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(54) Electric winch

(57) A hoist (1) includes a base body (3) adapted to support a motor (7) and a winder drum (9). The motor (7) drives the drum (9) to wind a cable (11) or the like for lifting a load. At least the drum (9) is mounted so that it can slide freely in an axial direction, so as to allow the cable (11) to wind uniformly around the drum (9).

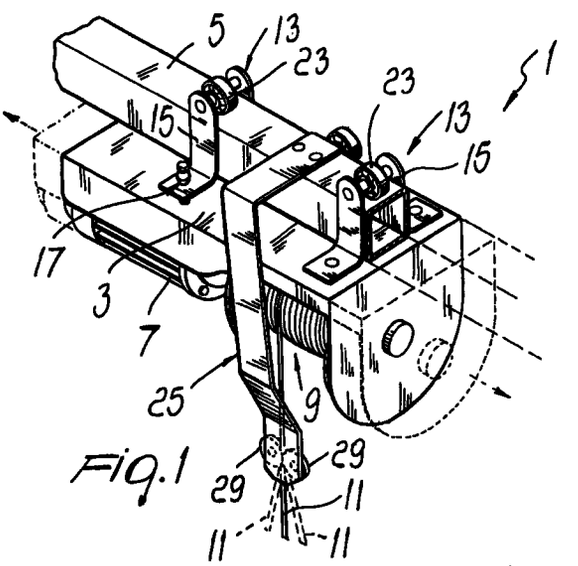

Fig.1

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Description

[0001] The present invention relates to an electric winch or hoist.

[0002] Electric hoists or electric winches are usually constituted by a drum which has a horizontal axis and on which a cable winds. One end of the cable is fixed to the drum. The drum is driven by a directly coupled electric motor which forms a monolithic unit therewith.

[0003] The hoist is usually suspended and used to lift loads by winding the cable on the drum.

[0004] Such electric hoists have been known and used for a long time for their simplicity and efficiency in operation.

[0005] However, these electric hoists can have a drawback, at least in certain operating conditions: instead of winding evenly on the drum in a helical pattern, the cable tends to overlap.

[0006] This uneven winding of the cable can cause problems in the operation of the hoist, because its components can be subjected to abnormal loads. The cable in fact deteriorates rapidly indeed because of its uneven winding.

[0007] Uneven winding of the cable can also cause jerking motions during the lifting and lowering of the load, consequently entailing discomfort and danger for users.

[0008] There are winches for cranes, hoisting towers, elevators, etc. which in order to obviate this drawback have a drum which is turned and grooved in a helical shape, so as to receive a cable having an exact diameter within the groove.

[0009] This type of structure of course entails a high cost for manufacturing the drum and in any case it is not suitable, from the functional point of view, for hoists, since the load can move the cable transversely to the point that the cable is still prevented from entering the helical groove. Furthermore, in hoists the cable is usually wound in multiple layers and accordingly the second layer would not have a guide with grooves except for the underlying layer of cable.

[0010] The aim of the present invention is to provide a hoist that obviates the cited inconveniences of conventional hoists.

[0011] An object of the invention is to provide a hoist with which the cable is wound on the drum uniformly in a helical pattern, without overlapping.

[0012] A further object of the invention is to provide a hoist which has a simple and reliable construction.

[0013] This aim, these objects and others which will become apparent hereinafter are achieved by a hoist comprising a base body adapted to support a motor and a winding drum, the motor being adapted to drive the drum to wind a cable or the like; characterized in that at least the drum is mounted so that it can slide freely axially with respect to the body, so as to allow the uniform winding of the cable on the drum.

[0014] Further characteristics and advantages will become apparent from the description of a preferred but not exclusive embodiment of the invention, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

FIG. 1 is a perspective view of the hoist according to the invention;

FIG. 2 is an enlarged-scale detail view of a shock-absorbing member.

[0015] With reference to the above figures, the hoist according to the invention, generally designated by the reference numeral 1, includes a base body constituted by a base plate 3 slidingly associated with a fixed support constituted by a bar 5 which is advantageously tubular with a square cross-section.

[0016] The plate 3 supports an electric motor 7 driving a winder drum 9, in a per se known manner. The winder drum 9 is adapted to wind a cable 11 in which one end (not shown) is fixed to the drum and the other end is provided with a hook or the like, in a per se known manner, in order to lift a load.

[0017] The plate 3 is associated with the bar 5 by virtue of omega-shaped members 13 which allow the free axial sliding of the plate-drum assembly with respect to the fixed support constituted by the bar 5.

[0018] Each omega-shaped member includes a pair of L-shaped members 15 which are fixed to the plate 3 by means of shock-absorbing members 17 which are constituted for example by a bolt 19 with an interposed elastic member 21. The L-shaped members 15 support a bearing 23 adapted to slide on the bar 5. The bar 5, in the illustrated case, has a square cross-section so as to have a horizontal upper supporting surface for the bearings 23, but might of course have any other cross-section suitable to allow the support and sliding of the omega-shaped members 13.

[0019] The hoist according to the invention also comprises a cable guiding member 25 which is rigidly coupled, at least in an axial direction, to the fixed support. The cable guiding member 25 includes an elongated bar which is fixed to the bar 5 and has a guiding member which is constituted, in the illustrated case, by a pair of wheels or pulleys 29 adapted to slidingly receive the cable 11.

[0020] The operation of the hoist according to the invention is substantially similar to the operation of a conventional electric hoist, except that during the winding or unwinding of the cable on the drum, the drum can freely axially move with respect to the thread guiding member, allowing the cable to wind uniformly on the drum, one turn next to the other, even when the cable is diverted from the optimum direction for winding on the drum, as shown in dashed lines in Figure 1.

[0021] It has been found in practice that the invention achieves the intended aim and objects, a hoist having been provided which ensures perfect and uniform wind-

ing of the cable on the drum in any load condition.

[0022] The hoist according to the invention is also suitable for different uses, for example as a winch for motor vehicles.

[0023] Motor vehicle winches, too, have the problem of uneven winding of the cable on the drum due to the less than optimum direction of the loaded cable with respect to the drum.

[0024] The hoist according to the invention is susceptible of numerous modifications and variations, within the scope of the accompanying claims. All the details may be replaced with other technically equivalent elements.

[0025] The materials used, as well as the dimensions, may of course be any according to the requirements and the state of the art.

Claims

1. A hoist comprising a base body supporting a motor and a winding drum, said motor being adapted to drive said drum to wind a cable or the like; characterized in that at least said drum is mounted so that it can slide freely axially with respect to said base body, so as to allow the uniform winding of said cable on said drum.

2. A hoist according to claim 1, characterized in that it comprises a cable guiding member adapted to keep said cable in a fixed position with respect to the longitudinal axis of said base body which is parallel to the axis of said drum.

3. A hoist according to claim 1 or 2, characterized in that said base body comprises a base plate which is slidingly mounted on a fixed support and is adapted to support said drum and said motor.

4. A hoist according to one or more of the preceding claims, characterized in that said support is constituted by a bar and said plate is mounted on said support by means of omega-shaped members.

5. A hoist according to one or more of the preceding claims, characterized in that said omega-shaped members comprise bearings which can slide on said bar.

6. A hoist according to one or more of the preceding claims, characterized in that said plate is fixed to said omega-shaped members by means of shock-absorbing members.

7. A hoist according to one or more of the preceding claims, characterized in that it comprises one or more of the descibed and/or illustrated characteristics.

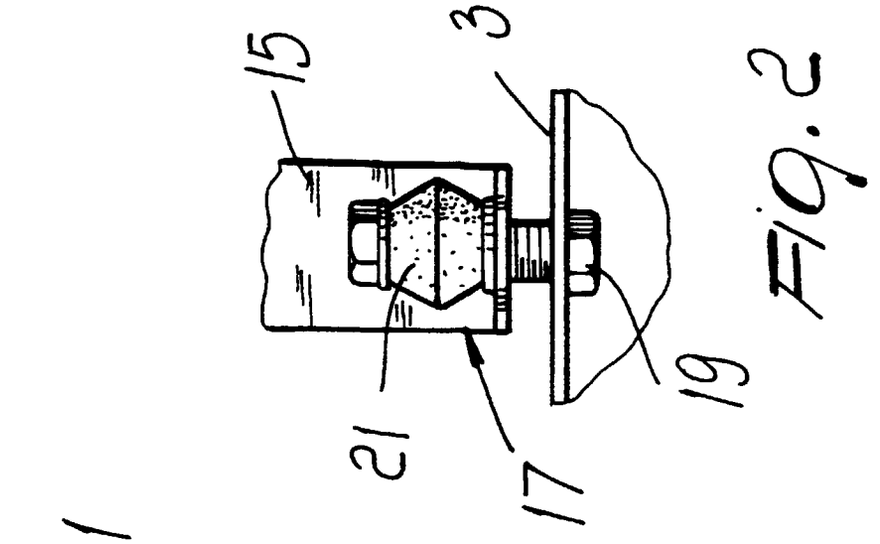

Fig. 2

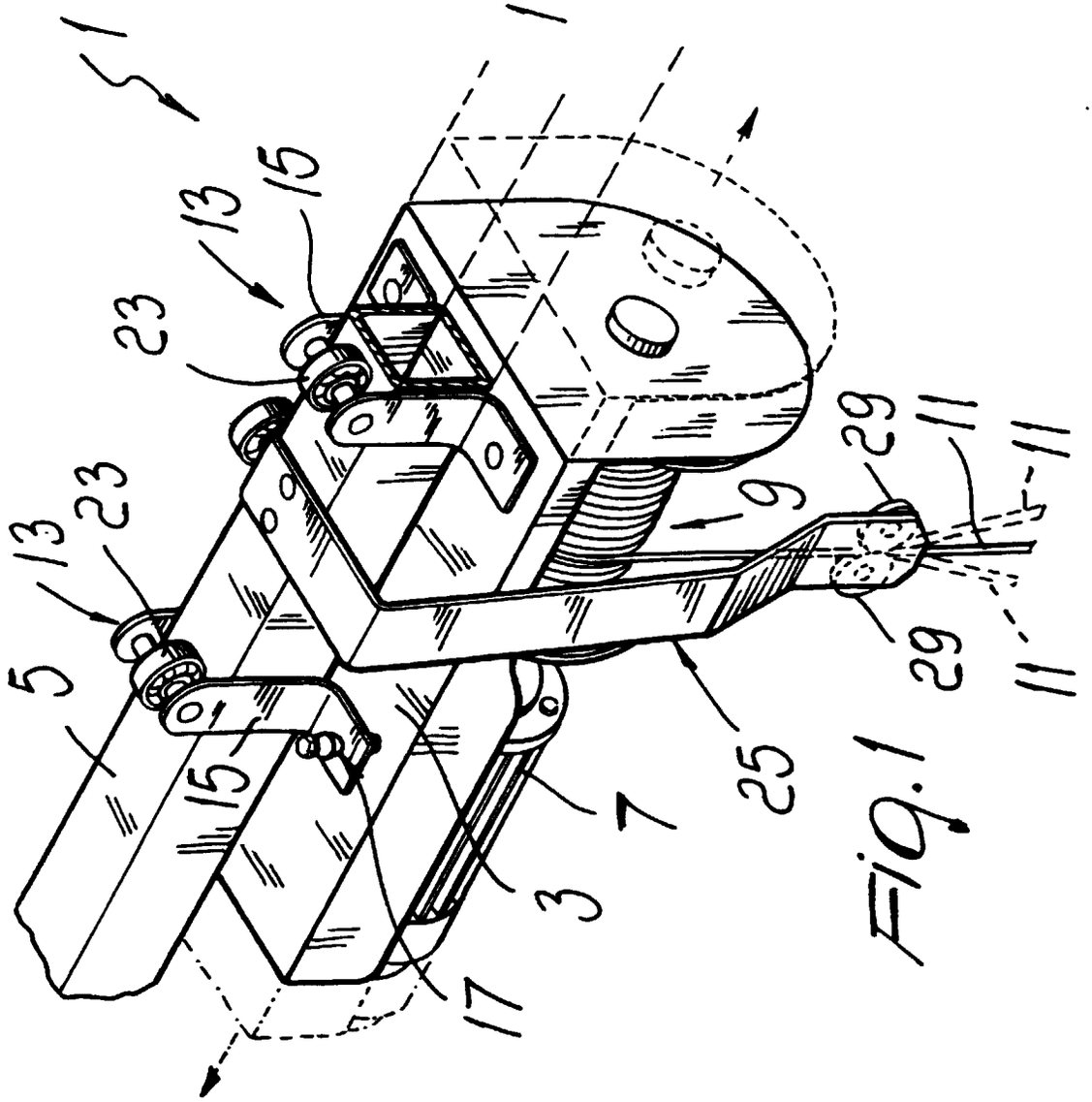

Fig. 1