

April 15, 1941.

F. GLASSFORD

2,238,727

WRAPPING MACHINE

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3 Sheets-Sheet 1

FIG. 1.

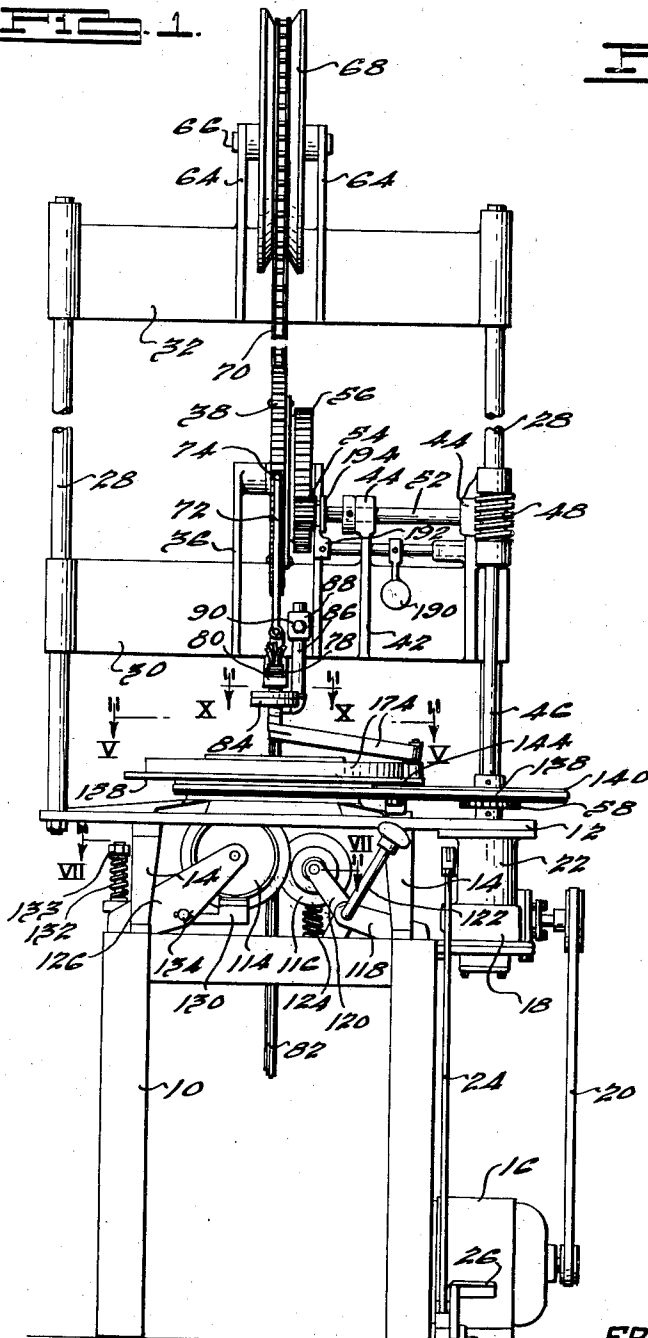
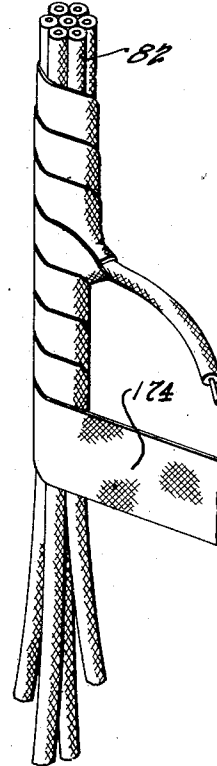


FIG. 1 1.



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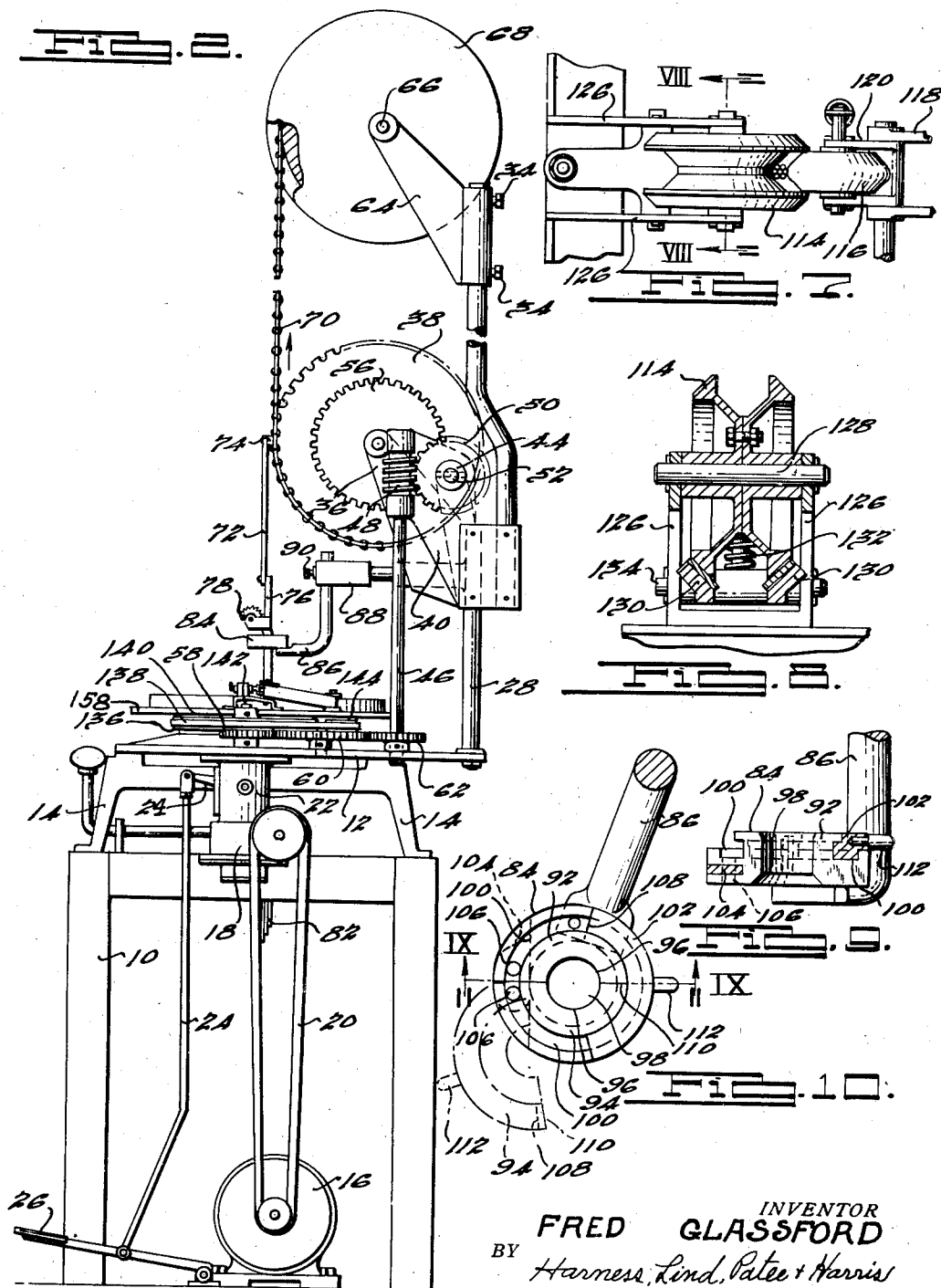
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2,238,727

WRAPPING MACHINE

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5 Claims. (Cl. 57—18)

This invention relates to a wrapping machine and more particularly to a machine for wrapping a tape around a plurality of strands such as insulated wires used in the wiring system of an automobile.

An object of the invention is to provide a rotatable tape carrier surrounding the strands to be wrapped with vertically movable clamping means for drawing the strands through the machine during the wrapping operation.

Another object of the invention is to provide a tension means for the strands which keeps the strands taut as they are passed through the machine and to provide a stationary guide adjacent the point of wrapping to prevent the tape from drawing the strands out of their vertical path of travel.

A further object of the invention is to provide a tape carrier which is rotatable on the machine and which is provided with a ring which is rotatable with the carrier and is rotatable relative to the carrier with friction means between the ring and carrier. Means are also provided on the ring to prevent relative rotation of the ring and a roll of tape carried by the ring and carrier.

Other objects and advantages of the invention will be more fully understood from the following description taken in connection with the accompanying drawings, in which:

Fig. 1 is a front elevation of the machine.

Fig. 2 is a side elevation of the machine shown in Fig. 1.

Fig. 3 is an enlarged fragmentary view taken on line III—III of Fig. 5 showing the supporting table and rotary tape supporting member in section.

Fig. 4 is a further enlarged view of the tape guide rolls as viewed on lines IV—IV of Fig. 5.

Fig. 5 is a plan view of the supporting table and rotary tape supporting member taken on line V—V of Fig. 1.

Fig. 6 is a fragmentary sectional view showing the tape ring on the rotary member.

Fig. 7 is a fragmentary view of the tension members taken on line VII—VII of Fig. 1.

Fig. 8 is a sectional view taken on line VIII—VIII of Fig. 7.

Fig. 9 is a sectional view of the guide member taken on line IX—IX of Fig. 10.

Fig. 10 is a plan view of the guide member taken on line X—X of Fig. 1.

Fig. 11 is an enlarged view showing a plurality of wires grouped and partially wrapped.

Referring to the drawings and particularly to Figs. 1 and 2, the machine is preferably formed

of a frame-like support 10 having a table 12 which is supported on the frame 10 by legs 14. A motor 16, preferably electric, may be supported on the frame 10 or, as shown, is supported on the floor adapted to drive a transmission mechanism 18 through a belt drive 20. The transmission is shown supported on the underside of the table 12 and is provided with a clutch mechanism 22 which is controlled by linkage 24 operated by a pedal 26.

At the rear edge of the table 12 are vertical supports 28 tied together by horizontally extending members 30 and 32, respectively. These members are vertically adjustable on the supports 28 and locked in position by set screws 34. The horizontally extending member 30 is provided with transversely extending arms 36 which journal a chain gear 38. The horizontally extending member 30 is further provided with a forwardly extending arm 40 at one side thereof and an arm 42 for supporting bearings 44.

A vertically extending shaft 46 has its lower end journaled in a bearing in the table 12 and is in driving connection with the clutch 22 and transmission 18. The upper end of the shaft 46 is journaled in the end of the arm 40 and is provided with a worm 48 which drives worm gear 50, cross shaft 52, pinion 54, and gear 56 connected to the chain gear 38. The shaft 46 is driven by a gear 58 connected to the clutch 22 driving through idler gear 60 and gear 62 on the shaft 46.

Arms 64, carried by the horizontally extending member 32, journal a shaft 66 which carries chain pulley 68. A continuous chain 70 is looped around the chain gear 38 and chain pulley 68.

At one point on the chain 70, a flexible member, such as a leather strap 72, is secured thereto as at 74. The free end of the strap 72 has a wire holding member 76 secured thereto. The holding member 76 has its lower end provided with a bifurcated end with a serrated cam member 78 pivoted between the arms 80 of the bifurcated end. The cam 78 is spaced from the back wall of the member 76 which spacing provides an opening for the reception of the wire or a plurality of wires 82 to be wrapped. When the wires are in the position shown in Fig. 3 the cam 78 can be swung toward the wires 82 and locked in position for following the chain 70 during its travel. The wires 82 are pulled slowly upwardly through the machine during the wrapping operation.

In wrapping the wires 82 it is desirable to hold the wires 82 against any lateral movement caused by the pull of the tape. Such a guide is shown at

84 in Figs. 1 and 2 and is illustrated in detail in Figs. 9 and 10. This guide 84 is supported by an arm 86 which is vertically adjustable in a support 88 carried by the horizontally extending member 30, it being held in adjusted position by the set screw 90.

The support 84 comprises two semi-circular members 92 and 94 having cooperating recesses 96 which together form a circular, central opening 98. The members are each provided with a groove 100 which receives a semi-circular member 102 fitting the groove 100 for sliding circumferentially. The members 92 and 94 are connected at one side by a link 104 which has its opposite ends pivotally connected to the members 92 and 94 by pins 106. When the member 102 is in the position shown in full lines in Fig. 10 the two members 92 and 94 are locked together. When it is desired to open them to a position shown by the dotted lines, the member 102 is slid so that its edge 108 is moved beyond the edges 110. The parts can then be opened for inserting the wires 82 in the opening 98. A handle for sliding the member 102 is shown at 112.

A tension holding device for the wires 82 is shown below the table 12 and in Figs. 7 and 8. A roller 114, preferably made in two halves, has its outer periphery grooved to receive the wires 82. Another roller 116 has its outer periphery formed to fit within the grooved roller 114. The roller 116 is pivotally supported on brackets 118. A yoke member 120 carries the roller 116 and a handle 122 is provided for swinging the roller 116 into and out of engagement with the roller 114. A spring 124 resiliently urges the roller 116 toward the roller 114.

The roller 114 is rotatably supported between arms 126 on a pinion 128. A pair of shoes 130 are in frictional engagement with the roller 114 and are held thereagainst by a spring 132 which is adjustable by nut 133 to vary the amount of frictional resistance of the shoes 130. The shoes are pivotally supported on a pin 134. The wires 82 are fed between the rollers 114 and 116 as shown in Fig. 1.

Mounted on the table 12 is a rotatable tape carrier 136 driven through a belt 138 by a pulley 140 connected to a shaft 142. The shaft 142 carries the gear 58 and is driven by the clutch 22. An idler pulley 144 is mounted on a bracket 146 which is secured to the table 12 by a bolt 148 passing through a slot 150. The bracket can be slid toward or away from the belt for adjusting the tension of the belt 138.

The tape carrier is held in position by an inner collar 152 which is detachably secured to the table 12 by screws 154. The collar 152 has an overhanging flange 156 for holding the carrier 136 in rotatable position on the table 12. A plate 158 is positioned on the carrier 136 and is provided with an inner, upwardly extending flange 160. A ring 162 is mounted around the flange 160 for relative rotation with the plate 158 and is held in position by a detachable ring 164. Friction blocks 166 are mounted in recesses formed in the flange 160 which are urged into engagement with the inner periphery of the ring 162 by springs 168 held to the flange 160 by screw 170. Vertically positioned knives 172 are arranged on the outer periphery of the ring 162 to engage the inner periphery of a roll of tape 174.

As the tape comes off the roll 174 it is first fed around a spool 176 carried by the rotatable plate 158. It then passes another spool 178 carried by a bracket 180 at a higher position than the spool

176. The spools 176 and 178 are tapered to permit the tape to follow a path above the roll of tape.

A tension device is shown in Fig. 4. A roller 182 is carried by a plunger 184. A spring 186 urges the roller into engagement with the tape opposite to the spool 178. A handle 188 is provided for drawing the roller 182 away from the tape.

In the operation of the machine, the wires 82 are inserted through the center of the roll of tape 174. The roller 116 is moved away from the pulley 114 and the wires inserted between the two. The wires are then inserted in the guide 84 and the ends of the wires are locked to the holding member 76. The operator then engages the clutch 22 through pedal 26 and the driving gears and belts above mentioned cause the carrier 136 to rotate in a direction indicated by the arrow in Fig. 5. At the same time the chain 70 moves slowly in a direction indicated by the arrow in Fig. 2.

In wrapping a wiring harness such as used on an automobile the wires are of different length and the ends are not covered by the tape as indicated in Fig. 11. When approaching one of the loose ends the operator can easily hold the end at right angles to the main strand as indicated in Fig. 11 to prevent it from being wrapped.

The machine can be readily started and stopped for reloading or correction of the wrapping in the event of some error.

If it is desired to double wrap a portion of the wires the machine may be stopped and the gear 54 slid out of mesh with the gear 56 by handle 190, yoke 192 and collar 194 on the gear 54.

The machine is particularly adapted for wrapping a wiring harness for an automobile because of its design, permitting the operator to handle the wires as they pass through the machine and because it can be quickly started and stopped.

It will be understood that various changes including the size, shape and arrangement of parts may be made without departing from the spirit of my invention and it is not my intention to limit its scope other than by the terms of the appended claims.

I claim:

1. A wrapping machine having an upper pulley, a lower pulley, a continuous looped member around said pulleys, a fastening device carried by said looped member, means for driving one of said pulleys, means for disengaging the driving connection to said pulley to permit free rotation of said pulley, a rotatable member having its axis arranged tangent to said lower pulley and at right angles to the axes of said pulleys, and means for driving said rotatable member at a speed greater than the speed of said pulleys.

2. A wrapping machine having a rotatable member for carrying a roll of tape, vertically movable means for drawing strands to be wrapped through the axis of said rotatable member, power means for driving said vertically movable means and said rotatable member, control means for said power means, manually operable means for connecting and disconnecting said power means with said vertically movable means independent of said power control means.

3. A tension means for wires to be wrapped in a wrapping machine consisting of a pair of pulleys having their outer peripheries in contact at a point coincident with the axis of the wires, friction means in engagement with one of the

pulleys, and means for moving one of said pulleys away from the other.

4. A wrapping machine having a pair of vertically spaced pulleys, a continuous looped member around said pulleys, a rotatable tape receiving member below said pulleys, means for driving one of said pulleys and said tape receiving member, means for disengaging the driving connection between driving means and the one of said pulleys to permit free rotation of said pulleys in 10

either direction, and a flexible member carried by said looped member for detachably engaging wires to be wrapped.

5. A guide member comprising a pair of semi-circular members having cooperating recesses, a link pivotally connecting said members together to permit opening and closing of said members, and a semi-circular member slidable in said recesses to lock the members in closed position.

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