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(54) **VERTICALLY-ACTUATED MOP WRINGER WITH TWISTING MOVEMENT FOR A MOP BUCKET**

(57) The present invention comprises a static base (2) and a movable wringing basket (3) which is located inside a cavity (13) of the base (2); wherein the basket (3) is coupled on the base (2) by means of a mechanism located in correspondence with the bottoms of the base (2) and the basket (3); and wherein an axial displacement of the bottom of the basket (3) generates a simultaneous rotation of said basket (3) with a helical travel of the bottom of the basket (3). During the helical travel of the bottom of the basket (3), its deformable structure has a radial movement selected from a movement with a contraction effect while wringing the mop with the downward movement of the bottom of the basket (3) when it is being pushed with a head of the mop, and a movement with an expansion effect while the bottom of the basket (3) moves upwards when pushing of the head of the mop ceases.

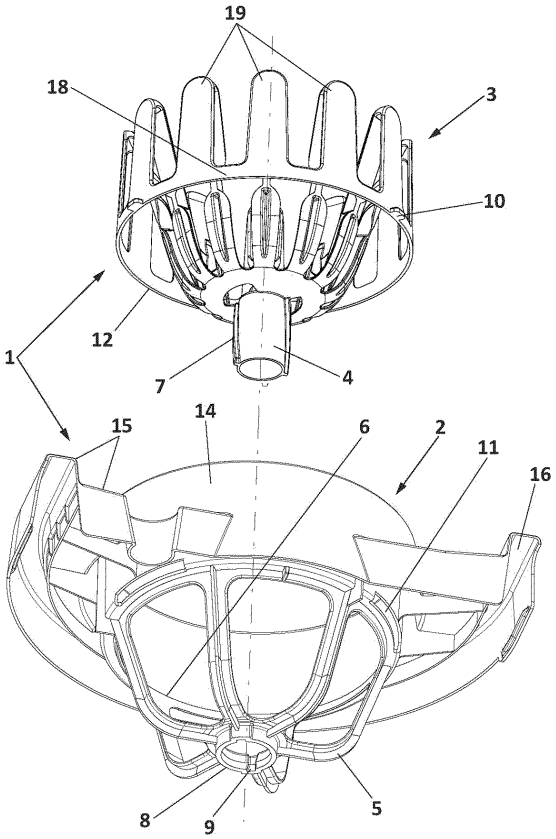

FIG. 1

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Description

Object of the invention

[0001] The present invention relates to a vertically-actuated mop wringer with twisting movement for a mop bucket, the purpose of which is to improve mop wringing, such that it is made easier without having to perform any rotational movement on the mop when wringing it by pushing downwards. In this way, to wring the mop it is only necessary to push and press the mop downwards against the structure of the wringer; wherein said structure of the wringer will press on the head of the mop in two combined ways: a first way by exerting a compression of all its strands or strips on the head of the mop, and a second way by means of a slight twisting movement with respect to the vertical shaft thereof corresponding to the stick of the mop, which improves both wringing sensation and performance.

[0002] The wringer of the invention is particularly applicable in the field of the industry of home cleaning articles.

Background of the invention

[0003] Mop wringers for mop buckets that are adapted to the mouth of the buckets and have a structure including an inverted frustoconical-shaped cavity including holes in the bottom and side walls thereof are available today, such that in order to wring the mop, the head of said mop is introduced into said cavity, pressing and rotating the mop for the wringing thereof. Document with publication number ES-283439 describes a mop wringer of this type.

[0004] Other wringers comprise a structure including a frame for being attached to the mouth of the bucket and a structure incorporating flexible downwardly-converging elements that are attached in correspondence with a perforated lower base, such that when the mop is pressed downwards, those elements press on the head so as to wring it, such that when the downward pushing of the mop ceases, those elements recover their standby position.

[0005] These wringers are disclosed, among others, in invention patents with publication numbers US2002/0066152 and EP-489237.

[0006] Document US2002/0066152 basically comprises a set of narrow flexible sheets which determine a frustoconical-shaped space, while such sheets converge downwards to form a circular base.

[0007] In contrast, document EP-489237 comprises two symmetrical groups of narrow flexible sheets converging towards the bottom and ending in an approximately rectangular base.

[0008] Neither of these two documents has successfully solved the problems of these wringing systems for cleaning buckets which consist of the fact that, due to the vertical force exerted thereon, the wringer is the weakest part and the one that ends up breaking first, and the entire assembly must be replaced, or a double-effect wringing which improves the performance of said wringing action by the user must be obtained.

[0009] Document with publication number ES-2360220-T3 presents an alternative that addresses the problem mentioned in the preceding paragraph. Said document (ES-2360220-T3) discloses a wringer that adapts to a cleaning bucket formed by two parts: a first part and a second part. The first part is a base that adapts to the bucket, while the second part is the one that performs the function of a wringer.

[0010] This second part is formed by two symmetrical bodies that are anchored to a support in the outer area while converging in the inner area, creating a concave shape with openings intended to receive the head of a mop or the like to be wrung. By means of downward pressure, the two symmetrical bodies of the second part press the head of the mop and excess water falls and flows through the openings.

[0011] However, this invention (ES-2360220-T3) has a drawback in terms of mop wringing capacity which is limited to the bending of the two concave bodies performing the function of a wringer and which, due to the configuration of the assembly, is very limited and does not generate a double wringing action, being limited exclusively to the compression of the head.

[0012] The same proprietor of document (ES-2360220-T3) that is being described is also the proprietor of the document with publication number ES1208287.

[0013] Lastly, it is important to point out the existence of the following documents, in which the inventors thereof indeed seek and try to obtain the double wringing effect mentioned above.

[0014] Thus, first, there is the US document with publication number US5611104 which already applies two wringing components, on one hand the pressure exerted on the strands once they are pressed against the wringing basket, and on the other hand, as a result of the vertical force of the mop, said basket rotates about a central shaft equipped with helical under-reliefs that transmit rotation, and therefore a twisting effect, to the assembly or the head of the mop as a result of the rotation of the entire basket.

[0015] Other documents that pursue this same double wringing effect are documents with publication numbers ES2715100 and ES2732469. However, in both cases the wringing basket does not move uniformly, since in the first cited document (ES2715100), its upper part and lower part rotate with respect to one another, causing a twisting effect between both parts; while in the second cited document (ES2732469) it is described that only the upper part of the wringing basket rotates with respect to the lower part, which in this case remains static, also causing a relative twisting between both parts.

[0016] Although the success of these systems is more or less acceptable, neither optimum performance nor a good sensation for the user is achieved in terms of wring-

ing liquid from the mop; and in some cases the complexity and cost of the wringer are very high, which makes them commercially unviable.

Description of the invention

[0017] To achieve the objectives and prevent the drawbacks mentioned in the preceding sections, the invention proposes a vertically-actuated mop wringer with twisting movement for a mop bucket which represents an evolution and a subsequent improvement of the wringer shown in document US5611104, since it also comprises a static base and a movable wringing basket which is located inside a cavity of the base; wherein the basket is coupled on the base by means of a mechanism located in correspondence with bottoms of the base and the basket; and wherein an axial displacement of the bottom of the basket generates a simultaneous rotation of said basket with a helical travel of the bottom of the basket, said basket now comprises a deformable elastic structure formed by double radial arms comprising inner parts converging at the bottom of the basket, and outer parts which are attached by means of a lower belt including a lower edge that is supported on an annular seat of the base delimiting a mouth of the cavity of said base; wherein said lower belt is located above the bottom of the basket.

[0018] The inner parts and the outer parts of the radial arms are attached by means of a succession of edges delimiting a mouth of the basket.

[0019] With this described arrangement, during the axial and rotational movements of the bottom of the basket with helical travel, its deformable structure has a radial movement selected from a movement with a contraction effect while wringing the mop with the downward movement of the bottom of the basket when it is being pushed with a head of the mop, and a movement with an expansion effect while the bottom of the basket moves upwards when pushing on the head of the mop ceases; wherein the entire basket rotates as a whole in a first direction when being pushed downwards and in the opposite direction when pushing ceases, when it moves upwards.

[0020] Therefore, while wringing the mop by pushing the head of the mop downwards on the bottom of the basket with helical travel, the inner parts of the double radial arms press on the head of the mop, meanwhile when the downward pushing of the head of the mop ceases, the bottom of the basket moves upwards with helical travel through the elastic action of the deformable elastic structure of the basket, recovering its original shape, and more importantly the entire basket rotates as a whole in a first direction when being pushed downwards and in the opposite direction when pushing ceases, when it moves upwards.

[0021] The cavity of the base is delimited by rigid radial arms that converge in their lower part and centrally at the bottom of the base, whereas in their upper part, the radial arms are attached to the annular seat of said base.

[0022] The bottom of the base includes a cylindrical hole delimited by a guide ring, into which a shaft of the basket emerging from the bottom of said basket fits. The shaft of the basket includes reliefs with a helical travel, that are coupled in guiding channels located on the inner surface of the guide ring, such that the helical travel of the bottom of the basket is generated by the coupling of the reliefs in the channels of the guide ring when axial displacement of said bottom of the basket is present.

[0023] The wringer of the invention furthermore includes means for limiting the angular amplitude of the rotation of the basket; wherein said means comprise appendages integral with the basket which are complemented with stops located in a part of the base.

[0024] The base of the wringer of the invention includes a perimeter wall above and around the annular seat of said base.

[0025] Moreover, at the convergence of the annular seat and the perimeter wall of the base, there are arched grooves into which the appendages of the basket fit; wherein the stops of the base which limit the angular amplitude of the rotation of the basket are opposite end edges of the arched grooves.

[0026] Each of the inner parts of the double radial arms of the basket comprises an upper portion attached to each of the edges of the mouth of the basket, a lower portion attached to the bottom of said basket, and a radial rib attaching both portions.

[0027] On one hand, the wringer of the invention incorporates a configuration which makes it easier to wring the head of the mop, without having to exert significant force, and on the other hand, it transmits a combined wringing sensation to the user, which translates into easy and effective liquid removal.

[0028] Essentially, this novel wringer indicated above is of the type described in US document US5611104 but incorporates improvements that make it easier to manufacture and more effective as it combines a type of wringing basket, such as that described in document ES1208287 belonging to the same proprietor, with a rotation system with helical travel.

[0029] Next, to help better understand this specification and as an integral part thereof, a series of figures is attached in which the object of the invention is depicted in an illustrative and non-limiting manner.

Brief description of the figures

[0030]

Figure 1 shows an exploded perspective view of the vertically-operated mop wringer with twisting movement for a mop bucket, object of the invention.

Figure 2 shows another exploded perspective view of the wringer of the invention.

Figure 3 shows a plan view of the mop wringer of the invention.

Figure 4 shows a cross-sectional view according to

section A-B of Figure 3.

Figures 5 and 6 show perspective views of a basket which is part of the wringer of the invention.

Description of an exemplary embodiment of the invention

[0031] Considering the numbering used in the figures, the vertically-actuated mop wringer 1 with twisting movement for a mop bucket comprises a movable wringing basket 3 and a static base 2; wherein the basket 3 is coupled on the base 2 and the entire assembly is assembled on a perimeter edge delimiting a mouth of the mop bucket which is not depicted in the figures.

[0032] The basket 3 is fitted into a cavity 13 of the base 2; wherein through said base 2 the entire assembly is assembled on the perimeter edge delimiting the mouth of the mop bucket.

[0033] The cavity 13 of the base 2 is delimited by rigid radial arms 5 that converge in their lower part and centrally at a bottom which includes a cylindrical hole delimited by a guide ring 8, into which a tubular shaft 4 of the basket 3 that is fitted into the cavity 13 of the base 2 fits; wherein said shaft 4 has a cylindrical configuration, emerging at the same time from a bottom of the basket 3, being an integral part thereof.

[0034] Said cavity 13 of the base 2 furthermore includes a mouth delimited by an annular seat 6 from which there emerge downwardly the radial arms 5 that converge at the bottom in which the guide ring 8 is located. Moreover, above the annular seat 6, the base 2 includes a perimeter wall 14, such that at the convergence of the annular seat 6 and the perimeter wall 14 there are arched grooves 11, such that said perimeter wall 14 is in turn attached to an outer structure 15 which includes a curved channelling 16, through which the base 2 is coupled to the perimeter edge of the mop bucket.

[0035] The shaft 4 of the basket includes externally reliefs 7 (propellers) with helical travel that are coupled in guiding channels 9 located on the inner surface of the guide ring 8; wherein this coupling between the shaft 4 with the reliefs 7 and the guide ring 8 with the channels 9 constitutes a mechanism equivalent to a screw-nut mechanism. Obviously, said shaft 4 is introduced into the cylindrical hole delimited by the guide ring 8.

[0036] The helical travel of the reliefs 7 of the shaft 4 of the basket 3 may be a counter-clockwise helical travel as shown in Figures 1 and 5 or a clockwise helical travel as shown in Figure 6.

[0037] Moreover, the basket 3 comprises an elastic enveloping structure formed by a set of double radial arms 17 comprising arched inner parts 17a converging at the bottom of the basket 3, and outer parts 17b which are attached by means of a lower belt 18 including a lower edge 12 that is supported on the annular seat 6 of the base 2. In turn, said belt 12 includes appendages 10 fitted into the arched grooves 11.

[0038] The inner parts 17a and the outer parts 17b of the double radial arms 17 converge in a succession of curved edges 19 delimiting a mouth of the basket 3, while the outer parts 17b have a smaller height than the inner parts 17a.

[0039] Moreover, each of the inner parts 17a of the double radial arms 17 comprises an upper portion attached to each of the curved edges 19 and a lower portion attached to the bottom of the basket 3, and a radial rib attaching both portions.

[0040] With this described arrangement, when the basket 3 is pushed down with a head of a mop in order to carry out the mop wringing operation, the reliefs 7 of the shaft 4 of the basket 3 are displaced along with the shaft 4 such that they are guided in the channels 9 of the base 2, forcing said wringing basket 3 to displace axially downwards simultaneously with a rotational movement as said basket 3 is vertically pushed from a first elevated, standby position to a second lower position in which the head of the mop is pressed by an enveloping part of the basket 3 to wring the head of the mop; wherein said downward displacement is performed against the resistance of elastic means that tend to displace the basket 3 upwards in a direction opposite the downward displacement.

[0041] To wring the head of the mop, said enveloping part of the basket 3 comprises the arched inner parts 17a which are part of the radial arms 17; wherein said arched inner parts 17a converge at the bottom of the basket 3 on which the head of the mop is supported.

[0042] The elastic means are integrated in the actual structure of the basket 3 and consist of the elastic enveloping structure formed by the double radial arms 17, such that during the operation of wringing the head of the mop, the double radial arms deform towards the centre of the basket 3 by pressing the curved inner parts 17a of the double radial arms 17 on the head of the mop, while the outer parts 17b thereof also deform by arching, with the exception of their lower belt.

[0043] Therefore, during the wringing operation with the simultaneous downward movement and rotation of the basket 3, said basket deforms, pressing and squeezing the head of the mop, with a radial inward displacement, reducing the inner space of the basket 3; all this as a result of the action of its elastic enveloping structure formed by elastic bands (arched inner parts 17a). The rotation of the basket 3 is a uniform rotation in a first direction, further generating a twisting effect on said head of the mop, when the user has previously introduced said head of the mop into the basket.

[0044] The annular seat 6 located inside the base 2 is envisaged as a sliding surface for the lower edge 12 of the wringing basket 3 during rotation thereof, since the entire basket rotates as a whole in a first direction when being pushed downwards and in the opposite direction when pushing ceases, when it moves upwards.

[0045] The appendages 10 guide the rotational displacement of said lower edge 12 and retain same as a result of their interaction with the grooves 11 of the base 2 into which said appendages 10 are fitted. Said grooves 11 has

a length equal to or greater than the maximum rotation of the wringing basket 3 which is depicted in Figure 3 with angle α.

[0046] The annular seat 6 may incorporate a coating which reduces the friction of the portions of the base 2 and the basket 3 such as, for example, a Teflon washer or film, etc.

[0047] The guiding channels 9 of the guide ring 8 of the base 2 comprises flared sections in their end segments for improving the displacement of the reliefs 7 of the shaft 4 which is part of the basket 3; all this as shown in detail in Figure 1 in which said flared sections configure a shape of two truncated cones that converge at the smaller bases thereof.

[0048] It is important to point out that in the invention with only two parts (the base 2 and the basket 3), double-effect wringing is achieved: axial and rotational displacement of the basket 3.

[0049] Once the downward pushing of the mop ceases, the return of the wringing basket 3 is achieved as a result of the elastic structure itself formed by the double radial arms 17 that cause the upward displacement and the rotation in a second direction of rotation of the basket 3; wherein said second direction of rotation is opposite the first direction of rotation activated during the wringing operation.

[0050] In one embodiment of the invention, said radial arms 17 are made of a plastic material; or optionally by using a complementary spring that is not depicted.

[0051] In the invention, it is only required for any spring means, either the elasticity of the material of the basket 3 itself as mentioned above, or a complementary spring, or both, to return the basket 3 from its lower position to the upper standby position once the user ceases exerting any pressure; and in turn for the shaft 4 of the basket 3 to cause it to rotate uniformly on the horizontal plane corresponding with the annular seat 6, until its standby position.

[0052] The lower part and the upper part of the basket 3 are displaced uniformly the same angular amplitude or distance α, without there being any type of relative movement between them in the horizontal plane or with respect to the imaginary vertical axis X thereof.

[0053] As can be seen, the angular amplitude α of the rotation of the wringing basket 3 is essentially defined by the vertical travel of the shaft 4 of the basket 3, and the arrangement of its guiding reliefs 7 fitted into the guiding channels 9 of the base 2.

[0054] It should be noted that the basket 3 rotates and is displaced axially in a uniform manner, both its mouth delimited by the succession of curved edges 19 and its bottom from which its shaft 4 with reliefs 7 emerge; all this as a single assembly and as is the case of US patent US5611104, unlike patents ES2715100 and the ES2732469, which propose independent rotations between two parts of the wringing basket.

[0055] In practice, while wringing the head of the mop, a right-handed person performs wringing by twisting the head of the mop in a clockwise direction of rotation (first option), the counter-clockwise reliefs 7 (propellers) cause a twisting effect on the head of the mop in the opposite direction, which translates into a more effective wringing, generating a technical effect equivalent to that achieved with the manual wringing of a cleaning cloth that is rotated in opposite directions (clockwise and counter-clockwise) with both hands.

[0056] On the other hand, in a second option, with the clockwise rotation, the basket 3 of the drainer of the invention performs an accompaniment of the rotation with the advantage of offering less vertical resistance, which implies less effort on the user's back.

[0057] Therefore, depending on one user or another, it seems more convenient to rotate the head of the mop clockwise or counter-clockwise, with the user adopting the best possible alternative or the most desired alternative.

Claims

1. **A vertically-actuated mop wringer with twisting movement for a mop bucket,** comprising a static base (2) and a movable wringing basket (3) which is located inside a cavity (13) of the base (2); wherein the basket (3) is coupled on the base (2) by means of a mechanism located in correspondence with bottoms of the base (2) and the basket (3); and wherein an axial displacement of the bottom of the basket (3) generates a simultaneous rotation of said basket (3) with a helical travel of the bottom of the basket (3); **characterised in that**:

   - the basket (3) comprises a deformable elastic structure formed by double radial arms (17) comprising inner parts (17a) converging at the bottom of the basket (3), and outer parts (17b) which are attached by means of a lower belt (18) including a lower edge (12) that is supported on an annular seat (6) of the base (2) delimiting a mouth of the cavity (13) of said base (2); wherein said lower belt (18) is located above the bottom of the basket (3);
   - the inner parts (17a) and the outer parts (17b) of the radial arms (17) are attached by means of a succession of edges (19) delimiting a mouth of the basket (3); wherein during the helical travel of the bottom of the basket (3), its deformable structure has a radial movement selected from a movement with a contraction effect while wringing the mop with the downward movement of the bottom of the basket (3) when it is being pushed with a head of the mop, and a movement with an expansion effect while the bottom of the basket (3) moves upwards when pushing on the head of the mop ceases; and wherein the entire basket (3) rotates as a whole in a first direction when

being pushed downwards and in the opposite direction when pushing ceases, when it moves upwards.

2. **The vertically-actuated mop wringer with twisting movement for a mop bucket** according to claim 1, **characterised in that** the cavity (13) of the base (2) is delimited by rigid radial arms (5) that converge in their lower part and centrally at the bottom of the base (2), whereas in their upper part, the radial arms (5) are attached to the annular seat (6) of the base (2).

3. **The vertically-actuated mop wringer with twisting movement for a mop bucket** according to any one of the preceding claims, **characterised in that** the bottom of the base (2) includes a cylindrical hole delimited by a guide ring (8), into which a shaft (4) of the basket (3) emerging from the bottom of said basket (3) fits; wherein the shaft (4) of the basket (3) includes reliefs (7) with a helical travel, that are coupled in guiding channels (9) located on the inner surface of the guide ring (8); and wherein the helical travel of the bottom of the basket (3) is generated by the coupling of the reliefs (7) in the channels (9) of the guide ring (8) when axial displacement of said bottom of the basket (3) is present.

4. **The vertically-actuated mop wringer with twisting movement for a mop bucket** according to claim 3, **characterised in that** the reliefs (7) with helical travel of the shaft (4) of the basket (3) is a helical travel selected from a clockwise helical travel and a counter-clockwise helical travel.

5. **The vertically-actuated mop wringer with twisting movement for a mop bucket** according to any one of the preceding claims, **characterised in that** it includes means for limiting the angular amplitude (α) of the rotation of the basket (3); wherein said means comprise appendages (10) integral with the basket (3) which are complemented with stops located in a part of the base (2).

6. **The vertically-actuated mop wringer with twisting movement for a mop bucket** according to any one of the preceding claims, **characterised in that** the base (2) includes a perimeter wall (14) above and around the annular seat (6) of said base (2).

7. **The vertically-actuated mop wringer with twisting movement for a mop bucket** according to claims 5 and 6, **characterised in that** at the convergence of the annular seat (6) and the perimeter wall (14) of the base (2), there are arched grooves (11) into which the appendages (10) of the basket (3) fit; wherein the stops of the base which limit the angular amplitude (α) of the rotation of the basket (3) are opposite end edges of the arched grooves (11).

8. **The vertically-actuated mop wringer with twisting movement for a mop bucket** according to any one of the preceding claims, **characterised in that** each of the inner parts (17a) of the double radial arms (17) of the basket (3) comprises an upper portion attached to each of the edges (19) of the mouth of the basket (3), a lower portion attached to the bottom of said basket (3), and a radial rib attaching both portions.

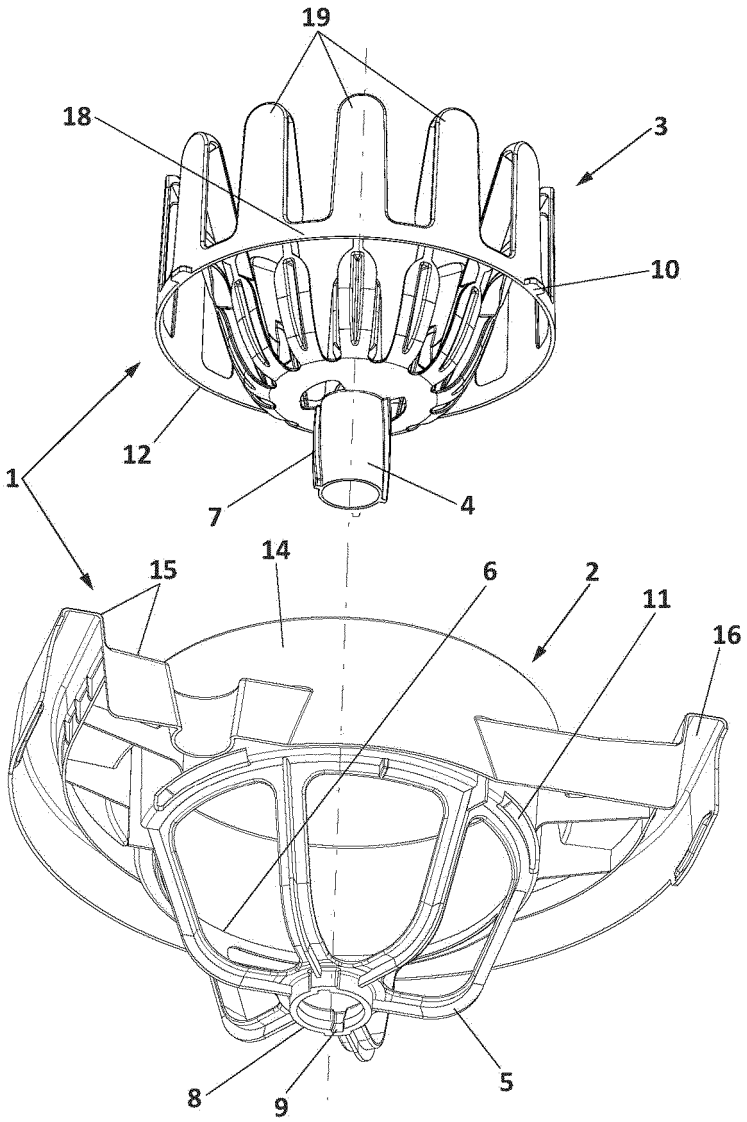

FIG. 1

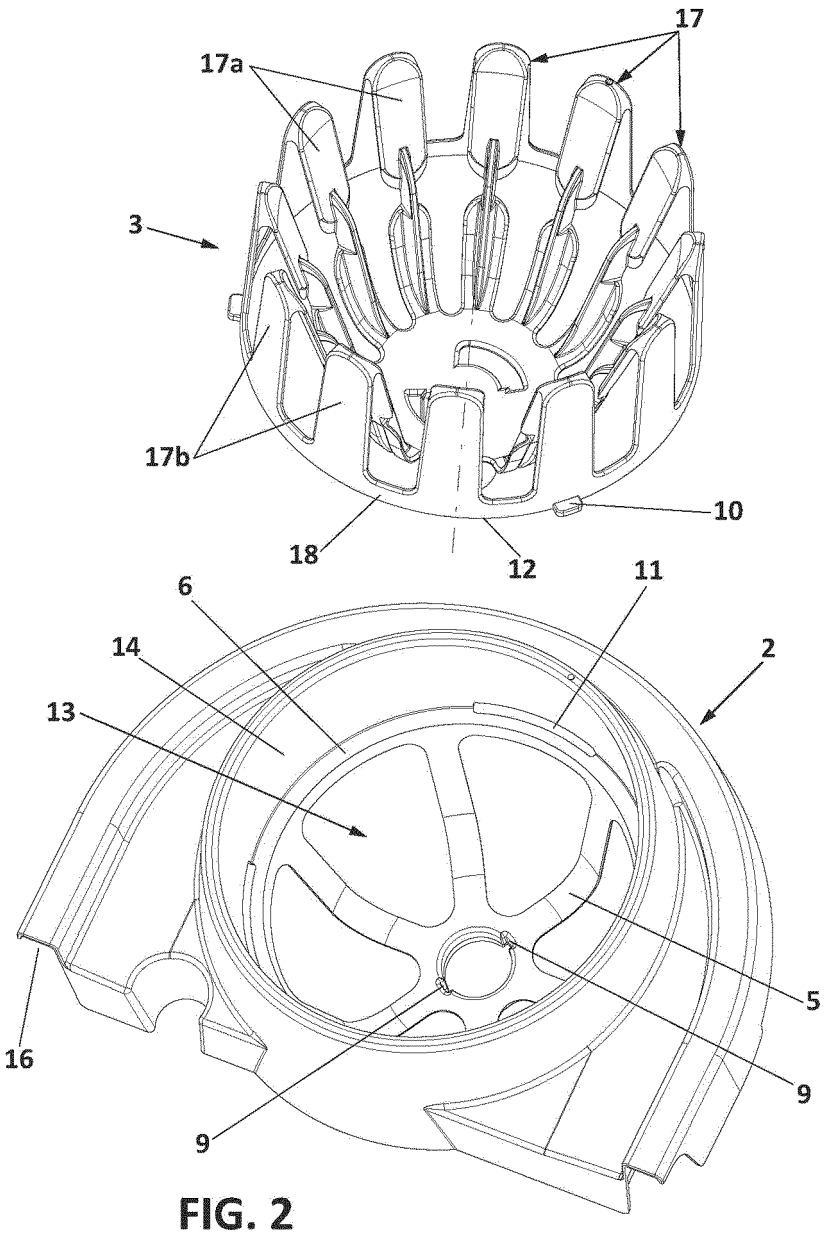

FIG. 2

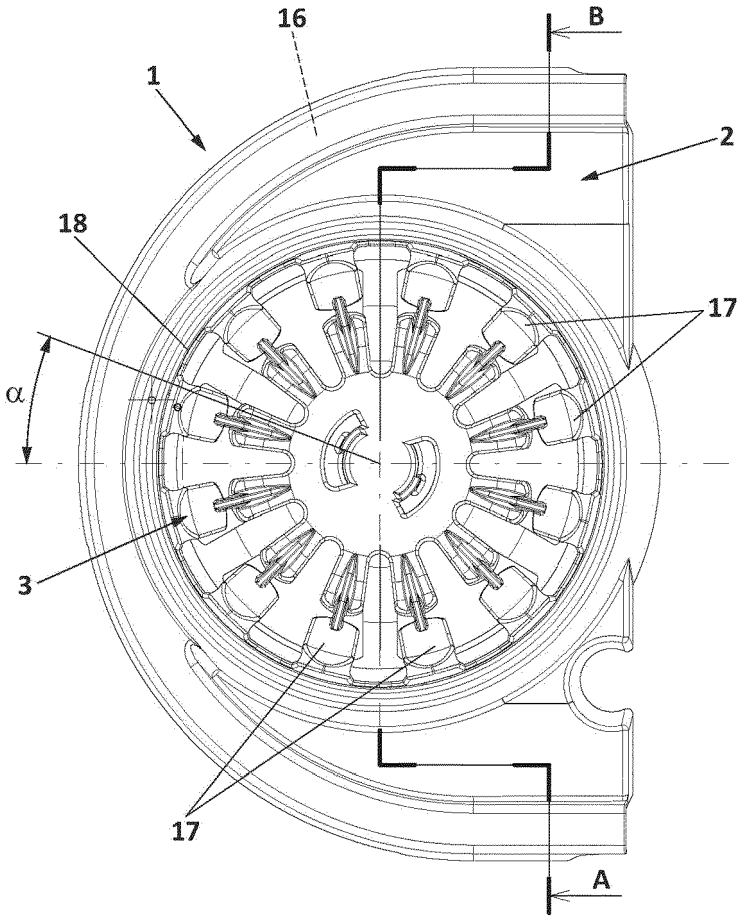

FIG. 3

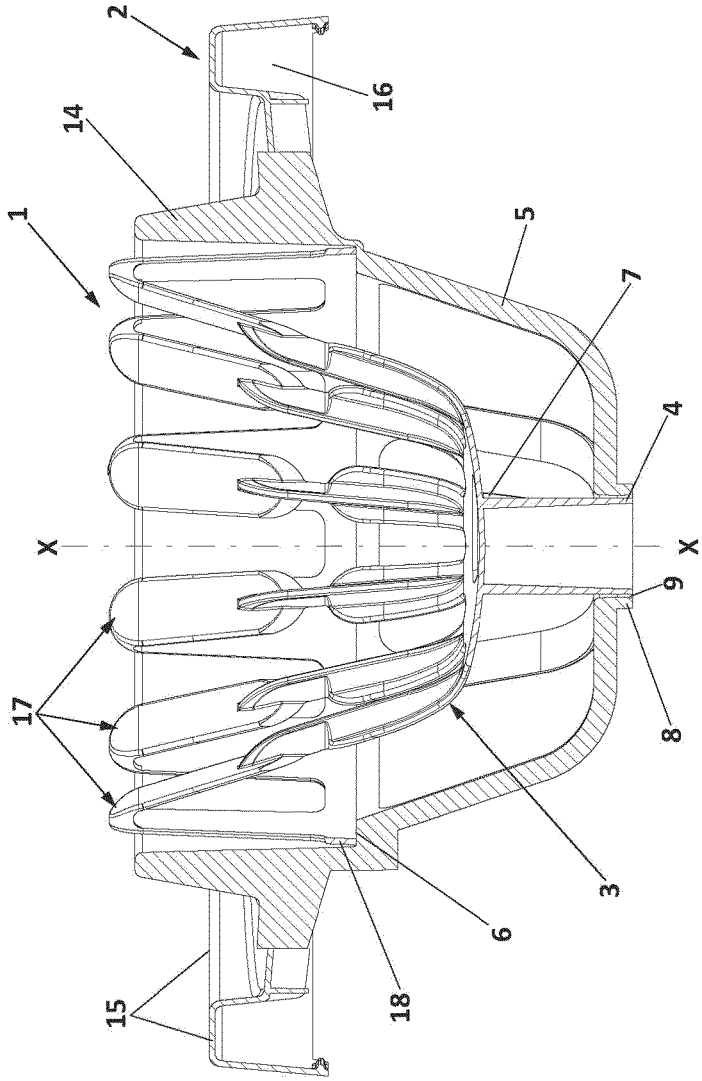

FIG. 4
A-B

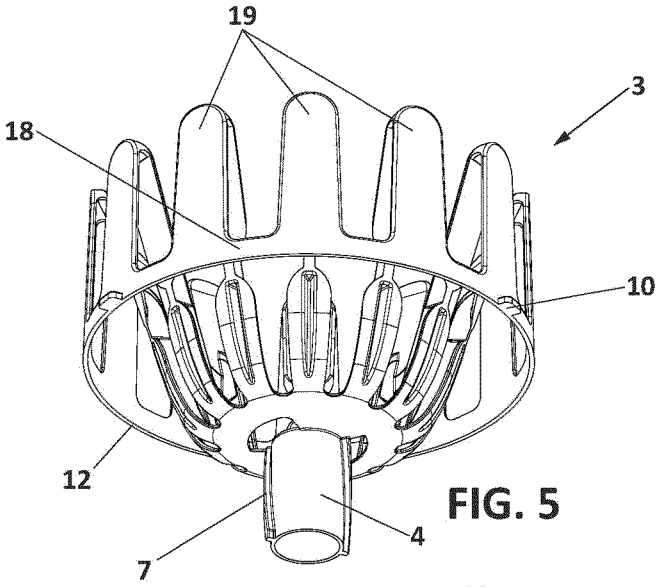

FIG. 5

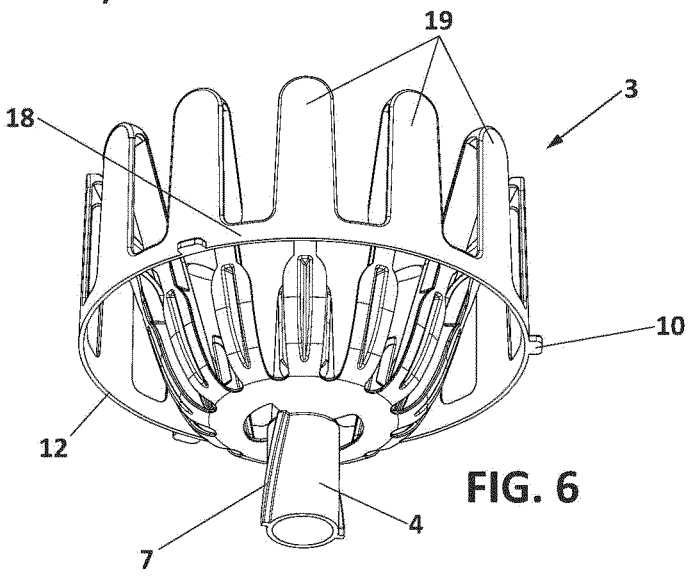

FIG. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 24 21 3247

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	CN 203 417 165 U (GUANGZHOU MINGLANG LIFE PRODUCTS MFG CO LTD) 5 February 2014 (2014-02-05)	1,2,5,8	INV. A47L13/58
A	* paragraphs [0012], [0013], [0024], [0025], [0027]; figures *	3,4,6,7	
A	ES 1 245 591 U (TA TAY PLASTICOS [ES]) 30 April 2020 (2020-04-30) * page 6, lines 12-13; claim 2; figures *	1-8	
A	EP 3 763 276 B1 (SP BERNER PLASTIC GROUP SL [ES]) 19 July 2023 (2023-07-19) * paragraphs [0023] - [0027]; figures *	1-8	

TECHNICAL FIELDS SEARCHED (IPC)

A47L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	15 April 2025	Eckenschwiller, A

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 24 21 3247

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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- ES 2732469 **[0015] [0054]**