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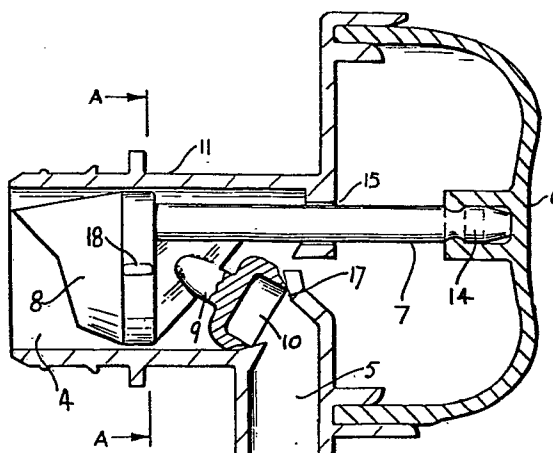
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54 Taps.

57 A tap for use with flexible containers which is capable of rupturing a fracturable diaphragm. The tap comprises a plunger 7 carrying a piercing spigot 8 and having attached thereto a rearwardly extending valve 10 which closes the tap outlet. The piercing spigot 8 is located adjacent the inlet of the tap. The plunger 7 is secured to a diaphragm 6. In use on a container depression of the diaphragm 6 enables the piercing spigot to rupture a membrane 13 which is part of the flexible container for fluids.



"TAPS"Technical field

This invention relates to taps and valves particularly for use with flexible containers for liquids.

Background art

5. Australian patents 402,978 and 435,591 (Malpas) disclose flexible bulk containers having a dispensing tap which is designed to rupture a membrane in the wall of the bulk container when it is fitted to the container. Bulk containers of this sort have proved
10. commercially successful for the storage and marketing of wine.

- The tap proposed by Malpas in patent 402,978 is inserted into a socket mounted on a wall of the flexible container. This socket incorporates a portion
15. of the container wall to form a rupturable membrane which is broken when the tap is inserted into the socket. An improved construction of the flexible container and socket is disclosed in Australian patent application 47367/79. Because the taps have to be
20. assembled into the socket of the container by the end user there has been consumer resistance to the use of taps of this kind. However it is also important to delay the rupturing of the membrane sealing the container until the contents are to be dispensed.
25. This requirement is important where the contents of the flexible container are to be kept airtight to avoid deterioration by oxidation.

- Another disadvantage of other designs is that the closure valve is distant from the outlet and because
30. liquid can accumulate between the valve and the outlet,

these taps are susceptible to dripping, which is unacceptable to consumers.

- It is an object of this invention to provide a tap convenient for end users and which avoids or diminishes the problems outlined above.
- 5.

Disclosure of the Invention

- To this end the present invention provides a tap adapted for use with a container having a rupturable membrane seal, the tap comprising a body;
10. an inlet in the said body adapted to be positioned in use adjacent the rupturable membrane of the container; an outlet in the said body of the tap communicating with the said inlet; means sealing the said outlet; membrane rupturing means disposed within the said
15. body of the tap; actuation means, actuatable and preferably accessible externally of the said body of the tap and remote from the said inlet, the said actuation means, when the tap is located on the container, being adapted to simultaneously move the
20. said membrane rupturing means to a position adjacent the said inlet to break the said membrane and to move the said outlet sealing means to open the said outlet.

- The present invention thus provides a tap which can be placed in position on the container without
25. rupturing the membrane seal. When it is desired to dispense the contents of the container the membrane is ruptured by the first operation of the tap.

- The tap of this invention can take several forms. Ideally the actuation means, the membrane rupturing
30. means and the outlet sealing means are integral.

In one embodiment of this invention the said actuating means comprises a resilient diaphragm which seals the said outlet and is connected to the said membrane rupturing means, displacement of the said resilient diaphragm acting to open the said outlet and move the said membrane rupturing means to break the said membrane seal of the container. In this arrangement the diaphragm in its normal position is stressed toward and over the outlet. In this arrangement it is difficult to provide a long travel path for the rupturing means.

Another embodiment of the present invention is characterized in that the said actuating means carries a membrane piercing shaft extending within the said tap body toward the said inlet and the said outlet sealing means comprises a valve having a valve stem connected either to the actuation means or the said membrane piercing shaft. Preferably the actuating means is a resilient diaphragm. With this construction movement of the shaft toward the inlet is designed to achieve breakage of the membrane seal of the container while at the same time opening the outlet by removal of the valve seat from the outlet.

Preferably one end of the body portion of the said tap, opposite the said fluid inlet, accommodates a resilient diaphragm to which the said shaft is attached. In its initial or normal position the resilience of the diaphragm retains the end of the said shaft just out of contact with the said membrane. In this normal position the valve seat also closes

- the fluid outlet. Depression of the diaphragm pushes the shaft through the membrane and removes the valve seat from the liquid outlet. Because of the relatively long distance of travel required by the valve stem to ensure that rupture occurs the diaphragm is preferably formed to include a resilient fold or concertina shape rather than a shallow dome. One such diaphragm is prescribed in British patent 977,660. Thus the tap of this invention is designed to rupture the membrane on its first operation. Because of this the tap of this invention can be assembled with the flexible container prior to rupturing of the membrane which is a distinct advantage over the prior art.

- Ideally the valve stem extends in a nearly opposite direction to the shaft so that the straightline motion of the shaft results in almost straight line motion of the valve seat. It is possible for the shaft and valve stem to be offset but parallel and the outlet would then be disposed below the diaphragm. Because the valve seat closes the outlet within the body portion the outlet can be exposed so that there is no possibility that dirt could accumulate in an outlet tube.

- Another alternative arrangement according to this invention is a tap wherein the said actuating means comprises an axially movable shaft extending within the said tap body the said shaft carrying a membrane piercing head adjacent the said inlet and a portion of the said shaft comprising a seal for the said outlet.

In this embodiment the first partial axial movement of the shaft may unseal the outlet so that only the first operation of the tap would require large axial movement to rupture the membrane seal. Axial movement of the shaft may be provided by sliding or rotary movement a screw threaded shaft being preferred.

Thus, the present invention also provides a flexible walled liquid container having secured to a wall thereof a tap socket incorporating a rupturable membrane sealing the liquid contents thereof, a tap inserted and secured within the said socket the said tap being made according to one of the embodiments of this invention.

Best mode of carrying out the Invention

The invention may be put into practice in various ways and one specific embodiment will be described by way of example to illustrate the invention with reference to the accompanying drawings in which:

Figure 1 is a side sectional view of a tap in accordance with the present invention;

Figure 2 is a view along the line A-A of Figure 1; and

Figure 3 is a side elevation of the tap shown in Figure 1 with the valve open.

The tap as illustrated comprises a body section 11 having an inlet end 4 and an outlet 5. One end of the body section is closed by a resilient diaphragm 6. The body section 11 is preferably composed of polypropylene and the preferred material for the diaphragm 6 is polyethyl vinyl acetate. The diaphragm may be

provided in any suitable form e.g. a concertina type resilient panel as long as the diaphragm is resilient, capable of large deformation and of subsequently resuming its normal shape under its own resilience.

5. Disposed within the body section is the plunger 7 which is preferably formed from nylon. At one end 14 of the shaft it is connected to the diaphragm 6. This connection at the end 14 in this embodiment is a snap fit into a recessed boss on the inside face of the
10. diaphragm 6. The plunger 7 extends through a guide ring 15 within the body portion 11. The plunger 7 carries at the end adjacent the inlet 4 a piercing spigot 8. Extending rearwardly from the spigot 8 is a valve stem 9 and a valve 10 which seals a valve
15. seat 17 provided on the inside of the outlet 5.

- Figure 2 which shows the end view of the spigot 8 illustrates one preferred form. Guide grooves 19 are provided on the inside of the tap body 11 and guide ribs 18 are provided on the spigot 8 and their
20. interengagement assists in ensuring direct movement of the plunger 7 and the spigot 8 past the inlet end 4 of the body section 11.

- Figure 3 shows the tap in use fitted in a collar 19 on the wall 12 of a flexible container. The
25. inlet 4 of the body section 11 abuts the membrane 13 which seals the container. When (as shown in Figure 3) the diaphragm 6 is depressed the piercing spigot 8 ruptures the membrane 13 and at the same time the valve closure 10 is withdrawn from the seating 17 of
30. the outlet 5 thus allowing the fluid contents of the

7.

container to be dispensed. On removal of the deforming pressure from the diaphragm it resiliently springs back to its normal position.

5. From the above description it can be seen that the present invention provides a tap convenient for consumers to use which still enables the rupturing of the sealed container to be delayed until dispensing of the fluid contents is commenced.

CLAIMS

1. A tap, adapted for use with a container having a rupturable membrane seal, the tap comprising a body; an inlet in the said body adapted to be positioned in use adjacent the rupturable membrane of the container; an outlet in the said body of the tap communicating with the said inlet; means sealing the said outlet; membrane rupturing means disposed within the said body of the tap; actuation means, actuatable externally of the said body of the tap and remote from the said inlet, said actuation means, when the tap is located on the container, being adapted to simultaneously move the said membrane rupturing means to a position adjacent the said inlet to break the said membrane and to move the said outlet sealing means to open the said outlet.

2. A tap as claimed in Claim 1 wherein the said actuating means comprise a resilient diaphragm which seals the said outlet and is connected to the said membrane rupturing means, and in which, when the tap is in use on a container, displacement of the said resilient diaphragm acts to open the said outlet and move the said membrane rupturing means to break the said membrane seal of the container.

3. A tap as claimed in Claim 1 wherein the said actuating means carries a membrane piercing shaft extending within the said tap body toward the said

inlet and the said outlet sealing means comprises a valve having a valve stem connected either to the actuation means or the said membrane piercing shaft.

4. A tap as claimed in Claim 3 wherein the said actuation means is a resilient diaphragm.

5. A tap as claimed in Claim 1 wherein the said actuating means comprises an axially movable shaft extending within the said tap body, the said shaft carrying a membrane piercing head adjacent the said inlet, a portion of the said shaft or means attached to the shaft comprising a seal for the said outlet.

6. A tap as claimed in Claim 1 in which the membrane rupturing means are carried on or are part of an actuating shaft, which also affords valve means for opening or closing the outlet from the tap body, the shaft or the membrane rupturing means or both being engaged by guide means afforded by the body of the tap whereby movement of the said shaft and membrane rupturing means longitudinally of the tap body is facilitated.

7. A flexible walled liquid container having secured to a wall thereof a tap socket incorporating a rupturable membrane adapted to seal the liquid contents thereof, and a tap inserted and secured within the said socket wherein the tap is as defined in any one of Claims 1 to 6.

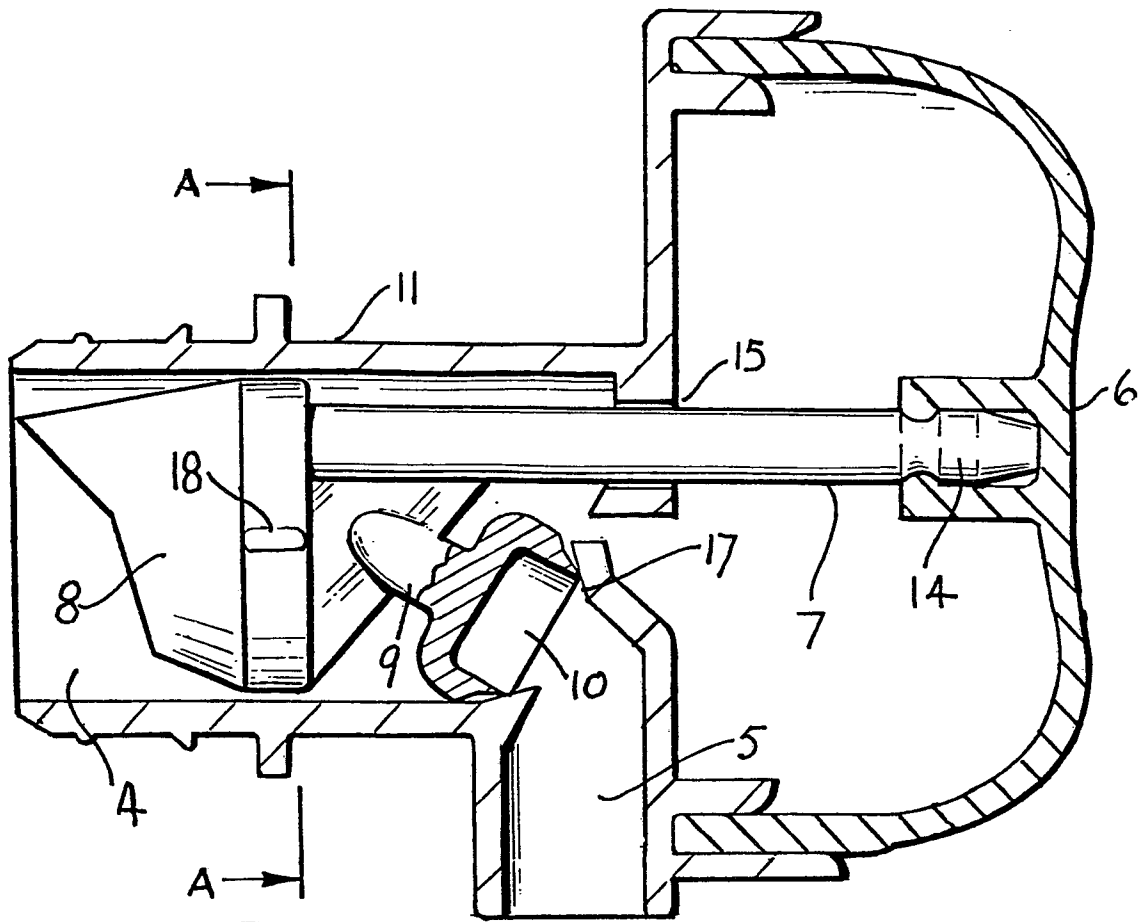


FIG. 1.

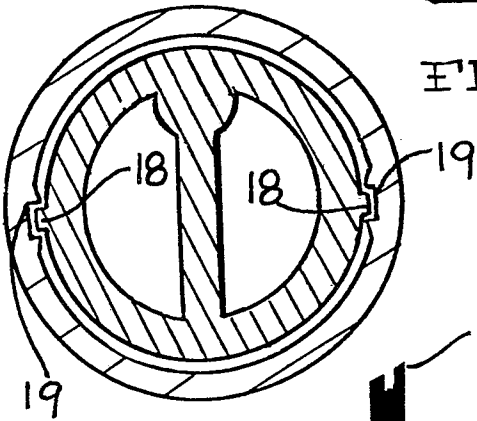


FIG. 2.

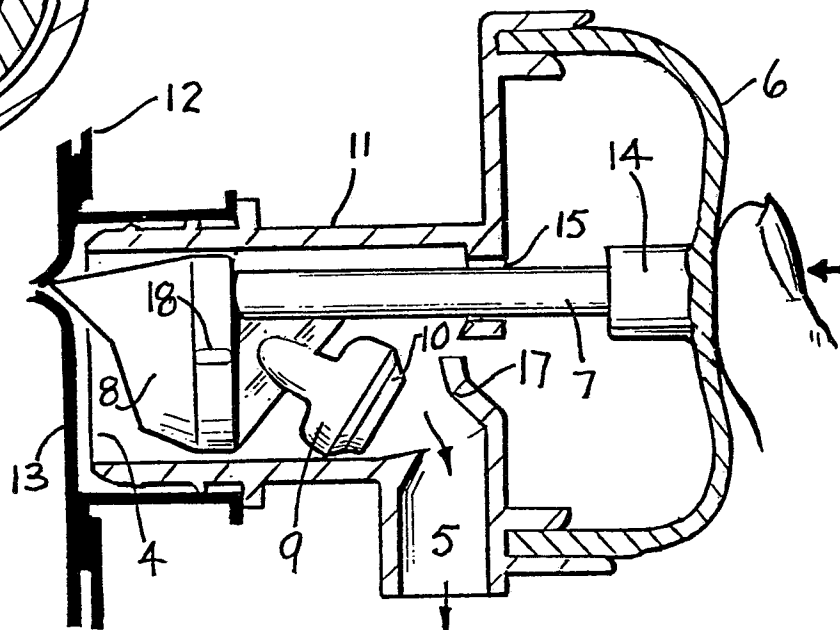


FIG. 3.



DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	<u>US - A - 1 763 924</u> (ERWIN) * the whole document * ---	1-6	B 67 B 7/26 B 65 D 77/06
X	<u>GB - A - 320 707</u> (MURDOCK) * the whole document * ---	1, 3, 5, 6	
	<u>US - A - 3 349 965</u> (THERMOPLASTIC) * column 2, lines 3-60; figures 1, 2 * ---	2, 4, 7	TECHNICAL FIELDS SEARCHED (Int. Cl. ³) B 67 B B 65 D
E	<u>WO - A - 81/02418</u> (CHRISTINE) * the whole document * -----	1-7	
			CATEGORY OF CITED DOCUMENTS X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons
☒ The present search report has been drawn up for all claims			&: member of the same patent family, corresponding document
Place of search The Hague		Date of completion of the search 06-10-1981	Examiner VROMMAN