 to pry the mounting member loose from the container neck. Due to the resiliency of the mounting member, the downward pressure applied thereto in securing the mounting member in the container neck will not collapse the container top wall.

It is to be understood that the mounting member is adapted to be secured in or attached to other types of containers than that disclosed in the drawing.

The other member of the embodiment of the invention, as shown in Figures 1 to 5, inclusive, is a valve-spout member of resilient material, such as polyethylene, and comprising a tubular portion 27 having a liquid-tight sliding fit with the constricted end 24 of the discharge passage 23 and an enlarged portion 28 at the inner end of the tubular portion 27 and having a straight side wall sliding in the discharge passage 23 above the valve seat 25, 26. The tubular portion 27 is provided with an axial bore 29 extended partially into the enlarged portion 28, as shown in Figures 1, 2 and 3, and communicating with a port 30 extending laterally through the lower section of the enlarged portion 28 on one side of the longitudinal axis of the valve-spout member, whereby the bore 29 communicates with the discharge passage 23. The communication of the bore 29 with the lower portion of the discharge

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passage 23 and the interior of the container 10 is controlled by a pin 31 integral with and extending axially from the bottom of the enlarged portion 28 to have a liquid-tight sliding fit with the opening 26 when the valve-spout member is moved into the mounting member. The pin 31 is guided into the opening 26 by providing the pin with a conical end 32. The length of the pin 31 is such that when the upper end or the top of the enlarged portion 28 is adjacent to or abuts the intumed lip 24, the pin 31 is fully disengaged from the opening 26, as shown in Figure 1, and when the lower end or the bottom of the enlarged portion is adjacent to or abuts the wall 25, the pin 31 is fully engaged in the opening 26 with the conical end 32 extending below the wall 25, as shown in Figure 2. The port 30 extends radially of the pin 31, as shown in Figure 4.

To discharge the contents of the container, the valve-spout member is pulled upwardly to disengage the pin 31 from the opening 26 and the container 10 is inverted to cause the flow of the contents from the container into the lower portion of the discharge passage 23 and through the opening 26 into the upper portion of the discharge passage 23 and thence to the bore 29 through the port 30.

The rate of flow of the contents of the container through the bore 29 can be controlled by the extent the valve-spout member is pulled upwardly in the mounting member, as shown in Figure 3, wherein the conical end 32 is partially positioned in the opening 26.

To discontinue the discharge of the contents from the container, the valve-spout member is pushed into the mounting member to fully engage the pin 31 in the opening 26, as shown in Figure 2.

To facilitate the breaking of the liquid-tight engagement between the pin 31 and the opening 26 when it is desired to discharge the contents from the container, the section of the tubular portion 27 extending above the mounting member cylindrical portion 21 is provided with longitudinal knurls or flutes 33 so that the valve-spout member can be simultaneously rotated and pulled in an upward direction.

Figures 6 to 9, inclusive, show modified forms of the valve seat in the mounting member and the enlarged portion of the valve-spout member. The modified form of valve seat comprises a wall 34 integral with the cylindrical portion 21 and extending transversely of the discharge passage 23. Said wall 34 is arranged with openings 35 in diametrically opposite portions of the wall 34 and a pin or projection 36 integral with said wall and extending upwardly therefrom. The modified form of enlarged portion of the valve-spout member comprises a spherical portion 37 at the lower end of the tubular portion 27 of a diameter to form a liquid-tight sliding fit with the inner wall of the cylindrical portion 21 above the valve seat wall 34. The spherical portion 37 is provided with an axial opening 38 corresponding to the size and shape of the valve seat pin 36 to form a liquid-tight sliding fit with said pin when the valve-spout member is moved into the mounting member. The opening 38 is in axial alignment with the bore 29 of the tubular portion 27 and the upper end of the opening 38 communicates with the lower end of the bore 29. The diameters of the valve seat pin 36 and the opening 38 are greater than the diameter of the bore 29. The diameter of the bore 29 of the tubular portion 27 in the modified form of the enlarged portion 27 shown in Figures 6, 7 and 9 is smaller than the diameter of the bore 29 of the tubular member 27 shown in Figures 1, 2 and 3. The advantage of the modified forms shown in Figures 6 to 9, inclusive, is that the valve-spout member can be accidentally tilted or tipped in the mounting member without breaking the liquid-tight seal between the spherical portion 37 and the inner wall of the cylindrical portion 21.

The operation of the modified forms shown in Figures 6 to 9, inclusive, is the same as the structure shown in Figures 1 to 5, inclusive, whereby in the lowermost posi-

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tion of the valve-spout member in the mounting member, the opening 38 engages the pin 36 and closes the communication between the discharge passage 23 and the bore 29, and the container is sealed. In the uppermost position of the valve-spout member in the mounting member, the communication between the discharge passage 23 and the bore 29 is open and the contents of the container is discharged upon tilting or inverting the container.

Due to the resiliency of the material of the mounting member and of the valve-spout member, the valve-spout member is readily assembled in the mounting member by forcing the enlarged portion 28 or 37 past the intumed lips 24.

Having thus described my invention, I claim:

1. A spout for a container comprising a mounting member having a cylindrical portion extending from one end of the mounting member and a discharge passage extending axially through the mounting member and the cylindrical portion, said cylindrical portion being arranged with a valve seat in an intermediate portion of the discharge passage in the cylindrical portion and an annular intumed lip at the outer end of the cylindrical portion to constrict the outer end of the discharge passage, and a valve-spout member having a tubular portion sliding in the constricted end of the discharge passage and an enlarged portion at the inner end of the tubular portion sliding in the discharge passage above the valve seat and arranged to engage the valve seat and close the discharge passage, the tubular portion of the valve-spout member having an axial bore opening at the outer end of the tubular portion and the enlarged portion of the valve-spout member being arranged with a port opening to said bore and forming a communication between the bore and the discharge passage, whereby outward movement of the valve-spout member opens the discharge passage and permits the discharge of the contents of the container through the part in the enlarged portion and the base of the tubular portion and inward movement of the valve-spout member closes the discharge passage and seals the container.

2. A spout for a container as claimed in claim 1, wherein the mounting member and the valve-spout member are of resilient material to facilitate the insertion of the enlarged portion into the discharge passage through the constricted end of the discharge passage and form a liquid-tight sliding fit between the mounting member and the valve-spout member and a liquid-tight fit between the enlarged portion and the valve seat.

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3. A spout for a container as claimed in claim 1, wherein the valve seat comprises a wall extending transversely of the discharge passage and having an axial opening therethrough, and the enlarged portion is arranged with an axial pin having a liquid-tight sliding fit with the opening in the transverse wall.

4. A spout for a container as claimed in claim 1, wherein the port is in the lower section of the enlarged portion on one side of the longitudinal axis of the valve-spout member.

5. A spout for a container as claimed in claim 1, wherein the valve seat comprises a wall extending transversely of the discharge passage and having an axial opening therethrough, and the enlarged portion is arranged with an axial pin having a liquid-tight sliding fit with the opening in the transverse wall and the port extends radially of the pin.

6. A spout for a container as claimed in claim 1, wherein the valve seat comprises a pin supported by the cylindrical portion to extend axially of said cylindrical portion, and the enlarged portion of the valve-spout member has a liquid-tight sliding fit with the discharge passage and an axial opening communicating with the bore of the tubular portion of the valve-spout member to constitute the port opening to said bore and said axial opening having a liquid-tight sliding fit with the pin to close the communication between the bore and the discharge passage.

7. A spout for a container as claimed in claim 1, wherein the valve seat comprises a wall extending transversely of the discharge passage and arranged with spaced openings and a pin extending axially from said wall toward the constricted end of the discharge passage, and the enlarged portion of the valve-spout member has a liquid-tight sliding fit with the discharge passage and an axial opening communicating with the bore of the tubular portion of the valve-spout member to constitute the port opening to said bore and said axial opening having a liquid-tight sliding fit with the pin to close the communication between the bore and the discharge passage.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 2,834,520

May 13, 1958

Robert Nyden

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 5, lines 36 to 38 inclusive, strike out "through the part in the enlarged portion and the base of the tubular portion" and insert instead -- through the port in the enlarged portion and the bore of the tubular portion --.

Signed and sealed this 23rd day of September 1958.

(SEAL)
Attest:

KARL H. AXLINE

Attesting Officer

ROBERT C. WATSON
Commissioner of Patents