

(19)



(11)

EP 1 726 559 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
17.03.2010 Bulletin 2010/11

(51) Int Cl.:
B66D 1/38 (2006.01)

(21) Application number: **06100065.9**

(22) Date of filing: **04.01.2006**

(54) **Cable guiding device particularly for a winch**

Seilführungseinrichtung insbesondere für eine Seilwinde

Dispositif de guidage de câble en particulier pour un treuil

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI
SK TR**

(30) Priority: **27.05.2005 IT TV20050072**

(43) Date of publication of application:
29.11.2006 Bulletin 2006/48

(73) Proprietor: **Bernardi Sas. Di Bernardi R. E G. & C.
31053 Pieve di Soligo TV (IT)**

(72) Inventor: **BERNARDI, Giancarlo
31053, PIEVE DI SOLIGO TV (IT)**

(74) Representative: **Modiano, Micaela Nadia et al
Dr. Modiano & Associati SpA
Via Meravigli 16
20123 Milano (IT)**

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Description

[0001] The present invention relates to a cable guiding device particularly for a winch.

[0002] Winches are currently used which comprise a drum which can be turned in order to wind thereon a cable, which is fixed by means of one of its ends to the lateral surface of the drum.

[0003] The portion of the cable that protrudes from the drum is typically made to pass through one or more guiding elements, constituted for example by one or more pulleys, and can be fixed, by means of its free end, to a body to be moved.

[0004] The cable winds onto the drum and forms turns which are arranged sequentially longitudinally with respect to such drum and are arranged on a plurality of superimposed layers as winding proceeds.

[0005] The turns are arranged more or less uniformly depending on the degree of tension of the cable and on the angle formed between the axis of the drum and the portion of cable that is incident thereon, and become more regular as such angle approximates a right angle.

[0006] The main drawback of these known types of winch is that, since a guiding pulley that the cable encounters at the exit of the drum is arranged in a fixed position, which typically corresponds to the centerline of said drum, the angle between the axis of the drum and the portion of cable that is incident thereon approximates a right angle only at such fixed position, and therefore as the cable increases its distance from said position the turns become increasingly irregular, since the cable is subjected to a return force which tends to make it slip toward such fixed position.

[0007] For this reason, the turns formed by the cable on the drum are often uneven: large empty spaces can form between them, and the turns may also overlap, and this limits the portion of cable that can be wound onto the drum and further entails a high risk of wear and/or pinching of the cable, which can reduce greatly its lifespan.

[0008] The unevenness of the winding is further increased by the fact that the tension on the cable is not constant due to the possible obstacles on the path along which the body is drawn.

[0009] In order to try to solve these drawbacks, so-called cable guides are used and applied to the cable between the drum of the winch and the first guiding element that such cable encounters.

[0010] A first known type of cable guiding device is constituted by a sheave, the rotation axis of which is approximately parallel to the rotation axis of the drum; such sheave is supported rotatably at a first end of at least one arm, which is pivoted at its second end to a rotation axis which is substantially perpendicular with respect to the rotation axis of the drum and is arranged approximately at the centerline thereof; the sheave can therefore move on a plane which is parallel to the longitudinal axis of the drum, tracing a circular arc whose radius is equal to the length of the arm that supports it.

[0011] The cable that exits from the drum is made to pass through the sheave before passing through the guiding pulley; during the winding of the cable, the sheave, moved by the movement of the cable axially with respect to the drum, moves along a circular arc, keeping the angle between the axis of the drum and the portion of cable that is incident thereon sufficiently close to a right angle approximately over the entire length of the drum.

[0012] However, the arm that supports the sheave must be considerably long in order to ensure a large radius of curvature for the path of such sheave.

[0013] The main drawback of these known types of cable guiding device is that they are rather unstable owing to the considerable length of the arm that supports the sheave; moreover, even the modest forces transmitted by the cable to the sheave produce, with respect to the center of rotation of the arm, large movements which tend to move both the arm and the sheave, compromising the uniformity of the distribution of the turns on the drum.

[0014] Moreover, these known types of cable guiding device require constant lubrication of the sheave and of the pivoting region of the arm that supports it; the lubricant may come into contact with the cable and/or with the various elements that constitute the winch, dirtying them and/or possibly compromising some of their functions.

[0015] A second known type of cable guiding device is constituted by a cylindrical shaft, which can rotate freely with respect to its own longitudinal axis and is approximately parallel to the longitudinal axis of the drum; a helical groove is formed on its lateral surface and has a pitch which depends on the diameter of the cable and on the dimensions of the drum; the cable that leaves the drum of the winch is associated with the groove formed within said shaft and is thus guided by it so that it keeps approximately right, substantially in any position, the angle between the axis of the drum and the portion of cable that is incident thereon.

[0016] The main drawback of these known types of cable guiding device is that they are very expensive and must further be designed according to the specific dimensions of the winch and of the cable to which they will be applied, since it is not possible to use them for winches in which the drums and cables have dimensions which differ even slightly with respect to the ones considered during design.

[0017] US-A-2 249 117 discloses a winch as defined in the preamble of claim 1.

[0018] The aim of the present invention is to solve the above-mentioned technical problems, eliminating the drawbacks of the cited background art, by providing a device which allows to wind a cable onto the drum of a winch, obtaining turns which are very compact and uniform, regardless of the dimensions of the cable.

[0019] Within this aim, an object of the invention is to provide a device which can be applied to a plurality of winches of the known type.

[0020] Another object is to provide a device which does

not require frequent maintenance thereof.

[0021] Another object is to provide a device which is structurally simple and has low manufacturing costs.

[0022] This aim and these and other objects, which will become better apparent hereinafter, are achieved by a winch comprising a drum, on which it is possible to wind and unwind selectively a cable, and a cable guiding device comprising an elongated guide which has a curved profile in plan view which lies, during use, on a plane which is substantially parallel to the axis of rotation of said drum, and with which a slider is slidingly associated, said slider supporting rotatably a pulley with which said cable is associable, said guide being arranged above said drum of said winch and approximately parallel thereto, wherein said guide has a curved profile, said guide being interposed between supports along an axis which is approximately parallel to the rotation axis of said drum, **characterized in that** said guide has an approximately rectangular transverse cross-section and a profile, in plan view, which lies on an arc of an ellipse in which the foci, once associated with said supports, lie advantageously on a straight line which is substantially parallel to the longitudinal axis of said drum.

[0023] Further characteristics and advantages of the invention will become better apparent from the following detailed description of a particular but not exclusive embodiment thereof, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a perspective view of a cable guiding device according to the invention, applied to a winch;

Figure 2 is a plan view of a cable guiding device according to the invention, applied to a winch;

Figure 3 is a sectional view, taken along the line III-III of Figure 2;

Figure 4 is an exploded perspective view of a cable guiding device according to the invention;

Figure 5 is an exploded perspective view of the slider of a cable guiding device according to the invention.

[0024] In the exemplary embodiments that follow, individual characteristics, given in relation to specific embodiments, may actually be interchanged with other different characteristics that exist in other exemplary embodiments.

[0025] Moreover, it is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0026] With reference to the figures, the reference numeral 1 designates a cable guiding device, particularly for a winch 2 which comprises a drum 3 on which a cable 4 can be wound and unwound selectively.

[0027] The drum 3 is supported rotatably between two

appropriately provided known supports 5.

[0028] The drum 3 is connected, by means of appropriately provided known mechanisms, not shown in the figures, to a power source, also not shown, which is adapted to turn the drum 3 with respect to its longitudinal axis.

[0029] The device 1 comprises a laminar elongated guide 6, which has a curved profile in plan view; the guide 6 is arranged between the supports 5 along an axis which is approximately parallel to the axis of rotation of the drum 3; advantageously, the guide 6 has an approximately rectangular shape in transverse cross-section.

[0030] Preferably, the guide 6 has, in plan view, a profile which lies on an arc of an ellipse in which the foci, once the guide is associated with the supports, lie advantageously on a straight line which is substantially parallel with respect to the longitudinal axis of the drum 3.

[0031] The guide 6 can be positioned, during use, above the drum 3 and approximately parallel thereto and has, at its ends, two tabs, designated respectively by the reference numerals 7a and 7b, which are advantageously shaped approximately like a parallelepiped, protrude transversely from the guide 6 and lie substantially on the same plane of arrangement as said guide.

[0032] The tabs 7a and 7b may have the chosen shapes and can be fixed to the supports 5 for example by welding or adhesive bonding or bolting or riveting or other known means for fixing respectively their lower and/or lateral surfaces to the supports 5.

[0033] Preferably, the tab 7a is provided with first holes 8, which are formed along axes which are approximately perpendicular to the plane of arrangement of the guide 6; the second tab 7b is provided with one or more second holes 9, which are formed along axes which are approximately perpendicular to the first holes 8; suitable screws for locking to the supports 5 can be inserted in the first holes 8 and in the second holes 9.

[0034] A slider 10 is associated axially and slidingly with the guide 6 and is constituted by two half-shells 12a and 12b, which are mutually mirror-symmetrical and have an external lateral surface which is substantially circular; a recess 13 is formed axially and eccentrically at the mutually facing surfaces of the two half-shells 12a and 12b and has such a shape as to allow an at least partial accommodation of the guide 6 therein.

[0035] The axial sliding of the slider 10 and the interconnection of the two half-shells 12a and 12b are allowed by the presence, at the region that is not affected by the recess 13, of third holes 14, the axes of which are perpendicular to the axis of the half-shells; the holes act as receptacles for pivots 15, to which two wheels 16 are freely fixed.

[0036] Said wheels interact with the convex lateral surface of the guide 6.

[0037] Advantageously, the wheels 16 are made of a plastic material which has self-lubricating characteristics.

[0038] The half-shells 12a and 12b are associated with the guide 6 by arranging said guide in the first recess 13,

with the interposition of two complementarily shaped sliding blocks 17.

[0039] Advantageously, the sliding blocks 17 are made of a plastic material which has self-lubricating characteristics.

[0040] Two mutually parallel grooves 18 are formed on the outer lateral surface of the half-shells 12a and 12b and lie on a circumference in which the center is the longitudinal axis of the slider.

[0041] A bearing 19 is advantageously associated coaxially with respect to the slider, between the grooves 18, and is kept in position by two first elastic rings 20, which can be associated with the grooves 18.

[0042] The bearing 19 supports rotatably a substantially cylindrical pulley 21, which is provided with a radial race 22 which accommodates the cable 4.

[0043] The pulley 21 is kept in position by means of a second elastic ring 23, which can be associated with an appropriately provided receptacle 24, which is formed annularly with respect to a lateral surface of the pulley 21; on the opposite side, the inside diameter of the pulley 21 is reduced, so as to form an abutment 25 for the perimetric edge of the bearing 19.

[0044] Use of the device of the invention is therefore as follows: with reference to the accompanying figures, after assembling the device 1, the device is associated proximate to the drum 3 and above it, fixing the tabs 7a and 7b of the guide 6 to the lateral supports 5.

[0045] The cable 4 that extends from the drum 2 is arranged on the race 22 of the pulley 21 and is then sent to an appropriately provided guiding element of a known type, which is constituted for example by a sheave, not shown in the accompanying figures; the free end of the cable 4 can therefore be fixed, either directly or after optionally passing through additional known types of guiding element, to a body to be moved by means of the winch 2.

[0046] By turning the drum 3, the cable 4 starts to wind thereon, turning the pulley 21 with respect to the slider.

[0047] During the rotation of the drum 3, the cable 4 is arranged thereon, forming turns which are arranged sequentially longitudinally with respect to the drum 3, moving the pulley 21, which thus performs a longitudinal translational motion with respect to the guide 6, keeping the portion of the cable 4 that is incident to the lateral surface of the drum 3 substantially at right angles to the longitudinal axis thereof over its entire length; in this manner, the turns formed by the cable 4 are very compact and uniform.

[0048] The particular curvature of the guide 6, which is preferably elliptical, causes the motion of the slider 10, and therefore of the pulley 21 rotatably supported thereby, to be scarcely susceptible to the influence of any forces transmitted to the pulley 21 by the cable 4, thus ensuring great compactness and uniformity of the turns even if, for example, the body to be moved slides over a very rough surface.

[0049] The wheels 16 and the sliding blocks 17 ensure

optimum mating between the slider 10 and the guide 6, improving the uniformity of the motion of the slider 10 and therefore of the pulley 21 with respect to the drum 3 and therefore contributing to further improving the uniformity of the turns.

[0050] It has thus been found that the invention achieves the intended aim and objects, a cable guiding device having been provided which allows to achieve high compactness and uniformity of the turns formed by a cable during its winding onto the drum of a winch.

[0051] Further, the cable guiding device according to the invention, thanks to the particular curvature of the guide, is affected to a minimum extent by any irregularities of the tension applied to the cable, ensuring the formation of very compact and uniform turns substantially in any condition.

[0052] Moreover, the cable guiding device according to the invention is very compact and solid, can be applied easily to ordinary known types of winch, and does not require frequent maintenance.

[0053] Further, the use of wheels and sliding blocks made of self-lubricating material allows to limit the use of lubricant in the couplings of the various elements of the device according to the invention.

[0054] The invention is of course susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0055] The materials used, as well as the dimensions that constitute the individual components of the invention, may of course be more pertinent according to specific requirements.

[0056] The various means for performing certain different functions need not certainly coexist only in the illustrated embodiment, but can be present per se in many embodiments, including ones that are not illustrated.

[0057] The characteristics indicated as advantageous, convenient or the like may also be omitted or be replaced with equivalents.

[0058] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A winch (2) comprising a drum (3), on which it is possible to wind and unwind selectively a cable (4), and a cable guiding device (1) comprising an elongated guide (6) which has a curved profile in plan view which lies, during use, on a plane which is substantially parallel to the axis of rotation of said drum, and with which a slider (10) is slidably associated, said slider (10) supporting rotatably a pulley (21) with which said cable (4) is associable, said guide (6)

being arranged above said drum (3) of said winch and approximately parallel thereto, wherein said guide (6) has a curved profile, said guide (6) being interposed between supports (5) along an axis which is approximately parallel to the rotation axis of said drum (3), **characterized in that** said guide (6) has an approximately rectangular transverse cross-section and a profile, in plan view, which lies on an arc of an ellipse in which the foci, once associated with said supports (5), lie on a straight line which is substantially parallel to the longitudinal axis of said drum (3).

2. The device according to claim 1, **characterized in that** said guide (6) can be arranged, during use, above said drum (3) and approximately parallel thereto, and has, at its ends, two tabs (7a, 7b) which are shaped approximately like a parallelepiped, protrude transversely from said guide (6), and lie substantially on the same plane of arrangement as said guide (6).
3. The device according to claim 2, **characterized in that** said tabs (7a, 7b) respectively have first holes (8), which are formed along axes which are approximately perpendicular to the plane of arrangement of said guide (6), and one or more second holes (9), which are formed along axes which are approximately perpendicular to said first holes (8), screws for locking to said supports (5) being inscrutable in said first (8) and second (9) holes.
4. The device according to claim 1, **characterized in that** a slider (10) is associated with said guide (6) axially and slidingly and is constituted by two mirror-symmetrical half-shells (12a, 12b), the outer lateral surface of which is substantially circular; a recess (13) being formed axially and eccentrically at the mutually facing surfaces of said two half-shells (12a, 12b) and having such a shape as to allow an at least partial accommodation of said guide (6) inside it
5. The device according to claim 4, **characterized in that** it comprises, at a region not affected by said recess (13), third holes (14) which have axes which are perpendicular to the axis of said half-shells (12a, 12b) and constitute receptacles for pivots (15) to which two wheels (16) are freely pivoted, said wheels (16) interacting with the convex lateral surface of said guide (6).
6. The device according to claim 4, **characterized in that** said half-shells (12a, 12b) are associated with said guide (6) by arranging it in said recess (13) with the interposition of two complementarily shaped sliding blocks (17) made of a plastic material which has self-lubricating characteristics.
7. The device according to claim 4, **characterized in**

that two mutually parallel grooves (18) are formed on the outer lateral surface of said half-shells (12a, 12b) and lie on a circumference the center of which is the longitudinal axis of said slider (10), coaxially to which a bearing (19) is associated between said grooves (18) and is kept in position by two first elastic rings (20), which can be associated with said grooves (18).

8. The device according to claim 7, **characterized in that** said bearing (19) supports rotatably said cylindrical pulley (21), which is provided with a radial race (22) which acts as a receptacle for said cable (4), said pulley (21) being kept in position by means of a second elastic ring (23), which can be associated with a receptacle (24) which is formed annularly with respect to a lateral surface of said pulley (21), the inside diameter of said pulley (21) being reduced on the opposite side with respect to said receptacle, so as to form an abutment (25) for the perimetric edge of said bearing (19).

Patentansprüche

1. Eine Seilwinde (2), beinhaltend eine Trommel (3), auf die ein Kabel (4) wahlweise auf- und abgewickelt werden kann, und eine Kabelführvorrichtung (1), mit einer länglichen Führung (6), die ein in Draufsicht bogenförmiges Profil aufweist und während der Verwendung in einer Ebene liegt, die im Wesentlichen parallel zu der Drehachse der Trommel ist, und mit der ein Reiter (10) verschiebbar verbunden ist, wobei der Reiter (10) eine drehbare Rolle (21) trägt, die dem Kabel (4) zuordnenbar ist, die Führung (6) ist oberhalb der Trommel (3) der Seilwinde und ungefähr parallel dazu angeordnet, wobei die Führung (6) ein bogenförmiges Profil aufweist, die Führung (6) ist zwischen Trägern (5) entlang einer Achse, die im Wesentlichen parallel zu der Drehachse der Trommel (3) ist, angeordnet, **dadurch gekennzeichnet, dass** die Führung (6) einen näherungsweise rechteckigen transversalen Querschnitt hat und ein Profil, das, in Draufsicht, auf dem Bogen einer Ellipse liegt, deren Foki, sobald sie den Trägern (5) zugeordnet sind, auf einer geraden Linie liegen, die im Wesentlichen parallel zu der Längsachse der Trommel (3) verläuft.
2. Die Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Führung (6) während der Benutzung über der Trommel (3) und näherungsweise parallel dazu angeordnet sein kann und an ihren Enden zwei Laschen (7a, 7b) hat, die näherungsweise wie ein Parallelepiped geformt sind, transversal von der Führung (6) abstehen und im Wesentlichen in der selben Anordnungsebene wie die Führung (6) liegen.

3. Die Vorrichtung nach Anspruch 2, **dadurch gekennzeichnet, dass** die Laschen (7a, 7b) jeweils erste Löcher (8), die entlang Achsen geformt sind, die näherungsweise senkrecht zu der Anordnungsebene der Führung (6) sind, und ein oder mehrere zweite Löcher (9), die entlang der Achsen geformt sind, die näherungsweise senkrecht zu den Achsen der ersten Löcher (8) sind, aufweisen; Schrauben für die Verriegelung an den Trägern (5) sind in die ersten (8) und zweiten (9) Löcher einsetzbar. 5
4. Die Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** ein Reiter (10) mit der Führung (6) axial und verschiebbar verbunden ist und von zwei spiegelsymmetrischen Halbschalen (12a, 12b) gebildet wird, deren äußere laterale Oberfläche im Wesentlichen kreisförmig ist; eine Aussparung (13) ist axial und exzentrisch an den sich gegenüberliegenden Oberflächen der beiden Halbschalen (12a, 12b) gebildet und weist eine solche Form auf, dass die zumindest teilweise Aufnahme der Führung (6) darin möglich ist. 10
5. Die Vorrichtung nach Anspruch 4, **dadurch gekennzeichnet, dass** sie, in einem Bereich, der nicht von der Aussparung (13) beeinflusst wird, dritte Löcher (14) aufweist, die Achsen aufweisen, die senkrecht zu der Achse der Halbschalen (12a, 12b) sind und Aufnahmen für Zapfen (15) bilden, an denen zwei Räder (16) frei drehbar gelagert sind, wobei die Räder (16) mit der konvexen lateralen Oberfläche der Führung (6) interagieren. 15
6. Die Vorrichtung nach Anspruch 4, **dadurch gekennzeichnet, dass** die Halbschalen (12a, 12b) der Führung (6) durch Anordnung in der Aussparung (13) mit der Einfügung von zwei komplementär geformten Gleitblöcken (17) aus einem Kunststoffmaterial, das selbstschmierende Eigenschaften aufweist, zugeordnet sind. 20
7. Die Vorrichtung nach Anspruch 4, **dadurch gekennzeichnet, dass** zwei zueinander parallele Nuten (18) an der äußeren lateralen Oberfläche der Halbschalen (12a, 12b) ausgebildet sind und auf einem Kreisumfang liegen, dessen Mittelpunkt die Längsachse des Reiters (10) ist, zu dem ein Lager (19) koaxial zwischen den Nuten (18) angeordnet und in seiner Position von zwei ersten elastischen Ringen (20) gehalten wird, welche den Nuten (18) zugeordnet werden können. 25
8. Die Vorrichtung nach Anspruch 7, **dadurch gekennzeichnet, dass** das Lager (19) die zylindrische Rolle (21) drehbar trägt, welche mit einem radialen Lauf- 30 ring (22) versehen ist, der als Aufnahme für das Kabel (4) wirkt, wobei die Rolle (21) mittels eines zweiten elastischen Rings (23) in Position gehalten wird, 35

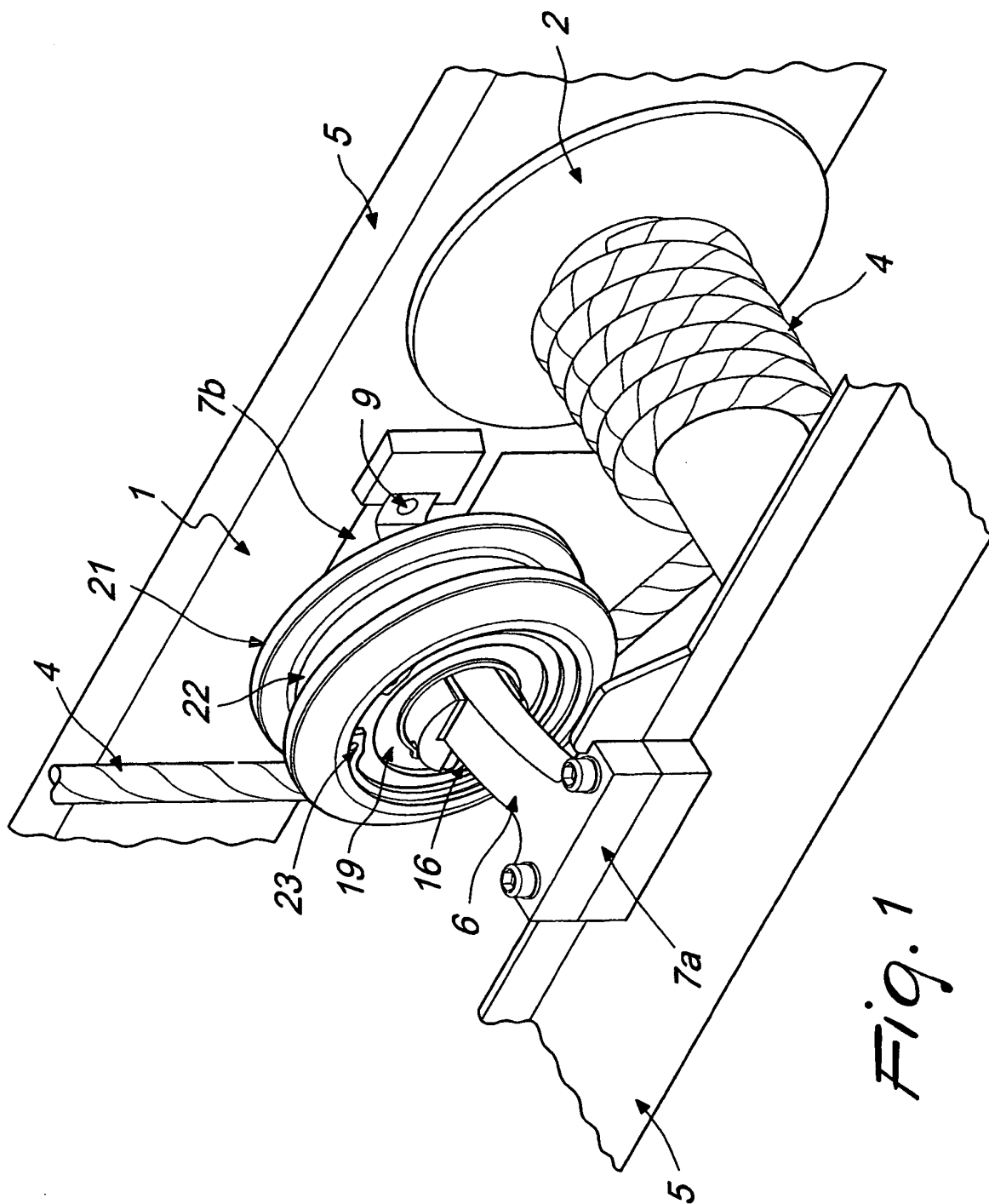
welcher einer Aufnahme (24) zugeordnet werden kann, die ringförmig mit Bezug auf die laterale Oberfläche der Rolle (21) ausgebildet ist, der innere Durchmesser der Rolle (21) ist auf der in Bezug zu der Aufnahme gegenüberliegenden Seite vermindert, um so ein Widerlager (25) für die Umfangskante des Lagers (19) zu bilden. 40

10 Revendications

1. Treuil (2) comprenant un tambour (3) sur lequel il est possible d'enrouler et de dérouler sélectivement un câble (4), et un dispositif de guidage de câble (1) comprenant un guide allongé (6) qui a un profil incurvé sur une vue en plan qui se trouve, à l'usage, sur un plan qui est sensiblement parallèle à l'axe de rotation dudit tambour, et avec lequel une glissière (10) est associée de manière coulissante, ladite glissière (10) supportant en rotation une poulie (21) avec laquelle ledit câble (4) peut être associé, ledit guide (6) étant agencé au-dessus dudit tambour (3) dudit treuil et approximativement parallèle à celui-ci, dans lequel ledit guide (6) a un profil incurvé, ledit guide (6) étant intercalé entre des supports (5) le long d'un axe qui est approximativement parallèle à l'axe de rotation dudit tambour (3), **caractérisé en ce que** ledit guide (6) a une section transversale approximativement rectangulaire et un profil, sur une vue en plan, qui se trouve sur un arc d'une ellipse dans laquelle les foyers, une fois associés avec lesdits supports (5), se trouvent sur une ligne droite qui est sensiblement parallèle à l'axe longitudinal dudit tambour (3). 45
2. Dispositif selon la revendication 1, **caractérisé en ce que** ledit guide (6) peut être agencé, à l'usage, au-dessus dudit tambour (3) et approximativement parallèlement à celui-ci, et a, au niveau de ses extrémités, deux languettes (7a, 7b) qui sont formées approximativement comme un parallélépipède, font saillie de manière transversale à partir dudit guide (6) et se trouve sensiblement sur le même plan d'agencement que ledit guide (6). 50
3. Dispositif selon la revendication 2, **caractérisé en ce que** lesdites languettes (7a, 7b) ont respectivement des premiers trous (8), qui sont formés le long des axes qui sont approximativement perpendiculaires au plan d'agencement dudit guide (6), et un ou plusieurs deuxièmes trous (9), qui sont formés le long des axes qui sont approximativement perpendiculaires auxdits premiers trous (8), des vis pour bloquer lesdits supports (5) pouvant être insérées dans lesdits premiers (8) et deuxièmes (9) trous. 55
4. Dispositif selon la revendication 1, **caractérisé en ce qu'**une glissière (10) est associée avec ledit guide 60

(5) de manière axiale et coulissante et est constituée par deux demi-coques symétriques en miroir (12a, 12b), dont la surface latérale externe est sensiblement circulaire ; un évidement (13) étant formé de manière axiale et excentrique au niveau des surfaces se faisant mutuellement face desdites deux demi-coques (12a, 12b) et ayant une forme telle qu'elle permet au moins un logement partiel dudit guide (6) à l'intérieur de celui-ci.

5. Dispositif selon la revendication 4, **caractérisé en ce qu'il** comprend, au niveau d'une région non affectée par ledit évidement (13), des troisièmes trous (14) qui ont des axes qui sont perpendiculaires à l'axe desdites demi-coques (12a, 12b) et constituent des réceptacles pour des pivots (15) auxquels deux roues (16) pivotent librement, lesdites roues (16) interagissant avec la surface latérale convexe dudit guide (6).
6. Dispositif selon la revendication 4, **caractérisé en ce que** lesdites demi-coques (12a, 12b) sont associées avec ledit guide (6) en l'agencant dans ledit évidement (13) en intercalant deux blocs coulissants (17) de forme complémentaire réalisés avec une matière plastique qui a des caractéristiques autolubrifiantes.
7. Dispositif selon la revendication 4, **caractérisé en ce que** deux rainures mutuellement parallèles (18) sont formées sur la surface latérale externe desdites demi-coques (12a, 12b) et se trouvent sur une circonférence dont le centre est l'axe longitudinal de ladite glissière (10), de manière coaxiale à laquelle un palier (19) est associé entre lesdites rainures (18) et est maintenu en position par deux premières bagues élastiques (20), qui peuvent être associées avec lesdites rainures (18).
8. Dispositif selon la revendication 7, **caractérisé en ce que** ledit palier (19) supporte en rotation ladite poulie cylindrique (21), qui est prévue avec un chemin de roulement radial (22) qui sert de réceptacle pour ledit câble (4), ladite poulie (21) étant maintenue en position au moyen d'une seconde bague élastique (23), qui peut être associée avec un réceptacle (24) qui est formé de manière annulaire par rapport à une surface latérale de ladite poulie (21), le diamètre interne de ladite poulie (21) étant réduit sur le côté opposé par rapport audit réceptacle, afin de former une butée (25) pour le bord périmétral dudit palier (19).



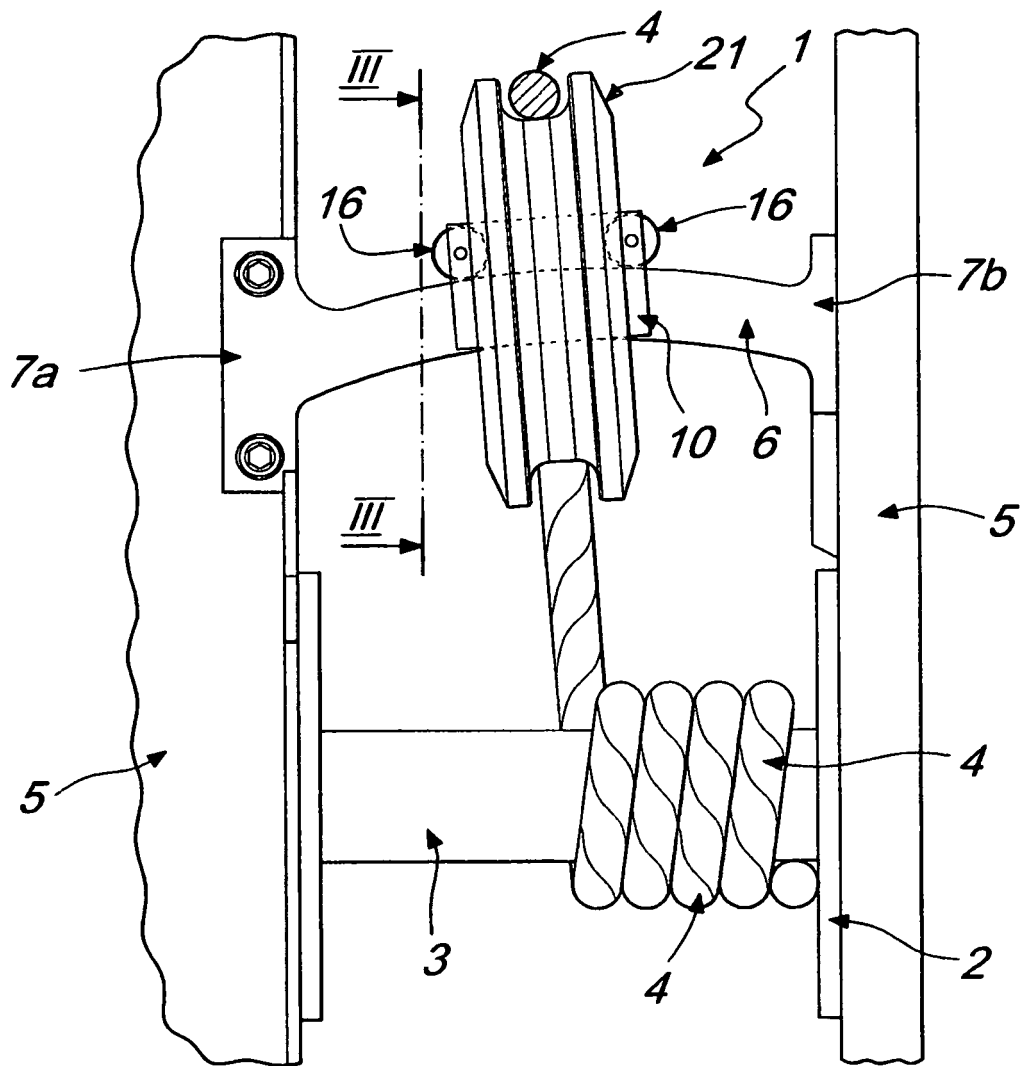


Fig. 2

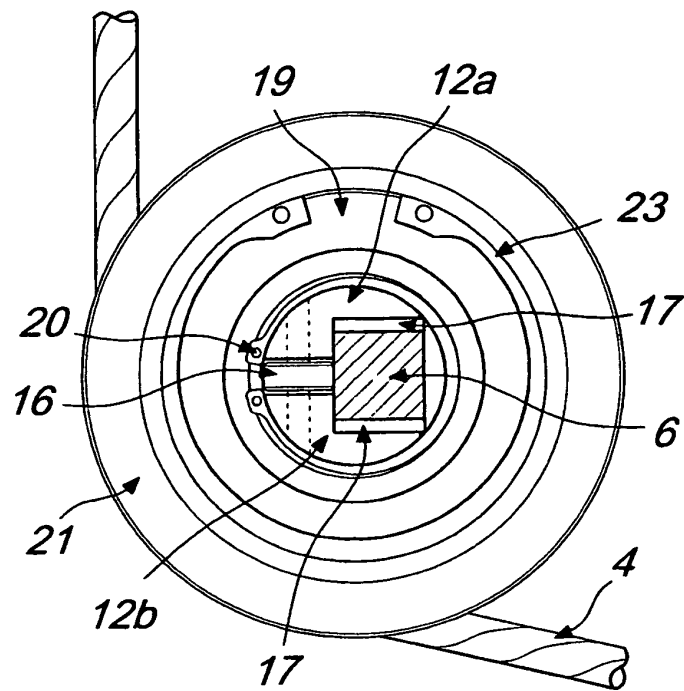


Fig. 3

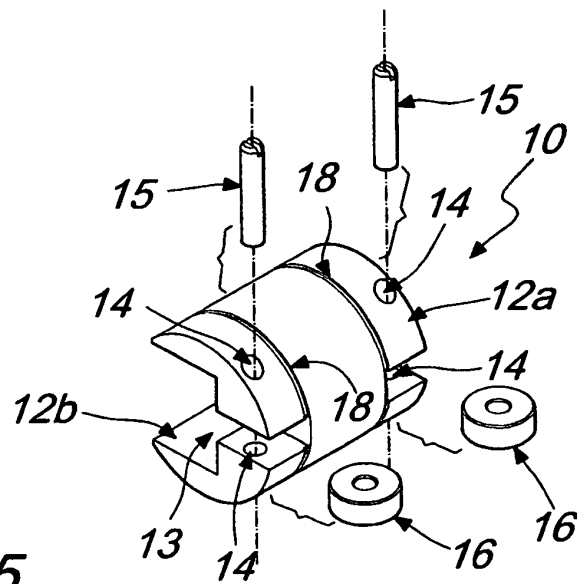


Fig. 5

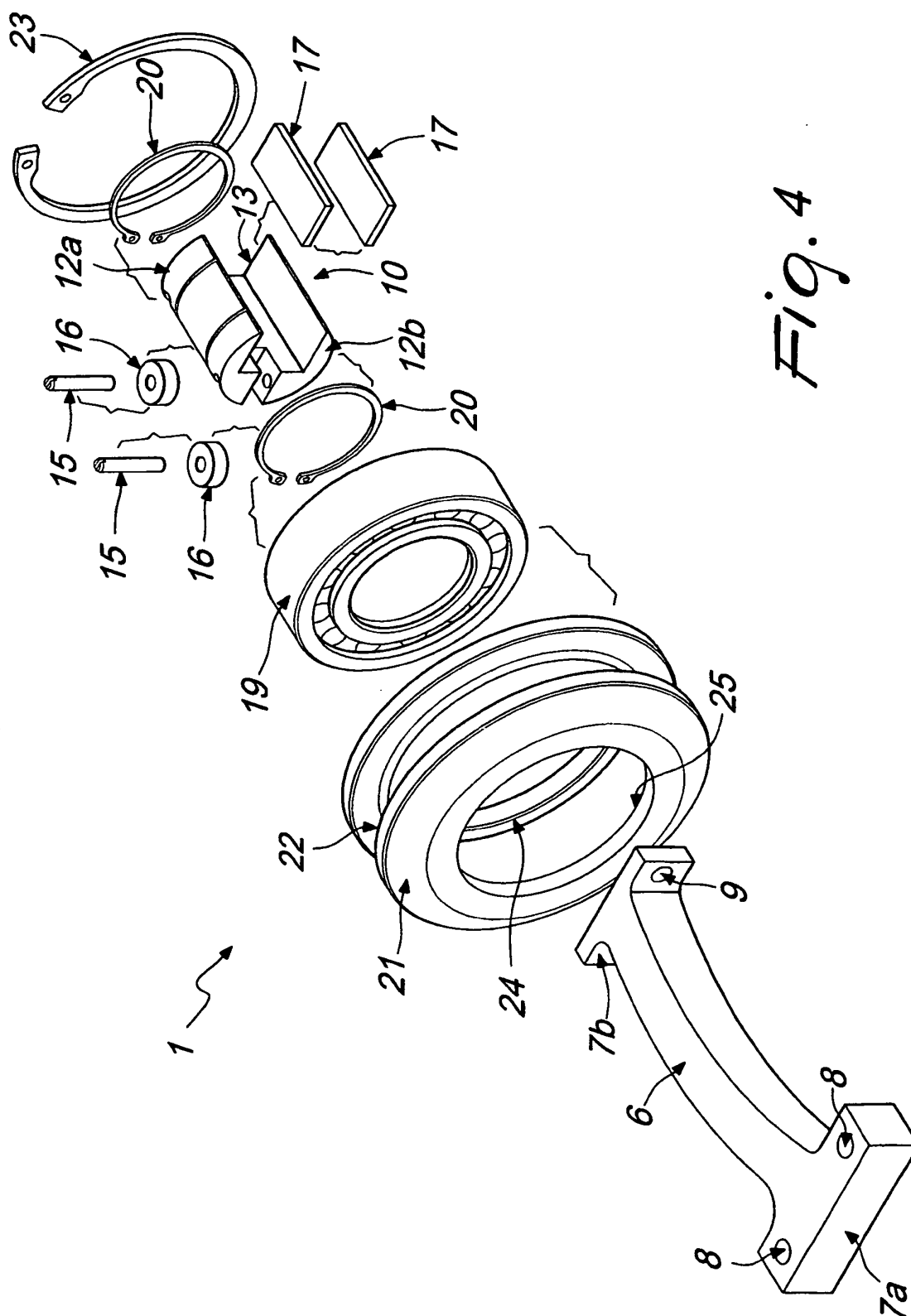


Fig. 4

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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