

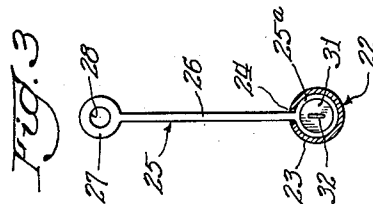
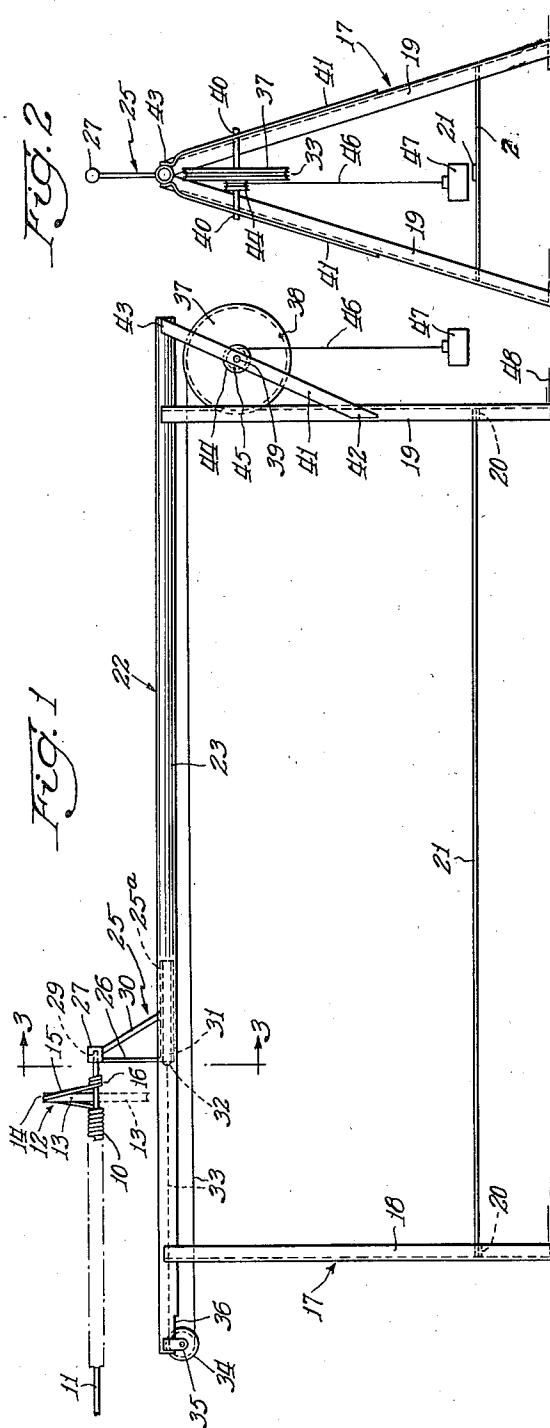
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SUPPORTING DEVICE

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## SUPPORTING DEVICE

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1

This invention relates to self retracting supporting device for article in motion and aims more particularly to provide a mechanical support for a mandrel or other rod-like article which while being worked with is being simultaneously rotated and moved longitudinally.

An object of the invention is to provide such supporting means which will accommodate itself not only to both the rotative and longitudinal movements of the mandrel but which will furthermore return automatically to its original position when one mandrel has been finished with and another one is to be received.

A further object of the invention is to provide such a support in which accommodation is made for a transverse post or the like on the mandrel and to permit free rotation of the mandrel with such post thereon without interference.

Other objects and advantages will be apparent from the following description, taken together with the accompanying drawings, of an illustrative embodiment of the invention, and in which drawings—

Figure 1 is a side elevational view of a device constructed in accordance with the present invention and showing a mandrel supported thereby;

Figure 2 is an end view of the structure of Figure 1 looking at the right-hand end thereof in the drawings, the mandrel being omitted;

Figure 3 is an enlarged cross-section taken on the line 3-3 of Figure 1; and

Figure 4 is a view of a mandrel such as here referred to.

The present invention is of particular utility in the making of elastic coil cables in which the cable 10, generally comprising one or more insulated electrical conductors, is produced by sheathing the conductor wire with a covering of unvulcanized rubber or rubber substitute, then coiling the composite cord upon a rod-like mandrel 11 in closely compact helical arrangement. Thereupon the mandrel with the cord coiled thereon may be subjected to a suitable vulcanizing temperature and the cord thereafter removed from the mandrel at which time it will exhibit such resilience that it may be repeatedly extended and contracted so as to have marked usefulness as an extension device for electrical conductors. Frequently a tangent end such as 12 is required on the cord for connection purposes and such end may be readily formed by providing the mandrel with a transverse post 13 over which the cord is looped before vulcanizing. After vulcanizing this may be severed at its apex 14 and the part 15 of

2

the loop and its anchorage portion 16 which is coiled about the mandrel may be discarded leaving the coiled cord 10 with a tangent end 12.

Turning now to the supporting device and referring in detail to the illustrative construction shown in the drawings, the base 17 may be a frame-like structure somewhat in the shape of a saw-horse having a pair of diverging legs 18 at one end and 19 at the other, each pair having a cross-piece 20 therebetween, and the longitudinal brace 21 joining the cross-pieces. Each pair of legs at their meeting upper ends carries one end of a track 22 here shown in the form of a tube 23 slotted as at 24 longitudinally at its upper face throughout its entire length.

In accordance with the present invention, there is a carriage 25 movable on this track and which carriage is here represented by a sliding cylinder 25a, fitting within the split tube 23 for smooth sliding movements therein and having an upstanding arm 26 secured thereto which projects upwardly through the slot 24 to a height somewhat greater than the height of the transverse post 13 on the mandrel 11. At its outer upper end, the arm 26 carries the holder 27 which is axially recessed as at 28 opening into one of its radial faces to provide a socket to receive the end 29 of the mandrel 11 and support the latter while permitting rotation of the mandrel therein. A brace 30 extending obliquely from the holder or socket member to the sliding cylinder 25a reinforces the parts, this brace also passing through the slot 24 so as to slide therein with the cylinder and its upstanding arm 26. The holder 27 is thus spaced from the track 22 a distance greater than the radius of rotation of the mandrel with the post 13 thereon.

The sliding cylinder 25a may be also conveniently tubular and in one end thereof may tightly receive a plug 31 to which may be secured as at 32 one end of a flexible member such as a cable 33 which runs through the tubular track 23 in the direction in which the socket 28 faces, thence over a pulley 34 journaled in brackets 35 suspended from that end of the tubular track 23, the track being here cut away as at 36 to permit the pulley 34 to turn therein. Thence the cable 33 runs back through the frame beneath the tube 23 and to a drum-like sheave 37 upon which it is wound and at this end secured thereto as at 38. The sheave 37 may be axled to turn on an arbor 39 mounted at each end as at 40 in oblique struts 41 secured at 42 respectively to the legs 19 and at 43 to the tubular track 22.

Co-axial with the relatively large sheave 37 and, in this instance, concentric therewith and rigidly secured thereto is the smaller sheave 44. Upon this smaller sheave 44 is secured at 45 one end of a second cable 46 which is wound upon the sheave 44 in the opposite direction from which the cable 33 is wound upon the sheave 37. To the free end of the cable 46 is attached a relatively heavy counter-weight 47 which is thus free to move up and down with respect to the base 17, moving downwardly under the influence of gravity as the sheaves 37 and 44 are rotated clock-wise in Figure 1, and upwardly, against force of gravity as the sheaves are rotated counter-clockwise.

The operation of the device is as follows:

When the carriage 25 is approximately at the left-hand end of the track 22 the sheaves 37 and 44 have been rotated approximately to the limit of their rotative movement in a clockwise direction and the counter-weight 47 is resting say on the floor 48 upon which the base 17 stands. The mandrel 11 is then extended into the socket 28 of the holder 27, with its end 29 therein. It will be understood that the other end of the mandrel (not shown in Fig. 1) is suitably supported at a height uniform with that of the holder 27 and in any suitable mechanism for both rotating the mandrel and causing it to move linearly or longitudinally toward the right in Figure 1, which mechanism forms no part of the present invention and need not be here described, it being sufficient to state here that during such rotative and longitudinal movements the cord 10 is coiled on the mandrel as already referred to.

As the mandrel 11 moves to the right, the carriage 25 yieldingly accommodates this movement while still supporting the mandrel, and, in this movement to the right, the sheaves 37 and 44 are turned counter-clockwise. At this time the cable 33 is unwound from the larger sheave 37 and the cable 46 is wound up on the smaller sheave 44, thus elevating the counter-weight 47. When the counter-weight reaches the limit of its upward movement, the operation upon the mandrel is completed and the mandrel is removed from the holder 27. At this time the carriage 25 is approximately at the right-hand end of the track 22.

When the force, here represented by the moving mandrel 11, which has moved the carriage 25 to the right, is discontinued, as by removing the mandrel, the potential energy stored up by elevation of the counter-weight 47 now comes into play and the counter-weight drops under the influence of gravity, thereby rotating the sheaves 37 and 44 in a clockwise direction and winding up the cable 33 upon the sheave 37, the cable in turn thereby drawing the carriage 25 along the track 22 from the right-hand end of the device to the left-hand end, thus automatically retracting the holder 27 into position to receive another mandrel such as 11 to repeat the cycle.

It will be understood that during rotation of the mandrel 11 in the holder 27 as shown in dotted lines in Figure 1, simultaneously with its longitudinal movement, the transverse post 13 on the mandrel will clear the track 22 without interference one from the other, the arm 26 on the carriage being higher than the vertical dimension of the post 13 and thus spacing the mandrel from the track a distance greater than the height of the post 13.

So constructed and arranged, a connection as shown, carried jointly by the base and carriage

permits movement of the carriage in one direction responsive to motion of the article and includes means for storing energy transferred by said movement in said direction whereby the carriage moves in the opposite direction to its original motion under the influence of said energy transformed from potential to kinetic energy, when the article is removed, to restore the carriage to its original position, and the cables, sheaves and counterweight are intended to exemplify means for this purpose.

It is to be noted that the relative sizes of the sheaves 37 and 44 are such that the counter-weight travels a proportionately smaller distance than the carriage, thus conserving space.

It is intended to be understood that the invention is not limited to details of construction shown for purposes of describing an illustrative embodiment thereof and that such changes may be made as fall within the scope of the appended claims without departing from the invention.

The invention having been described, what is here claimed is:

1. A supporting device of the class described comprising a base, a track thereon, a carriage movable on said track, a holder mounted on said carriage to supportingly engage an article in motion, a cable connected to the carriage, a pulley over which the cable is entrained, a relatively large sheave axled in the base upon which said cable is wound, a relatively small sheave rotatable with said first mentioned sheave, a second cable wound on said small sheave during unwinding movement of the first mentioned cable from said first mentioned sheave, and a counter-weight suspended by said second cable.

2. The structure of claim 1 wherein there is an arm extending upwardly from the carriage and to which the holder is fastened whereby to space the holder from the carriage, and the holder is in the form of a socket to receive the end of a mandrel which is being simultaneously rotated and moved longitudinally.

3. The structure of claim 1 wherein the track is in the form of a longitudinally slotted tube and the carriage is in the form of a cylinder slidable in said tube, and the carriage has an arm extending through said slot and mounting the holder thereon.

4. A self-retractable supporting device for rotating mandrels comprising a base, a track thereon, a carriage movable on said track, means carried by said carriage to supportingly engage a mandrel in motion, and accommodating rotation of the mandrel with respect to the carriage simultaneously with movement of the carriage and mandrel with respect to the base, a flexible member connecting the carriage and base, means for winding up the flexible member in movement of the carriage in one direction, a second flexible member connected at one end to said means and having a counter-weight suspended from its other end, said second flexible member being unwound in said movement and tending to cause said movement when wound thereon by movement of the carriage in the opposite direction.

5. A supporting device for a rotating and linearly moving article comprising a base, a track thereon, a carriage movable on said track, means carried by the carriage for supportingly engaging the article in motion and accommodating rotation of the article with respect to the carriage simultaneously with linear movement of the carriage and article with respect to the base, a cable connected to the carriage, a relatively large

5

sheave axled in the base upon which said cable is wound, a relatively small sheave rotatable with said first mentioned sheave, a second cable wound on said small sheave during unwinding movement of the first mentioned cable from said first mentioned sheave, and a counter-weight suspended by said second cable.

6. A supporting device for a rotating and linearly moving article comprising a base, a track thereon, a carriage movable on said track, a holder mounted on said carriage to supportingly engage an article in motion and accommodating rotation of the article with respect to the base simultaneously with linear movement of the carriage and article with respect to the base, a cable connected to the carriage, a relatively large sheave axled in the base upon which said cable is wound, a relatively small sheave rotatable with said first mentioned sheave, a second cable wound on said small sheave during unwinding movement of the first mentioned cable from said first mentioned sheave, and a counter-weight suspended by said second cable, said holder being spaced from the track a distance greater than the radius of rotation of the article.

6

7. A self retractable supporting device for a rotating and linearly moving article, comprising a base, a carriage movable on said base to supportingly engage said article and accommodating rotation of the article with respect to the carriage simultaneously with linear movement of the carriage and article with respect to the base, and a yielding connection carried jointly by the base and carriage for movement of the carriage in one direction responsive to motion of the article, said connection including means for storing potential energy created by said movement whereby the carriage moves in the opposite direction under the influence thereof transformed to kinetic energy when the article is removed.

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