(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 664 275 A2**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **95100717.8**

(51) Int. Cl.[6]: **B67D 5/02**, B05B 11/00

(22) Date of filing: **19.01.95**

(30) Priority: **19.01.94 DE 4401453**

(43) Date of publication of application:
26.07.95 Bulletin 95/30

(84) Designated Contracting States:
AT BE CH DE DK ES FR GB GR IE IT LI LU MC NL PT SE

(71) Applicant: **KRAFT MANUFACTURING GmbH**
Rigaer Strasse
D-28217 Bremen (DE)

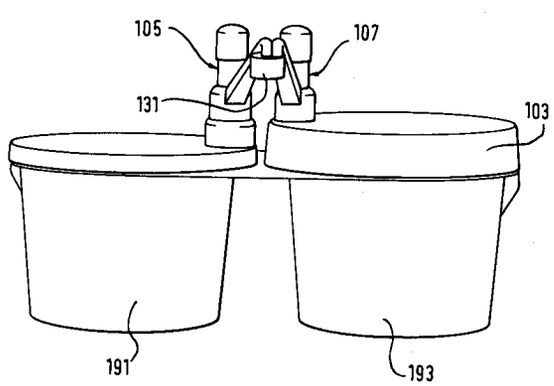
(72) Inventor: **Bellmann, Andreas, c/o Concept + Product Gmbh**
Bei der Neuen Münze 14a
D-22145 Hamburg (DE)

(74) Representative: **Weickmann, Heinrich, Dipl.-Ing. et al**
Patentanwälte
H. Weickmann, Dr. K. Fincke
F.A. Weickmann, B. Huber
Dr. H. Liska, Dr. J. Prechtel, Dr. B. Böhm
Postfach 86 08 20
D-81635 München (DE)

(54) Apparatus for dispensing a combined stream of at least two individual substances for consumption, their consistency ranging from liquid to soft-plastic.

(57) This apparatus selectively allows to dispense a combined stream consisting of the different individual substances or to dispense the individual substances separately. The apparatus comprises a corresponding number of individual substance storage chambers (191,193) and a corresponding number of individual substance pumps (105,107), The pumps have respective individual substance suction channels (77), dipped into respective individual substance storage chambers (191,193), and further have individual substance dispensing channels (83). A combined-stream dispensing head (131) is connected to the individual substance dispensing channels (83).

Fig.6



EP 0 664 275 A2

The invention relates to an apparatus for dispensing a combined stream of at least two individual substances for consumption, their consistency ranging from liquid to soft-plastic.

In the restaurant and food supply trade many an apparatus is known which permits to dispense measured amounts of viscous substances to influence the flavour, e.g. ketchup, mayonnaise, mustard or the like. Such an apparatus, taken separately, allows of dispensing one specific individual substance only. Such an apparatus is completely sufficient for consumers who desire only one of these substances individually in order to change the flavour of food, e.g. chips, as well as for consumers who desire to have more than one substance, yet arranged separately on a plate. The owner of the food supply shop, e.g. a snack-bar or the like, is required to provide such apparatus in a number equal to the number of the various flavoured substances offered.

The primary object underlying the invention is to create an apparatus for dispensing a combined stream of at least two individual substances for consumption, their consistency ranging from liquid to soft-plastic.

In order to attain this object the invention provides an apparatus characterised by a respective number of individual substance storage chambers, preferably in the form of respective individual substance storage containers, a respective number of individual substance pumps, the pumps each having an individual substance suction channel, dipped into a respective individual substance storage chamber, and an individual substance dispensing channel as well as a combined-stream dispensing head connected to the individual substance dispensing channels.

Using a combined-stream dispensing head arranged at the end of the pumping paths of the individual substances, as regarded in the direction of dispensing, i.e. subsequent to the individual substance dispensing channels of the pumps, makes it possible to employ essential components of a known apparatus suitable for dispensing only one individual substance, such as e.g. the entire pump assembly. Owing to the combining action being effected downstream from the individual substance pumps the shipping and storing containers containing and displaying the individual substances for sale may be used as individual substance storage containers. Consequently, the apparatus according to the invention is very inexpensive and can be manufactured with little expenditure.

Preferably, the combined-stream dispensing head is designed so as to permit one individual substance being dispensed, apart from the possibility of combining the at least two individual substances. Owing to the combined-stream dispening head being arranged at the end of the individual substance dispensing channels again it is ensured that the channels of a specific individual substance stay clear of any considerable contamination with another individual substance. This is irrelevant in case it is desired that a combined stream of several individual substances be dispensed, however, might be considered favourable by the consumer if it is desired that a specific individual substance be dispensed individually.

The apparatus according to the invention may completely replace any known apparatus intended for individually dispensing specific individual substances: it is not necessary, at increased financial expense, to provide for e.g. a snack bar both individual substance dispensers and the combined stream dispenser of the present invention.

The combined-stream dispensing head may be designed as an individual substance mixing head with a mixed-stream outlet. In this case the different single substances are mixed with one another while passing through the head and being dispensed via a common outlet, thereby avoiding the necessity of any stirring of individually dispensed substances on a plate, which at times is an unsavoury and unpleasant sight.

Alternatively, the combined-stream dispensing head may comprise a plurality of mutually adjacent single-stream outlets, at least one respective single-stream outlet for each of the individual substances. Using such a dispensing head it is possible to produce a bundled substance stream consisting of several individual substance stream filaments, each of which may consist of a different individual substance. Such a bundled substance stream is also a "combined stream" according to the terminology used for describing the present invention and, in shape and taste, resembles a combined stream in which the individual substances are intermixed. The individual substance filaments, however, may be optically discernible in such a bundled substance stream so that interesting optical multicolor effects may be obtained.

In such a combined-stream dispensing head with a plurality of single-stream outlets it is possible that, in terms of their cross-sectional area, direction and local distribution, the single-stream outlets are such that they favour combining of the individual substance streams discharged therefrom to form a coherent stream after discharge from the single-stream outlets. For instance, the single-stream outlets may converge in the outlet direction and/or the cross-section of the individual outlets and the distance between individual outlets may be chosen such that due to surface effects such as adhesion the individual substance streams approaching one another stick to each other after leaving the combined-stream dispensing head,

even if no blending of the single substance streams occurs due to possibly strong viscous characteristics of the individual substances normally used (ketchup, mayonnaise, mustard etc).

In forming a composite stream from the individual substance streams discharged from the combined-stream dispensing head it can be prevented by coherence that individual substance streams splash and hit at places where the substances are not desired. Moreover, it is possible to decorate food in an appealing manner by means of the combined stream and more particularly in case of multicolored bundled substance streams.

In order to better distribute, if desired, the individual substances over the cross-sectional area of a combined substance stream discharged from a combined-stream dispensing head with a plurality of outlets it is proposed that for each individual substance a plurality of single-stream outlets be provided in the combined-stream dispensing head. If the single-stream outlets are disposed along concentric circles around a common outlet axis of the combined-stream dispensing head, it is possible to produce a combined substance stream substantially circular in cross-section and substantially homogeneous throughout the cross-sectional area thereof.

In case the single-stram outlets allocated to a specific individual substance are disposed along at least one circle each it is possible to achieve an approximately even circumferential distribution of the respective individual substance. In case the single-stream outlets allocated to a specific individual substance are disposed along only one or along adjacent circles the supply channels for the individual substances leading to their allocated single-stream outlets may be constructed in a particularly simple manner, since the respective individual substance may be supplied as a central core stream and/or as one or several annular streams.

In a preferred embodiment of the invention it is provided that the single-stream outlets of a first individual substance are disposed along a first circle with a smaller diameter and the single-stream outlets of a second individual substance are disposed along a second circle with a larger diameter, each single-stream outlet of the larger circle each being uniformly spaced from two adjacent single-stream outlets of the smaller circle. Particularly in case the first individual substance is less viscous than the second individual substance, this measure can prevent that the first individual substance having a more liquid consistency runs out or spreads in an uncontrolled manner.

In such an arrangement it is advantageous if the cross-sectional area of a single-stream outlet disposed on a larger circle and the cross-sectional areas of two adjacent single-stream outlets disposed along a smaller circle are overlapping in radial direction. The latter measure has been found to favour the combining action of the individual substance streams discharged separatly from the combined-stream dispensing head to form a composite stream. Then, if the individual substance which is discharged from the radially inner portion of the dispensing head has a more liquid consistency (e.g. ketchup), this radially inner substance is reliably prevented from flowing round the second individual substance which has a more viscous consistency (e.g. mayonnaise).

According to a further feature of the invention it is proposed that the combined-stream dispensing head be provided with a nozzle plate which, in a direction opposite to the outlet direction, is followed by a supply channel near to the centre, intended for a first individual substance. The nozzle plate then is provided with a first group of outlet nozzles near to the centre, which are intended for the first individual substance and which are subsequent to the supply channel near to the centre. Further, the nozzle plate is equipped with a second group of outlet nozzles more remote from the centre, intended for a second individual substance, said outlet nozzles being connected with an annular chamber enclosing the supply channel near to the centre. The outlet nozzles of both groups may conveniently be realised by bores extending substantially orthogonally to the plane of the nozzle plate.

A particularly simple embodiment of the combined-stream dispensing head, in terms of manufacture and cleaning, is obtained if the nozzle plate is integral with a pipe neck forming the supply channel of the first individual substance and if the annular chamber is formed by a pot having a pot skirt and a pot bottom. According to the principle of pot and lid the nozzle plate then closes the pot at a rim opposite to the pot bottom, the pipe neck extending through a central hole in the bottom of the pot. The cleaning of equipment getting into contact with food products is of special importance and thus it has to be carried out with great diligence. In the case of this most simple embodiment this can be made possible in that this head is designed as a two-piece unit with individual structural members, each of which having very simple, geometrical basic structure. With such a unit dismantling and assembling for the purpose of general cleaning is particularly easy to carry out.

The pipe neck guided through the bottom of the pot may be connected directly with the individual substance dispensing channel of an individual substance pump. In order to make it possible that another individual substance be easily supplied to the outlet nozzles more remote from the centre it is proposed that the annular chamber has a supply channel for the second individual substance. In

order to provide for standardized connection facilities a solution is preferred according to which the supply channel for the second individual substance is formed by another pipe neck which extends from the bottom of the pot in a direction substantially opposite to the outlet direction and which is substantially parallel to the pipe neck forming the supply channel for the first individual substance.

For convenient and inexpensive manufacture of the combined-stream dispensing head it is furthermore proposed that the nozzle plate with the pipe neck and/or the pot be constructed as injection-moulded parts. Suitable materials are in particular light metal materials, such as e.g. aluminum, or plastic materials.

In order to avoid the danger that the nozzle plate falls from the pot, if the outlet direction is downwards, i.e. if the side of the nozzle plate remote from the pipe neck points downwards, it is proposed that the nozzle plate is arrested to the pot skirt rim opposite to the bottom of the pot and/or that the pipe neck integral with the nozzle plate is arrested to the bottom of the pot.

According to a further feature of the invention the combined-stream dispensing head is preferably connected with the respective individual substance outlet means of respective individual substance pumps by means of plug-in connections. This allows for the possibility of using pump equipment which is already available for dispensing only one individual substance, and to assemble the apparatus according to the invention by connecting the combined-stream dispensing head with the outlet means of these pumps. Plug-in connections between the dispensing head and the individual substance outlet means of the individual substance pumps are easy to handle and thus advantageous with respect to the cleaning of the apparatus. If the nozzle plate is provided with an integral pipe neck penetrating the bottom of the pot, separate arresting means for arresting the nozzle plate onto the pot may be omitted, if the plug-in connection between the pipe neck and the individual substance outlet means is resistant to disassembling such as to reliably retain the nozzle plate on the pot even if the individual substance in the annular space is pressurized.

It is advantageous if the individual substance pumps are disposed on a common support. If the pumps are operated by a careless users who apply an unnecessary high force it is thereby achieved that, at least in the plane of the common support, the individual substance pumps will maintain their mutual position and that the combined-stream dispensing head cannot be broken off the outlet means of the individual pumps.

As the individual substances should, for reasons of hygiene, be covered in their storage containers, it is further proposed that the common support of the individual substance pumps is formed by a lid member which may be common to the individual substance storage chambers.

It may be desirable that the shipping containers of the substances are immediately used as individual substance storage containers. As the shipping containers for different single-substances may have very different dimensions the common support and more particularly said commonly allocated lid member may have variable shape. Therefore, it is not desirable in all of the possible cases that the pumps be rigidly fixed on the common support and it is suggested to arrange the individual substance pumps on the common support such that they may be adjusted in respective connecting positions for being connectable with the combined-stream dispensing head.

Correspondingly, according to a further aspect of the invention the individual substance pumps on the common support are pivotable about a respective pivot axis, the individual substance pumps are provided with an outlet arm each, which projects from the respective individual substance pump in a substantially radial direction with respect to the pivot axis, and the combined-stream dispensing head is coupled after pivotal adjustment of the pumps to the outlet arms in a direction parallel to the pivot axis, in particular by means of a plug-in connection. Apart from the possibility of pivotal adjustment of the pumps about the pivot axes, in particular about pivot axes which are orthogonal to the plane of the support, the pumps may also be adjustable as to their height and to their mutual distance in order to make a connection between the combined-stream dispensing head and the outlet means of the respective individual substance pumps possible when using supports of different form.

As already explained above, it is desirable that the consumer has the possibility of dispensing individual substances apart from the possibility of obtaining a composite or mixed stream of different individual substances. According to the invention it is therefore further proposed that the individual substance pumps be operable individually and/or by means of a common actuating member.

If the individual substance pumps are disposed on a common support, as mentioned above, also a common actuating member is suitably mounted on the common support as it is thereby possible to create a universally usable constructional unit which merely has to be coupled with the individual substance storage chambers in order to form the apparatus according to the invention.

As the consumer wants to perform a short and simple movement in order to actuate a dispenser for e.g. ketchup and mayonnaise, it is further sug-

gested that the individual substance pumps each are equipped with a substantially vertically movable pump actuating member and that a hand-operable driver plate is pivotally mounted on the common support, which driver plate can act on the pump actuating members of the pumps in unison. The driver plate which commonly acts on the pump actuating member is a simple and effective means to fulfil the requirement of synchronizing the pumps so that a combined stream with predetermined shares of all individual substances may be obtained.

The driver plate may be pivotally mounted on a bearing plate to pivot about a substantially horizontal first axis; this bearing plate may be pivotally mounted on the common support to pivot about a second axis, which is substantially parallel to the first axis, the two pivot axes being disposed substantially parallel to a virtual vertical connection plane of the individual substance pumps. Thus, it is possible to create an actuating assembly which may be operated smoothly and needs small actuation force only. In particular in cases where the driver plate projects notably beyond the vertically movable pump actuating members a force reduction lever is obtained.

The common support of the pumps is suitably fixed on the individual substance storage chambers such that the rocking torque resulting from the lever action and acting on the support will not lift the support off the storage chambers. The fixation of the support on the storage chambers may be brought about e.g. by snap connections, screw connections and the like.

In order to ensure that the driver plate is in constant and synchronous engagement with the pump actuating members engagement structures may be mounted on the the pump actuating members and/or on the driver plate. These engagement structures may be formed by e.g. profiles, recesses or the like, which are provided on the driver plate. The driver plate may be removable from the area of engagement with the pump actuating members to such an extent that the actuating members of individual pumps may then be actuated individually by hand. The removal is preferably effected by pivoting the bearing plate such that it flatly rests on the common support and that the driver plate is then made rest on the bearing plate. Thus, the lever assembly largely dissapears from the optical field of view and it is protected against damage caused by careless users.

Basically, a common support of the individual substance pumps can be coupled with individual substance storage containers which directly accomodate the individual substances. It is conceivable that, after removing shipping or storing lids of individual substance storage containers, the common support can be coupled with these containers such as to form a replacement cover. It is also possible that the common support can be coupled with the individual substance storage containers while pushing pump suction pipes through wall portions, in particular the respective lids, of the individual substance containers.

Alternatively, however, the common support of the individual substance pumps can also be coupled with an over-container intended for continued use, in particular as a lid for this over-container. The individual substance storage containers are then inserted into said over-container. In this case it is on the one hand possible that the individual substance storage containers are designed as disposable containers with a lid that can be removed or perforated, i.e. the individual substance storage containers will be replaced by new ones as soon as they have been emptied. On the other hand it is possible that the individual substance storage containers are designed for repeated use, in particular for being recharged from a large drum, thus constituting a reusable container. These reusable individual substance storage containers again may either be equipped with a disposable lid that can be removed and/or perforated or with a reusable lid that can be removed.

The apparatus according to the invention has a pleasant design if the common support of the individual substance pumps and/or the over-container are made of high-quality material, in particular stainless steel. Moreover, these components may be shaped as ornamental parts.

The individual substance pumps may be constructed as a multiple pump unit, and more particularly as a dual pump unit. Alternatively it is possible that the individual substance pumps are constructed as mono pump units which are connected by means of a common support.

In a most simple embodiment of the invention an individual substance pump is designed as a piston pump having a pump piston in a piston chamber, said pump piston being pretensioned into an initial position within the piston chamber, the piston chamber being connected with the respective storage chamber via a first one-way valve, which opens toward the piston chamber, and being connected with the combined-stream dispensing head via another one-way valve, which opens toward the combined-stream dispensing head. As already indicated, it is thereby possible to use known pumps which available on the market. This minimizes manufacturing expenditure and lowers the costs.

For reasons of weight and on account of the fact that the individual substance pumps are normally not exposed to excessively great stress it is further proposed that they are made of injection-

moulded plastic parts.

If the individual substance pump is provided with a dispensing arm which projects substantially transversely to the movement direction of the respective pump piston, and if said dispensing arm is provided with respective connection means for the combined-stream dispensing head, in particular plug-in connection means, at its end remote from the pump piston, one can easily obtain sufficient height beneath the combined-stream dispensing head to insert a plate or the like under the combined-stream dispensing head as far as necessary to apply the individual substances in any chosen location thereon. This further facilitates connecting the combined-stream dispensing head with the pumps, as only the individual dispensing arms have to be adjusted to one another and as the dispensing head may then be attached under non-constricted room conditions without difficulty.

In general, the apparatus according to the invention can be cleaned in two ways. For instance, the entire undismantled pump assembly togehter with the combined-stream dispensing head may be rinsed with detergent or water, with the possibility of also filling the individual substance storage chambers with detergent and cleaning the apparatus by actuating the pumps. Owing to the simple construction of both the pumps and the combined-stream dispensing head it is just as easy to dismantle the individual structural members and afterwards clean them individually.

In the following two preferred embodiments of the invention will be illustrated on the basis of the accompanying drawings.

Fig. 1 is a perspective view of a first embodiment of the apparatus according to the invention;

Fig. 2a - 2c are different views of a nozzle plate with an integral pipe neck;

Fig. 2d - 2f are different views of a pot to be assembled with the nozzle plate of Fig. 2a - 2c for obtaining the combined-stream dispensing head shown in Fig. 1;

Figure 3 is a top view of a lid plate closing an over-container of the embodiment of Fig. 1;

Fig. 4 is sectional view across a driver plate for actuating the pumps;

Fig. 5 is a section across a piston pump used in the embodiment according to Fig. 1;

Fig. 6 is a perspective view of a second embodiment of the apparatus according the invention.

A cuboid over-container, which is open at the top, is referred to as 1. The over-container is formed from stainless-steel plates which may be welded or soldered together. In principle, it is conceivable that also different materials, such as e.g. light metals or plastic materials can be used. The dimension of the over-container 1 is chosen such that it can accomodate two storage-containers for different individual substances, preferably mayonnaise and ketchup, each of said storage containers having a capacity of approx. 3 l. Depending on the intended use, it is also possible to use any other dimension.

The over-container 1 is closed at the top by means of a lid plate 3 with a downwardly projecting rim. The lid plate 1 may be coupled with the over-container 1 by locking means, which are not shown, so that the lid plate 1 is protected against separation, but nevertheless may at any time be removed in order to recharge or replace the individual substance storage containers. For reasons of stability the lid plate will preferably be made of metallic materials, as it has to absorb forces occurring during actuation of the pumps.

Two identical individual substance pumps 5 and 7 are mounted on the lid plate 3, the individual components of the individual substance pumps being numbered in Fig. 1 only with regard to the pump 5. Each of the pumps 5,7 has an elongate pump body 9 as well as a pump head 11 which is rounded at the top, which is movable in a vertical direction V with respect to the pump body 9 and which serves as a pump actuating member. A dispensing arm 13 integral with the pump body 9 extends from the latter, said dispensing arm having an outlet 15 at its end remote from the pump body 9. Fig. 1 fails to show that the pumps 5,7 dip into one respective individual substance storage container by means of suction pipes in order to be able to suck in the respective individual substance. The pumps 5, 7 are conventional piston pumps, their construction and their fixing to the lid plate 3 being further illustrated in Fig. 5.

At that side of the pumps 5,7 which is remote from the dispensing arms 13 a bow 17 is fixed to the lid plate 3, said bow having a bar 19 which rests flat on the lid plate and two flanges 21 which are substantially orthogonal to the bar 19. A bearing plate 23 is pivotally mounted on the flanges 21 to pivot about a first pivot axis 25 which extends substantially parallel to a vertical connection plane containing the double arrow V and a straight line G connecting the two pumps 5, 7. A driver plate 25 is pivotable about a second pivot axis 29 on the bearing plate 23. The driver plate 29 acts in unison on the pump heads 11 and ensures synchronous actuation of the pump heads 11 when pivoting in a direction toward the lid plate 3. If the user acts on the driver plate 27 adjacent to its end remote from the second pivot axis 27 a force reduction is obtained. If the driver plate 27, the bearing plate 23 and the bow 17 are arranged as shown, it is also possible to actuate the pumps individually in that the bearing plate 23 is swung away from the pumps 5,7 toward a position parallel to the lid plate

3 and that the driver plate 27 is hereupon swung toward the bearing plate 23.

In order to combine the individual substance streams supplied by the pumps 5, 7 to form a composite stream a combined-stream dispensing head 31 is mounted to the outlets 15 of the respective dispensing arms 13 by means of plug-in connections. In the following said combined-stream dispensing head will be explained in greater detail with reference to Fig. 2a - 2f.

The combined-stream dispensing head comprises a nozzle plate 33 as well as a pot 35, both of which are preferably manufactured by way of an injection-moulding process. The nozzle plate 33, which in this succession is shown in Fig. 2a - 2f as a bottom view, i.e. viewed from the side of the outlet, as a sectional view taken along a line II-II of Fig. 2a and as a top view, is integral with a central pipe neck 37 with a bore 39. When fixing the combined-stream dispensing head the pipe neck 37 is plugged into an outlet 15 of a pump. This plug-in connection may optionally be locked by locking means 41. The nozzle plate 33 has a plurality of bores serving as single-stream outlets, namely bores 45 disposed along a first circle 43 which has a smaller diameter, and bores 49 disposed along a second circle 49 which has a larger diameter and is concentric with the first circle 43. Viewed from, in Fig. 2b, below, the bores 45, which are nearer to the centre, are mounted on the nozzle plate in a manner such that they are connected with the bore 39 of the pipe neck 37. This bore forms a supply channel for a first individual substance. The bores 49, which are more remote from the centre, are located such that they form a connection with an annular space 51 that surrounds the pipe neck 37 such that these bores 49 are connected with the annular space 51 for delivering a second individual substance.

With the pipe neck 37 first, the nozzle plate 33 is to be inserted into the pot 35 shown in Fig. 2d - 2f such that the pipe neck 37 extends through a hole 55 of a pot bottom 53. Thus, the pipe neck extends substantially parallel to a further pipe neck 57 integral with the pot 35. An opening 61 formed by a pot skirt 59 is closed by the nozzle plate 33. The pipe neck 57 forms a supply channel for a second individual substance and is shaped for a plug-in connection with the outlet of the other individual substance pump.

The dispensing paths of the two individual substances are as follows. The individual substance pumped by the pump 7 enters the bore 39 of the pipe neck 37 via the outlet 15 of the respective dispensing arm 13 and flows into and through the bores 45 disposed along the smaller circle 43 with a dispensing direction A. The second individual substance, which is conveyed by the pump 5, is discharged via the respective outlet 15 into the pipe neck 57 and then into the annular space 51. This second individual substance is then expelled out of the combined-stream dispensing head 31 via the radially outward bores 49 located on circle 47.

It is normally irrelevant which of the individual substances is dispensed through bores 45 and which is expelled through bores 49 as long as the viscosity of the individual substances is approximately the same. If, however, one of the individual substances has a very low viscosity, i.e. is highly liquid, dispensing of this highly liquid individual substance via the radially outward bores 49 could have the effect that the individual substance streams do not sufficiently adhere to each other as to form a stable combined stream. The more liquid, outwardly located individual substance stream filaments rather could spread and flow round the inner, more viscous individual substance stream filaments. Therefore, the more liquid individual substance should be dispensed via the inner bores 45. Then, the outer, more viscous individual substance stream filaments combine quickly and consequently enclose the more liquid individual substance as an external coat, thereby preventing that the latter substance stream will flow round the more viscous individual substance stream filaments. A further improvement of the rheology conditions is obtained by locating the bores 49 such as to have equal distances from a pair of adjacent bores 49.

The bar 19 of the bow 17 is fixed on the lid plate 3 by means of a plurality of welding points as shown in Fig. 3. The lid plate 3 is provided with holes 63 and 65 through which the suction pipes 79of the pumps 5, 7 may extend.

As can be seen from Fig. 4 the driver plate 27 is equipped with an engagement profile 67 which serves to catch the pump heads 11.

Apart from synchronizing the individual pumps the driver plate also serves to provide predetermined shares of all individual substances.

Fig. 5 shows a sectional view of a piston pump as an example of an individual substance pump to be employed according to the invention. A piston chamber 69 is provided in the pump body 9. A piston 71 which is fixed to the pump head 11 is prestressed into an initial position by means of a spring 73 supported on the pump body 9, and sealed to the inside of the pump body 9 by means of a seal 75. A suction pipe 79 of the piston chamber 69 is provided with a one-way valve 81 which opens toward the piston chamber 69. An outlet 15 of a dispensing channel 83 is connected with the piston chamber 69 by a ball valve 85 which opens toward the outlet end. Upon pushing down the pump head 11, the individual substance contained in the piston chamber 69 is urged toward the dispensing head 31 through the ball valve 85

which opens due to the pressure built up in the piston chamber 69, while upon reverse movement of the pump head 11 into its initial position, effected by means of the restoring force of the spring 73, the one-way valve 81 is opened and fresh individual substance is supplied via the suction channel 77 owing to the underpressure built up in the piston chamber 69.

The piston pump can be fixed on the lid plate 3 in that a nut 87 screwed on a thread of the pump body 9 is taken off, the suction pipe 79 is inserted through one of the holes 63, 65, of the lid plate 3, which are shown in Fig. 3, and afterwards the nut 87 is again screwed on from underneath the lid. This way of fixing allows for pivoting of the pump body and the dispensing arm 13 about a pivot axis 89 so that the individual outlets 15 may be adjusted for being connectable with the combined-stream dispensing head 31.

Fig. 6 shows an alternative embodiment of the apparatus according to the invention. Analogous structural members are numbered with identical reference numbers, however increased by 100. Besides, reference is made to the above description of Fig. 1 - 5.

In the case of this embodiment the two pumps 105, 107 are fixed on a lid 103 which directly covers two individual substance storage containers, which may, for example, represent the shipping containers of the substance supplied. When said storage containers 191, 193 are emptied, they may either be replaced by new containers or simply be recharged. The lever assembly for synchronous actuation of the two pumps, as shown in Fig. 1, is omitted from said embodiment shown in Fig. 6, however, may be mounted on the lid 103, if desired.

It is well conceivable that with an embodiment as shown in Fig. 6 a synchronizing actuating mechanism as shown in Fig. 1 is omitted and may be omitted. In such cases the consumer may press with the inner side of his hand simultaneously on both pump heads such as to simultaneously expel respective substances via both pumps. It is an essential feature of the embodiment shown in Fig. 6 that the pump heads are close with respect to each other so that they can be simultaneously actuated by one hand or by one finger of the consumer, if desired.

Claims

1. Apparatus for dispensing a combined stream of at least two individual substances for consumption, their consistency ranging from liquid to soft-plastic,
characterised by
a respective number of individual substance storage chambers, optionally in the form of respective individual substance storage containers,
a respective number of individual substance pumps (5,7), the pumps each having an individual substance suction channel (77), connected to a respective individual substance storage chamber, and an individual substance dispensing channel (83), and
a combined-stream dispensing head (31) which is connected to the individual substance dispensing channels (83).

2. Apparatus according to claim 1,
characterised in that
the combined-stream dispensing head (31) is designed as an individual substance mixing head with a mixed-stream outlet.

3. Apparatus according to claim 1,
characterised in that
the combined-stream dispensing head (31) comprises a plurality of single-stream outlets (45,49) in the form of a bundle, namely at least one respective single-stream outlet (45,49) for each of the individual substances.

4. Apparatus according to claim 3,
characterised in that,
in terms of their cross-section, direction and distribution, the single-stream outlets (45,49) are designed such that they favour combining of the individual substance streams discharged therefrom to form a composite stream after discharge from the single-stream outlets (45,49).

5. Apparatus according to claim 3 or 4,
characterised in that
for each individual substance a plurality of single-stream outlets (45,49) is provided in the combined-stream dispensing head.

6. Apparatus according to claim 5,
characterised in that
the single-stream outlets (45,49) are disposed along concentric circles (43,47) about a common outlet axis (A) of the combined-stream dispensing head (31).

7. Apparatus according to claim 6,
characterized in that
the single-stream outlets (45,47) allocated to a specific individual substance are disposed along respective circles (43,47) allocated to individual substances.

8. Apparatus according to claim 7, characterised in that the single-stream outlets (45) of a first individual substance, preferably an individual substance that is less viscous, are disposed along a first circle (43) with a smaller diameter and the single-stream outlets (49) of a second individual substance, preferably an individual substance of higher viscosity, are disposed along a second circle (47) with a larger diameter, one single-stream outlet (49) of the larger circle (47) being uniformly spaced apart from two adjacent single-stream outlets (45) of the smaller circle (43).

9. Apparatus according to claim 8, characterised in that the cross-sectional area of a single-stream outlet (49) disposed on a larger circle (47) and the cross-sectional areas of two adjacent single-stream outlets (45) disposed along a smaller circle (43) are overlapping in radial directions.

10. Apparatus according to one of claims 3 - 9, characterised in that the combined-stream dispensing head (31) is provided with a nozzle plate (33) which, in a direction opposite to an outlet direction (A), is followed by a supply channel (39) near to the centre and intended for a first individual substance, the nozzle plate (33) is provided with a first group of outlet nozzles (45) near to the centre, which are intended for the first individual substance and which are downstream from the supply channel (39) near to the centre, the nozzle plate (33) is further equipped with a second group of outlet nozzles (49) more remote from the centre and intended for the second individual substance, and the outlet nozzles (49) more remote from the centre are connected with an annular chamber (51) surrounding the supply-channel (39) near to the centre.

11. Apparatus according to claim 10, characterised in that the nozzle plate (33) is integral with a pipe neck (41) forming the supply channel (39) of the first individual substance, and the annular chamber (51) is formed by a pot (35) having a pot skirt (59) and a pot bottom (53), which pot (35) is closed at an opening (61) opposite to the pot bottom (53) by means of the nozzle plate (33), the pipe neck (41) extending to and preferably through a central hole (55) in the pot bottom (53).

12. Apparatus according to claim 10 or 11, characterised in that the annular chamber (51) has a supply channel for the second individual substance.

13. Apparatus according to claim 12, charactrised in that the supply channel for the second individual substance is formed by a further pipe neck (57) which extends from the pot bottom (53) in a direction opposite to the outlet direction (A) and which is substantially parallel to the pipe neck (41) forming the supply channel (39) for the first individual substance.

14. Apparatus according to one of claims 11 - 13, characterised in that the nozzle plate (33) with the pipe neck (41) and/or the pot (35) are constructed as injection-moulded parts.

15. Apparatus according to one of claims 11 - 14, characterised in that the nozzle plate (33) is arrested with respect to the opening (61) of the pot skirt (59) opposite to the pot bottom (53) and/or that the pipe neck (41) integral with the nozzle plate (33) is arrested with respect to the pot bottom (53).

16. Apparatus according to one of claims 1 - 14, characterised in that the combined-stream dispensing head (31) is releasably connected with individual substance outlet means (15) of the individual substance pumps (5,7), preferably by means of plug-in connections.

17. Apparatus according to one of claims 1 - 16, characterised in that the individual substance pumps (5,7) are disposed on a common support (3;103).

18. Apparatus according to claim 17, characterised in that the common support (103) of the individual substance pumps is formed by a lid member (103) which is commonly allocated to the individual substance storage chambers.

19. Apparatus according to one of claims 17 and 18, characterised in that on the common support (3) such that they may be adjusted toward respective connecting positions in which they are connectable with the combined-stream dispensing head (31).

20. Apparatus according to claim 19, characterised in that the individual substance pumps (5,7) on the common support (3) are pivotable about respective pivot axes (89), the individual substance pumps (5,7) are provided with an outlet arm (13) each, which projects from the respective pump in a substantially radial direction with respect to the respective pivot axis (89), and the combined-stream dispensing head (31) is adapted for being coupled to the outlet arms (13) along a direction parallel to the pivot axis (89), preferably by means of a plug-in connection.

21. Apparatus according to one of claims 1 - 20, characterised in that the individual substance pumps (5,7) are selectively operable individually or commonly.

22. Apparatus according to claim 21, characterised in that the individual substance pumps (5,7) are disposed on a common support (3), and a common actuating member (27) is mounted on said common support (3).

23. Apparatus according to claim 22, characterised in that the individual substance pumps (5,7) each are equipped with a substantially vertically movable pump actuating member (11), and a hand-operable driver plate (27) is mounted on the common support (3), which driver plate (27) can act on the pump actuating members (11) of the pumps in unison.

24. Apparatus according to claim 23, characterised in that the driver plate (27) is pivotally mounted on a bearing plate (23) to pivot about a substantially horizontal first axis (29), said bearing plate (23) being pivotally mounted on the common support (3) to pivot about a second axis (25), said second axis being substantially parallel to the first axis (29), the two pivot axes (29,25) being disposed substantially parallel to a virtual vertical connection plane of both said individual substance pumps (5,7).

25. Apparatus according to claim 23 or 24, characterised in that engagement structure means (67) for the pump actuating members (11) are mounted on the driver plate (27).

26. Apparatus according to one of claims 23 - 25, characterised in that the driver plate (27) is disengagable from the pump actuating members (11) to such an extent that the actuating members (11) of individual pumps may be actuated individually.

27. Apparatus according to one of claims 1 - 26, characterised in that a common support (103) of the individual substance pumps (105,107) is provided with coupling means adapted for coupling said common support with individual substance storage containers (191,193) which directly accomodate the individual substances.

28. Apparatus according to claim 27, characterised in that, said coupling means are adapted for coupling said common support (103) with said individual substance storage containers (191;193) after respective shipping or storing lids have been removed from said respective containers (191;193), said common support (103) acting as a replacement cover for said individual substance storage containers (191,193) coupled thereto.

29. Apparatus according to claim 27, characterised in that said coupling means are adapted for coupling said common support (103) with closed individual substance storage containers (191,193), said individual substance pumps (5,7) being provided with respective suction pipes (79), said suction pipes being located such with respect to said coupling means that said suction pipes (79) enter through wall portions, preferably top wall portions, of said closed containers when combining said common support (103) to said closed individual substance storage containers (191;193).

30. Apparatus according to one of claims 1 - 26, characterised in that a common support (3) of the individual substance pumps (5,7) is provided with coupling means adapted for coupling said common support (3) with an over-container (1) intended for continued use, said over-container (1) being adapted for accomodating individual substance storage containers, and said common support (3) being preferably shaped as a lid for said over-container (1).

31. Apparatus according to claim 30, characterised in that the individual substance storage containers are

designed as disposable containers with respective lids being removably mounted on respective disposable containers or said lids being adapted for being perforated by suction pipes.

32. Apparatus according to claim 30, characterised in that the individual substance storage containers are designed for repeated use, in particular for being recharged from a large drum.

33. Apparatus according to claim 32, characterised in that the reusable individual substance storage containers are either equipped with a disposable lid that can be removed and/or with a reusable lid adapted for repeated use.

34. Apparatus according to one of claims 30 - 33, characterised in that the common support (3) of the individual substance pumps (5,7) and/or the over-container (1) are made of high-quality material, in particular stainless steel, and are optionally provided with ornaments.

35. Apparatus according to one of claims 1 - 34, characterised in that the individual substance pumps (5,7) are constructed as a structural multiple pump unit, said structural multiple pump unit preferably comprising a common integral pump housing for respective individual pumps.

36. Apparatus according to one of claims 1 - 34, characterised in that the individual substance pumps (5,7) are constructed as separate pump units and connected by means of a common support (3).

37. Apparatus according to one of claims 1 - 36, characterised in that an individual substance pump (5,7) is designed as a piston pump (5,7) having a pump piston (71) in a piston chamber (69), said pump piston being pretensioned toward an initial position, the piston chamber (69) being connected with a respective storage chamber by means of a first one-way valve (81) which opens toward the piston chamber (69) and being connected with the combined-stream dispensing head (31) by means of a further one-way valve (85) which opens toward the combined-stream dispensing head (31).

38. Apparatus according to one of claims 1 - 37, characterised in that the individual substance pump (5,7) comprises injection-moulded plastic parts.

39. Apparatus according to one of claims 36 - 38, characterised in that the individual substance pump (5,7) is provided with a dispensing arm (13) which projects substantially transversely to the movement direction of the respective pump piston (71) and which is provided with connection means (15), preferably plug-in connection means, at its end remote from the piston chamber (69), said connection means (15) being adapted for connecting said combined-stream dispensing head (31) with the dispensing arm (13).

Fig.1

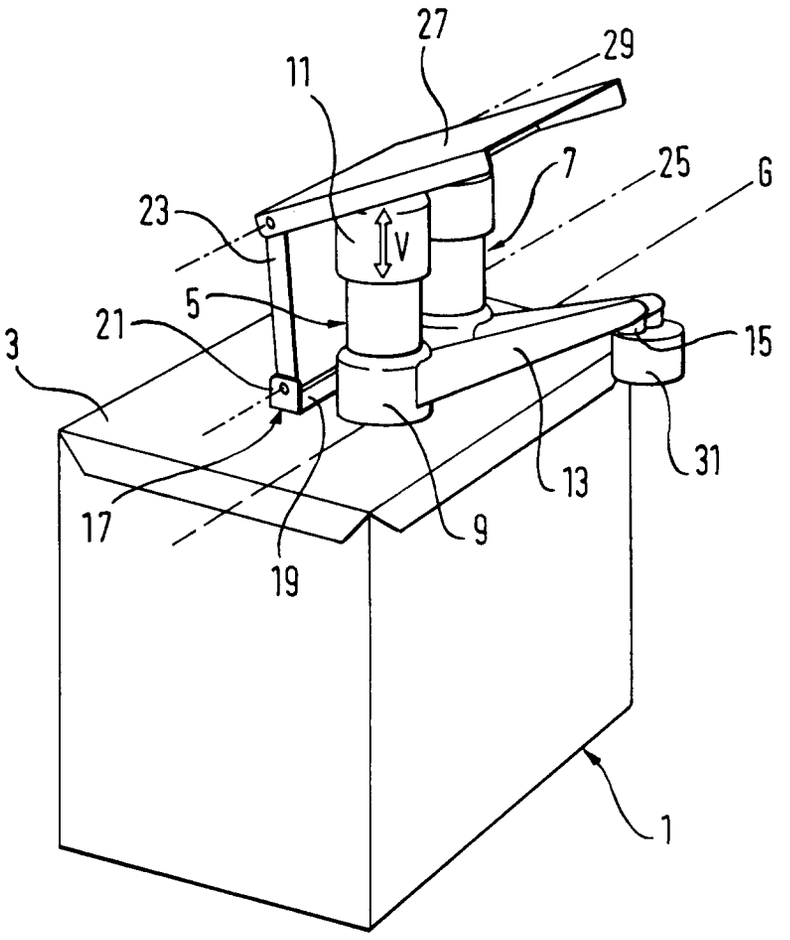


Fig. 2a

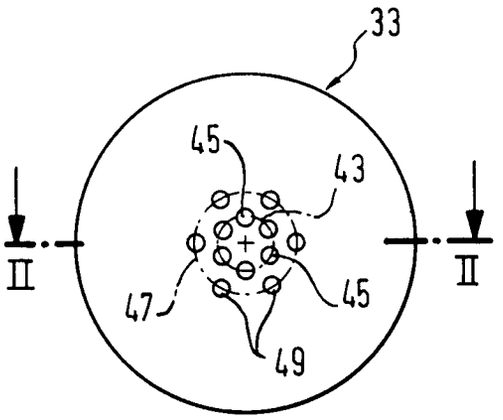


Fig. 2b

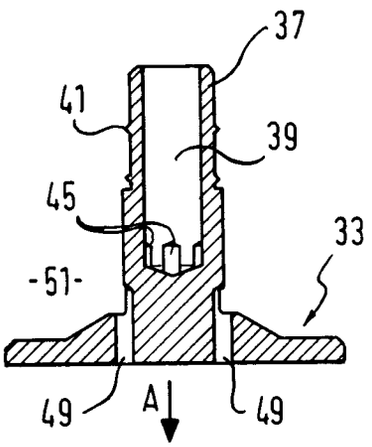


Fig. 2c

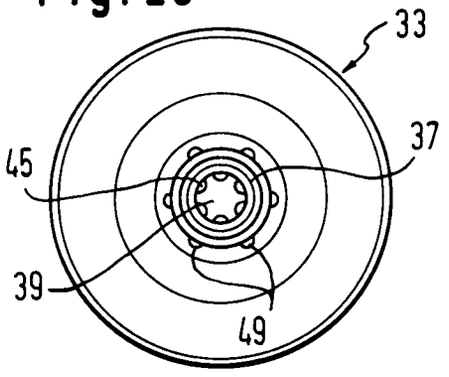


Fig. 2d

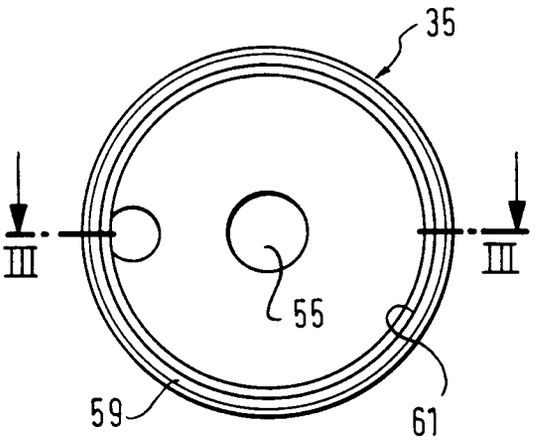


Fig. 2e

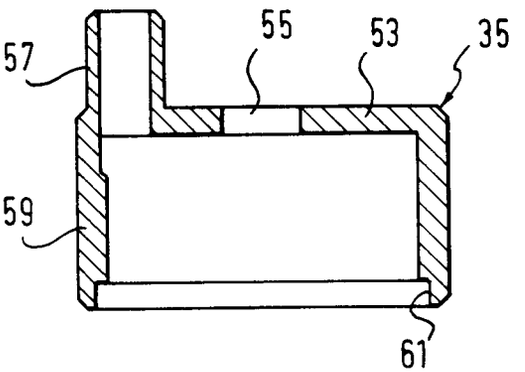


Fig. 2f

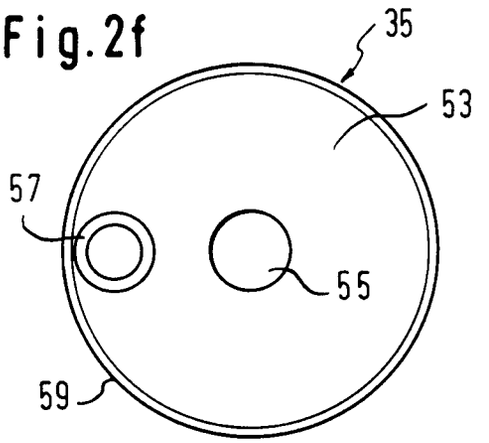


Fig. 3

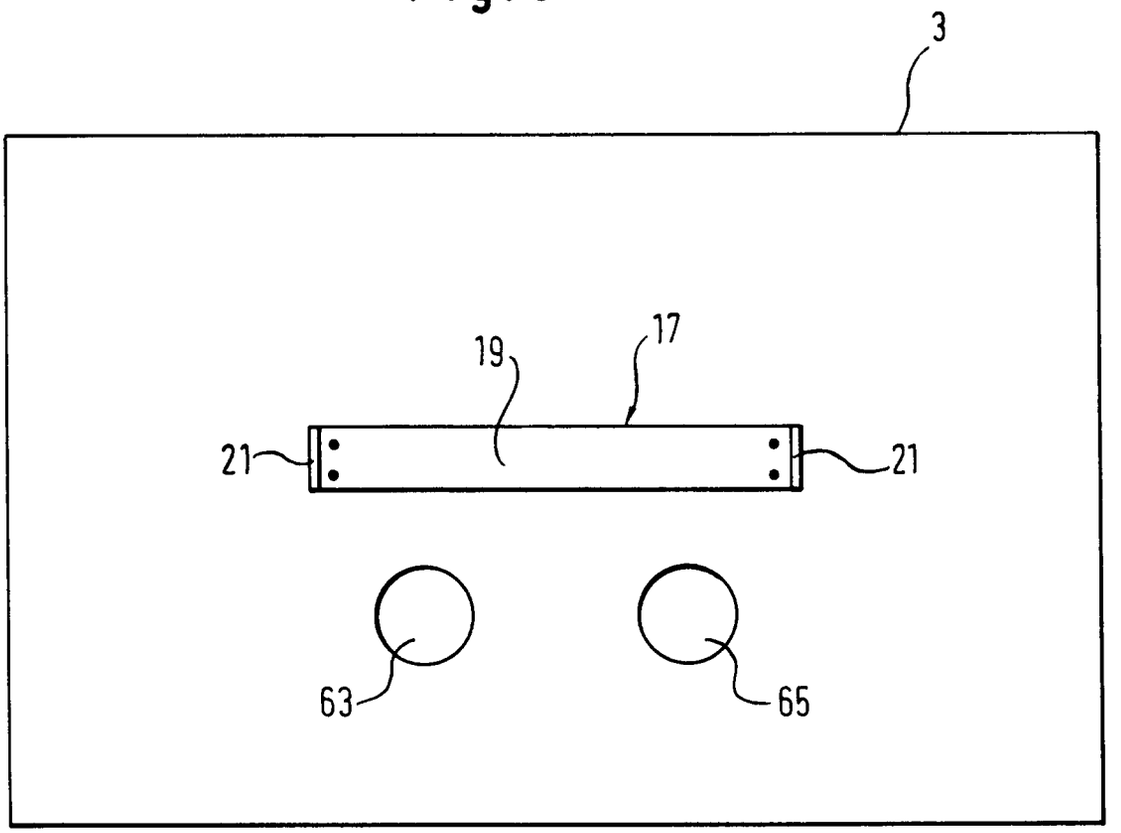


Fig. 4

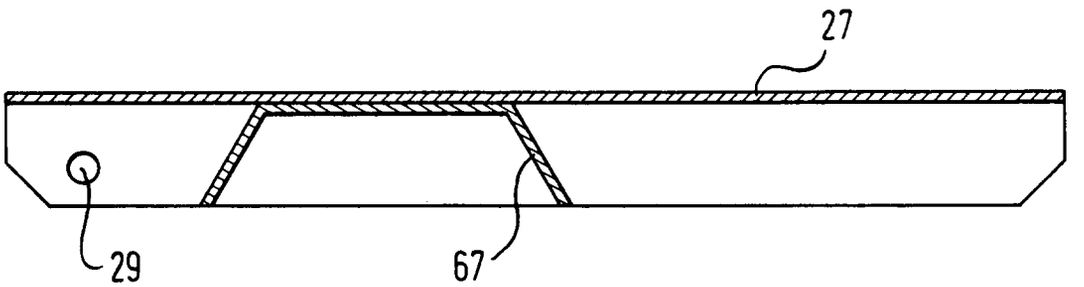


Fig. 5

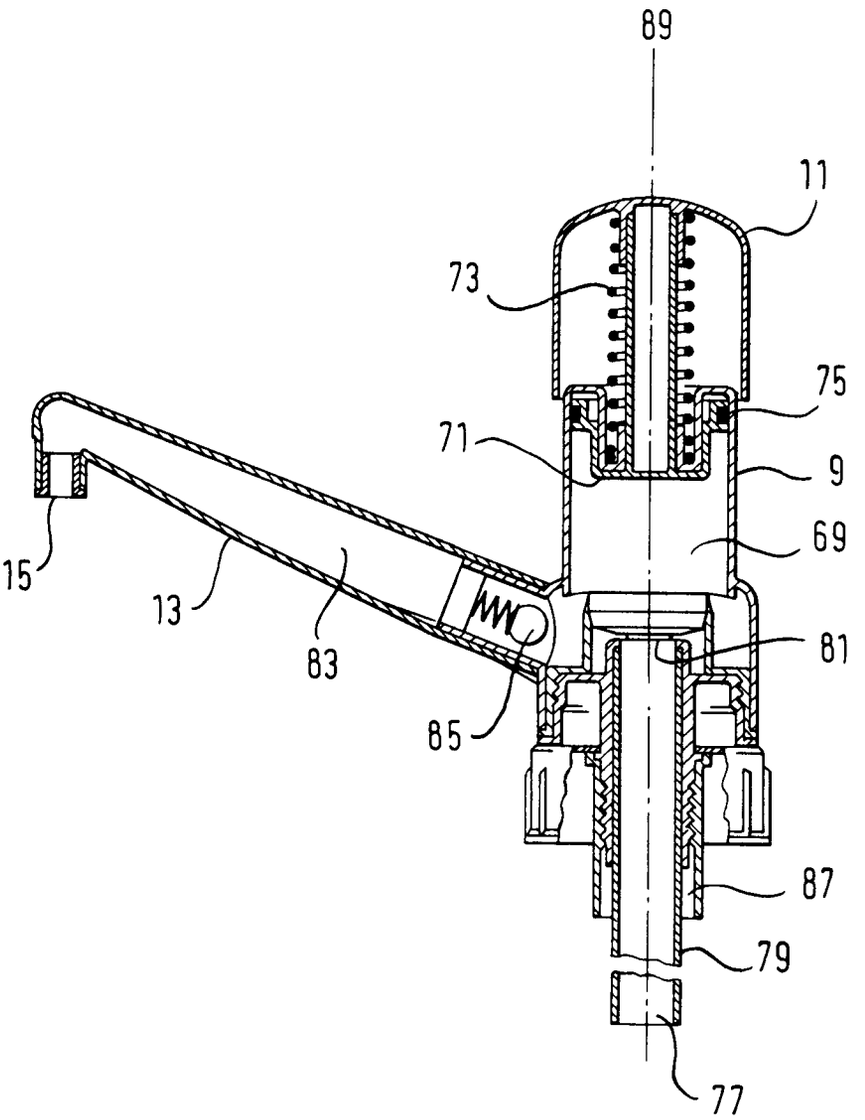


Fig.6