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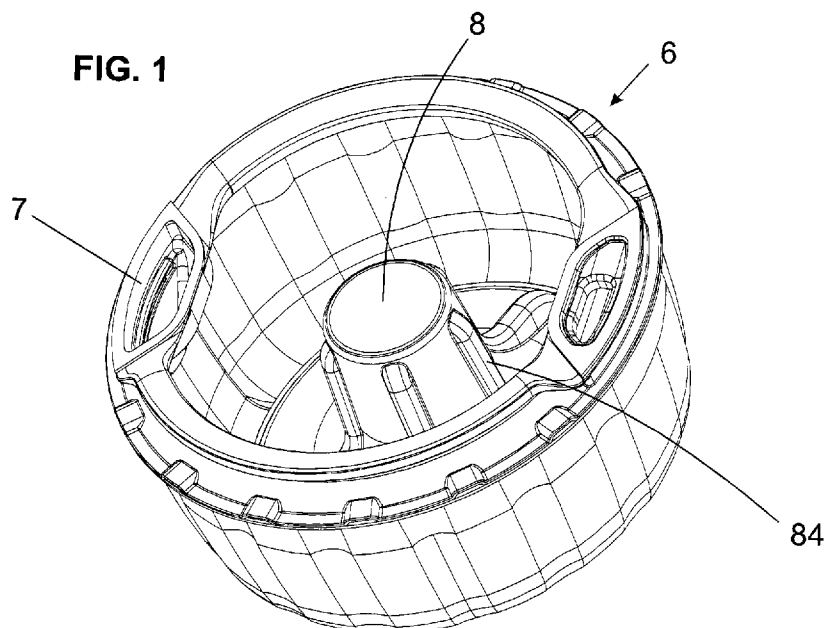
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(54) Title: PRODUCT STORAGE AND DISPENSING SYSTEM FOR HOUSEHOLD APPLIANCES



(57) Abstract: The present invention refers to a system characterized in that it comprises means to dilute and dispense products stored inside a compartment (70) of a product dispensing device (7) only by means of rotary movement of an agitator (8) cooperating with the rotor shaft (5) of the household appliance.

PRODUCT STORAGE AND DISPENSING SYSTEM FOR HOUSEHOLD APPLIANCES

Field of the Invention

The present invention refers to a system for storing and dispensing
5 products in household appliances. More specifically, it refers to an exclusively
mechanically operated system for handling detergent products (powder or liquid
soaps) in washing machines, integrated with a washing basket, wherein the use
of additional electronic components or devices is not required.

Background of the Invention

10 As widely known, automatic and semi-automatic washing machines
require the use of washing products for processing a load of clothes to be
cleaned, where the most used products are detergents (powder and liquid
soaps) and (conventional or concentrated) liquid fabric softener. Other products,
such as, for example, bleaching agents, are eventually also used but as a rule
15 of thumb only the use of detergents and softeners is sufficient to suitably wash
fabrics in general.

The majority of the population is also aware of the fact that with the
development of technology relative to equipments for washing clothes, solutions
have arisen allowing users to dispense products in the equipments prior to the
20 beginning of the washing cycle so that it is no longer necessary that an user
follows the washing steps so as to add at specific moments the products to the
water which will be used to process the load. Hence, dispensing drawers have
been developed which, as disclosed in documents BRPI204383-1 and
BRPI1101037-1, comprise additional washing compartments for the washing
25 compartment and operate with the aid of electrical electronic devices to deliver
products at specific moments of the cycle.

Other types of devices for dispensing washing products also comprise
elements independent of the basket and are basically hand-operated such as,
for example, those described in BRPI1101332-0 and MU9101963-0.

30 Thus, washing product dispensers known from the state of the art
depend on very complex construction process since they require production of
reservoirs and their mounting/installation in the equipments, which may lead to

a significant increase in manufacture costs and, consequently, commercialization costs. In the case where dispensers cooperate with electrical electronic elements, such costs are even higher, and manufacture processes more complex.

5 It should be mentioned that in lower cost equipments, and, therefore, most demanded by a population of low purchasing power, cycles are carried out in which there is no pre-washing, and a washing product can be simply directly delivered on the basket bottom or over the clothes, because same is used/dispensed in the already first filling. Nevertheless, such procedure may
10 stain clothes, in addition to the fact that there is no indication of the correct amount of product which must be used.

Therefore, it is observed that in the present state of the art there is a need for solutions to store and dispense washing products in household appliances, which are automatically operated and at the same time their
15 manufacture and marketing costs are low so that they can be purchased by low purchasing power consumers.

Objects of the Invention

Thus, one object of the present invention is to provide a product storage and dispensing system for household appliances which will not require
20 production and installation of a compartment in addition to those conventionally used in common washing machines.

Therefore, another object of the present invention is to provide a storage and dispensing system for washing products, which is directly incorporated into the washing basket of household appliances.

25 Still an object of the present invention is to provide a storage and dispensing system for washing products which will be automatically operated without requiring, therefore, the use of any type of electrical electronic components specific for this purpose.

Another object of the present invention is to provide a storage and
30 dispensing system for washing products which can be incorporated into a household appliance and purchased by low purchasing power consumers.

Summary of the Invention

The above mentioned objects are achieved by a product storage and dispensing system for household appliances, more specifically for washing machines comprising a housing containing a fixed tank cooperating with a main basket provided with a balancing device, wherein a moving tower cooperates
5 with the main basket which can alternately cooperating with an additional fixed or movable washing basket.

In a preferred embodiment of the present invention, said system comprises:

- a substantially cylindrical washing compartment comprising a central
10 cylindrical tower cooperating with a moving tower;

- at least one product dispensing device cooperating with the washing compartment, wherein said at least one product dispensing device comprises at least one compartment whose rear wall extends downwardly into proximity with the washing compartment bottom surface, ending in a horizontal platform,
15 wherein said rear wall forms together with the washing compartment wall at least one channel cooperating with said compartment wall and with the washing area;

- at least one agitator cooperating with the central cylindrical wall of the washing compartment comprising a body provided with an upper closing
20 platform and circular wall extending in an inclined lower platform form, wherein the outer surface of said agitator comprises equidistant prominences configuring paddles and the inner surface of the inclined lower platform comprises cooperating orthogonal walls having at least one channel.

Said at least one product dispenser can additionally comprise at least
25 one rip on the front wall cooperating with the inner area of the washing compartment to facilitate water flow.

It should be noted that the washing compartment cooperates with at least one product dispenser through at least one among the following forms: solidary joining, engagement, interference, fixing with pressure elements or coupling
30 with any fixation elements.

Said at least one product dispenser also comprises at least one compartment disposed between a substantially convex wall and the rear wall,

wherein said rear wall comprises a rip cooperating with the channel and compartment.

It is worth to mention that said lower orthogonal walls of the agitator comprise turbulence generators in the channel, wherein said means cause, through alternate movement (sometimes clockwise, sometimes anticlockwise movement of the agitator), the water to go up to reach the inner compartment of the product dispenser or to go down through the channel formed between the rear wall of the product dispenser and the washing compartment wall.

In an alternative embodiment of the invention, said at least one product storage reservoir cooperates with the movable basket or with the movable basket balancing device of the household appliance.

Finally, the present invention is characterized by comprising means to dilute and dispense products stored inside the inner compartment of the product dispenser only by means of a rotation movement of the agitator cooperating with the rotor shaft of household appliance.

Brief Description of the Drawings

The present invention will be more fully described below with reference to the drawings, wherein:

Fig. 1 shows a perspective view of a washing compartment for a washing machine according to a preferred embodiment of the product storage and dispensing system for household appliances of the present invention;

Fig. 2 shows a cross-sectional perspective view of the object illustrated in Fig. 1;

Fig. 3 shows a vertical cut view of the washing compartment in Fig. 1;

Fig. 4 shows an enlarged detail of the product storage and dispensing system in accordance with a preferred embodiment of the present invention;

Fig. 5 shows an enlarged detail of a cut illustrated in Fig. 3, but containing indicative arrows of the fluid flow during the household appliance operation equipped with a system in accordance with the present invention;

Fig. 6 shows a longitudinal cut view of a household appliance comprising the storage and dispensing system of the present invention;

Fig. 7 shows separately and in an upper perspective view, an agitator in

accordance with the present invention;

Fig. 8 shows a lower perspective view of an agitator illustrated in Fig. 7.

Detailed Description of the Invention

The object of the present application will be described in further details
5 and explained on the basis of the accompanied drawings which should be construed as merely exemplificative and not limitative, given that adaptations and modifications can be made without departing from the claimed scope of protection.

The present invention refers to a product storage and dispensing system
10 for household appliances, more specifically intended to store and dispense detergents in soap powder or liquid form in a load of clothes to be washed.

To this effect, said system is to be used in a washing machine 1 such as, for example, the one illustrated in Fig. 6, comprising a substantially parallelepipedal housing 2 having a vertical shaft and an access cover 21
15 disposed on its upper surface. Said housing 2 comprises, in its interior, a fixed tank 3 cooperating with a main basket 10 provided with a balancing device 11, wherein a moving tower 4 cooperates with the main basket 10 and with the rotor shaft 5 of the appliance.

The load of clothes to be processed will be inserted in a removable
20 washing compartment 6 (see Figs. 1 to 3), which, in the exemplary embodiments of the invention as illustrated in the appended drawings comprises a basket defined by a substantially cylindrical body provided with a cylindrical central wall 61 that configures a span to couple with the moving tower 4, wherein said washing compartment 6 comprises, in its upper edge, a
25 small peripheral platform 62 which aids supporting the basket on the balancing device 11, solidary with the main basket 10.

Furthermore, the dispensing system, in accordance with the present invention, can be used in removable washing baskets, in a fixed basket, or directly cooperating with the fixed tank 3 of the household appliance, without
30 departing from the presently claimed scope of protection.

With regard to this aspect, it should be pointed out that the product dispensing device 7 can be solidary with the body of the washing compartment 6

or coupled therewith by an engaging/fixing system aided by any elements, without departing from the presently claimed scope of protection.

Said product dispensing device 7 essentially comprises a compartment 70 defined by a substantially convex and tapered front wall 71 defined by a
5 substantial convex and tapered front wall 71 in its lower region, and a rear wall extending up to the next surface of bottom 63 of said washing compartment 6, and ending in a small horizontal platform 73.

An essential feature of the product dispensing device 7 refers to the fact that its rear wall 72 comprises a rip 75 and is away from the outer wall of the
10 washing compartment 6, resulting in a channel 74 through which said rip 75 allows the compartment 70 to receive water flow to dilute the detergent and analogously deliver to the washing are the detergent pre-diluted in water.

The product dispenser 7 of the present invention may optionally comprise, in the front wall 71, another rip similar to rip 75 to improve the water
15 flow passing through channel 74, crossing the compartment 70 e being dispensed in the inner area of the washing compartment.

Assembly of the product storing and dispensing system in accordance with a preferred embodiment of the present invention further comprises coupling an agitator 8 (see Figs. 7 and 8) with the washing compartment 6 once said
20 agitator 8 comprises a substantially cylindrical body provided with upper closing platform 81 and circular wall 82 which extends as an inclined lower platform 83, wherein the outer surface of the agitator 8 contains equidistant prominences configuring paddles 84 which, during operation of the household appliance, make an alternately clockwise or anticlockwise rotary movement such that they
25 become responsible for moving the washing load.

Furthermore, from the inner surface of the inclined lower platform 83, orthogonal walls protrude, which when rotated in function of the equipment rotor movement generate turbulence in the clothes washing water. It should be clarified that either the inclined lower platform or orthogonal walls 85 cooperate
30 with the horizontal platform 73 of the product disposing device 7, wherein the rotary and alternate movement of the orthogonal walls 85 pushes and eventually also suctions the water flow through the channel 74.

When using the system, before actuating a washing cycle a user must fill the compartment 70 with detergent (soap powder or liquid soap) of his choice. When the user turns on the machine and the washing basket 6 starts being filled by communicating vessels system, water begins to fill channel 74 and when it reaches rip 75 the first dilution of the detergent stored in the compartment 70 occurs. It is worth to mention that after the machine is filled, the water level faces the upper edge of the rip 75, represented by a dashed line, depicted in Figs. 3 and 5.

However, it occurs that only this filling is not sufficient to fully dilute a detergent in compartment 70 such that a residual amount thereof will still remain after the water exits by gravity or inertial centrifugal force. In order to just improve and optimize the use of detergent that the back-and-forth movement of the agitator 8 (and more specifically its orthogonal wall 85) causes turbulence in the water, which is impelled upward (see arrows in Fig. 5) the channel 74, consequently entering the compartment 70 under certain pressure to reach any detergent which still remains therein, thus diluting it. Alternately, instead of impelling water, the opposite movement of the agitator 8 then suctions the fluid through channel 74, thus pulling out water containing the already diluted detergent when water enters the compartment 70 (seed dashed arrows shown in Fig. 5).

It is thus noted that the system of the present invention permits that only the motor rotor movement that causes the equipment to operate is sufficient to the functioning of the product dispensing device 7, thereby merely and simply benefiting from physical laws to generate turbulence and direct the fluid flow through channel 74 connecting the washing area of the basket 6 with compartment 70 which stores the detergent.

Therefore, it can be assured that the object of the present invention practically, efficiently and economically solves the state-of-the-art problems once the use of additional physical and/or electrical electronic component to dispense the washing products during the equipment operation is not required, thus resulting in a system that can be incorporated in any type of equipments without increasing costs and therefore it can be used in low cost equipments

which can also be purchased by the population of low purchasing power.

It should also be pointed out that in the preferred embodiment shown in the accompanying drawings and description above, the present system is used in removable washing compartments 6 but it is worth to mention that same can
5 be used provided that it is immersed in other types of compartments irrespective of their dimensions, capacities or geometrical shapes, without departing from the presently claim scope of protection.

Additionally, attention should be drawn to the fact that in an alternative embodiment of the invention, the product dispensing system 7 can be optionally
10 used in the own main basket 10 without departing from the presently claimed scope of protection.

Furthermore, it should also be emphasized that the description above only intends to describe in a exemplificative form some of the preferred embodiments of the present invention. Therefore, those skilled in the art will
15 understand that many construction modifications, variations and combinations of elements having substantially the same function to achieve the same results will be within the scope of protection as limited by the appended claims.

CLAIMS

1. Product storage and dispensing system for household appliances, more specifically for washing machines (1) comprising a housing (2) containing a fixed tank (3) cooperating with a main basket (10) provided with a balancing device (11), wherein a moving tower (4) cooperates with the movable basket (10), said system being **CHARACTERIZED** in it comprises:

- a substantially cylindrical washing compartment (6) comprising a cylindrical central wall (61) cooperating with the moving tower (4);

- at least one product dispensing device (7) cooperating with the washing compartment (6), wherein said at least one product dispensing device (7) comprises at least one compartment (70) whose rear wall (72) extends downwardly into proximity with the bottom surface (63) of the washing compartment (6), ending in a horizontal platform (73), wherein said rear wall (72) configures, together with the wall of the wash compartment (6), at least one channel (74) cooperating with the compartment (70) and with the washing area of said washing compartment (6);

- at least one agitator (8) cooperating with the cylindrical central wall (61) of the washing compartment (6), said agitator (8) comprising a body provided with an upper closing platform (81) and circular wall (82) extending in a form of inclined lower platform (83), wherein said outer surface of the agitator (8) comprises equidistant prominences configuring paddles (84) and the inner surface of the inclined lower platform (83) comprises orthogonal walls (85) cooperating with said at least one channel (74).

2. System, in accordance with claim 1, **CHARACTERIZED** in that said washing compartment (6) cooperates with said at least one product dispensing device (7) through at least one among the following forms: solidary joining, engagement, interference, fixing with pressure elements or coupling with any fixation elements.

3. System, in accordance with claim 1, **CHARACTERIZED** in that said at least one product dispensing device (7) comprises at least one compartment (70) disposed between one substantially convex wall (71) and rear wall (72), said rear wall (72) comprising a rip (75) cooperating with channel (74) and compartment (70).

4. System, in accordance with claims 1 and 3, **CHARACTERIZED** in that said at least one product dispenser (7) further comprises at least one rip on the front wall (71) cooperating with the inner area of the washing compartment (6).

5 5. System, in accordance with claim 1, **CHARACTERIZED** in that the orthogonal walls (85) of the agitator (8) comprises turbulence generators in the channel (74).

6. System, in accordance with claim 1, **CHARACTERIZED** in that said at least one product dispensing device (7) cooperates with the main basket (10).

10 7. System, in accordance with claim 1, **CHARACTERIZED** in that said at least one product dispensing device (7) cooperates with the balancing device (11) of the main basket (10).

15 8. System, in accordance with claim 1, **CHARACTERIZED** in that it comprises means to dilute and dispense products stored inside the compartment (70) of said product dispensing device (7) only by means of rotary movement of said agitator (8) cooperating with the rotor shaft (5) of the household appliance.

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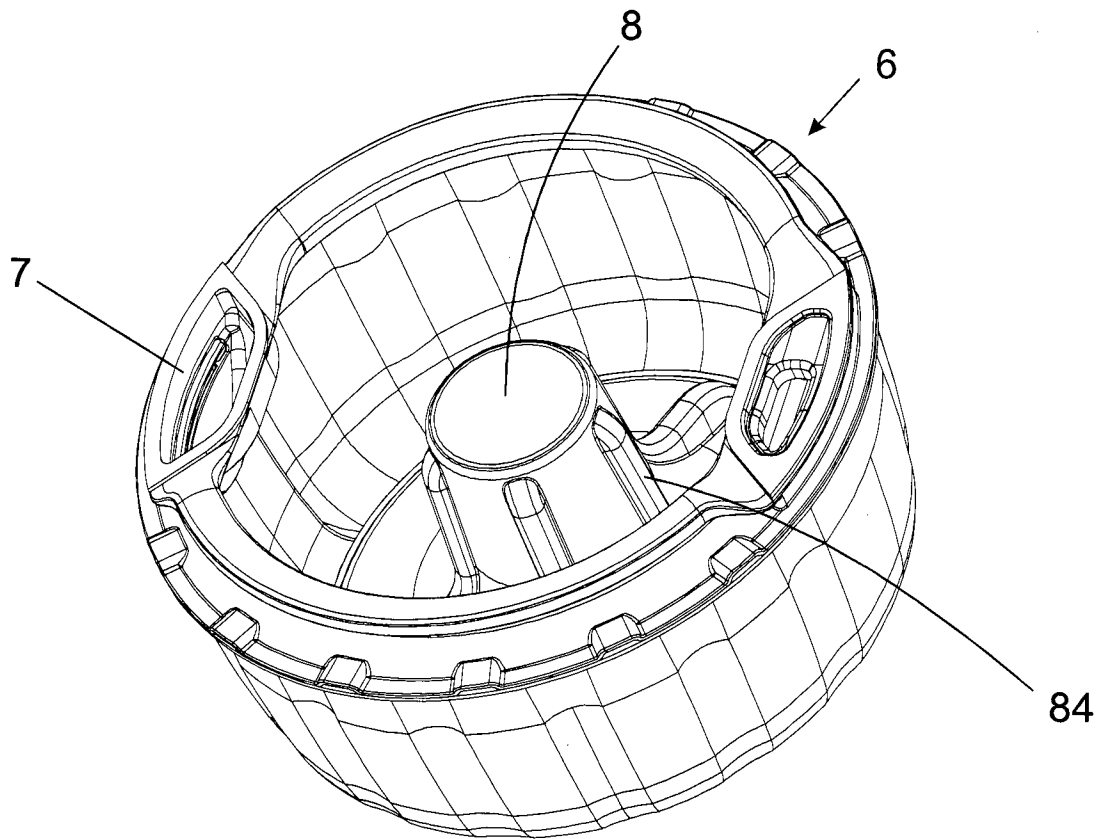


FIG. 1

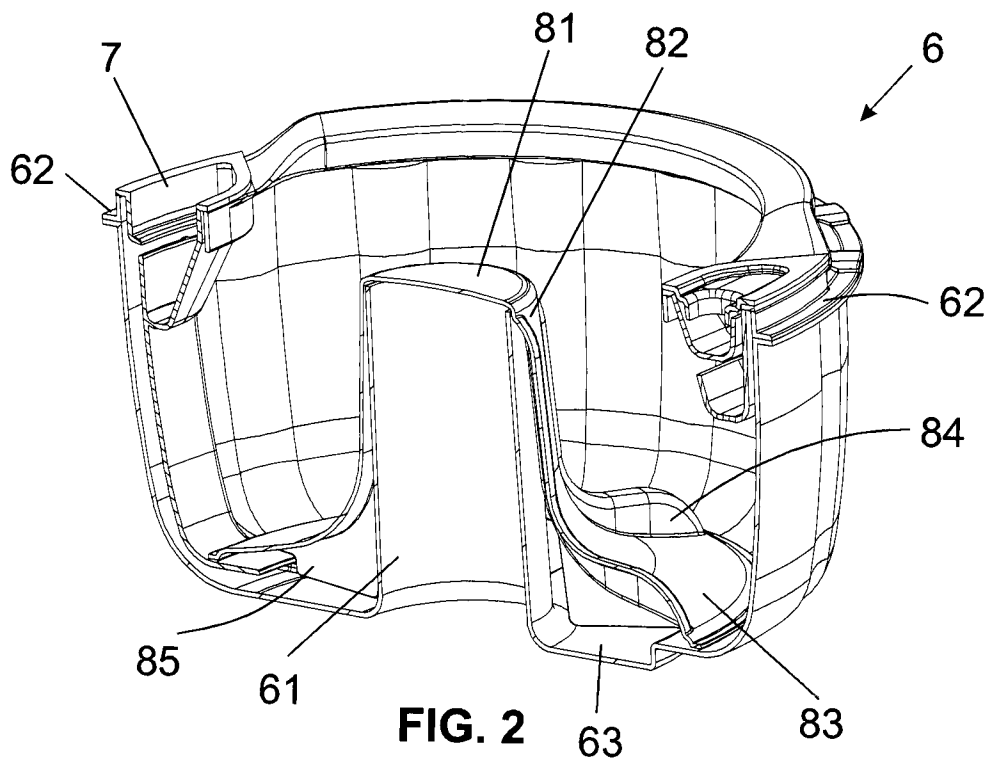
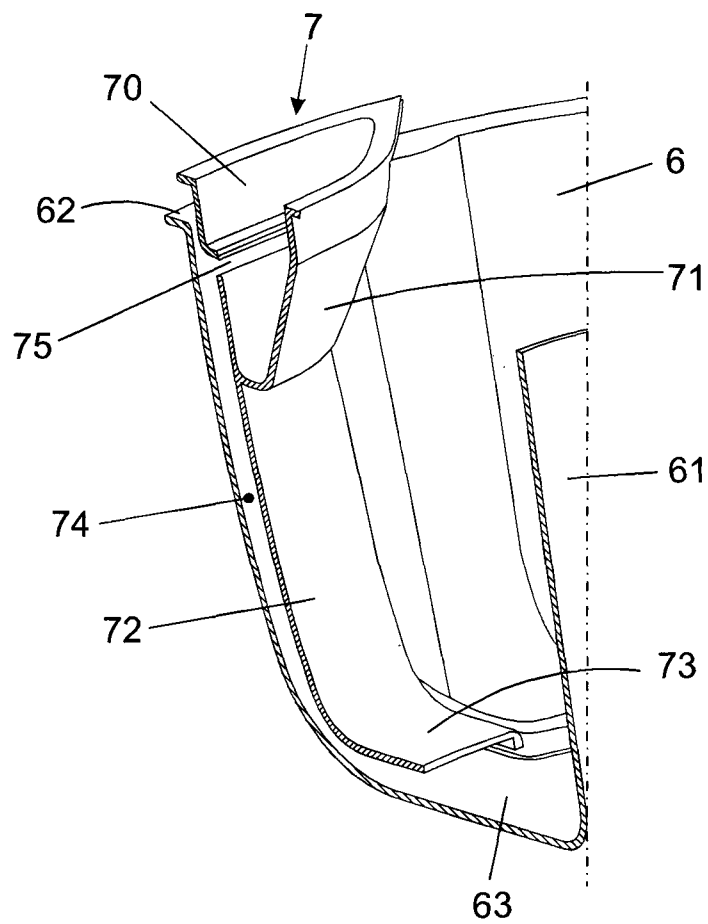
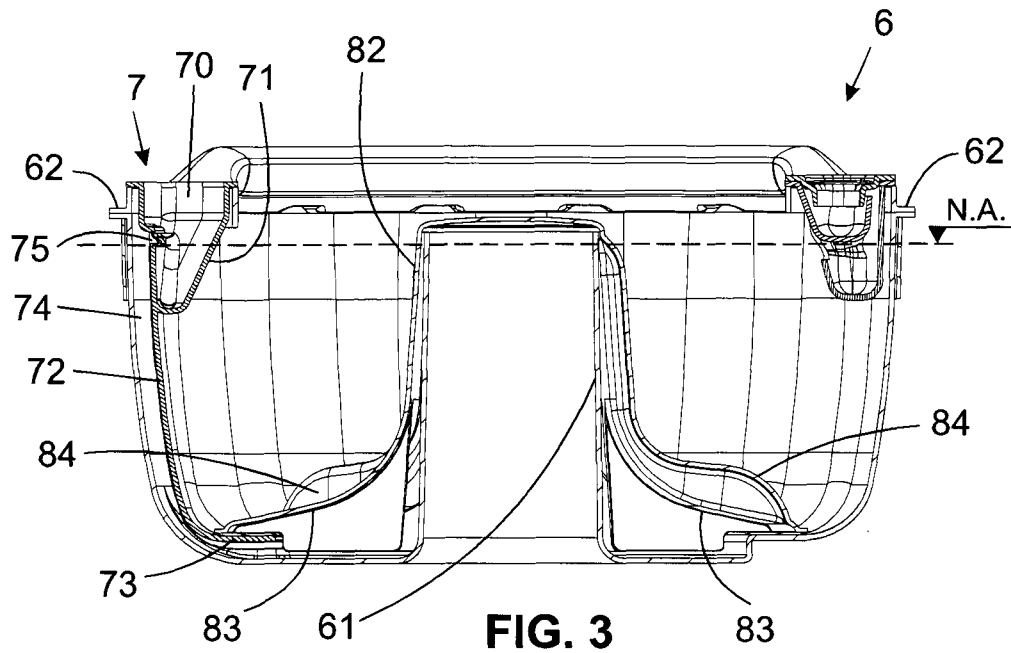


FIG. 2



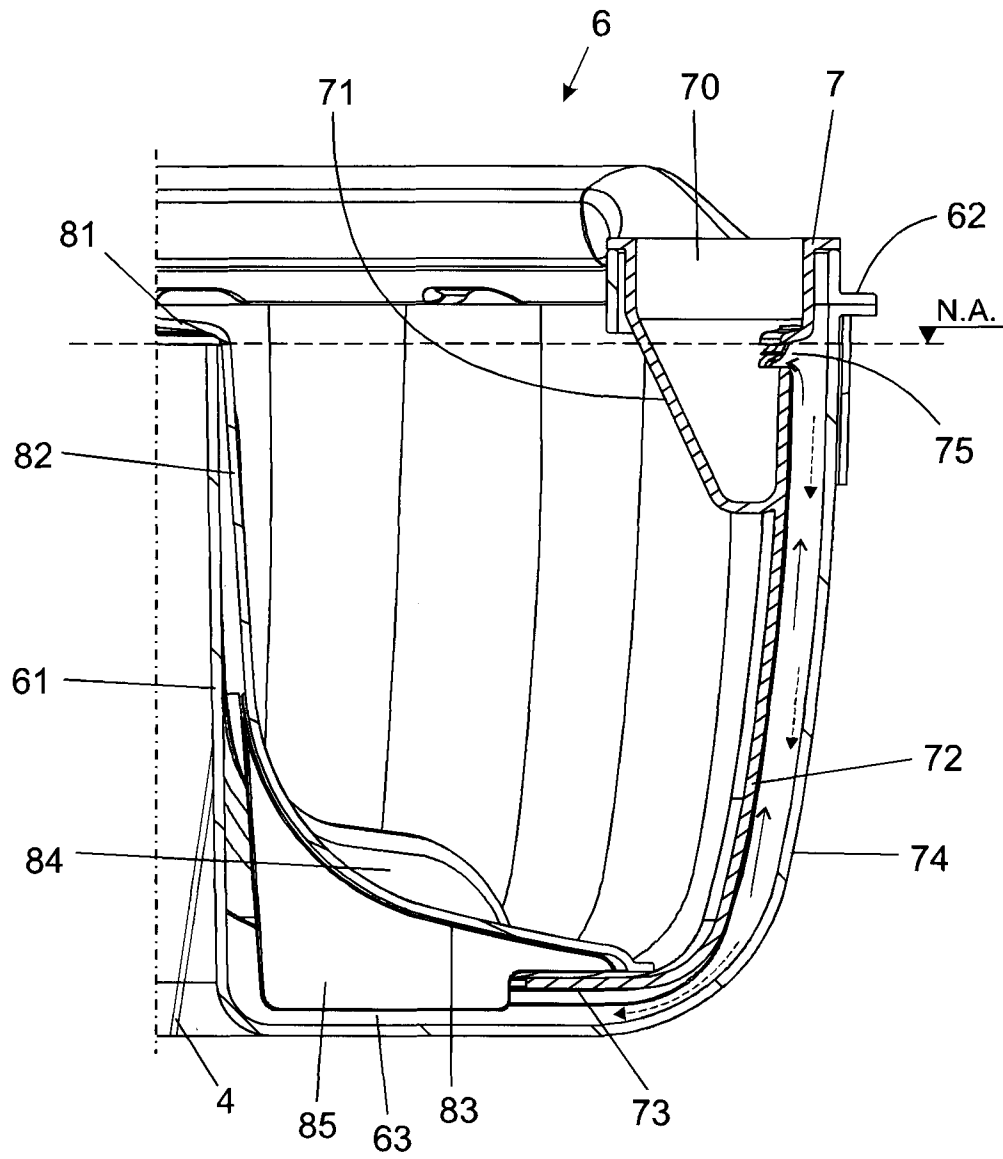


FIG. 5

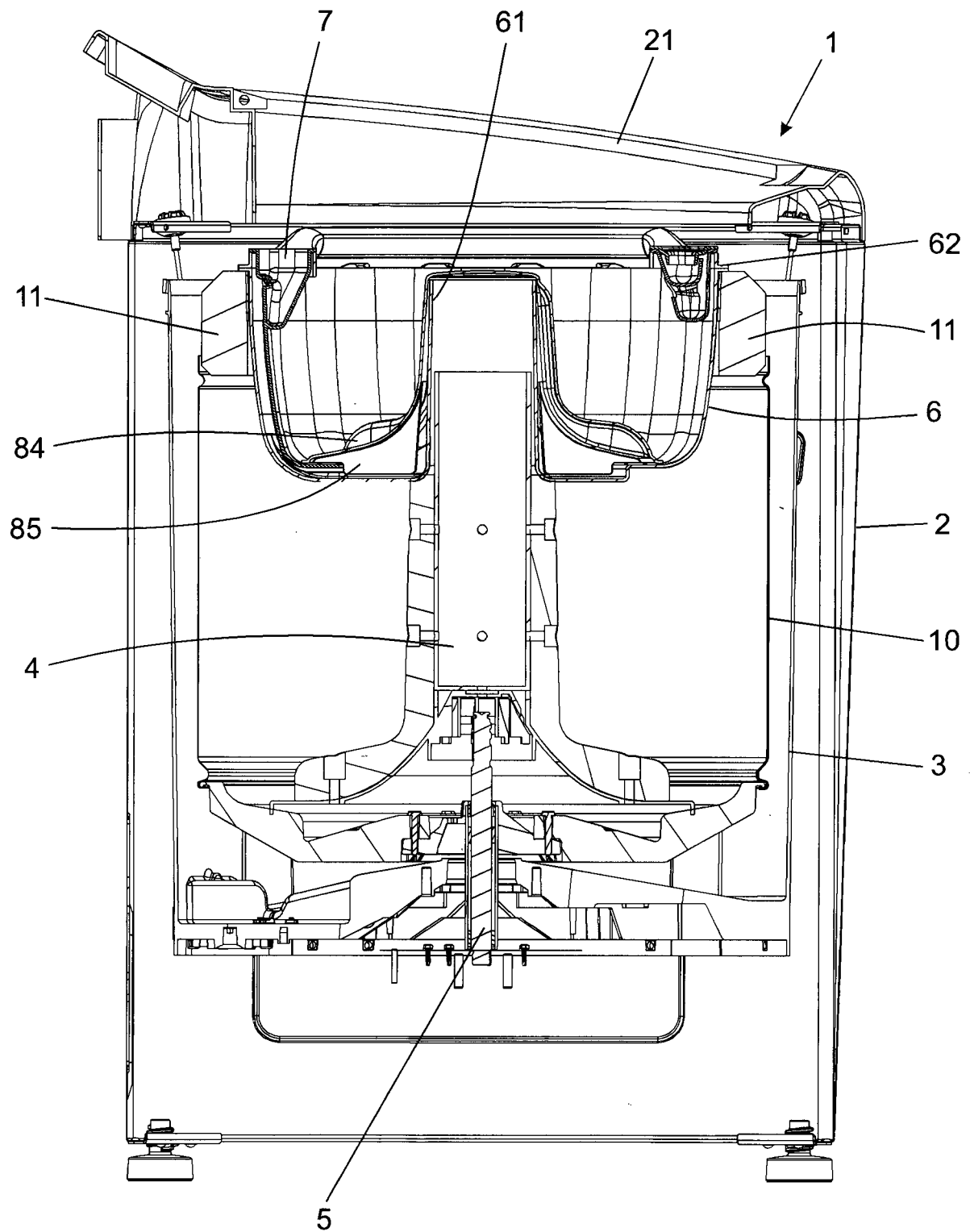


FIG. 6

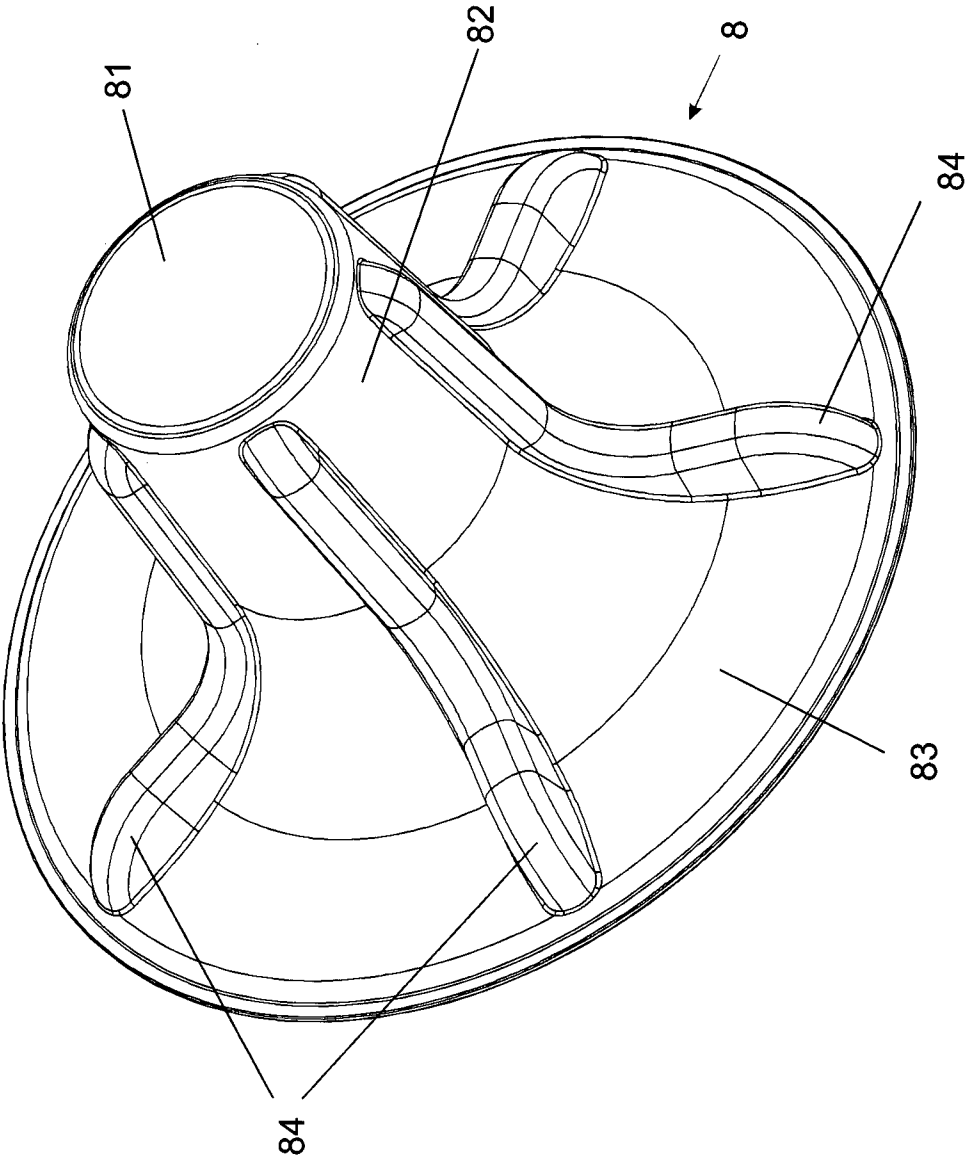


FIG. 7

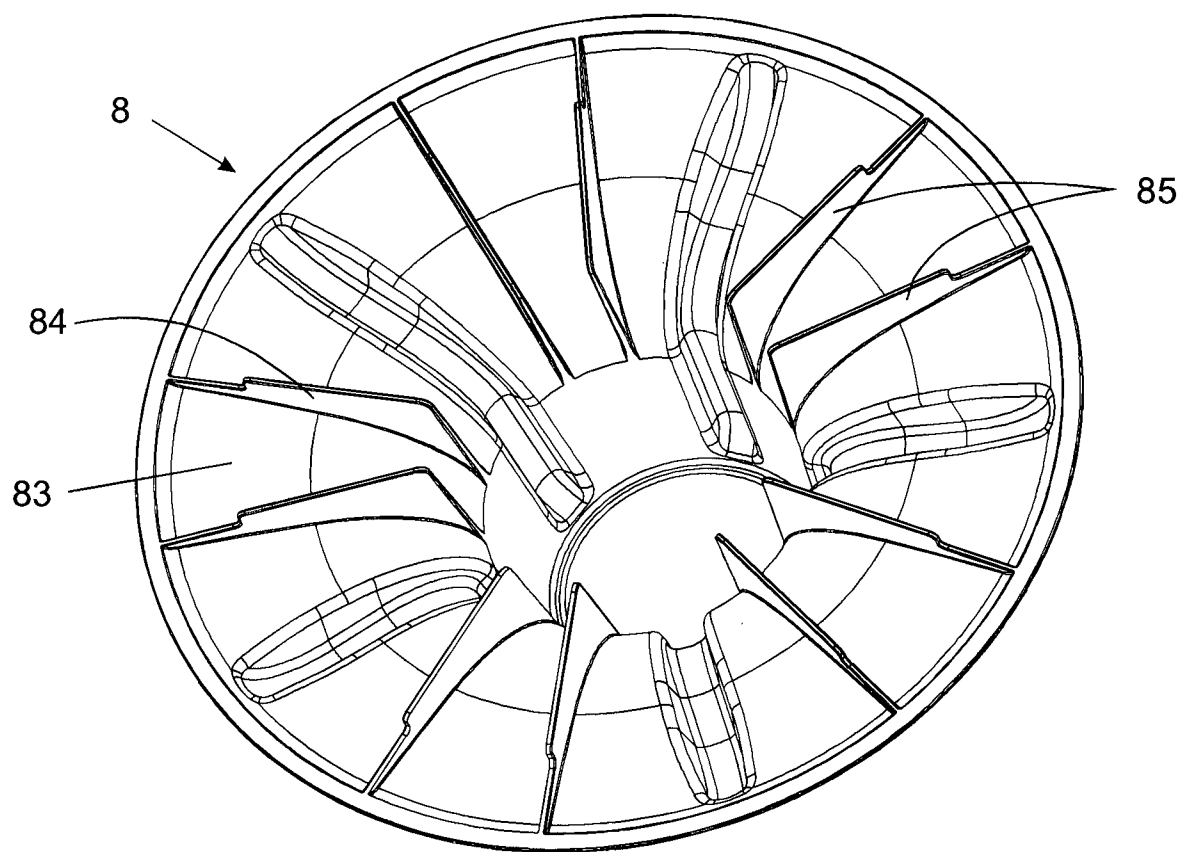


FIG. 8

INTERNATIONAL SEARCH REPORT

International application No
PCT/BR2014/000233

A. CLASSIFICATION OF SUBJECT MATTER
INV. D06F39/02
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
D06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 044 178 A (ALTNAU SR RONALD L [US]) 3 September 1991 (1991-09-03) column 6, lines 16-68; figures 1-3 -----	1-8
A	US 5 500 967 A (WILSON STEVEN R [US] ET AL) 26 March 1996 (1996-03-26) column 5, lines 8-52; figures 1-3 -----	1-8
A	GB 2 220 007 A (TOSHIBA KK [JP]) 28 December 1989 (1989-12-28) abstract; figure 1 -----	1-8



Further documents are listed in the continuation of Box C.



See patent family annex.

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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Date of the actual completion of the international search

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Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/BR2014/000233

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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