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(54) **A DISHWASHER HAVING A PLURALITY OF SPRAY ARMS**

GESCHIRRSPÜLMASCHINE MIT MEHREREN SPRÜHARMEN

LAVE-VAISSELLE AYANT UNE PLURALITÉ DE BRAS DE PULVÉRISATION

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## Description

**[0001]** The present invention relates to a dishwasher, in particular to a dishwasher having a plurality of spray arms wherein the spray arms are attachable and detachable on to each other and on to the tub in a way predetermined by the manufacturer.

**[0002]** In dishwashers, the items placed on to the dishwasher drawers close or on to the corner regions of a tub may not be cleaned well due to the washing tubs generally having a rectangular cross-section and the pivoting spray arms forming an annular washing area. By use of multiple spraying arms rotating on different axes and heights relative to the bottom of the tub are known as a solution. In order to create the momentum necessary to rotate the first arm and the second arm attached to the first arm, multiple nozzles are provided on the second arm so as to eject the water thereby rotating the second arm. The first arm rotates on the base of the tub and around an axis, created by the momentum of water sprayed through the nozzles provided on the second arm. The first arm rotates about another axis offset from the axis of the second arm. By this, the end of the second arm extends farther to the corner regions, enabling better cleaning of the items near the corner regions. During the cleanup of the second arm and the first arm the users need to detach the second arm and the first arm from the dishwasher. The second arm has to be attached on to the first arm in a specific predetermined setting. Likewise, the first arm has to be attached on to the tub in a specific predetermined setting. Otherwise, rotations of the first arm and the spray arm does not follow predetermined rotation sequence, causing the dishes placed near or on to the corners of the tub not to be cleaned properly. This necessitates a user friendly method to attach and detach the spray arm and the actuator meanwhile eliminating the possibility of an faulty assembly.

**[0003]** A prior art publication in the technical field of the present invention may be referred to as CN107374541A among others, the document disclosing a dishwasher comprising a primary and secondary wash arms. Another prior art document US5464482A discloses a wash arm assembly for dishwasher comprising a primary wash arm and a secondary wash arm rotatably mounted to the first wash arm.

**[0004]** An objective of the present invention is to provide a fail proof assembly of the first arm and the second arm which are used together in order to effectively clean the dishes placed close or on to the corners of the tub.

**[0005]** The dishwasher realized to achieve the aim of the present invention and disclosed in the first claim and the dependent claims comprises a dishwasher having a body, having a tub wherein washing, rinsing and drying operations take place. A first arm is rotatably attached to the water inlet at the bottom of the tub around a first axis via a first hub. Likewise, a second arm is rotatably attached onto the first arm around a second axis via a second hub. The second axis upon rotation of the first arm

and the second arm starts to rotate around first axis in circular trajectory, the first axis being located in the center of the circular trajectory. The first hub and the second hub comprises a first gear and a second gear respectively. The first axis passes through the first gear and similarly the second axis passes through the second gear. The said gears are interconnected to each other via an intermediary gear. The number and radius of the intermediary gear may vary from application to application. In order to increase or decrease the number of revolutions per unit time, a multiple tier intermediary gear may also be utilized. The intermediary gear is placed inside the first arm. The first arm is connected to the mains via the water inlet transferring water to the first arm which in turn transfers water to the second arm. During spraying water towards the dishes via the nozzles provided on the second arm and the first arm, the second arm and the second gear starts to rotate around the second axis. The rotation is then transferred to the first arm via the intermediary gear. The first gear remains stationary and does not rotate, meanwhile the intermediary gear starts to rotate around the first gear therefore rotating the first arm. The first arm comprises an assembly means constraining the way the first arm can be attached on to the tub in a position predetermined by the manufacturer.

**[0006]** The first hub comprises a first retainer which is at least partially inserted inside the water inlet. The first hub further comprises a first pin which extends between the first retainer and the first arm therefore connecting the first arm on to the tub via the first retainer. The first pin is in tubular shape and is connected to the first arm from one end and to the first retainer from the other end. Due to the cylindrical shape the first pin has, the first arm is rotatably attached on to the water inlet.

**[0007]** In an embodiment of the invention, the first retainer has a hollow and tapped surface configured to rotatably receive the first pin inside it. The inner surface of the first retainer is tapped and the outer surface of the first pin has corresponding threads suitable to be rotatably inserted inside the first retainer. Therefore, a robust assembly is achieved.

**[0008]** In an embodiment of the invention, the second hub which is used to rotatably attach the second arm on to the first arm comprises a second retainer and a second pin. The second retainer extends between the first arm and the second arm and acts as a connection means connecting said arms. The second pin is connected to the first arm and to the second retainer from respective ends attaching the second arm on to the first arm around the second axis.

**[0009]** In an embodiment of the invention, the second retainer has a hollow central axis wherein the second pin is inserted. The second pin, being formed in the shape of a cylinder, has curves closer to the end wherein the second pin is to be inserted inside the second retainer. A locking tab is formed on the inner surface of the second retainer and is configured to match with the curves of the second pin which upon insertion inside the second re-

tainer, form fittingly couples with the second pin. The curves are continuous around the second pin therefore the second pin is rotatably attached with respect to the second retainer. The user may pull the second arm releasing the locking tab from the second pin. Likewise, during assembly the user may push the second arm and therefore the second retainer towards the first pin which will be inserted inside the second retainer and rotatably attaching the second arm on to the first arm.

**[0010]** The assembly means comprises a locking bracket in the shape of a ring having a base which has a hollow center wherein an end of the first pin is passing through and wherein the locking bracket is placed on to the first pin. The locking bracket has two first protrusions protruding upwards from the base towards the first arm. The first arm is mainly formed by two parts, the two parts being the lower cap and the upper cap. The first arm has a first indentation formed on the upper cap wherein the first protrusions are inserted. Due to non-symmetrical geometry the first arm has with respect to the first axis, the upper cap can be attached onto the lower cap in a specific orientation predetermined by the manufacturer. Upon attachment, the first protrusions are inserted inside the first indentation, therefore, eliminating the possibility of an assembly fault. Additionally, the first pin is inserted inside the first indentation along with the first protrusions. By this means, the assembly is further strengthened.

**[0011]** In an embodiment of the invention, the second retainer comprises two second protrusions, formed at the lower surface of the second retainer protruding downwards towards the second gear wherein the second protrusions are form fittingly inserted inside a pair of second indentations constituted on the first gear. As a result, the second retainer is coupled to the second gear and therefore to the first arm from one end. The other end of the second retainer is partially inside the second arm in a rotatable manner. The second gear is also placed on to the first arm in a rotatable manner. The user may pull the second arm and therefore the second retainer upwards, releasing the second protrusions from the second indentations thereby freeing the second arm from the first arm. Likewise, the user may push the second arm and therefore the second retainer towards the first arm inserting the second protrusions to the second indentations and rotatably fixing the first pin via the locking tab inside the second retainer.

**[0012]** In an embodiment of the invention, a first spring is placed between the first arm and the locking bracket. The spring is compressed between the first arm and the locking bracket which creates a tension pushing the locking bracket towards the first pin. The first pin has a hollow center used to transfer water from the water inlet to the first arm. The first spring pushes the locking bracket towards the first pin thereby closing the water passage. Upon activation of the water pump so as to transfer water inside the first arm via the water inlet, the water passes through the first pin and pushes the locking bracket and therefore the first spring upwards. By means of the first

spring, it is ensured that water passes through the first pin only during the activation of the water pump which helps to eliminate the odor that may be originating from the mains.

**[0013]** In an embodiment of the invention, a second spring is placed between the first arm and the second gear. The second spring pushes the second gear upwards and towards the second retainer. Therefore the connection between the second gear and the second retainer becomes stronger. Another advantageous effect of using the second spring is that the second spring creates a gap between the second gear and first arm which helps reduce the friction.

**[0014]** In an embodiment of the invention, an aligning bushing extends along the water inlet in between the locking bracket and a bushing fixer placed underneath the first retainer and inside the water inlet. The aligning bushing extends along the hollow center of the first retainer and the first pin. It contacts the locking bracket from below and pushes it towards the first arm compressing the first spring. The aligning bushing helps the water to enter inside the first arm via the water inlet by pushing the locking bracket upwards therefore making it easier for water to open the water passage for the water to pass through which helps reduce the back pressure and therefore the energy consumption of the water pump.

**[0015]** A major advantageous effect of the invention is that the assembly means provides the correct installation of the first arm onto the tub, in which the first arm direction is aligned and locked without being left to the user's initiative, preventing malfunctions caused by incorrect assembly of the first arm and the second arm.

**[0016]** The drawings are not meant to delimit the scope of protection as identified in the claims nor should they be referred to alone in an effort to interpret the scope identified in the claims without recourse to the technical disclosure in the description of the present invention.

Figure 1 - is a perspective view of the dishwasher.

Figure 2 - is a perspective exploded view of the bottom of the tub with the first arm and the second arm.

Figure 3 - is a cross sectional view along the A-A line in Figure 2.

Figure 4 - is an exploded view of the first arm.

Figure 5 - is a cross sectional view along the B-B line in Figure 2.

**[0017]** The following numerals are assigned to different parts demonstrated in the drawings and referred to in the present detailed description of the invention:

1. Dishwasher
2. Body
3. Tub
4. First Arm
5. Water inlet
6. First hub
7. Second arm

8. Second hub
9. First gear
10. Second gear
11. Intermediary gear
12. Assembly means
13. First retainer
14. First pin
15. Second retainer
16. Second pin
17. Locking tab
18. Locking bracket
19. Base
20. First protrusion
21. First indentation
22. Second protrusion
23. Second indentation
24. First spring
25. Second spring
26. Aligning bushing
27. Bushing fixer

**[0018]** The present invention relates to a dishwasher (1) comprising; a body (2), a tub (3) inside the body (2) wherein the washing operation takes place, a first arm (4) rotatable attachable to the bottom of the tub (3) through a water inlet (5) and around a first axis via a first hub (6), a second arm (7) rotatable attachable on to the first arm (4) around a second axis via a second hub (8), wherein the first hub (6) and the second hub (8) comprises a first gear (9) and a second gear (10) respectively, wherein the first gear (9) and the second gear (10) are rotatable connected to each other through at least an intermediary gear (11) placed inside the first arm (4), wherein the second arm (7) is in fluid communication with the first arm (4) which is in fluid communication with the water inlet (5).

**[0019]** The present invention relates to a dishwasher (1) further comprising an assembly means (12) constraining the first arm (4) being attachable onto the tub (3) in a position predetermined by the manufacturer, fixing the initial relative positions of the first arm (4) and the tub (3). The first arm (4) is attached on to the tub (3) in rotatable manner through the water inlet (5), therefore the first arm (4) sprays the dishes placed inside the tub (3) during washing operations. The first arm (4) is attached on to the tub (3) via the first hub (6) and the central axes of both the first hub (6) and the water inlet (5) is aligned along the first axis. The second arm (7) is attached on the first arm (4) around the second axis different than the first axis via the second hub (8) rotatably attaching the second arm (7) with respect to the first arm (4). The first hub (6) and the second hub (8) comprises the first gear (9) and the second gear (10) respectively. The first gear (9) may be formed as an integral or a separate part of the first hub (6). The first axis and the second axis are passing through the center of the first gear (9) and the second gear (10) and forming a right angle with the said gears respectively. The intermediary gear (11) is placed

in between the first gear (9) and the second gear (10) so as to transfer rotational force in between the said gears. The rotation of the first arm (4) and the second arm (7) is achieved by the water passing through the water inlet (5), the first arm (4), the second arm (7) and the nozzles respectively. By spraying water out of the nozzles provided on both the first arm (4) and the second arm (7), the second arm (7) starts to rotate which in turn rotates the second hub (8) and the second gear (10). The second gear (10) transfers the rotational movement to the intermediary gear (11) which starts to turn around the first gear (9). The first hub (6) connects the first arm (4) to the tub (3) rotatably. On the other hand, The first hub (6) itself is stationary and cannot rotate. Therefore, the first gear (9) formed around the first hub (6) to connect with the intermediary gear (11) remains stationary during the rotation of the first arm (4) and the second arm (7). The intermediary gear (11) rotates around the first gear (9) in a circular trajectory, the first axis being positioned at the center, providing movement of the first arm. The total number of gears, including the first gear (9) and the second gear (10), must be an odd number so as to rotate the first arm (4) in the opposite direction with respect to the second arm (7). Therefore, the corners of the tub (3) are sprayed effectively with water and cleaning agent through the second arm (7). An assembly means (12) is provided inside the first arm (4) and is used to constrain the way the first arm (4) is attached on to the tub (3) in a specific setting predetermined by the manufacturer. Therefore, relative initial position of the first arm (4) and the tub (3) is fixed, preventing the user from attaching the first arm (4) on to the tub (3) in an incorrect orientation which may cause the first arm (4) and the second arm (8) collide with the body (2) causing physical damage to the first arm (4) and the second arm (8). By means of the assembly means (12), possible spare parts costs are prevented by guiding the user to attach the first arm (4) on to the water inlet (5) in a specific orientation.

**[0020]** The first hub (5) comprises a first retainer (13) at least partially inserted inside the water inlet (5) and a tubular first pin (14) extending in between the first retainer (13) and the first arm (4). The first retainer (13) is placed at least partially inside the water inlet (5) and fixed via a clips used to attach the first retainer (13) around the periphery of the water inlet (5). After the first retainer (13) is secured inside the water inlet (5), the tubular first pin (14) is placed so as to extend in between the first arm (4) and the water inlet (5) contacting the first retainer (13), fixing the first arm on to the water inlet (5). By this means, the first arm (4) is attached on to the water inlet (5) in a robust and simple method. Additionally, the first gear (9) is formed around the tubular first pin (14) as an integral or removable part of the tubular first pin (14).

**[0021]** In an alternative embodiment, the first retainer (13) has a hollow and tapped inner surface wherein the tubular first pin (14) is rotatable inserted via corresponding threads. The first retainer (13) is roughly in the shape of a cylinder and has a bore extending along the longi-

tudinal axis of the first retainer (13) with the inner surface being tapped so as to match with corresponding threads provided around the tubular first pin (14). The tubular first pin (14) is inserted inside the first retainer (13) by rotating the tubular first pin (14) around the first axis which coincide with the longitudinal axis of the first retainer (13). Thereby, the first arm (4) is attached on to the tub (3) in a robust and rotating manner.

**[0022]** In another embodiment, the second hub (8) comprises a second retainer (15) rotatably connecting the first arm (4) to the second arm (7) and further comprising a second pin (16) extending in between the second retainer (15) and the first arm (4). The second retainer (15) is extending in between the first arm (4) and the second arm (7) each end of the second retainer (15) being partially inserted inside the first arm (4) and the second arm (7), therefore connecting said arms. The second pin (16) is placed on to the first arm (4) from one end via a recess and extends towards the second retainer (15). The second pin (16) is connected to the second retainer (15) rotatably from the other end, thereby retaining the second retainer (15). The second retainer (15) is connected to the second arm (7), thereby retaining the second arm (4) rotatably. As a result, the second arm (7) is rotatably attached on to the first arm (4) in an easy and robust manner.

**[0023]** In an alternative embodiment, the second retainer (15) has a hollow central axis wherein the second pin (16) is form fittingly and rotatably inserted and a locking tab (17) formed on the inner surface of the second retainer (15) to lock upon engagement with the second pin (16). The second retainer (15) has a cylindrical shape and has a bore extending along the longitudinal axis of the second retainer (15). The second pin (16) is in the shape of a cylindrical rod having curves provided around the end of the said pin configured to match with the form of the locking tab (17). By this means, upon rotation of the second arm (7) and the second retainer (15), the second pin (16) remains seated inside the second retainer (15). The user may separate the second arm (7) from the first arm (4) by pulling the second arm (7), freeing the second pin (16) from the grip of the locking tab (17).

**[0024]** The assembly means (12) comprises a locking bracket (18) placed on to the first retainer (13) having a ring shaped base (19) wherein the tubular first pin (14) is passing through and two first protrusions (20) protruding upwards from the base (19) towards the first arm (4) and by a first indentation (21) formed on to the first arm (4) wherein the first protrusions (20) are seated inside. The locking bracket (18) is placed on to the first retainer (13) in a position predetermined by the manufacturer. Upon placement, the locking bracket (18) is positioned on the first retainer (13) in an unmovable manner. Due to the ring shaped structure the locking bracket (18) has, the tubular first pin (14) passes through the locking bracket (18). The locking bracket (18) has two first protrusions (20) extending upwards and towards the first arm (4), wherein the first protrusions (20) are inserted into the first

indentation (21) formed on the upper part of the first arm (4) along with the first pin (4). By means of the locking bracket (18) and the first protrusions (20), it is assured that the first arm (4) is rotatably attached on to the tub (3) in a specific and predetermined configuration, eliminating the possibility of the erroneous assembly by the user.

**[0025]** In an alternative embodiment, the second retainer (15) comprises two second protrusions (22) protruding downwards towards the second gear (10) wherein the second protrusions (22) are form fittingly placed inside a pair of second indentations (23) formed onto the second gear (10) in a position predetermined by the manufacturer, fixing the initial relative positions of the first arm (4) and the second arm (7). The second retainer (15) is placed inside the second arm (7) in a form fitting and predetermined way, limiting the way the second retainer (15) can be placed inside the second arm (7) to a single way. Moreover, the second retainer (15) can be placed onto the second gear (10) via a pair of second protrusions (22) configured to be form fittingly inserted inside the corresponding pair of second indentations (23) formed on to the second gear (10). Therefore, it is ensured that the user may attach the second arm (7) on to the first arm (4) in a single way, eliminating the possibility of the erroneous assembly by the user after cleanup of the said arms.

**[0026]** In another embodiment, a first spring (24) is placed in between the first arm (4) and the locking bracket (18). The locking bracket (18) is placed upon the first pin (14) blocking the passage of the water by closing upper open end of the tubular first pin (14). The first spring (24) is used to push the locking bracket (18) towards the tubular first pin (14), thereby the locking bracket (18) easily remains seated on the tubular first pin (14) and blocks the hollow central bore of the tubular first pin (14). Therefore, the locking bracket (18) is lifted upwards only during the passage of the water through the tubular first pin (14). By this means, unwanted odors coming from the mains are prevented. Another advantage of using the first spring (24) is that the locking bracket (18) is easily removed from the first indentations (21), should the user disassemble the cover of the first arm (4) for cleaning the inside of the first arm (4).

**[0027]** In another embodiment a second spring (25) is placed in between the first arm (4) and the second gear (10). Therefore, the second spring (25) pushes the second gear (10) towards the second retainer (15). As a result, the pair of second indentations (23) are pushed against the second protrusions (22) formed on to the second gear (10) creating a robust assembly.

**[0028]** In another embodiment, an aligning bushing (26) extends through the tubular first pin (14) and the first retainer (13), compressing the first spring (24) between the locking bracket (18) and the first arm (4) and by a bushing fixer (27) placed underneath the first retainer (13) whereon the aligning bushing (26) is placed. The aligning bushing (26) extends through the hollow center

of the tubular first pin (14), and is placed in between the locking bracket (18) and the bushing fixer (27) and is used to create tension on the first spring (24).

[0029] By means of this invention, a dishwasher (1), having a first arm (4) and a second arm (7) attached onto the tub (3) and the first arm (4) respectively in a predetermined position is achieved which eliminates the possibility of the erroneous assembly after cleaning the insides of the said arms thereby ensuring correct functioning of the said arms and as a result improving cleaning quality of the dishwasher (1) for items placed on to the drawers which are close or on the corner regions of the tub (3).

## Claims

### 1. A dishwasher (1) comprising;

- a body (2),
- a tub (3) inside the body (2) wherein the washing operation takes place,
- a first arm (4) rotatably attachable to the bottom of the tub (3) through a water inlet (5) and around a first axis via a first hub (6), wherein the first hub (5) comprises a first retainer (13) at least partially inserted inside the water inlet (5) and a tubular first pin (14) extending in between the first retainer (13) and the first arm (4)
- a second arm (7) rotatably attachable on to the first arm (4) around a second axis via a second hub (8), wherein the first hub (6) and the second hub (8) comprises a first gear (9) and a second gear (10) respectively, wherein the first gear (9) and the second gear (10) are rotatably connected to each other through at least an intermediary gear (11) placed inside the first arm (4), wherein the second arm (7) is in fluid communication with the first arm (4) which is in fluid communication with the water inlet (5), and
- an assembly means (12) for fixing the first arm (4) onto the tub (3) in an initial relative position to the tub (3) predetermined by the manufacturer and **characterized in that** the assembly means (12) comprises: a locking bracket (18) placed on to the first retainer (13) having a ring shaped base (19) wherein the tubular first pin (14) is passing through and two first protrusions (20) protruding upwards from the base (19) towards the first arm (4), and a first indentation (21) formed on to the first arm (4) wherein the first protrusions (20) are seated inside.

### 2. A dishwasher (1) according to claim 1, **characterized by** the first retainer (13) having a hollow and tapped inner surface wherein the tubular first pin (14) is rotatable inserted via corresponding threads.

3. A dishwasher (1) according to claim 1 or 2, **characterized by** the second hub (8) comprising a second retainer (15) rotatably connecting the first arm (4) to the second arm (7) and further comprising a second pin (16) extending in between the second retainer (15) and the first arm (4).

4. A dishwasher (1) according to claim 3, **characterized by** the second retainer (15) having a hollow central axis wherein the second pin (16) is form fittingly and rotatably inserted and a locking tab (17) formed on the inner surface of the second retainer (15) to lock upon engagement with the second pin (16).

5. A dishwasher (1) according to claim 3 or 4, **characterized by** the second retainer (15) comprising two second protrusions (22) protruding downwards towards the second gear (10) wherein the second protrusions (22) are form fittingly placed inside a pair of second indentations (23) formed on to the second gear (10) in a position predetermined by the manufacturer, fixing the initial relative positions of the first arm (4) and the second arm (7).

6. A dishwasher (1) according to any one of the preceding claims, **characterized by** a first spring (24) placed in between the first arm (4) and the locking bracket (18).

7. A dishwasher (1) according to claim 6, **characterized by** a second spring (25) placed in between the first arm (4) and the second gear (10).

8. A dishwasher (1) according to claim 6 or 7, **characterized by** an aligning bushing (26) extending through the tubular first pin (14) and the first retainer (13), compressing the first spring (24) between the locking bracket (18) and the first arm (4) and by a bushing fixer (27) placed underneath the first retainer (13) whereon the aligning bushing (26) is placed.

## Patentansprüche

### 1. Eine Geschirrspülmaschine (1) umfasst

- einen Körper (2),
- eine Wanne (3) im Inneren des Körpers (2), in der der Waschvorgang stattfindet,
- einen ersten Arm (4), der über einen Wassereinlass (5) und über eine erste Nabe (6) um eine erste Achse drehbar am Boden der Wanne (3) befestigt werden kann, wobei die erste Nabe (5) einen ersten Halter (13), der zumindest teilweise in den Wassereinlass (5) eingesetzt ist, und einen rohrförmigen ersten Stift (14) umfasst, der sich zwischen dem ersten Halter (13)

- und dem ersten Arm (4) erstreckt,  
 - einen zweiten Arm (7), der über eine zweite Nabe (8) um eine zweite Achse drehbar am ersten Arm (4) befestigbar ist, wobei die erste Nabe (6) und die zweite Nabe (8) jeweils ein erstes Zahnrad (9) und ein zweites Zahnrad (10) umfassen, wobei das erste Zahnrad (9) und das zweite Zahnrad (10) über mindestens ein Zwischenzahnrad (11), das im ersten Arm (4) platziert ist, drehbar miteinander verbunden sind, wobei der zweite Arm (7) in Fluidverbindung mit dem ersten Arm (4) steht, der in Fluidverbindung mit dem Wassereinlass (5) steht, und  
 - ein Montagemittel (12) zum Befestigen des ersten Arms (4) an der Wanne (3) in einer vom Hersteller vorgegebenen anfänglichen relativen Position zur Wanne (3), gekennzeichnet ist sie dadurch, dass das Montagemittel (12) Folgendes umfasst: einen Verriegelungsbügel (18), der auf dem ersten Halter (13) angebracht ist und eine ringförmige Basis (19) aufweist, durch die der rohrförmige erste Stift (14) verläuft und zwei erste Vorsprünge (20), die von der Basis (19) nach oben in Richtung des ersten Arms (4) vorstehen, und eine erste Vertiefung (21), die am ersten Arm (4) ausgebildet ist, wobei die ersten Vorsprünge (20) darin sitzen.
2. Eine Geschirrspülmaschine (1), wie in Anspruch 1 aufgeführt, **ist dadurch gekennzeichnet, dass** der erste Halter (13) eine hohle und mit Gewinde versehene Innenfläche aufweist, in die der erste rohrförmige Stift (14) über entsprechende Gewinde drehbar eingeführt ist.
3. Eine Geschirrspülmaschine (1), wie in Anspruch 1 oder 2 aufgeführt, **ist dadurch gekennzeichnet, dass** die zweite Nabe (8) einen zweiten Halter (15) umfasst, der den ersten Arm (4) drehbar mit dem zweiten Arm (7) verbindet und außerdem umfassend einen zweiten Stift (16), der sich zwischen der zweiten Halterung (15) und dem ersten Arm (4) erstreckt.
4. Eine Geschirrspülmaschine (1), wie in Anspruch 3 aufgeführt, **ist dadurch gekennzeichnet, dass** die zweite Halterung (15) eine hohle Mittelachse aufweist, in der der zweite Stift (16) formschlüssig und drehbar eingesetzt ist und eine Verriegelungslasche (17), die an der Innenfläche des zweiten Halters (15) ausgebildet ist, um beim Eingriff mit dem zweiten Stift (16) zu verriegeln.
5. Eine Geschirrspülmaschine (1), wie in Anspruch 3 oder 4 aufgeführt, **ist dadurch gekennzeichnet, dass** die zweite Halterung (15) zwei zweite Vorsprünge (22) umfasst, die nach unten in Richtung des zweiten Zahnrads (10) vorstehen, wobei die zweiten Vorsprünge (22) formschlüssig innerhalb eines Paares von zweiten Vertiefungen (23) angeordnet sind, die auf dem zweiten Zahnrad (10) in einer vom Hersteller vorbestimmten Position ausgebildet sind, wodurch die anfänglichen relativen Positionen des ersten Arms (4) und des zweiten Arms (7) fixiert werden.
6. Eine Geschirrspülmaschine (1), wie in einem der vorherigen Ansprüchen aufgeführt, **ist dadurch gekennzeichnet, dass** eine erste Feder (24) zwischen dem ersten Arm (4) und dem Verriegelungsbügel (18) angeordnet ist.
7. Eine Geschirrspülmaschine (1), wie in Anspruch 6 aufgeführt, **ist dadurch gekennzeichnet, dass** eine zweite Feder (25) zwischen dem ersten Arm (4) und dem zweiten Zahnrad (10) angeordnet ist.
8. Eine Geschirrspülmaschine (1), wie in Anspruch 6 oder 7 aufgeführt, **ist dadurch gekennzeichnet, dass** eine Ausrichtungsbuchse (26), die sich durch den rohrförmigen ersten Stift (14) und den ersten Halter (13) erstreckt und die erste Feder (24) zwischen dem Verriegelungsbügel (18) zusammendrückt und dem ersten Arm (4) und durch eine Buchsenbefestigung (27), die unter dem ersten Halter (13) platziert ist, auf dem die Ausrichtungsbuchse (26) platziert ist.

## Revendications

### 1. Un lave-vaisselle (1) comprenant :

- un corps (2),
- une baignoire (3) à l'intérieur du corps (2) dans laquelle se déroule l'opération de lavage,
- un premier bras (4) pouvant être fixé de manière rotative au fond de la baignoire (3) à travers une entrée d'eau (5) et autour d'un premier axe via un premier moyeu (6), dans lequel le premier moyeu (5) comprend un premier dispositif de retenue (13) au moins partiellement inséré à l'intérieur de l'entrée d'eau (5) et un premier axe tubulaire (14) s'étendant entre le premier dispositif de retenue (13) et le premier bras (4)
- un second bras (7) rotatif sur le premier bras (4) autour d'un second axe par l'intermédiaire d'un second moyeu (8), dans lequel le premier moyeu (6) et le second moyeu (8) comprennent respectivement un premier engrenage (9) et un second engrenage (10), dans lequel le premier engrenage (9) et le second engrenage (10) sont reliés de manière rotative l'un à l'autre par au moins un engrenage intermédiaire (11) placé à l'intérieur du premier bras (4), dans lequel le second bras (7) est en communication fluide avec le premier bras (4) qui est en communica-

- tion fluïdique avec l'entrée d'eau (5), et  
 - un moyen d'assemblage (12) pour fixer le premier bras (4) sur la baignoire (3) dans une position relative initiale par rapport à la baignoire (3) prédéterminée par le fabricant et **caractérisé en ce que** le moyen d'assemblage (12) comprend : un support de verrouillage (18) placé sur le premier dispositif de retenue (13) ayant une base en forme d'anneau (19) dans laquelle le premier axe tubulaire (14) passe et deux premières protubérances (20) faisant saillie vers le haut depuis la base (19) vers le premier bras (4), et une première indentation (21) formée sur le premier bras (4) dans laquelle les premières protubérances (20) sont logées.
2. Un lave-vaisselle (1) selon la déclaration 1, **caractérisé par le fait que** le premier dispositif de retenue (13) a une surface intérieure creuse et taraudée dans laquelle la première goupille tubulaire (14) peut être insérée de manière rotative par l'intermédiaire de filets correspondants.
3. Un lave-vaisselle (1) selon la déclaration 1 ou 2, **caractérisé par le fait que** le second moyeu (8) comprend un second dispositif de retenue (15) reliant de manière rotative le premier bras (4) au second bras (7) et comprenant en outre une seconde goupille (16) s'étendant entre le second dispositif de retenue (15) et le premier bras (4).
4. Un lave-vaisselle (1) selon la déclaration 3, **caractérisé par le fait que** le second dispositif de retenue (15) a un axe central creux dans lequel la seconde goupille (16) est insérée de manière ajustée et rotative et une languette de verrouillage (17) formée sur la surface intérieure du second dispositif de retenue (15) pour se verrouiller lors de l'engagement avec la seconde goupille (16).
5. Un lave-vaisselle (1) selon la déclaration 3 ou 4, **caractérisé par** le second dispositif de retenue (15) comprenant deux secondes protubérances (22) faisant saillie vers le bas en direction du second engrenage (10), dans lequel les secondes protubérances (22) sont placées de manière appropriée à l'intérieur d'une paire de secondes indentations (23) formées sur le second engrenage (10) dans une position prédéterminée par le fabricant, fixant les positions relatives initiales du premier bras (4) et du second bras (7).
6. Un lave-vaisselle (1) selon l'une quelconque des déclarations précédentes, **caractérisé par** un premier ressort (24) placé entre le premier bras (4) et le support de verrouillage (18).
7. Un lave-vaisselle (1) selon la déclaration 6, **caractérisé par** un deuxième ressort (25) placé entre le premier bras (4) et le deuxième engrenage (10).
8. Un lave-vaisselle (1) selon la déclaration 6 ou 7, **caractérisé par** une douille d'alignement (26) s'étendant à travers le premier axe tubulaire (14) et le premier dispositif de retenue (13), comprimant le premier ressort (24) entre le support de verrouillage (18) et le premier bras (4) et par un fixateur de douille (27) placé sous le premier dispositif de retenue (13) sur lequel la douille d'alignement (26) est placée.

Figure 1

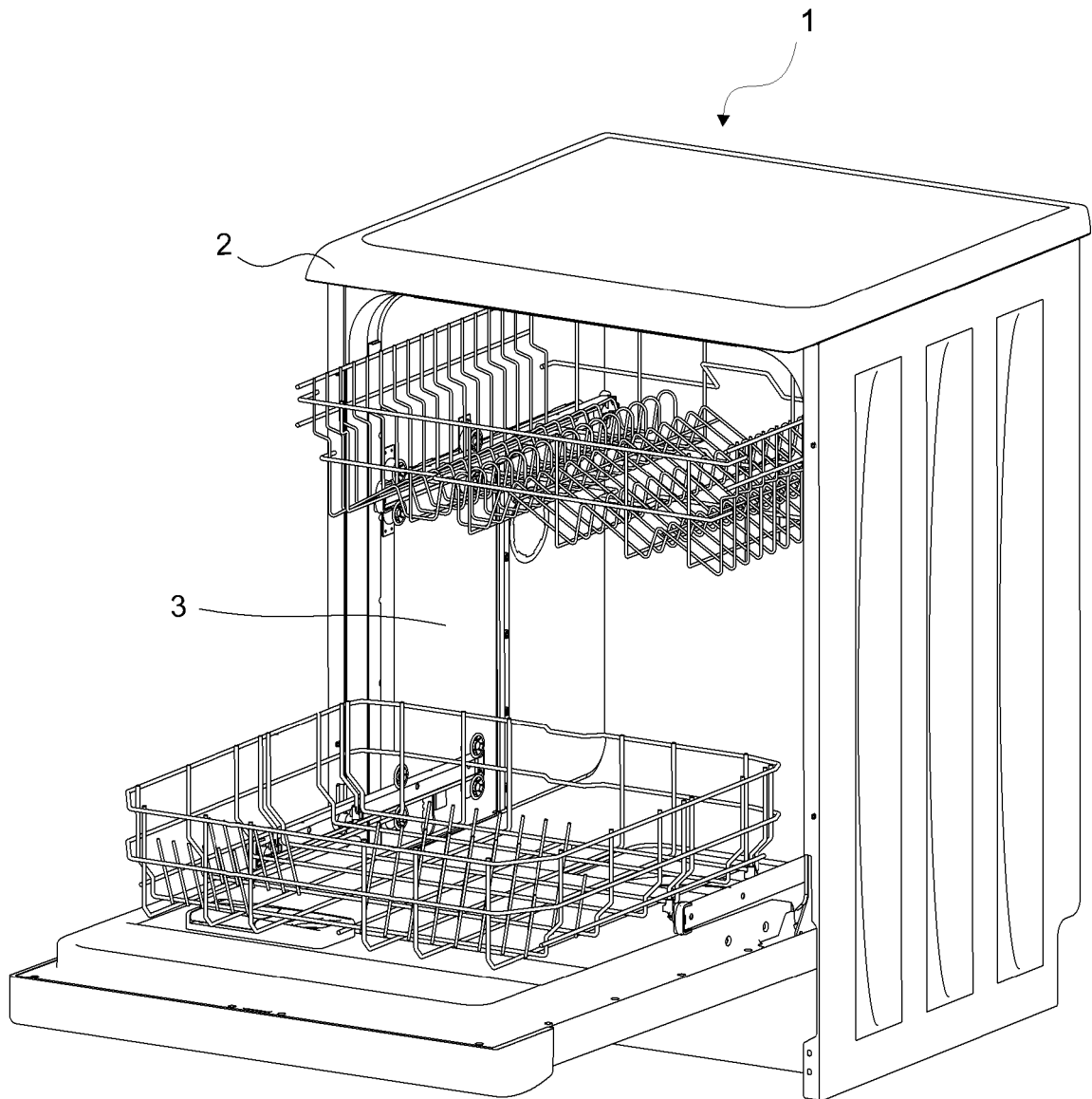


Figure 2

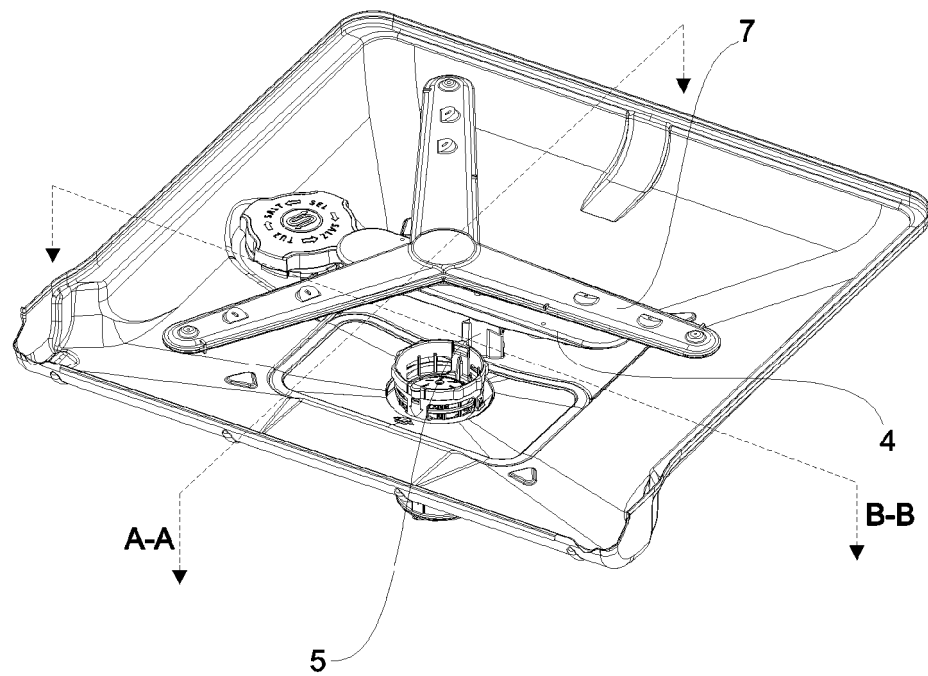


Figure 3

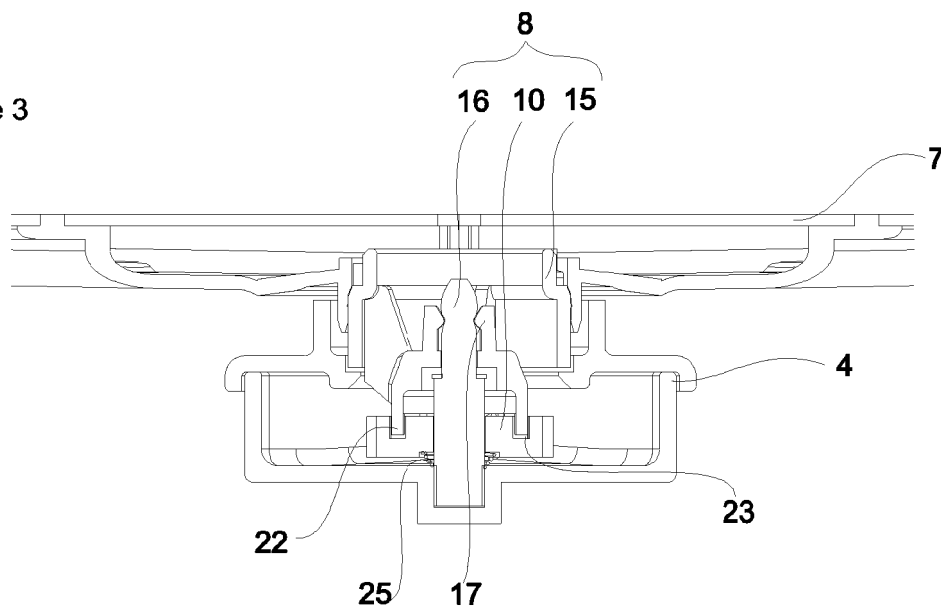


Figure 4

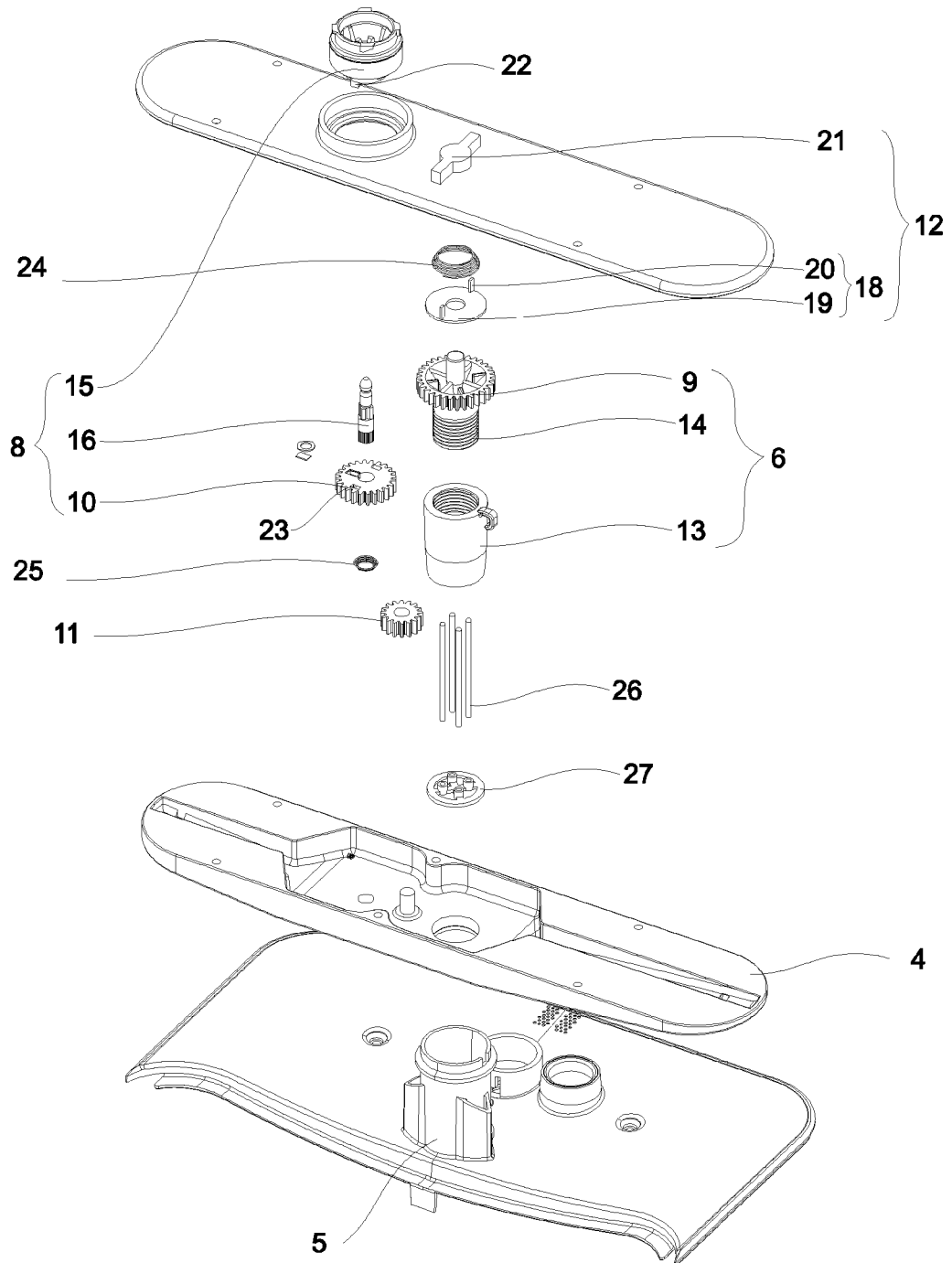
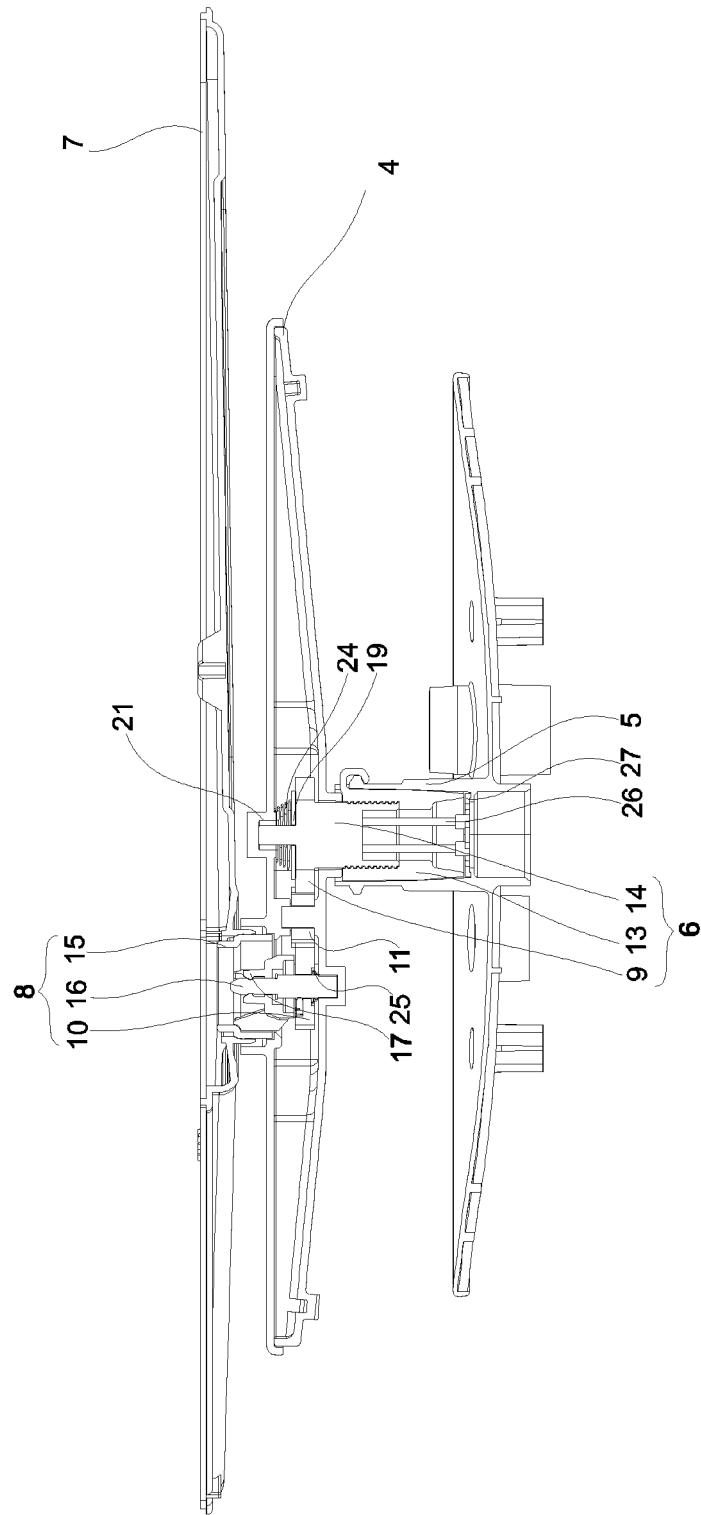


Figure 5



**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

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- US 5464482 A [0003]