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(54) Dual liquid dispensing system.

(57) A dual dispensing system for delivering aliquots of a liquid product such as liquid soap, comprising a housing (1), two reservoirs (2,3) for the liquid product, each reservoir being connected to a pump (4,5) which can be manually operated via actuating means (6,7), whereby there are provided means (8,9,10) to automatically switch-over from one pump to the other pump when the liquid product in the first reservoir is exhausted, and vice versa.

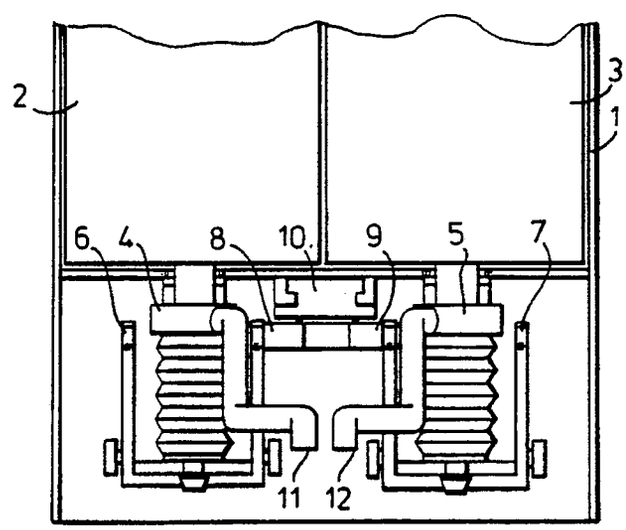


Fig.1b

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The present invention is concerned with a dispenser of the kind for delivering aliquots of a liquid product from a reservoir by means of a pump which is manually operable. Such dispensers are often used in washrooms, etc. for dispensing small amounts of a liquid soap product for hand washing purposes.

Various dispensers of this kind have been described in the literature. For example, the US-patent 4,256,242 (Christine) discloses a liquid soap dispenser comprising a housing, a collapsible bag for holding the liquid soap product and an operating lever or handle for actuating controlled amounts of soap from the bag. The collapsible bag is connected to an outlet by means of a flexible conduit which comprises a pump.

These known type of dispensers offer hygiene and ease of handling for the user. However, one problem with this kind of dispensers resides in the fact that only a small amount of liquid soap may be dispensed at a time, due to the limited capacity of the pump. The amount is usually not more than 0.5 to 1 ml.

Another problem which is commonly encountered is the fact that the dispenser may run out of soap unnoticed, which causes annoyance and hygiene risks for the user. Frequently checking by janitors will reduce the likelihood of a soap dispenser being out of soap for a long time, but this is not an economical solution.

It has also been suggested in the European patent application 110,686 (Kimberley-Clark) to provide the soap dispenser with a window through which the reservoir level may be seen. This offers only a partial solution to the above mentioned problems, because it is not possible to determine when exactly the reservoir will run out of soap. It may even lead to a waste of liquid soap product if it becomes customary to replace the reservoirs before they are completely emptied.

It is therefore an object of the present invention to provide a dispenser of the aforementioned kind, which does not possess these or other disadvantages.

We have now found that these disadvantages can be overcome by the dual dispensing system for delivering aliquots of a liquid product, comprising a housing, two reservoirs for the liquid product, each reservoir being connected to a pump which can be manually operated via actuating means, whereby there are provided means to automatically switch-over from one pump to the other pump when the liquid product in the first reservoir is exhausted, and vice versa.

Preferably, the reservoirs are collapsible and the switch-over means is actuated by the vacuum which is created in a reservoir when it is fully collapsed.

The dispensing system according to the invention preferably comprises indicating means to indicate that a switch-over has occurred. It is especially preferred that these indicating means are visual indicating means.

The pumps may be of any suitable kind, but bellow-type pumps are preferred. They may have a capacity of from about 0.1 to 10 ml, preferably from about 1 to 5 ml.

The invention will now be better explained by way of the following preferred embodiment, and with reference to the accompanying drawings, in which:

Figures 1 A,B and C show schematic cross-sectional views of a liquid soap dispenser according to the invention, as seen from the side, the front and from below, respectively;

Figures 2 A,B and C show the same dispenser, upon pressing the operating lever;

Figures 3 A,B and C show the same dispenser, upon releasing the operating lever;

Figures 4 A,B and C show the same dispenser whereby the switch-over means switches from the first collapsible reservoir to the second; and

Figures 5 A,B and C show the same dispenser after the switch-over has occurred.

Figures 1 A,B and C show three schematic cross-sectional views of the dual dispensing system of the invention. The dual dispenser of the invention features a housing 1 surrounding two separate collapsible reservoirs 2,3 for holding the liquid soap product. Although there are two reservoirs, only one of them is operative at a time. In the depicted situation this is reservoir 2. Each reservoir is connected to its own pump 4,5 which is preferably a bellow-type pump. The bellow-type pumps are preferred because they are very compact and they can be used for larger volumes of up to 10 ml and more.

Each of the pumps is also provided with an outlet nozzle 11,12 through which the liquid soap is to be dispensed.

In Figures 2 A,B and C is shown what happens upon pressing the operating lever or press bar 13 which is situated at the front of the dispenser, as indicated by the arrow. The press bar is mounted on a hinge 14. The action of the press bar 13 is transferred on to a push rod 10 which is movable in a horizontal direction and acts against a spring. Attached to the push rod 10 there are provided two switch bars 8,9 which can be pivoted around two vertical axes 15,16 and which are kept apart by a spring means 17. A notch in one of the switch bars fits into either one of two holes in the other switch bar, thus constituting a bi-stable ensemble. The ensemble of the switch bars is at all times preferably in one of two possible states, corresponding to the states in which either one of the reservoirs is

engaged for dispensing liquid soap.

It should be mentioned here that although reference is made here to liquid soap, it is to be understood that the dispenser is in fact suitable for any liquid, gel or paste-like product, for cleaning or sanitizing purposes or even for other products like food products, for instance mayonnaise, all within the scope of the present invention.

In each of the two above-mentioned states, on of the switch bars 8,9 engages with one of the tilting tables 6,7 by means of a notch in the switch bar fitting into a hole in the corresponding tilting table. The tilting tables are connected to the two bellow pumps 4,5 in such way that upon tilting the table, the pump is activated and liquid soap is expelled from the outlet nozzle.

In Figures 3 A,B and C the press bar 13 is released. The push rod 10 which acts against a spring, is then also released and will move in the direction indicated by the arrow. The switch bar 8 is engaged in the tilting table 6 and the horizontal movement of the push rod 10 is thereby transformed into a vertical movement of the bellow pump 4. Thereby new liquid soap is sucked into the bellow pump from reservoir 2.

When the press bar 13 is pressed again, the process is repeated and a new aliquot of liquid soap is dispensed from the outlet 11. This may continue until the liquid soap in reservoir 2 runs out.

In Figures 4 A,B and C the situation is shown wherein the press bar 13 is returning to its outward position, after the last aliquot of liquid soap has been dispensed from reservoir 2. The bellow pump 4 is now unable to suck in new liquid soap from reservoir 2 and remains in the compressed state. The tiling table 6 which is connected to the bellow pump 4 is now retained in the upward position.

Because the push rod 10 is acting against a spring it will tend to return to the outward position. The notch on the switch bar 8 is thereby pushed from the hole in the tilting table 6 and is pushed towards switch bar 9. The tilting table 6 is now uncoupled from switch bar 8.

As the push rod 10 is travelling further to its outward position, the notch on the switch bar 9 finds the hole in the tilting table 7 and engages in therein. This is shown in Figures 5 A,B and C. The bi-stable ensemble formed by the switch bars 8,9 is now in its other state, and the switch-over from reservoir 2 to reservoir 3 has taken place. Bellow pump 5 and reservoir 3 are now engaged, and upon pressing the press bar 13, liquid soap is dispensed from reservoir 3 via outlet 12.

This process may be repeated until the liquid soap product in reservoir 3 has run out and a switch-over to reservoir 2 occurs, analogous to the way described above for the switch-over from reservoir 2 to 3. If the empty reservoir 2 has been replaced in the mean time by a new reservoir, the supply of liquid soap from the dispenser is never interrupted. Because the switch-over occurs automatically, the user does not have to draw the attention of an operator if the liquid soap in one of the reservoirs runs out.

The dispenser of the invention has a much lower probability to be empty at a particular moment in time, than the conventional liquid soap dispensers. In order to further reduce the probability, the dispenser may be equipped with indicating means to indicate that a switch-over has occurred. The operator will then be able to determine whether one of the reservoirs has run out of liquid soap without having to open the dispenser.

The indicating means preferably are visual indicating means. The indicating means may comprise two arms, each being connected to one of the tilting tables 6,7. As shown above, a tilting table will remain in the upward position when the corresponding reservoir is empty. The arms comprise a signalling part which is visible from the outside when the tilting table is in its upward position, and when one of the reservoirs is empty. When the empty reservoir is replaced by a new one, the corresponding tilting table is moved into its downward position and the signalling part will automatically disappear.

It is emphasized that the dispenser shown in the Figures illustrates a only preferred embodiment of the invention and that various constructional alternatives will be immediately evident to the man skilled in the art, without departing from the scope of the present invention

Claims

1. A dual dispensing system for delivering aliquots of a liquid product, comprising a housing (1), two reservoirs (2,3) for the liquid product, each reservoir being connected to a pump (4,5) which can be manually operated via actuating means (6,7), whereby there are provided means (8,9,10) to automatically switch-over from one pump to the other pump when the liquid product in the first reservoir is exhausted, and vice versa.

2. A dispensing system according to Claim 1, whereby the reservoirs (2,3) are collapsible and the switch-over means (8,9,10) is actuated by the vacuum which is created in a reservoir when it is fully collapsed.

3. A dispensing system according to either preceding Claim, comprising indicating means to indicate that a switch-over has occurred.

4. A dispensing system according to Claim 3, wherein the indicating means are visual indicating means.

5. A dispensing system according to either preceding Claim, wherein the pumps have a capacity of about 0.1 to 10 ml.

6. A dispensing system according to either preceding Claim, wherein the pumps have a capacity of 1 to 5 ml.

7. A dispensing system according to either preceding Claim, wherein the pumps are bellow pumps.

8. A reservoir adapted for use in the dual dispensing system according to any of the preceding claims.

Fig.1.

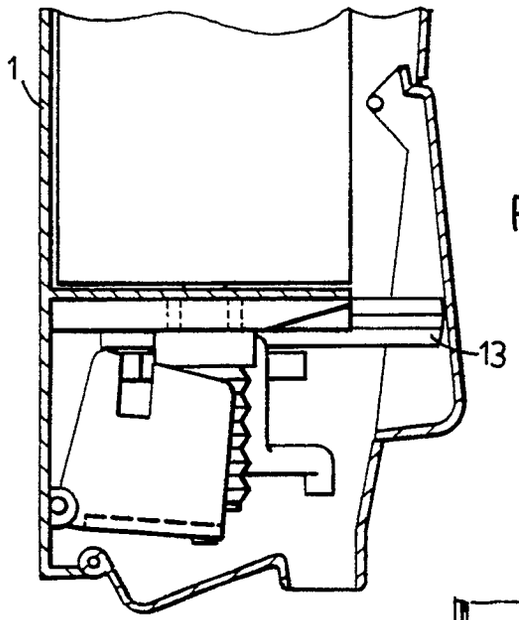


Fig.1a

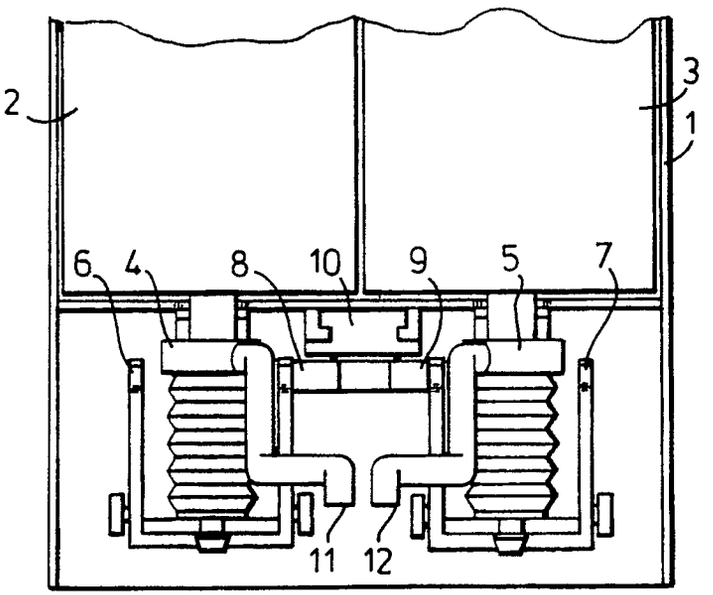


Fig.1b

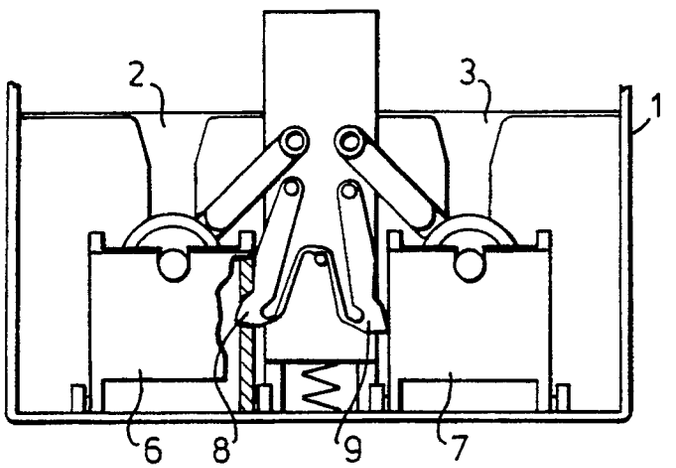


Fig.1c

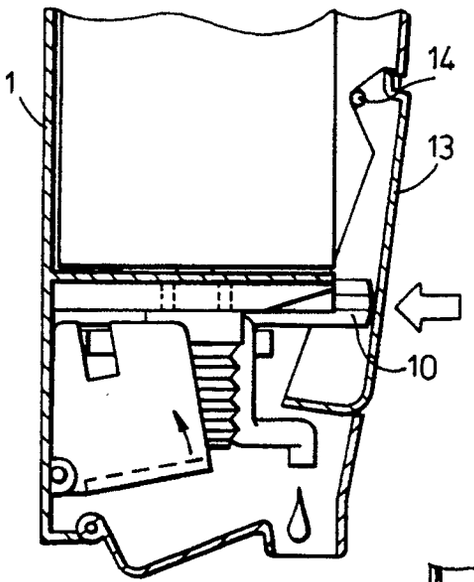


Fig.2.

Fig.2a

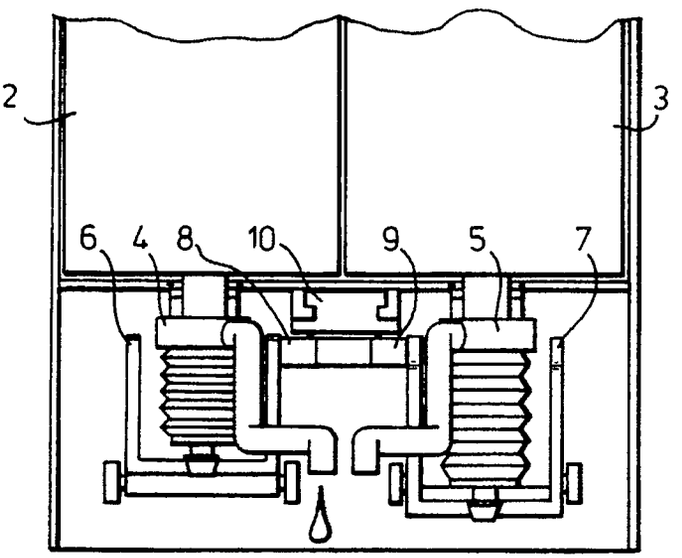


Fig.2b

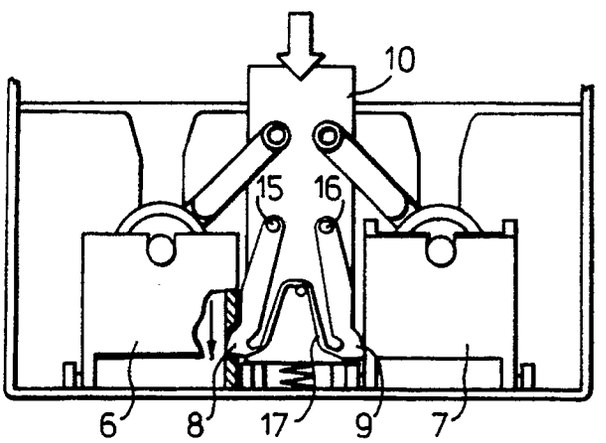


Fig.2c

Fig.3.

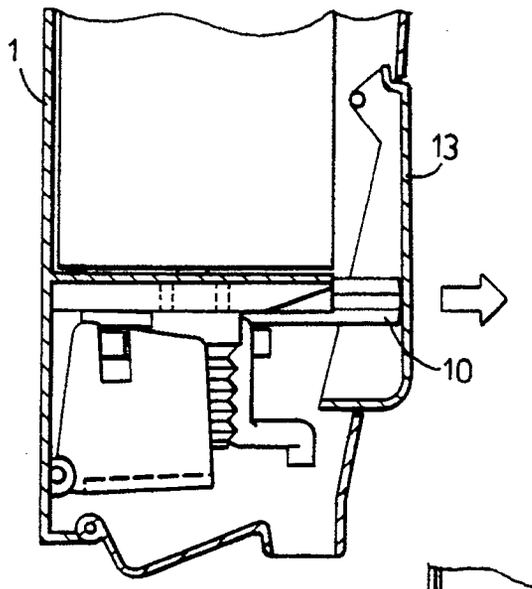


Fig.3a

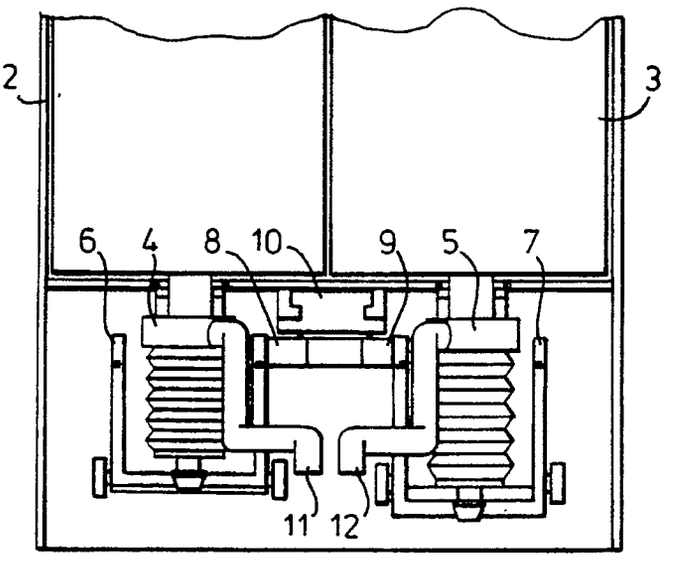


Fig.3b

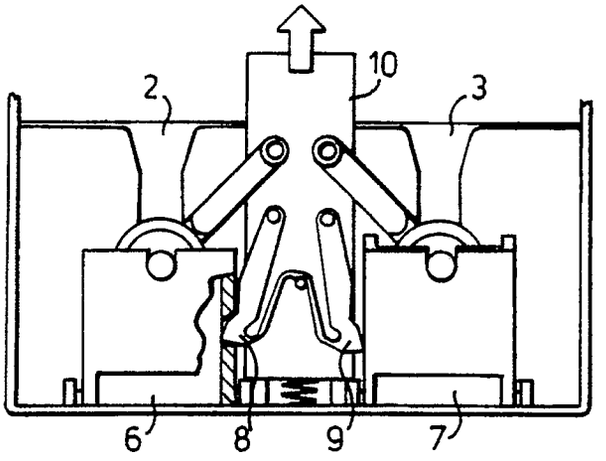


Fig.3c

Fig. 4.

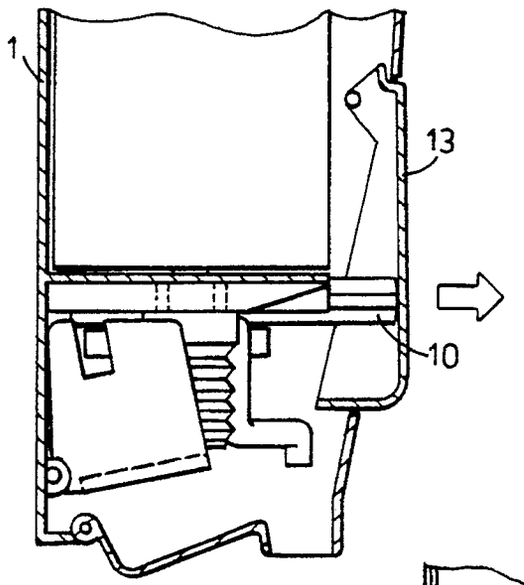


Fig. 4a

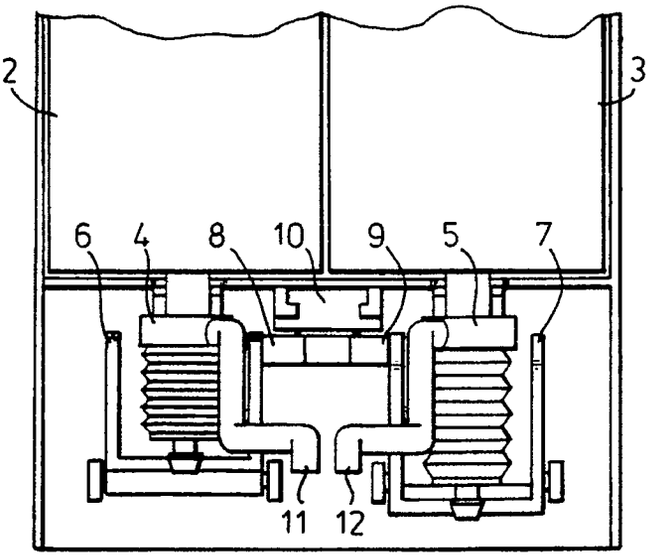


Fig. 4b

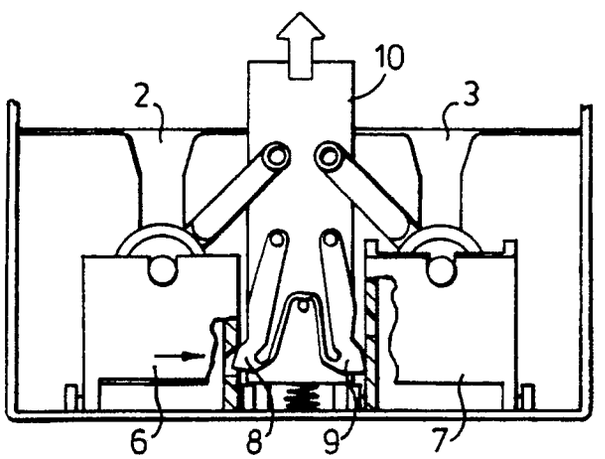


Fig. 4c

Fig.5.

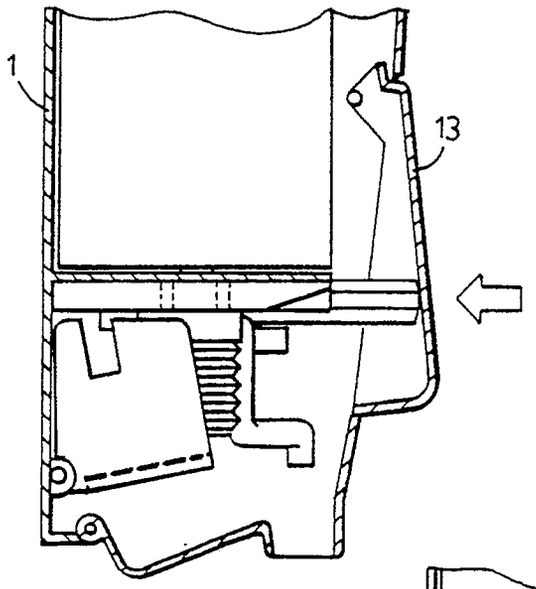


Fig.5a

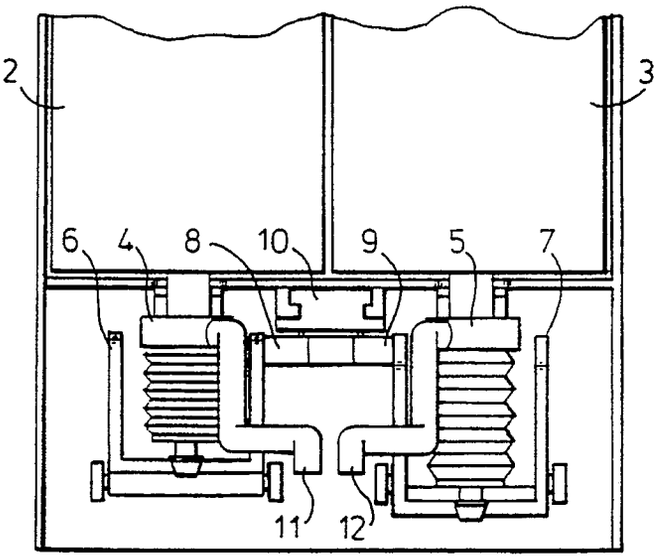


Fig.5b

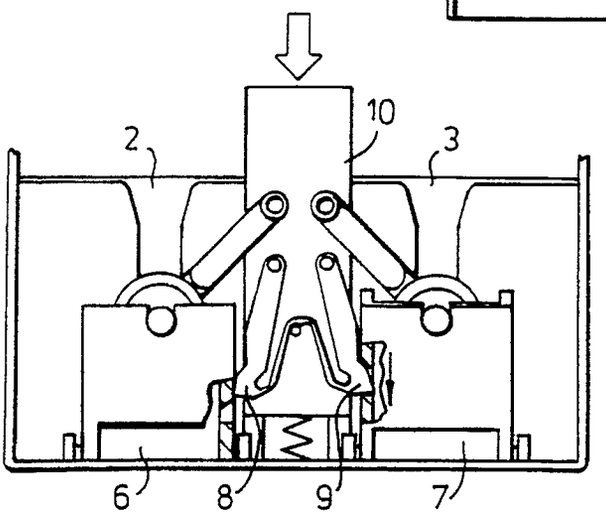


Fig.5c

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 91 20 0599

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	WO-A-8 903 803 (SCOTT PAPER COMPANY) * abstract; claim 1; figures 1-6 *	1,2,3,4	B 67 D 1/12 A 47 K 5/12
A	EP-A-0 109 180 (PRODUCT RESEARCH & DEVELOPMENT) * abstract * * page 1, line 26 - page 5, line 7; figure 1 *	1,2,8	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B 67 D
A 47 K

The present search report has been drawn up for all claims

Place of search	Date of completion of search	Examiner
The Hague	04 July 91	GUILLAUME G.E.P.

CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone
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