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F. H. SLEEPER ET AL

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TAKE-UP MACHINE

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2 Sheets-Sheet 1

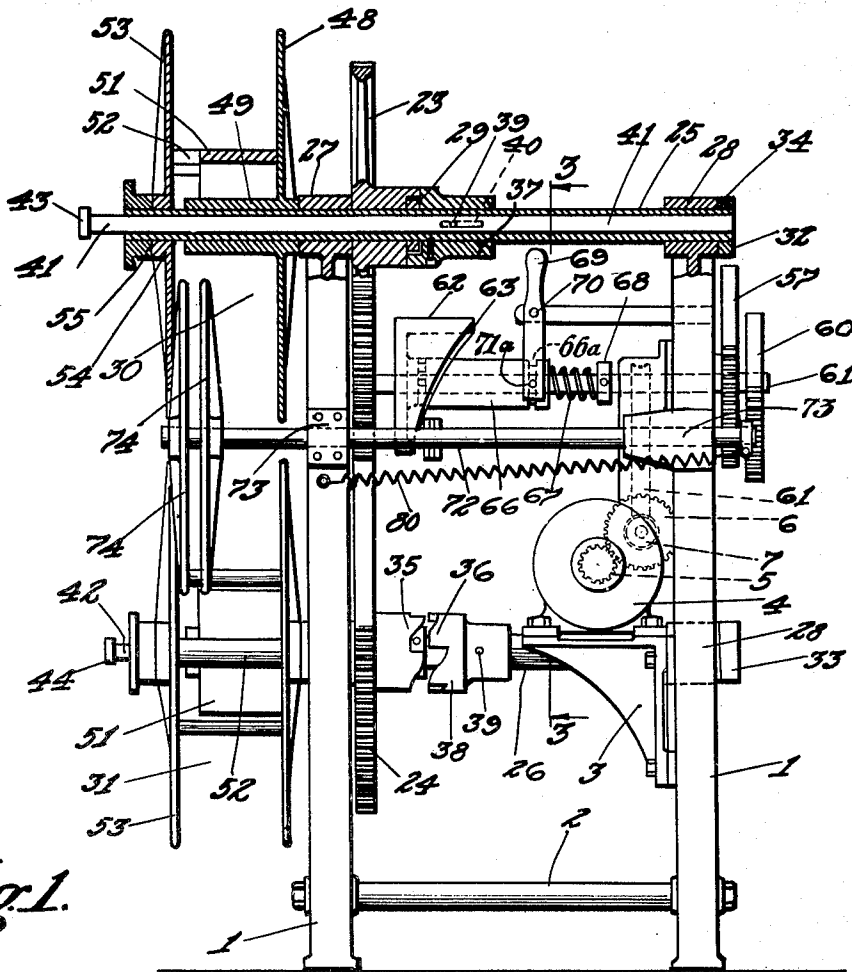


Fig. 1.

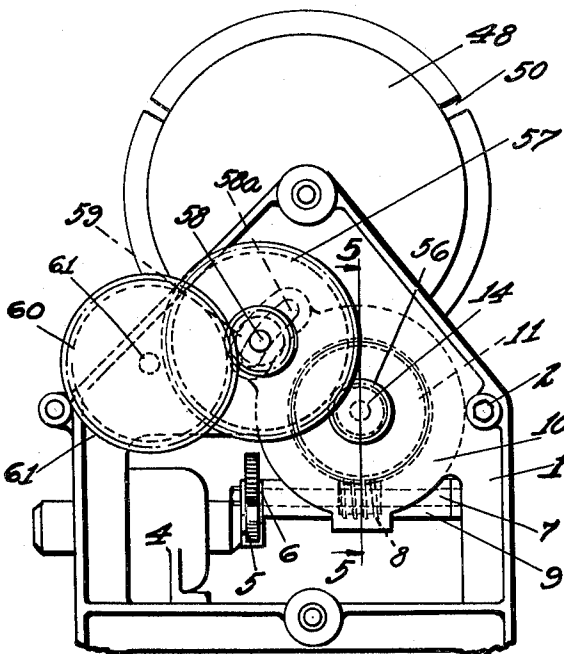


Fig. 2.

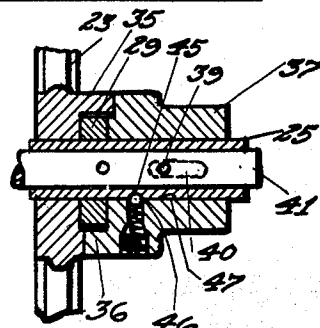


Fig. 6.

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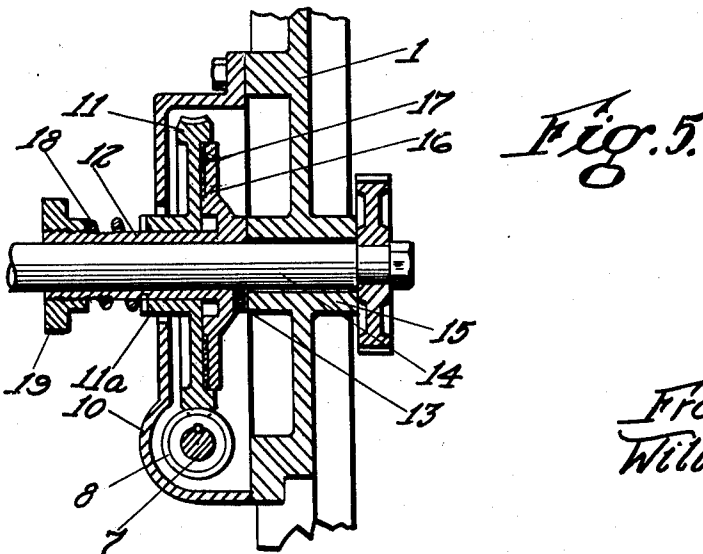
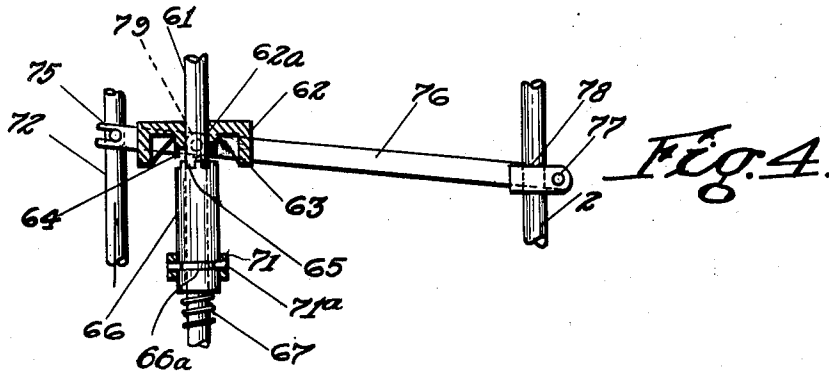
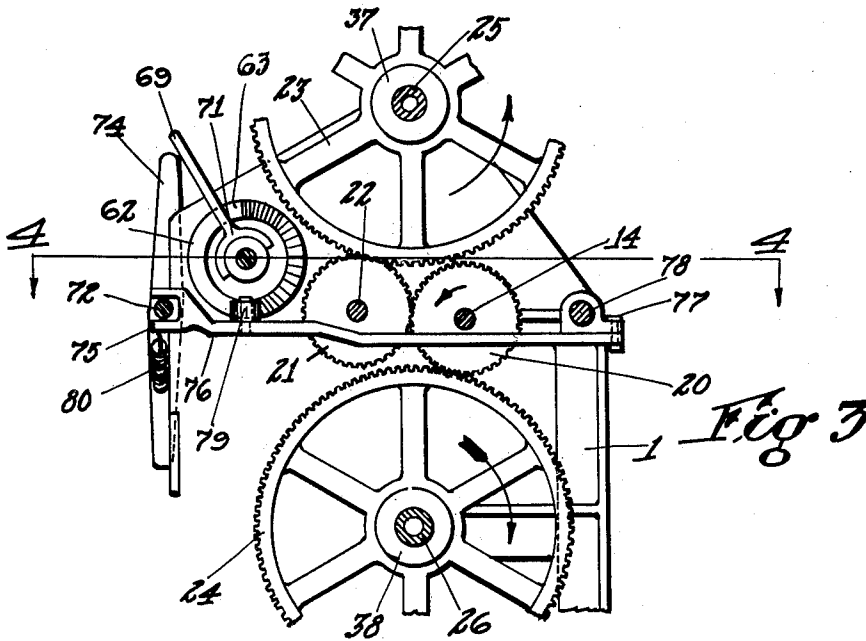
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TAKE-UP MACHINE

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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TAKE-UP MACHINE

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The present invention relates to take-up machines, and contemplates a machine particularly adapted to wind heavy flexible material, such as armored cable or metallic tubing, into coils or bundles which may be readily handled.

One object of the invention is to provide a machine of this class having twin reels, with associated driving and clutching mechanism whereby either reel may be driven while the other remains idle. This arrangement permits an operator to start winding on the empty reel while he removes a coil or bundle from the other reel; thus the machine that delivers the finished product to our improved take-up machine may be operated continuously.

A further object of the invention is to provide a traversing motion that is simple and positive and can be readily controlled. The traversing motion for both reels is obtained from a common shaft and thus the speed of the traverse is always the same for both reels. Furthermore, the drive for the traversing motion is so arranged that the speed of traverse may be readily adjusted.

The above and further advantages of the invention will hereinafter more readily appear, reference being had to the accompanying drawings, in which:

Fig. 1 is a front elevation of the machine, certain parts being shown in section and certain parts being broken away to more readily show the construction.

Fig. 2 is a fragmentary elevation of the upper part of the machine, viewed from the right hand side.

Fig. 3 is a sectional view on the line 3—3 of Fig. 1, looking in the direction of the arrows.

Fig. 4 is an enlarged view of the traversing mechanism, as seen in horizontal section on the line 4—4 of Fig. 3, looking in the direction of the arrows.

Fig. 5 is an enlarged sectional view on the line 5—5 of Fig. 2, looking in the direction of the arrows.

Fig. 6 is a fragmentary view showing a portion of the parts shown in Fig. 1 on an enlarged scale.

Like reference characters refer to like parts in the different figures.

Referring first to Figs. 1 and 2, the machine generally comprises a pair of spaced frame portions 1, 1, held together by a plurality of cross members 2. One frame 1 carries a bracket 3, which serves as a base for a driving motor 4, it being obvious that any other suitable source of power could be substituted for this motor. On the motor shaft is a pinion gear 5, in mesh with a gear 6 mounted on a shaft 7, which also carries a worm 8. The shaft 7 is suitably journaled in an extension 9 which forms part of a casing 10, within which the worm is enclosed, as shown in Fig. 5.

Referring now to Fig. 5, the worm 8 meshes with a worm wheel 11, which has a hub portion 11^a, loosely mounted on a sleeve 12. The sleeve 12 is fastened, as by means of a set screw 13, to a shaft 14, which is journaled at 15 in the frame 1. The sleeve 12 has a disk 16 formed integrally therewith, and between this disk 16 and the web of worm wheel 11 a layer 17 of frictional material is interposed. The disk 16 and wheel 11 are pressed together by a spring 18 surrounding sleeve 12, the spring extending between the hub portion 11^a and a collar 19 screwed onto the sleeve 12; thus providing means for adjusting the tension of the spring and the degree of frictional engagement.

The above arrangement provides a compact reduction gearing together with a frictional drive for the shaft 14 for a purpose to be hereinafter described. The shaft 14 extends between the frames 1, and as shown in Fig. 3, carries a gear 20 in mesh with a gear 21, which is rotatably mounted on a stud 22 that projects from the frame 1. The gear 21 meshes with a large gear 23, and the gear 20 also meshes with a large gear 24, so that the gears 23 and 24 are driven at substantially the same rate of speed, but in opposite directions of rotation. Referring again to Fig. 1, the gears 23 and 24 are freely mounted on long sleeves 25 and 26, which extend between the frames 1, and are rotatably supported in journals 27 and 28 provided in the frames. The gears 23 and 24 are held from endwise dis-

placement on the sleeves 25 and 26 by the journals 27 on one side, and by small collars 29 on the other side, said collars 29 being secured to the sleeves 25 and 26.

5 The sleeves 25 and 26 extend beyond the left hand frame portion 1 (Fig. 1) and reels, which are generally designated by the numerals 30 and 31, are fastened to the sleeves at this point. The reels 30 and 31 abut the journals 27 and endwise movement of the sleeves 25 and 26 with the reels is prevented by collars 32 and 33 secured to the sleeves beyond the journals 28 by set screws 34. In order to clutch and unclutch either sleeve 25 or 26 from the gears 23 and 24, respectively, clutch teeth 35 are formed on the hubs of gears 23 and 24, while members 37 and 38 provide complementary clutch teeth 36.

10 As best shown in Fig. 6, pins 39 extend through the members 37 and 38, these pins being movable in longitudinal slots 40 in the sleeves 25 and 26 and passing through shifting rods 41 and 42, into which they are tightly fitted. This construction fastens the clutch members 37 and 38 to the sleeves 25 and 26, and yet allows said members to be shifted longitudinally on the sleeves by the rods 41 and 42 to engage and disengage the teeth 35 and 36. The shifting rods 41 and 42 extend 15 outwardly beyond the sleeves and have head portions 43 and 44 for manual operation. Spring pressed balls 45 are carried by the clutch members 37 and 38, the balls 45 being adapted to fit in one of two depressions 46, 47 that are provided in each of the sleeves 25 and 26, and thus serve to maintain the parts in position.

20 The reels 30 and 31 are identical in construction, and a description of one will therefore do for both, the lower reel 31 being shown in elevation in Fig. 1, while the upper reel 30 is shown partly in section. Each reel comprises an inside flange 48 provided on a hub portion 49 which is secured to either sleeve 25 or 26. Each flange 48 has radial slots 50, Fig. 2, for a purpose to be hereinafter described, and the hub 49 provides longitudinal ribs 51. These ribs 51 interlock with longitudinal ribs 52 extending from a flange 53, which provides a hub 54 secured to the sleeve 25 by a nut 55. Removal of the nut 55 permits the flange 53 to be withdrawn from the sleeve, whereupon a completed coil may be removed from the reel.

25 Referring now to Figs. 1, 2 and 4, the shaft 14 carries a pinion 56 in mesh with a gear 57 mounted on a stud 58, the position of which is adjustable by means of a slot 58^a provided in the housing 10. The stud 58 carries a pinion 59 in mesh with a gear 60 on a shaft 61, which extends across the machine between the frames 1. With this arrangement of gearing, it is obvious that the speed of the shaft 61 is considerably less than 30 the speed of the shaft 14 which drives the

reels, and that the ratio between the reduction gears may be readily changed in order to vary the speed of the shaft 61, all of the gears 56, 57, 59 and 60 being accessible from the end of the machine.

35 The shaft 61 carries a cam 62 loosely mounted thereon and the cam 62 provides a face 63 having a helical form. The hub 62^a of the cam 62 provides an end surface having a projecting dog 64 which is adapted to be received in any one of a series of notches 65 provided on the end of a sleeve 66, slidably keyed on the shaft 61. See Fig. 4. The sleeve 66 is normally pressed toward the cam 62 by means of a spring 67 surrounding the shaft 61 between the end of the sleeve 66 and a collar 68 fast on the shaft 61. A lever 69, pivoted on the frame at 70 provides a yoke 71 embracing the sleeve 66, and carries inwardly projecting pins 71^a, freely engaging in a groove 66^a on the outer periphery of sleeve 66, as best shown in Fig. 4, whereby the sleeve 66 may be moved longitudinally on the shaft 61 against the spring 67 to disengage the dog 64 from a notch 65. When the sleeve 66 is so retracted the cam 62 is free to turn on the shaft 61 for a purpose to be hereinafter described.

40 A bar 72 slidably mounted in guides 73 on the frames 1, carries at one end a pair of spaced parallel guide members 74, and it is evident from Fig. 1 that these guide members 74 are adapted to lead the material to be coiled to either reel 30 or 31. As best shown in Figs. 3 and 4, the bar 72 has connected thereto the forked end 75 of a lever 76 pivotally supported at its other end on a pin 77 carried by a fixed bracket 78. The lever 76 carries a roller 79 intermediate its ends, which roller 79 is held in engagement with the helical face 63 of the cam 62 by means of a spring 80 connected at one end to a frame 1 and at the other end to the bar 72.

45 As previously pointed out, the spring 67 normally maintains the dog 64 in engagement with a notch 65, so that rotation of the sleeve 66 causes rotation of the cam 62, which in turn imparts a reciprocatory movement to the bar 72 through the roller 79. Therefore, rotation of the shaft 61 will result in a slow traversing movement of the guides 74, and material will be wound back and forth on whichever reel is being driven. In Fig. 1 the upper reel 30 is shown as being driven by engagement of the clutch parts 35 and 36, while the lower reel 31 has been rendered inoperative by pushing in the head 44 to disengage the clutch parts 35 and 36. The clutching members 37 and 38 are adapted to be held in either an engaged or disengaged position by means of the spring pressed balls 45 coacting with the depressions 46 and 47, as shown in Fig. 6.

50 When the material has been fully wound on the upper reel 30, the operator can quickly

stop rotation of this reel by pushing in the head 43, thereby disengaging the clutch parts 35 and 36. At the same time the lower reel 31 can be started by pulling out the head 44 and after the material has been severed, its free end can be passed between the guide members 74 below the bar 72 and inserted in one of the notches 50 of the flange 48 of the lower reel. The material will then immediately begin to wind on the lower reel 31 with the same traversing movement, which will give the operator opportunity to remove the completed coil, or bundle, from the upper reel 30 after taking off the outside flange 53.

When starting a new coil on either reel 30 or 31 it is always possible to bring the guide members 74 in position to begin laying the material at the same point on a reel, by moving the lever 69 to disengage the dog 64 from the particular notch 65 in which it is received. The cam 62 is then free to turn on the shaft 61, and the pressure exerted on the cam face 63 by the spring 80 acting through the lever 76 and roller 79 is sufficient to always return the cam 62 to the position shown in Fig. 1. Therefore, upon releasing the lever 69, the cam 62 is clutched to the shaft 61 in position to resume the traversing movement of the bar 72 with the guides 74 at the extreme left hand position with respect to either reel, as shown in Fig. 1.

When the material starts to wind on a reel, the speed of the shaft 14 is substantially the same as the positively driven worm wheel 11, but as the diameter of the bundle increases while the speed of the delivery of the material remains constant, the frictional material 17 permits a certain amount of slippage between shaft 14 and the worm wheel 11. This slippage obviously prevents the material being subjected to too great a tensile strain as it is wound. Since both the winding and traversing motions are obtained from the shaft 14, each revolution of a reel is accompanied by the same amount of traverse, while the rate of traverse can be readily varied by changing the ratio between the reduction gearing 56, 57, 59 and 60, as previously pointed out.

We claim,

1. In a machine of the class described, a traversing mechanism comprising in combination a rotating driving member, a pair of take-up reels adapted to be selectively driven by said rotating member, a cam device, a traversing member common to both of said reels adapted to receive a reciprocatory motion from said cam device, and means for connecting said cam device to said driving member at the will of the operator.

2. In a machine of the class described, a traversing mechanism comprising in combination a rotating driving member, a pair of take-up reels adapted to be selectively driven by said rotating member, a cam device, a traversing member common to both of said reels

adapted to receive a reciprocatory motion from said cam device, and means for establishing a driving connection between said cam device and said rotating member at any desired point in the path of movement of said traversing member.

3. In a machine of the class described, a traversing mechanism comprising in combination a rotating driving member, a pair of take-up reels adapted to be selectively driven by said rotating member, a cam device, a traversing member common to both of said reels adapted to receive a reciprocatory motion from said cam device, and means for connecting said cam device to or disconnecting said cam device from said rotating member at any point in the movement of said traversing member.

4. In a machine of the class described, a traversing mechanism comprising in combination a rotating driving member, a pair of take-up reels adapted to be selectively driven by said rotating member, a cam device, a traversing member common to both of said reels adapted to receive a reciprocatory motion from said cam device, means for connecting said cam device to said rotating member, and means for turning said cam independently of said rotating member.

5. In a machine of the class described, a traversing mechanism comprising in combination a rotating shaft, a cam loosely mounted thereon, a traversing member adapted to receive a reciprocatory movement from said cam, a sleeve slidable on said shaft and rotatable therewith, and means for shifting said sleeve to establish a driving connection between said cam and said shaft.

6. In a machine of the class described, a traversing mechanism comprising in combination a rotating shaft, a cam loosely mounted thereon, a traversing member adapted to receive a reciprocatory movement from said cam, a sleeve slidable on said shaft and rotatable therewith, and clutching members carried by said cam and said sleeve respectively, for connecting said cam to said shaft at any desired point in the path of movement of said traversing member.

7. In a machine of the class described, a traversing mechanism comprising in combination a rotating driving member, a pair of take-up reels mounted one above the other, means for selectively connecting said reels to said rotating member, a traversing member slidably supported between the parallel axes of said reels for delivering material to either one of said reels, and means for connecting said traversing member to said rotating member to initiate a reciprocating traversing movement of said traversing member at a predetermined point along the axis of either one of said reels.

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