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(71) Applicant: Delaney, Francis Alfred
22a Broome Road
Southport(GB)

(84) Designated Contracting States:
AT BE CH DE FR IT LU NL SE

(71) Applicant: Unsworth, Leonard
22a Broome Road
Southport(GB)

(84) Designated Contracting States:
AT BE CH DE FR IT LU NL SE

(71) Applicant: Leonard, Peter
22a Broome Road
Southport(GB)

(84) Designated Contracting States:
AT BE CH DE FR IT LU NL SE

(72) Inventor: Delaney, Francis Alfred
22a Broome Road
Southport(GB)

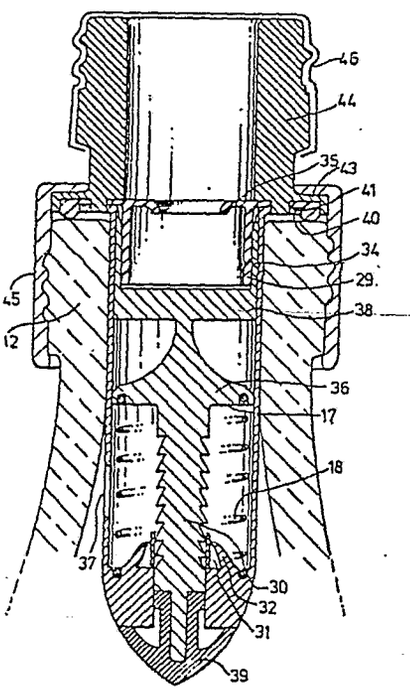
(74) Representative: Livesley, John Ronald
111 The Albany, Old Hall Street
Liverpool L3 9EU(GB)

(54) **Bottle closure insert.**

(57) A bottle closure comprises a valved insert comprising a housing 11 and a valve member 17 which is initially biassed by a spring 18 into a closed condition. Insertion of a measure dispenser spigot moves the member 17 into an open condition. Removal of the spigot, causes the member 17 to move into a closed condition. The member carries a spindle 30 which co-operates in pawl and ratchet manner with pawls 32 which prevent movement into the open condition. This pawl and ratchet detent is initially ineffective since the pawls are held out of co-operation by a bush 31 which is a tight frictional fit on the spindle and during an opening movement is held so the spindle slides through it but on a subsequent closing movement is held by the spindle and drawn out from the pawls so releasing them. Thus the bottle cannot be re-used once on a measure dispenser.

Other embodiments show a valve member co-operating with other movable parts to form a sleeve valve which is initially locked open by a detent but closes as a result of an initial opening movement and subsequent closing movement.

Various refinements are shown.



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EP 0 005 995 A1

BOTTLE CLOSURE INSERT

The present invention concerns bottle closure inserts for insertion into a bottle neck and for use with measure dispensers such as optic dispensers (optic is a trademark).

In bars and other places where spirits and other liquids are dispensed by the measure from a bottle, bar tenders can dishonestly obtain money by substituting their own bottles and pocketing the profit. Even the use of specially marked trade bottles does not prevent an externally bought bottle being used since it is only necessary to pour the contents of the bought bottle into an empty trade bottle. A dishonest bar tender can also add water to, or otherwise tamper with, a correct trade bottle to cheat the customer and escape tax on profits.

The present invention provides a bottle closure insert for use with measure dispensers having a spigot which penetrates a bottle neck comprising a cylindrical housing for positioning in the bottle neck and being sealed thereto with at least one opening permitting the contents of the bottle to be poured out through the opening and the housing's interior, a member displaceable within the housing from a first condition preventing flow through the interior to a second condition permitting such flow and thence to a third condition preventing such flow, an abutment for engagement by the spigot upon its insertion to displace the member from its first to its second condition, a means for displacing the member from its second to its third condition on subsequent removal of the spigot, and a detent arranged so that contact of the spigot with the abutment causes movement of the member from the first to second condition but not from the third condition to the second.

It will be appreciated that it is impossible to abstract

any liquid and adulterate the bottle with water in the first, closed,condition. The space availavle for tampering with the insert so as to wedge the member into the second, open, condition is restricted and need be no more than the size of the spigot and failure in tampering results in the insert going into the third, locked closed, condition. When the spigot is inserted, the insert is driven into the second, open, condition and remains therein until the spigot is withdrawn but on withdrawal of the spigot whether or not the bottle is empty the insert goes into the third, locked closed, condition so that it is impossible to tamper with a half-empty or empty bottle.

The three conditions can involve three positions with the third condition defined by an over-travel beyond the first condition during a return from the second condition or with the member or an associated part being ratchetted around to the three positions. However the positions of the first and third conditions can be coincident with the conditions differing only in the state of the detent. The detent can be arranged either to initially hold the member fast on the abutment but to be disengaged during the movement to the third condition so that subsequent movement of the abutment does not move the member into the second condition or the detent can be initially disengaged but caused to engage the member to lock it in the third condition (the member can be integral with the abutment in this case).

Absolute leak tightness of the member in the housing is not essential since the main flow path is controlled by the dispenser although leaks outside the main flow path are to be avoided. The insert should be designed so that visible signs are left of any attempt to remove and reseal the insert. The insert can be a distinctive colour which shows through a bottle neck to identify the bottle as a trade, or restricted use, bottle rather than one obtained externally retail, and/or secured on the bottle neck by an externally visible non-removable cap. Thus it would be pointless to transfer a trade label to a non-trade bottle since an inspector could survey a row of dispensers, which by their nature are on open display and detect any non-trade bottle.

To avoid misunderstanding since bottles are mounted upside

on dispensers, references to an upward or downward direction in the Specification mean with the bottle neck upwards.

Embodiments of the invention will now be described, by way of example, with reference to the accompanying drawings.

LIST OF DRAWINGS

Figure 1 is a schematic axial section through a bottle neck fitted with a closure insert with a spigot of a dispenser on the point of insertion,

Figure 2 is an axial section through a more developed closure insert,

Figure 3 is an axial section through a third embodiment,

Figure 4 is a schematic axial section of a fourth version,

Figure 5 is a schematic axial section of a fifth version.

An insert as shown in Figure 1 comprises a cylindrical housing 11 adapted to be a tight sealing fit permanently in a bottle neck 12. The housing is of an inert plastics material compatible with the contents of the bottle and may be coloured distinctively so as to show through the bottle neck. The housing can have grooves 14 and/or wiper nibs 15 to ensure reliable sealing and/or be secured in place with adhesives. The housing can have resilient arms 16 which are compressed during insertion but thereafter spring out to prevent the insert being extracted or pushed down into the bottle. Within the housing, a member 17 is free to slide with a bias spring 18 urging the member upwardly. In the initial condition, a catch 19 which is biased out of engagement with the member is held in engagement therewith by the force of the spring holding the member against the catch and thereby preventing disengagement of the catch. The member is positioned so that insertion of a standard dispenser spigot 20 into the bottle neck causes the spigot to engage an abutment surface on the member and drive the member away from the initial condition disengaging the catch, and bringing ports 21 in the member and in the housing into register in a second condition permitting flow through the insert. The member remains in this second condition until the spigot is removed when the spring 18 causes the member to move back into the first condition and since the catch no longer engages the member through an over-travel into a third condition wherein a detent 22 locks the member against further movement.

It is possible to have the catch so designed that the momentum of the member on its upward movement into the third condition is sufficient to over-ride the catch which therefore does not have to be released as described and need be no more than an integrally formed nib in the housing. This calls for critical design of the catch nib but the design can be simplified by having the spring 18 initially held by further nibs which are flexed by downward movement of the member to release the spring; thus the catch need not initially withstand the spring force.

The housing could alternatively or additionally retained by a spun-on non-removable cap but this will be dealt with more fully later in this Specification. With a simple spun-on cap used with the embodiment of Figure 1, the housing would be designed so that, if the cap was removed and an attempt made to pull out the insert, the housing would tear apart.

The insert of Figure 2 is theoretically very similar to that of Figure 1. However in the first condition, the spring 18 holds the member against a stop 29 in the form of a flanged bush. The member carries a fir-tree spindle 30 which passes through the central aperture in a bush 31, the spindle being a tight frictional fit in the bush, and is arranged to pass through an aperture in the bottom of the housing on downward movement. On this downward movement, the bush is pushed relatively up the spindle and when the spindle moves upwardly the bush is carried thereby. The aperture in the bottom of the housing is surrounded by a ring of resilient pawls 32 which initially bear on the outside of the bush but when the bush is drawn up by the spindle engage the ratchet teeth on the spindle 30 so as to permit continuation of any upward movement but preventing subsequent downward movement. These pawls and the ratchet teeth thus provide the desired detent preventing movement from the third condition.

This Figure 2 also shows a number of features for rendering tampering difficult. The member 17 has an upstanding skirt 34 which lies between the housing 11 and the bush 29 and remains therebetween throughout the entire travel of the member so that it is impossible to insert a wedge to lock the insert in the second condition after pushing the member down. The bush 29 has a membrane 35 which is ruptured by the insertion of the

dispenser spigot or has an aperture which widens out on the insertion of the spigot but in any event restricts access to the member. The member 17 has a piston-like part 36 for co-operation with the flow ports 37 in the housing to seal or open the ports but these ports are protected against insertion of illegal locking means by means of a perforated shield 38 integral with the part 36 which permits flow of the liquid but not access to the ports. The perforations in the shield are so small and so arranged that it is impossible to push a stiff wire down through the perforations to hook into the ports. An expandible member 39 is located in the aperture in the bottom of the housing and is arranged to grip the spindle 30 as it descends through that aperture and dislodges the member 39 from the aperture so the member 39 remains captive on the spindle. On subsequent upward movement of the spindle, the member 39 which has expanded resiliently on dislodgement from the aperture cannot re-enter the aperture and is thereby dislodged from the spindle. The member is of a plastics material which will float and thus acts as a tell-tale that the dispenser spigot has been removed and that the bottle should not be in use. The housing has a flange 40 which sits on the bottle neck and is received in a recess in the flange 41 of the flanged bush stop 29 so that an annular sealing nib 42 of the flange 41 also makes contact with the bottle neck. A flange 43 of a dummy bottle neck 44 sits on top of the flange 41 and these flanges are gripped under pressure to the bottle neck by a non-removable spun-on metal cap 45; it is of course possible to make the dummy bottle neck integral with the bush stop 29 but the cap is still needed. The dummy bottle neck is in turn fitted with a spun-on screw-off tamper-proof closure 46 with the usual break-line. This dummy bottle neck not only further restricts access to the insert but also compensates for the amount of air expansion space in the bottle occupied by the insert so that use of the closure does not require the use of a non-standard bottle or under-filling a standard bottle or special handling to restrict the temperature range to which the bottle is exposed. The spun-on cap remains visibly in place when the bottle is on a dispenser and so informs an inspector that all is well. The flanges can be relatively hard and demand a high

sealing pressure from the cap 45 so that if the cap is carefully prised off and replaced it will be impossible to get the required pressure and the bottle will leak if placed on a dispenser. In this embodiment there is a clearance between the housing and the inside of the bottle neck and all sealing is done on the flanges. The various flanges 40, 41 and 43 can be locked together by projections from one penetrating the others to withstand the spigot insertion friction forces dragging the bush stop 29 down with the spigot.

. The operation of this embodiment is similar to that of Figure 1. The spigot abuts the shield 38 and so drives the part 36 from an initial sealing position to a second open condition. On removal of the spigot, the spring 18 pushes the part 36 upwards arming the detent formed by the pawls and the spindle and dislodging the tell-tale member 39. On reaching a third closed condition, the member is locked against further movement by the detent.

In the embodiment of Figure 3, a perforated shield abutment 51 has an imperforate head 52 slidingly sealed in a sleeve-like member 53 which forms with the abutment 51 a sleeve valve controlling flow through the abutment. This sleeve valve is initially locked open. The abutment has a flanged spindle 54 extending downwardly through the member 53 and between the flange 55 of this spindle and an internal flange 56 of the member 53 there is a detent member 57. This detent member is initially held engaging the two flanges by a sleeve 58 which is a tight frictional grip on the spindle. The detent member can be integral with the sleeve or a separate component but would comprise a ring of arms which are initially wedged apart by the flange 55. In the first condition, ports 59 are sealed off by the member 53 and the head 52, but flow paths 60 through the abutment are open. On the abutment being forced down by a dispenser spigot, the ports are brought into register with the flow paths so flow can occur. The sleeve is engaged with a ring of catches 61 on the bottom of the housing. On removal of the spigot, the catches 61 retain the sleeve so that the detent member is no longer clamped between the end of the sleeve and the flange 55 but can relax into a smaller state wherein it is wholly within the internal

flange's internal diameter and so the member 53 under the force of the spring 18 closes up on the abutment and seals off the flow paths. The spindle and the sleeve would have complementary tapers to facilitate the retention of the sleeve by the catches. The housing is shown with an open bottom but this would in fact be closed by a tell-tale displaceable cap. The retention of this insert would be as described in relation to Figure 2.

Figures 4 and 5 are alternative forms of the embodiments of Figures 2 and 3 respectively employing a split resilient spindle 62 which is initially held in a radially contracted state by a retaining ferrule 63 which is chamfered to guide the spindle into a hole 64 in the bottom of the housing. On retraction of the spindle the ferrule is knocked off by the hole and acts as a tell-tale. In Figure 4, the spindle merely opens out and cannot re-enter the hole but in Figure 5 the spindle initially acts as a spring collet holding a shaft 64 of a separate shield abutment 65 and on release of the ferrule the valve member closes back on the abutment. The ferrule and the end of the spindle are chamfered and otherwise arranged to facilitate the knocking off of the ferrule.

Claims

1. A bottle closure insert for use with measure dispensers having spigots for entering bottle necks, comprising a cylindrical housing for positioning in a bottle neck and being sealed thereto with at least one opening permitting the contents of the bottle to be poured out through the opening and the housing's interior, a member displaceable within the housing from a first condition preventing flow through the interior to a second condition permitting such flow and thence to a third condition preventing such flow, an abutment for engagement by a dispenser spigot on its insertion to displace the member from the first to the second condition, a means for displacing the member from its second to its third condition on subsequent removal of the spigot, and a detent so arranged that contact of the spigot with the abutment causes movement of the member from its first to second condition but not from the third condition to the second.

2. An insert according to claim 1 wherein the member is linearly movable without rotation playing any part.

3. An insert according to claim 1 or claim 2 wherein the abutment is integral with the member and the detent locks the member against movement relative to the housing.

4. An insert according to claim 3 wherein the detent is locked out of operation in the first condition by a member which is dislodged during the movements to the second and third conditions.

5. An insert according to claim 4 wherein the member has a spindle designed to operate in pawl and ratchet manner with detent pawls which are initially held out of engagement with the spindle by a bush carried by the spindle and which is carried out from the pawls by movement from the second condition.

6. An insert according to claim 1 or claim 2 wherein the member co-operates with a separate abutment member in the manner of a sleeve valve sealing the interior of the housing with the detent initially holding the sleeve valve open but being disengaged to close the sleeve valve during subsequent movement.

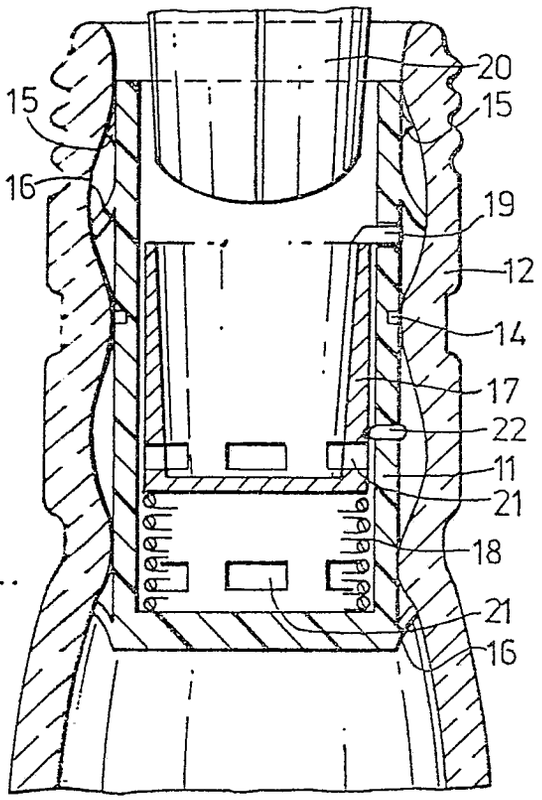
7. An insert according to any preceding claim wherein the abutment is a perforated shield preventing access to the member proper.

8. An insert according to claim 7 wherein the abutment has a skirt extending outwardly of the bottle neck and a flanged bush is fitted within the skirt preventing access to a free edge so that it is not possible to wedge the insert open.

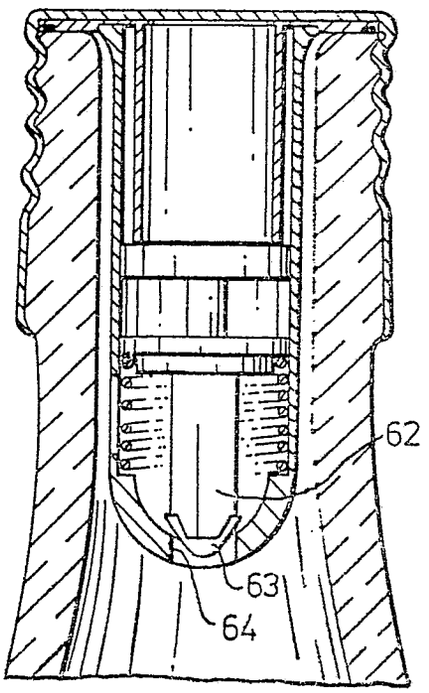
9. An insert according to claim 8 wherein the insert is secured to the bottle neck by a spun-on non-removable cap clamping a flange of the housing and the flange of the flanged bush.

10. An insert according to claim 9 wherein a dummy bottle neck sealed with a tamper-proof cap is also sealed to the bottle neck by the non-removable cap.

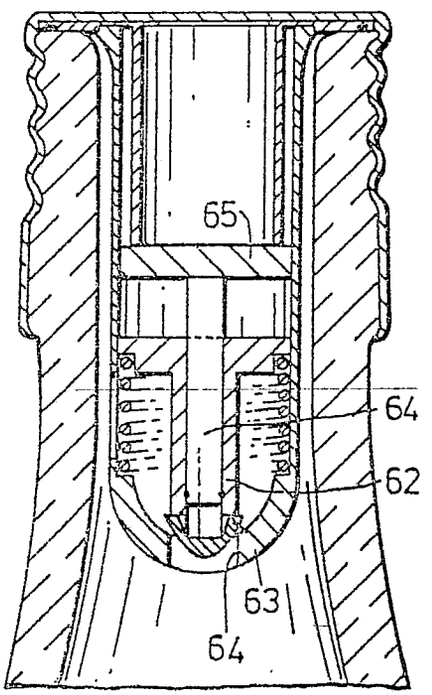
11. An insert according to any preceding claim provided with a member which is dislodged by movement from the second to third condition and which is designed to float in the bottle to serve as a tell-tale that the bottle should not be in use.



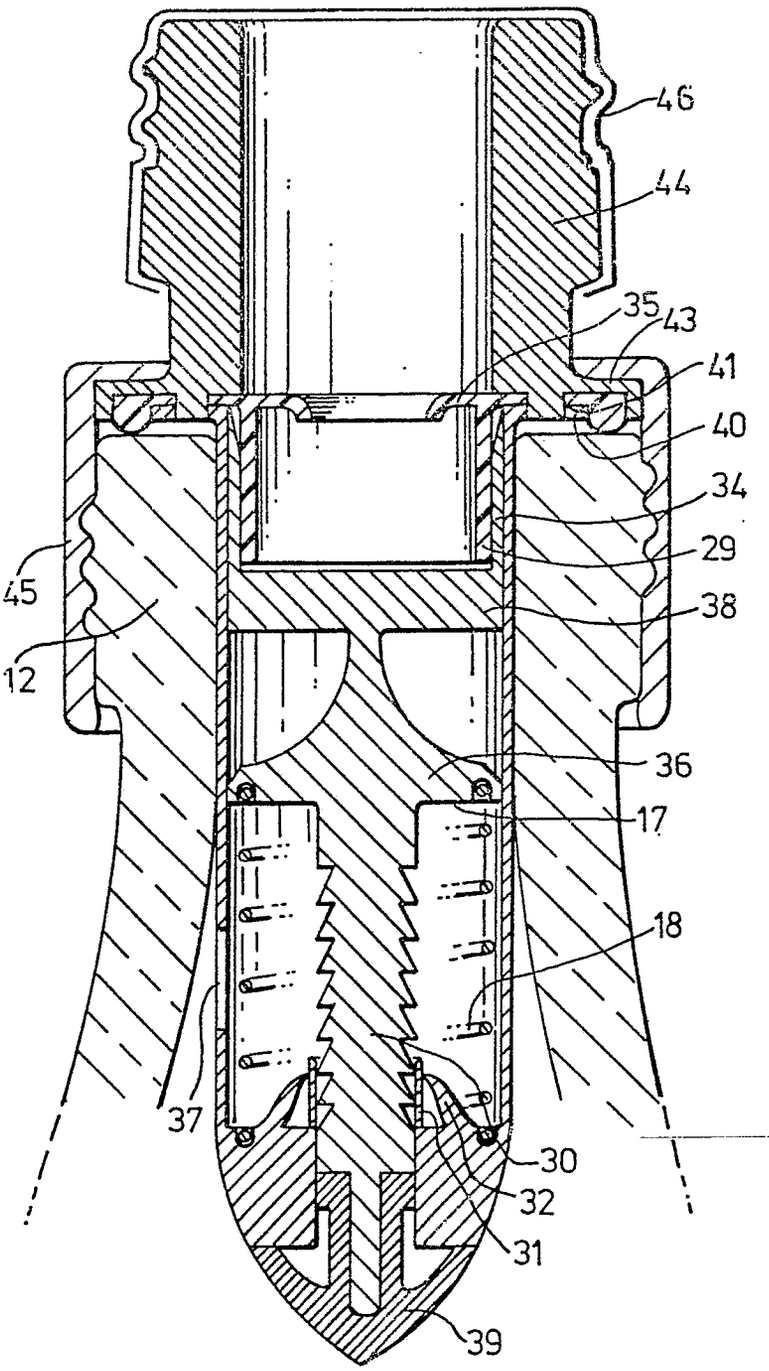
-FIG.1-



-FIG.4-



-FIG.5-



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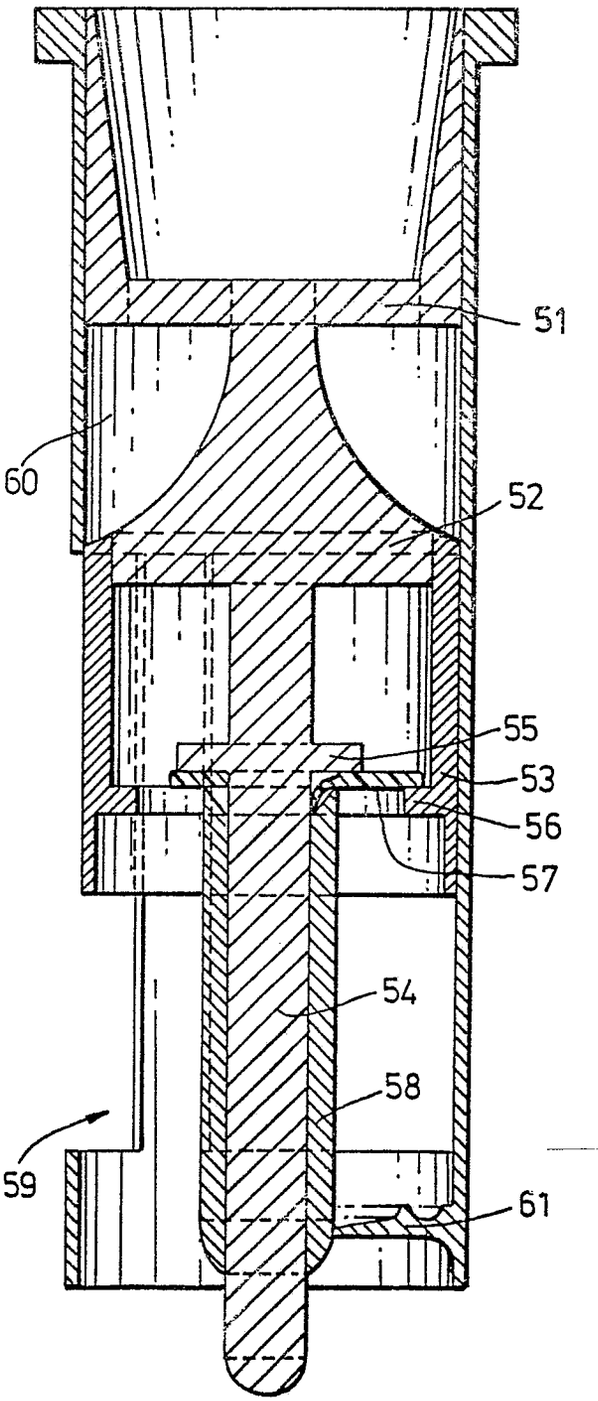

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European Patent Office

EUROPEAN SEARCH REPORT

Application number
79800987.9

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
	US-A- 2 476 587 (Doblin) *Totality* --	1,4
	US-A- 587 790 (Burrow) *Totality* --	1
	US-A- 2 585 381 (Gronemeyer) *Fig.3,4* --	2
	US-A- 1 067 583 (Brague) *Page 1, lines 64,65; fig.1,2* --	2,3
	DE-C- 190 930 (Julien) *Page 1, line 24; fig.1* --	3
	US-A- 987 298 (Hecker) *Fig.4* --	8,9
	DE-C- 90 325 (Hubener) *Page 1, column 2, lines 12 to 18* --	11
	US-A- 759 496 (Baker) *Page 2, line 19; fig.1,2* ----	11

CLASSIFICATION OF THE APPLICATION (Int.Cl.³)

B 65 D 49/00
B 65 D 49/08

TECHNICAL FIELDS SEARCHED (Int.Cl.³)

B 65 D 25/52, 45/18, 47/00, 47/02, 47/34, 49/00, 49/08, 49/12;
B 67 D 3/00, 3/04, 5/16;
A 61 J 1/00, 1/06
A 45 D 34/04

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

&: member of the same patent family, corresponding document

X The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	22-08-1979	TROJAN