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(54) Mop wringer.

(57) This invention relates to a wringer for a mop (42) with turfts the mop being fastened on an elongated, plate shaped rigid holder (41) which together with the mop is inserted in the wringer in order to squeeze liquid from the tufts of the mop. The wringer comprises three rolls (12,13) two of which (12) are coaxial and placed so that a gap is formed between them whereas the direction of the axis of the third roll (12) is parallel with the direction of the axis of the coaxial rolls. The axis of the rolls are movable with respect to each other making it possible to insert the holder (41) with the mop (42) between the rolls. At least one of the rolls (13) is under the influence of a spring (31) which presses the roll against one of or the other rolls (12) and the width of the rolls (12,13) is less than the length of the holder. At least one of the rolls is driven by an electric motor (23) so that the holder with the mop is fed between the rolls and the liquid is squeezed from the turfts of the mop. The wringer also comprises feeding means (20) for the turfts the feeding means being so arranged that the turfts are fed between the holder and the third roll.

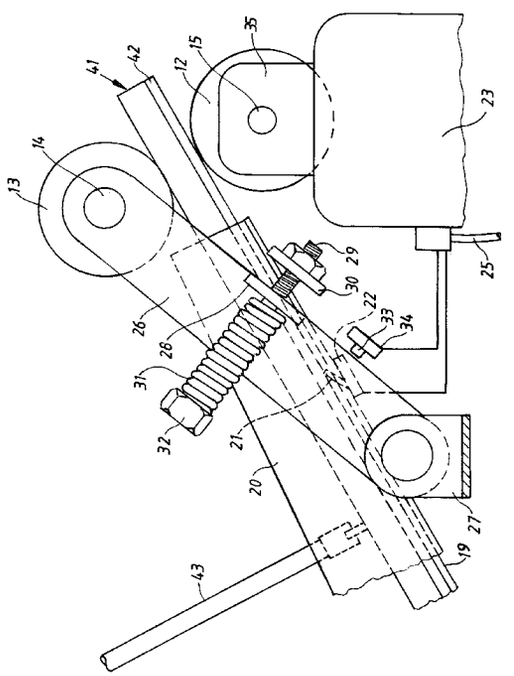

Fig. 2

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This invention relates to a wringer for a mop with turfts the mop being fastened on an elongated, plate shaped rigid holder which together with the mop is inserted in the wringer in order to squeeze liquid from the tufts of the mop, the wringer comprising three rolls two of which are coaxial and placed so that a gap is formed between them whereas the direction of the axis of the third roll is parallel with the direction of the axis of the coaxial rolls, that the axis of the rolls are movable with respect to each other making it possible to insert the holder with the mop between the rolls, that at least one of the rolls is under the influence of a spring which presses the roll against one of or the other rolls.

Mops for treating floors usually comprise a holder on which the mop is fixed. The holder is via a universal joint applied to a shaft. When being used the holder with the mop is dipped into liquid, usually water with cleaning agents and is then mowed on the surface to be cleaned. In order to remove surplus water from the mop before it is placed on the floor or when dirty water has been taken up from the floor the mop usually is removed from the holder and is placed in a wringer squeezing the surplus water out of the mop. However, conventional wringers have the disadvantage that manual steps have to be taken for the press operation which means that it is cumbersome, time demanding and unhygienic to remove and put back the mop on the holder and to handle it during the press operation. Conventional wringers usually have spring loaded rolls between the mop with its tufts is fed by means of a crank or comprise parallel pressure plates between which the mop is squeezed by means of a handle.

In order to avoid said unhygienic work flexible holders have been developed. Such holders comprise two halves which are linked to each other via a hinge by means of which the holder can be folded together so that the mop which is fastened at the two short ends of the holder has its turfts hanging down from the holder. In this form and without removing it from the holder the mop is placed in a wringer. However, usually the wringer is manually operated and moreover the holder has the drawback that it is difficult to maintain the flat shape when being used because of the play which is present between the two halves of the holder.

It has also been suggested to use a wringer driven by an electric motor for the lastmentioned purpose in order to avoid a part of the manual work during the press operation. Such a press is described in WO 89/12419. However also when using this type of wringer it is necessary that the user makes certain operations manually.

Different types of wringers for rigid elongated holders are also known. For instance there is equipment in which the holder with the mop is placed in a box having drainage openings at the bottom. A plate is by means of a pedal pressed against the upper side of the holder so that the water in the mop is removed and flows out from the box through the drainage openings. The drawback with this arrangement is that the press force available is too small to create a sufficently large pressure on the large pressplate which means that only a small quantity of water is removed.

According to another type of arrangement, see US patent 725256, a rigid mop holder with a mop is pressed between spring loaded rolls. This wringer is also manually operated but has the disadvantage that a large amount of the turfts will pass between the rolls but beside the holder without being squeezed.

The purpose of this invention is to eliminate the drawbacks mentioned above that is to create a wringer which in an efficient way and automatically, i.e. without any manual measurement being taken, removes water from practically all the turfts of a mop which is fastened on a plate shaped, rigid holder and without removing the mop from the holder. The wringer is a userfriendly device which contributes to improve the ergonomic enviroment for the cleaning staff.

This is achieved by means of a device which has the caracteristics mentioned in the claims.

An embodiment of the invention will now be described with reference to the accompanying drawings in which Fig. 1 in a perspective view and in an inactive position shows a mop wringer according to the invention, Fig. 2 is a side view which shows the most important parts when the mop wringer has been activated and Fig. 3 is a partly broken plan view of the arrangement shown in Fig. 2.

As appears from Fig. 1 the mop wringer comprises a press housing which is fastened on two vertical brackets 10. Each bracket has two slot shaped recesses 11 making it possible to put the wringer on two horizontal rods on a conventional cleaning cart not shown. The cart is as usual also equipped with a bucket for water and cleaning agents a part of the bucket being placed just below the wringer so that the liquid which flows out from the wringer flows to the bucket. It is of course also possible to use other types of means for fastening the wringer to a cart being used.

The press housing supports a lower horizontal roll 12 which preferably has on outer frictional layer for instance of rubber or polyurethane and two upper rolls 13 having coaxial shafts 14, the axis of the upper rolls being parallel with the shaft 15 of the lower roll. Between the two upper rolls 13 there is a gap the purpose of which will appear from the following. The press housing also comprises two halves 16, 17 each being covered by a casing hiding a driving means. The halves 16 and 17 resp. are connected to each other by means of a slanting outflow plate 18. Above the outflow plate 18 there is a feeding table 19 and on each side of this table there are feeding means 20.

The feeding table 19 has a central opening from which an arm 21 extends upwards and acts on a first micro switch 22.

One half 16 of the cover of the press housing surrounds an electric motor 23 (see Fig. 2 and 3) which is supplied with current from an accumulator placed in a box 24 which also contains a battery charger. The box is placed on the cleaning cart and is connected to the wringer via a cable 25. It is possible to remove the box from the cleaning cart and connect it to a conventional socket for charging.

The press mechanism which is hidden by the casings in Fig. 1 comprises at each side a tilting lever 26 one end of which is turnably fastened to a bracket 27 on resp. half of the press housing. The other end of the tilting lever supports the shaft 14 with the upper roll 13. Further each lever arm has a flange 28 with a hole through which a bolt 29 extends. The bolt 29 also extends through a flange 30 arranged at each half of the press housing and is surrounded by a compression spring 31 which is clamped between the flange 28 and the head 32 of the bolt 29 so that the upper roll 13 is urged towards the lower roll 12. The tilting lever 26 via an operating arm 33 acts on a second micro switch 34.

It should be mentioned that it, in order to achieve a synchronized movement of the levers, is possible to make a stiff connection between the two levers instead of using tilting levers having individual moving possibilities.

The shaft 15 of the lower roll 12 is rotatably supported at each half of the press housing and is driven by means of an electric motor 23 via a transmission 35.

The feeding means 20 arranged at both sides of the feeding table 19 are L-shaped and have a leg 36 which is placed just below the feeding table and parallel with it whereas a second leg 37 is perpendicular to the feeding table. The legs 37 of the feeding means 20 are so shaped that they converge in the direction towards the rolls. One end of the legs 36 are fastened at the feeding table at its outer parts and can be turned about an axis 38 extending perpendicular to the feeding table. The other end of the legs 36 has an opening 39 each taking up an end of a tension spring 40 which, when the wringer is not used, presses the leg 37 of the feeding means against the edges of the feeding table 19.

The micro switch 22 is so arranged that when the arm 21 is depressed then a first current supply circuit to the electric motor 23 is activated. The micro switch 34 is so arranged that when its operating arm 33 is depressed then a second current sypply circuit to the electric motor is deactivated whereas when the operating arm 33 is in its outer position the motor is activated.

The device operates in the following way. The wringer is normally placed on a cleaning cart on which also a bucket with cleaning agents is placed. The wringer is via the cabel 25 connected to the box 24 with the accumulator and the box is also placed on the cleaning cart. Then a mop holder 41, comprising a rigid elongated body, for instance of plastic and which is pivotally connected to a shaft 43 and has a mop 42 with turfts, is dipped into the bucket with the cleaning liquid. In order to squeeze surplus water out from the mop before cleaning the holder with the mop is then placed with its bottom side on the feeding table 19 and with one of its short ends directed towards the rolls 12,13 which means that the arm 21 for the micro switch 22 is depressed and current is supplied to the electric motor 23 so that the roll 12 rotates. Then the holder is pressed against the feeding table and moved towards the rolls 12, 13 by the user which means that the legs 37 of the feeding means when being touched by the side edges of the holder are moved outwards at the same time as the turfts of the mop are pushed in below the holder. When the short front end of the holder reaches the rolls 13 the tilting lever 25 is lifted and the holder with the mop is fed in the forward direction by means of the rotating roll 12 thereby squeezing the surplus water out of the mop and the turfts. The water flows from the outflow plate back to the bucket, not shown, on the cleaning cart. Since the press force is applied in the form of line contact on the narrow part of the holder a sufficently large press forces are achieved by means of resonable spring forces in order to effectively remove water from the mop turfts. When the tilting lever 25 is moved upwards the operating arm 33 of the micro switch 34 is moved to its outermost portion which means that current is also supplied to the electric motor by means of this switch.

When the holder is moved between the rolls the connection between the handle 43 and the holder will pass in the gap between the upper rolls 13. When the rear short end of the holder has passed the arm 21 the arm is moved to its outer position which means that the microswitch 22 deactivates the first current supply circuit to the motor. However the motor will continue to drive the roll 12 since the microswitch 34 is still active. When the rear short end of the holder has passed the rolls 12, 13 the rolls and the tilting levers 25 fall back to their original positions which means that the operating arm 33 is depressed and the second current supply circuit is deactivated so that the drive of the electric motor 23 and hence the roll 12 is stopped.

When the cleaning work has been finished the box 24 with the accumulator is taken away from the cleaning cart and is connected to a socket whereby the accumulator is again loaded by means of the charger in the box so that the accumulator after a while is ready to be used again.

It should be mentioned that it is also possible to use cleaning carts which are provided with two buck-

ets for the liquid one bucket for instance being used for clean water whereas the second bucket is used for dirty water. By collecting the water flowing down from the wringer in a drain channel or the like whose outlet can be moved between the two buckets the user can at each moment choose in which bucket the removed water should be collected.

Claims

1. Wringer for a mop (42) with turfts the mop being fastened on an elongated, plate shaped rigid holder (41) which together with the mop is inserted in the wringer in order to squeeze liquid from the tufts of the mop, the wringer comprising three rolls (12,13) two of which (12) are coaxial and placed so that a gap is formed between them whereas the direction of the axis of the third roll (12) is parallel with the direction of the axis of the coaxial rolls, that the axis of the rolls are movable with respect to each other making it possible to insert the holder (41) with the mop (42) between the rolls, that at least one of the rolls (13) is under the influence of a spring (31) which presses the roll against one of or the other rolls (12), **caracterized in** that at least one of the rolls is driven by an electric motor (23) so that the holder with the mop is fed between the rolls and the liquid is squeezed from the turfts of the mop the wringer also comprising feeding means (20) for the turfts the feeding means being so arranged that the turfts are fed between the holder and the third roll.

2. Wringer according to claim 1, **caracterized in** that it is provided with a feeding table (19) for the holder (41) the feeding table being provided with an arm (21) for a switch (22) activating the electric motor (23) when the holder is placed on the feeding table.

3. Wringer according to claim 1 or 2, **caracterized in** that the feeding means comprises first legs (37) placed at each side of the feeding table and converging towards the rolls the legs being spring loadet towards each other.

4. Wringer according to claim 3, **caracterized in** that the feeding means also comprise a second leg (36) which is mainly perpendicular to the first leg (37) and which is turnably fastened to the feeding table (19), the two second legs being connected to each other by means of a spring.

5. Wringer according to any of the preceding claims, **caracterized in** that the electric motor (23) can be connected to a power source such as an accumulator.

6. Wringer according to claim 5, **caracterized in** that the accumulator is placed in a portable unit (24) which also contains a battery charger.

7. Wringer according to any of the preceding claims, **caracterized in** that the press force is created as a line contact on the narrow part of the holder.

8. Wringer according to any of the preceding claims, **caracterized in** that it is arranged on a cart which supports at least two buckets for liquid, the liquid flowing fom the wringer via a channel or the like which is movable between the buckets being directed to one of the buckets.

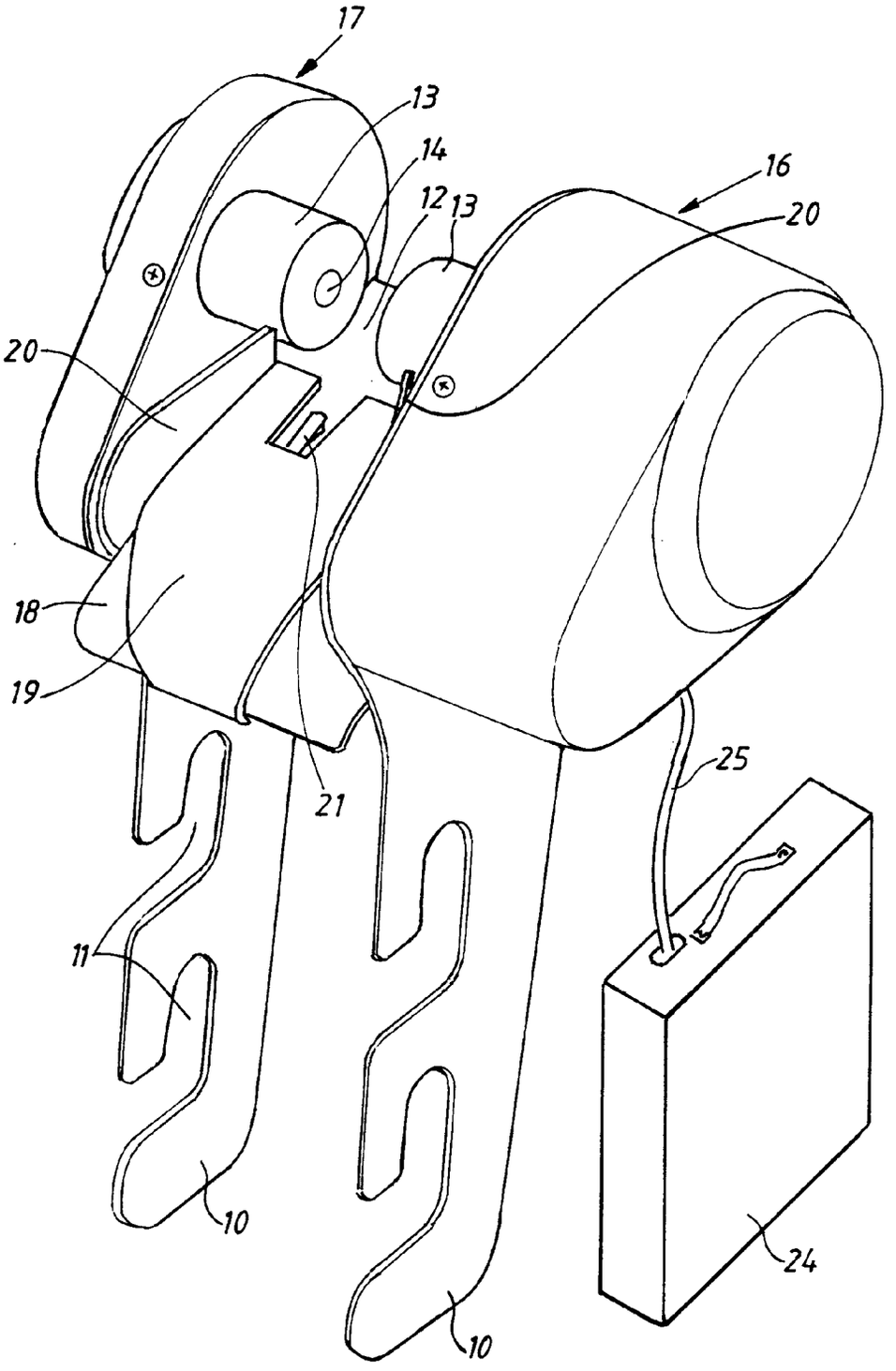

Fig.1

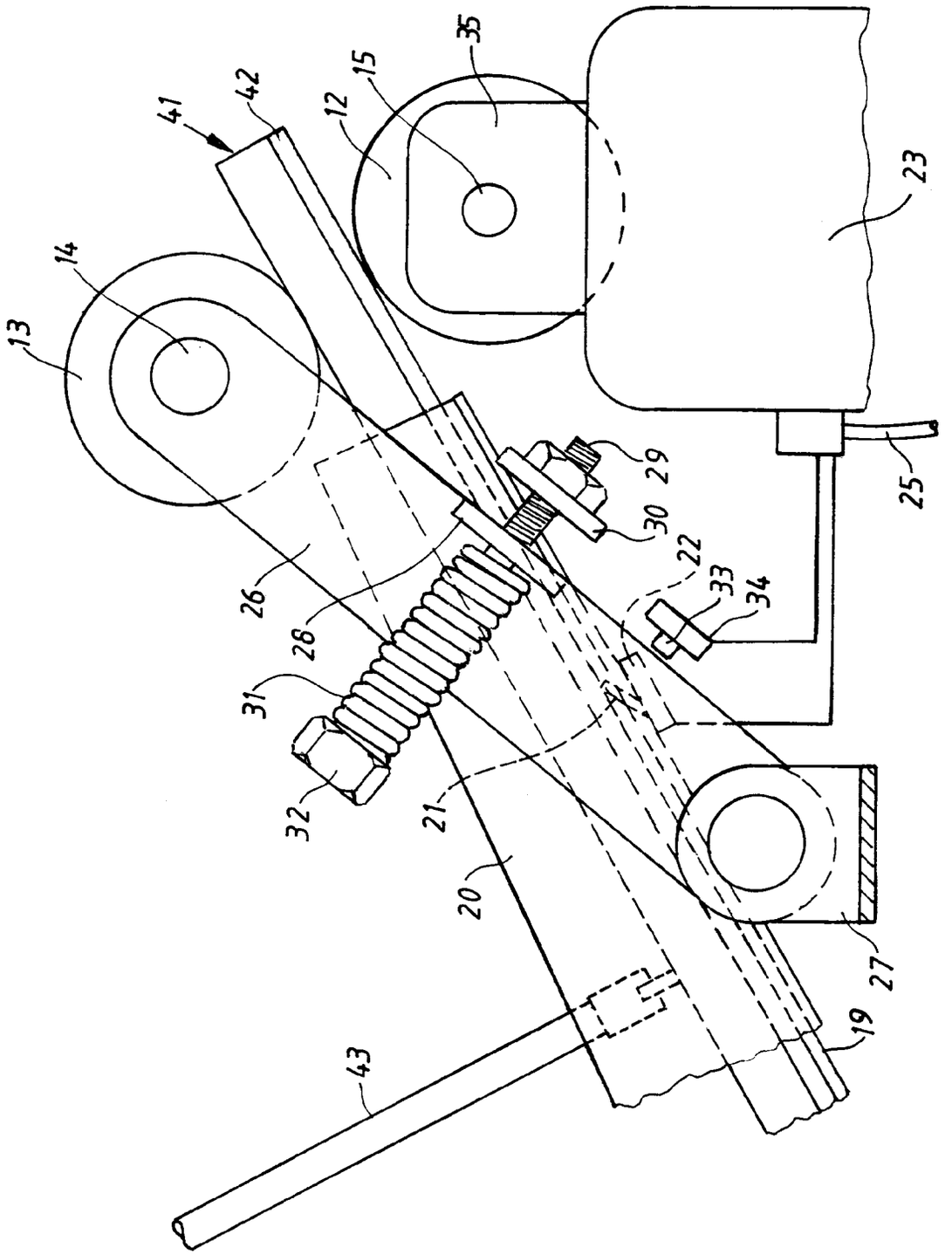

Fig. 2

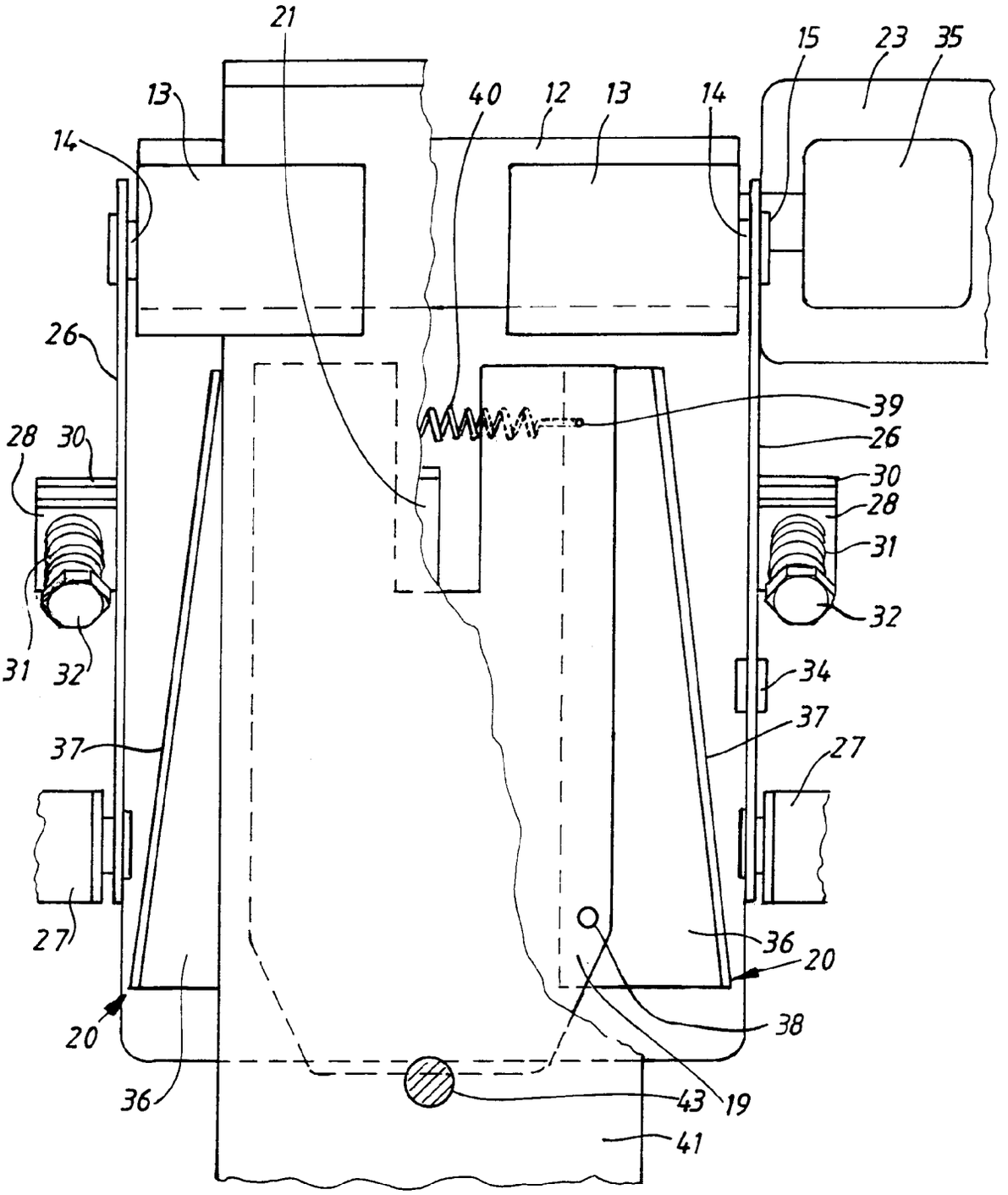
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Fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 94 85 0011

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
Y	EP-A-0 394 801 (HENKEL KG) * column 4, line 29 - column 5, line 21; figures *	1,3,4,7	A47L13/60
D,Y	WO-A-89 12419 (FR. DITLEVSENS EFTF AS) * page 11, line 24 - line 35; figures *	1,3,4,7	
A	DE-A-32 25 734 (HENKEL KG) * abstract; figures 7,8 *	1,8	

TECHNICAL FIELDS SEARCHED (Int.Cl.5)
A47L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	25 April 1994	Vanmol, M

CATEGORY OF CITED DOCUMENTS

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