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(71) Applicant:
THE PROCTER & GAMBLE COMPANY
Cincinnati, Ohio 45202 (US)

(72) Inventors:
- **van Dijk, Paul Irma Albertus**
  2580 Putte (BE)
- **van Poucke, Jeroen**
  9160 Lokeren (BE)

(74) Representative:
Mather, Peter Geoffrey et al
Procter & Gamble
European Technical Center N.V.
Temselaan 100
1853 Strombeek-Bever (BE)

(54) Tablet dispensing device

(57) The present invention relates to a tablet dispensing device (10) being liquid permeable. The device comprises a first member (11) an opposing second member (14) and connecting means (12). The first member and the second member are substantially rigid. The first member and the second member are connected to the connecting means, the connecting means being flexible so that the distance between the first member and the second member is variable allowing the first and second members to come into close proximity. The first member and the second member are movable in a substantial free manner from each other when the dispensing device is placed in a laundry washing machine.

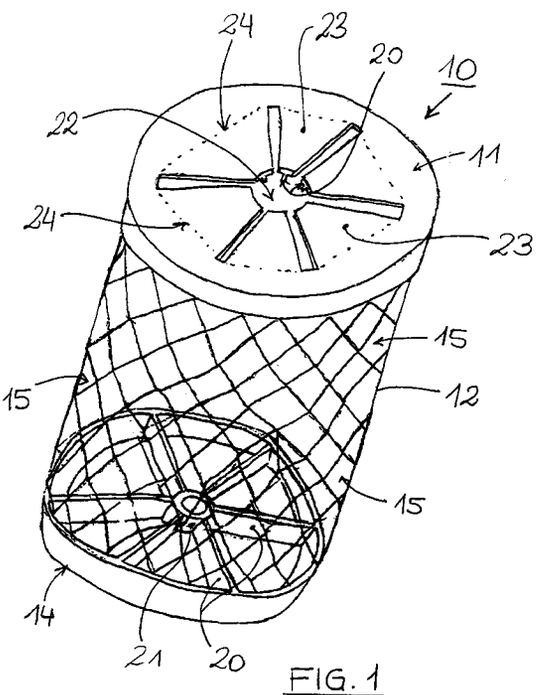

FIG. 1

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Description

Field of the invention

The present invention relates to a dispensing device for detergent tablets to be introduced with the laundry in a washing machine.

Background of the invention

Detergent compositions formed as non particulate solids such as bars or tablets or briquettes are known in the art. In the following, the term "tablet" will refer to any form of non particulate solids. The tablet provides a number of advantages to both the consumer and the manufacturer. For example, the tablet avoids spillage of the detergent composition. Furthermore, the tablet eliminates the need for the user to estimate the dosage of detergent composition required and ensures that the correct dosage of detergent composition per wash cycle is used by the user.

To further simplify handling and in order to maximize dissolution, thus improving the performance of the detergent tablet, many detergent compositions manufacturers provide the consumer with dispensing devices in which to place the detergent tablet prior to being placed in the washing machine. Indeed, dispensing devices in the form of baskets or cradles are often utilized for example in automatic dish washing machines to maximize the performance of the tablet. Usually, these dispensing devices are based on a rigid cage structure. An example of a dispensing device for tablets with a rigid cage structure is described in co-pending European Patent Application No. 95304115.9

It has been found that the detergent tablet is slowly dissolved within these dispensing devices based on rigid cage structures, especially when the dispensing device is placed into a laundry washing machine together with the laundry. Indeed, it is very likely that the dispensing device is covered by the laundry during a wash cycle of the washing machine. Consequently, the wash liquor is substantially prevented from directly reaching the dispensing device to dissolve the detergent tablet. This results in reduced dissolution of the detergent tablet in a laundry washing machine together with the laundry. By contrast, it has been found that a detergent tablet broken up during the wash cycle results in an improved dissolution of the detergent tablet in a laundry washing machine.

EP-A-0 473 532 describes a tablet dispensing device to be placed in a washing machine for washing clothes. This device is a flexible bag-like body containing in its interior a freely movable disintegrating body. This disintegrating body helps in pulverizing the detergent tablet during the wash cycle of a laundry washing machine. Consequently, the pulverized detergent tablet is dissolved more quickly. Nevertheless, the disintegrating body is an additional and separate piece which has to be inserted into the bag-like body in the manufacturing process before closing the dispensing device. This complicates the manufacturing process of this dispensing device resulting in increased manufacturing costs. Furthermore, this disintegrating body may damage the drum of the washing machine. Indeed, the bag-like body does not protect the drum from the disintegrating body which may be thrown against the drum e.g. during the tumble-dry of the wash cycle.

EP-A-0 479 711 describes another tablet dispensing device to be placed in a washing machine for washing clothes. This device comprises also a flexible bag. This bag has a mouthpiece defining an inlet opening for the detergent. The bag further comprises a closing part opposite the mouthpiece. The closing part is adapted to be releasably engaged with the mouthpiece forming a rigid structure. The tablet is broken up when the textile during the wash cycle presses the tablet against the rigid structure of the engaged mouthpiece and the closing part. The mouthpiece and the closing part have to be provided with an appropriate engaging means. This complicates the manufacture, which increases the manufacturing costs, and the handling of the dispensing device.

It is therefore an object of the present invention to provide a dispensing device providing an improved breaking up of the detergent tablet in laundry washing machine without using additional disintegrating bodies in the dispensing device.

Summary of the invention

The present invention is a tablet dispensing device being liquid permeable. The device comprises a first member, an opposing second member and connecting means. The first member and the second member are substantially rigid. The first member and the second member are connected to the connecting means, the connecting means being flexible so that the distance between the first member and the second member is variable allowing the first and second members to come into close proximity. The first member and the second member are movable in a substantial free manner from each other when the dispensing device is placed in a laundry washing machine.

Brief description of the figures

Figure 1 is a perspective front view of an embodiment of the tablet dispensing device according to the present invention.

Figure 2 illustrates a perspective front view of another embodiment of the tablet dispensing device according to the present invention.

Figure 3a shows a top view of a first member and/or a second member of the tablet dispensing device in an embodiment according to the present invention. Figure 3b shows a side view a first member and/or a second

member of the tablet dispensing device in an embodiment according to the present invention.

Figure 4a is a perspective front view of another embodiment of the tablet dispensing device according to the present invention. Figure 4b shows a top view of the first member and the second member of the tablet dispensing device of Figure 4a.

Figures 5 to 6 show top views of a first member and/or a second member of the tablet dispensing device according to the present invention.

Figure 7 illustrates a perspective front view of another preferred embodiment of the tablet dispensing device according to the present invention.

Detailed description of the invention

In the following any form of non particulate solids such as bars or tablets or briquettes will be encompassed by the term "tablet". The tablet is made from a detergent composition for dish or laundry washing. The tablet may have any shape or dimension. Preferably, the solid, non particulate tablet is symmetrical to ensure the uniform dissolution of the tablet in the wash liquor.

According to the present invention the detergent tablet may comprise any ingredients known in the art. Such ingredients may include surfactants, suds suppressors, beaches, chelants, builders, enzymes, fillers and perfumes.

According to the present invention the detergent composition of the tablet is prepared in its granular or particulate form and then formed into tablets of the desired shape and size by any one of the methods known in the art. Suitable methods include compression, extrusion and casting. The detergent composition may be homogeneously distributed throughout the tablet or may comprise distinct layers of certain detergent ingredients.

The preferred embodiment of a tablet dispensing device (10) according to the present invention is shown in Figure 1. This dispensing device is for retaining a detergent tablet and for dispensing a detergent tablet in a wash liquor of a laundry washing machine. The device is liquid permeable so that a liquid passing through the device dispenses the detergent tablet when the device retains a detergent tablet. The device comprises a first member (11), a connecting means (12) and a second member (14). The first member is connected to one end of the connecting means. The second member is also connected to the connecting means on an opposite end of the connecting means with respect to the first member. The connecting means is flexible so that the distance between the first member and the second member is variable. The connecting means allows the first member and the second member to come into close proximity. As herein referred to, "close proximity" is such that a detergent tablet is squeezed between the first member and the second member when the detergent tablet is placed within the dispensing device.

Preferably, the connecting means (12) is a net, as shown in Figure 1. The net comprises orifices (15) of appropriate size. The "appropriate size" is such that the tablet, when inserted into the dispensing device (10), is not able to escape through the net until the detergent tablet is sufficiently reduced in size by breaking up and/or dissolution in the wash cycle. The detergent tablet is sufficiently reduced in size when no poor dissolution of the reduced detergent tablet is observed in the wash cycle. Preferably, the net comprises a slit to insert a detergent tablet into the dispensing device. The slit may be obtained by a net which is interrupted. For example, this may be achieved by a superimposed net connected together only to the first member (11) and the second member (14). Thus, the tablet is inserted through the superimposed region of the net between the first member and the second member.

In an alternative embodiment, the connecting means (12) is flexible and resilient. For example this may achieved by connecting means in form of a spring or of bellows. An example of connecting means formed as bellows is shown in Figure 2. The connecting means of Figure 2 comprises a plurality of arms (16). The free space between the arms is such that a detergent tablet inserted into the dispensing device is not able to escape through the connecting means until the detergent tablet is sufficiently reduced in size by breaking up and/or dissolution in the wash cycle. The connecting means shaped as bellows is hinged at the connection (18) with the first member (11) and the second member (14). Preferably, each arm of the bellows further comprises a hinge (19) located on each arm half way between the first member and the second member. The bellows may fold inwards to interior of the dispensing device or outwards away from the interior of the dispensing device. The connecting part in this embodiment is flexibly and resiliently deformed along the hinges (18) and (19) allowing the first member and the second member to come into close proximity to each other. This enables the squeezing of the detergent tablet between the first member and the second member when the detergent tablet is inserted into the dispensing device according to the present invention. This facilitates the breaking up of the detergent tablet.

The material of the connecting means (12) has to be sufficiently resistant to the temperatures of the wash liquor reached during the washing. Preferably, the material of the connecting means is a woven or non-woven material made from natural or synthetic fibres or a mixtures of such fibres. The material of the connecting part may also be extruded or co-extruded films, provided with perforations. The material of the connecting means may also be plastic material, like elastomers, or made of paper or other porous, water resistant cellulosic material. Possible elastomeric materials are, for example, polypropylene, polyethylene or polyester. All these elastomers ensure enough compatibility with the wash liquor and resistance to the temperatures mentioned

before. However, metal is another possible material for the connecting means. A metal material, like aluminium is especially suitable when the connecting means is in a form of a spring. It is preferable then that the metal material is stainless steel or it is protected by a layer of plastic on the outside. The metal material has the advantage that it allows an easier variation in shape of the connecting means itself. If the material used for the connecting means does not itself have sufficient resistance to water, it may be provided with a coating making it water resistant. For example, in the case of porous paper, the coating may consist of a latex based binder associated with a hydrophobic substance.

According to the present invention the first member (11) and the second member (14) are substantially rigid. As herein referred to, "substantially rigid" mean that the first member and the second member are rigid or hard enough to help to break-up the detergent tablet placed within the dispensing device. The first member and the second member are movable in a substantial free manner from each other when the dispensing device is placed in a laundry washing machine. As herein referred to, "substantial free movements" are such that the first member and the second member move independently from each other whereby their movement is only limited by the connection to the connecting means. The substantial free movements of the first member and the second member help to break up the detergent tablet whenever the first member and the second member come into close proximity.

The first member and the second member come to close proximity when the dispensing device (10) is agitated during a wash cycle within the drum of the laundry washing machine. Indeed, the distance between the first member and the second member is variable with the agitation during a wash cycle due to the flexible connecting means. Thus, the detergent tablet is repeatedly squeezed between the first member and the second member during the wash cycle. The repeated squeezing of the detergent tablet within the dispensing device is allowed by the substantial free movements of the first member and the second member. The squeezing of the detergent tablet is further aided by the weight of at least part of the wash liquor loaded textiles in the drum of the laundry washing machine. It has been found that this repeated squeezing of the detergent tablet between the first member and the second member improves the breaking up of the detergent tablet. This improved breaking up of the detergent tablet is achieved without the need of an additional freely movable disintegrating body within the dispensing device. The breaking up of the detergent results in an improved dissolution of the detergent tablet, especially when the detergent tablet contains surfactant. Indeed, surfactant containing detergent tablets are usually poorer in dissolution than detergent tablets not containing surfactants.

To improve the rigidity of the first member (11) and/or of the second member (14), the first member (11) and/or the second member (14) may preferably comprise ribs (20). The ribs are located on the side of the first member and the second member directed to the interior of the dispensing device, as shown in Figure 1. As a preferred option, the ribs converge towards the midpoint of the first member and the second member, as shown for example in Figure 1. The midpoint of the first member and/or of the second member may further comprise a circular ring (21) onto which the other ribs converge.

In a preferred embodiment of the present invention, the first member (11) and/or the second member (14) may be a solid wall or an interrupted wall. The interrupted wall is a wall comprising at least one opening (22) through the thickness of wall. The first member and/or the second member being interrupted walls further improves the liquid permeability of the dispensing device, and consequently improves the dissolution of the detergent tablet. The size of the opening (22) is such that the tablet, when inserted into the dispensing device, is not able to escape through the opening without the detergent tablet being sufficiently broken up and/or sufficiently dissolved during a wash cycle of the laundry washing machine.

It is possible to use deformable and resilient materials for the first member (11) and/or the second member (14), but hard enough to allow the helping in the breaking up of the detergent tablet. A deformable first member and/or second member reduces the noise of the device (10) during the agitation in the drum of the washing machine. The resilient first member and/or second member insure that the opening (22) is always held open as wide as possible during the washing. Such a material is, for example, polyurethane (PU) or other elastomers.

As a preferred option the size of the opening (22) can be flexibly and resiliently enlarged to facilitate the introduction of a detergent tablet into the dispensing device. A possible example of an opening which can be flexibly and resiliently enlarged is shown in Figures 1 and 2. The opening on the first member (11) and/or the second member (14) can be enlarged through the hinged movable elements (23). The elements (23) are movable around the interrupted line (24). These elements (23) are flexed towards the interior of the dispensing device when a detergent tablet is inserted through the opening. Once the detergent tablet is inside the dispensing device, the elements (23) resiliently flex back to the original position shown in Figure 1 or 2. The shape of the first member (11) and of the second member (14) is preferably rounded to avoid to cause scratches in the laundry through sharp edges.

In a further embodiment, the first member (11) and/or the second member (14) comprise at least a hinged element (30). The hinged element allows the insertion of a tablet into the dispensing device, but impedes that the inserted tablet exits from the dispensing device. Indeed, the hinged element turns only

towards the inside of the dispensing device for the insertion of the tablet at the hinge (34). In practice the hinged element works like a trap door. The hinged element (30) may comprise an opening (22). As shown in the top view of Figure 3a, the first and/or the second member comprise two hinged elements opposed to each other and both connected to a rim (32). Both hinged elements comprise openings (22).

Figure 3b shows the first member and/or the second member in another preferred embodiment, in which the hinged elements (30) and (30') turn in opposite directions. Indeed, the hinged element (30) turns towards the inside of the dispensing device, whereas the opposing hinged element (30') turns to the outside of the dispensing device. In the rest position, when the hinges are not turned around the hinge, the hinged elements (30) and (30') are at least partially overlapping. These hinged elements (30) and (30'), turning in opposite directions, allow an easy insertion of a tablet into the dispensing device, but reduce the risk that the tablet once inserted into the dispensing device escapes from inside the dispensing device.

Figure 4a illustrates another preferred embodiment of the first member (11) and/or second member (14) comprising a hinged element (30). The hinged element is made of a bent arm (33), whereby both ends of the bent arm are hinged to the rim (32) the hinges (34). Preferably, the first member and/or the second member comprise several hinged bent arms (33) placed around the rim (32), as shown in Figure 4a. Figure 4b shows that the first and the second member may be made out of one piece. The first member comprises the hinged elements. The second member is connected to the rim (32) through breakable tabs (35), as shown in Figure 4b. The dispensing device shown in Figure 4a is achieved by separating the second member from the rim along the breakable tabs and attaching the connecting means (12) between the first member and the second member.

In another alternative, but preferred embodiment of the present invention, the first member (11) and/or the second member (14) is an interrupted wall comprising impellers (40, 50, 60). Top views of a first member or a second member of a dispensing device according to the present invention are shown in Figures 5 and 6. Figure 7 shows an even more preferred embodiment of a tablet dispensing device according to the present invention. The first member (11) and the second member (14) comprise impellers (60) which are in a curved form. Preferably, the first member and the second member comprise six such impellers. The connecting means is the net as described above comprising a slit allowing the insertion of a detergent tablet into the dispensing device. The advantage of the first member and the second member being an interrupted wall, as described before, or having impellers resides in the fact that they further break up the detergent tablet before parts of the detergent tablet get on the laundry or in the wash liquor. This means, that the interrupted wall or these impellers further contribute to the better dissolution of the detergent tablet in the wash cycle.

Another important advantage of the tablet dispensing device (10) according to the present invention is that the flexible connecting means (12) allows to bring the dispensing device in a collapsed configuration. The collapsed configuration of the device (10) reduces to a minimum the space needed in a package to contain the detergent tablet and the device (10). The device (10) in collapsed configuration can be easily put onto or inside the packages. For example, the device (10) being in collapsed configuration can be fastened outside or put inside the package. Preferably, the dispensing device is fastened or kept in a tight bag to hold the collapsed configuration. The packages containing the detergent tablets and the collapsed tablet dispensing device have mainly the same dimensions and occupy the same volume as those packages which do not contain the tablet dispensing devices. Also, the packaging may comprise a greater amount of detergent tablets for a given package volume due to the reduced volume of the dispensing device. Therefore, packaging and storing costs can be reduced.

Claims

1. A dispensing device enabling the insertion of at least a tablet and being liquid permeable, the device comprising a first member, an opposing second member and connecting means, the first member and the second member being substantially rigid, the first member and the second member being connected to the connecting means, the connecting means being flexible so that the distance between the first member and the second member is variable allowing the first and second members to come into close proximity, characterized in that the first member and the second member are movable in a substantial free manner so that the tablet is squeezed between the first and second member when external force is applied to the dispensing opening.

2. A tablet dispensing device according to claim 1 characterized in that the connecting means (12) is a net.

3. A tablet dispensing device according to claim 1 characterized in that the connecting means (12) is flexible and resilient

4. A tablet dispensing device according to claim 3 characterized in that the connecting means (12) is in a form of bellows or of a spring.

5. A tablet dispensing device according to any of the preceding claims characterized in that the connecting means (12) comprises a slit.

6. A tablet dispensing device according to any of the preceding claims characterized in that the first member (11) and/or the second member (14) comprise ribs (20).

7. A tablet dispensing device according to any of the preceding claims characterized in that the first member (11) and/or the second member (14) comprise a hinged element (30).

8. A tablet dispensing device according to any of the preceding claims characterized in that the first member (11) and/or the second member (14) comprise an interrupted wall with an opening (22).

9. A tablet dispensing device according to claim 8 characterized in that the size of the opening (22) is flexibly and resiliently enlarged.

10. A tablet dispensing device according to claim 8 characterized in that the first member (11) and/or the second member (14) comprise impellers (40, 50, 60).

11. A method for the machine washing of laundry in which a detergent tablet is inserted into a dispensing device according to any of the preceding claims, the dispensing device being then placed into the laundry washing machine together with the textiles to be washed, characterized in that the detergent tablet is repeatedly squeezed between the first member and the second member of the dispensing device during the wash cycle of the laundry washing machine whenever the first member and the second member come into close proximity, thereby helping to break up the detergent tablet.

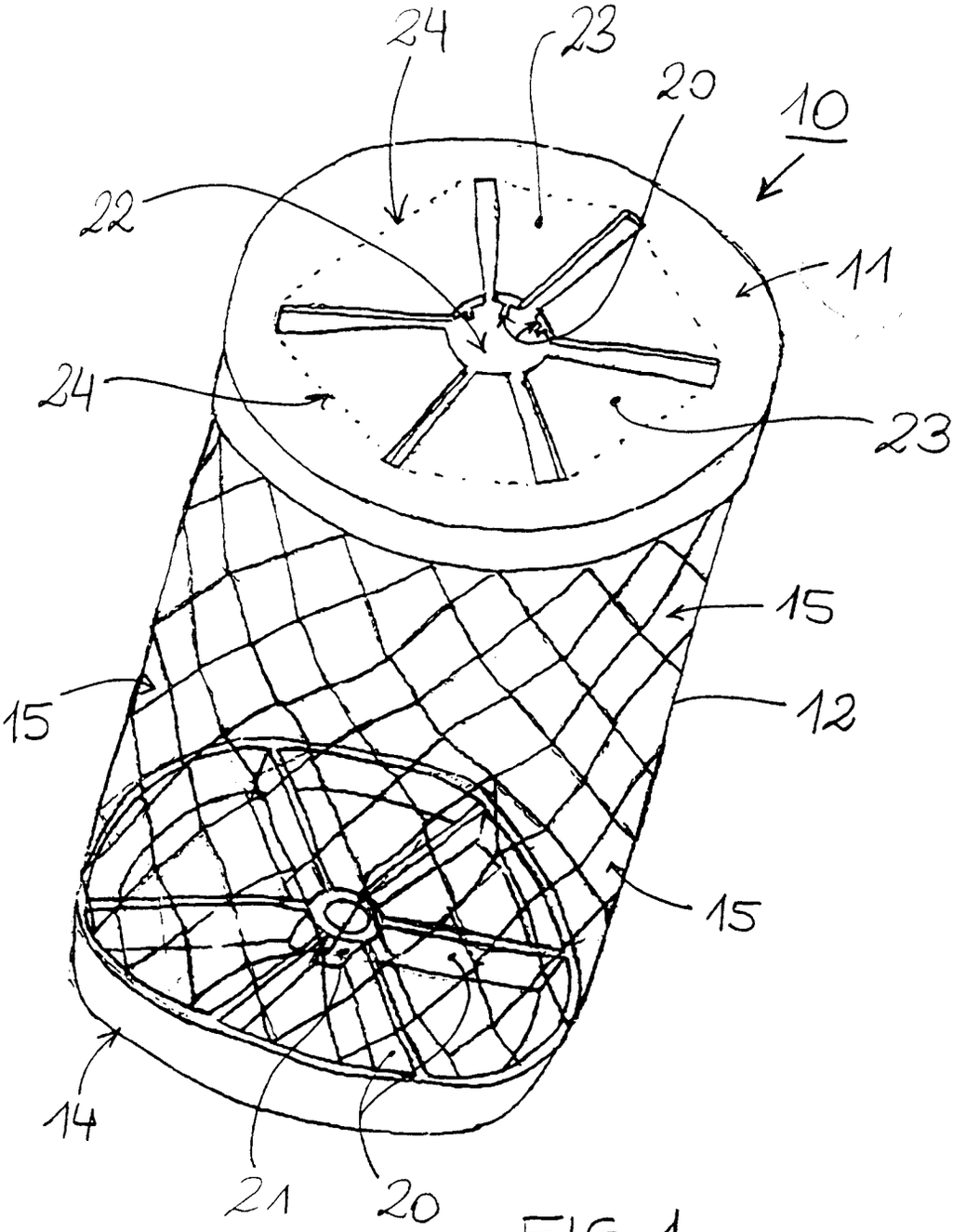

FIG. 1

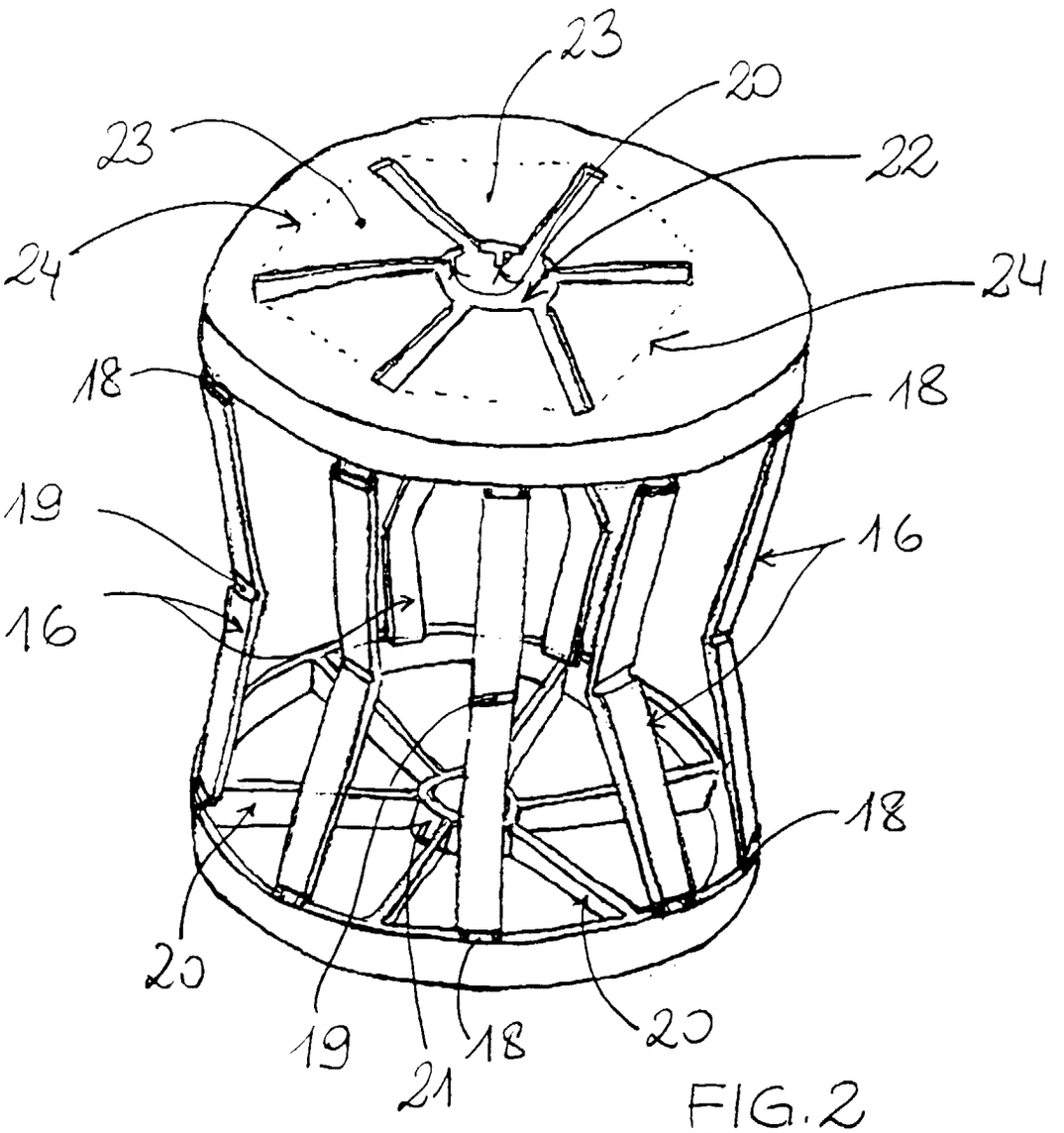

FIG.2

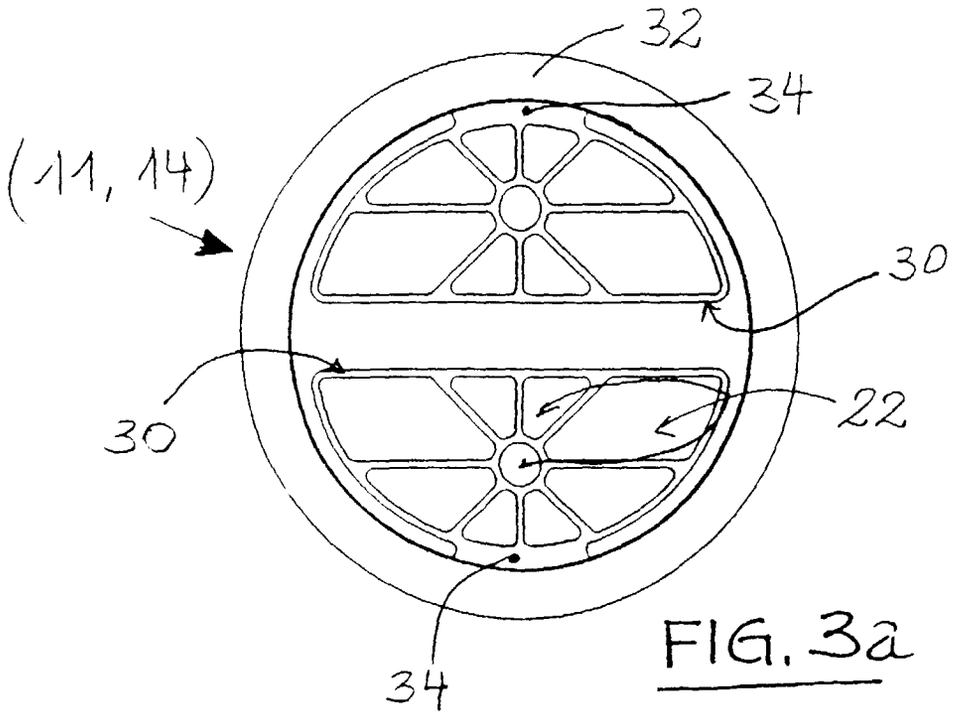

FIG. 3a

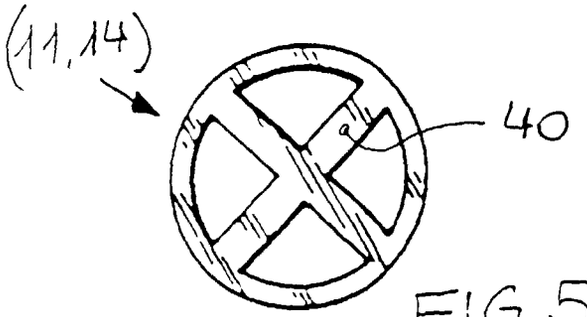

FIG. 5

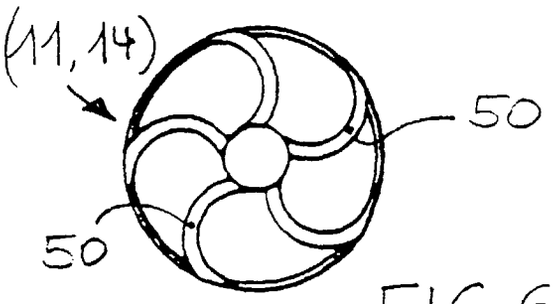

FIG. 6

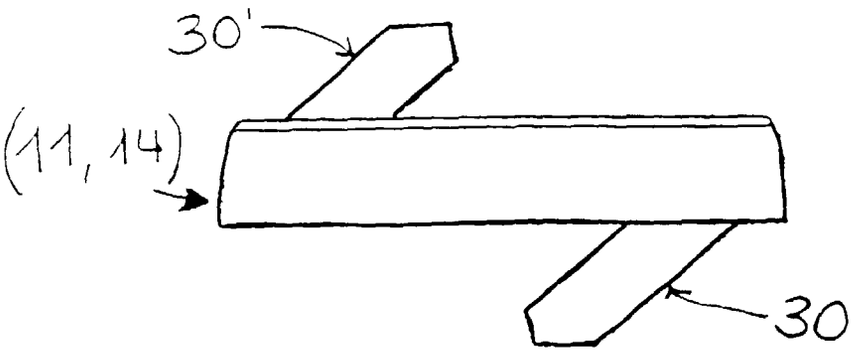

FIG. 3b

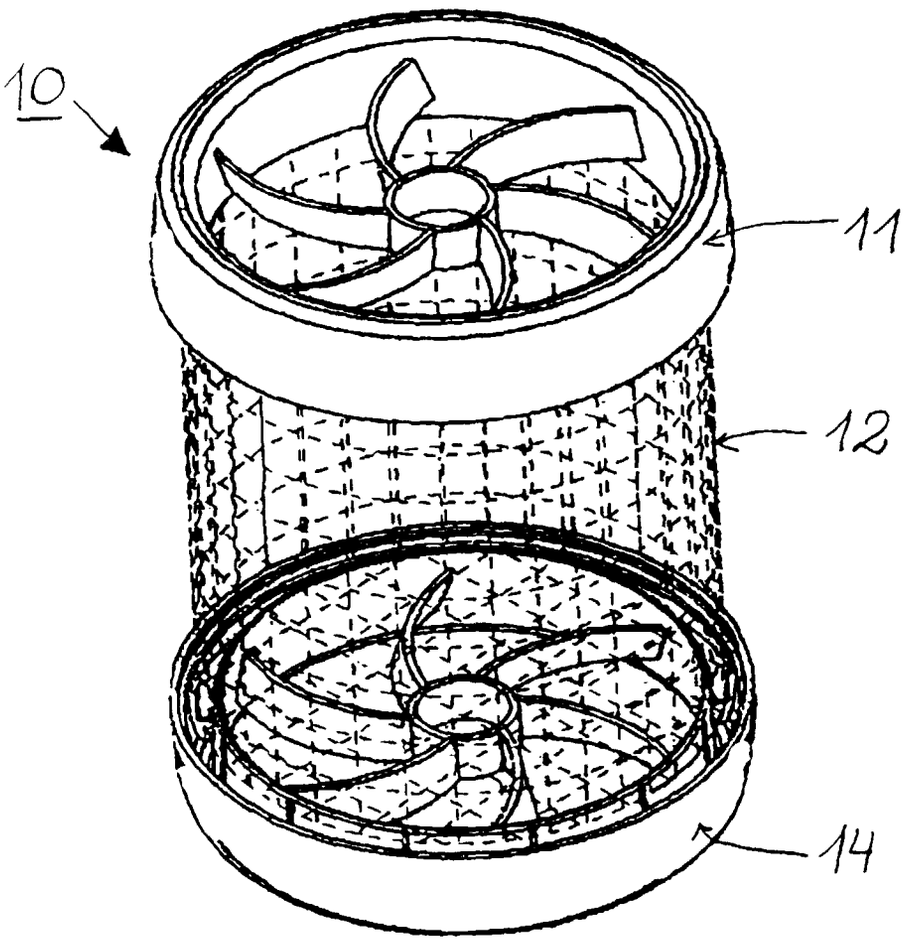

FIG. 7

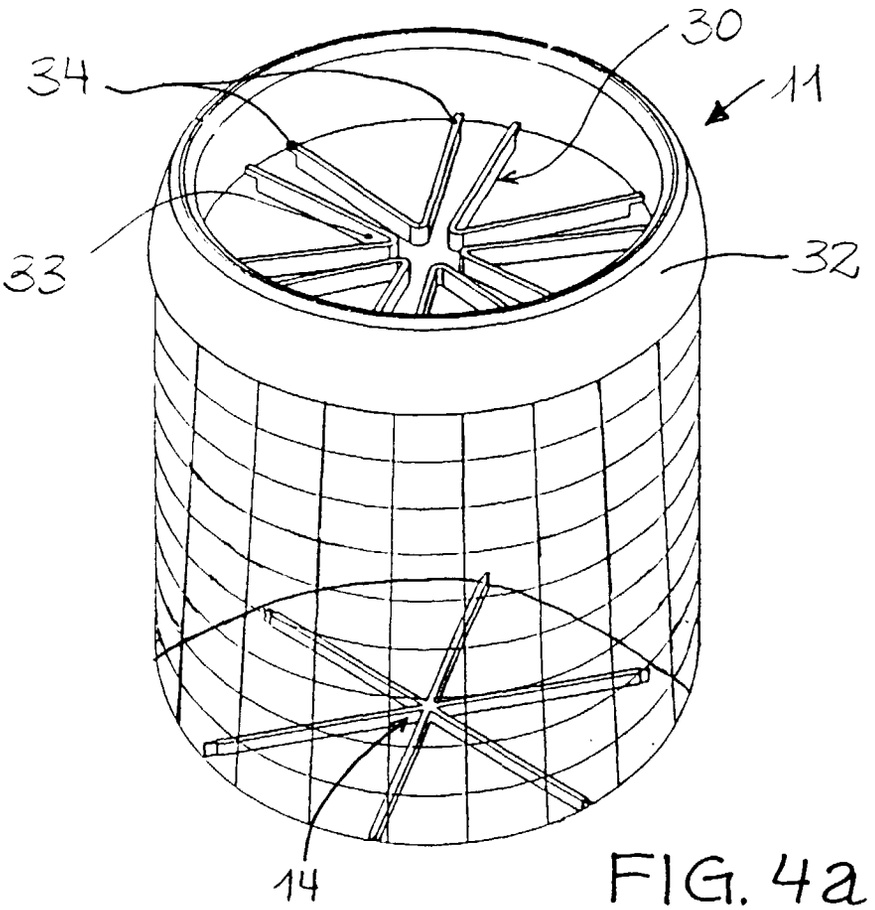

FIG. 4a

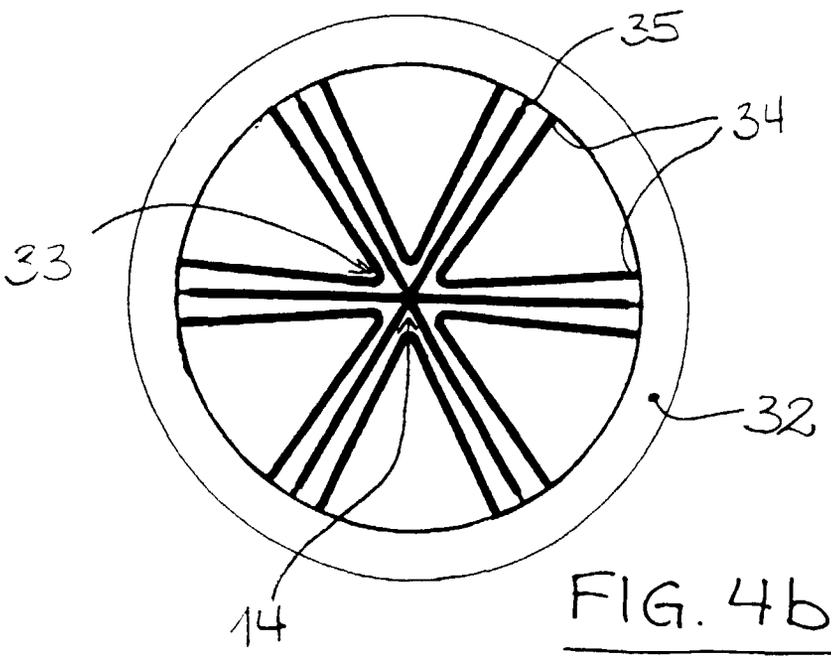

FIG. 4b

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 20 3462

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X A	DE 195 31 000 C (HENKEL KGAA.) * column 3, line 59 - column 4; figures 1,2,5-7 *	11 1,3,4,8	D06F39/02
A	EP 0 683 262 A (THE PROCTER & GAMBLE COMPANY) * claims; figures *	1-4,8, 10,11	
A	EP 0 628 652 A (CLEANTABS A/S) * claims; figures *	1,11	
A,D	EP 0 473 532 A (VIKING INDUSTRIES LIMITED) * claims; figures *	1,11	
A,D	EP 0 479 711 A (VIKING INDUSTRIES LIMITED) * claims; figures *	1,11	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6) D06F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	22 May 1997	Courrier, G

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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