

(19)



Europäisches Patentamt

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Office européen des brevets



(11)

EP 0 861 628 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

19.04.2000 Bulletin 2000/16

(51) Int Cl.7: **A47L 9/00**, A47L 9/26

(21) Application number: **97830074.7**

(22) Date of filing: **21.02.1997**

(54) **Flex-rewinding device for domestic vacuum cleaners and the like**

Kabelaufrollvorrichtung für Haushaltstaubsaugers und dergleichen

Enrouleur de câble électrique pour des aspirateurs domestiques et similaires

(84) Designated Contracting States:
DE FR GB IT

(43) Date of publication of application:
02.09.1998 Bulletin 1998/36

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GB-A- 1 356 388 **US-A- 3 450 369**
US-A- 3 808 382

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Description

[0001] The present invention relates to an automatic flex-rewinding device for domestic vacuum cleaners and the like (floor polishers, carpet sweepers), which could be defined as a universal device since, with a few minor constructional modifications which do not involve significant increases in manufacturing costs, it can be adapted to meet various requirements, whether of a dimensional or functional nature.

[0002] Domestic type vacuum cleaners with an automatic flex-rewinding device are known.

[0003] This device essentially consists of a flex-carrying spool that is pivoted on a spindle of a fixed support on the body of the vacuum cleaner and is held in a rest or retracted position by a coil spring, one end of which is attached to the support and the other to the spool.

[0004] The spool has a hub, with means for securing an electric flex, and a pair of sliding electrical contacts that engage with fixed contacts mounted on the spindle and connect the vacuum cleaner to the mains supply. Spools having these features are disclosed for example in US-A-3 808 382 or US-A-3 450 369.

[0005] The spool of some of these flex-rewinding devices may be made as a single piece by injection moulding a plastic material under pressure.

[0006] The fact that the spool has a considerable number of elements with undercuts makes it impossible to mould the article using a simple mould and counter-mould set, requiring the use of numerous additional sliding platens (at least two and, in practice, even three or four), in order to define the internal shape of the spool flanges as well as their external shape, together with the external shape of the hub.

[0007] Although the spool produced in this way has the advantage of being in a single piece, the costs involved in its production are extremely high and are only justifiable in the case of mass production runs and especially runs in which the size or shape of the spool does not need to be modified, since the moulds do not easily or economically lend themselves to modifications to produce spools, and therefore flex-rewinding devices, of a different size or which fulfil a different function, for example which carry flex of a different length or offer the possibility of having both automatic and manual rewinding modes.

[0008] In order to satisfy a variety of requirements, therefore, the manufacturer needs to make specific production investments, or, if he wishes to use existing flex-rewinding devices, he will have to resort to compromises that are far from ideal; alternatively, he will simply have to forget the whole idea of employing the device in appliances whose dimensions and structure do not allow the use of existing flex-rewinding devices.

[0009] Another drawback of known flex-rewinding devices is the difficulties involved in actually fitting them, in particular in securing the mains flex to the spool, which should really be a straightforward operation so

that it can be easily replaced whenever the need arises.

[0010] These drawbacks are overcome by the flex-rewinding device that forms the subject of the present invention and which comprises a spool that is essentially formed by two flanged hubs, each of which is produced by moulding it in a simple mould and counter-mould, without the need for any additional sliding platens, which hubs are coupled together to form a spool by coupling and clamping means consisting, for example, of two simple self-tapping screws that can be easily screwed in via an end face of one of the hubs which is external to the spool.

[0011] In this way, using simple mould inserts, it is possible to adapt the diameter of the flanges and the axial length of the hubs, or even of only one of the hubs, in order to satisfy various requirements relating to size and flex-carrying capacity.

[0012] At least one of the flanges is provided with means that position and couple it to a box housing a rewinding spring, and with a cylindrical friction ring that engages with a rewind-locking device, while the other flange is essentially flat and is optionally provided with means (for example one or more flared holes) via which it is coupled to a manual rewinding knob.

[0013] In this way, depending on different requirements, it is possible to produce both automatic and manual rewinding devices having compact and minimal dimensions, as well as devices with a double rewinding spring, by using a combination of hubs having flanges of both types or of the same type.

[0014] In a preferred embodiment the flex is advantageously secured simply by forming a flex housing in the coupling plane between the two hubs, so that when the two hubs are clamped together, the flex is firmly secured.

[0015] A further problem encountered with flex-rewinding devices lies in the fact that the electrical connection between the mains flex and the electrical components in the appliance is provided by sliding contacts which, as a result of a faulty connection caused by dirt or oxidation of the contacts, can generate electric arcs (sparks) and high local temperatures, with the possibility of triggering combustion reactions.

[0016] This problem, too, is easily solved in the flex-rewinding device of the present invention by using bushes and washers made of fire-resistant material which are inserted in housings in the two hubs in order to form two chambers for positioning and accommodating the fixed and movable sliding contacts.

[0017] These and other features and advantages of the present invention will become more apparent from the following description of a preferred embodiment and its variants, which description is given with reference to the appended drawings in which:

- Figure 1 is a diametral section through a first embodiment of a flex-rewinding device according to the present invention,

- Figure 2 is a view of the device of Fig. 1, limited to the spool hub only, on the plane A-A in Fig. 1,
- Figure 3 is a view of the device of Fig. 1, limited to the spool hub only, on the plane B-B in Fig. 1,
- Figure 4 is a view of the device of Fig. 1, limited to the spool hub only, on the plane C-C in Fig. 1,
- Figure 5 is a diametral section, limited to the spool hub only, of a first variant of the device in Fig. 1,
- Figure 6 is a diametral section, limited to the spool hub only, of a second variant of the device in Fig. 1,
- Figure 7 is an exploded perspective view, limited to the spool hub only, of a third variant of the device in Fig. 1.

[0018] With reference to Figures 1 to 4, a flex-rewinding device according to the present invention comprises a fixed support 1, known per se, via which the device is fixed to the appliance.

[0019] The support may be provided with reinforcement ribs 2.

[0020] Attached to the support, which can be produced by moulding a plastic material, and perpendicular to it, is a hollow cylindrical body 3 that acts as a supporting pin or spindle for a flex-carrying spool.

[0021] The spindle 3 is expediently cut or opened along a cylindrical arc in order to allow electrical connections to pass from the outside into its hollow interior.

[0022] Fitted on the spindle 3 is a spool that consists of a first cylindrical hub 4 having a flat circular flange 5 at its axial end closest to the support 1, and a second cylindrical hub 6 also having a flat circular flange 7, but at its axial end furthest away from the support 1.

[0023] The hubs 4, 6, which have the same diameter as the flange 5, are preferably, but not necessarily, of different axial length.

[0024] The two hubs are rigidly coupled together by means of two or more screws, preferably self-tapping screws, that screw into two diametrically opposite holes 8, 9 that extend in the axial direction of the hub 4.

[0025] The two screws pass freely into corresponding holes in the hub 6.

[0026] Two eccentric and preferably straight grooves 10, 11, of semi-circular and semi-oval section respectively, are formed in the flat juxtaposed faces of the two hubs and, when these two hubs are coupled together, these grooves form two housings, of circular and oval section respectively, with dimensions suited to accommodating the plastic-sheathed electric flexes which are to be housed in the spool.

[0027] Transverse projections 12, 13 are formed in the grooves 10, 11 so that, when the screws that couple the two hubs together are loosened, the electric flex can easily be inserted in one of the housings formed by the grooves 10, 11, without having to disassemble the hubs completely and, when the screws are retightened, the flex is reliably secured, with the projections 12 or 13 acting as clamping jaws.

[0028] It should be noted that the projections 12, 13

can be located in a staggered position in the two hubs, in order to force the flex to follow a serpentine path which, without excessively deforming the plastic sheath, gives the flex an extremely efficient grip against tensile stresses.

[0029] The ends of the grooves 10, 11 which open out on to the periphery of the hubs are suitably connected to the cylindrical surface of the hubs in order to prevent the flex from being bent sharply as it is wound on the spool hub.

[0030] These connections also allow electrical leads (each of which has its own insulating protection) to pass into a housing, formed in each of the two hubs, that has two terminals connecting up with sliding contacts.

[0031] In each of the hubs, this housing essentially consists of an axial recess 14, 15, formed on the periphery of the hub and extending from the hub face that is juxtaposed to the other hub towards the corresponding flange, and a cavity 16, 17, formed inside the hub, that extends axially and is open at least on the hub face that is aligned with the corresponding flange.

[0032] Preferably, at least one of these internal cavities, for example the cavity 16 in Figs 1 and 3, is closed at its other end by a hub wall that separates the two cavities in the two hubs and provides insulation between the terminals by means of a dielectric material that has a greater rigidity than air.

[0033] Needless to say, all these elements can be produced by moulding them in a mould and counter-mould that are coupled together on a plane perpendicular to the axis of the hub, and the views in Figures 2, 3 and 4 can refer to both the hub 4 and the hub 6 since, apart from their axial length, which is preferably different, and the diameter of the holes such as 8 and 9, the two hubs can be identical.

[0034] Formed in the face of the hubs 4, 6 that is coplanar with the flange is an annular recess that is coaxial with the axis of the hubs and houses two plastic washers 18, 19 respectively, which are in the shape of a toroidal cup and contain a fixed sliding contact ring, denoted 20, 21 respectively, which has projecting corrugations lying in the direction of the hub axis, each ring having a connection tab 22, 23 that extends radially inside the contact ring in order to connect up with the ends of electric wires provided with "conventional" attachments.

[0035] The tabs 22, 23 project through the axial opening in the pin 3 and right inside the pin so that the sliding contact rings 20, 21 and the associated washers are prevented from rotating on the pin 3.

[0036] The rotation of the washers 18, 19 with respect to the pin 3 can be prevented, not only by the tabs 22, 23, but also, for example, by providing a tooth that extends radially into the washer 18 and engages in the axial groove in the pin 3.

[0037] A similar arrangement can be used for the washer 19 which is fixed to the end of the pin 3 by means of a screw 24 (or a snap-fastening tooth) which can be loosened, together with the hub-clamping screws, in or-

der to insert the electric flex into the relevant housing where it is secured.

[0038] Housed in each of the annular recesses, located between the fixed electrical contacts 20, 21 and an internal stop piece at the bottom of the corresponding annular recess, are movable electrical contacts 25, 26 respectively, in the form of flat washers provided with brackets 27, 28 that support clamping terminals which face the grooves 14, 15 respectively in the hubs, in order to allow electrical connection of the flex ends.

[0039] In their simplest form, as illustrated, the terminals can consist of threaded cavities which take screws for clamping eyelet terminals, but they could also be formed by conducting bushes for the insertion and screw-clamping of rheophores, or by other types of terminals known per se.

[0040] The flex-rewinding device formed by the support 1 and the spool consisting of the two flanged hubs is then completed in a known way, with an automatic rewinding spring 29 housed in a box 30 which is in turn inserted in a cylindrical ring 31 provided on the flange 5.

[0041] This ring is knurled on the outside so that it can engage in a known manner with a pawl 32 that is held by a spring and, when engaged, allows the flex to be unwound only from the spool (by pulling on the flex) and, when disengaged from the ring 31 by means of manual pressure on a push button 33 connected to the pawl, allows the flex to be rewound automatically.

[0042] Needless to say, the flex-rewinding device described may undergo numerous variations, for example, the structure of the spool, which is made up of two axially coupled half-elements, enables flex-rewinding devices with different characteristics to be produced, thereby satisfying the most diverse requirements.

[0043] Indeed, it is quite clear that, simply by introducing annular inserts of varying diameters into the moulds, it is possible to form flanges of different diameters.

[0044] In the same way, again by using annular inserts of varying thicknesses, it is possible to vary the axial length of the hubs and therefore produce spools having a width and diameter specifically designed to carry a predetermined length of flex and/or to comply with given size limitations.

[0045] Also, by providing radially opposite pairs of peripheral axial grooves such as 14, 15 in the hubs 4 and 6, and terminal housings such as 16, 17 (which is obviously useful from the point of view of reducing the volume of material used and of ensuring that the moulded parts have a more uniform cross-section), it is then possible and advantageous not only to position the flex-rewinding spool in either direction, but also to distance the connection terminals from one another, positioning them radially opposite each other.

[0046] In order to pass one of the wires from the exit of the securing recess (10 or 11) into the radially opposite terminal housing, the second securing recess (11 or 10) which has not been used can be used, or a special channel can be formed in the juxtaposed faces of the

two hubs.

[0047] Positioning the terminals radially opposite each other is particularly important in the case of spools which have a reduced axial length since, if the terminals were placed in the same radial position, they would be so close together that the necessary electrical insulation could not be ensured.

[0048] If a manual rewinding device is to be produced, the spool can be made with two flanged hubs of the same type, with the flange, for example the flange 7, not having a cylindrical ring.

[0049] Advantageously, the flange 7 can be provided at the moulding stage with one or more holes, such as the hole 34, for fixing a manual rewinding knob (optionally of the type that fits flush).

[0050] When using a spool with a box for housing the return spring, in which the spring is variably distributed around the spool spindle and around an attachment spindle parallel with the former, the flange 5 does not need to be provided with a cylindrical ring such as the ring 31 to house the box; instead, the periphery of the flange can be used as a stopping and braking drum that engages with a friction block or pawl.

[0051] It is also quite easy to modify the structure of the hub in order to house bushes made of fire-resistant material that form a chamber in which the sliding contacts are contained.

[0052] This ensures maximum safety and protection against electric arcs without the need to use a fire-resistant material for the entire spool.

[0053] This embodiment variant is represented in the diametral section shown in Fig. 5 (limited solely to the hubs) which differs from the embodiment of Fig. 1 only in that an annular housing for a bush or washer 35 made of fire-resistant material is formed in the hub 4, between the movable sliding contact 25 and the hub 4.

[0054] The cup-shaped washer 18, which contains the fixed sliding contact, is, of course, also made of fire-resistant material.

[0055] Similarly, an annular housing is formed in the hub 6 for a bush or washer 36 made of fire-resistant material, between the movable sliding contact 26 and the hub 6.

[0056] The washer 19 is made of fire-resistant material.

[0057] It is also quite straightforward to modify the structure of the hub in order to house three pairs of sliding contacts, in other words so that there is an earth connection for the metal parts of an appliance in addition to the connections to the mains.

[0058] Figure 6 shows this variant in diametral section (limited solely to the hubs).

[0059] Figure 6 shows two terminal housings formed in one of the hubs, for example the hub 4, these housings being radially opposite each other with respect to the axis of the hub and consisting of an axial groove 14, 37 which is open on the periphery of the hub, and of an internal cavity 16, 38 respectively.

[0060] In addition, an annular housing is formed in the end face of the hub 4, juxtaposed to the hub 6, to house a cup-shaped plastic washer 39 which in turn houses an enclosed fixed sliding contact ring 40, together with a rotating contact ring 41 in the shape of a flat washer which is integral in rotation with the hub 4, between the hub and the plastic washer 39.

[0061] The terminal of the rotating contact 41 is housed in the cavity 38.

[0062] Preferably, but not necessarily, a bush 35 made of fire-resistant material dielectrically separates the terminal of the rotating contact 41 from the rotating contact 25, even in the event of the terminal being stressed inappropriately and deformed.

[0063] The cup-shaped washer 39 is then held in position by coupling the two hubs 4 and 6 together.

[0064] In this variant, in order to avoid interference between the plastic washer 39 and the grooves in which the electric flex is housed and secured (such as 10 and 11 in Fig. 2), it is sufficient to increase the external diameter of the hubs by a few millimetres.

[0065] In the embodiments described above, the hubs are easily clamped together by screws that can be accessed on an external face of one of the spool flanges.

[0066] The electric connection terminals, on the other hand, are clamped by working between the flanges and, although quite straightforward, this may present some problems to an inexperienced operator.

[0067] It is, however, possible to avoid this limitation too by providing an insulating block which supports the movable contacts, the associated terminals and the devices which secure the electric flex, and which is fully removable from the spool, fitting between the two hubs and being removable therefrom by simply loosening the latter.

[0068] In this way all the operations involving securing the flex and clamping the terminals can be carried out comfortably, easily and reliably and, once these operations are complete, the insulating support block can be inserted into the spool and fixed therein by clamping the two hubs together.

[0069] Figure 7 shows this embodiment in a perspective exploded view which is limited to a single hub 4 and to the terminal block.

[0070] On its end face which is coupled to the other hub, the hub 4 has a prismatic opening 42 that extends as far as the diametric centre line of the hub, or even beyond this.

[0071] On the periphery of the hub 4, a segment-shaped tooth 43, formed integrally with the hub, extends into the opening 42.

[0072] As in the previous figures, a fixed sliding contact 20 is housed in the hub 4 and faces the opening 42, at least over a semi-circular arc.

[0073] The structure of the other hub which is juxtaposed to the hub 4 is identical.

[0074] The opening 42 (and the corresponding opening in the other hub) houses a removable plastic, and

optionally fire-resistant, terminal block 44, which has a semi-cylindrical groove 45 in which the spool support pin is accommodated.

[0075] Two movable sliding contacts, in the shape of flat half-rings 48, 49, are snap-fastened by means of retention teeth 46, 47 on to the end faces of the terminal block 44, perpendicular to the axis of the semi-cylindrical groove 45. These movable sliding contacts have connection terminals 50, 51 that are housed in suitable recesses in the terminal block 44 body formed in the opposite face to that with the semi-cylindrical groove 45.

[0076] This same face has openings for fixing a flex grip 52 and two projections 53, 54 that engage with the segment 43 and the corresponding segment in the other hub respectively.

[0077] The terminal block 44 can also be produced by moulding it in a mould and counter-mould, without the need for sliding platens.

[0078] In order to insert the terminal block into its housing in the spool, all that needs to be done is to loosen the screws that couple the two hubs together so as to allow it to pass between the retention segments.

[0079] Once the hubs have been retightened, the projections 53, 54 engage with the retention segments and the terminal block is immobilized in the spool.

[0080] At the same time the movable contacts 48, 49 come into contact with the corresponding fixed contacts of the spool.

[0081] Many other modifications can be made to the embodiments described.

[0082] For example, in addition to a first automatic re-winding spring, located on a first flange of the spool, a second spring can be provided which is juxtaposed to the second flange and wound in the same direction as the first spring but is coupled to the spool with a mechanism that inverts the direction of rotation.

[0083] The second spring is advantageously stressed when the first is relaxed.

[0084] The two springs work together to apply torques in the same direction to the spool, their strengths varying inversely according to the winding conditions.

[0085] In this way it is possible to even out the winding torque and the pull exerted on the flex, optionally also taking into account the varying diameter of the quantity of flex on the spool with respect to the different winding conditions.

Claims

1. Flex-rewinding device for domestic vacuum cleaners and the like, of the type in which a flex-carrying spool (4, 5, 6, 7) is rotatably mounted on a spindle (3) of a fixed support (1) said device being provided either with a rewinding knob or with a coil spring (29) for holding said device in a rest position, one end of which is attached to said support (1) and the other to said spool, said spool being provided with means

for securing the electric flex and with at least one pair of sliding contacts that engage with fixed contacts,

characterized in that said spool comprises

- a first flanged hub (4, 5) pivoted on said spindle (3) and produced by moulding a plastic material in a mould and counter mould which are coupled together in a plane perpendicular to the axis of said first hub (4), without any transverse sliding platen;
- a second flanged hub (6, 7) pivoted on said spindle (3) and produced by moulding a plastic material in a mould and counter mould which are coupled together in a plane perpendicular to the axis of said hub,

said first (4) and second (6) hubs being coupled together in axial alignment on a plane perpendicular to the axis of said hubs,

- means (8, 9) for axially coupling and clamping said first and second hubs together, which means can be screwed in on the opposite end face of one of said hubs to that on the said coupling plane;
- a first plastic cup-shaped washer (18) that supports and accommodates a first fixed electrical contact (20), which washer can rotate with respect to said first hub, is housed in a first annular housing formed in the opposite face of said first hub (4) to that on the said coupling plane, and is provided with rotation-locking means that engage with said support spindle;
- a second plastic cup-shaped washer (19) that supports and accommodates a second fixed electrical contact (21), which washer can rotate with respect to said second hub, is housed in a second annular housing formed in the opposite face of said second hub (6) to that on said coupling plane, and is provided with rotation-locking means that engage with said support spindle;
- at least one pair of sliding contacts (25, 26, 48, 49) that can rotate together with said hubs (4, 6), are in electrical contact with said first (20) and second (21) fixed electrical contacts respectively, and are housed in said first and second hubs respectively, each of the sliding contacts having a terminal (27, 28, 50, 51) that provides the electrical connection with an electric flex wound on said hubs.

2. Flex-rewinding device according to Claim 1, in which said first and second hubs form, in the coupling plane, an eccentric through housing for an electric flex which is secured therein when said hubs are clamped together by means of said cou-

pling means.

3. Flex-rewinding device according to Claim 1 or 2, in which said first (4) and second (6) hubs form a third (14, 16) and fourth (15, 17) housing respectively, these housings being open along the periphery of said hubs and communicating with said first and second annular housings respectively so that each of them houses one of said electrical connection terminals (27, 28).
4. Flex-rewinding device according to Claim 1, 2 or 3 in which said first (18) and second (19) washers are made of fire-resistant insulating material and which also comprises a pair of bushes (35, 36) made of fire-resistant insulating material which are housed in said first and second housings respectively.
5. Flex-rewinding device according to Claim 3, in which said third (14, 16) and fourth (15, 17) housings are respectively repeated in diametrically opposite positions on their respective hubs.
6. Flex-rewinding device according to Claim 1, in which said hubs form a third housing (42) for a terminal block (44), which housing is open along the periphery of said hubs and communicates with said first and second housings, said block having means (52) for securing the electric flex, supporting said pair of sliding contacts (48, 49), said electrical-connection terminals (50, 51), and being removable from said third housing by loosening said coupling and clamping means.

Patentansprüche

1. Kabelaufrollvorrichtung für Haushaltsstaubsauger oder dergleichen, bei der eine das Kabel tragende Rolle (4,5,6,7) drehbar auf einer Spindel (3) einer festen Halterung (1) montiert ist, wobei diese Vorrichtung entweder mit einem Aufwickelgriff oder mit einer Wendelfeder (29) versehen ist, die dazu dient, die Vorrichtung in einer Ruhestellung zu halten und deren eines Ende an der Halterung (1) und das andere an der Rolle befestigt ist, bei der ferner die Rolle mit Mitteln zum Halten des elektrischen Kabels und mit mindestens einem Paar von Gleitkontakten versehen ist, die mit feststehenden Kontakten in Berührung kommen,
dadurch gekennzeichnet, dass
die Rolle folgende Merkmale aufweist:
 - eine erste mit einem Flansch versehene Nabe (4, 5), die drehbar auf der Spindel (3) angeordnet ist und durch Ausformen eines Kunststoff-materiales in einer Form und einer Gegenform hergestellt ist, die in einer Ebene senkrecht zu

der Achse der ersten Nabe (4) miteinander verbunden werden, ohne dass irgendwelche quer verschiebbaren Traversen vorgesehen sein müssen,

- eine zweite, mit einem Flansch versehene Nabe (6, 7), die auf der Spindel (3) schwenkbar angeordnet ist und durch Ausformen eines Kunststoffmaterials in einer Form und einer Gegenform hergestellt wird, die in einer Ebene untereinander zusammengesetzt sind, die senkrecht zu der Achse der Nabe verläuft,

die erste (4) und die zweite Nabe (6) sind untereinander in axialer Ausrichtung in einer Ebene senkrecht zu der Achse der Naben zusammengesetzt,

- Mittel (8, 9) zum axialen Zusammenkuppeln und Klemmen der ersten und der zweiten Nabe, die jeweils in die gegenüberliegenden Endseiten einer der Naben in die in der Kupplungsebene gelegene Seite einschraubbar sind,
- ein erster aus Kunststoff bestehender tassenförmig ausgebildeter Dichtungsring (18), der einen ersten festen, elektrischen Kontakt (20) aufnimmt und trägt und der sich in bezug zur ersten Nabe drehen kann und in einer ersten ringförmigen Aufnahme in der der Kupplungsebene entgegengesetzten Stirnfläche der ersten Nabe (4) aufgenommen ist und der ferner mit Mitteln zur Drehsicherung versehen ist, die mit der Tragspindel in Eingriff stehen,
- ein zweiter aus Kunststoff bestehender tassenförmiger Dichtungsring (19), der einen zweiten festen elektrischen Kontakt (1) aufnimmt und trägt, wobei sich dieser Dichtungsring in bezug auf die zweite Nabe drehen lässt und in einer zweiten ringförmigen Aufnahme in der der Kupplungsebene entgegengesetzten Stirnfläche der zweiten Nabe (6) aufgenommen und mit Mitteln zur Drehsicherung versehen ist, die mit der Tragspindel in Eingriff stehen,
- ein Paar von Gleitkontakten (25, 26, 48, 49), das mit den Naben (4, 6) drehbar ist und das jeweils in elektrischem Kontakt mit dem ersten (20) und zweiten festen elektrischen Kontakt (21) steht und das jeweils in der ersten und in der zweiten Nabe untergebracht ist, wobei jeder Gleitkontakt einen Anschluß (27, 28, 50, 51) besitzt, der zum elektrischen Anschluß an das Elektrokabel dient, welches auf den Naben aufgewickelt ist.

2. Kabelaufrollvorrichtung nach Anspruch 1, bei der die erste und die zweite Nabe in ihrer Kupplungsebene eine exzentrische durchgehende Aufnahme für ein Elektrokabel bilden, welches darin gesichert wird, wenn die Naben mit Hilfe der Kupplungsmittel zusammengeklemt werden.

3. Kabelaufrollvorrichtung nach Anspruch 1 oder 2, bei der die erste (4) und die zweite Nabe (6) jeweils eine dritte (14, 16) und vierte (15, 17) Aufnahme bilden, die längs der Peripherie der Naben offen sind und mit der ersten und zweiten ringförmigen Aufnahme jeweils in Verbindung stehen, so dass jede von ihnen einen der genannten elektrischen Verbindungsanschlüsse (27, 28) aufnimmt.

4. Kabelaufrollvorrichtung nach Anspruch 1, 2 oder 3, bei der der erste (18) und der zweite Dichtungsring (19) aus feuerbeständigem Isolationsmaterial bestehen und jeweils ein Paar Buchsen (35, 36) ebenfalls aus feuerbeständigem Isolationsmaterial aufweisen, die jeweils in den ersten und zweiten Aufnahmen untergebracht sind.

5. Kabelaufrollvorrichtung nach Anspruch 3, bei der die dritten (14, 16) und vierten (15, 17) Aufnahmen jeweils auf ihren jeweiligen Naben in diametral gegenüberliegenden Positionen wiederholt angeordnet sind.

6. Kabelaufrollvorrichtung nach Anspruch 1, bei der die Naben eine dritte Aufnahme (42) für einen Anschlussblock (44) bilden, wobei diese Aufnahme längs der Peripherie der Naben offen ist und in Verbindung steht mit den ersten und zweiten Aufnahmen und wobei dieser Block Mittel (52) zur Sicherung des Elektrokabels, zum Tragen des Paares von Gleitkontakten (48, 49) der elektrischen Verbindungsanschlüsse (50, 51) aufweist und von der dritten Aufnahme durch Lösen der Kupplungs- und Klemmmittel entnehmbar ist.

Revendications

1. Dispositif enrouleur de câble destiné à des aspirateurs domestiques et analogue, du type dans lequel une bobine de support de câble (4, 5, 6, 7) est montée avec possibilité de rotation sur une broche (3) d'un support fixe (1), ledit dispositif étant muni soit d'un bouton de ré-enroulement, soit d'un ressort hélicoïdal (29) destiné à maintenir ledit dispositif dans une position de repos, dont une première extrémité est fixée audit support (1) et l'autre à ladite bobine, ladite bobine étant munie d'un moyen destiné à fixer le câble électrique et d'au moins une paire de contacts coulissants qui viennent en prise avec des contacts fixes,

caractérisé en ce que ladite bobine comprend

- un premier moyeu à flasque (4, 5) pivotant sur ladite broche (3) et fabriqué en moulant une matière plastique dans un moule et un contre-moule qui sont accouplés dans un plan perpendiculaire à l'axe dudit premier moyeu (4), sans

aucun plateau coulissant transversal quelconque,

- un second moyeu à flasque (6, 7) pivotant sur ladite broche (3) et fabriqué en moulant une matière plastique dans un moule et un contre-moule qui sont accouplés dans un plan perpendiculaire à l'axe dudit moyeu,

lesdits premier (4) et second (6) moyeux étant accouplés en alignement axial sur un plan perpendiculaire à l'axe desdits moyeux,

- des moyens (8, 9) destinés à accoupler et serrer axialement lesdits premier et second moyeux ensemble, lesquels moyens peuvent être vissés sur la face d'extrémité de l'un desdits moyeux à l'opposé de celle sur ledit plan d'accouplement,
- une première rondelle en forme de cuvette en matière plastique (18) qui supporte et loge un premier contact électrique fixe (20), laquelle rondelle peut tourner par rapport audit premier moyeu, est logée dans un premier logement annulaire formé dans la face dudit premier moyeu (4) à l'opposé de celle sur ledit plan d'accouplement, et est munie de moyens empêchant la rotation qui viennent en prise avec ladite broche du support,
- une seconde rondelle en forme de coupelle en matière plastique (19) qui supporte et loge un second contact électrique fixe (21), laquelle rondelle peut tourner par rapport audit second moyeu, est logée dans un second logement annulaire formé dans la face dudit second moyeu (6) à l'opposée de celle sur ledit plan d'accouplement, et est munie de moyens empêchant la rotation qui viennent en prise avec ladite broche du support,
- au moins une paire de contacts coulissants (25, 26, 48, 49) qui peuvent tourner en même temps que lesdits moyeux (4, 6), sont en contact électrique avec lesdits premier (20) et second (21) contacts électriques fixes, respectivement, et sont logés dans lesdits premier et second moyeux, respectivement, chacun des contacts coulissants comportant une borne (27, 28, 50, 51) qui permet la connexion électrique avec un câble électrique enroulé sur lesdits moyeux.

2. Dispositif enrouleur de câble selon la revendication 1, dans lequel lesdits premier et second moyeux forment, dans le plan d'accouplement, un logement traversant excentrique destiné à un câble électrique qui est fixé dans celui-ci lorsque lesdits moyeux sont serrés ensemble au moyen desdits moyens d'accouplement.

3. Dispositif enrouleur de câble selon la revendication

1 ou 2, dans lequel lesdits premier (4) et second (6) moyeux forment un troisième (14, 16) et un quatrième (15, 17) logement, respectivement, ces logements étant ouverts le long de la périphérie desdits moyeux, et communiquant avec lesdits premier et second logements annulaires, respectivement, de sorte que chacun d'eux loge l'une desdites bornes de connexion électrique (27, 28).

4. Dispositif enrouleur de câble selon la revendication 1, 2 ou 3 dans lequel lesdites première (18) et seconde (19) rondelles sont faites d'un matériau isolant ignifuge, et qui comprend également une paire de douilles (35, 36) faites d'un matériau isolant ignifuge qui sont logées dans lesdits premier et second logements, respectivement.
5. Dispositif enrouleur de câble selon la revendication 3, dans lequel lesdits troisième (14, 16) et quatrième (15, 17) logements sont répétés, respectivement, en des positions diamétralement opposées sur leur moyeu respectif.
6. Dispositif enrouleur de câble selon la revendication 1, dans lequel lesdits moyeux forment un troisième logement (42) destiné à un bloc de bornes (44), lequel logement est ouvert le long de la périphérie desdits moyeux et communique avec lesdits premier et second logements, ledit bloc comportant un moyen (52) destiné à fixer le câble électrique, supportant ladite paire de contacts coulissants (48, 49), lesdites bornes de connexion électrique (50, 51), et pouvant être enlevé dudit troisième logement en desserrant lesdits moyens d'accouplement et de serrage.

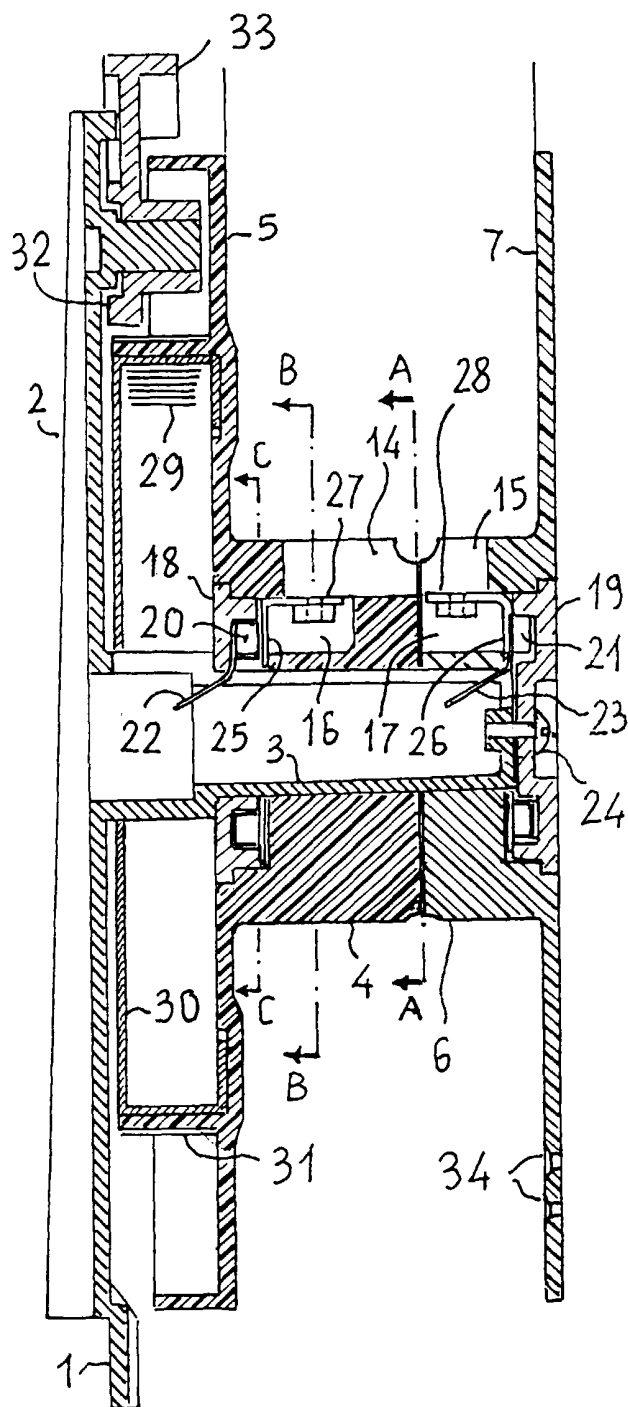


FIG. 1

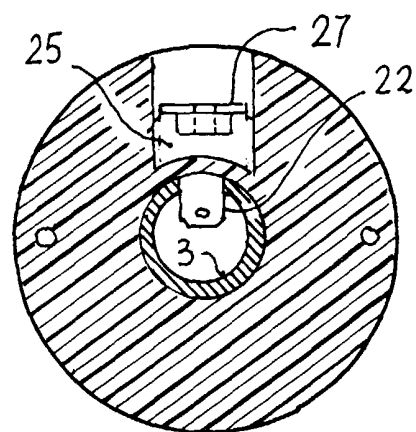
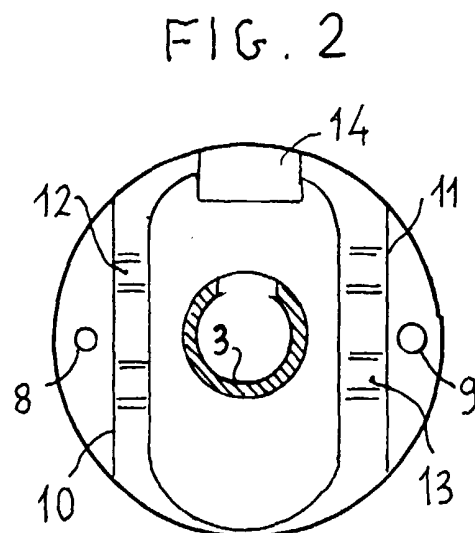


FIG. 3

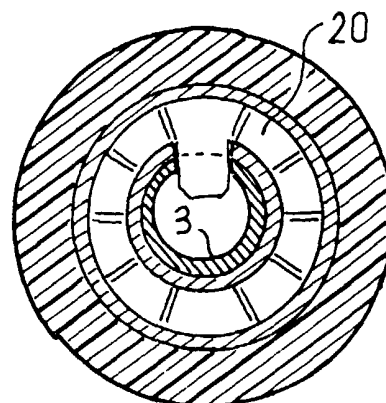


FIG. 4

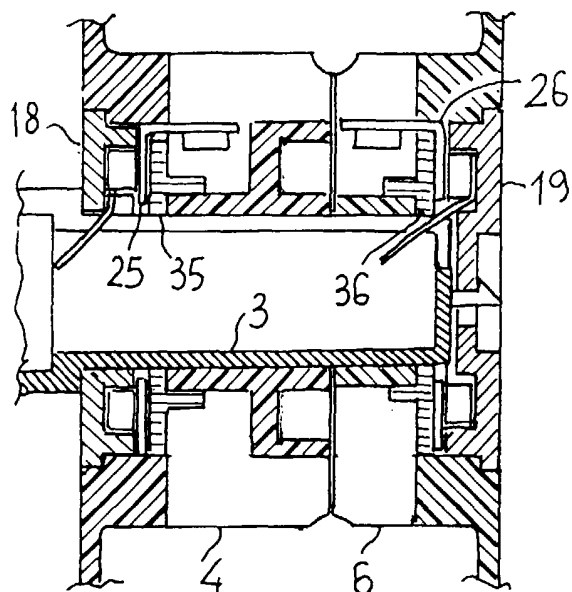


FIG. 5

FIG. 6

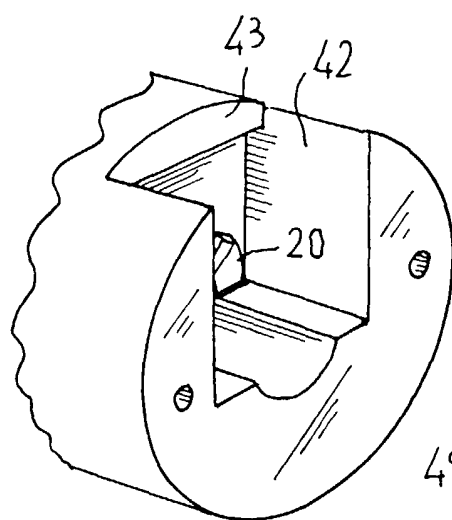
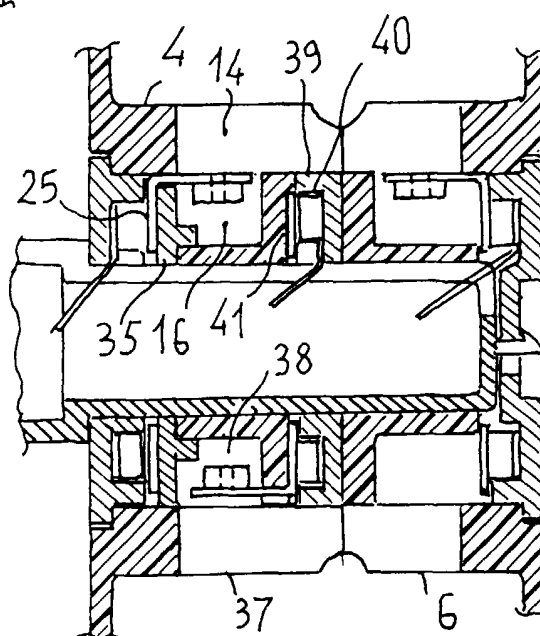


FIG. 7

