

Jan. 16, 1934.

A. O. ABBOTT, JR., ET AL

1,944,142

MACHINE FOR WRAPPING WIRES

Filed Sept. 13, 1930

2 Sheets-Sheet 1

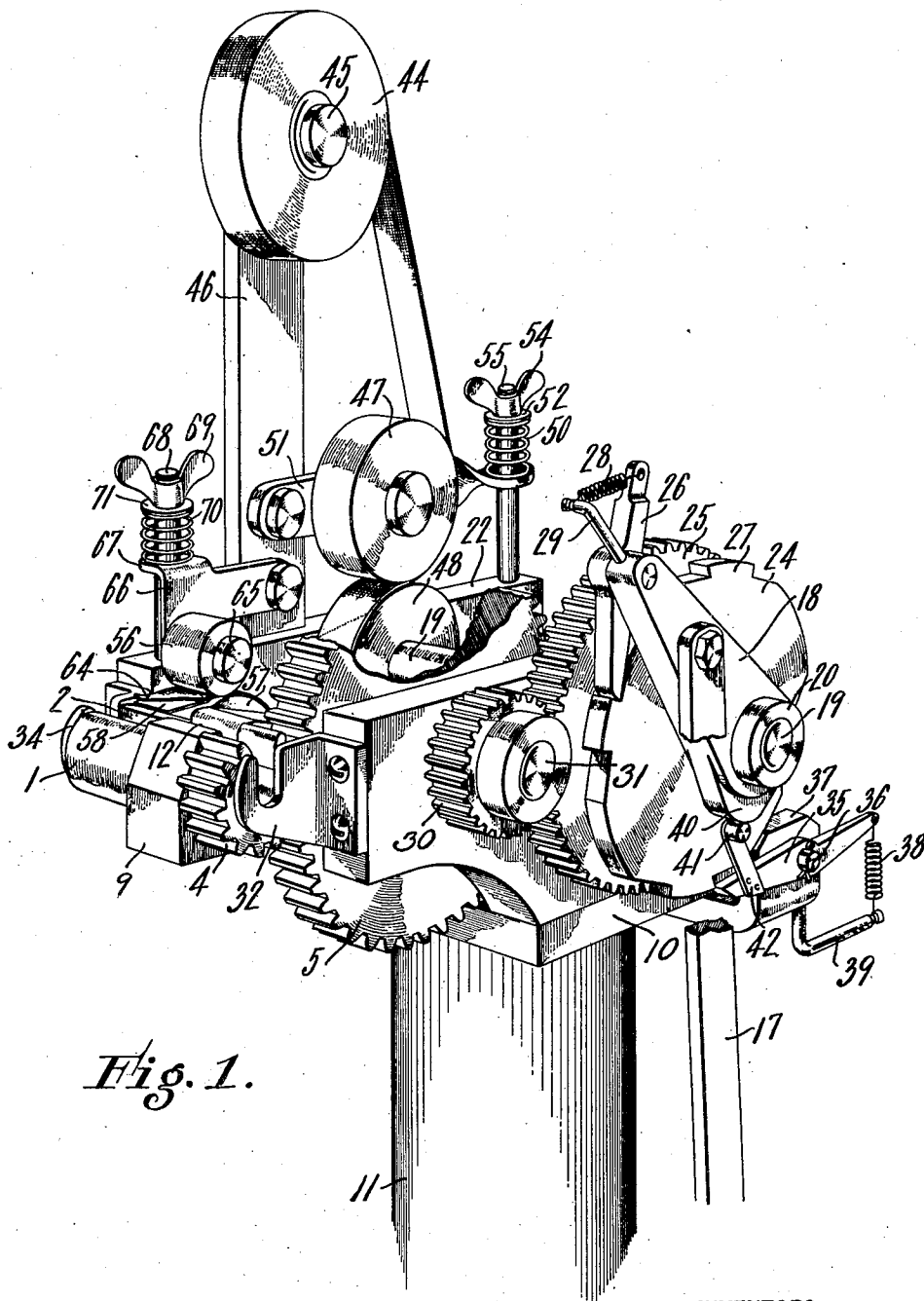


Fig. 1.

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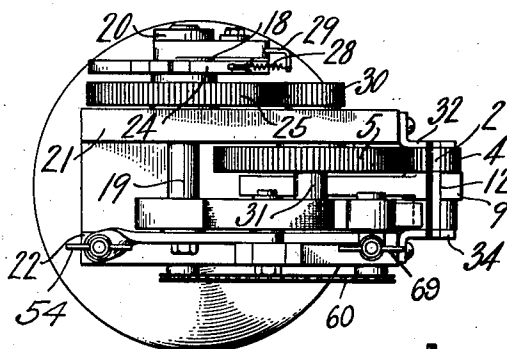


Fig. 3.

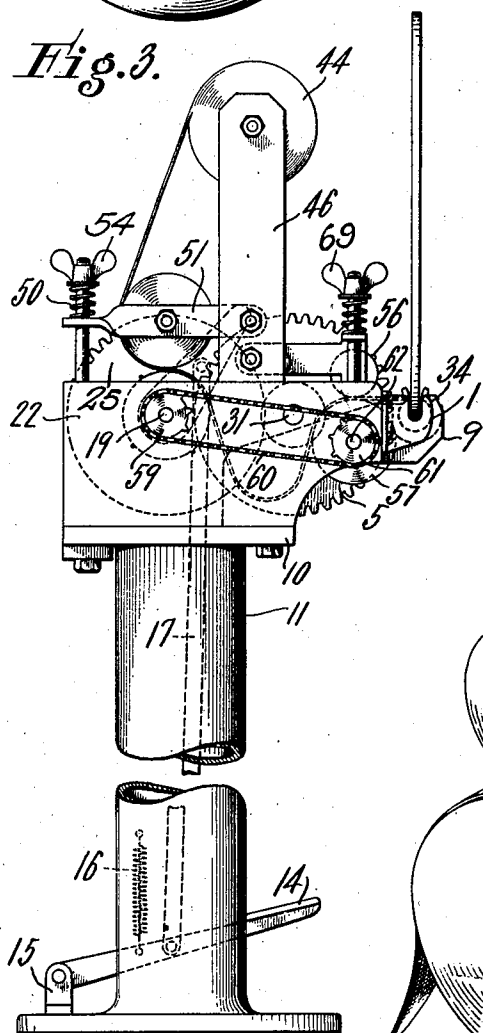


Fig. 2.

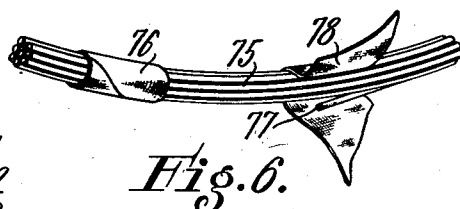


Fig. 6.

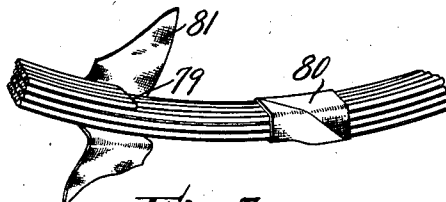


Fig. 7.

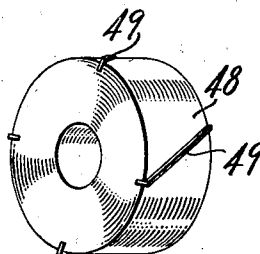


Fig. 5.

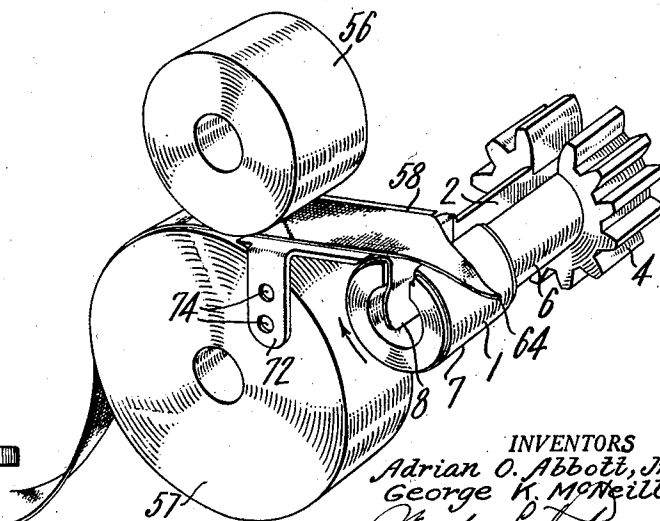


Fig. 4.

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MACHINE FOR WRAPPING WIRES

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Serial No. 481,623

8 Claims. (Cl. 117-41)

Our invention relates to machines for wrapping wires, and more particularly to machines for wrapping rings of wire used in making beads for tires and other purposes.

In the manufacture of rings composed of a plurality of separate wires or strands, such as the bead rings used in automobile tires, it is customary to wrap the whole or a part of the ring to hold the ends of the constituent wires in place. Such wrapping is also beneficial in that it covers the exposed ends of the wires and prevents chafing or injury to fabric which may be placed in engagement with the rings.

We provide a machine for wrapping such composite wire rings or bands in which a definite amount of wrapping material is marked and positioned to be engaged by a wrapping tube. When the ring to be wrapped is placed in the wrapping tube a single impulse is given to a rod which transmits energy to a gear train. The gear train in turn rotates the winding tube and causes a marked strip of material to be advanced to the tube. Upon the rotation of the tube the marked wrapping material is torn from the feed supply so that the entire wrapping operation is substantially automatic.

The accompanying drawings illustrate a present preferred embodiment of our invention, in which

Figure 1 is a broken perspective view of our wrapping machine;

Fig. 2 is a side elevational view thereof;

Fig. 3 is a plan view thereof;

Fig. 4 is a diagrammatic perspective view of the wrapping tube and adjacent feed rollers;

Fig. 5 is a perspective view of a measuring and marking wheel; and

Figs. 6 and 7 are perspective views of portions of different types of wire rings illustrating the wrapping of the wire ends.

Referring to the drawings, a wrapping tube 1 is provided with a longitudinally extending slot 2 for the reception of a ring or bundle of wires or an equivalent object to be wrapped. A gear 4 is positioned at one end of the tube for rotating it. In order to complete the slot 2 one of the teeth of the gear 4 is omitted. However, the gear 4 and a co-operating driving gear 5 are so proportioned that a sufficient number of teeth will always be in mesh for rotating gear 4 even when the blanked portion of the gear 4 is in co-operative position relative to the gear 5. The tube is provided with an undercut bearing portion 6 for supporting the tube. A spring clip 7 is slipped over the other end of the tube. The

clip 7 terminates in a curved portion 8 disposed within the slot 2 for pressing wrapping material against the ring or other device being wrapped, as hereinafter described.

The bearing portion 6 of the tube 1 is inserted in a bracket 9 supported by a bedplate 10 resting on a pedestal 11. The bracket 9 is provided with a slot 12 for alinement with the slot 2 during the reception and discharge of a ring or other member to be wrapped. The gear 4 is mounted on the tube after the tube is seated in the bracket 9.

The wrapping tube 1 is rotated a definite number of times for each wrapping operation. A convenient number of rotations is three. Provision is made for causing the desired number of rotations upon a single impulse being delivered to a driving member. To accomplish actuation of the wrapping tube, a treadle 14 is pivotally secured between lugs 15 attached to the pedestal 11. A spring 16 normally urges the treadle into a raised position. A link 17 extends from the treadle 14 to an arm 18. The arm 18 is rotatably mounted on a shaft 19 and is secured in place by a collar 20. The shaft 19 extends through and is supported by frame plates 21 and 22 resting on the bedplate 10.

A ratchet disc 24 and a gear 25 are rigidly secured to the shaft 19. A pawl 26 is mounted near the end of the arm 18 and is urged in a position to engage teeth 27 on the disc 24 by a spring 28 secured to an extension 29 of the arm 18. Accordingly, upon each depression of the treadle 14 the pawl 26 engages the ratchet disc 24 for rotating the shaft 19 and gear 25 through substantially a definite distance, provided the operator fully depresses the treadle 14.

The gear 25 meshes with a gear 30 mounted on a shaft 31 which is also supported by the plates 21 and 22. The gear 5 is mounted on the shaft 31. The gears 5 and 25 are made of considerably greater diameter than the gears 4 and 30, respectively, so that a single impulse given to the link 17 results in the desired number, preferably three, rotations of the wrapping tube 1. It is to be understood, however, that the exact ratio between the movement of the arm 18 and the rotation of the tube 1 may be varied as desired. Slotted guide plates 32 and 34 are positioned on the ends of the plates 21 and 22, respectively. The guide plates 32 and 34 serve as positioning and holding means for the article being wrapped.

In order that the slot 2 in the wrapping tube shall stop in alinement with the slots in the

bracket 9 and the guide plates 32 and 34, it is necessary to provide means to prevent over-traveling of the tube by reason of the momentum of the moving parts. Such a stopping device comprises a latch 35 mounted on a pin 36 projecting from a bracket 37 carried by the bedplate 10. The latch 35 is urged in position to engage the teeth 27 on the disc 24 by a spring 38 connected between an end of the latch 35 and a lug 39 projecting from the bracket 37 beneath the latch 35.

For releasing the latch 35 at the beginning of a downward or power stroke of the arm 18, the latter is provided with a cam surface 40 which bears against a roller 41 carried on an extension 42 of the latch 35. The shape of the cam surface 40 is such that when the arm 18 is in its upper or raised position the latch 35 is thrown out of engagement with the teeth 27. When the arm 18 is in its lower position, or at the end of the power stroke, the roller 41 is nearer to the shaft 19 so that the latch 35 engages a tooth 27 to prevent further turning movement. As the treadle is released and the arm 18 rises the latch 35 is withdrawn from engagement with the tooth 27.

For supplying wrapping material in measured lengths to the wrapping tube a reel 44 of the material is mounted on a shaft 45 carried by a bracket 46. The material from the reel 44 passes downwardly and under a loaded roller 47 which cooperates with a marking roller 48, illustrated in Fig. 5. The roller 48 is provided with one or more blunt teeth 49 which are preferably set at an angle to the direction of rotation of the roller. The roller 47 is so loaded, or held in such tight engagement with the roller 48, that the fabric which lies between the teeth 49 and the roller 47 is crushed but not cut. The crushing is sufficient so that the fabric may subsequently be torn. The roller 47 is loaded by means of a spring 50 bearing against and engaging one end of the roller supporting lever 51 which extends from the bracket 46. The spring 50 is confined by a washer 52 bearing against a wing nut 54 threaded onto the end of a post 55 mounted in the plate 22.

From the rollers 47 and 48 the marked fabric passes between feed rollers 56 and 57 and then onto a guideway 58 so that the advancing edge of the strip may overhang the slot 2. The marking roller 48 is mounted on the shaft 19 and is driven in unison with the gear 25 and disc 24. The circumference of the roller 48 is such that the correct amount of material is marked during each complete cycle of movement of the arm 18. The shaft 19 terminates in a sprocket wheel 59 externally of the plate 22. A chain 60 is connected between the sprocket wheel 59 and a sprocket wheel 61 mounted on the end of a shaft 62 rigidly supporting the feed roller 57.

The relative diameters of the rollers 48 and 57 together with sizes of the sprocket wheels 59 and 61 are so chosen that the peripheral speeds of the rollers 48 and 57 are the same and bear a definite ratio to the movement of the arm 18. The peripheral speed of the rollers 56 and 57 is less than the speed of the winding tube 1. However, at the end of each cycle of operation an advancing end 64 of the wrapping material overlies the slot 2.

The roller 56 is mounted on a shaft 65 carried by a bracket 66 pivotally mounted on the bracket 46. The bracket 66 is provided with an ear 67

having an opening for the reception of a threaded post 68 which is surmounted by a wing nut 69. A spring 70 is interposed between a washer 71 bearing against the wing nut 69 and the ear 67. The guide plate 58, as shown in Fig. 4, is supported by the plate 22 through the medium of a lug 72 having openings 74 for the reception of screws, bolts or the like.

Referring to Fig. 6, we have shown a section of a band or ring 75 formed of several convolutions of wire, one end of which is covered by a wrapping 76 and the other end 77 of which is about to be covered by a wrapping 78. In Fig. 7 a plurality of wires 79 have their ends at substantially the same place. One group of ends is shown to be covered by a wrapping 80 while the other group of ends is shown as about to be covered by a wrapping 81. It is to be understood that the types of rings or bands shown in Figs. 6 and 7 are purely diagrammatic and are not limitations of the invention.

In the operation of our machine a ring, band, or the like, which is to be wrapped is inserted in the aligned slots in the tube, bracket and guides. During the insertion of the ring the projecting end 64 of the wrapping material is forced into the slot between the article and the curved portion 8 of the spring clip. The operator then depresses the treadle 14 which, through the mechanism heretofore traced, causes three complete rotations of the wrapping tube 1. As soon as rotation of the tube begins the wrapping material is drawn forward by the tube more rapidly than it is delivered by the several feed rollers, with a result that the wrapping fabric is torn along the marking or crushing line which was previously formed between the rollers 47 and 48. The wrapping material thus freed is twisted around the object being wrapped before the end of the operating stroke of the treadle.

The movement of the several feed rollers, however, is sufficient to advance another end of the wrapping material over the slot 2 prior to the end of the actuating operation. The machine is then stopped and the wrapped article is removed from the slot, which movement slightly displaces the advanced end 64. The article is again seated, or a new article is inserted into the slot 2 for depressing the advancing end of the fabric into the slot and securing it against the curved portion 8. The foregoing cycle of operations may be repeated indefinitely and very rapidly as substantially the entire attention of the operator is devoted to inserting and withdrawing articles from the wrapping tube and operating the treadle 14. The delivery, marking and severing of the wrapping material is automatic.

While we have shown and described a present preferred embodiment of our invention, it is to be understood that it may be otherwise embodied within the spirit of the invention and the scope of the appended claims.

Having thus described our invention, what we claim and desire to protect by Letters Patent is:

1. In a wrapping machine, a slotted wrapping tube, means for feeding wrapping material into co-operative position relative to the slot in said tube, and means for measuring and partially severing said wrapping material preparatory to a complete separation by the operation of the wrapping tube.

2. In a wrapping machine, a slotted wrapping tube, means for feeding wrapping material into

- co-operative position relative to the slot in said tube, and means for measuring and weakening said wrapping material so that when the end of the material is seized in the tube a definite
5 length of the material is detached for use in a winding operation.
3. A slotted wrapping tube having a spring mounted therein for holding wrapping material.
4. In a wrapping machine, a pair of co-oper-
10 ating feeding rollers, one of which is provided with means for weakening material passing therebetween, and means for urging the rollers toward each other.
5. In a wrapping machine, a pair of co-oper-
15 ating feeding rollers, one of which is provided with a blunt tooth for weakening material passing therebetween, and means for urging the rollers towards each other.
6. In a wrapping machine, a wrapping tube,
20 means for driving the tube comprising a link, a pawl operated by the link, and a ratchet disc, means for preventing the overrunning of the disc, and means for controlling the last men-
25 tioned means in accordance with the relative operating positions of the pawl and disc.
7. In a wrapping machine, a wrapping tube, a source of wrapping material, means for meas-
uring and marking the wrapping material so that required amounts may be readily severed, means for advancing the marked wrapping ma-
terial into co-operative relation to said tube, means associated with said tube for seizing the
80 wrapping material for severing it, and means for simultaneously rotating the tube and the marking and advancing means at different rela-
tive speeds to permit the severing of wrapping material for the wrapping of an article while a
85 succeeding unit of wrapping material is ad-
vanced.
8. In a wrapping machine, a wrapping tube, a source of wrapping material, means for meas-
90 uring and marking the wrapping material so that required amounts may be readily severed, means for advancing the marked wrapping ma-
terial into co-operative relation to said tube, means associated with said tube for seizing the
95 wrapping material for severing it, and means for rotating the tube and the marking and ad-
vancing means at different relative speeds to permit the severing of wrapping material for the wrapping of an article while a succeeding
100 unit of wrapping material is advanced.
- ADRIAN O. ABBOTT, JR.
GEORGE K. MCNEILL.

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