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(54) CLEANING DEVICE OF A DISHWASHER AND METHOD FOR UNCLOGGING THE OUTLET NOZZLES OF THE SPRAY ARMS OF THE CLEANING DEVICE

(57) Cleaning device (100) of a dishwasher comprising a plurality of spray arms (1), each arm (1) comprising a plurality of outlet nozzles (1a), and a method for unclogging the outlet nozzles (1a) of said arms (1). The arms (1) are adapted to be fixed inside the washing chamber of the dishwasher, and the outlet nozzles (1a) are configured to project into the washing chamber a cleaning fluid circulating through the respective arm (1). Each arm (1) comprises at least one evacuation opening (2a) arranged downstream of the outlet nozzles (1a), such that when said evacuation opening (2a) is closed, the cleaning fluid is projected through the nozzles (1a) to clean the products arranged in the dishwasher, and when the evacuation opening (2a) is open, the cleaning fluid flows out through the evacuation opening (2a), dragging any impurities that may be inside the arm (1) and ejecting them through the evacuation opening (2a). Each arm (1) has a washing position in which the evacuation opening (2a) is closed, and a self-cleaning position in which the evacuation opening (2a) is open.

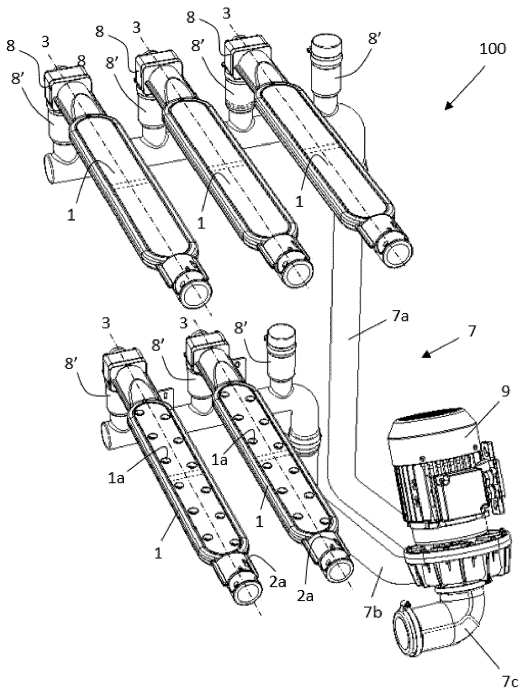

FIG. 2A

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Description

TECHNICAL FIELD

[0001] The present invention relates to cleaning devices of dishwashers comprising spray arms.

PRIOR ART

[0002] The dishwasher is an appliance that projects a fluid, usually water, onto the crockery, cutlery, glassware and utensils, usually kitchen utensils, either mixed with detergent at the beginning or pure at the end to rinse, by means of spray arms. The products to be cleaned are usually placed in baskets that are housed inside the washing chamber of the dishwasher.

[0003] Usually, the fluid is accumulated in the washing chamber and is pumped into the spray arms, being projected back into the washing chamber through outlet nozzles comprised in the spray arms, cleaning the products arranged in the washing chamber, i.e. crockery, cutlery, glassware and utensils. The fluid is usually recirculated to save water and energy, and therefore, the spray arms become clogged very often by the dirt accumulated in the washing chamber.

[0004] In the state of the art there are known solutions in which the spray arms are removed for cleaning and then they are reassembled, but there are also known solutions in which the spray arms do not have to be disassembled.

[0005] In this regard, document WO2019191182A1 describes a dishwasher comprising a washing chamber in which the products to be cleaned are arranged. The dishwasher comprises a plurality of spray arms arranged inside the washing chamber. Each arm comprises a plurality of outlet nozzles configured to project into the washing chamber the cleaning fluid circulating through the respective arm. The spray arms are arranged in parallel. The distal end of each arm comprises an orifice, the orifices of all the arms being covered by a pivotable movable cover which in normal operation of the dishwasher obstructs these orifices. However, when the cover is pivoted, the orifices of the arms are open, providing access to the inside of the spray arms. When the cover is pivoted, it is not possible to close the dishwasher's door.

DISCLOSURE OF THE INVENTION

[0006] An object of the invention is to provide a cleaning device of a dishwasher, as defined in the claims.

[0007] Another object of the invention is to provide a dishwasher comprising the cleaning device of the invention.

[0008] Another object of the invention is to provide a method for unclogging the outlet nozzles of the spray arms of the cleaning device of the invention.

[0009] The dishwasher of the invention comprises a washing chamber where the products to be cleaned and the cleaning device according to the invention are arranged. The cleaning device of the invention comprises a plurality of spray arms adapted to be fixed inside the washing chamber. Each arm comprises a plurality of outlet nozzles configured to project into the washing chamber a cleaning fluid circulating through the respective arm, and at least one evacuation opening arranged downstream of the outlet nozzles according to the flow direction of the cleaning fluid, such that when said evacuation opening is closed, the cleaning fluid is projected through the nozzles to clean the products arranged inside the washing chamber, and when said evacuation opening is open, the cleaning fluid flows out through the evacuation opening, said cleaning fluid dragging the impurities that may be inside the arm to eject them through the evacuation opening. Each arm has a washing position in which the evacuation opening is closed, and a self-cleaning position in which the evacuation opening is open.

[0010] In the method for unclogging the outlet nozzles of the spray arms of the cleaning device of the invention, the evacuation openings of each arm are first opened and then the cleaning fluid is circulated under pressure through each spray arm, the cleaning fluid flowing out from each arm into the washing chamber through the corresponding evacuation opening, the cleaning fluid dragging any impurities that may be inside the arm and ejecting them through said evacuation opening into the washing chamber.

[0011] With the cleaning device and the method of the invention, it is possible to unclog the outlet nozzles of the spray arms without having to disassemble the spray arms from the dishwasher, which makes this task much easier. Moreover, by circulating the cleaning fluid inside the arms to unclog the outlet nozzles, the cleaning process of the spray arms is more efficient and faster as all the arms are cleaned at the same time.

[0012] These and other advantages and features of the invention will become apparent in view of the figures and the detailed description of the invention.

DESCRIPTION OF THE DRAWINGS

[0013]

Figure 1 shows a perspective view of an embodiment of the dishwasher according to the invention comprising the cleaning device according to the invention.

Figure 2A shows a perspective view of an embodiment of the cleaning device according to the invention, the spray arms being in the washing position.

Figure 2B shows the cleaning device of Figure 2A but with the spray arms being in the self-cleaning position.

Figure 3 shows another perspective view of the

cleaning device of Figure 2A, showing part of the attaching device of the spray arms of the cleaning system to the washing chamber of the dishwasher.

Figure 4A shows a front view of a part of the cleaning device of Figure 3, the spray arms being in the washing position.

Figure 4B shows another front view of the part of the cleaning device shown in Figure 4A but with the spray arms being in the self-cleaning position.

Figure 5A shows a detail in perspective of one of the spray arms of the cleaning device shown in Figure 2B, said spray arm being in the self-cleaning position.

Figure 5B shows another detail in perspective of the arm shown in Figure 5A, but in this case the arm being in the washing position.

Figure 6 shows a perspective and exploded view of one of the spray arms of Figure 2A and part of the system for attaching the arm to the washing chamber of the dishwasher.

DETAILED DISCLOSURE OF THE INVENTION

[0014] Figure 1 shows a perspective view of a first embodiment of the dishwasher 200 according to the invention. Said dishwasher 200 comprises a washing chamber 201 where some products to be cleaned are arranged, for example crockery, kitchenware, cutlery, glassware and other utensils, usually kitchen utensils, and the cleaning device 100 according to the invention, as can be seen in Figure 1.

[0015] The cleaning device 100 of the invention comprises a plurality of spray arms 1 adapted to be fixed inside the washing chamber 201. In the preferred embodiment of the invention the arms 1 are adapted to be fixed both at the top and at the bottom of the washing chamber 201. Thus, as shown in the non-limiting example of Figure 2A, the cleaning device 100 comprises two levels of arms 1, providing arms 1 at different heights inside the washing chamber 201 of the dishwasher 200, i.e. in the Z direction. In the non-limiting example of Figure 2A, three arms 1 are arranged at the upper height and two arms 1 are arranged at the lower height, although the number of arms 1 is not relevant to the invention.

[0016] The arms 1 are attached to the washing chamber 201 in a removable manner, i.e. in such a way that they can be dismounted, for example to replace an arm 1 in case of damage or to repair an arm 1.

[0017] The dishwasher 200 shown in Figure 1 is a tunnel type industrial dishwasher, also known as a conveyor dishwasher, and therefore the arms 1 are arranged in parallel, as shown for example in Figure 2A. However, the orientation and arrangement of the arms 1 is not relevant to the invention.

[0018] In the preferred embodiment of the invention, each arm 1 comprises a plurality of outlet nozzles 1a, as can be seen for example in Figure 6, configured to project into the washing chamber 201 a cleaning fluid circulating through the respective arm 1, and at least one evacuation opening 2a arranged downstream of the outlet nozzles 1a according to the flow direction of the cleaning fluid. When said evacuation opening 2a is closed, the cleaning fluid is projected through the nozzles 1a to clean the products arranged inside the washing chamber 201, and when said evacuation opening 2a is open, the greater quantity of the cleaning fluid flows out through the evacuation opening 2a, said cleaning fluid dragging the impurities that may be inside the arm 1 to eject them through the evacuation opening 2a. Each arm 1 has a washing position in which the evacuation opening 2a is closed, the aim being that the cleaning fluid only flows out through the outlet nozzles 1a to clean the products arranged inside the washing chamber 201, and a self-cleaning position, different from the washing position, in which the evacuation opening 2a is open, the aim being that the greater part of the cleaning fluid flows out through the evacuation opening 2a, dragging the impurities deposited inside the corresponding arm 1 in its path, and which clog the outlet nozzles 1a, to eject them out of the arm 1.

[0019] The cleaning fluid can be pure water, or a mixture of water, rinse aid and/or detergent.

[0020] Therefore, with the cleaning system 100 of the invention it is possible to unclog the outlet nozzles 1a of the spray arms 1 without disassembling the arms 1 from the dishwasher, which makes this task much easier. Furthermore, by circulating the cleaning fluid inside the arms 1a to unclog the outlet nozzles 1a, the cleaning process of the spray arms 1 is more efficient and faster as all the arms 1 are cleaned at the same time. As the cleaning of the arms 1 is carried out while the dishwasher 200 is running, as will be detailed further below, the cleaning fluid enters the arms 1 under pressure, effectively evacuating any residue that may be inside the corresponding arm 1, being a very fast operation that takes only a few seconds.

[0021] Each spray arm 1, according to the preferred embodiment of the invention, comprises a main body 4 comprising the outlet nozzles 1a and the evacuation opening 2a, as can be seen for example in Figure 6, and a plug 5 coupled to one end of said main body 4 so that the angular position between the main body 4 and the plug 5 can be varied. The cleaning fluid enters the corresponding arm 1 at one end of the main body 4 and as the opposite end of the main body 4 is plugged by the plug 5, said cleaning fluid flows out through the outlet nozzles 1a under pressure, the cleaning fluid being sprayed, i.e. projected, towards the interior of the washing chamber 201. Removing the plug 5 allows access to the interior of the main body 4, but as will be explained further below, with the cleaning device of the invention it is not necessary to remove the plug 5 in order to clean

the interior of the main body 4.

[0022] In the preferred embodiment of the invention, part of the plug 5 of each arm 1 is housed inside the main body 4 so that the main body 4 can rotate with respect to the plug 5, and therefore, the evacuation opening 2a is arranged in the main body 4.

[0023] As can be seen in the detail of Figures 5A and 5B, each plug 5 comprises a complementary opening 2b, such that in the washing position of the corresponding arm 1 the main body 4 and the plug 5 are arranged in an initial relative angular position in which the evacuation opening 2a and the complementary opening 2b are not overlapping and therefore, said evacuation opening 2a remains open, and in the self-cleaning position the main body 4 and the plug 5 are arranged in a different relative angular position in which the evacuation opening 2a and the complementary opening 2b are overlapped and therefore the evacuation opening 2a remains open as the plug 5 does not obstruct the evacuation opening 2a.

[0024] Figure 5A shows the relative angular position between the main body 4 and the respective plug 5 where the evacuation opening 2a is open. In such an angular position, the evacuation opening 2a of the main body 4 and the complementary opening 2b of the respective plug 5 are overlapped, and furthermore aligned, so that the plug 5 itself does not obstruct part of the evacuation opening 2a. In the preferred embodiment of the invention the cross-section of the complementary opening 2b is equal to or larger than the cross-section of the respective evacuation opening 2a, preferably larger, thus ensuring, the full opening of the evacuation opening 2a when the respective arm 1 is arranged in the self-cleaning position. In the context of the invention that the evacuation opening 2a and the complementary opening 2b are overlapping means that both openings 2a and 2b are overlapping each other totally or partially. In this respect, in the self-cleaning position the overlap between the evacuation opening 2a and the corresponding complementary opening 2b is total, so that the passage opening 2 formed by the overlap between both openings 2a and 2b (so that the cleaning fluid can flow out into the washing chamber 201) is the maximum, the passage area of the passage opening 2 being in this case conditioned by the passage area of the evacuation opening 2a not obstructed by the plug 5, the evacuation opening 2a in the preferred embodiment of the invention being the opening arranged closest to the washing chamber 201. That is to say, when the spray arms 1 are arranged in the self-cleaning position the evacuation opening 2a and the respective complementary opening 2b of each arm 1 face each other and are aligned, such that, if both openings 2a, 2b are equal, i.e, if the cross-section of both openings 2a and 1b are equal, the passage opening 2 with a passage area equal to the passage area of the openings 2a and 2b is generated, and, if the openings 2a and 2b are different, a passage opening 2 with a passage area equal to the passage area of the smaller opening 2a or 2b is generated. In the self-cleaning position therefore, the evacuation opening 2a is communicated with the interior of the corresponding arm 1 through the passage opening 2 formed.

[0025] Figure 5B shows the initial relative angular position between the main body 4 and the respective plug 5 where the evacuation opening 2a is closed. In this relative angular position, the evacuation opening 2a of the main body 4 and the complementary opening 2b of the respective plug 5 are not overlapping, not even partially, so that a part of the plug 5 completely obstructs the evacuation opening 2a, so that no passage opening 2 is generated through which the cleaning fluid can flow out into the washing chamber 201.

[0026] In a non-limiting example of the invention the cross-section of the evacuation opening 2a of each arm 1 is greater than or equal to the sum of the cross-sections of the outlet nozzles 1a of said arm 1, at least if said arm 1 comprises a single evacuation opening 2a. In another non-limiting example of the invention wherein each arm 1 comprises more than one evacuation opening 2a, the sum of the cross sections of the evacuation openings 2a will be greater than or equal to the sum of the cross sections of the outlet nozzles 1a of said arm 1.

[0027] In the preferred embodiment of the invention, each spraying arm 1 comprises two evacuation openings 2a arranged downstream of the outlet nozzles 1a (according to the flow direction of the cleaning fluid), said evacuation openings 2a being preferably facing each other, as will be detailed further below. Of course, for each evacuation opening 2a there is a respective complementary opening 2b.

[0028] As there are two evacuation openings 2a, the total cross-section through which the cleaning fluid has to flow out is increased, and therefore, it is prioritised that the largest amount of the cleaning fluid is evacuated from the arms 1 through said evacuation openings 2a, and not through the outlet nozzles 1a, without the need to create a single evacuation opening 2a with an excessively large cross-section.

[0029] In the preferred embodiment of the invention the plug 5 is housed inside the corresponding end of the main body 4 and therefore the evacuation openings 2a are disposed in the main body 4, as already discussed, and the complementary openings 2b in the plug 5, the main body 4 being in this case configured to rotate with respect to the plug 5 to move from the washing position to the self-cleaning position and vice versa. However, in a variant of the invention wherein the end of the main body 4 cooperating with the corresponding plug 5 would be disposed inside said plug 5, then the evacuation openings 2a would be disposed in the plug 5 and the complementary openings 2b in the main body 4, the plug 5 being in this case configured to rotate with respect to the main body 4 to move from the washing position to the self-cleaning position and vice versa, the operation of the arm 1 being otherwise the same.

[0030] In the preferred embodiment of the invention the plug 5 is configured to be fixed to the washing cham-

ber 201, as will be detailed further below, the main body 4 being axially attached (in the Y direction of the figures) in a removable manner inside the washing chamber 201 through said plug 5 and through a bracket 6 to which the other end of the main body 4 is coupled, said main body 4 being rotatable with respect to the plug 5 and the bracket 6. The bracket 6 comprises a conduit 6a, as shown in Figure 6, through which the cleaning fluid is supplied to the interior of the main body 4, said conduit 6a being connected to a hydraulic circuit, as will be detailed further below.

[0031] In the preferred embodiment of the invention the main body 4 comprises a central area 4a comprising the outlet nozzles 1a and a coupling area 4b at each end, as shown in Figure 6, such that the coupling areas 4b are rotatably coupled to a part of the plug 5 and to the support 6, the evacuation openings 2a being arranged in the coupling area 4b downstream of the central area 4a according to the direction of the cleaning flow, i.e. in the coupling area 4b cooperating with the plug 5.

[0032] In the preferred embodiment of the invention, the coupling areas 4b of each arm 1 comprise a circular cross-section to facilitate pivoting between the plug 5 and the corresponding coupling area 4b, and the bracket 6 and the corresponding coupling area 4b. Accordingly, and similarly, the section of the plug 5 cooperating with the corresponding coupling area 4b and the bracket 6 also comprise a circular cross-section, as can be seen in Figure 6.

[0033] In the preferred embodiment of the invention, wherein each arm 1 comprises two evacuation openings 2a, said evacuation openings 2a are arranged diametrically opposite each other in the corresponding coupling area 4b, as shown in Figure 6, so that they face each other. Similarly, in order to each complementary opening 2b can cooperate with the corresponding evacuation opening 2a to form a respective passage opening 2, both complementary openings 2b are also arranged diametrically opposite each other in the corresponding plug 5, facing each other.

[0034] In the spray arms 1 arranged in the upper part of the washing chamber 201 the spray nozzles 1a are arranged downwards, i.e. in such a way that they face towards the centre of the washing chamber 201. In contrast, in the arms 1 arranged in the lower part of the washing chamber 201 the spray nozzles 1a are arranged upwards, i.e. so that they also face towards the centre of the washing chamber 201. Therefore, as each spray arm 1 can be arranged both at the top of the washing chamber 201 and at the bottom, in the preferred embodiment of the invention the evacuation openings 2a of each arm 1 are arranged in such a way that said evacuation openings 2a are opened by turning the main body 4 counterclockwise, both in the upper and in the lower arms 1. Of course, the evacuation openings 2a could also have been designed to open when the main body 4 is rotated clockwise.

[0035] In the preferred embodiment of the invention, to change the position of the spray arms 1, i.e. to change the position of the arms 1 from the washing position to the self-cleaning position or vice versa, only the central area 4a of the main body 4 is rotated manually, thus varying the angular position between the main body 4 and the plug 5, as shown for example in Figures 5B or 6. In a variant not shown in the drawings, the main body 4 could include a handle to facilitate manual rotation of the main body 4.

[0036] Likewise, to facilitate this task, in case it is carried out manually, each spray arm 1 comprises visual signals to indicate both the washing position and the self-cleaning position of each arm 1. In this regard, in a non-limiting example of the invention, the plug 5 (which remains immobile with respect to the main body 4) comprises a visual mark and the main body 4 two visual marks, one for indicating the washing position of the corresponding arm 1 and the other for indicating the self-cleaning position, as can be seen for example in Figures 5A and 5B. To move from the washing position to the self-cleaning position, the main body 4 is rotated relative to the plug 5 until the mark on the main body 4 relative to the self-cleaning position is aligned with the mark on the plug 5. Similarly, to move from the self-cleaning position to the washing position, the main body 4 is rotated relative to the plug 5 in the opposite direction until the mark on the main body 4 relative to the washing position is aligned with the mark on the plug 5. In a variant of the invention, the plug 5 (which remains immobile) could comprise the two marks relating to the washing and the self-cleaning positions, and the main body 4 a single mark which must be aligned with one of the marks on the plug 5, depending on the operation to be carried out.

[0037] The cleaning device 100 of the invention also comprises a hydraulic circuit comprising at least one hydraulic pump 9 and at least one main conduit 7 associated with said pump 9, such that the hydraulic pump 9 conducts the cleaning fluid towards the arms 1 through the main conduit 7. As the cleaning device 100 of the invention may comprise spray arms 1 at both the top and the bottom of the washing chamber 201 of the dishwasher 200, the hydraulic circuit comprises an upper main conduit 7a leading the cleaning fluid towards the arms 1 arranged at the top of the chamber 201 and a lower main conduit 7b leading the cleaning fluid towards the arms 1 arranged at the bottom of the chamber 201, as can be seen in Figure 2A.

[0038] The dishwashing machine 200 of the invention comprises a tank, not shown in the figures, containing the cleaning fluid which is continuously circulated through the spray arms 1 of the cleaning device 100. The cleaning fluid evacuated into the washing chamber 201 by the spray arms 1 returns back to said tank. The cleaning fluid of the tank is usually renewed automatically with the rinsing water or by an automatic or manual renewal of the rinsing tank.

[0039] The hydraulic circuit also comprises an inlet conduit 7c associated with the hydraulic pump 9, said

inlet conduit 7c being configured to be in fluidic communication with the dishwasher tank 200.

[0040] As shown in Figure 3, each spray arm 1 is removably attached at one end to the main conduit 7, either to the upper main conduit 7a or to the lower main conduit 7b, via a respective connector 8 which is coupled to a branch 8' of the main conduit 7a or 7b and which comprises the conduit 6a through which the cleaning fluid enters the corresponding arm 1. The surrounding wall of said conduit 6a forms the bracket 6 to which the main body 4 of the corresponding arm 1 is coupled. On the other hand, the distal end of the arm 1 is removably attached to the washing chamber 201 through the plug 5, as detailed below.

[0041] The inner chamber 201 of the dishwasher 200 comprises a frame comprising a plurality of attachments 11a and 10a, a corresponding plug 5 being removably fixed to a respective attachment 11a or 10a so that each plug 5 hangs from a respective attachment 11a or 10a. In the upper part, the frame comprises an upper framework 11 to which upper attachments 11a are fixed in order to be able to fix the arms 1 arranged in the upper area of the washing chamber 201, and in the lower part, the frame comprises a structure 10 on which lower attachments 10a are fixed in order to be able to fix the arms 1 arranged in the lower area of the washing chamber 201. As shown in Figures 5A, 5B and 6, the plug 5 comprises a locking cap 12, removable with respect to the plug 5, to allow the assembly and disassembly of the spray arms 1.

[0042] Thus, as already described, each arm 1 is axially fixed in a removable manner between the plug 5 and the corresponding bracket 6, so that the main body 4 can rotate with respect to an axial axis 3 of the arm 1, as can be seen for example in Figures 2A and 2B. In Figure 2A the arms 1 of the cleaning device 100 of the invention are in the washing position and in Figure 2B said arms 1 are in the self-cleaning position. For a better understanding of the invention Figures 4A and 4B have been added. Figure 4A shows a front view of two spray arms 1, in this case arms 1 arranged at the bottom of the washing chamber 201, said arms 1 being in the washing position of the cleaning device 100 which corresponds to the initial relative angular position between the corresponding main body 4 and the corresponding plug 5. In Figure 4B however, the arms 1 of Figure 4A are shown but being in the self-cleaning position corresponding to a relative angular position α which differs from the initial relative angular position.

[0043] To unclog the outlet nozzles 1a of the spray arms 1 of the cleaning device 100 of the invention, proceed as follows:

- with the spray arms 1 in the washing position, where the evacuation openings 2a are closed, the evacuation openings 2a of each spray arm 1 are opened moving the arms 1 to the self-cleaning position,
- the cleaning fluid is then circulated under pressure through each spray arm 1, the cleaning fluid flowing out from each arm 1 into the washing chamber 201 through the corresponding evacuation openings 2a, dragging any impurities that may be inside the corresponding arm 1 and ejecting these impurities through the corresponding evacuation openings 2a into the interior of the washing chamber 201.

[0044] After completion of the cleaning operation of the arms 1, i.e. the unclogging operation of the arms 1, the evacuation openings 2a of the arms 1 are closed returning the arms 1 again to the washing position.

[0045] In the preferred embodiment of the invention, the opening and closing of the evacuation openings 2a is carried out manually by a user. In this case, while the dishwasher is 200 stopped, the user manually modifies the position of each arm 1 from the washing position to the self-cleaning position in order to proceed with the cleaning of the arms 1. The dishwasher 200 is then started to circulate the cleaning fluid through the spray arms 1. At the end of this operation, and with the dishwasher 200 stopped, the user manually changes again the position of the arms 1, moving the arms 1 from the self-cleaning position to the washing position. All these tasks can be synchronised by a control unit of the dishwasher 200 which will show and indicate to the user on a display screen of the dishwasher 200 step by step the operations to be carried out.

[0046] In a variant of the invention, the opening and closing of the evacuation openings 2a is carried out automatically controlled by the control unit of the dishwasher 200, before circulating the cleaning fluid through the arms 1. That is to say, the relative rotation of the main body 4 with respect to the plug 5 is carried out automatically, via the control unit. Likewise, with the arms 1 being in the self-cleaning position, the cleaning fluid is circulated through the spray arms 1 and at the end of this operation, which may take a few seconds, the arms automatically return to the washing position.

[0047] In the self-cleaning position, there are usually no products to be cleaned inside the washing chamber 201.

Claims

1. Cleaning device for a dishwasher (200), the dishwasher (200) comprising a washing chamber (201) where the products to be cleaned are arranged, and the cleaning device (100) comprising a plurality of spray arms (1) adapted to be fixed inside the washing chamber (201), each arm (1) comprising a plurality of outlet nozzles (1a) configured to project into the washing chamber (201) a cleaning fluid circulating through the respective arm (1), **characterised in that** the arms (1) also comprise at least one evacuation opening (2a) arranged downstream of the outlet nozzles (1a) according to the flow direction of the

cleaning fluid, in such a way that when said evacuation opening (2a) is closed, the cleaning fluid is projected through the nozzles (1a) to clean the products arranged inside the washing chamber (201), and when said evacuation opening (2a) is open, the cleaning fluid flows out through the evacuation opening (2a), said cleaning fluid dragging any impurities that may be inside the arm (1) and ejecting them through said evacuation opening (2a), wherein each arm (1) has a washing position in which the evacuation opening (2a) is closed, and a self-cleaning position in which the evacuation opening (2a) is open.

2. Cleaning device according to claim 1, wherein each arm (1) comprises a main body (4) comprising the outlet nozzles (1a) and the evacuation opening (2a), and a plug (5) coupled to one end of said main body (4) such that the angular position between the main body (4) and the plug (5) can be varied, the plug (5) comprising a complementary opening (2b), such that in the washing position the main body (4) and the plug (5) are arranged in an initial relative angular position in which the evacuation opening (2a) and the complementary opening (2b) do not overlap and therefore the evacuation opening (2a) remains closed, and in the self-cleaning position (1) the main body (4) and the plug (5) are arranged in a different relative angular position in which the discharge opening (2a) and the complementary opening (2b) are overlapped and therefore the discharge opening (2a) remains open.

3. Cleaning device according to claim 2, wherein when the spraying arms (1) are arranged in the self-cleaning position the evacuation opening (2a) and the complementary opening (2b) of each arm (1) face each other, in such a way that, if both openings (2a, 2b) are equal, a passage opening (2) is generated in each arm (1) with a passage area equal to the passage area of the openings (2a, 2b), and, if the openings (2a, 2b) are different, a passage opening (2) is generated with a passage area equal to the passage area of the smaller opening (2a, 2b).

4. Cleaning device according to claim 2 or 3, wherein the main body (4) is configured to rotate relative to the plug (5) to move from the washing position to the self-cleaning position and vice versa, or the plug (5) is configured to rotate relative to the main body (4) to move from the washing position to the self-cleaning position and vice versa.

5. Cleaning device according to claim 4, wherein the plug (5) is configured to be attached to the washing chamber (201), the main body (4) being attached inside the washing chamber (201) through said plug (5) and through a bracket (6) to which the other end of the main body (4) is coupled, said main body (4) being rotatable with respect to the plug (5) and the bracket (6), and the bracket (6) comprising a conduit (6a) through which the cleaning fluid is supplied to the interior of the main body (4).

6. Cleaning device according to claim 5, wherein the main body (4) comprises a central area (4a) comprising the outlet nozzles (1a), and a coupling area (4b) at each end, such that the coupling areas (4b) are rotatably coupled to the plug (5) and the bracket (6), the outlet opening (2a) being arranged in the coupling area (4b) downstream of the central area (4a).

7. Cleaning device according to claim 6, wherein the coupling zones (4b) comprise a circular cross-section and a section of the plug (5) cooperating with the corresponding coupling zone (4b) also comprises a circular cross-section.

8. Cleaning device according to any one of the preceding claims, comprising at least one hydraulic pump (9) and at least one main conduit (7a, 7b), such that the hydraulic pump (9) leads the cleaning fluid to the arms (1) through the main conduit (7a, 7b).

9. Cleaning device according to claim 8, comprising at least one spray arm (1) adapted to be fixed to the upper part of the interior of the washing chamber (201) and at least one spray arm (1) adapted to be fixed to the lower part of the interior of the washing chamber (201), so that the hydraulic pump (9) leads the cleaning fluid to the arm (1) arranged in the upper part of the washing chamber (201) through an upper main conduit (7a) and to the arm (1) arranged in the lower part of the washing chamber (201) through a lower main conduit (7b).

10. Cleaning device according to any one of the preceding claims, wherein the cross-section of the evacuation opening (2a) of each arm (1) is greater than the sum of the cross-sections of the outlet nozzles (1a).

11. Cleaning device according to any one of the preceding claims, wherein the spray arms (1) comprise two evacuation openings (2a) arranged downstream of the outlet nozzles (1a), said evacuation openings (2a) preferably being facing each other.

12. Dishwasher comprising a washing chamber (201) and a cleaning device (100) according to any one of the preceding claims.

13. Method for unclogging the outlet nozzles (1a) of the spray arms (1) of a cleaning device (100) according to any one of claims 1 to 11 of a dishwasher (200), wherein being the spray arms (1) in the washing po-

sition where the evacuation openings (2a) are closed, the evacuation openings (2a) of each spray arm (1) are opened moving the arms (1) to a self-cleaning position and then the cleaning fluid is circulated through each spray arm (1) under pressure, said cleaning fluid flowing out from each arm (1) into the washing chamber (201) through the corresponding evacuation opening (2a), dragging said cleaning fluid any impurities that may be inside the arm (1) and ejecting them through said evacuation opening (2a) into the inside of the washing chamber (201).

14. Method according to claim 13, wherein the opening of the evacuation openings (2a) of the spray arms (1) is performed manually by a user while the dishwasher (200) is stopped, and then the dishwasher (200) is started to circulate the cleaning fluid through the spray arms (1).

15. Method according to claim 13, wherein the opening of the evacuation openings (2a) of the spraying arms (1) is performed automatically before circulating the cleaning fluid through the spray arms (1).

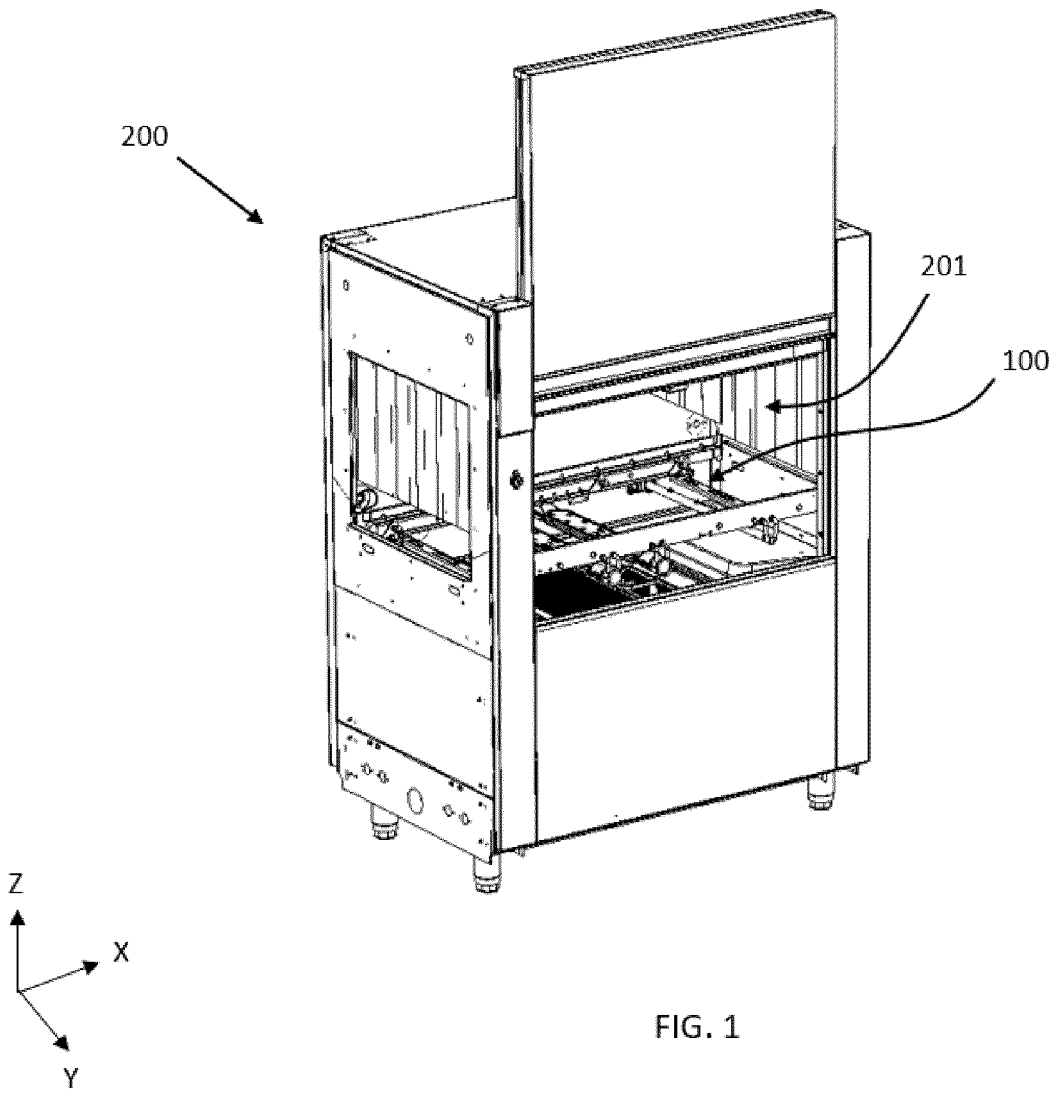

FIG. 1

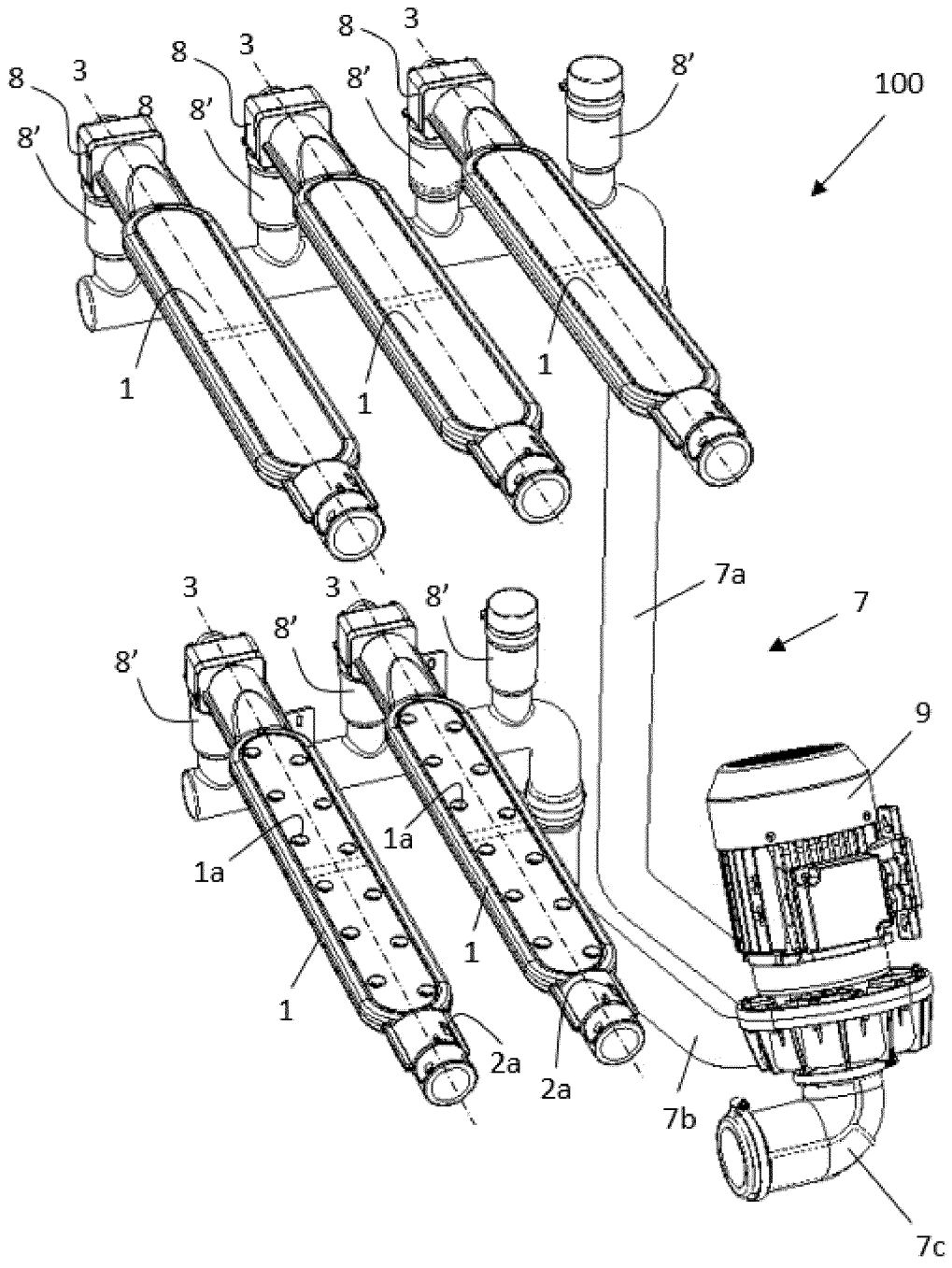

FIG. 2A

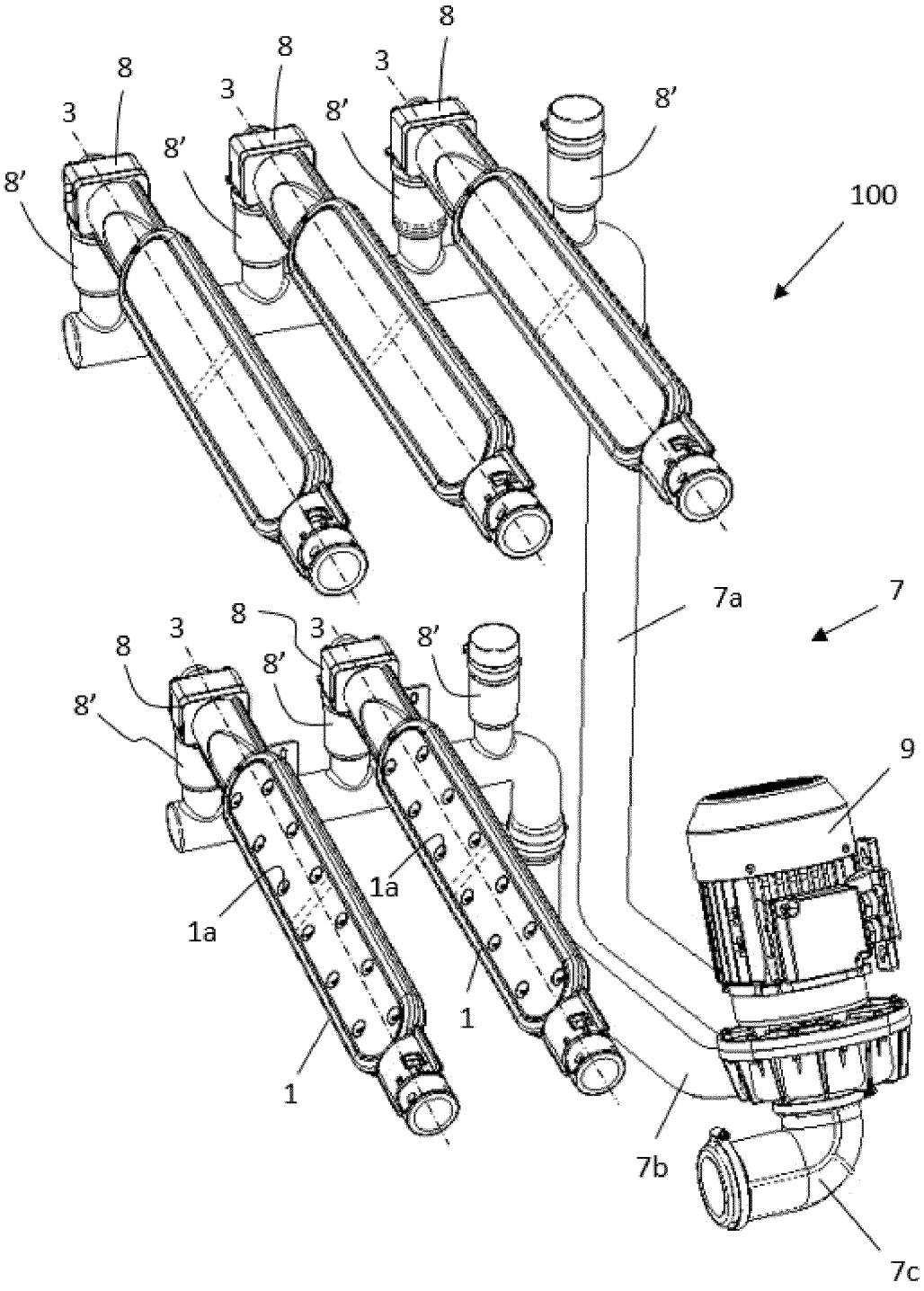

FIG. 2B

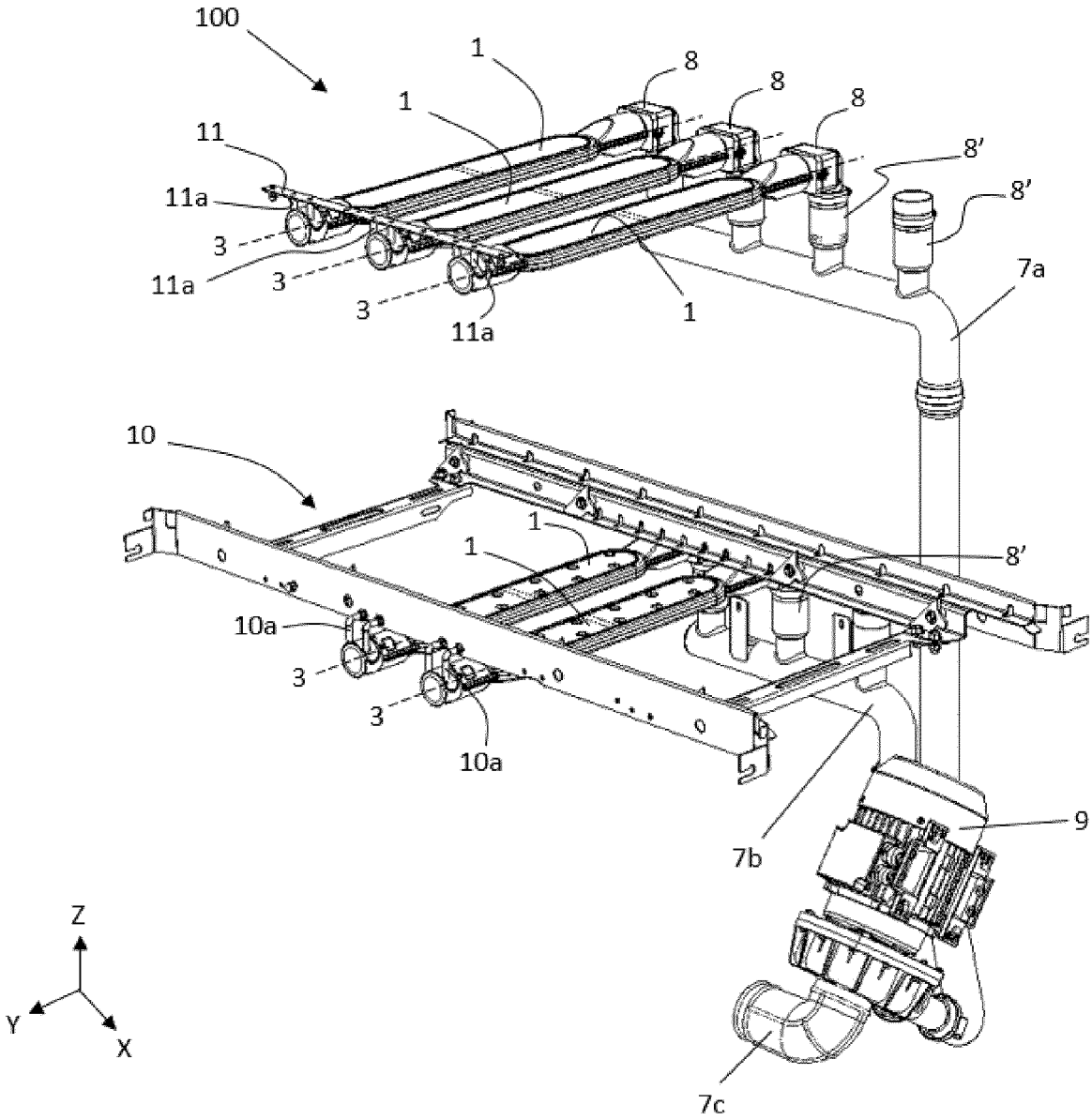

FIG. 3

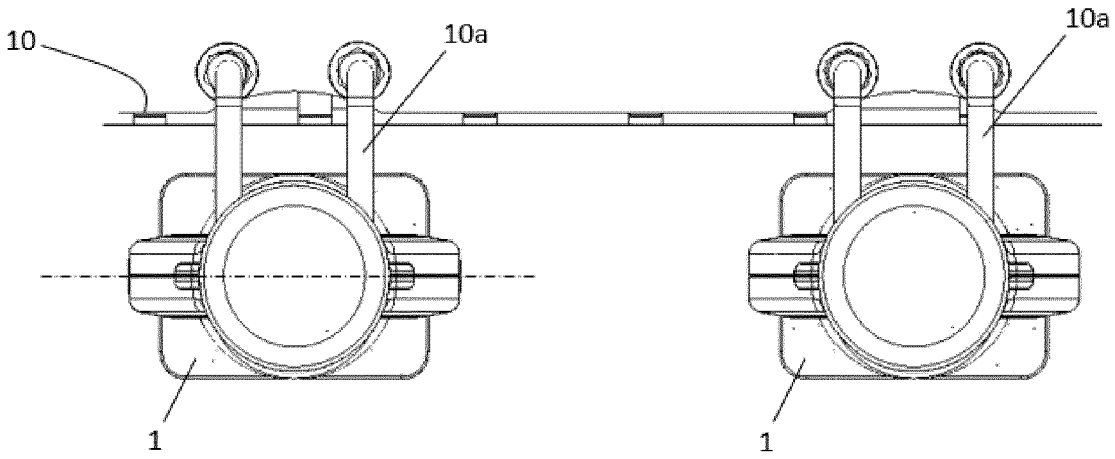

FIG. 4A

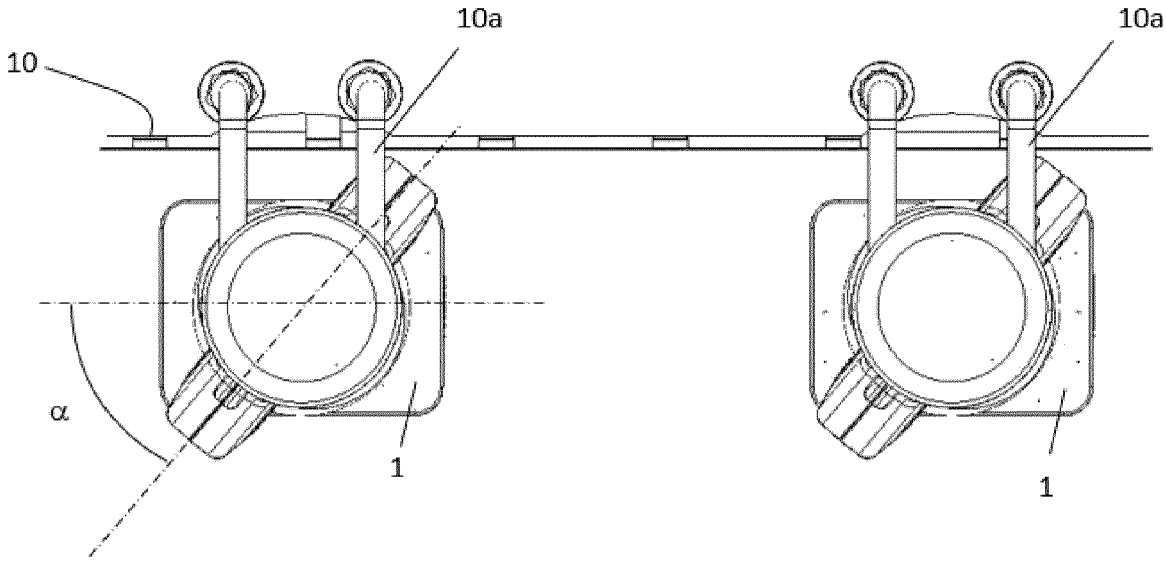

FIG. 4B

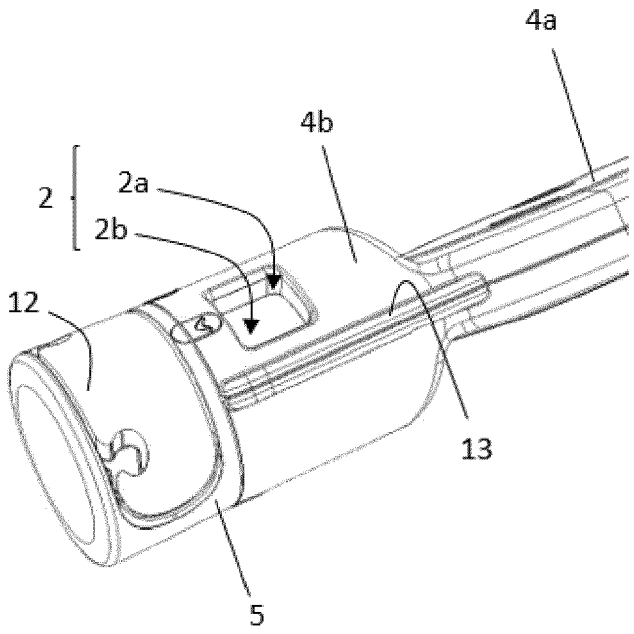

FIG. 5A

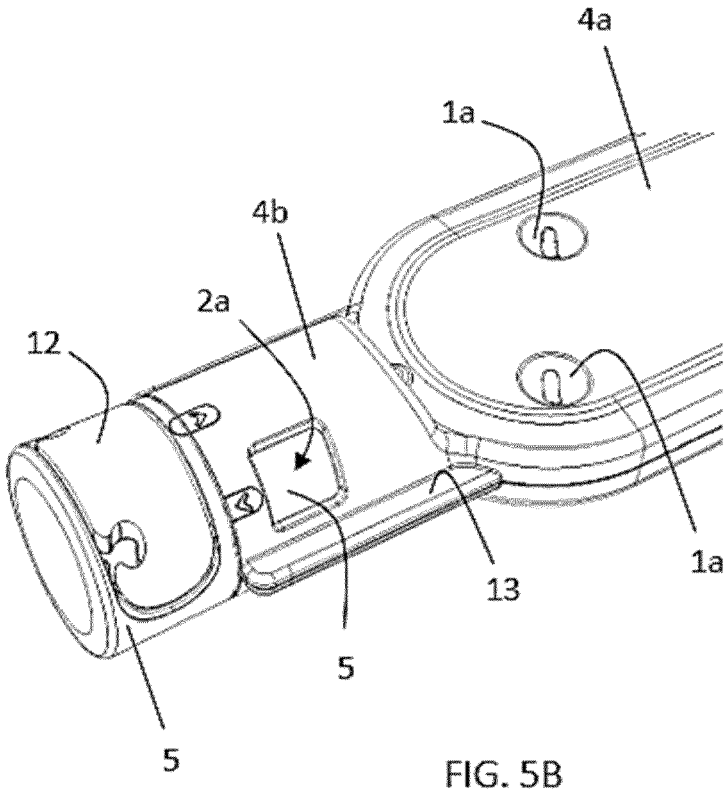

FIG. 5B

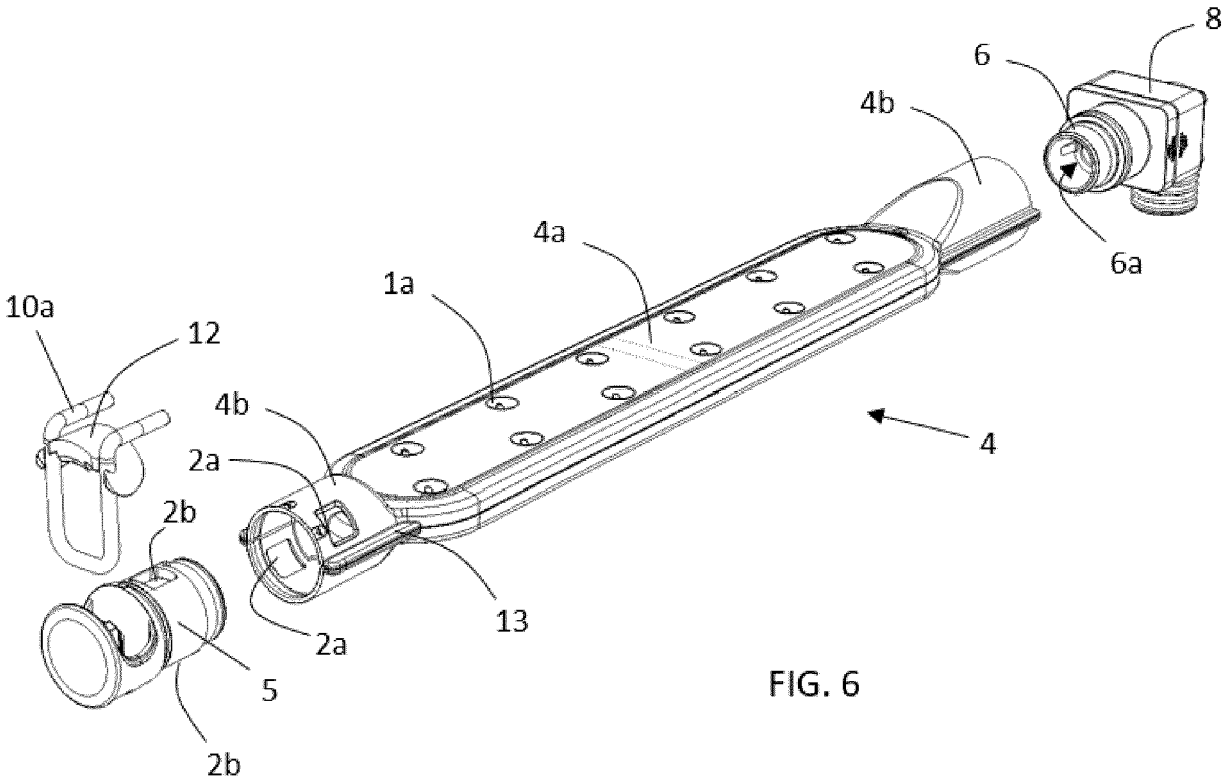

FIG. 6

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EUROPEAN SEARCH REPORT

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	23 October 2023	Weidner, Maximilian

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