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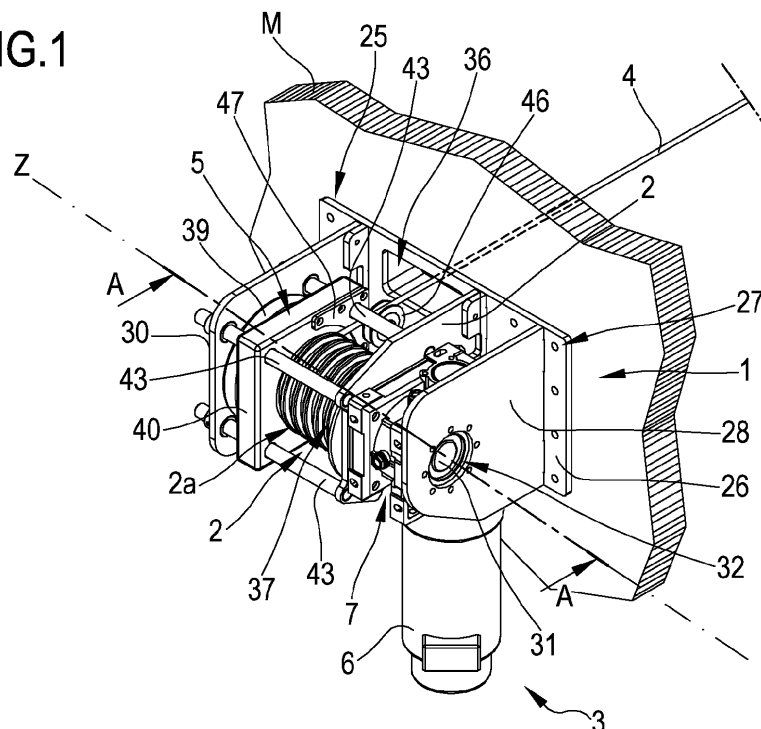
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**BA ME**(30) Priority: **23.03.2012 IT VR20120056**(71) Applicant: **B. Financial S.r.L.****24067 Sarnico (BG) (IT)**(72) Inventor: **Besenzoni, Giovanni****I-24067 SARNICO (BG) (IT)**(74) Representative: **Contadin, Giorgio et al****Praxi Intellectual Property S.p.A.****Via N. Tommaseo, 76/D****35131 Padova (IT)**(54) **Mechanical member for moving loads, particularly for boats**

(57) A mechanical member (1) for moving loads, particularly boats, comprising an operating drum (2), suitable to be coupled with a reference structure (M) and defining a longitudinal axis (Z) which is rotated around by actuation means (3) and a recovery cable (4), provided with a first free end, suitable to be at necessary bound to the load, and a second end connected with the operating drum (2) in such a way that the recovery cable (4), due to the action of the actuation means (3), is at least partly

wound/unwound on/from the outer surface (2a) of the operating drum (2). In particular, the mechanical member (1) comprises guiding and positioning means (5), operatively connected with the operating drum (2) in such a way as to progressively interfere with consecutive sections of the recovery cable (4) during winding/unwinding of the recovery cable (4) itself on/from the outer surface (2a) of the operating drum (2) so that the recovery cable (4) is wound/unwound in an orderly manner on/from the operating drum (2).

**FIG.1**

## Description

**[0001]** The present invention relates to a mechanical member for moving loads, particularly suitable for being installed on board of boats where it is used, for example, for manoeuvring the anchor or sails (in which case it is traditionally called "winch" in the nautical jargon) during navigation and/or during mooring, warping and so on operations.

**[0002]** In the nautical field, the mechanical member of the invention is typically represented by a winch or by a windlass, while the load that the same mechanical member is responsible for moving is, for example, the anchor or sail of a boat or any other object, tool, device or accessory which can be towed/lifted during normal activity and operation of the boat itself. It is widely known that the mechanical members for moving loads (or weights) used in sectors such as sailing, aeronautics, construction, agriculture and so on, typically called winches or windlasses depending on whether used for towing or lifting respectively, are available in a variety of constructive types, many of which exploit potentials of a gear which multiplies the force transmitted by actuator means in order to get the movement of the loads themselves.

**[0003]** Basically, such a mechanical member of known type comprises an operating, generally cylindrical, drum made of a material with high mechanical strength (e.g. steel or plastic material), suitable to be coupled with a reference structure which is specific to the field of use.

**[0004]** The operating drum of the aforesaid mechanical member of the prior art defines a longitudinal, horizontal or vertical, axis which is placed at necessary in rotation around by actuation means which can be, obviously, manual or automatic and that, as said, transmit the force which the load is moved with.

**[0005]** Such operating drum is also provided with an outer surface that is actually affected by the winding of the recovery cable of the external device and which is usually, though not exclusively, smooth.

**[0006]** According to the prior art, a mechanical member of the type here concerned also includes a recovery cable (or rope or chain), provided with a first free end, suitable to be at necessary bound to the load in question, and a second opposite end connected with the operating drum or, more properly, with the relative support frame in such a way that the recovery cable, as result of the force imparted by the actuation means, is at least partly wound/unwound on/from the outer surface of the operating drum.

**[0007]** The actuation means belonging to the known mechanical members concerned are of manual or automatic type, in which case are constituted by electric motors or linear actuators of hydraulic or pneumatic type.

**[0008]** The functionality of the mechanical members just briefly described has been known for several years and evidently well acquired to the state of the art: their use allows to solve with extreme effectiveness practical situations characterized by a certain criticality if not

sometimes also by a clear danger for the conditions they determine for the operators (think about for example to rescuing with helicopter of persons missing at open sea due to a shipwreck, typical situation where the use of the mechanical member concerned is required). However, the mechanical members for moving loads of the current state of the art still have some recognized drawbacks.

**[0009]** A first drawback of the mechanical members under consideration of the known type is constituted by the fact that the winding of the recovery cable around the outer surface of the operating drum occurs in a free, irregular and/or disorderly manner, however carefully and slowly performed by the manual or automatic actuation means.

**[0010]** This operational situation inevitably submits one or more sections of the recovery cable at inopportune, unnecessary and improper traction and/or torsion efforts (further ones with respect to those typical and expected ones resulting from the moving of the load) that, over time, cause the deterioration thereof up to also compromise its structural integrity and, therefore, the actual effective use.

**[0011]** It should be noted that the accuracy of the winding of the recovery cable around the outer surface of the operating drum is in any case relative, since the operation is typically performed without paying that attention that would be required in order to ensure the preservation of the structural integrity of the recovery cable.

**[0012]** In addition, the irregular, uncontrolled and free winding of the recovery cable around the operating drum complicates all the same the inverse operation of the unwinding of the recovery cable itself, especially if the actuation means which provoke it are of the manual type.

**[0013]** Starting, therefore, from the knowledge of the foregoing drawbacks of the prior art, the present invention intends to remedy to them.

**[0014]** In particular, main purpose of the present invention is to provide a mechanical member for moving loads, particularly for boats, that, contrary to the equivalent mechanical members of known type, ensures a regular and orderly winding of the recovery cable around the outer surface of the operating drum.

**[0015]** In the context of the aforesaid purpose, it is task of the present invention to indicate a mechanical member for moving loads, particularly for boats, by means of which it is possible to ensure the preservation of the structural integrity of the recovery cable, under the continuous use cycles, for times longer than those ones obtainable with known mechanical members.

**[0016]** It is another task of the invention to develop a mechanical member for moving loads, particularly though not exclusively for boats, which makes it easier and faster than the prior art manoeuvring of unwinding of the recovery cable from the operating drum, mostly in the case in which they are performed manually.

**[0017]** It is a second purpose of the present invention to allow that the operator responsible for the operation of a mechanical member, such as a winch or a windlass,

can exclusively and with confidence devote themselves to the execution of the most important and delicate moving of the load and incidental conditions of the environment in which it takes place, without the need, however often disregarded, to continuously check the conditions with which the recovery cable is actually wound around the operating drum.

**[0018]** It is a last but not least purpose of the invention to give substance to a mechanical member for moving loads, particularly for boats, which, while achieves the above purposes, presents at the same time a simple and cost-competitive construction.

**[0019]** The foregoing objects are achieved by means of a mechanical member for moving loads, particularly for boats, according to claim 1 attached herewith, as hereinafter referred for the sake of exposure brevity.

**[0020]** Further technical features of detail of the mechanical member of the invention are contained in the corresponding dependent claims.

**[0021]** The above claims, in the following specifically and concretely defined, are considered integral part of the present description.

**[0022]** Advantageously, the mechanical member for moving loads, particularly for boats, of the invention ensures a smooth and orderly winding of the recovery cable around the outer surface of the operating drum: this thanks to the presence of the guiding and positioning means which, being operatively connected with the operating drum, progressively interfere with consecutive sections of the recovery cable during the winding/ unwinding of the recovery cable on/ from the outer surface of the operating drum.

**[0023]** Still advantageously, the mechanical member of the present invention allows to the recovery cable to keep unaltered its structural and, consequently, functional, integrity under continuous use cycles, longer than similar mechanical members of known type.

**[0024]** Equally advantageously, thanks to the fact that the winding of the recovery cable on the operating drum takes place according to a regular, ordered and precise pattern - determined by the guiding and positioning means -, the mechanical member of the present invention simplifies, thus making it more rapid and practice than the equivalent known art, the reverse manoeuvre of unwinding the recovery cable from the operating drum, especially if it must be done manually by the operator, by means of a handle coupled with the operating drum itself.

**[0025]** The operator is thus more free, while the mechanical member of the invention is operating, to engage with the utmost attention and tranquility to the execution of the moving of the load concerned and to the ancillary conditions of the environment of manoeuvre, without the need, however difficult to meet, to verify the state of winding of the recovery cable on the outer surface of the operating drum.

**[0026]** In advantageous manner, furthermore, the mechanical member for moving loads, particularly for boats, which is the object of the present invention, achieves the

advantages set out above presenting at the same time a simple construction and low or otherwise competitive production costs.

**[0027]** Said purposes and advantages, as well as others which will emerge below, will appear to a greater extent from the detailed description which follows, relating to a preferred embodiment of the mechanical member object of the invention, given by way of indicative and illustrative, but not limiting, title with reference to the accompanying drawings, in which:

- figure 1 is a assonometric view of the mechanical member of the invention under application or installation conditions;
- figure 2 is an assonometric separate view of the mechanical member of figure 1;
- figure 3 is an enlarged view of figure 1 according to the section plane AA;
- figure 4 is an exploded view of the mechanical member of figure 2.

**[0028]** The mechanical member of the invention, used for moving loads, is illustrated in figure 1, where it is globally numbered with 1, in one of the possible application conditions, represented by the inside of the wall M of a boat.

**[0029]** More properly, the mechanical member 1 of the invention is used for the movement of lifting and/or towing of loads such as objects, devices, tools or accessories which it is necessary to handle for any reason within a boat: the loads to be handled are thus represented by sails, anchors, small pleasure crafts (such as water motorcycles, canoes, rubber boats) and even more.

**[0030]** As it can be seen, the mechanical member 1 here described includes:

- an operating drum 2, suitable to be coupled with a reference structure (the wall M, as just mentioned) and defining a longitudinal axis Z around which it is set in rotation by actuation means, overall marked with 3;
- a recovery cable 4, provided with a first free end, but suitable to be at necessary connected with the load, and a second end connected directly or indirectly with the operating drum 2 so that the recovery cable 4, due to the action of the actuation means 3,

is at least partly wound/unwound on/from the outer surface 2a of the operating drum 2. According to the invention, the mechanical member 1 comprises guiding and positioning means, on the whole indicated with 5, operatively connected with the operating drum 2 so as to progressively interfere with consecutive sections of the recovery cable 4 during the winding/unwinding of the recovery cable 4 on/from the outer surface 2a of the operating drum 2 so that the recovery cable 4 itself is wound/unwound in an orderly way on/from the operating drum 2.

**[0031]** In the specific case, the actuation means 3 ac-

tually belong to the mechanical member 1 and are electrically connected with control means, not visible in the figures which follow but of the type per se known to the man skilled in the art, accessible to the operator and used for automatic actuation of the actuation means 3 themselves.

**[0032]** The actuation means 3 comprise any of the automatic actuators selected from the group consisting of electric motor, hydraulic or oil-pressure cylinder and pneumatic cylinder.

**[0033]** Preferably, as shown in figures 1 and 2, the actuation means 3 include in this case an electric motor 6 connected by means of a reducer 7 with a drive shaft 8 which, as best seen in figure 3, is inserted into a first axial through hole 9 of the operating drum 2, which is made integral with through constraint means, indicated as a whole with 10.

**[0034]** Moreover, the drive shaft 8 is inserted into a second axial through hole 11 made in the reducer 7 with which the drive shaft 8 is keyed and made integral by a first interconnection key 12 contained in a first slot 13 made in the outer wall 8a of the drive shaft 8 in such a manner as to partially protrude from such an outer wall 8a.

**[0035]** As far as the constraint means 10 are concerned, figure 3 shows that preferably but not necessarily they comprise:

- a laminar flange 14 which is coupled with a first side edge 2b of the operating drum 2 through first fastening means, generally indicated with 15, and presents a central through opening 16 through which the drive shaft 8 passes;
- an auxiliary bushing 17 externally coaxial to the drive shaft 8, stably coupled with the laminar flange 14 so as to protrude from a first face 14a of the laminar flange 14 itself in according to an axial direction and at the central through opening 16 of the latter; the auxiliary bush 17 is also engaged in an inner annular recess 18 made at the first side edge 2b and in the inner surface 2d delimiting the first axial through hole 9 of the operating drum 2;
- a second interconnection key 19 contained in a second slot 20, made in the outer wall 8a of the drive shaft 8 and separated from the first slot 13, and in a third slot 21 made in a limited portion 22 of the inner surface 17a of the auxiliary bushing 17.

**[0036]** The inner annular recess 18 in which the auxiliary bushing 17 engages, therefore, faces the second axial through hole 11 of the reducer 7 and, if the operating drum 2 is considered as a separate component, communicates with the outside.

**[0037]** Moreover, the auxiliary bushing 17 is coupled with the first face 14a of the laminar flange 14 through junction means, comprising for example an annular line of welding.

**[0038]** Such a constructive composition that, it is re-

peated, has been given purely by way of indication, is predominantly a consequence of the fact that the operating drum 2 is, preferably, made of plastic material and it is, therefore, technically convenient that the interconnection key 19, for its function, cooperates by contact with a surface made of metallic material, which is that one of the auxiliary bushing 17, rather than with a surface made of plastic material.

**[0039]** Advantageously, the drive shaft 8 is in this case provided substantially near the intermediate zone 8b and in the outer wall 8a with an annular projection 23, well visible in figure 4, contrasting, at one side, with the first interconnection key 12 and, at the opposite side, with an annular spacer 24, made for example of polymeric material, interposed between the annular projection 23 and the laminar flange 14 which is disposed close against from opposite sides.

**[0040]** The annular projection 23 is made in single piece, directly by means of turning, with the drive shaft 8.

**[0041]** The figures quoted so far illustrate that the operating drum 2 is firmly coupled with the reference structure M through support means, on the whole reported with 25.

**[0042]** In a preferred but not binding manner for the purposes of the innovative technical concept of the present invention, the support means 25 include:

- a main strike plate 26 suitable to be coupled with the reference structure M through second fastening means, as a whole numbered with 27 and of the type per se known in this kind of constructions;
- a pair of shaped brackets 28, 29 spaced apart and facing each other, projecting cantilevered from the main plate 26 and supporting the actuation means 3;
- an auxiliary plate 30, spaced apart from and facing to one of the shaped brackets 28, 29, also projecting from the main plate 26 and supporting the operating drum 2 together with one of the shaped brackets 28, 29.

**[0043]** Specifically, each shaped bracket 28, 29 defines a development plane substantially orthogonal to the development plane defined by the main strike plate 26.

**[0044]** Furthermore, the shaped brackets 28, 29 are arranged near the first end 26a of the main strike plate 26 in such a way that a first shaped bracket 28 is the outermost one and faces the side edge 26c of the main strike plate 26 and a second shaped bracket 29 is the innermost one and faces the central zone 26d of the main strike plate 26.

**[0045]** The auxiliary plate 30 is, in turn, arranged near a second end 26b, opposite to the first end 26a, of the main strike plate 26 and, together with the second innermost shaped bracket 29, laterally delimits the intermediate containment space of the operating drum 2.

**[0046]** As a function of the just described composition of the support means 25, it is therefore possible to specify that the drive shaft 8 includes:

- a first pin 31 inserted into a third axial through hole 32 made in the first shaped bracket 28;
- a second pin 33 inserted into a fourth axial through hole 34, coaxial to the third axial through hole 32, made in the auxiliary plate 30;
- an inner portion, for the sake of expositive simplicity not accompanied by a reference number, inserted into a fifth axial through hole 35, coaxial to the axial through holes 9, 11, 32, 34 so far introduced, made in the second shaped bracket 29.

**[0047]** Since, as previously mentioned, the mechanical member 1 of the invention is, in the specific example, installed close to the inner part of the wall M of a boat, the main strike plate 26 presents a through slit 36 which, as it is well observed in figures 1 and 2, allows the passage of the recovery cable 4 for the connection with the load and the traction/ release of the load itself during its winding/ unwinding on the operating drum 2.

**[0048]** Preferably but not exclusively, in the outer surface 2a the operating drum 2 is provided with a drive endless screw 37 defining a helical groove 38 which extends along the longitudinal axis Z for the entire length of the operating drum 2 and receives consecutive sections of the recovery cable 4 during its winding, where it remains blocked by the guiding and positioning means 5.

**[0049]** The operating drum 2 is provided at the second side edge 2c with a friction head 39 projecting from the outer surface 2a of the operating drum 2 in such a way that the outer face 39a of the friction head 39 results close to the inner face 30a of the auxiliary plate 30 of the support means 25; preferentially, the friction head 39 is formed monolithically with the drive endless screw 37 of the operating drum 2, as clearly shown in figure 3.

**[0050]** According to the preferred embodiment described herein of the guiding and positioning means 5, they include an operating block 40 provided with an axial through nut screw 41 in which the drive endless screw 37 engages in such a manner that the operating block 40 slides along the aforesaid longitudinal axis Z and progressively interfere with consecutive sections of the recovery cable 4 contained into the helical groove 38 when the operating drum 2 is set in rotation around the longitudinal axis Z by the actuation element 3.

**[0051]** The operation block 40 is coupled with the second shaped bracket 29 and the auxiliary plate 30 through, by way of pure example, guide means, indicated as a whole with 42, which support the operating block 40 and substantially surround the operating drum 2.

**[0052]** More in detail, the guide means 42 preferably comprise four longitudinal slide columns 43 spaced apart and parallel each other, arranged around the operating drum 2 according to the vertexes of a hypothetical square, as clearly highlighted by figure 4.

**[0053]** Each of the longitudinal slide columns 43 is first of all provided with ends constrained on one side, to the second shaped bracket 29 and, on the opposite side, to the auxiliary plate 30, in both sides through third fastening

means, as a whole numbered with 44 and of the type per se known to the person skilled in the art.

**[0054]** Each of the longitudinal columns 43 is then inserted into a peripheral through hole 45 made in the operating block 40 according to a linear axis Z' parallel to the longitudinal axis Z defined by the operating drum 2 and, consequently, by the axial through nut screw 41 of the operating block 40 itself.

**[0055]** It is understood that in further embodiments of the mechanical member of the invention, not represented in the accompanying drawings, the guide means could comprise a number of longitudinal sliding columns spaced apart and parallel each other different from that one described above and illustrated in the drawings, this number could vary depending on the constructive choices starting from two.

**[0056]** In a preferred, advantageous but not exclusive, way the mechanical member 1 of the invention also includes an auxiliary guide pulley 46, arranged and operating downstream the operating drum 2 which it cooperates with in such a way as to receive consecutive sections of the recovery cable 4 during winding/unwinding of the recovery cable 4 itself, ensuring as more aligned and in tension position as possible thereof at the output of the drive endless screw 37 of the operating drum 2.

**[0057]** In particular, the auxiliary guide pulley 46 is idle and is rotatably coupled with a shaped plate 47 fixed to the inner side wall 40a of the operating block 40 which the guide pulley 46 is thus structurally and operatively integral with.

**[0058]** Operatively, the mechanical member 1 of the invention is firmly fixed to the boat by coupling the main strike plate 26 close to the inner part of the wall M of the boat itself through the second fastening means 27; obviously, at the mechanical member 1 and, more precisely, at the through slit 36 of the main strike plate 26, the wall M of the boat presents an appropriate through access mouth B.

**[0059]** In this case, the electric motor 6 of the actuation means 3 is electrically connected with the control means available to the operator on board of the boat, for example inside the control cabin.

**[0060]** When the mechanical member 1 of the invention is required for use in the nautical field, for moving any permissible load, the operator unwinds the recovery cable 4 from the operating drum 2 for a length suitable for the manoeuvres to be carried out and connects the free end of the recovery cable 4 to the load itself.

**[0061]** In the unwinding phase, thanks to the presence, in first place, of the guiding and positioning means 5 and, in second place, of the auxiliary guide pulley 46 located downstream the operating drum 2, the recovery cable 4 is moved in effectively way and without any mishap by the actuation means 3 according to a suitable aligned position at the point of detachment of the recovery cable 4 from the operating drum 2 and at its release to the outside through the through slit 36.

**[0062]** However, the main advantage brought by the

mechanical member 1 of the invention is realized in the winding phase of the recovery cable 4 around the outer surface 2a of the operating drum 2 which, as seen before, comprises in this specific case the drive endless screw 37.

[0063] Indeed, the presence of the guiding and positioning means 5 allows to keep stably and neatly successive sections of the recovery cable 4, which progressively winds around the outer surface 2a of the operating drum 2, in the helical groove 38 defined by the drive endless screw 37, avoiding uncontrolled, unplanned, improper and therefore very risky and/or dangerous seat escapes and those overlapping or kinks of the recovery cable 4, which can be instead typically and easily found in similar mechanical members of the prior art.

[0064] The operation of the guiding and positioning means 5 of the mechanical member 1 of the invention is well marked and evident in figure 3, where it is observed as the relative operating block 40, advancing by linear motion along the longitudinal axis Z due to the effect of the rotation of the operating drum 2 integral with the drive shaft 8, maintains sequentially consecutive sections of the recovery cable 4 stably and properly housed in the helical groove 38 of the drive endless screw 37 of the operating drum 2.

[0065] In particular, advancing of the operating block 40 along the longitudinal axis Z is imparted by the rotation in a given direction of the drive endless screw 37 (or involute screw), belonging to the operating drum 2, meshing or engaging in the axial through nut screw 41 of the operating block 40 itself.

[0066] The risks of wear, deterioration or breakage over time, under continuous use cycles, of the recovery cable 4 of the mechanical member 1 are thus greatly reduced compared to the equivalent known technique.

[0067] Based on the foregoing, it is understood, therefore, that the mechanical member for moving loads, particularly for boats, of the present invention achieves the objects and realizes the advantages previously mentioned.

[0068] In the invention, winding of the recovery cable around the outer surface of the operating drum is more regular, precise and uniform than what happens in similar mechanical members currently used for moving loads or weights.

[0069] Upon implementation, changes could be made to the mechanical member for moving loads of the invention consisting, for example, in guiding and positioning means different from those ones described earlier in reference to the preferred embodiment of the invention itself. In addition, in other constructive solutions of the mechanical member claimed herein, not accompanied by explanatory drawings, the actuation means may be different from those ones previously described, which does not affect the advantage brought by the present invention.

[0070] For example, versions of the mechanical member of the invention alternative to that one described

above, not shown, could provide that the actuation means are of the manual type so that the rotation of the operating drum is impressed by the hand of a user by means of a special handle connected with the operating drum itself.

[0071] Moreover, it is stated precisely that the mechanical member for moving loads, object of the present invention, could be associated with any reference structure and thus result suitable to use even in fields different than the nautical one: for instance, the mechanical member of the invention could be used even in helicopters provided at Public Administration institutions for the above rescue of people from difficulty or danger setting.

[0072] It is, finally, clear that several other changes could be made to the mechanical member concerned, without departing from the principle of novelty intrinsic in the inventive idea expressed herein, as it is clear that, in the practical implementation of the invention, materials, shapes and sizes of the illustrated details could be changed, as needed, and replaced with others technically equivalent.

[0073] Where the constructive features and techniques mentioned in the following claims are followed by reference numbers or signs, those reference signs have been introduced with the sole objective of increasing the intelligibility of the claims themselves and therefore they have no limiting effect on the interpretation of each element identified, by way of example only, by these reference signs.

## Claims

1. Mechanical member (1) for moving loads, particularly boats, comprising:

- an operating drum (2), suitable to be firmly coupled with a reference structure (M) through support means (25) and defining a longitudinal axis (Z) which is suitable to be rotated around by actuation means (3);
- a recovery cable (4), provided with a first free end, suitable to be at necessary bound to said load, and a second end connected with said operating drum (2) in such a way that said recovery cable (4), due to the action of said actuation means (3), is at least partly wound/unwound on/from the outer surface (2a) of said operating drum (2);
- guiding and positioning means (5), operatively connected with said operating drum (2) in such a way as to progressively interfere with consecutive sections of said recovery cable (4) during winding/unwinding of said recovery cable (4) on/from said outer surface (2a) of said operating drum (2) so that said recovery cable (4) is wound/unwound in an orderly manner on/from said operating drum (2),

wherein in said outer surface (2a) said operating drum (2) is provided with a drive endless screw (37) defining a helical groove (38) extending along said longitudinal axis (Z) for the entire length of said operating drum (2) and receiving said consecutive sections of said recovery cable (4) during said winding, where it remains blocked by said guiding and positioning means (5), and wherein said support means (25) include:

- a main strike plate (26) suitable to be coupled with said reference structure (M) through second fastening means (27);
- a pair of shaped brackets (28, 29) spaced apart and facing each other, projecting from said main plate (26) and supporting said actuation means (3);
- an auxiliary plate (30), spaced apart from and facing to one of said shaped brackets (28, 29), projecting from said main plate (26) and supporting said operating drum (2) together with one of said shaped brackets (28, 29),

**characterized in that** said operating drum (2) is provided at a second side edge (2c) with a friction head (39) projecting from said outer surface (2a) of said operating drum (2) in such a way that the outer face (39a) of said friction head (39) is close to the inner face (30a) of said auxiliary plate (30) of said support means (25).

2. Member (1) according to claim 1) **characterized in that** said actuation means (3) belong to said mechanical member (1) and are electrically connected with control means, accessible to the operator, for the automatic operation of said actuation means (3).
3. Member (1) according to claim 2) **characterized in that** said electric motor (6) is connected through a reducer (7) with a drive shaft (8) which is inserted into a first axial through hole (9) present in said operating drum (2), which is made integral with through constraint means (10), and into a second axial through hole (11) present in said reducer (7) which is keyed with and made integral by a first interconnection key (12) contained in a first slot (13) made in the outer wall (8a) of said drive shaft (8) in such a manner as to partially protrude from said outer wall (8a) of said drive shaft (8).
4. Member (1) according to claim 3) **characterized in that** said constraint means (10) comprise:

- a laminar flange (14) which is coupled through first fastening means (15) with a first side edge (2b) of said operating drum (2) and presents a central through opening (16) through which said drive shaft (8) passes;

- an auxiliary bushing (17) externally coaxial to said drive shaft (8), coupled with said laminar flange (14) so as to protrude from a first face (14a) of said laminar flange (14) according to an axial direction and at said central through opening (16), and engaged in an inner annular recess (18) made at said first side edge (2b) and in the inner surface (2d) delimiting said first axial through hole (9) of said operating drum (2);
- a second interconnection key (19) contained in a second slot (20), made in said outer wall (8a) of said drive shaft (8) and separated from said first slot (13), and in a third slot (21) made in a limited portion (22) of the inner surface (17a) of said auxiliary bushing (17).

5. Member (1) according to claim 4) **characterized in that** said drive shaft (8) is provided near the intermediate zone (8b) and in said outer wall (8a) with an annular projection (23) contrasting at one side with said first interconnection key (12) and at the opposite side with an annular spacer (24), interposed between said annular projection (23) and said laminar flange (14) which is disposed close against from opposite sides.
6. Member (1) according to any of the previous claims **characterized in that** each of said shaped brackets (28, 29) defines a development plane substantially orthogonal to the development plane defined by said main strike plate (26).
7. Member (1) according to any of the previous claims **characterized in that** said shaped brackets (28, 29) are arranged near a first end (26a) of said main strike plate (26) in such a way that a first shaped bracket (28) is the outermost one and faces the side edge (26c) of said main strike plate (26) and a second shaped bracket (29) is the innermost one and faces the central zone (26d) of said main strike plate (26).
8. Member (1) according to any of the previous claims **characterized in that** said auxiliary plate (30) is arranged near a second end (26b), opposite to said first end (26a) of said main strike plate (26) and, together with said second innermost shaped bracket (29), laterally delimits the intermediate containment space of said operating drum (2).
9. Member (1) according to claim 7) or 8) **characterized in that** said drive shaft (8) includes:
  - a first pin (31) inserted into a third axial through hole (32) made in said first shaped bracket (28);
  - a second pin (33) inserted into a fourth axial through hole (34), coaxial to said third axial through hole (32), made in said auxiliary plate (30);

- an inner portion inserted into a fifth axial through hole (35), coaxial to said axial through holes (9, 11, 32, 34), made in said second shaped bracket (29).

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10. Member (1) according to any of the previous claims **characterized in that** said main strike plate (26) presents a through slit (36) that allows the passage of said recovery cable (4) for connection with said load and traction/release of said load during said winding/unwinding of said recovery cable (4).

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11. Member (1) according to claim 1) **characterized in that** said guide and positioning means (5) include an operating block (40) provided with an axial through nut screw (41) which said drive endless screw engages in (37) in such a manner that said operating block (40) slides along said longitudinal axis (Z) and progressively interferes with said consecutive sections of said recovery cable (4) contained into said helical groove (38) when said operating drum (2) is set in rotation around said longitudinal axis (Z) by said actuation means (3).

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12. Member (1) according to claim 11) **characterized in that** said operation block (40) is coupled with said second shaped bracket (29) and said auxiliary plate (40) through guide means (42) substantially surrounding said operating drum (2).

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13. Member (1) according to claim 11) **characterized in that** said guide means (42) include at least two longitudinal slide columns (43), each of which is:

- provided with ends constrained through third fastening means (44), on one side, to said second shaped bracket (29) and, on the opposite side, to said auxiliary plate (30);
- inserted into a peripheral through hole (45) made in said operating block (40) according to a linear axis (Z') parallel to said longitudinal axis (Z) defined by said operating drum (2).

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14. Member (1) according to any of the preceding claims **characterized in that** it comprises an auxiliary guide pulley (46), arranged and operating downstream said operating drum (2) which it cooperates with in such a way as to receive said consecutive sections of said recovery cable (4) during winding/unwinding of said recovery cable (4), ensuring as more correct and in tension position as possible at the output of said operating drum (2).

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15. Member (1) according to claim 14) **characterized in that** said auxiliary guide pulley (46) is idle and is rotatably coupled with a shaped plate (47) fixed to the inner side wall (40a) of said operating block (40) which said guide pulley (46) is structurally and func-

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FIG.1

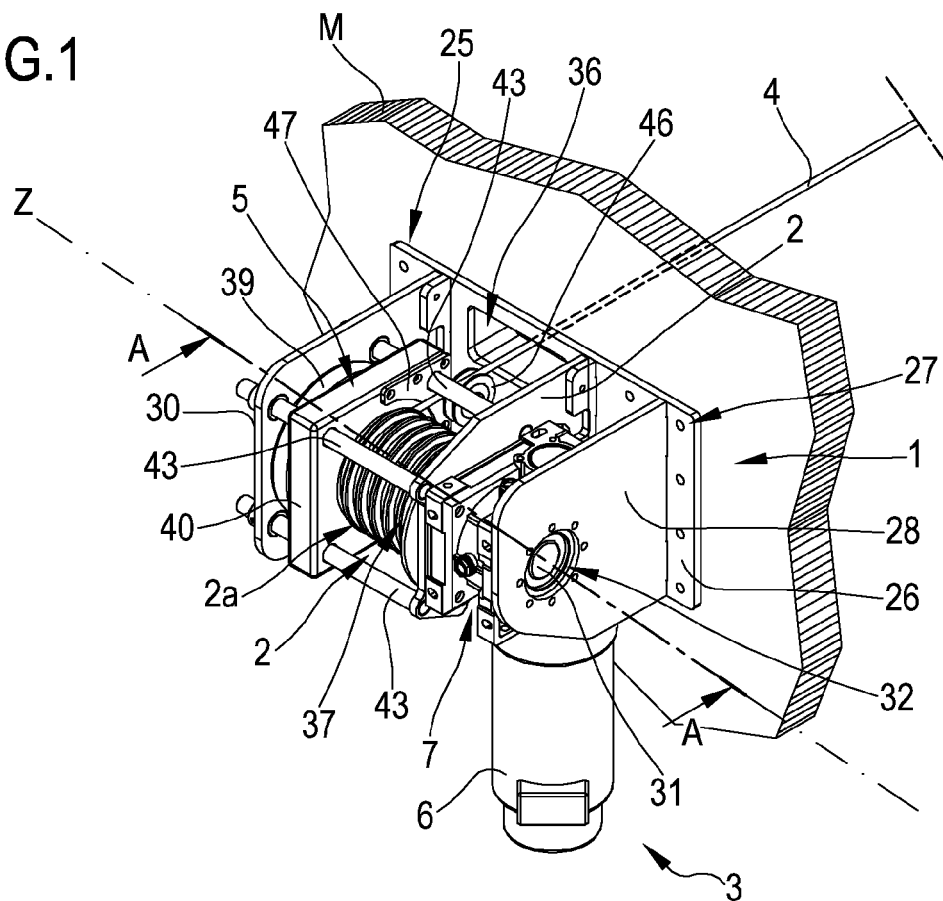


FIG.2

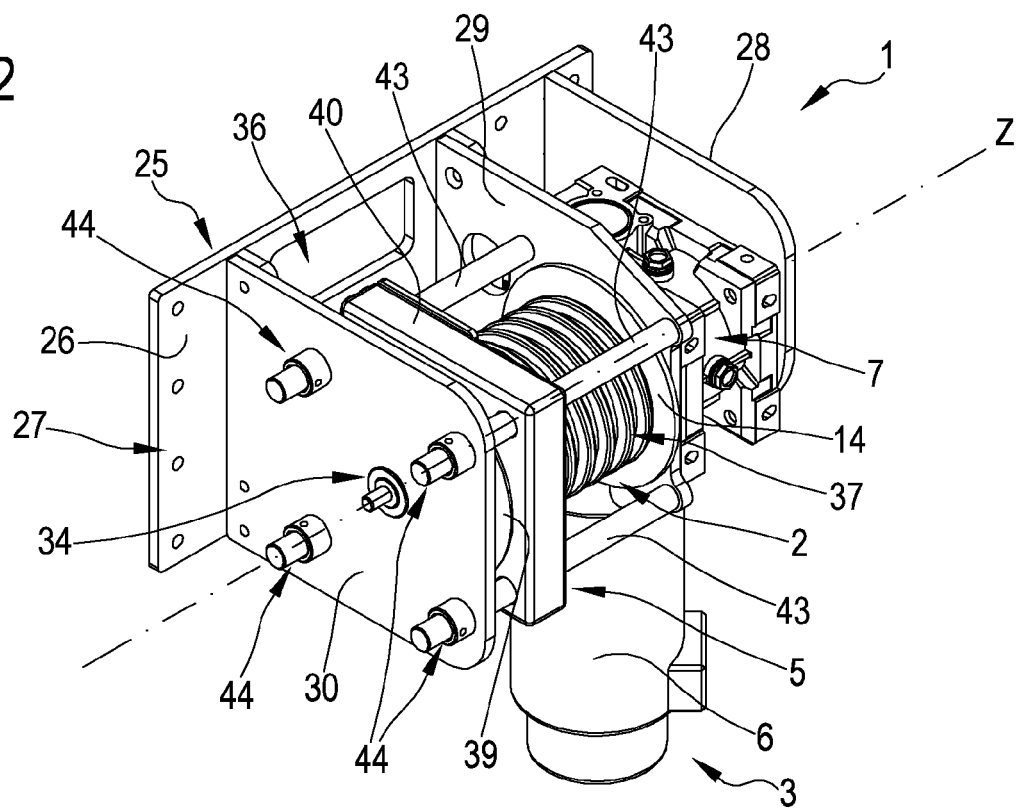
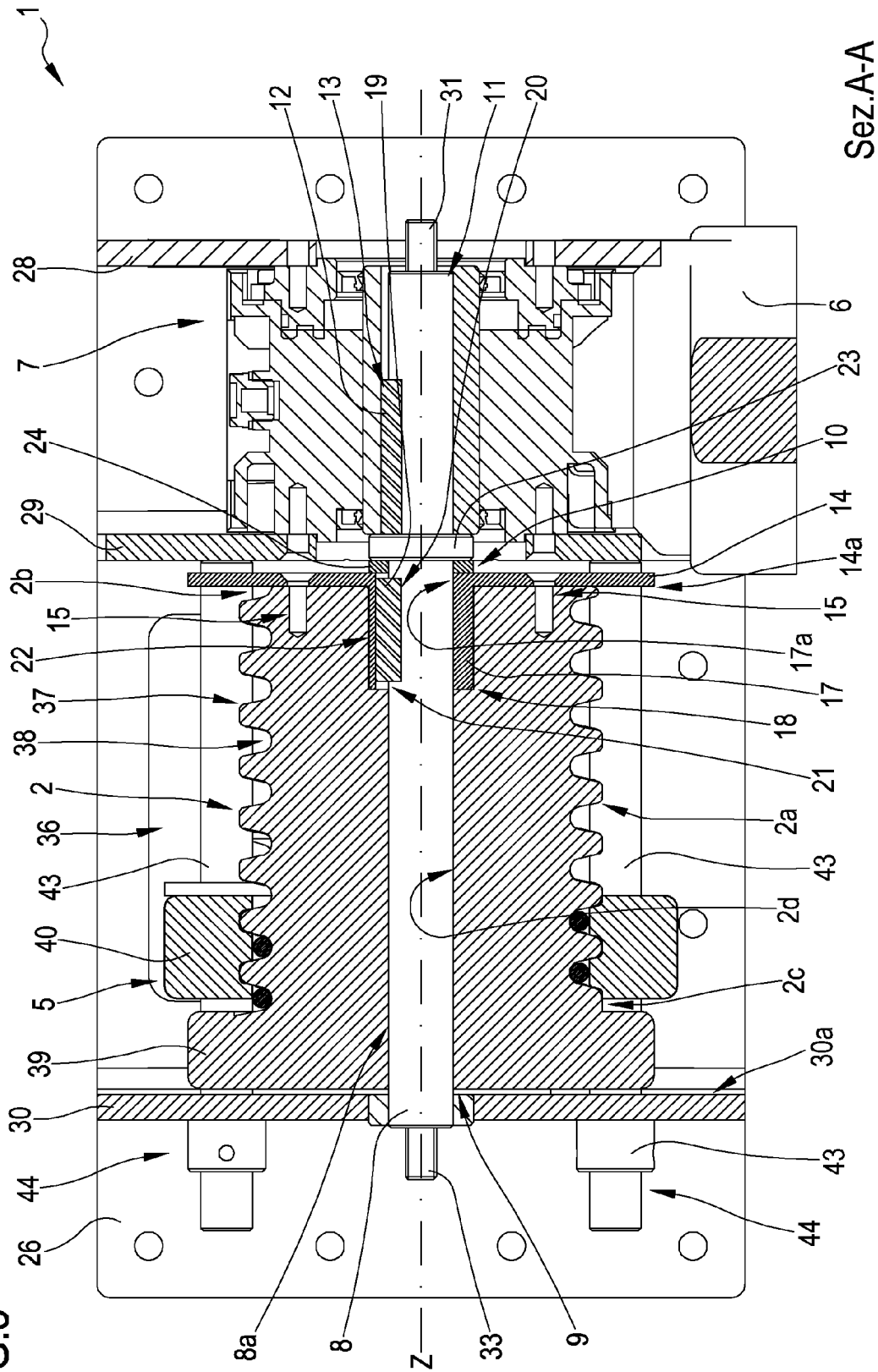
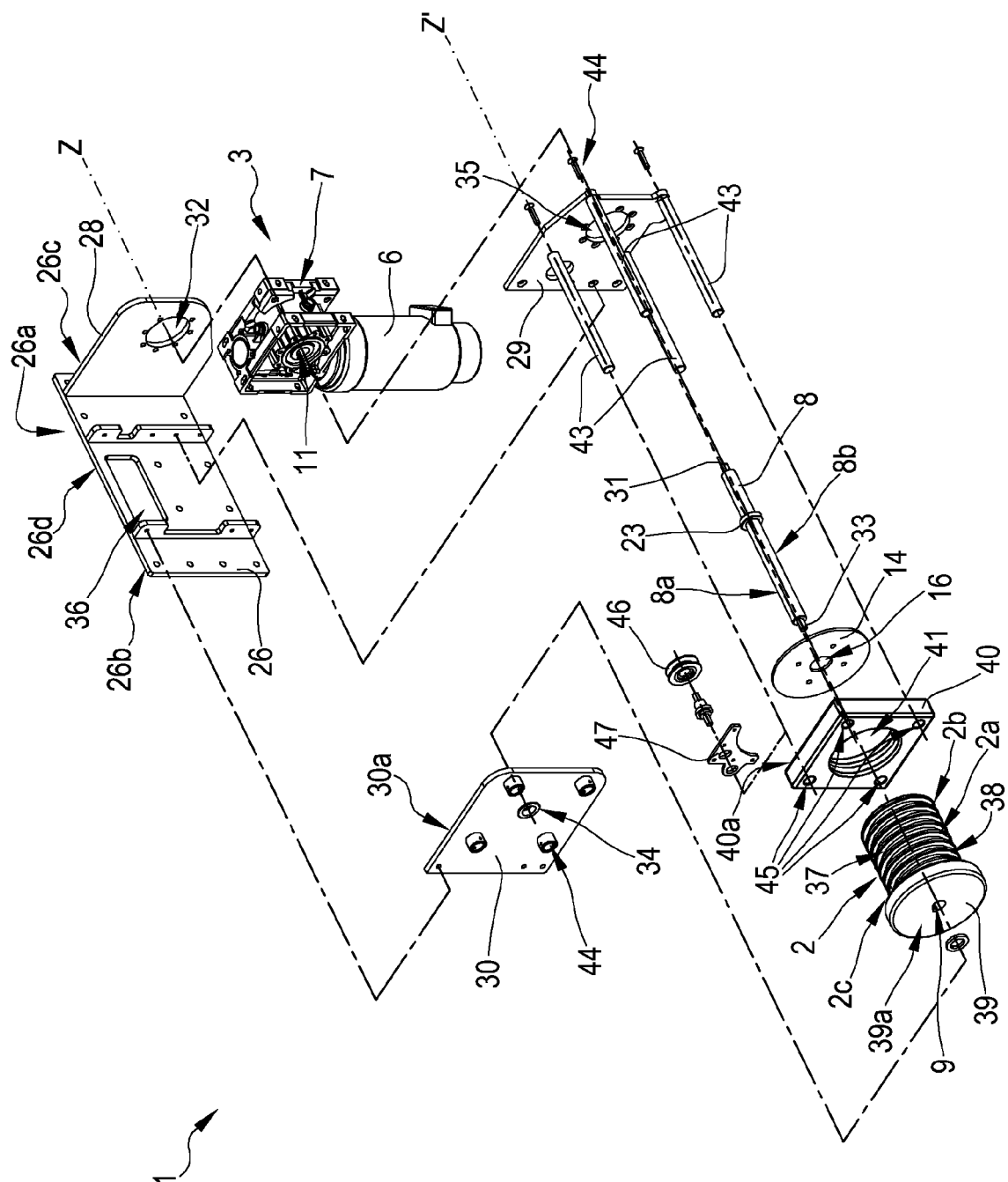


FIG.3





**FIG.4**



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<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... &amp; : member of the same patent family, corresponding document</p>			

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