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APPARATUS FOR REELING STRIP MATERIAL

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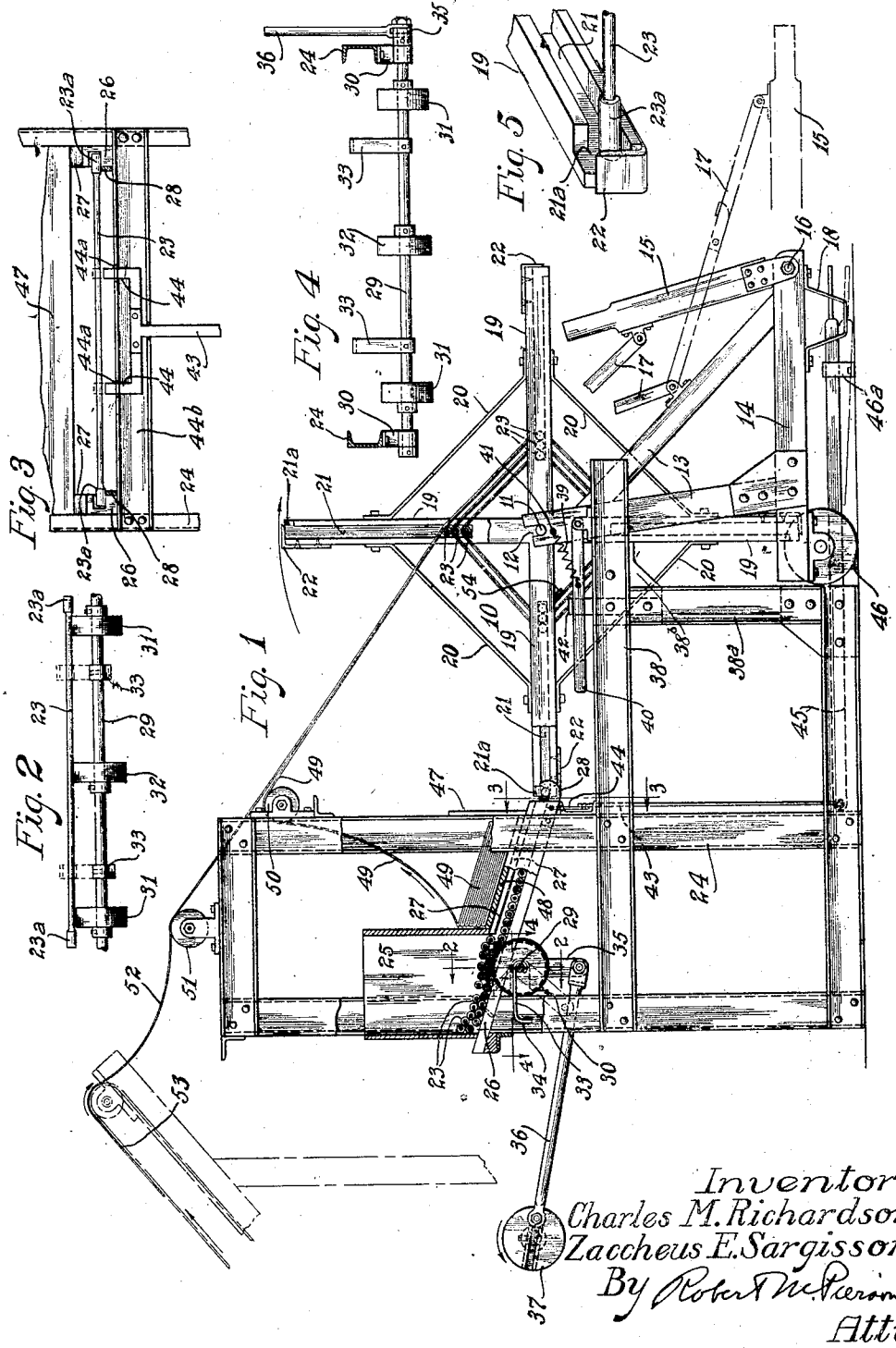


Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

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APPARATUS FOR REELING STRIP MATERIAL.

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This invention relates to apparatus for reeling strip material, and more particularly to reels wherein the successive layers of material are held out of firm contact with each other. It is especially applicable to the reeling of long lengths of thin, plastic, sheet material such as unvulcanized rubber, which, even when carried on a liner, may require to be wrapped on a reel in a manner to keep its exposed surface from pressing excessively against the liner of the succeeding wrap. This is commonly accomplished by wrapping the liner and material upon a reel provided with transverse spacing rods which separate the several convolutions of material, the spacer rods being placed in radial guide slots in the reel as the material is wrapped thereon. Heretofore the placing of the rods, so far as we are aware, has been performed by hand, requiring the full attention of an operator for the reeling of a sheet as the latter comes from a calender.

The chief object of this invention is to provide improved apparatus for reeling lengths of strip material, and more specifically to save labor by automatically placing the spacer rods in the reel.

Of the accompanying drawings,

Fig. 1 is a side elevation of our improved apparatus with parts broken away and in section and a strip of material being wound therein.

Fig. 2 is a section on the line 2—2 of Fig. 1.

Fig. 3 is a section on the line 3—3 of Fig. 1.

Fig. 4 is a section on the line 4—4 of Fig. 1.

Fig. 5 is a perspective view of the end of one of the reel spokes.

Referring to the drawings, 10 represents generally a stock reel which is rotatably mounted on axial trunnions, one of which is shown at 11, said trunnions being journalled in open-ended slots such as 12 in the upper ends of a pair of supporting brackets, one of the latter being shown at 13, constituting parts of a two-wheeled truck 14. The truck 14 is provided with a pair of folding handles, one being shown at 15, said handles being hinged to the truck at 16 and connected with the respective brackets 13 by knee-jointed hinge braces such as 17, the handles and braces being at the sides of the truck so as to be clear of the reel when in their folded positions. 18 is one of a pair of feet with which the truck is provided.

The reel 10 comprises a pair of end members including radial spokes 19, 19, and spoke-braces 20, 20, said end members being spaced apart by an axial hub (not shown), and the spokes of the two end members being paired about the axis of the reel. On the inner face of each spoke is a longitudinal spacer-rod-receiving channel 21, extending from adjacent the reel's axis to the outer end of the spoke, where it extends to the end face of the spoke and opens on the face of the spoke which is foremost as the reel is turned in winding the material thereon. An angle plate 22 is secured to the end of the spoke so as to provide an end wall for said channel but to leave the channel open on the forward face of the spoke, providing a mouth 21^a, to admit the end portion of the spacer-rod to the channel 21. The spacer rods, 23, 23, are formed with enlarged end portions 23^a, 23^a, to provide substantial separation between the middle portions of adjacent rods, whereby contact between the strip material and adjacent spacer rods is avoided.

Supported in an upright frame 24, with relation to which the truck, with the reel thereon is positioned for the reeling operation, is a hopper 25 adapted to hold a supply of the spacer rods parallel with the axis of the reel. The bottom of said hopper is open over its middle area so that the rods are supported at their ends only, by parallel, inclined guides 26, 26, leading from the hopper, said guides being formed, from the adjacent hopper wall to their lower ends, with flanges 27, 27, parallel with and at such distance above the rod supporting faces of the guides as to provide grooves constituting a guideway or chute for a single file of the rods 23. Secured to the lower ends of the respective guides 26, in extension thereof, are upturned rod-supporting and stopping hooks 28, 28, adapted to hold the file of rods so that the foremost rod is in position for its ends to enter the mouth 21^a of the channel 21 in a pair of the reel spokes as the

reel is rotated, said hooks being secured to the inner faces of the guides 26 so that the reel spokes clear them in passing and the ends of the rods project past said hooks so as to be caught by the reel spokes.

In order that the spacing rods will be fed regularly and evenly into the chute, we have provided, under the hopper 25, an agitator comprising a rock shaft 29, journalled in brackets 30, 30 secured to the frame 24. Said rock shaft has friction-surfaced rollers 31, 31 secured thereon near its ends, a similar but somewhat larger roller 32 at its middle, and a pair of radial beater-arms 33, 33 positioned intermediate said rollers, said arms having downwardly bent portions 34 at their outer ends to prevent rods from rolling under them when they enter the hopper. Secured to one end of the rock shaft 29 is a depending lever 35 adapted to be oscillated by a variable-stroke pitman 36 mounted at its other end upon a rotating member 37 which may be a part of an adjacent machine, such as the shaft of a calender-apron roll. The rollers 31, 32 extend into the hopper 25, and the middle roller 32 is of such size that any rod in contact therewith can be in contact with only one of the rollers 31, as is clearly shown in Fig. 2, as we find that this arrangement results in better feeding of the rods into the chute than occurs when the rollers are of such size as to all contact the same rod at the same time. The radial arms 33 are so positioned upon the shaft 29 as intermittently to enter the hopper from below, as shown in dotted lines in Fig. 1, as said shaft is oscillated, to agitate the rods and urge them toward the rollers 31, 32.

Projecting horizontally from the upright frame 24 are a pair of beams, one being shown at 38, between which the brackets 13 of the truck 14 fit abutting stops such as 38^b on said frame, to align the reel 10 in position for the reel arms successively to pick up the rods 23 from the hooks 28, as the reel is manually rotated in the direction of the arrow in Fig. 1, and the frame is provided with a pair of vertical leg members such as 38^a adapted to be abutted by the wheels of the truck to limit the movement of the latter toward the hopper 25. For holding the truck firmly in position against the leg members 38^a and the stops 38^b, with the legs 18 slightly above the floor as shown, anchoring devices are provided at each side of the frame, one of the same being shown in Fig. 1, where 39 is a tension spring permanently secured at one end to a hand-lever 40 pivoted on the beam 38, the other end of said spring being adapted to be hooked onto a stud 41 on the adjacent bracket 13 of the truck, and 42 is a detent for said lever, mounted on said beam.

In order that the reel 10 on occasion may be rotated without inserting spacer rods therein, as in reeling more than one convolution of stock without intervening spacer rods, means is provided whereby the descent of said rods in the chute may be obstructed, said means comprising a vertical, forked gate 43 having a pair of fork-arms 44, 44 projecting upward through guide apertures 44^a, 44^a, formed in a horizontal member 44^b of the frame, the gate 43 being adapted to be raised to project the arms 44 through the file of spacer rods and lowered to withdraw said arms and permit the descent of the rods. For so raising and lowering said gate its downwardly extending stem portion is pivoted on one arm of a foot lever 45, the latter being fulcrumed on a floor bracket 46. The other arm of said lever extends, under the truck, to the front end of the latter, and a detent or hook 46^a, mounted on the floor, is provided for holding said lever in its gate closing position against the weight of the forked structure 43 and the adjacent lever arm.

Rotation of the reel without the picking up of rods may also readily be effected by pulling the same slightly away from the spacer-rod chute, against the force of the springs 39, as by depressing the front end of the truck until the legs 18 rest on the floor.

Means for supporting a supply of liner 49 may be provided, the means here shown comprising a plate 48 secured upon and bridging the space between the rod guides 26 and adapted to support the liner in folded form. A wall member 47 is secured on the frame 24 to prevent the liner from sliding from the inclined plate 48. Loosely journalled on the frame 24 near its top is a liner-guiding and supporting roll 50, and a stock-guiding and supporting roll 51 is loosely journalled on the top of said frame and adapted to receive the sheet of stock, 52, from the delivery conveyor 53 of a calender and support said sheet as the latter is drawn, with the liner, onto the reel.

In the operation of the apparatus, the truck with the reel thereon is run between the beams 38, as shown, the springs 39 are hooked onto the studs 41, and the levers 40 are hooked under the detents 42, to hold the truck in place. The stock 52 and the liner 49 are then led over their respective guide rollers by hand and their leading ends, shown at 54, are secured to a spacer-rod in the reel, the spokes in which said rod is mounted preferably projecting upward and away from the source of stock supply, so that the subsequent pull of the stock and liner will hold it toward the axis of the reel and so that it will not run by gravity to the outer ends of the spokes before the stock and liner are attached to it. Such rod and the following one may be mounted in the reel by simply turning the reel by hand before starting the work thereon, the

lever 45 of course being released so that the file of rods is not obstructed by the gate-arms 44 during this operation.

The reel is then turned by hand at such speed as to wind thereon the stock, with its liner, as fast as said stock is delivered from the calender, each successive pair of reel spokes picking a spacer rod from the hooks 28 as they pass the latter, the angle plates 22 on the spoke ends passing between the lowermost rod and the next in order. Said rods run down the channels 21 by gravity as the spokes rise to vertical position, and the stock and the liner are drawn from their sources of supply by the rotation of the reel and wound upon the latter in successive convolutions separated by the spacer rods as shown. Meanwhile the agitator, being driven by the pitman 36, agitates the spacer rods in the hopper and thus causes the rods to enter the chute in a continuous, orderly file. Each liner is usually of just sufficient length to fill a reel, and when the reel is filled the stock is severed, the truck released and removed, and the operation as described is repeated.

Our invention is susceptible of modification within its scope, and we do not wholly limit our claims to the specific construction shown.

We claim:

1. In apparatus for reeling strip material, the combination of a reel having substantially radial spacer rod guides on the inner faces of its end members, said guides turning forward at their outer ends, and means for holding successive spacer rods in position to be picked up by the forwardly-turned end portions of said guides as the latter rise in the rotation of the reel.

2. In apparatus for reeling strip material, the combination of a rotatable reel having substantially radial, spacer-rod guide-grooves on the inner faces of its end members, said grooves having forwardly facing mouths at their outer ends adapted to receive successive spacer rods, and means for holding successive spacer rods in position for their end portions to enter said mouths as the latter rise in the rotation of the reel.

3. In apparatus for reeling strip material, the combination of a reel adapted automatically to receive and carry forward spacer-rods as it is rotated, a mounting therefor, a spacer-rod chute adapted to conduct successive spacer rods and hold them in position to be engaged by said reel, a stop member adapted to position said reel with relation to said chute by engagement with its mounting, and yielding means for holding said mounting against said stop member.

In witness whereof we have hereunto set our hands this 15th day of August, 1923.

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