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- (54) Title: DRYING FINS APPLIED TO TOP-LOAD WASH AND DRY MACHINE AND TOP-LOAD WASH AND DRY MACHINE

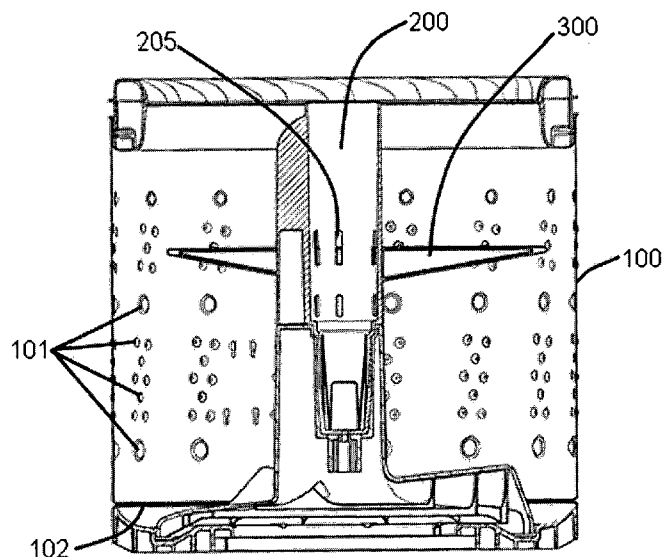


Fig. 5

(57) Abstract: The invention, in a general manner, refers to laundry machines and, more particularly, to machines of the top-load wash and dry type to which a drying fin is associated. The invention also refers to drying fins applied to said machine and used in the laundry drying cycle. According to one embodiment, a drying fin (300) for a top-load wash and dry machine comprises a first plane (301) and a second plane (302) orthogonal to said first plane, wherein said first or second plane also comprises means (303) to fasten to an agitator (200) or in a drum (100) of said machine.

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“DRYING FINS APPLIED TO TOP-LOAD WASH AND DRY MACHINE AND TOP-LOAD WASH AND DRY MACHINE”

FIELD OF THE INVENTION

The invention, in a general manner, refers to laundry machines
5 and, more particularly, to machines of the top-load wash and dry type to which a
drying fin is associated. The invention also refers to drying fins applied to said
machine and used in the laundry drying cycle.

BACKGROUND OF THE INVENTION

Laundry washing machines are domestic utensils widely used in
10 assisting in the task of cleaning clothes and other fabrics used in a household.
There are various laundry washing machine embodiments, the best known of
which consist of wash tubs, front-load machines and top-load machines.

The so-called “wash tubs” are generally a device substantially in
the shape of a common wash tub, but that have a small turbine coupled to a
15 motor, both mounted on the lower portion of the tub. The motor with the turbine
only has the function of agitating the water contained inside the tub in order to
assist in the process of washing the fabrics, but other automated functions
relating to the washing cycle, such as rinsing, spinning etc. are not present.
These wash tubs are normally simple devices, and also do not present
20 compartments specific for storing and dispensing products for cleaning and care
of the laundry, such as powder, softener, bleach, etc.

Regarding washing machines that comprise full wash cycles, such
as wash, rinse, spin cycles etc., the front-load and top-load ones are mainly
known. The so-called front-load machines present an opening and a door for
25 access to the inside, where there is located the washing drum, at its front part,
while in top-loaders, access inside the washing compartment is by an opening
in the upper portion of the machine.

However, the working principle of these washing machine models is similar, and consists of a perforated drum, in order to allow the passage of water and/or cleaning agents of the fabrics, generally rotating both clockwise and anti-clockwise. The laundry contained inside the drum is immersed in water with the cleaning agent, and the rotary drum turns the laundry in an alternate cycle, creating an agitation that helps in the cleaning of the fabrics. After washing and rinsing, there is normally a spin cycle, the purpose of which is to eliminate excess water contained in the fabrics, so as to facilitate subsequent drying thereof. In the spin cycle, the drum rotates in one direction only at a relatively high rotation, such as 500, 1,000 rpm or more.

Although front and top-load machines present similar working principles, as described above, there is a substantial difference in relation to their construction. For front-load machines, the rotation axis of the drum is in a horizontal position centralized thereto, and the laundry churns inside the drum due to the action of gravity, that is, the laundry inside the drum has a natural tendency to displace to the lower part of the drum when it turns. Fins mounted on the inner sides of the drum can also be used to help jolt the laundry on the inside. In contrast, in top-load machines, the rotation axis of the drum is in a vertical position. Due to the action of gravity, as the laundry tends to clump at the bottom of the drum, it is necessary to create a mechanical action inside the drum in order to assist agitation of the laundry. Accordingly, said top-load machines generally have a central element mounted inside the drum and coinciding with the centerline of the rotation axis of the drive motor. This element can be an impeller or an agitator. The agitator, as the name itself suggests, has the function of jolting the water inside the drum and implementing the mechanical action of the laundry in order to assist in cleaning the fabrics and preventing the laundry from clumping in the lower portion of the drum. For this purpose, it is common for the agitators to have hydrodynamic profiles to

promote the agitation of the water and the fabrics inside the drum when immersed in water.

Also known are washing machines that combine a dry cycle after the washing cycle, called "wash and dry machines". Generally these types of combined machines are presented in a front-load arrangement, since for the dry cycle, it is also necessary to jolt the laundry inside the drum, otherwise drying would be inefficient. In front-load machines, the laundry is naturally jolted inside the drum due to the action of gravity. However, for the top-load wash and dry machines, since in the dry cycle there is no water inside the drum, the laundry tends to clump together at the bottom of the drum. Consequently, the dry cycle is adversely affected, since the laundry, tangled at the bottom of the drum, does not allow suitable passage of the air between the fabrics, hampering the removal of humidity and, therefore, the drying of the fabrics. In a possible dry cycle for a top-load machine, the agitator would have little function, since there is no water inside the drum and, therefore, there would be no way of jolting the fabrics.

What is more, be it in front or top-load, drying, chiefly when using fine or woolen fabrics, may damage the fabric or crimple it, an undesirable fact notably because additional work would be required to iron the laundry to restore the adequate and smooth appearance of the fabric.

Therefore, there is a need to promote efficient drying the laundry in a top-load wash and dry machine.

Additionally, for these types of top-load wash and dry machines, there is also a need for preventing them from being damaged or crimped during the drying cycle, particularly for fine fabrics or those having wool in their composition.

The aim of the present invention is to solve these drawbacks.

DEFINITIONS

For an appropriate understanding of the present specification and interpretation of the claims further ahead, the following definitions are used:

- Laundry or fabric: terms used indistinctly herein for any object, such as, but not limited to, blouses, shirts, pants, bedspreads, sheets, pillow cases, table cloths and towels, tennis shoes, etc., that has, at least in part, a fabric in its composition that can be washed in the presence of water.

- Cleaning agents: any product used for the care and cleaning of a fabric, such as soap powder, liquid soaps, concentrated soaps, softeners, bleaches, stain removers, whiteners, indigo, etc.

- Washing cycle: refers to an operation or a set of operations used in the cleaning and care of fabrics, such as washing, rinsing, spinning, etc. regardless of repetition of these operations or their duration time.

- Dry cycle: defined as the operation for drying a fabric, generally employed after washing, that may consist of the use of air flow, heated or not, containing water vapor or not.

Fine fabric: fabrics such as silk, lace, crochet, synthetic fabrics, fabrics used in underwear and sleepwear laundry, etc. requiring special care for washing or drying in order to avoid damage thereto.

DESCRIPTION OF THE INVENTION

In order to overcome the drawbacks cited above, among others, and to achieve the objectives of the present invention, the invention is a fin for a washing machine of the top-load wash and dry kind which comprises a first plane and a second plane orthogonal to said first plane, wherein said first or second plane also comprises means for incasing and fastening on an agitator or drum of said machine.

According to additional embodiments of the invention, a fin may additionally comprise, alone or in combination, the following characteristics, but without limitation:

- said fin comprises a substantially triangular format;
- 5 - said fin comprises a substantially cylindrical format;
- said fin comprises means for fastening the laundry;
- said laundry fastening means is a clamp provided on the fin itself;
- said means for fastening on an agitator or drum of said machine is a hook provided for in the first plane of said fin;
- 10 - said means for fastening on an agitator or drum of said machine is a thread or incasement provided in the first plane of said fin.

According to a second aspect, the invention refers to a top-load wash and dry machine which comprises at least a drum and an agitator, wherein said agitator or the said drum comprises at least means for incasing
15 and fastening at least a fin which projects substantially orthogonally in relation to said agitator or to said drum.

According to alternative embodiments of the present invention, the wash and dry machine may additionally comprise the following characteristics, alone or in combination, but without limitation:

- 20 - said means for incasing and fastening a fin is an opening provided in said agitator or in said drum;
- said means for incasing and fastening a fin is a thread provided in said agitator or in said drum; and
- said means for incasing and fastening a fin is a lock.

25 According to another embodiment, the invention refers to a top-load wash and dry machine which comprises at least a drum and an agitator, wherein said agitator or said drum comprises solidarily and retractably at least a

fin which projects substantially orthogonally in relation to said agitator or the said drum.

According to this embodiment of the invention, the wash and dry machine may additionally comprise the following characteristics, alone or in
5 combination, but in a non-limitative manner:

- said fin may pivot in relation to said agitator or to said drum;
- said fin incases solidarily to said agitator or to said drum when pivoted; and

Also according to an alternative embodiment of the invention, said
10 fins are mounted on the upper opening of said drum.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described in relation to particular embodiments, with reference to the accompanying drawings. Said drawings are schematical and their dimensions and proportions may not correspond to
15 reality, since they are merely intended to describe in a didactic way, without imposing any limitations other than those defined in the claims further ahead, wherein:

- Figure 1 is a schematic view in perspective of a drum associated to an agitator of a top-load wash and dry machine, according to one
20 embodiment of the present invention;

- Figure 2 is a perspective view of the agitator comprising the fins, pursuant to one embodiment of the present invention;

- Figure 3 is an exploded view of figure 2;

- Figure 4 is a detailed view of figure 2;

25 - Figure 5 is a cut-off front view according to the line A-A of figure 6; and

- Figure 6 is a top view of the drum associated to an agitator pursuant to figure 1.

DESCRIPTION OF PARTICULAR EMBODIMENTS

With reference to the drawings, a description of the invention is now set forth in relation to particular embodiments. Figure 1 schematically reveals a drum associated (100) to an agitator (200) of a wash and dry machine, particularly a top-load wash and dry machine. Other elements existing in said machine, such as its structure, closing lid, drive motor, gearbox, electrical circuits, etc. have been omitted in order to facilitate the understanding of the purpose of the invention.

Both the drum (100) and the agitator (200), better seen in figure 5, are elements present in top-load wash and dry machines. The drum (100) usually has a cylindrical format in its upper portion open in order to allow the placement and withdrawal of the laundry to and from the inside, and a closed inner portion (102), in order to keep the laundry contained in the inside. Normally made of stainless steel, the drum may also present a plurality of holes or orifices (101) to allow the circulation of water and cleaning agent of the fabrics on the inside, both for filling and draining that occur during the washing cycles.

Generally mounted in the center of the drum and coinciding with the centerline of the drive motor (not revealed) is the agitator (200), which also generally presents a substantially cylindrical hollow format and that may present one or more hydrodynamic profiles (201) to promote agitation of the water and the laundry inside the drum (100). These elements described thus far are known in laundry washing machines of the state of the art.

However, for washing machines that are associated to a dry cycle, and particularly for top-load wash and dry machines, in the dry cycle the drum (100) is not filled with water and, accordingly, the laundry contained therein tends to clump at the bottom thereof. This accumulation of laundry at the bottom of the drum has two main consequences for the dry cycle. Firstly, since the

laundry piles up on top of each other, the passage of air needed for efficient drying is adversely affected, hampering drying and, minimally, increasing the drying time of the cycle. Moreover, the laundry being piled up on top of each other, and operating a dry cycle, there will be a tendency to be extremely
5 creased or wrinkled, which will require a subsequent step of ironing.

In order to overcome these drawbacks, the present invention proposes, at a first moment, a drying fin (300) for a top-load wash and dry machine. The fin, as can be seen better in figures 2 to 5, comprises a first plane (301) and a second plane (302) substantially orthogonal. The first plane is
10 designed to be supported on the agitator or on the drum of the machine, and the second plane is designed to support the laundry or fabrics to facilitate drying thereof during the dry cycle. Associated to one of the two planes, it is possible to provide means for fastening the fin on the agitator or on the drum. As per the embodiment illustrated, such means of incasing and fastening is a hook (303)
15 provided on the first plane of the fin, for being incased in a corresponding opening in agitator. Naturally, other means of incasing and fastening may be used, such as, for example, but not limited to, threads, screws, bolts, pins, pegs, snap-fit, etc.

Further according to this particular embodiment illustrated here,
20 the fins (300) are shaped in a triangular crosswise section, but it is natural that a series of changes can be provided in the fins so that they fulfill their function of keeping the laundry totally or partially hung out inside the drum, such as, but without limitation, cylindrical, square, trapezoidal, irregular, hanger shapes, etc.

It is also possible to provide fastening means of the laundry on the
25 fins (300), such as clamps or other equivalent means, in order to avoid the laundry from being released from the fins during movement of the drum or of the agitator, if there is any movement of these components during the dry cycle.

In a second aspect, the invention refers to machine of the wash and dry kind in which the agitator (200) comprises one or more means (205) designed to receive and fasten fins (300) which project orthogonally in relation to said agitator, as can also be better noted in figures 2 to 6.

5 In this sense, the invention allows that before beginning the dry cycle said fins (300) be positioned and fastened to the agitator, such that the laundry may be hang out over one or more fins. Accordingly, the hung out laundry allows, on the one hand, that the air for drying flows with greater ease between the fabrics and, on the other hand, prevents the laundry from creasing
10 or wrinkling during the dry cycle, facilitating the following step of ironing or, depending on the fabric, allowing total elimination of the need to iron the fabric and give it a smooth appearance.

Pursuant to this illustrated embodiment, the means for incasing and fastening the fins provided on the agitator are openings comprising a
15 suitable geometry for receiving, incasing, fastening and supporting the fins. In this sense, as already described, the fins present in one of their planes a hook shape, which is introduced inside the openings provided in the agitator and incased in the subsequent wall thereof. It is thus possible to allow a quick and efficient incasement of one or more fins, whilst at the same time providing
20 suitable support and anchoring in the agitator.

Moreover, the user may decide on the quantity and disposition of the fins arranged in the agitator for better accommodation of the laundry, depending on the type of fabric, quantity and size of the laundry washed.

Naturally, it is possible to provide other means of incasing and
25 fastening the fins that are not represented here. However, preferably, the means of fixing the fins in the agitator has a removable characteristic, that is, the possibility or withdrawing or putting back the fins as per the user's need or wish.

The number or disposition of the fastening means (205) provided on the agitator (200) may vary, depending on size, capacity of the washing machine, as well as the characteristics of size and resistance of the agitator itself (200). According to the embodiment illustrated herein, there are provided
5 12 means for fastening the fins, being two overlapping rows each comprising 6 orifices spaced apart in a regular and symmetrical manner. A greater or lesser number of fastening means for the fins can be provided, as well as a non-symmetrical disposition or, further, it is possible to provide one, two or more overlapping rows for placement of the fins on top of each other.

10 According to another embodiment of the invention (not illustrated), the fins are not removable from the agitator, but are solidary thereto. In this sense, it is possible to provide fins which project from the agitator or drum, but which cannot be removed or withdrawn therefrom, and are fastened thereto.

In order to hide the fins, for example during the washing cycle, it is
15 possible to provide means for pivoting the fins so that they are incased inside the agitator or drum. Therefore, in this particular embodiment, it is possible to provide means for locking the fins, so that they stay in a horizontal position (open) in relation to bottom of the drum or housed in the agitator or drum (closed position), so that they remain hidden during the washing and spinning
20 cycle, for example.

Further according to another embodiment, also not illustrated, the fins can be hung out from the lower portion of the agitator or of the drum, like hangers which project from the bottom of the agitator or drum and have a transversal support for hanging out the laundry.

25 Further according to an additional embodiment, the fins can be incased and fastened to the circular opening located in the upper part of the drum.

It must be recognized that although the present invention has been described in relation to particular embodiments, persons skilled in the art,

based on the teachings set forth herein, may carry out a series of alterations and modification in shape, or even expand the concepts expounded about for other purposes, yet without straying from the principles of the invention. Therefore, the accompanying claims should be interpreted as covering all
5 equivalents.

CLAIMS

1. A FIN (300) FOR A TOP-LOAD WASH AND DRY MACHINE, characterized by comprising a first plane (301) and a second plane (302) orthogonal to said first plane, wherein said first or second plane also comprises means (303) to incase and fasten on an agitator (200) or in a drum (100) of said machine.

2. A FIN (300), according to claim 1, comprising a substantially triangular format.

3. A FIN (300), according to claim 1, comprising a substantially cylindrical format.

4. A FIN (300), according to claim 1, wherein said fin is mounted on the upper opening of the drum (100) of a washing machine.

5. A FIN (300), according to claim 1, additionally comprising means for fastening the laundry.

6. A FIN (300), according to claim 5, wherein said laundry fastening means is a clamp provided on the fin itself.

7. A TOP-LOAD WASH AND DRY MACHINE, comprising at least a drum (100) and an agitator (200), wherein said agitator comprises at least means (205) for incasing and fastening at least a fin (300) which projects substantially orthogonally in relation to said agitator.

8. A TOP-LOAD WASH AND DRY MACHINE, which comprises at least a drum (100) and an agitator (200), wherein said drum comprises at least means (205) for incasing and fastening at least a fin (300) which projects substantially orthogonally in relation to said drum.

9. A WASH AND DRY MACHINE, according to claim 7 or 8, wherein said means for incasing and fastening a fin is an opening (205) provided in said agitator or in said drum.

10. A WASH AND DRY MACHINE, according to claim 7 or 8, wherein said means (205) for incasing and fastening a fin is a thread provided in said agitator or in said drum.

11. A WASH AND DRY MACHINE, according to claim 7 or 8,
5 wherein said means (205) for incasing and fastening a fin is a lock.

12. A TOP-LOAD WASH AND DRY MACHINE, which comprises at least a drum (100) and an agitator (200), wherein said agitator comprises solidarily and retractably at least a fin (300) which projects substantially orthogonally in relation to said agitator.

10 13. A TOP-LOAD WASH AND DRY MACHINE, which comprises at least a drum (100) and an agitator (200), wherein said drum comprises solidarily and retractably at least a fin (300) which projects substantially orthogonally in relation to the said drum.

14. A TOP-LOAD WASH AND DRY MACHINE, according to
15 claim 12 or 13, characterized wherein said fin pivots in relation to said agitator or to said drum.

15. A TOP-LOAD WASH AND DRY MACHINE, according to claim 12 or 13, characterized wherein said fin incases solidarily to said agitator or to said drum when pivoted.

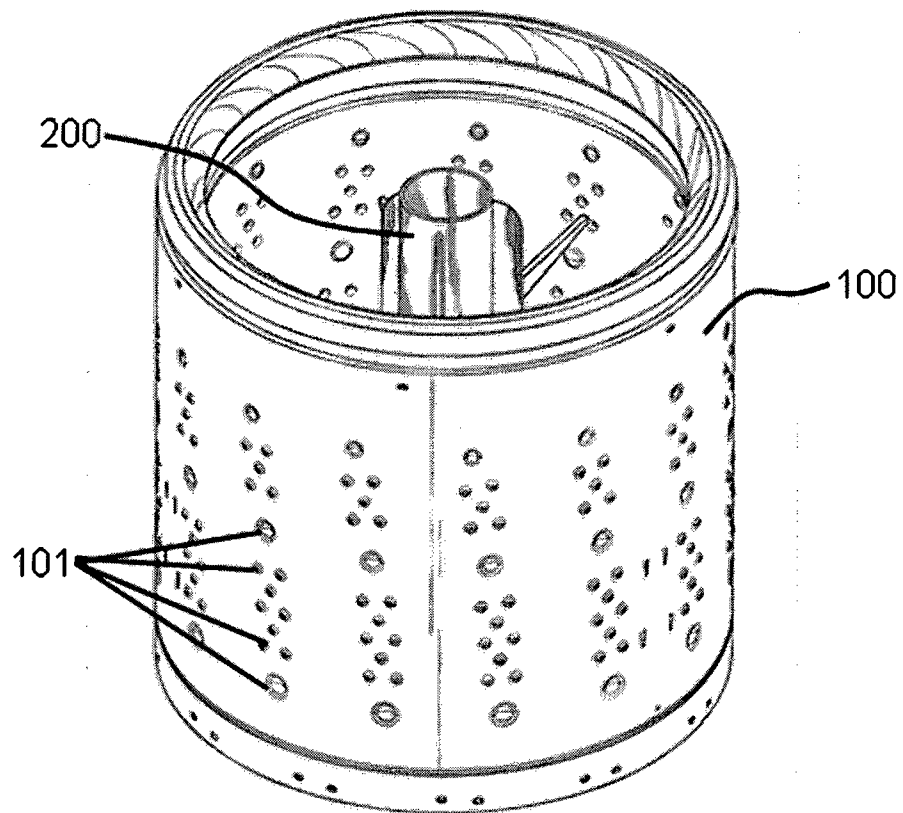
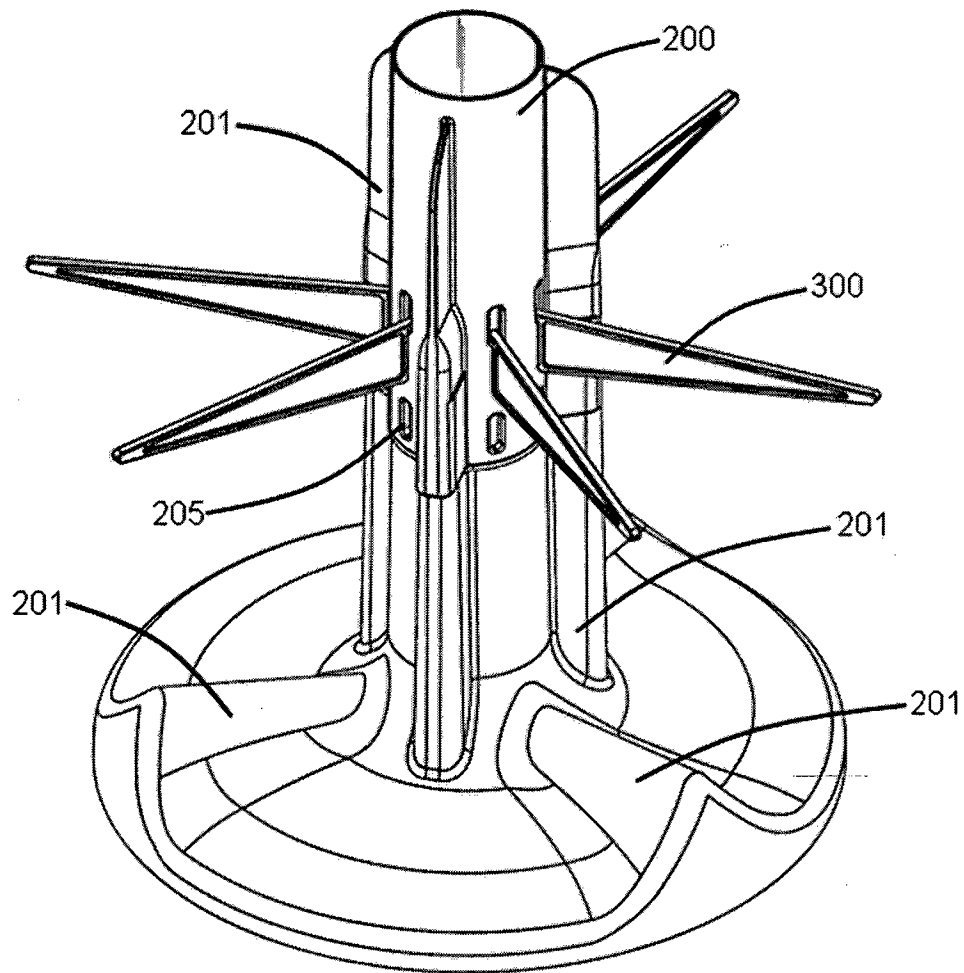
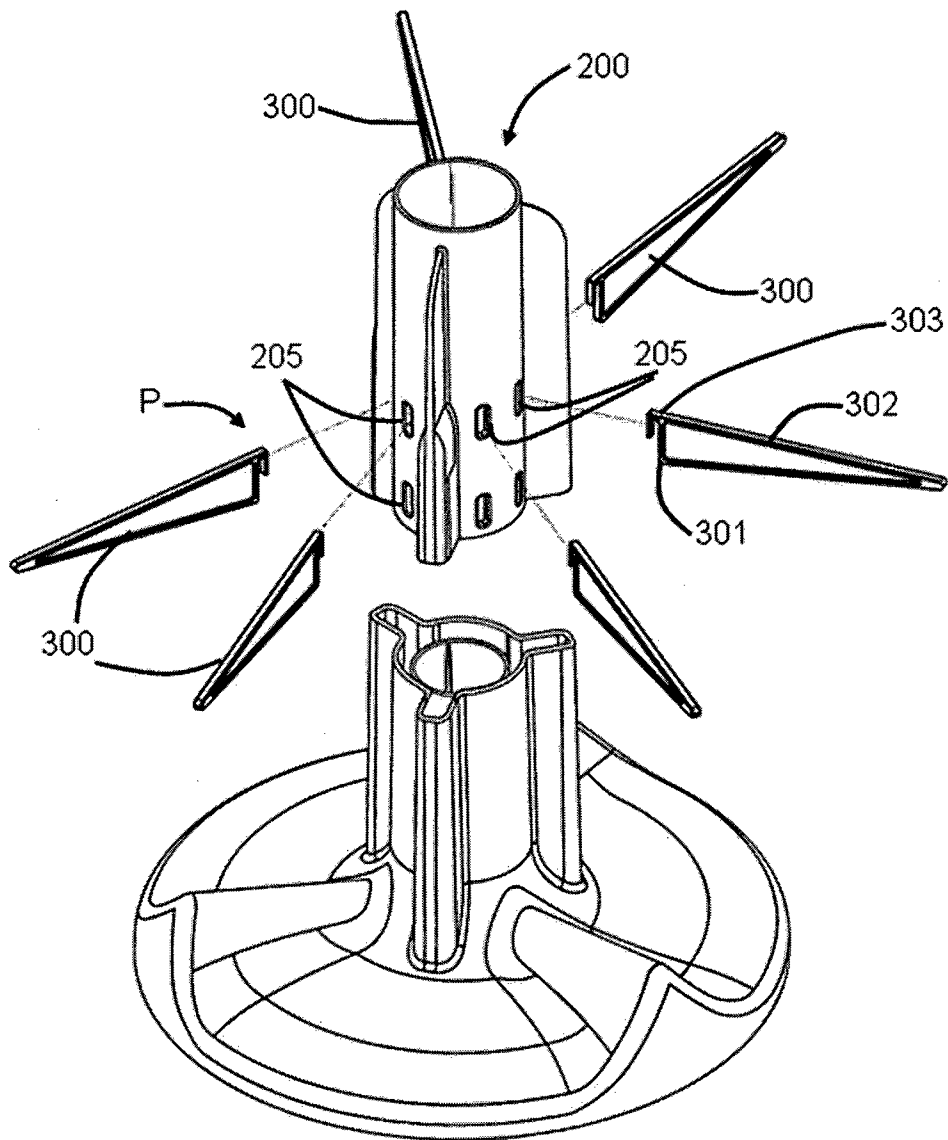
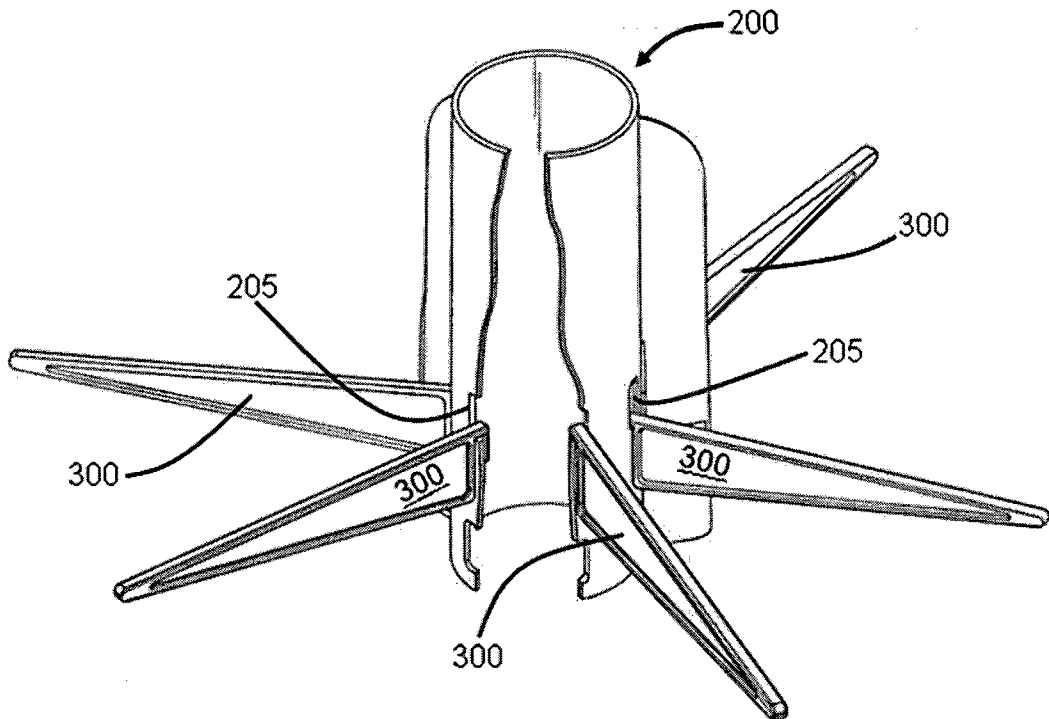
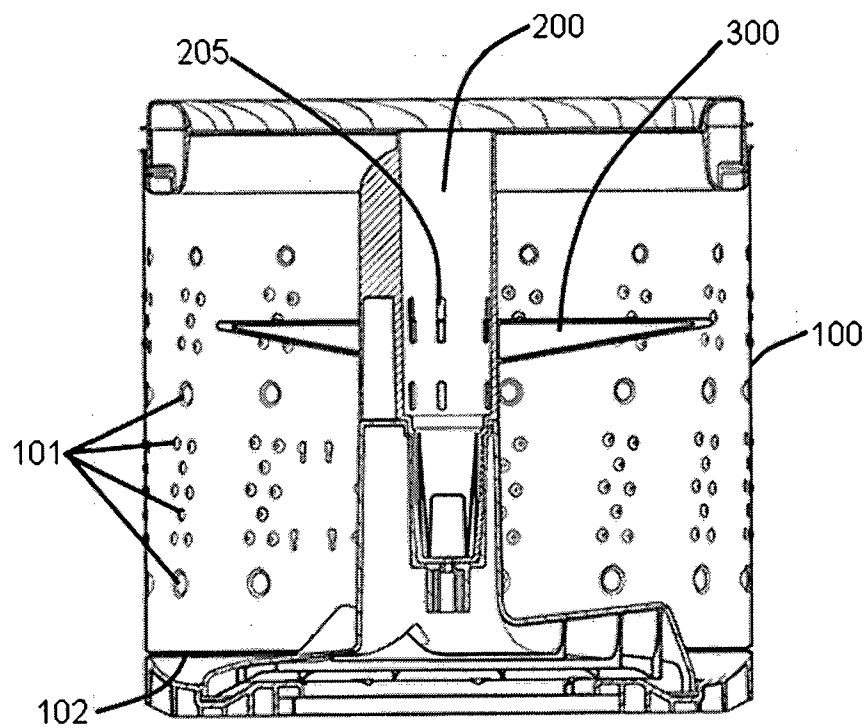
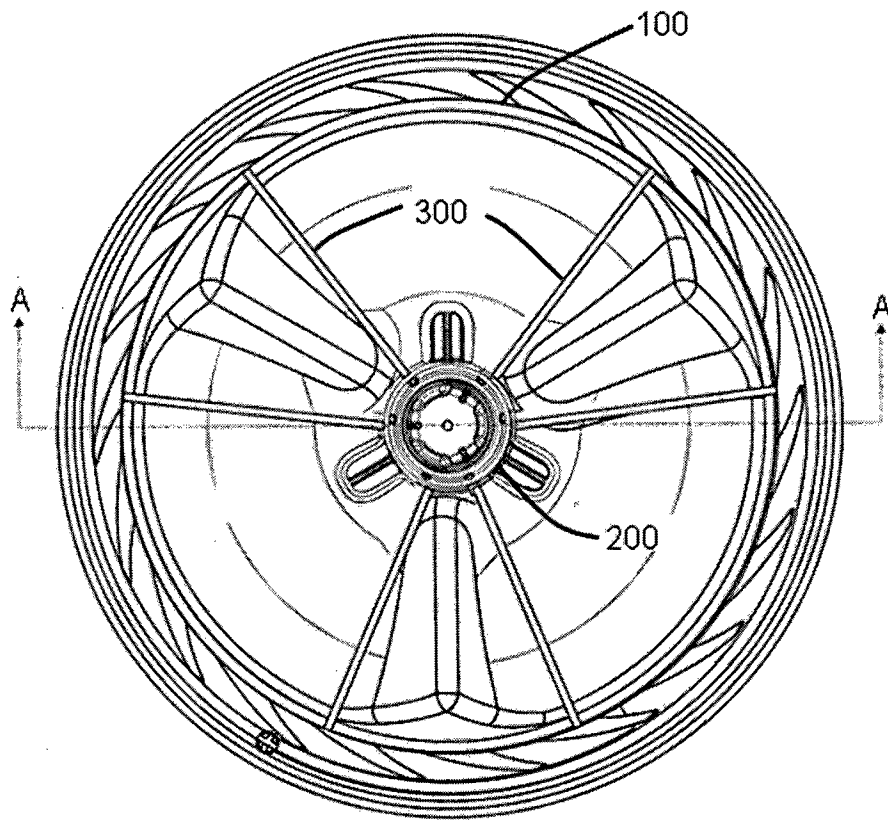


Fig. 1

**Fig. 2**

**Fig. 3**

**Fig. 4****Fig. 5**

**Fig. 6**