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

(11) Publication number: **0 528 768 B1**

(12) # EUROPEAN PATENT SPECIFICATION

(45) Date of publication of patent specification: **26.07.95** (51) Int. Cl.[6]: **D06F 39/02**

(21) Application number: **92830247.0**

(22) Date of filing: **22.05.92**

(54) **Improvements in and/or related to the devices for supplying detersives and additives to washing machines.**

(30) Priority: **12.06.91 IT MI910523 U**

(43) Date of publication of application:
24.02.93 Bulletin 93/08

(45) Publication of the grant of the patent:
26.07.95 Bulletin 95/30

(84) Designated Contracting States:
DE FR GB IT

(56) References cited:
DE-A- 1 785 156
GB-A- 1 211 560
US-A- 3 085 715

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Description

The present invention relates to improvements in/and related to devices for supplying detersives and additives to a washing machine.

As is known, conventional linen washing machines comprise a metering-dispenser assembly for supplying powder detersives, as well as additives and the like, into the machine washing basin.

Also known is the fact that conventional metering-dispenser assemblies do not provide a sufficient flexibility in operation, i.e. in the metering of the several detersives and additives to be used.

On the other hand, because of the increasing environment pollution it is at present very important to remarkably reduce the use of the detersive materials which, even if they are rather biodegradable, are however always polluting.

In this connection it should be noted that there are at present commercially available the so-called "compact" detersives, which are advantageously held in vessels or trays of a comparatively small volume with a good use autonomy.

These compact detersives, however, since they are held in their holding vessels for a comparatively long period of time, are susceptible to clot or coagulate, so that a proper metering thereof into the washing basin is a rather difficult operation.

Moreover, if a multiple-dose of a compact detersive is to be loaded in a conventional washing machine, then it is necessary to provide openings through the top panel of the washing machine, which hinders a possible use of this panel as a bearing surface.

The document DE-A-1 785 156 discloses a device for supplying detersive and additives to washing machines having substantially the features of the pre-characterizing part of the main claim.

SUMMARY OF THE INVENTION

Accordingly, the main object of the present invention is to overcome the above mentioned drawbacks by providing an improved device for supplying detersives and additives to washing machines, which is adapted to assure a perfect metering of these substances or materials.

Within the scope of the above mentioned aim, a main object of the present invention is to provide such an improved device for supplying detersives and additives to washing machines which is very flexible in operation, i.e. in the metering of the detersive materials.

Yet another object of the present invention is to provide such an improved device for supplying detersives and additives to washing machines which can be quickly and easily applied to a conventional washing machine without the need of modifying the working panel of these washing machines, that is without the need of forming openings through the working or top panel of the washing machine.

According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by an improved device for supplying detersives and additives to washing machines, having the features of the characterizing portion of the main claim.

BRIEF DESCRIPTION OF THE DRAWINGS

Further characteristics and advantages of the improved device for supplying detersives and additives to washing machines, according to the present invention, will become more apparent from the following detailed disclosure of a preferred, though not exclusive, embodiment thereof which is illustrated, by way of a merely indicative, but not limitative, example, in the figures of the accompanying drawings, where:

Figure 1 illustrates a functional diagram of the improved device according to the invention;

Figure 2 is a schematic partial view illustrating the additive holding tray or vessel;

Figure 3 schematically illustrates two check valves which are mounted, at the inlet and outlet, in the additive taking or suction circuit;

Figures 4 and 5 are respectively a transversal cross-sectional view and a vertical cross-sectional view of the housing vessel of the drawer; and

Figure 6 is a schematic horizontal cross-sectional view of the mixer apparatus included in the improved device according to the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the figures of the accompanying drawings, the improved device for supplying detersives and additives to washing machines according to the present invention comprises a drawer 1 which is slidably engaged in a vessel 2 and being divided, by means of a vertical wall element 3, into two trays, respectively indicated at 4 and 5.

More specifically, the tray 5 is so designed as to receive a given multiple dose of a so-called compact detersive, whereas the tray 4 is provided for receiving a concentrated additive.

In the above mentioned detersive tray a propeller supply element 6 is arranged, which is driven by an axial geared motor 7 connected to the rear

wall of the vessel or housing 2 and including a plug-in joint adapted to allow the supply device to operate exclusively with the drawer in its closed condition.

This propeller supply device will allow, through conventional mixing, breaking and propelling operations, to obtain very accurate doses and it will overcome possible drawbacks due to the hygroscopicity and heterogeneity of the detersive formulations.

In the additive tray the end portion of a duct 9 is engaged, the other end portion of which leads to a check valve 10 communicating with a suction apparatus generally indicated at the reference number 11.

This apparatus substantially comprises a chamber divided by a resiliently deformable membrane 12 on a side of which there is provided, in addition to the above mentioned check valve 10, a second check valve 13, with an outlet flow, whereas, on the opposite side, there is provided a perimetrical opening 14 for the inlet of pressurized water.

This pressurized water, in particular, is supplied by a suitable solenoid valve 15 which conveys the water or liquid flow through a duct 16 to a mixing apparatus 17, and a further liquid flow, subdivided through a branch 18, into the above mentioned opening 14.

Thus, the pulsating flow sent into said chamber, will cause the resilient membrane to reciprocate so as to suck the additive into the tray 5 during its depressurized condition, and so as to convey said additive, during its pushing condition, through the valve 13 and a duct 19 to the above mentioned mixer apparatus.

This mixer apparatus will receive, through the duct 20, the remaining water flow for recovering the additive and, through the propeller supplying element 6, it will aslo receive the desired detersive dose.

More specifically, the above mentioned mixer apparatus will receive the detersive conveying water through the duct 16, the additive dose through the duct 19 and the remaining additive entraining water through the duct 20.

Said mixer apparatus will convey the received flows through the syphon 21 to the washing basin 22,of which there have been schematically illustrated the basket 23, as well as the pre-loading 24 and washing 25 levels.

In this connection it should moreover be pointed out that with the above mentioned membrane a screw element cooperates which is provided with an adjusting rod 26 which can be driven by means of a handle or knob 27 so as to cause the oscillation amplitude of the membrane to vary depending on the requirements.

While the invention has been disclosed and illustrated with reference to a preferred embodiment thereof, it should be apparent that the disclosed embodiment is susceptible to several modifications and variations all of which will come within the scope of the appended claims.

Claims

1. An improved device for supplying detersives and additives to washing machines, comprising a supplying drawer (1) including a powder-detersive tray (4) having a supplying propeller element (6), and an additive tray (5), therefrom the liquid material is taken, characterized in that said liquid material is pneumatically taken by means of a membrane pump (11) which is driven by pressurized water supplied by a load solenoid valve (15) energized depending on a required dose, said detersive and ad-ditive being sent to the basin (22) of the washing machine through a mixer apparatus (17).

2. An improved device, according to Claim 1, characterized in that said drawer (1) is slidably housed in a casing (2) and is divided, by means of a vertical wall (3), into two trays (4, 5) one of which (5) is so sized as to receive a set multiple dose of a compact detersive, whereas the other (4) is so designed as to receive a concentrated additive.

3. An improved device, according to Claims 1 and 2, characterized in that said propeller supply element (6) is driven by an axial geared motor (7) coupled to the rear wall of said casing (2) and being provided with a plug-in joint (8) adapted to allow said propeller supply element to operate exclusively with the drawer-(1) in a closed condition.

4. An improved device, according to one or more of the preceding claims, characterized in that in said additive tray (5) there is engaged and end portion of a pipe (9) the other end portion of which leads to a check valve (10) communicating with a suction apparatus (11) including substantially a chamber divided by a resliently deformable membrane (12) on a side of which there is provided, in addition to said check valve (10), a second check valve (13), with an outlet flow, whereas, on the opposite side thereof, there is provided a perimetrical opening (14) for the inlet of pressurized water.

5. An improved device, according to one or more of the preceding claims, characterized in that said pressurized water is supplied by a sole-

noid valve (15) which conveys a liquid flow through a first duct (16), to a mixer apparatus (17), and a further liquid flow, subdivided by means of branching means (18), into said opening (14) through a second duct.

6. An improved device, according to one or more of the preceding claims, characterized in that said mixer apparatus (17) receives the detersive entraining water, the additive dose, and the remaining additive entraining water and conveys the received flows along a syphon element (21) to the underlaying washing basin (22) of the washing machine.

7. An improved device, according to one or more of the preceding claims, characterized in that with said membrane (12) a screw element cooperates, said screw element being provided with an adjusting rod (26) which can be driven by means of a handle element (27) so as to cause the oscillation or swinging movement of said membrane (12) to vary depending on requirements.

Patentansprüche

1. Eine verbesserte Vorrichtung für das Zuführen von Waschmitteln und Zusätzen zu Waschmaschinen, umfassend eine Schublade (1) für das Zuführen, die eine Schale (4) mit einem liefernden Schraubenteil (6) für ein pulveriges Waschmittel umfaßt, und eine Schale (5) für den Zusatz, der das flüssige Material entnommen wird, dadurch gekennzeichnet, daß dieses flüssige Material pneumatisch durch eine Membranpumpe (11) entnommen wird, die durch Wasser unter Druck betätigt wird, das durch ein Lademagnetventil (15) zugeführt wird, das je nach der benötigten Dosis mit Strom versorgt wird, dabei wird dieses Waschmittel und dieser Zusatz zum Behälter (22) der Waschmaschine durch eine Mischvorrichtung (17) geleitet.

2. Eine verbesserte Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß diese Schublade (1) gleitend in einem Gehäuse (2) untergebracht ist und durch eine vertikale Wand (3) in zwei Schalen (4, 5) aufgeteilt ist, von denen eine (5) so bemessen ist, daß sie eine bestimmte, mehrfache Dosis eines kompakten Waschmittels aufnehmen kann, während die andere (4) so entworfen ist, daß sie einen konzentrierten Zusatz aufnehmen kann.

3. Eine verbesserte Vorrichtung nach den Ansprüchen 1 und 2, dadurch gekennzeichnet, daß dieses schraubenförmige Lieferteil (6) durch einen axialen Getriebemotor (7) betrieben wird, der mit der Hinterwand dieses Gehäuses (2) verbunden ist, und der mit einer steckbaren Verbindung (8) ausgestattet ist, die angepaßt ist, diesem schraubenförmigen Lieferteil zu ermöglichen, ausschließlich mit der Schublade (1) in einem geschlossenem Zustand zu wirken.

4. Eine verbesserte Vorrichtung nach einem oder mehreren der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß mit dieser Schale (5) für den Zusatz das Endteil einer Röhre (9) verbunden ist, deren anderes Endteil zu einem Rückschlagventil (10) führt, das mit einer Saugvorrichtung (11) in Verbindung steht, die im wesentlichen eine Kammer umfaßt, die durch eine elastisch deformierbare Membran (12) aufgeteilt wird, auf deren einer Seite ein zweites Rückschlagventil (13) mit einem Auslaß zusätzlich zu diesem Rückschlagventil (10) bereitgestellt ist, während auf der anderen Seite davon eine Öffnung (14) längs des Umfangs für das Einlassen von Wasser unter Druck bereitgestellt ist.

5. Eine verbesserte Vorrichtung nach einem oder mehreren der vorstehenden Ansprüche, dadurch gekennzeichnet, daß dieses Wasser unter Druck durch ein Magnetventil (15) zugeführt wird, das einen Flüssigkeitsfluß durch eine erste Leitung (16) zu einer Mischvorrichtung (17) leitet, und einen weiteren Flüssigkeitsfluß, der mittels einer Verzweigungsvorrichtung (18) aufgeteilt wird, in diese Öffnung (14) durch eine zweite Leitung führt.

6. Eine verbesserte Vorrichtung nach einem oder mehreren der vorstehenden Ansprüche, dadurch gekennzeichnet, daß diese Mischvorrichtung (17) das Wasser, das das Waschmittel mit sich führt, die Dosis des Zusatzes und das restliche Wasser, das den Zusatz mit sich führt, aufnimmt und die aufgenommenen Flüsse über einen Saugheber (21) zum darunterliegenden Waschbehälter (22) der Waschmaschine befördert.

7. Eine verbesserte Vorrichtung nach einem oder mehreren der vorstehenden Ansprüche, dadurch gekennzeichnet, daß mit dieser Membran (12) ein Schraubenteil zusammenwirkt, dabei ist dieses Schraubenteil mit einer Stellstange (26) bereitgestellt, die mittels eines Griffteils (27) betätigt werden kann, so daß eine Änderung dieser oszillierenden oder schwingenden Bewegung dieser Membran (12)

je nach den Bedürfnissen bewirkt wird.

Revendications

1. Un dispositif amélioré pour délivrer des détersifs et des additifs aux machines à laver, comportant un tiroir (1) d'alimentation incluant un bac (4) à détersif en poudre avec un élément à hélice (6) d'alimentation, et un bec (5) à additif dont le matérieau liquide est prélevé, caractérisé en ce que ledit matérieau liquide est prélevé pneumatiquement au moyen d'une pompe à membrane (11) entraînée par l'eau sous pression fournie par une soupape électromagnétique de chargement (15) alimentée en courant dépendamment de la dose requise, lesdits détersif et additif étant convoyés vers la cuve (22) de la machine à laver à travers un appareil mélangeur (17).

2. Un dispositif amélioré selon la revendication 1, caractérisé en ce que ledit tiroir (1) est situé glissant dans un boîtier (2) et divisé par une paroi verticale (3) en deux bacs (4, 5), dont l'un (5) a une dimension telle à accueillir une dose multiple donnée d'un détersif compact, tandis que l'autre (4) est conçu de manière à recevoir un additif concentré.

3. Un dispositif amélioré selon les revendications 1 et 2, caractérisé en ce que ledit élément d'alimentation à hélice (6) est entraîné par un moteur à engrenage axial (7) couplé à la paroi postérieure dudit boîtier (2) et étant pourvu d'un joint enfichable (8) adapté à permettre audit élément d'alimentation à hélice de n'opérer qu'avec le tiroir (1) dans une condition fermée.

4. Un dispositif amélioré selon l'une ou plusieurs des revendications précédentes, caractérisé en ce que dans ledit bec à additif (5) est enclenchée une extrémité d'un tuyau (9), dont l'autre extrémité porte à une soupape de non-retour (10) communiquant avec un dispositif à dépression (11) incluant substantiellement une chambre divisée par une membrane résiliente déformable (12), sur un côté de laquelle se trouve, conjointement avec ladite soupape de non-retour (10), une seconde soupape de non-retour (13) avec un orifice de sortie, tandis que sur son côté opposé se trouve une ouverture périmétrique (14) pour l'entrée d'eau sous pression.

5. Un dispositif amélioré selon l'une ou plusieurs des revendications précédentes, caractérisé en ce que ladite eau sous pression est alimentée à partir d'une vanne électromagnétique (15) qui convoie un écoulement de liquide à travers un premier conduit (16) à un appareil mélangeur (17), et un ultérieur écoulement de liquide subdivisé au moyen d'une branche (18) dans ladite ouverture (14) par l'intermédiaire d'un second conduit.

6. Un dispositif amélioré selon l'une ou plusieurs des revendications précédentes, caractérisé en ce que ledit appareil mélangeur (17) reçoit l'eau entraînant le détersif, la dose d'additif et l'eau résiduelle entraînant l'additif, et convoie les écoulements reçus le long d'un siphon (21) vers la cuve de lavage (22) sousjacente de la machine à laver.

7. Un dispositif amélioré selon l'une ou plusieurs des revendications précédentes, caractérisé en ce qu'avec ladite membrane (12) coopère une élément à vis, ledit élément à vis étant doté d'un tirant de réglage (26) qui peut être commandé au moyen d'une poignée (27) de manière à provoquer des variations du mouvement oscillant ou basculant de ladite membrane (12) dépendamment des nécessités.

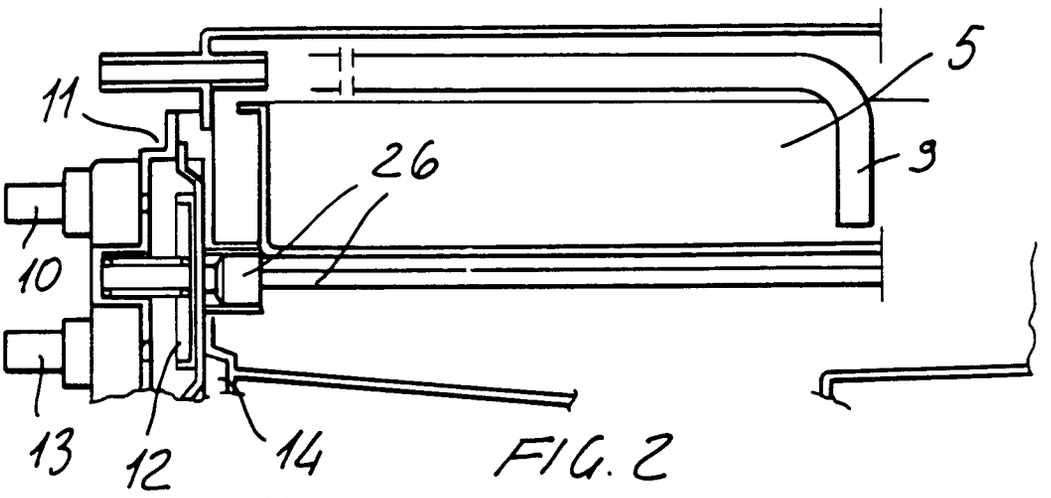


FIG. 2

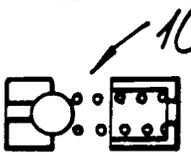
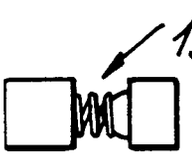


FIG. 3



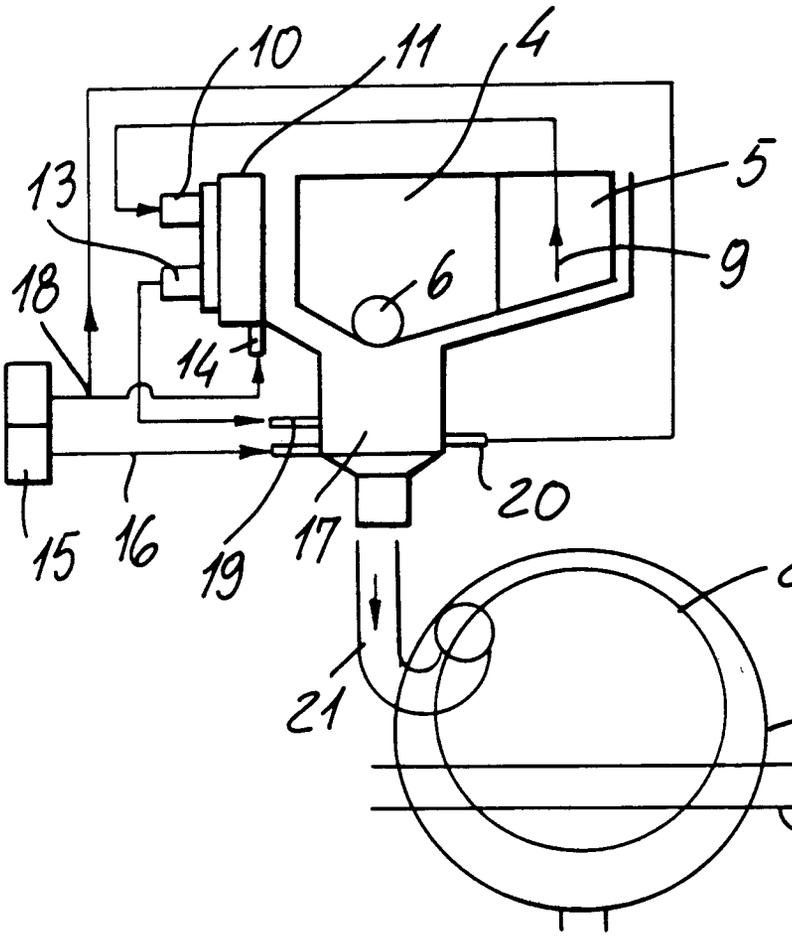


FIG. 1

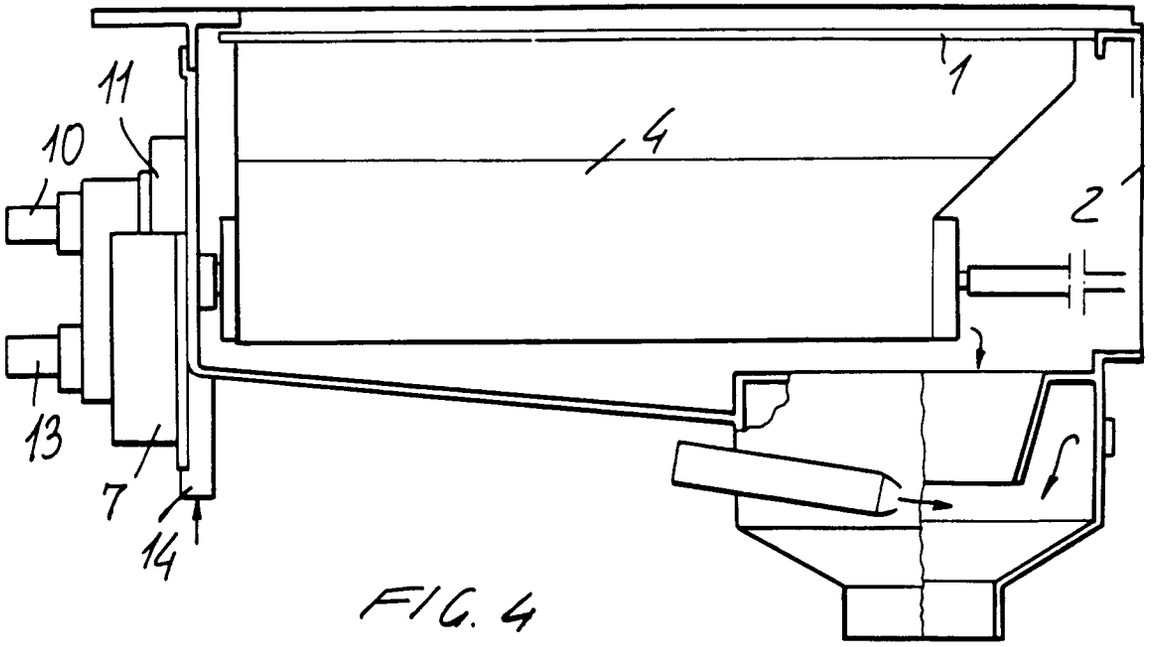


FIG. 4

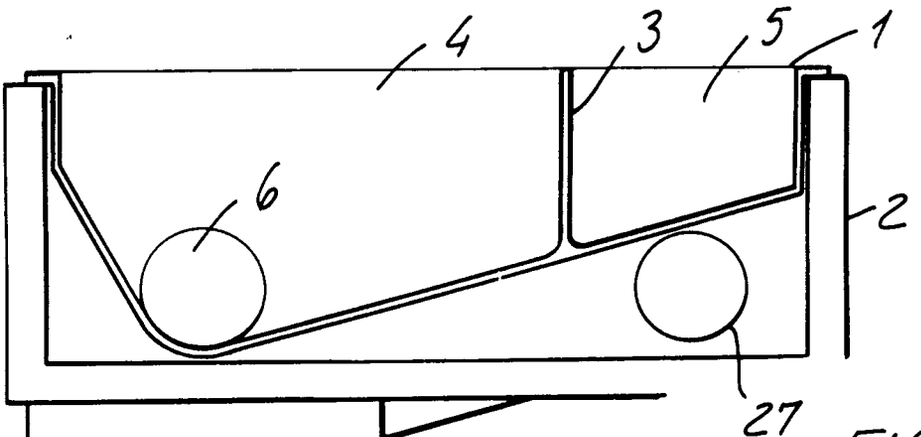


FIG. 5

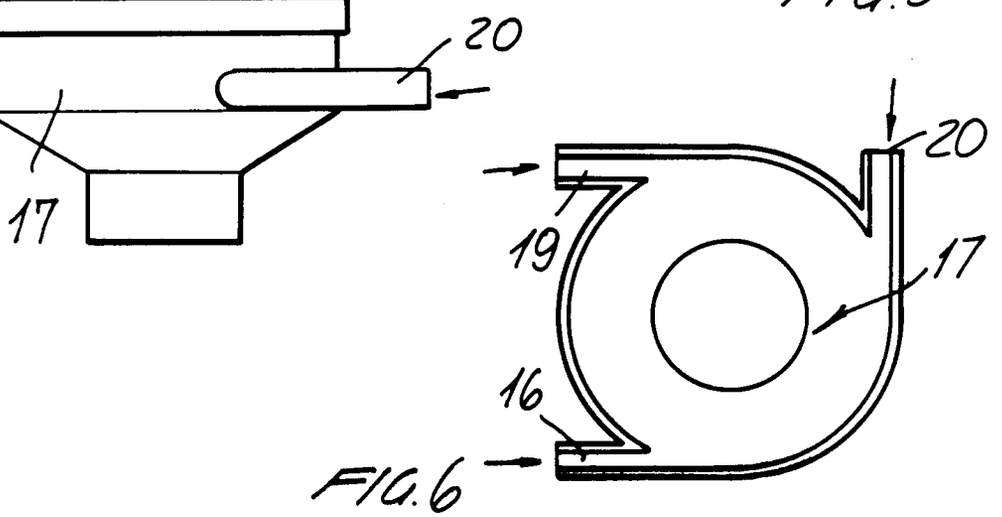


FIG. 6