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(54) CONNECT/DISCONNECT ARRANGEMENT FOR REVOLVING SPRINKLERS OF DISHWASHERS

ANORDNUNG ZUM VERBINDEN UND TRENNEN DREHBARE SPRÜHÄRME VON SPÜLMASCHINEN

AGENCEMENT DE CONNEXION / DÉCONNEXION POUR BRAS ROTATIFS DE LAVE-VAISSELLE

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EP 3 241 479 B1

Description

[0001] The present invention relates to professional dishwashers or similar machines, such as apparatuses for disinfection, and in particular to a dishwasher provided with a quick connect/disconnect system of the revolving sprinkler which makes it easily mountable and removable.

[0002] It is known that a conventional revolving sprinkler essentially consists of an elongated tubular body that is centrally pivoted on a hollow pivot with a vertical axis, corresponding to the axis of rotation of the sprinkler, mounted at the outlet of a water supply duct. The rotatory motion about this axis is usually created by at least one propulsion nozzle at each end, the jet emitted by such a nozzle being substantially perpendicular to the axis of rotation, while washing nozzles are arranged along the sprinkler to emit jets substantially parallel to the axis of rotation. The sprinkler is mounted on the hollow pivot in a removable manner so that it can be removed when it is necessary to carry out the periodical cleaning or sanitizing of the sprinkler by removing dirt and deposits that can build up inside it.

[0003] This problem is particularly serious in a professional dishwasher in which the wash liquid is not replaced at each cycle of operation but only integrated with an addition of clean water. Therefore, the presence of dirt increases with each cycle rather quickly, given the continuous use of the machine, and it is necessary to perform a frequent cleaning of the sprinkler. A similar problem of frequent cleaning is present in the apparatuses for disinfection, in which the standards of cleanliness are particularly high and require that the washing circuit, including the interior of the sprinkler, is kept constantly clean.

[0004] Obviously the sprinkler removal implies a downtime whose duration should be limited as much as possible, in order to maintain high productivity of the dishwasher. The conventional sprinkler connect/disconnect systems are not optimal in this respect, both in the time required for the connecting/disconnecting of the sprinkler and in the complexity of the systems that are quite expensive to manufacture, inconvenient to use and of low reliability.

[0005] For example, US 5211190 discloses a connect/disconnect system of a revolving sprinkler that corresponds to the preamble of claim 1, such a system requiring a snap-fit arrangement between a lower coupling stud and an upper coupling member in order to mount the sprinkler at the outlet of a water supply duct by means of a threaded connection between said upper coupling member and said outlet. Therefore the replacement of the sprinkler requires the unthreading of the upper coupling member from the outlet and the forced disengagement of the lower coupling stud from the upper coupling member.

[0006] The object of the present invention is therefore to provide a quick connect/disconnect system of the revolving sprinkler that overcomes the above-described limitations of prior art systems. This object is achieved by means of a system in which the hollow pivot on which the sprinkler is pivoted has a terminal portion with a cylindrical shape surmounted by a frusto-conical end shape with the larger base adjacent to said cylindrical shape and of a diameter greater than it, the sprinkler being pivoted on said pivot by means of a hub which accommodates at least two latches radially sliding with respect to the longitudinal axis of the pivot in correspondence with its cylindrical shape and biased toward said longitudinal axis by corresponding resilient means, said hub also accomodating a rotor in contact with said sliding latches and shaped in such a way that its rotation in a given direction moves the latches away from the pivot axis up to a distance greater than the radius of said larger base of the frusto-conical shape, said rotor being provided with a gripping member external to the hub and suitable to allow an operator to rotate it. Other advantageous features are disclosed in the dependent claims.

[0007] The main advantage of the connect/disconnect system of the sprinkler according to the present invention is that of being extremely quick and easy to use, even with one hand only, by the operator.

[0008] A further advantage of this system stems from the fact that its simple and rugged design ensures greater reliability and a lower cost.

[0009] These and other advantages and features of the connect/disconnect system of the sprinkler according to the present invention will become apparent to those skilled in the art from the following detailed description of an embodiment thereof with reference to the accompanying drawings in which:

Fig.1 is an exploded perspective view from above of the main components of the system;
Fig.2 is an enlarged sectional view of the system in the assembled condition and with the latches in contact with the pivot;
Fig.3 is a view similar to the previous one with the latches disengaged from the pivot;
Fig.4 is a top plan view of the system in the condition of Fig.2 with the upper elements removed for clarity; and
Fig.5 is a view similar to the previous one with the system in the condition of Fig.3.

[0010] Referring to the above figures there is seen that a quick connect/disconnect system of a revolving sprinkler according to the invention comprises a hollow pivot 1 mounted on a supply pipe (not shown) and provided with a terminal portion with a cylindrical shape 1a surmounted by a frusto-conical end shape 1b, whose larger base is adjacent to said cylindrical shape 1a and has a diameter larger than it so as to form an undercut. In the figures there is shown in particular a connect/disconnect system for a sprinkler that is fed from below, but it is clear that what is said also applies to a sprinkler that is fed from above, i.e. with pivot 1 facing down.

[0011] The sprinkler is pivoted on pivot 1 by means of a hub 2 which internally accommodates at least two latches 3 sliding radially with respect to the longitudinal axis of pivot 1 in correspondence with the cylindrical shape 1a. Said latches 3 are preferably arranged at equidistant positions along the perimeter of hub 2, and are biased towards the longitudinal axis of pivot 1 by corresponding springs 4 so as to engage the undercut formed in the terminal portion of pivot 1. Hub 2 also accommodates a rotor 5 which is rotatable with respect thereto and in contact with the upper faces of the sliding latches 3, in particular with projections 3a formed on said upper faces.

[0012] Rotor 5 is shaped with cam profiles 5a in the parts in contact with said projections 3a in such a way that its rotation in a given direction (clockwise in the example shown) moves the sliding latches 3 away from the axis of pivot 1 up to a distance greater than the radius of the larger base of the frusto-conical shape 1b, so that latches 3 are disengaged from pivot 1 (Fig.3). Rotor 5 is also made integral with a lever 6 external to hub 2, passing through a cover 7 of the hub, so as to allow an operator to rotate rotor 5 by acting on lever 6 with a rotation in the horizontal plane.

[0013] In the light of the description above, it is readily understood how the sprinkler connect/disconnect system according to the present invention achieves the desired results of low cost, strength and ease of removal and repositioning of the sprinkler since a limited rotation of lever 6 (of about 20° in the illustrated example) is sufficient to turn rotor 5 that pushes with the cam profiles 5a on projections 3a overcoming the resistance of springs 4 and moves the sliding latches 3 away from pivot 1 enough to disengage the sprinkler, which can thus be easily removed using only one hand. Note that the movement of latches 3 is a smooth sliding linear motion since they are received in suitable guides formed in hub 2 and retained therein by cover 7, and that the release stroke of rotor 5 is preferably defined by end stops 2a formed on hub 2.

[0014] So that the sprinkler can be repositioned with great ease and speed simply by pressing it on pivot 1, instead of having to act on lever 6 also in the connection phase, latches 3 preferably have a lower beveled profile 3b that cooperates with the frusto-conical shape 1b to transform the operator's vertical push into a horizontal push for the compression of springs 4. In this way, latches 3 move back until they overcome the bottom larger base of the frusto-conical shape 1b, after which springs 4 bring them into contact with the cylindrical shape 1a so that latches 3 are once again engaged in the undercut of pivot 1.

[0015] Note also that latches 3 are also preferably provided with a frontal concave profile 3c which corresponds to the cylindrical shape 1a, so as to maximize the surface area of engagement with pivot 1 to give greater stability and solidity to the coupling.

[0016] It is clear that the above-described and illustrated embodiment of the sprinkler connect/disconnect system according to the invention is just an example susceptible of various modifications. In particular, the exact number, shape and arrangement of latches 3 and of the relevant elastic bias means (springs 4 or equivalent) can vary somewhat depending on the specific manufacturing needs as long as the general structure shown above is maintained. Obviously the seats in hub 2 and the cam profiles 5a of rotor 5 will be modified accordingly on the basis of latches 3.

Claims

1. A connect/disconnect system of a revolving sprinkler of a dishwasher, wherein the sprinkler comprises an elongated tubular body that is centrally pivotable on a hollow pivot (1) fitted at the outlet of a water supply duct of the dishwasher and having a vertical axis corresponding to the axis of rotation of the sprinkler, **characterized in that** said hollow pivot (1) has a terminal portion with a cylindrical shape (1a) surmounted by a frusto-conical end shape (1b) having a larger base adjacent to said cylindrical shape (1a) and of a diameter greater than it, and **in that** said revolving sprinkler is pivoted on the hollow pivot (1) by means of a hub (2) that accommodates at least two latches (3) sliding radially with respect to the longitudinal axis of the hollow pivot (1) in correspondence with its cylindrical shape (1a) and biased towards said longitudinal axis by corresponding elastic means (4), said hub (2) also accomodating a rotor (5) in contact with said latches (3) and shaped in such a way that its rotation in a given direction moves the latches (3) away from the longitudinal axis of the pivot (1) up to a distance greater than the radius of said larger base of the frusto-conical shape (1b), said rotor (5) being provided with a gripping member (6) external to the hub (2).

2. System according to claim 1, **characterized in that** the rotor (5) is in contact with projections (3a) formed on the upper faces of the latches (3), the rotor (5) being shaped with cam profiles (5a) in the parts in contact with said projections (3a).

3. System according to claim 1 or 2, **characterized in that** the latches (3) have a lower beveled profile (3b) which cooperates with the frusto-conical shape (1b) of the pivot (1).

4. System according to any of the preceding claims, **characterized in that** the latches (3) are provided with a frontal concave profile (3c) which corresponds to the cylindrical shape (1a) of the pivot (1).

5. System according to any of the preceding claims, **characterized in that** the gripping member (6) of the rotor (5) is a lever connected to the rotor (5) pass-

ing through a cover (7) of the hub (2).

6. System according to any of the preceding claims, **characterized in that** the release stroke of the rotor (5) is defined by end stops (2a) formed on the hub (2).

7. System according to any of the preceding claims, **characterized in that** the latches (3) are arranged at equidistant positions along the perimeter of the hub (2).

Patentansprüche

1. Ein System zum Verbinden / Trennen eines drehbaren Sprinklers eines Geschirrspülers, wobei der Sprinkler einen langgestreckten rohrförmigen Körper aufweist, der auf einer hohlen Achse (1) mittig drehbar gelagert ist, die auf einem Auslass einer Wasserversorgungsleitung des Geschirrspülers montiert ist und eine vertikale, der Rotationsachse des Sprinklers entsprechende Achse aufweist, **dadurch gekennzeichnet, dass** die besagte hohle Achse (1) einen Endbereich aufweist von zylindrischer Gestalt (1a) unterhalb eines kegelstumpfförmigen Endstücks (1b) mit einer größeren Basis im Anschluss an die besagte, zylindrische Gestalt (1a) und von einem Durchmesser größer als jene, sowie dadurch, dass der besagte drehbare Sprinkler auf der hohlen Achse (1) mittels einer Nabe (2) drehbar gelagert ist, die wenigstens zwei Schnappriegel (3) aufnimmt, welche radial bezüglich der Längsachse der hohlen Achse (1) entsprechend deren zylindrischer Gestalt (1a) gleiten und mittels elastischer Mittel zu der besagten Längsachse hin (4) vorgespannt sind, wobei die besagte Nabe (2) auch einen Rotor (5) beherbergt, der in Kontakt mit den besagten Schnappriegeln (3) steht und derart geformt ist, dass seine Rotation in einer vorgegebenen Richtung die Schnappriegel (3) von der Längsachse der Achse (1) weg bewegt bis zu einem Abstand größer als der Radius der besagten größeren Basis der kegelstumpfförmigen Gestalt (1b), wobei der besagte Rotor (5) mit einem außen an der Nabe (2) angeordneten Greifteil (6) versehen ist.

2. System gemäß Anspruch 1, **dadurch gekennzeichnet, dass** der Rotor (5) mit Vorsprüngen (3a) in Kontakt steht, welche auf den oberen Flächen der Schnappriegel (3) ausgebildet sind, wobei der Rotor (5) in Bereichen, welche in Kontakt mit den besagten Vorsprüngen (3a) stehen, mit Nockenprofilen (5a) ausgestaltet ist.

3. System gemäß Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Schnappriegel (3) ein unteres abgeschrägtes Profil (3b) aufweisen, das mit der kegelstupfförmigen Gestalt (1b) der Achse (1) zusammenwirkt.

4. System gemäß einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Schnappriegel (3) mit einem vorderen konkaven Profil (3c) versehen sind, welches mit der zylindrischen Form (1a) der Achse (1) korrespondiert.

5. System gemäß einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** das Greifteil (6) des Rotors (5) ein Hebel ist, der mit dem Rotor (5) verbunden ist und durch eine Abdeckung (7) der Nabe (2) hindurch geht.

6. System gemäß einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** der Lösehub des Rotors (5) durch an der Nabe (2) ausgebildete Endanschläge (2a) definiert ist.

7. System gemäß einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Schnappriegel (3) an äquidistanten Positionen entlang des Umfangs der Nabe (2) angeordnet sind.

Revendications

1. Système de connexion / déconnexion d'un gicleur rotatif d'un lave-vaisselle, dans lequel le gicleur comprend un corps tubulaire allongé qui peut pivoter de manière centrale sur un pivot creux (1) monté au niveau de la sortie du conduit d'alimentation en eau du lave-vaisselle et ayant un axe vertical correspondant à l'axe de rotation du gicleur, **caractérisé en ce que** ledit pivot creux (1) a une partie terminale avec une forme cylindrique (1a) surmontée par une forme d'extrémité tronconique (1b) ayant une plus grande base adjacente à ladite forme cylindrique (1a) et un diamètre supérieur à cette dernière, et **en ce que** ledit gicleur rotatif est pivoté sur le pivot creux (1) au moyen d'un moyeu (2) qui loge au moins deux verrous (3) coulissant de manière radiale par rapport à l'axe longitudinal du pivot creux (1) en correspondance avec sa forme cylindrique (1a) et sollicités vers ledit axe longitudinal par des moyens élastiques (4) correspondants, ledit moyeu (2) logeant également un rotor (5) en contact avec lesdits verrous (3) et formé de sorte que sa rotation dans une direction donnée éloigne les verrous (3) de l'axe longitudinal du pivot (1) jusqu'à une distance supérieure au rayon de ladite plus grande base de la forme tronconique (1b), ledit rotor (5) étant prévu avec un élément de préhension (6) extérieur au moyeu (2).

2. Système selon la revendication 1, **caractérisé en ce que** le rotor (5) est en contact avec des saillies (3a) formées sur les faces supérieures des verrous (3), le rotor (5) étant formé avec des profilés de came

(5a) dans les parties en contact avec lesdites saillies (3a).

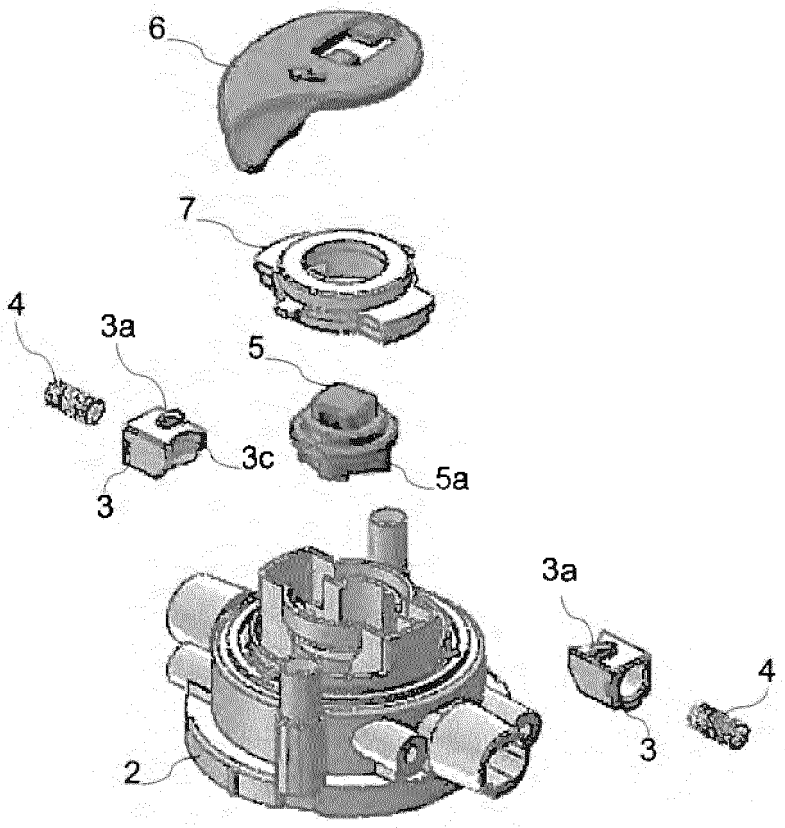
3. Système selon la revendication 1 ou 2, **caractérisé en ce que** les verrous (3) ont un profilé biseauté inférieur (3b) qui coopère avec la forme tronconique (1b) du pivot (1).

4. Système selon l'une quelconque des revendications précédentes, **caractérisé en ce que** les verrous (3) sont prévus avec un profilé concave frontal (3c) qui correspond à la forme cylindrique (1a) du pivot (1).

5. Système selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'élément de préhension (6) du rotor (5) est un levier raccordé au rotor (5) passant par un couvercle (7) du moyeu (2).

6. Système selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la course de libération du rotor (5) est définie par des butées d'extrémité (2a) formées sur le moyeu (2).

7. Système selon l'une quelconque des revendications précédentes, **caractérisé en ce que** les verrous (3) sont agencés dans des positions équidistantes le long du périmètre du moyeu (2).



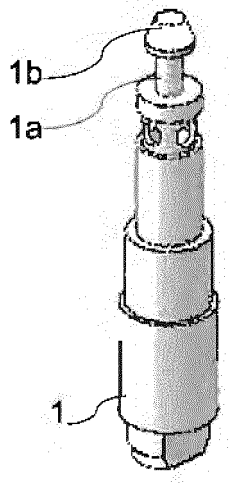


Fig.1

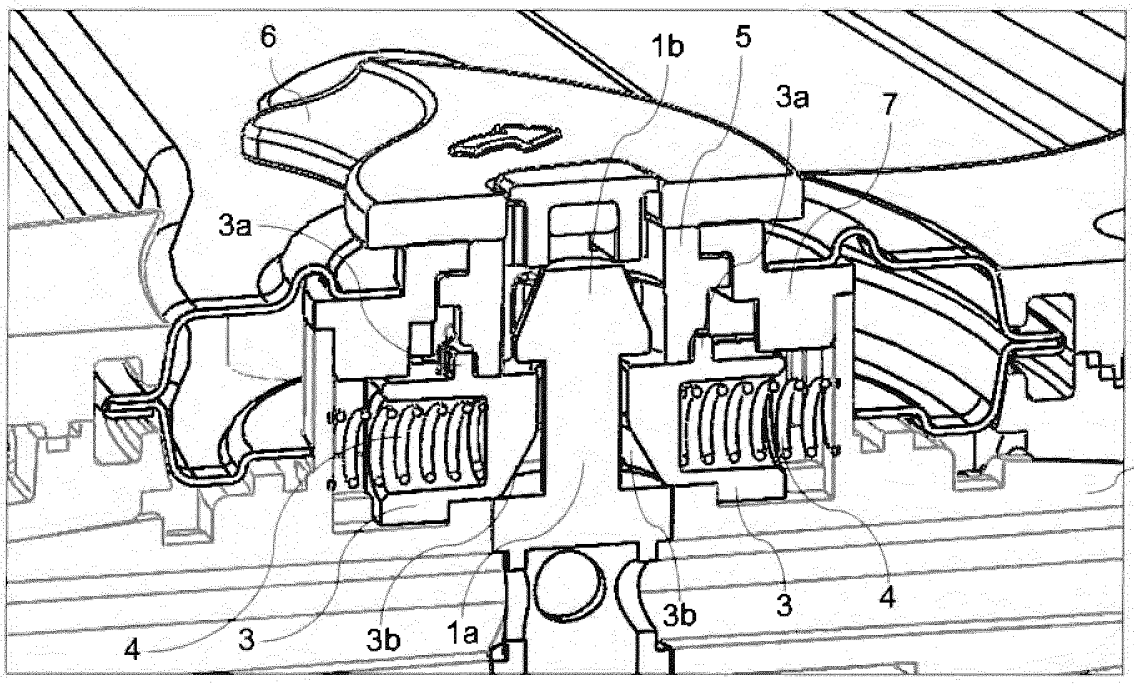


Fig.2

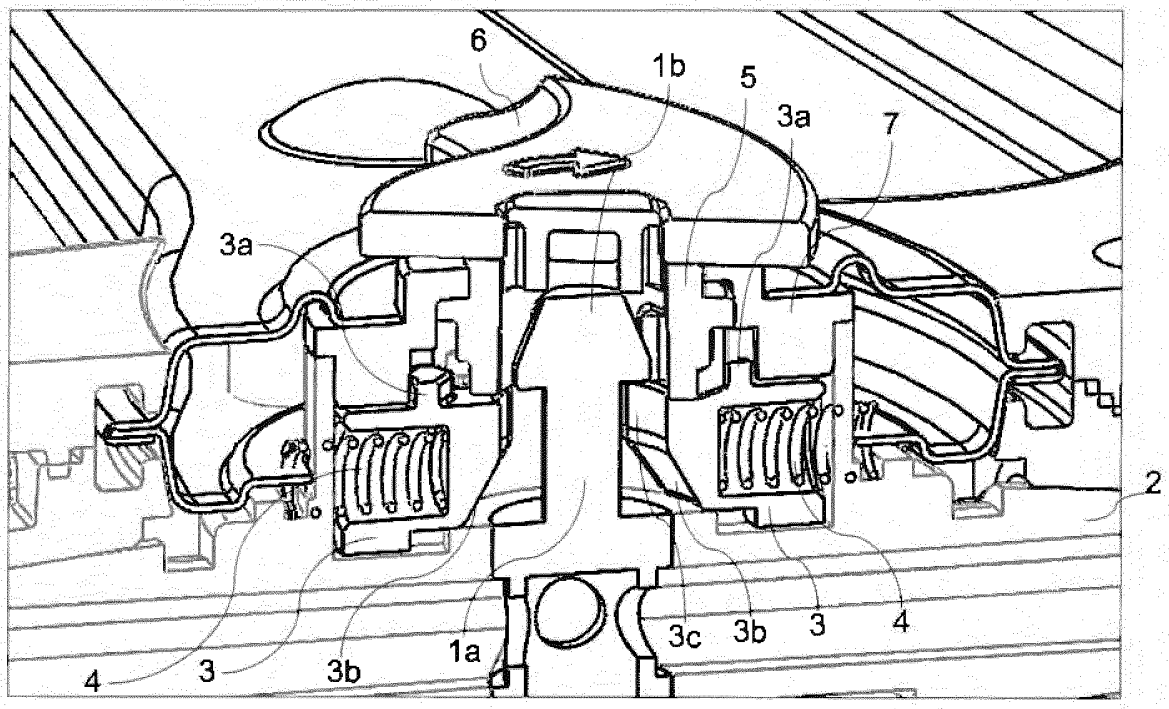


Fig.3

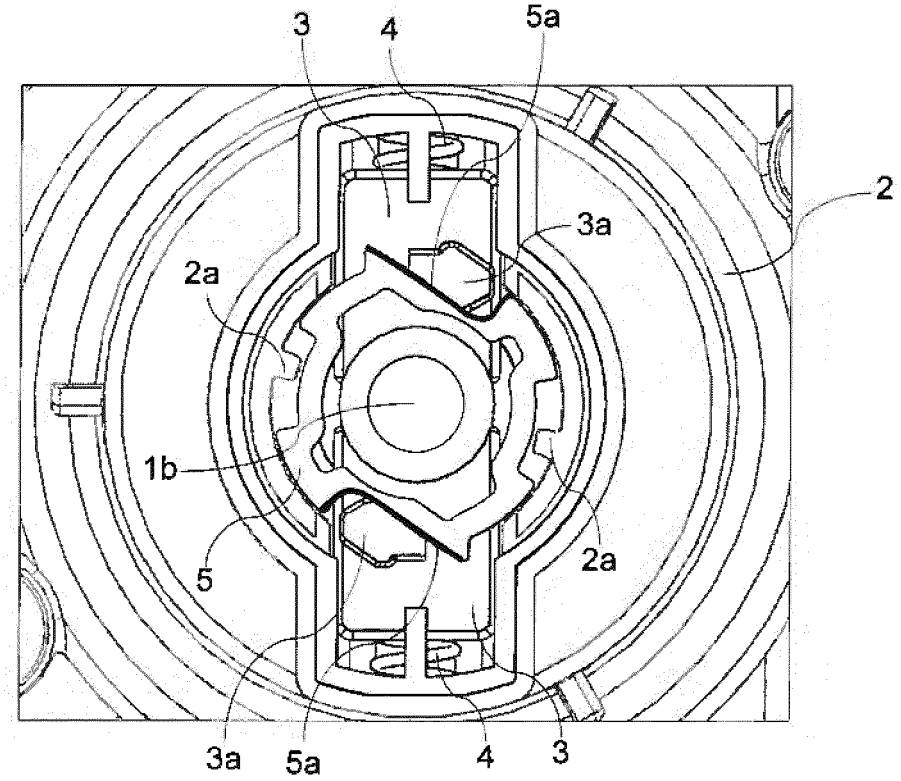


Fig.4

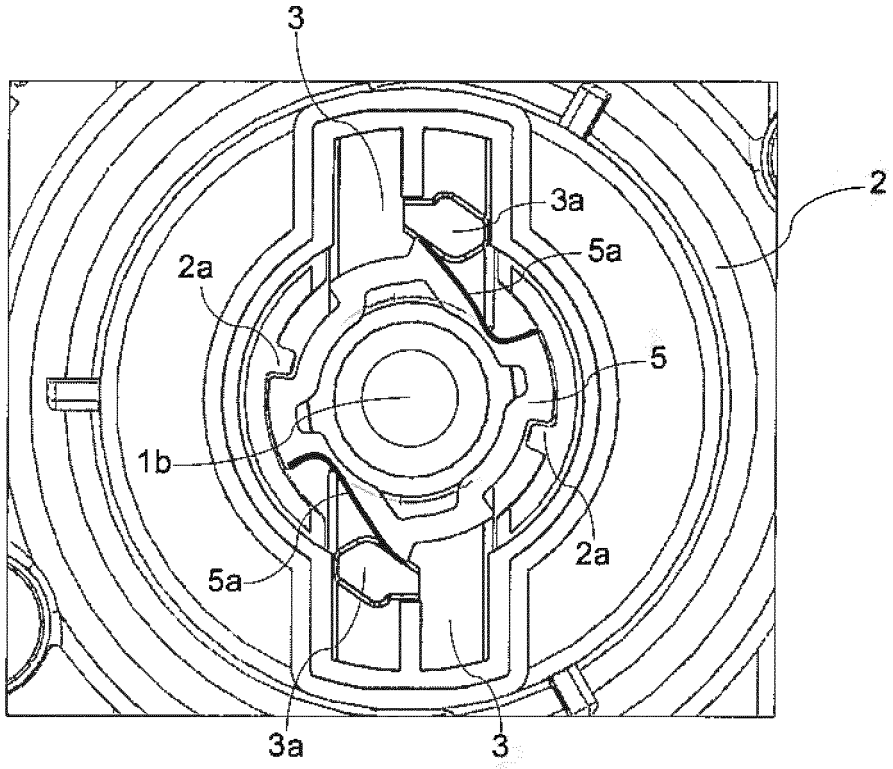


Fig.5

REFERENCES CITED IN THE DESCRIPTION

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