(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 397 129 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
04.09.2019 Bulletin 2019/36

(21) Application number: **16804811.4**

(22) Date of filing: **01.12.2016**

(51) Int Cl.:
A47L 15/50 *(2006.01)*

(86) International application number:
PCT/EP2016/079418

(87) International publication number:
WO 2017/114630 (06.07.2017 Gazette 2017/27)

(54) A DISHWASHER

GESCHIRRSPÜLER

LAVE-VAISSELLE

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **29.12.2015 TR 201517375**

(43) Date of publication of application:
07.11.2018 Bulletin 2018/45

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Description

[0001] The present invention relates to a dishwasher wherein the height of the rack is adjustable.

[0002] In dishwashers, generally a lower rack and an upper rack on which the dishes are placed are disposed in the washing tub. The lower rack is suitable for placing relatively dirtier and bigger food containers such as pots and wide plates, and relatively smaller food containers such as glasses and bowls are placed in the upper rack. Therefore, the distance between the lower rack and the upper rack should be determined so as not to limit the size of the food containers placed in the upper rack, and to enable the big containers to be placed in the lower rack without a problem. In the state of the art various height adjustment mechanisms that enable the height of the upper rack in the dishwasher to be adjusted by the user are used. The height adjustment mechanisms are generally disposed at both sides of the rack so as to be fixed to the wires that constitute the side wall of the rack. The mechanism is moved upwards and downwards so as to slide on the vertical wires and enables the height of the rack to be adjusted by bearing against the horizontal wires at certain heights. However, these types of mechanisms cause the wire geometry of the rack to be changed or cause production and assembly difficulties since additional wires are needed to be added on the rack. Moreover, considering that the dishwashers are often operated in high temperatures, the parts of the mechanism that carry the rack may be deformed in time and even get broken by losing resistance against constraints. Therefore, a height adjustment mechanism that can easily be assembled and that has a durable structure is needed.

[0003] In the state of the art International Patent Application No. WO2010138262, the adjusting of the height of the rack by means of the claws disposed on the arms that are disposed at both sides of the rack and that can be moved around the shaft being attached to the steps that are disposed on the rail unit is explained.

[0004] The aim of the present invention is the realization of a dishwasher wherein the height of the rack is effectively adjusted.

[0005] The dishwasher realized in order to attain the aim of the present invention, explicated in the claims, comprises a body; a carrier on which the body is mounted, and an arm that extends between the body and the carrier and that is mounted to the body so as to move. When the user exerts pressure to the arms that are disposed on both sides of the rack, the body enables the rack to be brought to a higher or a lower position in the tub by sliding on the carrier.

[0006] The dishwasher of the present invention comprises a pin that is moved by means of the arm; a housing in which the pin is moved and that is arranged on the carrier, and more than one recess arranged on the body so as to be on top of one another. When the user applies no force on the arm, the pin is positioned outside the housing and is seated in a recess. When the user pushes the arm towards the rack, the pin is pushed into the housing by the arm, and enables the body to move on the carrier by being released from the recess. The rack can be lowered or raised in the tub by means of the pins being seated in the next higher or next lower recesses. Thus, the users can precisely adjust the height of the rack and can efficiently use both the lower rack and the upper rack.

[0007] In an embodiment of the present invention, extensions that extend outwards from the edges of the pin are disposed on the pin and a channel through which the end of the pin passes so that the extensions bear against the arm and that extends almost along the arm is arranged on the arm. The extensions limit the movement of the pin and enable the pin to always contact the arm. Thus, the force applied to the arm can efficiently be delivered to the pin.

[0008] In another embodiment of the present invention, the movement of the pin is realized by a first spring that enables the pin to move into the housing by being compressed when the arm is pushed towards the rack and that pushes the pin outside the housing by at least partially returning to the balance position when the user stops applying force on the arm. Thus, the pin can easily move in the housing.

[0009] In another embodiment of the present invention, a ramp is disposed under each recess so as to constitute an inclined surface into the recesses on the body. Thus, the pin is seated into the housing in a softer manner and the rack can be carried to a relatively higher position with a fluid movement. Thus, the perception of quality is increased.

[0010] In another embodiment of the present invention, the upper portion of the recess has a curved shape so as to enable the pin to be seated therein. Thus, the contact surface between the pin and the recess is widened and the body is enabled to be kept in a durable manner.

[0011] In another embodiment of the present invention, the recesses are disposed in the horizontal direction in a sliding manner with respect to each other so that the lowermost recess is the closest to the carrier. Thus, the force to be applied to the arm so that the pin is leaped over the recesses that have different height levels is not needed to be changed. Thus, ease of use is provided.

[0012] In another embodiment of the present invention, a pressing plate is disposed at one end of the arm, that extends upwards from above the body and that enables the user to easily access the arm. Thus, the use of the arm is facilitated.

[0013] In another embodiment of the present invention, a second spring is disposed between the pressing plate and the body, that pushes the pressing plate in the opposite direction while the arm is being moved. Thus, the users can detect the amount of the movement of the pin by means of the force the second spring applies to the arm. Thus, the use of the arm is facilitated.

[0014] By means of the present invention, the desired number of recesses can be formed on the body that has

the required width, and thus the desired number of height levels can be provided without changing the rack geometry. Moreover, since the rack load is not carried by the arm, the body is fixed on the carrier in a safer and more stable manner.

[0015] The dishwasher realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

Figure 1 - is the perspective view of the dishwasher related to an embodiment of the present invention.
Figure 2 - is the perspective view of the rack, the carrier and the body related to an embodiment of the present invention.
Figure 3 - is the front view of the carrier related to an embodiment of the present invention.
Figure 4 - is the perspective view of the body related to an embodiment of the present invention.
Figure 5 - is the perspective view of the arm related to an embodiment of the present invention.
Figure 6 - is the perspective view of the pin related to an embodiment of the present invention.
Figure 7 - is the side cross-sectional view of the body, the carrier and the pin related to an embodiment of the present invention.
Figure 8 - is the side cross-sectional view of the body, the carrier and the pin related to an embodiment of the present invention.

[0016] The elements illustrated in the figures are numbered as follows:

1. Dishwasher
2. Rack
3. Body
4. Carrier
5. Arm
6. Housing
7. Pin
8. Recess
9. Extension
10. Channel
11. First spring
12. Pressing plate
13. Second spring
14. Ramp

[0017] The dishwasher (1) comprises a rack (2) wherein the dishes are placed; a body (3) that is disposed at both sides of the rack (2); a carrier (4) on which the body is mounted, and an arm (5) that is disposed on the body (3), that has a lock opening position that enables the body (3) to be moved on the carrier (4) when moved towards the rack (2) by applying force and that has a locking position that enables the rack (2) to be kept at the desired height by the position of the body (3) being fixed on the carrier (4) in the situation when the external force is not applied. When the arm (5) is brought to the lock opening position, the rack (2) can be moved to the higher or the lower position in the tub by means of the body (3) being slid on the carrier (4). When the arm (5) is set free, the rack (2) is fixed at the present height.

[0018] The dishwasher (1) of the present invention comprises a housing (6) disposed on the carrier (4); more than one recess (8) that is disposed on the body (3) so as to be on top of each other, and a pin (7) that can be moved with the arm (5) by contacting the arm (5), that is almost entirely outside the housing (6) so as to be seated in the recess (8) when the arm (5) is in the locking position and that is released from the recess (8) by being pushed into the housing (6) by the arm (5) while the arm (5) is brought to the lock opening position. The arm (5) extends downwards between the body (3) and the carrier (4), and is mounted on the body (3) so as to be moved by being rotated around a horizontal rotating axis. When the rack (2) is desired to be carried to the higher or the lower position from the fixed position, the user presses the arms (5) that are disposed at both sides of the rack (2) towards the rack (2) from one end. The pin (7) bearing against the other end of the arm (5) is pushed into the housing (6) by the arm (5) so as to move away from the body (3) and is released from the recess (8). Thus, the rack (2) can be moved by being slid on the carrier (4). When the arm (5) is released as the rack (2) is brought to the desired height level, the force applied by the arm (5) on the pin (7) is removed. Thus, the pin (7) moves outside the housing (6) by returning to the free position, and enables the height of the rack (2) in the cabin to be fixed by being seated in the recess (8) of the present height level of the rack (2).

[0019] In another embodiment of the present invention, a channel (10) is arranged on the arm (5), through which the end of the pin (7) passes and extends towards the body (3), and the extensions (9) that enable the pin (7) to bear against the arm (5) by contacting the edges of the arm (5) that surround the channel (10) and to move with the arm (5) extend outwards from above the pin (7). When the arm (5) is in the locking position, the end of the pin (7) is seated in the recess (8) by passing through the channel (10) so that the extensions (9) on the pin (7) bear against the arm (5). While the arm (5) is brought to the lock opening position, the protrusions bearing against the arm (5) enable the pin (7) to be pushed into the housing (6) by the arm (5). By means of the channel (10), the movement of the pin (7) is limited.

[0020] In another embodiment of the present invention, the dishwasher (1) has a first spring (11) that pushes the pin (7) outside the housing (6) when the arm (5) is in the locking position and that enables the pin (7) to be pushed into the housing (6) by being compressed while the arm (5) is brought to the lock opening position. As a result of the pressure exerted to the pin (7) by the arm (5) while the arm (5) is being moved by the user, the first spring (11) is compressed and enables pin (7) to move into the housing (6). When the arm (5) is brought to the locking position by being released, the first spring (11) that is at

least partially returned to the balance position pushes the pin (7) outside the housing (6).

[0021] In another embodiment of the present invention, a ramp (14) that has the shape of an inclined surface towards the recess (8) and that enables the pin (7) to gradually move into the recess (8) while the rack (2) is carried to a relatively higher position than the present position is disposed right under the recess (8). While the rack (2) is carried to a relatively higher position, the end of the pin (7) rubs against the ramp (14), and thus the movement of the pin (7) into the recess (8) is slowed down.

[0022] In another embodiment of the present invention, a curve that is suitable with the shape of the pin (7) is present at the upper portion of the recess (8). When the arm (5) is in the locking position, the pin (7) is seated in the recess (8) so as to bear against the curved upper wall of the recess (8). Thus, the rack (2) is enabled to be kept steady by preventing the movement of the pin (7) in the housing (6) such as sliding and vibrating.

[0023] In another embodiment of the present invention, a distance in the horizontal plane remains between the recesses (8) so that the ports of the recesses (8) move closer to the carrier (4) from the top to the bottom. By means of the recesses (8) being positioned in the horizontal direction in a sliding manner with respect to each other, the pin (7) can be leaped over the recesses (8) that are disposed in different distances to the rotating axis of the pin (7) by the arm (5) being rotated in the same angle. Thus, the height of the rack (2) is adjusted, and applying a different amount of force to the arm (5) for each height level is not needed.

[0024] In another embodiment of the present invention, the dishwasher (1) comprises a pressing plate (12) that extends outwards from the body (3) at one end of the arm (5) and that enables the user to easily move the arm (5). Thus, the area that the force is applied is moved away from the shaft, and the users can move the arm (5) by spending less force.

[0025] In another embodiment of the present invention, a second spring (13) that supports the pressing plate (12) from the back by being compressed while the arm (5) is brought to the lock opening position is disposed between the body (3) and the pressing plate (12). By means of the second spring (13) that pushes the pressing plate (12) outwards from the rack (2), the pin (7) can be leaped over the recesses (8) in a controlled manner. Thus, the pin (7) can be seated in the next lower recess (8) by being barely leaped over the recess (8), and the rack (2) is prevented from falling to the lowermost level each time.

[0026] In the dishwasher (1) of the present invention, the pin (7) can linearly move in the horizontal direction by means of the structure of the pin (7) that is independent from the arm (5), and thus the pin (7) is prevented from being released of the recess (8) in cases such as trying to carry the rack (2) by force, or overloading of the rack (2). Moreover, in the dishwasher (1) of the present invention, in cases the rack (2) is lifted up fast, the pin (7) is prevented from leaping several levels, and the perception of quality is increased by enabling the mechanism to operate in a more stable and balanced manner.

Claims

1. A dishwasher (1), comprising a rack (2) wherein the dishes are placed; a body (3) that is disposed at both sides of the rack (2); a carrier (4) on which the body is mounted, an arm (5) that is disposed on the body (3), that has a lock opening position that enables the body (3) to be moved on the carrier (4) when moved towards the rack (2) by applying force and that has a locking position that enables the rack (2) to be kept at the desired height by the position of the body (3) being fixed on the carrier (4) in the situation when the external force is not applied, a housing (6) arranged on the carrier (4); more than one recess (8) that is arranged on the body (3) so as to be on top of each other, and a pin (7), **characterized in that** the pin (7) is moved by means of the arm (5) by contacting the arm (5), such that the pin (7) is almost entirely outside the housing (6) so as to be seated in the recess (8) when the arm (5) is in the locking position and it is released from the recess (8) by being pushed into the housing (6) by the arm (5) while the arm (5) is brought to the lock opening position.

2. A dishwasher (1) as in Claim 1, **characterized by** a channel (10) that is arranged on the arm (5), through which the end of the pin (7) passes and extends towards the body (3), and the extensions (9) that enable the pin (7) to bear against the arm (5) by contacting the edges of the arm (5) that surround the channel (10) and to move with the arm (5) extend outwards from above the pin (7).

3. A dishwasher (1) as in any one of the above claims, **characterized by** a first spring (11) that pushes the pin (7) outside the housing (6) when the arm (5) is in the locking position and that enables the pin (7) to be pushed into the housing (6) by being compressed while the arm (5) is brought to the lock opening position.

4. A dishwasher (1) as in any one of the above claims, **characterized by** a ramp (14) that is disposed right under the recess (8), that has the shape of an inclined surface towards the recess (8) and that enables the pin (7) to gradually move into the recess (8) while the rack (2) is carried to a relatively higher position than the present position.

5. A dishwasher (1) as in any one of the above claims, **characterized by** the recess (8) that has a curve at the upper portion that matches the shape of the pin (7).

6. A dishwasher (1) as in any one of the above claims, **characterized by** the recesses (8) that have a distance there between in the horizontal plane so that the ports of the recesses (8) move closer to the carrier (4) from the top to the bottom.

7. A dishwasher (1) as in any one of the above claims, **characterized by** a pressing plate (12) that is disposed at one end of the arm (5), that extends outwards from the body (3) and that enables the user to easily move the arm (5).

8. A dishwasher (1) as in any one of the above claims, **characterized by** a second spring (13) that is disposed between the body (3) and the pressing plate (12) and that supports the pressing plate (12) from the back by being compressed while the arm (5) is brought to the lock opening position.

Patentansprüche

1. Eine Geschirrspülmaschine (1) umfasst einen Gestell (2), worin das Geschirr gestellt wird; einen Körper (3), der an beiden Seiten des Gestells (2) angeordnet ist; einen Träger (4), an dem der Körper (3) angebracht ist und einen Arm (5) der an dem Körper (3) angeordnet ist und einer Verriegelungsöffnungsposition aufweist, die es ermöglicht, das Gestell (2) auf der gewünschten Höhe zu halten, indem die Position des Körpers (3) auf dem Träger in dem Gestell fixiert wird und in der die äußere Kraft nicht aufgebracht wird; ein Gehäuse (6), das an dem Träger (4) angeordnet ist, mehrere Aussparungen (8), die an dem Körper (3) übereinander angeordnet sind und einen Stift; gekennzeichnet ist es dadurch, dass der Stift (7) mithilfe des Arms (5) durch Berühren des Arms (5) bewegt wird, so dass sich der Stift (7) nahezu vollständig außerhalb des Gehäuses (6) befindet, um in der Aussparung (8) zu sitzen, wenn sich der Arm (5) in der Verriegelungsposition befindet und freigegeben aus der Aussparung (8) ist, indem er durch den Arm (5) in das Gehäuse (6) gedrückt wird, während der Arm (5) in die Verriegelungsöffnungsposition gebracht wird.

2. Eine Geschirrspülmaschine (1), wie in Anspruch 1 aufgeführt, **ist dadurch gekennzeichnet, dass** der am Arm (5) angeordnete Kanal (10), durch den das Ende des Stiftes (7) verläuft und sich in die Richtung des Körpers (3) erstreckt und die Verlängerungen (9), mit denen der Stift (7) am Arm (5) anliegt, indem er die Kanten des Arms (5) berührt, die den Kanal (10) umgeben und die sich mit dem Arm (5) von oben nach außen mit dem Stift (7) bewegen.

3. Eine Geschirrspülmaschine (1), wie in den vorherigen Ansprüchen aufgeführt, **ist dadurch gekennzeichnet, dass** eine erste Feder (11) den Stift (7) außerhalb des Gehäuses (6) drückt wenn sich der Arm (5) in der Verriegelungsposition befindet und es ermöglicht, dass der Stift durch Zusammendrücken in das Gehäuse (6) gedrückt wird, während der Arm (5) in die Verriegelungsöffnungsposition gebracht wird.

4. Eine Geschirrspülmaschine (1), wie in den vorherigen Ansprüchen aufgeführt, **ist dadurch gekennzeichnet, dass** eine Rampe (14) direkt unter der Aussparung (8) angeordnet ist und eine Form einer geneigten Oberfläche in Richtung der Aussparung (8) hat und es ermöglicht, dass der Stift (7), um sich in die Aussparung (8) zu bewegen, während das Gestell (2) in eine relativ höhere Position als die gegenwärtige Position gebracht wird.

5. Eine Geschirrspülmaschine (1), wie in den vorherigen Ansprüchen aufgeführt, **ist dadurch gekennzeichnet, dass** die Aussparung (8), die im oberen Bereich eine Krümmung aufweist und der Form des Stifts (7) entspricht.

6. Eine Geschirrspülmaschine (1), wie in einem der vorherigen Ansprüchen aufgeführt, **ist dadurch gekennzeichnet, dass** die Aussparungen (8), die in der horizontalen Ebene einen Abstand zwischen sich haben, so dass sich die Öffnungen der Aussparungen (8) näher an den Träger (4), von oben nach unten bewegen.

7. Eine Geschirrspülmaschine (1), wie in einem der vorherigen Ansprüchen aufgeführt, **ist dadurch gekennzeichnet, dass** eine Druckplatte (12), die an einem Ende des Arms (5) angeordnet ist, sich vom Körper (3) nach außen erstreckt und dem Benutzer es ermöglicht, dass der Arm (5) leicht bewegt werden kann.

8. Eine Geschirrspülmaschine (1), wie in einem der vorherigen Ansprüchen aufgeführt, **ist dadurch gekennzeichnet, dass** eine zweite Feder (13), die zwischen dem Körper (3) und der Druckplatte (12) angeordnet ist und die Druckplatte (12) abstützt und den Rücken zusammendrückt, während der Arm (5) in die Verriegelungsöffnungsposition gebracht wird.

Revendications

1. Un lave-vaisselle (1), comprenant un rayon (2) dans laquelle sont placés les plats; un corps (3) qui est disposé des deux côtés du rayon (2); un support (4) sur lequel est monté le corps et un bras (5) disposé sur le corps (3), qui présente une position d'ouverture du verrou permettant au corps (3) de se déplacer sur le support (4) lorsqu'il est déplacé vers le rayon

(2) sous l'effet d'une force et qu'il possède une position de verrouillage permettant de maintenir le rayon (2) à la hauteur souhaitée par la position du corps (3) fixée sur le support (4) dans le dans le cas où la force externe n'est pas appliquée, un boitier (6) disposé sur le support (4); plus d'un évidement (8) qui est agencé sur le corps (3) de manière à être superposé, et une goupille (7) **caractérisée en ce que** la goupille (7) est déplacée au moyen du bras (5) en mettant en contact le bras (5), de telle sorte que la goupille (7) se trouve presque entièrement à l'extérieur du boitier (6), de manière à reposer dans l'évidement (8) lorsque le bras (5) est en position de verrouillage et qu'il est libéré depuis l'évidement (8) en étant poussés dans le boitier (6) par le bras (5) pendant que le bras (5) est amené dans la position d'ouverture du verrou

2. Un lave-vaisselle (1) selon la déclaration 1, **caractérisé par** un canal (10) qui est agencé sur le bras (5) à travers lequel l'extrémité de la goupille (7) passe et s'étend vers le corps (3), et les extensions (9) qui permettent à la goupille (7) de prendre appui sur le bras (5) en touchant les bords du bras (5) entourant le canal (10) et de se déplacer avec le bras (5) s'étendant vers le haut depuis l'extérieur de la goupille (7).

3. Un lave-vaisselle (1) selon l'une quelconque des déclarations précédentes, **caractérisé par** un premier ressort (11) qui pousse la goupille (7) à l'extérieur du boîtier (6) lorsque le bras (5) est en position de verrouillage et que permet de pousser la goupille (7) dans le boitier (6) en la comprimant pendant que le bras (5) est amené dans la position d'ouverture du verrou.

4. Un lave-vaisselle (1) selon l'une quelconque des déclarations précédentes, **caractérisé par** une rampe (14) disposée juste sous l'évidement (8), qui a la forme d'une surface inclinée vers l'évidement (8) et permet à la goupille (7) de se déplacer progressivement dans l'évidement (8) tandis que le rayon (2) est porté dans une position relativement plus haute que la position actuelle.

5. Un lave-vaisselle (1) selon l'une quelconque des déclarations précédentes, **caractérisé par** l'évidement (8) qui présente une courbe à la partie supérieure qui correspond à la forme de la goupille (7).

6. Un lave-vaisselle (1) selon l'une quelconque des déclarations précédentes, **caractérisé en ce que** les évidements (8) sont espacés dans le plan horizontal de sorte que les ports des évidements (8) se rapprochent au support (4) du haut vers le bas.

7. Un lave-vaisselle (1) selon l'une quelconque des déclarations précédentes, **caractérisé par** une plaque de pression (12) qui est disposée à une extrémité du bras (5), qui s'étend vers l'extérieur du corps (3) et qui permet à l'utilisateur de déplacer facilement le bras (5).

8. Un lave-vaisselle (1) selon l'une quelconque des déclarations précédentes, **caractérisé par** un second ressort (13) disposé entre le corps (3) et la plaque de pression (12) et supportant la plaque de pression (12) par l'arrière pendant que le bras (5) est amené dans la position d'ouverture du verrou.

Figure 1

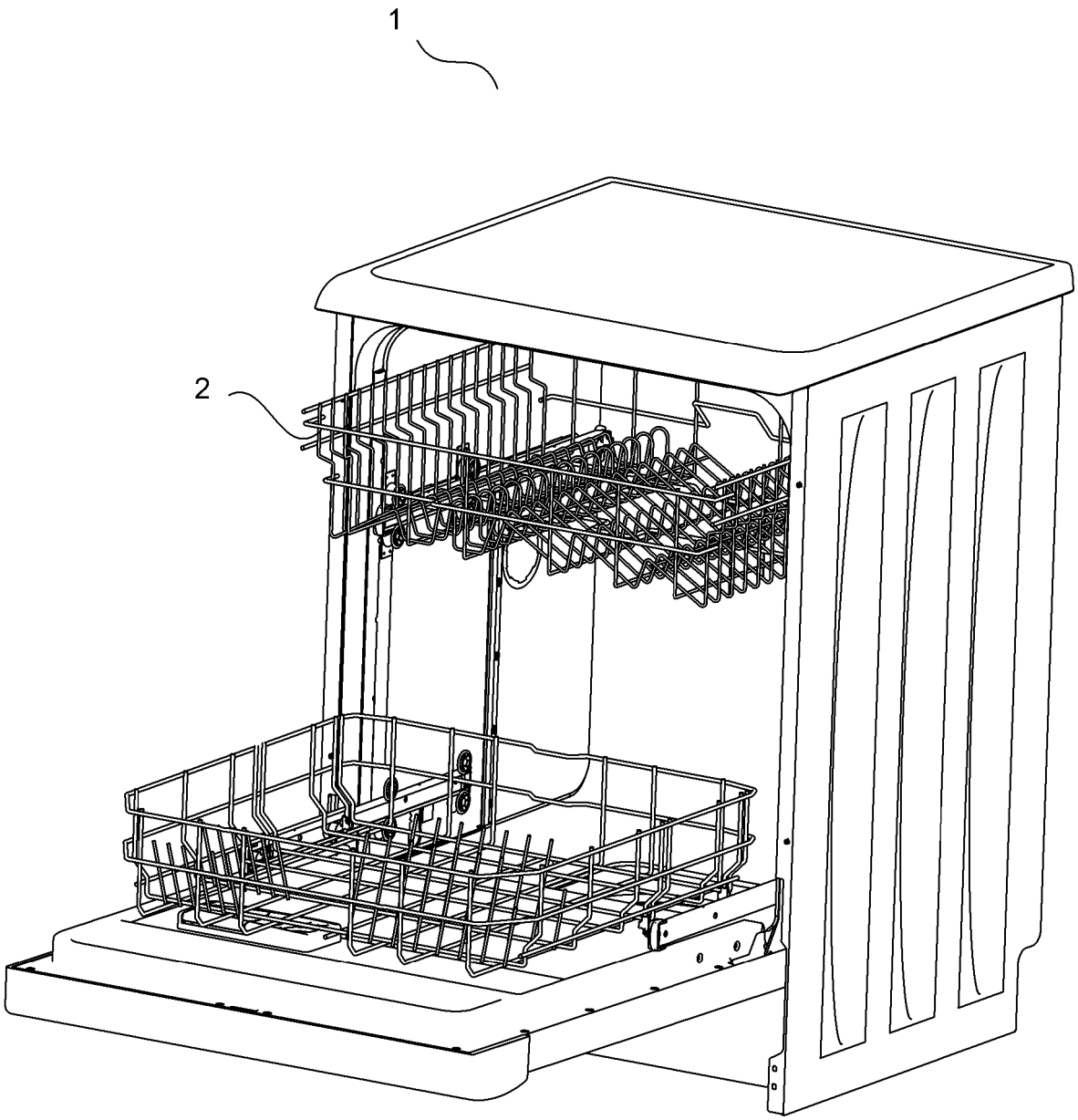


Figure 2

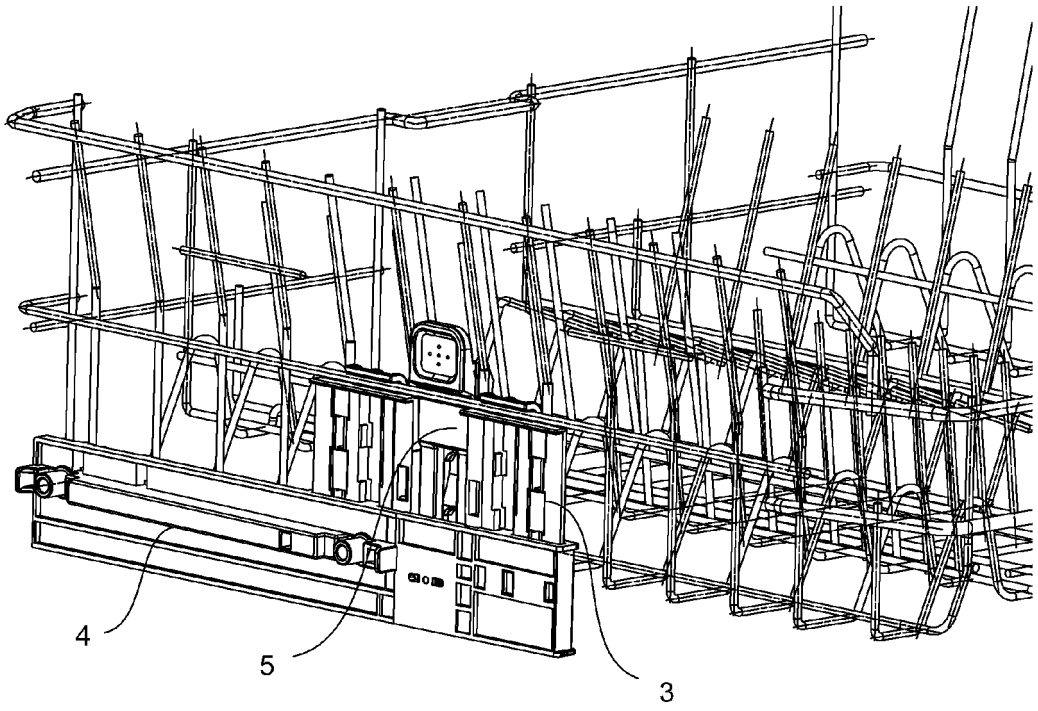


Figure 3

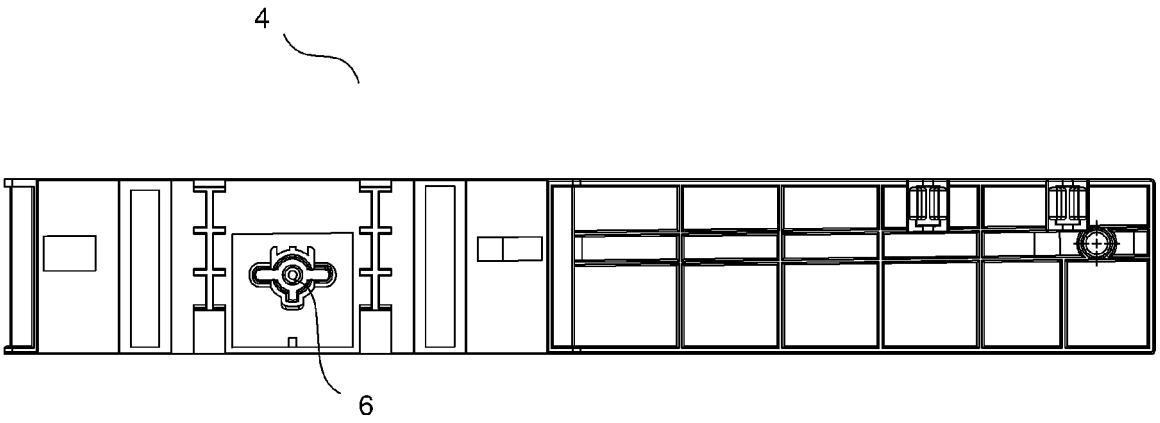


Figure 4

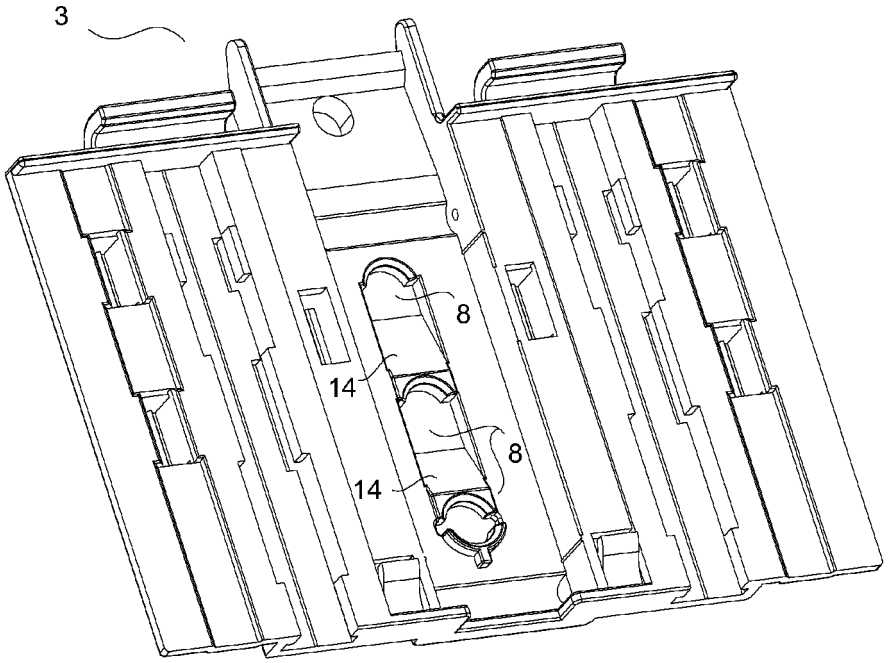


Figure 5

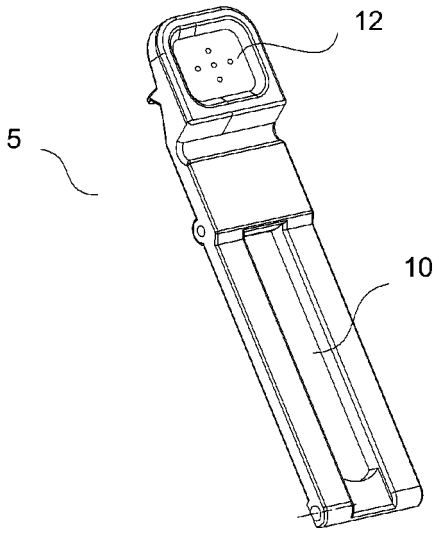


Figure 6

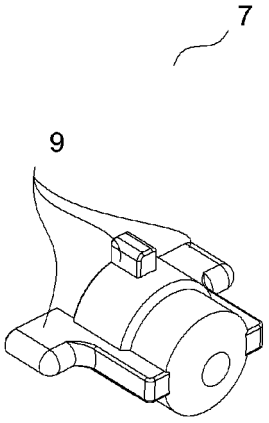
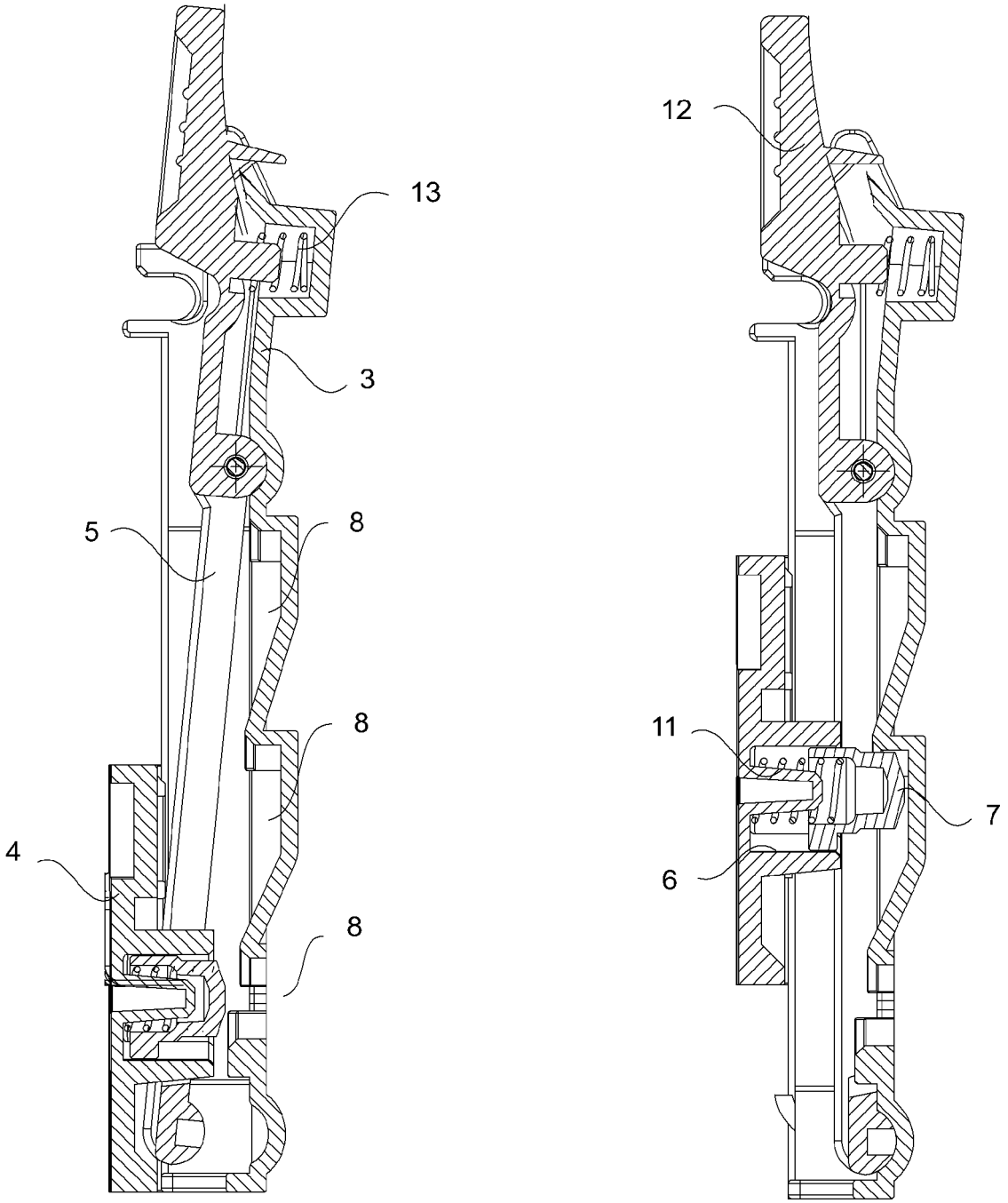


Figure 7



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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