AUTOMATIC WIRE TYING MACHINE

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4 Claims. (Cl. 100—31)

1. This invention has to do with automatic wire tying machines of the type in which the wire is fed into the machine from a coil or other continuous supply, is looped about the box or other article to be bound, and is thereafter drawn taut under predetermined tension about the article by a reversal of the wire feeding means.

The purpose of the invention is to provide new and improved means for controlling the slack which develops in the wire between the feeding means and the coil or other continuous supply upon the reversal of the feeding means, whereby to prevent kinking or other damage to the wire and maintain the same in condition for feeding upon the next operation of the machine.

Other more specific objects and advantages of the invention will be apparent to those skilled in the art upon a full understanding of the construction, arrangement and operation of the new slack take-up means.

A preferred embodiment of the invention is presented herein for the purpose of exemplification, but it will of course be appreciated that the invention is capable of embodiment in other structurally modified forms coming equally within the scope of the appended claims.

This application is a division of application Serial No. 371,334 filed December 23, 1940, which has issued as Patent 2,416,859, dated March 4, 1947.

In the accompanying drawings:

Fig. 1 is a perspective view of an automatic wire tying machine equipped with slack take-up means constructed in accordance with the invention;

Fig. 2 is a front elevation of the machine;

Fig. 3 is a fragmentary plan view of the right-hand end of the table-like top of the machine, showing the pocket for accumulating the slack wire fed back by the feed rolls during the reverse operation of the latter;

Fig. 4 is a front elevation of the same portion of the machine;

Fig. 5 is a fragmentary vertical section through the feed-back pocket, taken on the line 8—8 of Fig. 3; and

Fig. 6 is a horizontal section through the delivery end of the wire tube leading from the coil or other continuous supply, showing the one-way clutch for preventing return movement of the wire through the tube, taken on the line 6—6 of Fig. 3.

The automatic wire tying machine which is shown in the drawings is illustrated and described in detail in Patent 2,416,859 referred to above and is therefore only illustrated and described here to the extent necessary to explain the relationship thereto of the slack take-up means.

As will be observed in the drawings, the machine includes a table-like support 10. The boxes or other articles to be tied are moved across the support 10, preferably on anti-friction rollers 14, onto a plate 12, into overhanging relation to the front edge 13 of that plate. The plate 13 is provided intermediate its ends with a forwardly projecting lip 14 which supports the overhanging portion of the article during the tying operation. The machine is provided, in substantially the vertical plane of the front edge 13, with a wire looping track 33, which track extends in a generally rectangular helical path from its receiving end 40 to its delivery end 41. The wire used in the machine is drawn from a coil or other continuous supply (not shown), passes through the tube 42 (see Figs. 3, 4 and 6) past a spring pressed clutch block 43 which prevents any reverse movement of the wire through the tube, enters a large flat feedback pocket 44 formed within the upper portion of the right-hand side of the table-like support 10, leaves the pocket 44 through a guide 45 which is spaced from but aligned axially with the delivery end of the tube 42, passes between two pairs of grooved feed rolls 46, enters a flexible tube 47, and is directed by the tube 47 into a groove (not shown) in the receiving end 40 of the track 33.

This groove extends the full length of the looped track 33, in confronting relationship to the article on the top plate 12, and is partially closed at all points throughout its length by one or more fingered spring strips 48, which spring strips confine the wire within the groove when being projected through the same while allowing the wire to be stripped from the groove when the leading end of the wire is held against return movement and the direction of rotation of the feed rolls 46 is reversed.

As the incoming wire—indicated at 50 in Figs. 3, 4 and 6—is drawn from the tube 42 by the feed rolls 46 it forces back a light leaf spring 51 located in the pocket 44. When the direction of rotation of the feed rolls 46 is reversed, causing the wire to be fed back toward the supply, the spring 51 will push the wire sidewise a short distance and cause it to accumulate in the pocket 44 in a large loose loop 52 in readiness for the next wire feeding operation. The feed rolls 46 are mounted in a bracket 53 and are driven in first one direction and then the other from a reversible electric motor 54. When the leading end of the wire, after traveling the full length of the looped track 33, reaches
the delivery end 41 of the track it is automatically engaged and held by a gripper (not shown), which gripper is located at the right-hand side of the wire tying mechanism indicated generally by the numeral 15. This gripper transfers the leading end of the wire to the left-hand side of the wire tying mechanism, after which the direction of rotation of the feed rolls 46 is reversed, causing the looped portion of the wire to be stripped from the track 35 and pulled taut under predetermined tension about the article resting on the plate 12, with the then overlapped portions of the wire operatively positioned with respect to the tying mechanism. The tying mechanism then twists the overlapped portions of the wire together and severs the surplus wire at the ends of the tie. During the reverse rotation of the feed rolls 46 the slack which develops in the wire between the feed rolls and the tube 42 is directed by the spring 51 into the loop formation 52, without kinking or other damage to the wire, leaving the wire in condition for proper feeding by the rolls 46 upon the next operation of the machine.

We claim:

1. In a machine of the character described, means for feeding wire from a supply, means for reversing the feed of the wire, means for forming into a loose loop of progressively increasing size the wire accumulating by reason of the reversal of the feed, and one-way clutch means engageable with the wire intermediate the loop therein and the supply for preventing the wire in the loop from moving backwardly toward the supply.

2. In a machine of the character described, rolls for feeding wire into the machine from a point of supply, a flat chamber between the feed rolls and the point of supply, means for reversing the feed rolls, and a spring located in the path of feed of the wire for deflecting the wire laterally into the chamber in the form of a loose loop during the reversal of the feed rolls.

3. In a machine of the character described, rolls for feeding wire into the machine from a point of supply, a flat chamber between the feed rolls and the point of supply, means for reversing the feed rolls, and a leaf spring extending generally in the direction of feed of the wire with a resiliently yieldable portion thereof located in the path of the feed for deflecting the wire laterally into the chamber in the form of a loose loop during the reversal of the feed rolls.

4. In a machine of the character described, rolls for feeding wire into the machine from a point of supply, a flat chamber between the feed rolls and the point of supply, means for reversing the feed rolls, a spring located in the path of feed of the wire for deflecting the wire laterally into the chamber in the form of a loose loop during the reversal of the feed rolls, and one-way clutch means engageable with the wire intermediate the loop therein and the supply for preventing the wire in the loop from moving backwardly toward the supply.

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