

(19)



(11)

EP 1 097 668 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
30.04.2008 Bulletin 2008/18

(51) Int Cl.:
A47L 15/42 ^(2006.01)

(21) Application number: **00120150.8**

(22) Date of filing: **21.09.2000**

(54) **Assembly for the regulation the quantity of regeneration salt taken from the salt tank of the decalcifier of a washing machine**

Vorrichtung zur Regelung der aus dem Salzvorratsbehälter der Enthärteeinrichtung einer Waschmaschine entnommenen Regenerationssalzmenge

Dispositif de régulation de la quantité de sel de régénération provenant de réservoir de l'adoucisseur d'une machine à laver

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**

(30) Priority: **30.09.1999 IT MI992033**

(43) Date of publication of application:
09.05.2001 Bulletin 2001/19

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Description

[0001] The present invention relates to an assembly for the regulation of the quantity of regeneration salt to be taken from the salt tank of the decalcifier of a washing machine.

[0002] A decalcifier for washing machines of the known type comprises a tank for the ion exchanging resins for softening the washing water and a tank for the salt for regenerating the ion exchanging resins, communicating through the opening of a regeneration solenoid valve.

[0003] So as to regenerate the resins the salt is removed at opening of the regeneration solenoid valve by regeneration water taken from the water supplying the washing tub and accumulated in a special dispenser receptacle.

[0004] Given that the hardness of the washing water varies according to the water supply system from which it is taken, it is necessary to be able to regulate the quantity of regeneration salt to be removed in order to avoid unnecessary waste.

[0005] According to a known system for the regulation of the removal of salt from the decalcifier, the regeneration water is distributed between two or more conduits inside the salt tank and outflowing at a predetermined distance from the inlet section of the resins tank, so that for greater distances the regeneration water succeeds in removing increasing quantities of salt.

[0006] According to another system traditionally adopted, the removal of the salt can be controlled by sending only a part of the regeneration water for removal from the salt tank, while the remaining part is channelled directly towards the resins tank and is used for diluting the brine removed from the salt tank.

[0007] In both cases the regeneration water is distributed via a distribution part formed by a small vertical rotating rod whose lower shaped end forms on the bottom of the salt tank a gate valve which intercepts and conveys the regeneration water towards the conduit selected.

[0008] For the selection of a conduit the upper end of the small rod, situated in the area enclosed by the salt filler, is formed by an indicator plate provided with a notch for inserting the tip of a screwdriver or the like, capable of orientating the indicator plate itself in the various angular positions corresponding to the opening of each of the exit ways of the gate valve.

[0009] A disadvantage which occurs in traditional systems consists in the fact that the diameter of the rod must be very limited in order not to obstruct the operation of filling the salt through the relative filler (see EP-A-0 433 676 for example).

[0010] The indicator plate, arranged horizontally, must also necessarily be small, therefore becoming accessible with difficulty for the operations both of simple reading and selection by the user.

[0011] The need for reduced transverse overall dimensions for the distribution part does not allow a free choice of the dimension and number of outflow apertures of the

gate valve, reducing versatility of the distribution system.

[0012] Since the gate valve is immersed in the brine on the base of the salt tank, it is usually necessary to provide the distribution part with a small rubber part which creates a perfect seal between the gate valve and the conduits supplied thereby.

[0013] The rubber seal part increases the complexity of the system and has a significant effect on its overall cost as regards the distribution part.

[0014] Finally, in traditional systems of the type described above, the welding of the two half parts forming the decalcifier is in general also used to restrain the rod in the correct position inside the salt tank.

[0015] This complicates control of the operation of welding of the decalcifier which has to be performed with extreme precision if correct operation of the distribution part is not to be jeopardised.

[0016] The object of the present invention is that of providing an assembly for the regulation of the quantity of regeneration salt to be taken from the salt tank of the decalcifier of a washing machine which avoids the disadvantages suffered in a traditional system.

[0017] In particular one object of the present invention is that of providing an assembly for regulation of the quantity of regeneration salt to be taken from the salt tank of the decalcifier of a washing machine which is easily accessible and visible from outside the decalcifier without obstructing loading of the salt from the filler of the relative tank.

[0018] Another object of the present invention is that of providing an assembly for the regulation of the quantity of regeneration salt to be removed from the salt tank of the decalcifier of a washing machine formed by a small number of parts so as to be simple and inexpensive.

[0019] Yet another object of the present invention is that of providing an assembly for the regulation of the quantity of regeneration salt to be removed from the salt tank of the decalcifier of a washing machine which can be adapted with flexibility to various working conditions.

[0020] Another object again of the present invention is that of providing an assembly for the regulation of the quantity of regeneration salt to be removed from the salt tank of the decalcifier of a washing machine which can be positioned in the decalcifier with care and without complicating assembling of the same decalcifier.

[0021] These objects are achieved by providing an assembly for the regulation of the quantity of regeneration salt to be removed via regeneration water from the salt tank of the decalcifier of a washing machine for the regeneration of the ion exchanging resins contained in the resins tank of the decalcifier, comprising a part for the distribution of regeneration water between at least a first and a second conduit of the decalcifier, of which conduits at least one leads to removal of the regeneration salt, said distribution part comprising a rotating gate valve capable of adjusting the apertures for outflow of said regeneration water towards said conduits, a rod for driving rotation of the gate valve, and a selector of the required

distribution of regeneration water attached to the end of the drive rod opposite the gate valve, characterised in that said distribution part is arranged horizontally in the salt tank with the rod provided at the internal side of the upper covering wall of the salt tank and with the selector provided at the internal side wall of the salt tank filler.

[0022] The horizontal orientation of the distribution part advantageously allows the possibility of placing the drive rod of the gate valve outside of the space of the salt tank underneath the relative filler in such a way that there are no obstacles to loading the salt.

[0023] The drive rod and the gate valve which can be actuated thereby can consequently be dimensioned as required in such a way as to achieve regulation which can be set with versatility for several conditions of salt removal.

[0024] The selector is preferably formed by a wheel coaxial to the rod so as to have a large diameter without penalising the passage of the salt from the filler towards the base of the relative tank.

[0025] The selection wheel is thus fully visible and provides a clearly legible indication from the outside of the decalcifier to the user who has removed the plug from the filler of the salt tank, at the same time offering the further advantage of being able to be actuated directly by hand.

[0026] The distribution part is inserted in the upper part of the salt tank, where the regeneration water still has such a head as to guide it vertically downwards through the gate valve without axial overflows, and therefore makes the use of a rubber seal part on the body of the gate valve superfluous.

[0027] By saving the rubber part a reduction in the complexity and cost of the distribution part is achieved.

[0028] Other advantages of the present invention will be made clearer on reading the following description of a preferred embodiment which refers to the accompanying drawings in which:

Fig. 1 shows schematically the decalcifier-regeneration dispenser receptacle assembly of a washing machine;

Fig. 2 shows a side elevation enlargement of the distribution part of the present invention;

Fig. 3 is a section of the distribution part seen from line 3-3 of Fig. 2;

Fig. 4 is a section of the distribution part seen from line 4-4 of Fig. 2;

Fig. 5 is a sectioned and enlarged side elevation view of the upper half part of the tank comprising the distribution part of the present invention; and

Fig. 6 is a sectioned and enlarged front view of only the seat for housing the distribution part of the

present invention.

[0029] In Fig. 1 the decalcifier 1 of a washing machine is composed of an ions exchanging resins tank 3 and of a salt tank 5 communicating via a regeneration solenoid valve (not shown).

[0030] On the decalcifier 1 a regeneration dispenser receptacle 11 is positioned whose base has a special mouth 2 for the inflow of water coming from an external water supply source. Part of this water is intended to be sent directly towards the resins tank 3 so as to be softened before being fed into the washing tub, while the remaining part is accumulated temporarily in a special compartment of the dispenser receptacle 11 in such a way as to be able to be fed, following energisation of the regeneration solenoid valve, towards the salt tank 5 for removal of the regeneration salt.

[0031] The resins tank 3 has, on the upper covering part, a mouth 7 which can be coupled to a pin 7', mounted on the base of the regeneration dispenser receptacle 11, wherefrom it receives the washing water to be softened, and on the lower part a mouth (not shown) which feeds the softened washing water into the washing tub.

[0032] The salt tank 5 has, on the upper covering part, a mouth 9 which can be coupled to a pin 9', mounted on the base of the regeneration dispenser receptacle 11, wherefrom it receives the regeneration water temporarily accumulated in the dispenser receptacle 11 itself, and a filler 13 fitted with a plug 15 for loading the salt.

[0033] As can be seen in particular from Fig. 5, for the regulation of the quantity of salt to be removed for regeneration of the resins a part 17 is provided which is attached at the upper covering wall of the salt tank 5 and which distributes the regeneration water between two conduits whose inlet section alone is shown in Fig. 5 with the reference numerals 19 and 21 respectively.

[0034] In the case in question the conduit 19 carries the regeneration water which traverses it for removal of the salt contained in the salt tank 5, while the other conduit 21 returns the regeneration water which traverses it to the resins tank 3 so as to dilute the brine removed by the regeneration water which has traversed the conduit 19.

[0035] Alternatively it can be foreseen that both conduits carry the regeneration water which traverses them for removal of the salt, and in this case the point of outflow of the two conduits on the base of the salt tank 5 should occur at a distance different from the inlet section of the resins tank 3.

[0036] The distribution part 17, as is also clear from the remaining figures, is formed by a rotating gate valve 23 which intercepts the regeneration water coming from the mouth 9 to then distribute it to the conduits 19 and 21, by a rod 25 with circular plan for driving the gate valve 23 and by a selector 27 of actuation of the drive rod 25.

[0037] The body of the rod 25 is formed by axial ribs 26 capable of opposing the deforming stresses of a thermal origin which intervene during the process of moulding, while at the rear base of the rod 25 a first solid disk

50 is formed and wherefrom the gate valve 23 extends axially and is in turn formed by two baffles 29 and 31 orientated perpendicularly one in relation to the other and joined by the interposition of a second disk 33 of identical shape and size to the first disk 50.

[0038] The first disk 50 is centred on the rear base of the rod 25 and in relation thereto has a slightly larger diameter.

[0039] The first baffle 29 projects axially from a section of the first disk 50 formed by imagining intersecting said disk 50 with two parallel planes perpendicular thereto, one of which planes passes from a diameter thereof.

[0040] Similarly the second baffle 31 projects axially from a section of the second disk 33 formed by imagining intersecting said disk 33 with two parallel planes perpendicular thereto, one of which planes passes from a diameter thereof.

[0041] The two disks 33 and 50 have the main task of preventing the regeneration water which traverses the gate valve 23 vertically from succeeding in overflowing axially.

[0042] Perpendicularly to the lateral edge of each baffle 29 and 31 respectively a slot 35 and 37 respectively is formed which, as we will see, forms a section for controlled passage of the regeneration water.

[0043] The selector 27 is formed by a selection wheel 39 mounted coaxially on the other end of the rod 25.

[0044] Along a circumference of the body of the selection wheel 39 an arched track 41 is formed, having an angular opening of 90°.

[0045] The track 41 passes through the thickness of the wheel 39 and its radially external edge forms four notches 43, angularly equidistant, to each of which a numerical impression 45, in a diametrically opposed point of the wheel 39, corresponds.

[0046] Finally the external edge of the wheel 39, in the sections between two successive numerical impressions 45, is knurled.

[0047] The distribution part 17 is inserted in a special seat formed on the internal side of the upper covering wall of the salt tank 5.

[0048] The distribution part 17 is supported by a U-shaped bracket 59 attached vertically near the internal side wall of the salt filler 13 so as to support, with its internal arched part 61, the front end of the rod 25, and by a seat 47 for engaging the gate valve 23 co-operating with the bracket 59 so as to support the distribution part 17 in a horizontal position.

[0049] Given that the selector lies in a vertical plane, the wheel can be provided with a large diameter, 5 cm here, without obstructing loading of the salt and at the same time being accessible and fully visible from outside the salt tank 5.

[0050] The engaging seat 47, also prolonging from the internal side of the upper wall of the salt tank 5, comprises an upper wall 49, a front wall 51 and a lower wall 53.

[0051] The seat 47 is shaped internally in such a way as to allow axial engaging and support during rotation of

the gate valve 23 and therefore has a circular front aperture with diameter equal to the diameter of the disks 33 and 50.

[0052] The external side of the upper wall 49 opens upwards so as to form the mouth 9 for feeding the regeneration water to the gate valve 23, while in the lower wall 53 two openings 55 and 57 respectively, vertically aligned with a corresponding interception element 29 and 31 respectively, are capable of receiving the regeneration water from the outflow apertures of the gate valve 23 in such a way as to feed the inlet sections of the conduits 19 and 21 respectively.

[0053] The front wall 51 forms instead a striking surface for the rear base of the second baffle 31 of the gate valve 23.

[0054] In order to prevent the distribution part 17 from sliding axially in relation to the bracket 59 and to the seat 47, the front surface of the arched part 61 of the bracket 59 is provided with an element which can be engaged with the distribution part 17 itself.

[0055] In particularly a small tooth 63 is thus provided which can be snap-inserted in the track 41 of the selection wheel 27.

[0056] The selection wheel 27 is thus blocked in the groove 67 defined by the small tooth 63 and the axial translation of the distribution part 17 is prevented.

[0057] The rotation of the distribution part 17 is however permitted by the sliding of the small tooth 63 along the track 41.

[0058] The small tooth 63 also serves to indicate the obtaining of a selection set by the user, achieved when it reaches one of the angular positions of the track 41 occupied by the notches 43.

[0059] Advantageously the distribution part 17 is already supported in the correct working position by the upper cover of the decalcifier before the two half parts of the decalcifier are thermally welded one to the other. Thermal welding of the decalcifier does not play an active role in positioning of the distribution part 17 and can therefore be performed in an extremely random manner.

[0060] Operation of the assembly for the regulation of the quantity of regeneration salt to be removed from the decalcifier in accordance with the present invention can be inferred clearly from the accompanying drawings, and involves manual setting by the user by means of the wheel 39 for selection of the required operating condition.

[0061] When a finger of the user acts on a knurled edge of the selector 27, the selection wheel 39 drives the drive rod 25 which in turn rotates the gate valve 23 supported rotatively in its engaging seat 47, while the small tooth 63 traverses the track 41 until it stops on the notch 43 corresponding to the numerical impression of the required selection.

[0062] The operating conditions permitted in the present preferred embodiment are four.

[0063] By setting the selection wheel 39 at the numerical value "1", the baffle 29 is in a horizontal position while the baffle 31 is in a vertical position. On opening of the

regeneration solenoid valve the regeneration water which, from the mouth 9, enters the salt tank 5 and finds the baffle 31 in the position which allows maximum outflow of water towards the underlying conduit 21, while the baffle 29 completely blocks the passage of the regeneration water towards the underlying conduit 19, with the exception of the slot 35 which allows a controlled passage of regeneration water.

[0064] The rate of flow of regeneration water through the controlled passage is defined with extreme precision by the dimensions of the slot. By way of an example, in the present invention, the controlled passage has an area of 4.5 mm² compared to an area of 100 mm² approximately of the relative baffles 19 and 21.

[0065] This setting of the selector 39 is very suitable for the case of regeneration of resins for very low hardness of the washing water, given that it performs minimum withdrawal of salt from the salt tank 5, diverting most of the regeneration water towards the resins tank 3 for the dilution of the salt removed from the salt tank 5.

[0066] The opposite situation occurs when the selection wheel is rotated through 90° in relation to the previous setting, moving onto the numerical value "4". In this case the baffle 29 is in a vertical position while the baffle 31 is in a horizontal position. On opening of the regeneration solenoid valve the regeneration water which, from the mouth 9, enters the salt tank 5 and finds the baffle 29 in the position which allows maximum outflow of water towards the underlying conduit 19, while the baffle 31 blocks completely the passage of the regeneration water towards the underlying conduit 21, with the exception of the slot 37 which allows controlled passage of regeneration water.

[0067] This setting of the selector 39 is very suitable for the case of regeneration of resins for very high hardness of the washing water, given that it performs maximum withdrawal of salt from the salt tank 5, diverting the minimum part of regeneration water towards the resins tank 3 for dilution of the salt removed from the salt tank 5.

[0068] The settings "2" and "3" of the selection wheel 39 refer to an intermediate operating condition between the two now shown for regeneration with average hardness values of the washing water. In this case the slant of the two baffles 29 and 31 regulates the amplitude of the passage apertures of the gate valve 23 in such a way that at setting "2" a greater quantity of regeneration water reaches the conduit 21, and at setting "3" a greater quantity of regeneration water reaches the conduit 19.

[0069] Clearly the present invention may undergo various changes without thereby departing from the general principle claimed.

[0070] In particular the distribution part, due to the very fact of being positioned in such a way as not to interfere substantially with the salt tank filler, can provide a gate valve formed by a higher number of interception elements than that illustrated hitherto for feeding a corresponding higher number of conduits of the decalcifier and obtaining distribution of regeneration water which is even more

flexibly adaptable to the various working conditions.

Claims

1. An assembly for the regulation of the quantity of regeneration salt to be removed by means of regeneration water from the salt tank (5) of the decalcifier (1) of a washing machine for the regeneration of the ions exchanging resins contained in the resins tank (3) of the decalcifier (1), comprising a part (17) for the distribution of the regeneration water between a first (19) and at least a second (21) conduit of the decalcifier (1), of which conduits (19, 21) at least one (19) leads to withdrawal of the regeneration salt, said distribution part (17) comprising a rotating gate valve (23) capable of adjusting the apertures of outflow of said regeneration water towards said conduits (19, 21), and a rod (25) for driving rotation of the gate valve (23), said gate valve (23) extending axially from one end of said drive rod (25), and a selector (27) for setting the required distribution of regeneration water attached to the other end of the drive rod (25), **characterised in that** said distribution part (17) is arranged horizontally in the salt tank (5) with the rod (25) provided at the internal side of the upper covering wall of the salt tank (5) and with the selector (27) provided at the internal side wall of the salt tank filler (13).
2. An assembly according to claim 1, **characterised in that** said selector (27) is in the form of a selection wheel (39) mounted coaxially to the drive rod (25).
3. An assembly according to any one of the previous claims, **characterised in that** said gate valve (23) comprises in axial succession a first (29) and respectively at least a second (31) element for interception of the regeneration water associated with said first (19) and respectively at least a second (21) conduit of the decalcifier (1) and rotating around the axis of the rod (25) with a predetermined angle one in relation to the other.
4. An assembly according to the previous claim, **characterised in that** adjacent interception elements (29, 31) are in the form of flat baffles (29, 31) joined by the interposition of a corresponding separation element (50, 33) in such a way as to prevent the regeneration water from overflowing axially from one to the other.
5. An assembly according to any one of the previous claims, **characterised in that** said rod (25) has a circular plan and is formed by axial ribs (26) capable of opposing the deforming stresses of a thermal origin which intervene during the process of moulding of the rod (25).

6. An assembly according to the previous claim, **characterised in that** the rear base of the rod (25) and the interception element (29) adjacent thereto are joined with the interposition of a corresponding element of separation (50) in such a way as to prevent the regeneration water from overflowing axially from the gate valve (23) to the rod (25). 5
7. An assembly according to any one of claims 4 to 6, **characterised in that** each of said separation elements (50, 33) has the shape of a solid disk with a diameter no smaller than the diameter of the rod (25) and coaxial to the rod (25), while each of said interception baffles (29, 31) projects axially from a section of said disk (50, 33) formed by intersecting said disk (50, 33) with two parallel planes perpendicular thereto, one of which passing through one of its diameters. 10
8. An assembly according to any one of claims 4 to 7, **characterised in that** said first and at least a second interception element (29, 31) are orientated perpendicularly one in relation to the other. 15
9. An assembly according to any one of claims 4 to 8, **characterised in that** an opening is provided through the thickness of each of said interception elements (29, 31) in such a way as to allow controlled passage of the regeneration water. 20
10. An assembly according to the previous claim, **characterised in that** said opening has the shape of a slot (35, 37) formed perpendicularly to the side edge of the interception element. 25
11. An assembly according to any one of the previous claims, wherein the salt tank (5) comprises a filler (13) for loading the salt and a mouth for feeding the regeneration water, **characterised in that** it provides first means of supporting the distribution part (17) on the internal side of the upper covering wall of the salt tank (5) vertically aligned below the mouth for feeding regeneration water, and second means for supporting the distribution part (17) on the internal wall of the filler (13) of the salt tank (5). 30
12. An assembly according to the previous claim, **characterised in that** said first means comprise a vertical U-shaped bracket (59) attached cantilevered to the internal wall of the filler (13) of the salt tank (5) in such a way as to support with its arched part the end of the rod (25) on the side of the selector (27). 35
13. An assembly according to any claim 11 and 12, **characterised in that** said second support means are in the form of a seat (47) for axial engaging of the gate valve (23). 40
14. An assembly according to the previous claim, **characterised in that** said axial engaging seat (47) defines internally a circular engaging area having a diameter equal to the diameter of said separation elements (50, 33). 45
15. An assembly according to any claim 13 and 14, **characterised in that** said engaging seat (47) comprises an upper wall (49) formed by said mouth for feeding regeneration water into the salt tank (5), communicating with the gate valve (23), a rear wall (51) which acts as a stop surface for the gate valve (23) in the position of engaging in the relevant seat (47), and a lower wall (53) provided with a first (55) and at least a second (57) opening vertically aligned with a corresponding one of said interception elements (29, 31) so as to send the water received from the gate valve (23) towards a corresponding one of said conduits (19,21) of the decalcifier (1). 50
16. An assembly according to any claim 11 to 15, **characterised in that** said first support means and said selector comprise means which can be reciprocally engaged to lock axial sliding of the rod (25) without preventing its rotation. 55
17. An assembly according to the previous claim, **characterised in that** said reciprocally engagable means are in the form of a small tooth (63) extending from the front surface of the U-shaped bracket (59) and of an arched track (41) formed through the thickness of the selector (27), said tooth (63) defining a groove which can be slidingly snap-hooked on an arched edge of said track (41).
18. An assembly according to the previous claim, wherein the front surface of the selection wheel (39) provides a series of angularly spaced impressions (43), each of which corresponds to a working condition which can be selected by the user, **characterised in that** a working condition is selected when the tooth (63) reaches a position diametrically opposite the impression (43) corresponding to the chosen working condition.
19. An assembly according to any one of claims 8 to 18, **characterised in that** four different working conditions are provided which can be obtained by rotating the selector (27) by steps of 30°, with the first working condition corresponding to a vertical arrangement of an interception element (31) and horizontal of the other interception element (29).
20. An assembly according to any one of the previous claims, **characterised in that** the selector (27) can be actuated manually by the user.

Patentansprüche

1. Vorrichtung zur Regelung der durch Regenerationswasser aus dem Salzvorratsbehälter (5) der Enthärteeinrichtung (1) einer Waschmaschine zu entnehmenden Regenerationssalzmenge zur Regeneration der im Harzbehälter (3) der Enthärteeinrichtung (1) enthaltenen Ionenaustauscherharze, bestehend aus einem Bauteil (17) zur Verteilung des Regenerationswassers zwischen einer ersten (19) und mindestens einer zweiten (21) Leitung der Enthärteeinrichtung (1), von denen (19, 21) mindestens eine Leitung (19) zur Entnahme des Regenerationssalzes führt, wobei genannter Verteilungsbauteil (17) aus einem drehbaren Absperrventil (23) besteht, das in der Lage ist, die Öffnungen des Abflusses genannten Regenerationswassers zu genannten Leitungen (19, 21) zu regulieren, weiters aus einer Stange (25) zum Drehungsantrieb des Absperrventils (23), wobei genanntes Absperrventil (23) sich von einem Ende der genannten Antriebsstange (25) axial erstreckt, und aus einem am anderen Ende der Antriebsstange (25) befestigten Wähler (27) zum Einstellen der erforderlichen Verteilung des Regenerationswassers, **dadurch gekennzeichnet, dass** genannter Verteilungsbauteil (17) waagrecht im Salzvorratsbehälter (5) angeordnet ist mit der Stange (25), die sich an der Innenseite der oberen Abdeckung des Salzvorratsbehälters (5) befindet und dem Wähler (27), der sich an der internen Seitenwand des Salztankfüllers (13) befindet. 5
2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** genannter Wähler (27) die Form einer Wahlscheibe (39) hat und koaxial zur Antriebsstange (25) montiert ist. 10
3. Vorrichtung nach einem der vorausgehenden Ansprüche, **dadurch gekennzeichnet, dass** genanntes Absperrventil (23) in axialer Reihenfolge aus einem ersten (29) bzw. mindestens einem zweiten (31) Element zum Abfangen des Regenerationswassers besteht, verbunden mit genannter ersten (19) bzw. mindestens einer zweiten (21) Leitung der Enthärteeinrichtung (1) und zueinander mit einem vorbestimmten Winkel um die Achse der Stange rotierend (25). 15
4. Vorrichtung nach dem vorausgehenden Anspruch, **dadurch gekennzeichnet, dass** die angrenzenden Abfangelemente (29, 31) in der Form von flachen Ablenkplatten (29, 31) ausgebildet sind und durch die Zwischenlegung eines entsprechenden Trennelements (50, 33) derart verbunden sind, dass verhindert wird, dass das Regenerationswasser axial von einem zur anderen überfließt. 20
5. Vorrichtung nach einem der vorausgehenden Ansprüche, **dadurch gekennzeichnet, dass** genannte Stange (25) kreisförmigen Grundriss hat und durch axiale Rippen (26) gebildet ist, die in der Lage sind, der während des Prozesses der Formgebung der Stange (25) eintretende Biegebungsbelastung thermischen Ursprungs entgegenzuwirken. 25
6. Vorrichtung nach dem vorausgehenden Anspruch, **dadurch gekennzeichnet, dass** der rückseitige Boden der Stange (25) und das daran angrenzende Abfangelement (29) durch die Einfügung eines entsprechenden Trennelementes (50) derart verbunden sind, dass verhindert wird, dass das Regenerationswasser axial vom Absperrventil (23) zur Stange (25) überfließt. 30
7. Vorrichtung nach einem der vorausgehenden Ansprüche 4 bis 6, **dadurch gekennzeichnet, dass** jedes der genannten Trennelemente (50, 33) die Form einer festen Scheibe hat mit einem nicht kleineren Durchmesser als der Durchmesser der Stange (25) und koaxial zur Stange (25) ist, während jede der genannten Ablenkplatten (29, 31) axial hervorsticht aus einem Abschnitt der genannten Scheibe (50, 33), ausgebildet durch die Überschneidung genannter Scheibe (50, 33) mit zwei daran senkrechten parallelen Ebenen, von denen eine durch einen ihrer Durchmesser durchgeht. 35
8. Vorrichtung nach einem der vorausgehenden Ansprüche 4 bis 7, **dadurch gekennzeichnet, dass** genanntes erstes und mindestens ein zweites Abfangelement (29, 31) senkrecht zueinander gerichtet sind. 40
9. Vorrichtung nach einem der vorausgehenden Ansprüche 4 bis 8, **dadurch gekennzeichnet, dass** eine Öffnung durch die Dicke von jedem der genannten Abfangelemente (29, 31) derart vorgesehen ist, dass der gesteuerte Durchgang des Regenerationswassers möglich ist. 45
10. Vorrichtung nach einem der vorausgehenden Ansprüche, **dadurch gekennzeichnet, dass** genannte Öffnung die Form eines senkrecht zum Seitenrand des Abfangelementes ausgebildeten Schlitzes (35, 37) hat. 50
11. Vorrichtung nach einem der vorausgehenden Ansprüche, in der der Salzvorratsbehälter (5) aus einem Füller (13) zum Aufladen des Salzes und einer Öffnung zum Einfüllen des Regenerationswassers besteht, **dadurch gekennzeichnet, dass** sie mit ersten Stützmitteln für den Verteilungsbauteil (17) an der inneren Seite der oberen Abdeckwand des Salzvorratsbehälters (5), senkrecht unterhalb der Öffnung zum Einfüllen des Regenerationswassers aus- 55

gerichtet, sowie mit zweiten Stützmitteln für den Verteilungsbauteil (17) auf der Innenwand der Füllers (13) des Salzvorratsbehälters (5) ausgerüstet ist.

12. Vorrichtung nach dem vorausgehenden Anspruch, **dadurch gekennzeichnet, dass** die genannten ersten Stützmittel aus einem U-förmigen Bügel (59) bestehen, derart ausladend an der Innenwand des Füllers (13) des Salzvorratsbehälters (5) befestigt, dass er mit seinem gewölbten Teil das Ende der Stange (25) auf der Seite des Wählers (27) stützt. 5 10
13. Vorrichtung nach einem der Ansprüche 11 und 12, **dadurch gekennzeichnet, dass** genannte zweite Stützmittel in der Form eines Auflagers (47) zum axialen Eingreifen in das Absperrventils (23) ausgebildet sind. 15
14. Vorrichtung nach dem vorausgehenden Anspruch, **dadurch gekennzeichnet, dass** genanntes axial eingreifendes Auflager (47) intern einen rundförmigen Eingriffsbereich bestimmt, der den gleichen Durchmesser wie der Durchmesser der genannten Trennelemente (50, 33) hat. 20
15. Vorrichtung nach einem der Ansprüche 13 und 14, **dadurch gekennzeichnet, dass** genanntes axial eingreifendes Auflager (47) aus einer oberen Wand (49) besteht, die durch genannte mit dem Absperrventil (23) verbundene Öffnung zum Füllen des Regenerationswassers in den Salzvorratsbehälter (5) gebildet ist, aus einer rückseitigen Wand (51), die wie eine Anschlagfläche für das Absperrventil (23) in eingreifender Position im entsprechenden Auflager (47) wirkt und aus einer unteren Wand (53), die mit einer ersten (55) und mindestens einer zweiten (57) senkrecht mit einem der entsprechenden Abfangelemente (29, 31) angeordneten Öffnung derart ausgestattet ist, dass das vom Absperrventil (23) empfangene Wasser zu einer entsprechenden der genannten Leitungen (19, 21) der Enthärteeinrichtung (1) geleitet wird. 25 30 35 40
16. Vorrichtung nach einem der Ansprüche 11 bis 15, **dadurch gekennzeichnet, dass** die genannten ersten Stützmittel und der genannte Wähler aus Mitteln bestehen, die ineinander greifen können, um ein axiales Absinken der Stange (25) zu hemmen, ohne ihre Drehung zu verhindern. 45 50
17. Vorrichtung nach dem vorausgehenden Anspruch, **dadurch gekennzeichnet, dass** genannte ineinander greifende Stützmittel die Form einer kleinen Zacke (63), die aus der Vorderfläche des U-förmigen Bügels (59) hervorragt, und einer bogenförmigen Führungsschiene (41) haben, gebildet aus der Dicke des Wählers (27), wobei genannte Zacke (63) eine Kehle bildet, die auf eine bogenförmige Kante ge-

nannter Führungsschiene (41) stufenflexibel eingehakt werden kann.

18. Vorrichtung nach dem vorausgehenden Anspruch, in der die Stirnfläche der Wahlscheibe (39) mit einer Reihe von eckig bedruckten Aufdrucken (43) versehen ist, die jeweils einem Betriebszustand entsprechen, der vom Benutzer vorgewählt werden kann, **dadurch gekennzeichnet, dass** ein Betriebszustand gewählt wird, wenn die Zacke (63) eine dem gewählten Betriebszustand entsprechenden Abdruck (43) diametral entgegengesetzte Position erreicht. 55
19. Vorrichtung nach einem der Ansprüche 8 bis 18, **dadurch gekennzeichnet, dass** vier verschiedenen Betriebszustände zur Verfügung stehen, die mit dem Wähler (27) durch schrittweise Drehungen um 30° erhalten werden, wobei der erste Betriebszustand einer senkrechten Anordnung eines Abfangelements (31) und einer waagerechten des anderen Abfangelements (29) entspricht. 1
20. Vorrichtung nach einem der vorausgehenden Ansprüche, **dadurch gekennzeichnet, dass** der Wähler (27) vom Benutzer manuell betätigt werden kann. 25

Revendications

1. Un dispositif pour le réglage de la quantité de sel de régénération à enlever au moyen de l'eau de régénération du réservoir de sel (5) de l'adoucisseur (1) d'une machine à laver pour la régénération des résines pour l'échange des ions contenues dans le réservoir des résines (3) de l'adoucisseur (1), comprenant une partie (17) pour la distribution de l'eau de régénération entre un premier (19) et au moins un second (21) conduit de l'adoucisseur (1), conduits (19, 21) dont au moins un (19) provoque l'enlèvement du sel de régénération, ladite partie de distribution (17) comprenant une vanne pivotante à obturateur (23) capable d'ajuster les ouvertures du flux de sortie de ladite eau de régénération vers lesdits conduits (19, 21), et une tige (25) pour entraîner la rotation de la vanne à obturateur (23) ladite vanne à obturateur (23) s'étendant dans l'axe d'un bout de ladite tige d'entraînement (25), et un sélecteur (27) pour régler la distribution désirée d'eau de régénération attaché à l'autre bout de la tige d'entraînement (25), **caractérisé par le fait que** ladite partie de distribution (17) est disposé horizontalement dans ledit réservoir de sel (5) avec ladite tige (25) procurée sur la partie intérieure de la paroi supérieure de couverture du réservoir de sel (5) et avec le sélecteur (27) procuré sur la paroi latérale interne du remplisseur du réservoir de sel (13). 30 35 40 45 50 55

2. Un dispositif selon la revendication 1, **caractérisé par le fait que** ledit sélecteur (27) est en forme de roulette de sélection (39) montée dans l'axe de la tige d'entraînement (25).
3. Un dispositif selon n'importe quelle des revendications qui précèdent, **caractérisé par le fait que** la vanne à obturateur (23) comprend en succession axiale un premier (29) et respectivement au moins un second (31) élément pour l'interception de l'eau de régénération associée au dit premier (19) et respectivement au moins à un second (21) conduit de l'adoucisseur (1) et pivotant autour de l'axe de la tige (25) dans un angle prédéterminé l'un par rapport à l'autre.
4. Un dispositif selon la revendication qui précède, **caractérisé par le fait que** les éléments d'interception adjacents (29, 31) sont sous forme de déflecteurs plats (29, 31) joints par l'interposition d'un élément de séparation correspondant (50, 33) de manière à empêcher que l'eau de régénération ne déborde dans l'axe de l'un à l'autre.
5. Un dispositif selon n'importe quelle des revendications précédentes, **caractérisé par le fait que** ladite tige (25) a un plan circulaire et est formée de nervures axiales (26) capables de s'opposer à des contraintes déformantes d'origine thermique qui se produisent durant le processus de moulage de la tige (25).
6. Un dispositif selon la revendication précédente, **caractérisé par le fait que** la base arrière de la tige (25) et l'élément d'interception (29) qui y est adjacent sont joints par l'interposition d'un élément de séparation correspondant (50) de manière à empêcher que l'eau de régénération ne déborde dans l'axe de la vanne à obturateur (23) vers la tige (25).
7. Un dispositif selon n'importe quelle des revendications de 4 à 6, **caractérisé par le fait que** chacun desdits éléments de séparation (50, 33) a la forme d'un disque plein avec un diamètre non inférieur au diamètre de la tige (25) et coaxial à la tige (25), tandis que chacun desdits déflecteurs d'interception (29, 31) projette dans l'axe d'une section dudit disque (50, 33) formé par le croisement dudit disque (50, 33) avec deux plans parallèles perpendiculaires à celui-ci, un desquels passe à travers un de ses diamètres.
8. Un dispositif selon n'importe quelle des revendications de 4 à 7, **caractérisé par le fait que** ledit premier et au moins un second élément d'interception (29, 31) sont orientés perpendiculairement l'un par rapport à l'autre.
9. Un dispositif selon n'importe quelle des revendications de 4 à 8, **caractérisé par le fait qu'une** ouverture est procurée à travers l'épaisseur de chacun desdits éléments d'interception (29, 31) de manière à permettre un passage contrôlé de l'eau de régénération.
10. Un dispositif selon la revendication qui précède, **caractérisé par le fait que** ladite ouverture a la forme d'une rainure (35, 37) formée perpendiculairement par rapport au bord du côté de l'élément d'interception.
11. Un dispositif selon n'importe quelle des revendications qui précèdent, dans lequel le réservoir de sel (5) comprend un remplisseur (13) pour charger le sel et une bouche pour alimenter l'eau de régénération, **caractérisé par le fait qu'il** est prévue un premier moyen pour soutenir l'élément de distribution (17) sur le côté interne de la paroi supérieure de couverture du réservoir de sel (5) aligné verticalement sous la bouche pour alimenter l'eau de régénération, et un second moyen pour soutenir l'élément de distribution (17) sur la cloison interne du remplisseur (13) du réservoir de sel (5).
12. Un dispositif selon la revendication précédente, **caractérisé par le fait que** ledit premier moyen comprend une fixation verticale en forme de U (59) attachée en console à la paroi interne du remplisseur (13) dudit réservoir de sel (5) en sorte de soutenir avec sa partie arquée le bout de la tige (25) du côté du sélecteur (27).
13. Un dispositif selon n'importe quelle revendication 11 et 12, **caractérisé par le fait que** le second moyen de support est en forme de siège (47) pour l'engagement axial de la vanne à obturateur (23).
14. Un dispositif selon n'importe quelle des revendications qui précèdent, **caractérisé par le fait que** ledit siège d'engagement axial (47) définit à l'intérieur une zone d'engagement circulaire ayant un diamètre égal au diamètre desdits éléments de séparation (50, 33).
15. Un dispositif selon n'importe quelle revendication 13 ou 14, **caractérisé par le fait que** ledit siège d'engagement (47) comprend une paroi supérieure (49) formée par ladite bouche d'alimentation de l'eau de régénération dans le réservoir de sel (5), communiquant avec la vanne à obturateur (23), une paroi arrière (51) qui sert de surface d'arrêt pour la vanne à obturateur (23) dans la position d'engagement dans le siège afférent (47), et une cloison inférieure (53) procurée avec une première (55) et au moins une seconde (57) ouverture alignée verticalement à une ouverture correspondante dans lesdits éléments

d'interception (29, 31) de manière à envoyer l'eau reçue de la vanne à obturateur (23) vers une correspondante dans lesdits conduits (19, 21) de l'adoucisseur (1).

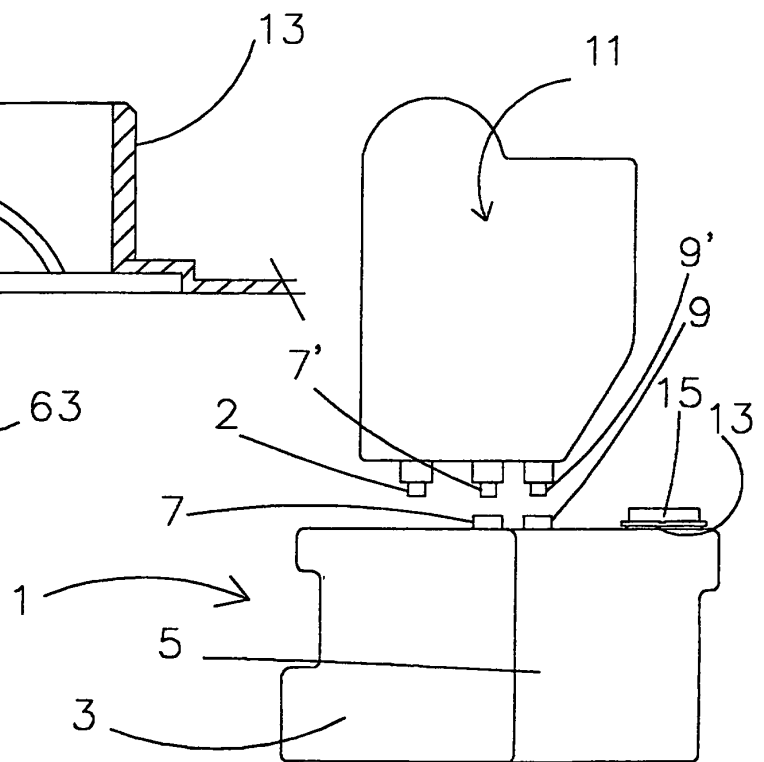
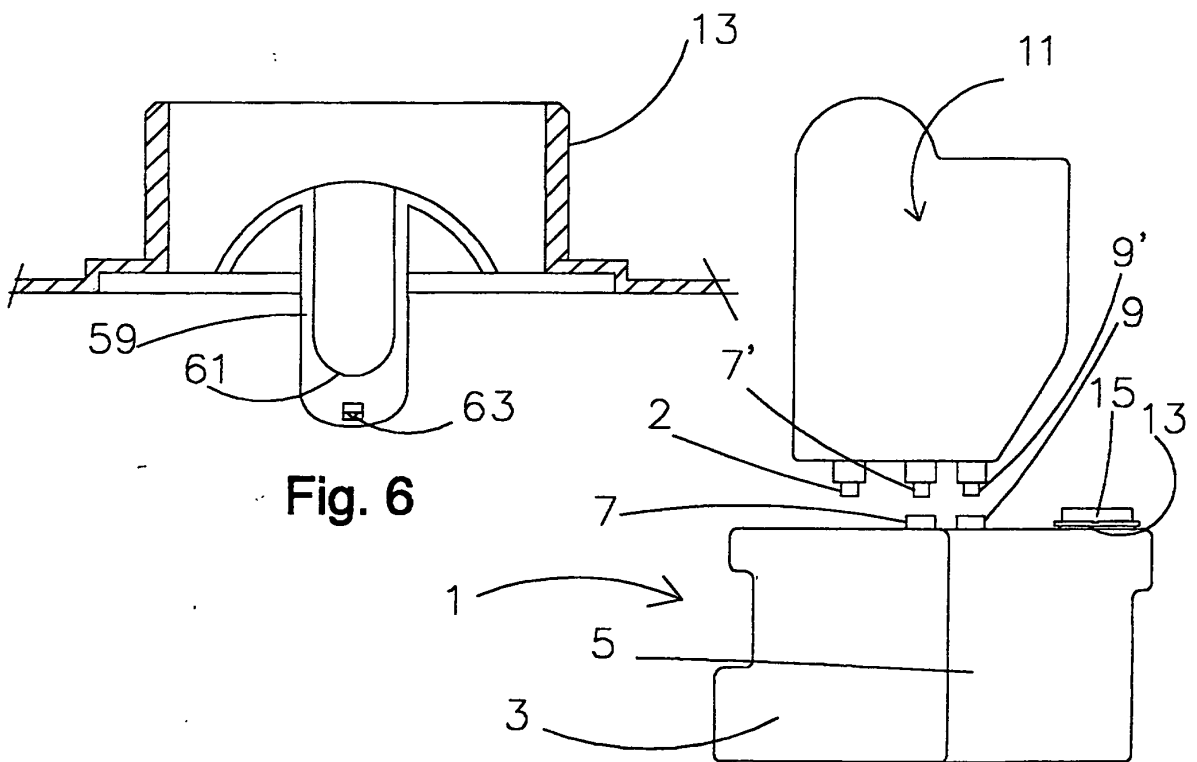
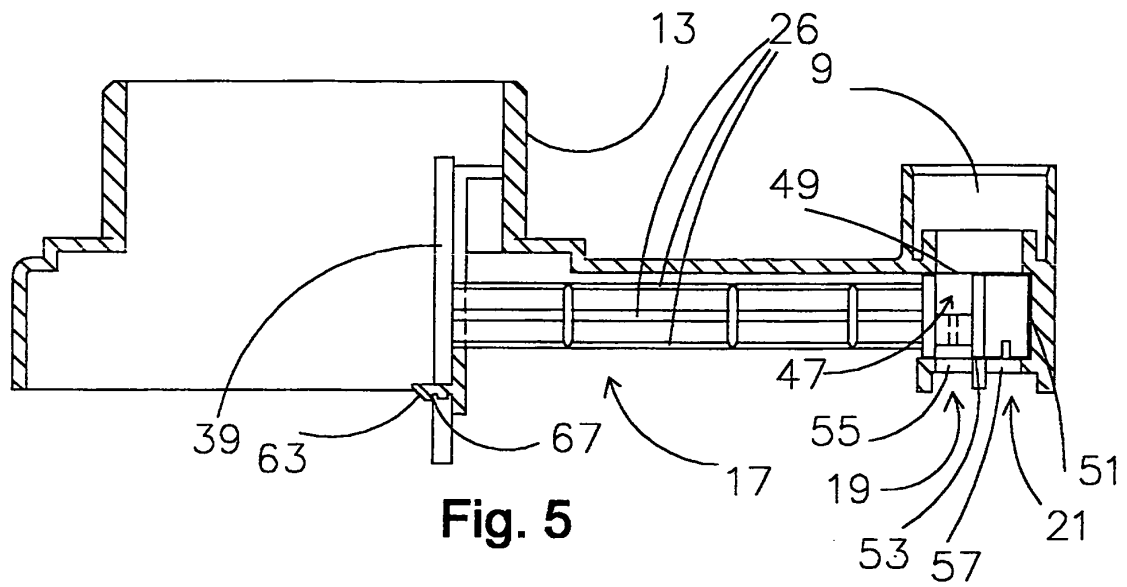
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16. Un dispositif selon n'importe quelle des revendications de 11 à 15, **caractérisé par le fait que** lesdits moyens de support et ledit sélecteur comprennent des moyens qui peuvent s'engager réciproquement pour bloquer le glissement axial de la tige (25) sans empêcher sa rotation. 10
17. Un dispositif selon la revendication qui précède, **caractérisé par le fait que** lesdits moyens d'engagement réciproque sont sous forme d'une petite dent (63) sortant de la surface avant de la fixation en forme de U (59) et d'une trace arquée (41) formée dans l'épaisseur du sélecteur (27), ladite dent (63) dessinant une rainure qui peut être encliquetée en glissant sur un bord arqué de ladite trace (41). 15 20
18. Un dispositif selon la revendication qui précède, dans lequel la surface avant de la roulette de sélection (39) procure une série d'impressions espacées en angle (43), chacune desquelles correspondant à une condition de travail qui peut être sélectionnée par l'utilisateur, **caractérisé par le fait que** la condition de travail est choisie lorsque la dent (63) atteint une position diamétralement opposée à l'impression (43) correspondant à la condition de travail choisie. 25 30
19. Un dispositif selon n'importe quelle des revendications de 8 à 18, **caractérisé par le fait que** quatre conditions de travail différentes sont procurées qui peuvent être obtenues en tournant le sélecteur (27) par crans de 30°, avec la première condition de travail correspondant à un arrangement vertical d'un élément d'interception (31) et horizontal de l'autre élément d'interception (29). 35 40
20. Un dispositif selon n'importe quelle des revendications qui précèdent, **caractérisé par le fait que** le sélecteur (27) peut être activé manuellement par l'utilisateur. 45

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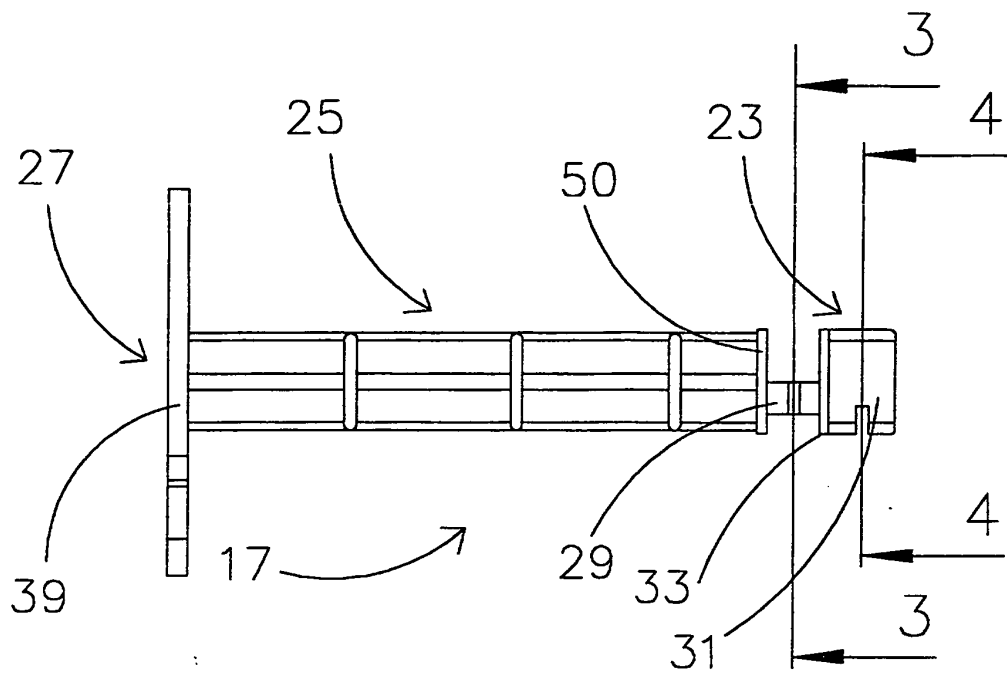


Fig. 2

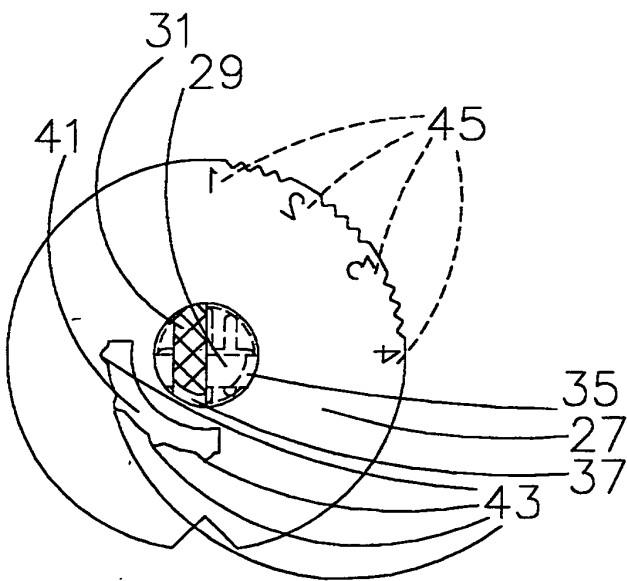


Fig. 4

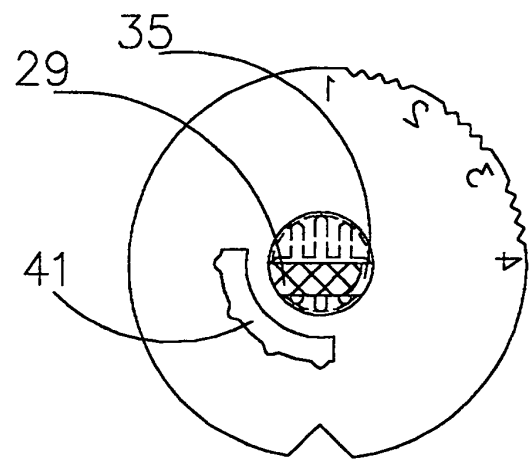


Fig. 3

REFERENCES CITED IN THE DESCRIPTION

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