Jan. 30, 1951 K. A. KING 2,539,667

TRAVERSE MECHANISM

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FIG. 1

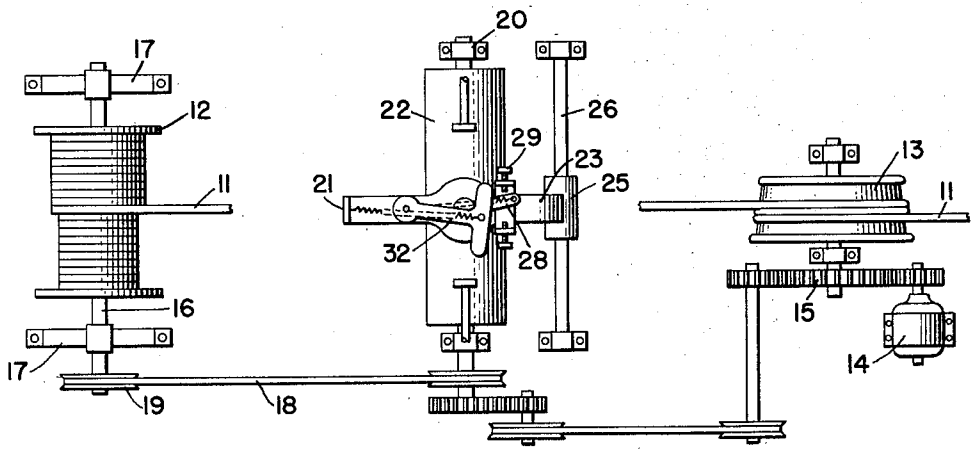
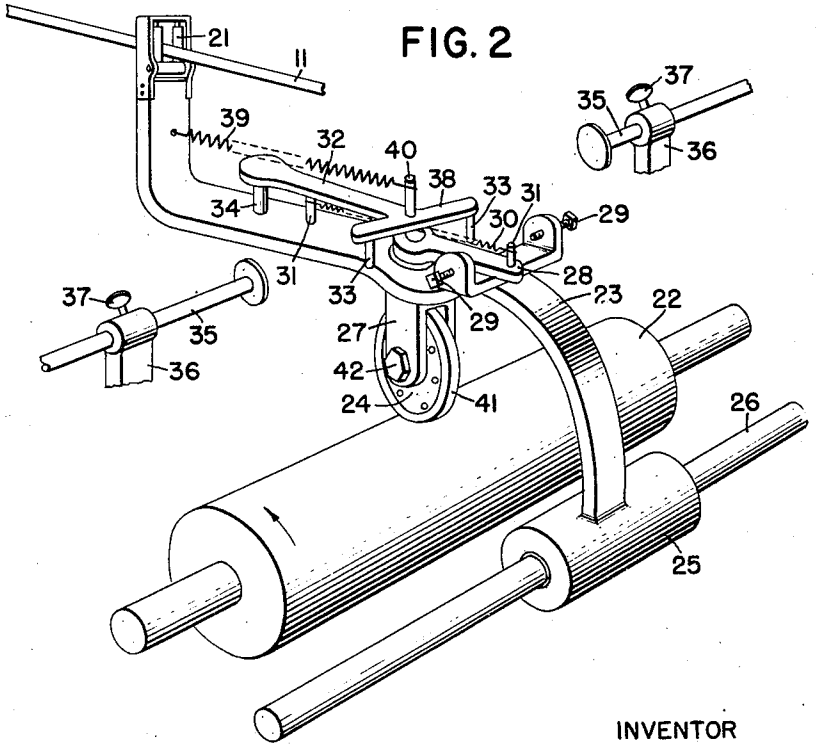


FIG. 2



INVENTOR

KENNETH A. KING

BY

ATTORNEY

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TRAVERSE MECHANISM

Kenneth A. King, Orange, Calif.

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2 Claims. (Cl. 242—158)

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The present invention relates to traverse mechanisms and more particularly to types of mechanism which are used to guide a strand of rope or wire so that it will be laid up in closely wound turns upon a spool, drum or reel.

Heretofore, mechanisms of this kind have been based upon a guider which is driven across the face of the drum or reel by the rotation of a lead screw. Because the reel and the traverse are both driven from the same source, the movement of the traverse and the rotation of the reel are inter-related. Variations in the length of the traverse and in the relative rate of traverse as compared to the speed of rotation of the take-up reel are obtained by varying the gearing between the traverse and the reel.

As compared with such mechanisms, an important object of the present invention is to provide a device in which the amount of traverse and the speed of traverse are infinitely variable.

A further object of the invention is to provide a design of traverse which renders the use of change gears unnecessary. Another object of this invention is to provide a traverse in which the speed across the face of the reel may vary according to the direction of travel—that is the guide may travel at one rate of speed when progressing from left to right and at either a slower or a faster rate when moving from right to left. This feature is not available in any other form of traverse which is in use today.

A still further object of the invention is to provide means for making the length of traverse readily adjustable.

Other objects and advantages of the invention will be apparent during the course of the following discussion.

In the accompanying drawings, forming a part of this specification, and in which like numerals are employed to designate like parts:

Figure 1 is a plan view of a traverse mechanism incorporating the present invention which also shows, by way of example, the relation of the traverse mechanism to a capstan and take-up reel.

Figure 2 is a perspective view of the traverse mechanism.

One of the uses of the invention would be in the cordage industry in which it is necessary to wind the rope or strand 11—as shown in the drawings—neatly upon a reel 12. As is customary today, the rope 11 is pulled through the preceding operations such as stranding or cabling by a capstan 13 about which the rope has been passed several times.

The motor 14 which drives the capstan 13 through bull gear 15 also rotates reel 12 which is mounted on axle 16 and is supported by a suitable frame 17. Preferably the reel 12 is driven

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at a slightly higher peripheral speed than that of the capstan. This is desirable so that the rope will be wound on the reel under tension, resulting in a smooth package. Overstressing of the rope 11 is avoided by driving the reel through a slipping belt 18 and pulley 19. A detailed description of these parts is unnecessary since the mechanism which has been described to this point is in common use today.

The invention is embodied in the traverse mechanism 20 which, by driving the guide 21 at a pre-determined rate across the face of the reel 12 lays the rope upon the reel in turns which lie side by side in layers but do not pile up upon each other.

The traverse mechanism comprises two major parts. One, the drive roll 22, which is rotated from the same source which drives capstan 13, thus bears a fixed relationship to the rotation of capstan 13 and therefore to the speed with which the rope 11 goes through the machine and is wound upon the reel 12. The second portion of the device is frame 23 which at one end carries a guider 21 that controls the position of the rope 11 as it is wound upon the reel. The frame is supported by a skew wheel 24 and cross head 25 which rides upon circular shaft 26. As shown in the drawing the cross head is free to slide lengthwise upon the shaft. Since the cross head can rotate about shaft 26 a second point of support for the frame is necessary and this is supplied by skew wheel 24 which rests upon drive roll 22.

The skew wheel which is mounted in trunnion 27 rotates freely about its axis which is shown in the drawing as bolt 42. Attached to trunnion 27, which is journaled within frame 23 by a suitable bearing is tiller arm 28 whose motion is limited by adjustment screws 29. The center line of tiller arm 28 lies in the plane of rotation of skew wheel 24 and is rigidly attached to trunnion 27 so that movement of the tiller arm changes the angle between wheel 24 and drive roll 22 The tiller arm is held against one or the other of the adjustment screws by spring 30 which is tensioned between pins 31.

Mounted above the tiller arm 28 is a T 32, fitted with depending strikes 33 which drive the tiller arm which they contact across the space between the two adjustment screws 29, thus reversing the angle between skew wheel 24 and drive roll 22.

T 32 is mounted so that it can rotate about pivot 34 (which also acts as a support) except as its motion is restricted by strikes 33. It, T 32, is impelled in its motion initially by contact with one or the other of stops 35 until it reaches dead center position and is then snapped through the remainder of the arc by spring 39 which is tensioned between frame 23 and pin 40, thus

quickly reversing the position of tiller arm 28.

The point at which the reversal of the angle of skew wheel 24 takes place is therefore controlled by the position of stops 35 which are mounted in columns 36 in such a manner that the distance between them can be varied by loosening wing bolts 37 and advancing or retracting the stops.

Stops 35 are so arranged that regardless of the distance between them they contact the respective ends of the cross arm portion 38 of T 32.

In operation, roll 22 is driven from the same source, for example, motor 14, that drives capstan 13 and take-up reel 12. Hence its motion bears a direct relationship of these other parts. Skew wheel 24, which bears upon the drive roll is provided with a surface ring 41 of suitable material such as rubber which will minimize slippage. Because the plane of rotation of skew wheel 24 is at an angle to a plane which passes normally through drive roll 22, there is a component of force which drives the wheel, and therefore the entire associated mechanism including frame 23 lengthwise along shaft 26. In this way the guider 21 traverses the space between the heads of reel 12. It may be pointed out that the weight of the frame is supported by the skew wheel and this provides the pressure between the end of the drive roll.

The motion of frame 23, carrying with it guide 21, continues until one of the extremities of cross arm 38 contacts one of the stops 35. Even at this point the lateral motion of the frame and guide is not affected since strikes 33 do not come in contact with tiller arm 28 until the T, because of contact with one of stops 35, has been pressed half-way across its arc. At this point the tension of spring 39 snaps T 32 through the remainder of its arc. When this occurs strike 33 hits tiller arm 28 forcing it to move from contact with one adjustment screw 29 to the opposing screw. This motion reverses the angle of the skew wheel to the drive roll and therefore reverses the direction in which the frame and guide 21 move across drive roll 22. This motion continues until it is again reversed by contact between cross arm 38 and the opposite stop 35.

From this description it is apparent that the mechanism is almost universally adjustable. For example, the length of traverse of the guide 21 which carried with it the rope 11 may be increased or decreased by increasing or decreasing the distance between stops 35 to match the width of reel 12.

Obviously, the speed with which the guide moves is dependent upon the amount of angle between the plane of rotation of the skew wheel and a plane passing normally through the drive roll. This angle may be increased by backing off the adjustment screw 29, in this way increasing the speed of travel.

Furthermore, it is not necessary that the two adjustment screws 29 be set to yield identical angles. Hence it is possible to provide a slow motion while moving, for example, from right to left by setting one of the adjustment screws 29 so that a considerable angle will be created between the skew wheel and the drive roll. The

speed of return may be much less or greater as the device moves from left to right by setting the opposing adjustment screw for a smaller or larger angle.

In the description in the accompanying drawing certain parts whose functions are obvious and which would obscure the drawing are not shown, thus the mechanism which drives roll 22 has been omitted in the detailed Figure 2 as has the frame which supports shaft 26 and columns 36. Furthermore, the construction of guide 21 has not been given in detail since any anti-friction bearing is suitable which will minimize wear between the guide and the rope 11 that passes through it.

For convenience, the mechanism has been described in terms of a traverse which serves to guide rope as it is laid up upon a reel. However, it is obvious that similar, if not identical, equipment can also be applied to such diverse uses as winding thread upon spools, guiding metal wires or cables in preparing it for shipment or even in manufacturing electrical coils in which many layers of extremely fine wire are wound upon a core to form a magnetic coil.

While these various uses would necessarily imply traverses of different degrees of size and delicacy of operation, the parts which are claimed as new would be common to them all.

What I claim is:

1. A traverse mechanism comprising a drive roll, a driven idler wheel set at an angle to said drive roll, a guider whose motion results from the force created by the angle between said drive roll and said idler wheel, stops serving to limit the travel of the idler wheel, a tiller arm controlling the angle between the idler wheel and the drive roll and spring actuated means for reversing the angle between the idler wheel and the drive roll.

2. A traverse comprising a frame which is supported by a drive roll, a guider and a skew wheel arranged on said frame, the frame being moved along the length of said drive roll when the drive roll is rotated as a result of the angle between the plane of rotation of the drive roll and the plane of rotation of the skew wheel, a pair of stops designed to limit the travel of the guider, a tiller arm controlling the angle between the plane of rotation of the drive roll and the plane of rotation of the skew wheel and means actuated by said stops for reversing the angle between the plane of rotation of the drive roll and the plane of rotation of the skew wheel when the limit of travel of the frame is reached.

KENNETH A. KING.

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