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H. F. ALBRIGHT, JR

FEEDING MECHANISM

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Inventor
Henry F. Altoright, Jr.
by H. A. Patterson. Atty.

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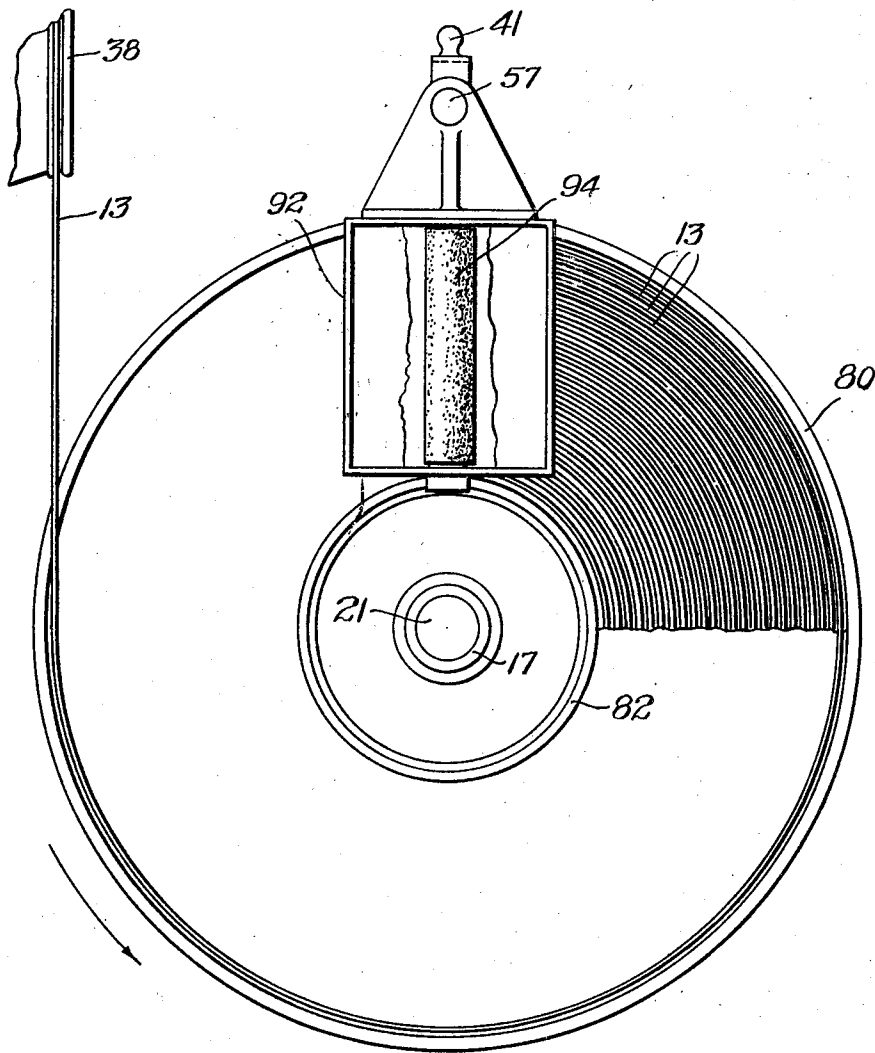
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Fig. 3.



Inventor
Henry F. Albright Jr.
by Ad. Patterson
Atty.

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UNITED STATES PATENT OFFICE.

HENRY FLEETWOOD ALBRIGHT, JR., OF OAK PARK, ILLINOIS, ASSIGNOR TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

FEEDING MECHANISM.

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This invention relates to feeding mechanism, and more particularly to a mechanism for feeding a strand into a receiver.

In the manufacture of rubber covered wire, where a core of wire is coated with a rubber compound which is later to be vulcanized, it is necessary, in the stage before vulcanization, to preserve the comparatively plastic coating from distortion which would deleteriously affect its insulative properties. This may be accomplished by coiling the coated strand in superimposed layers, each convolution of which fits smoothly against the adjacent ones, and surrounding and supporting it with powdered soapstone to prevent deformation of the coating and adhesion of adjacent turns.

An object of the present invention is to improve and simplify a device for storing a strand.

Another object is to coil a strand in a receiver by regulating the rotary and lateral movements of a receiver.

An apparatus made in accordance with the invention may comprise a rotatable storage pan mounted upon a movable carriage which is operated reciprocally at a predetermined speed to allow strand, which is fed into the pan at a constant speed, to be coiled therein in regular superimposed layers.

These and other features of the invention not specifically mentioned will appear from the following description and the accompanying drawings, in which:

Fig. 1 is a view in side elevation of a machine embodying the invention;

Fig. 2 is a view in end elevation of the mechanism;

Fig. 3 is a partial plan view of the mechanism showing the pan and hopper;

Fig. 4 shows an enlarged partial section on the line 4-4 of Fig. 1, and

Fig. 5 is a fragmentary plan view of the driving mechanism and associated parts.

Referring to the drawings in detail, a base plate 10, which may be of cast metal, has parallel ridges 11 on its upper surface running longitudinally thereof to form a track for a carriage, shown generally at 12, which moves reciprocally thereon during the operation of the machine. At either end of this base plate are affixed uprights 14 and 16 respectively, while a third upright 18 carries a capstan 38 which receives the wire 1 from a covering

machine (not shown) and feeds it into the coiling machine. A drive shaft 20 is carried by bearings in uprights 16 and 18 and may be operated by a driven pulley 22 keyed to this shaft and rotated by a belt 24 which may be connected to any suitable source of power (not shown) to furnish a variable speed drive therefor. On one end of the drive shaft is affixed a bevel gear 26 which, acting in conjunction with another bevel gear 27, serves to drive a vertical shaft 28, and this in turn, through another pair of bevel gears 30 and 32 and a pinion 34 and a rack gear 36, serves to rotate the capstan 38.

Also carried by the drive shaft 20 is a member 40 in the form of a truncated cone, which cooperates with a second conical member 42 by means of a belt 44 to drive this second member, and the speed of the second member as to that of the first may be varied by moving the handle 46, connected to a sliding yoke 48, to change the position of the belt 44. The second conical member has integral therewith a bevel gear 50 which, cooperating with a bevel gear 52, drives a shaft 54 supported between uprights 14 and 16. Keyed to this shaft is a wheel 56, upon the hub of which is affixed a sprocket wheel 58. The periphery of the wheel 56 carries a tire 23, which may be of rubber, as does also a second wheel 60 integral with a bushing 62 which rides loosely upon the shaft 54 so as to be able to rotate independently thereof. This bushing is machined on one side of the wheel 60 to form a reversible screw thread 64, and annular plates 66, bearing against the ends of the threaded part of the bushing 62, form a bearing therefor, causing the carriage to be moved with the bushing. The remainder of the bushing has a keyway cut longitudinally thereof in which a key 25 is secured by a set screw 15, and the position of wheel 60 on the bushing may be changed by means of the set screw to regulate its mean rate of rotation, as will be more fully brought out later. A post 84 affixed to the bed of the machine carries in its upper end a dog 86 which fits into the reversible thread of the bushing and is reversed as it reaches either end of the thread in a well-known manner. From the sprocket 58 a drive chain 19 encircles a second sprocket on shaft 68, which is carried by bearings in uprights 14 and 16 and has integral with it two drive

clutch members 70, the purpose of which will be made clear later.

To consider the carriage 12 in detail, a framework having two end members 72, each of which is supported on two wheels 74, carries a rotatable disk 76 which is mounted on a ball bearing pivot 78 and rests on the two wheels 56 and 60. A pan 80, which has a circular wall 82 about its center to aid in properly seating strand during the operation of the machine, rests on this table and is held in position by a central tubular portion 17 of the pan 80 which fits over a post 21 integral with the platform 76.

Extending from the rear of the carriage is an arm 90 which carries a hopper 92 in which powdered soapstone may be placed and in which a brush 94 is rotatably mounted over a slot 96 in the bottom of the hopper. A friction drive wheel 98 is rotatably mounted on the lower end of an arm 97, pivoted at 93, the upper end of this arm being held between a screw 89 and a spring 85. A pulley 81, integral with wheel 98, carries a belt 77 which, operating around idlers 73 and pulley 69, transmits the motion of wheel 98 to the shaft of the brush 94. The idlers 73 are mounted on either side of a pivoted weight 65 which acts to keep the belt 77 taut at all times.

It will be noted that the pulley 69 is fixed upon an arm from post 90, while the hopper is pivotally mounted upon a sleeve 61 which fits over a post 57 integral with arm 90. A pin 51 set in post 57 and riding in a slot 47 in the sleeve 61, serves to limit the rotation of the sleeve, while a locking pin 41, being forced inward by spring 37, fits into a depression in post 57 when the hopper is in position for operation to lock the sleeve in place. In order to permit the hopper to swing on its pivot, the shaft of the pulley 69 is splined at one end and a projection from the brush shaft fits into it as shown at 33, thus permitting the separation of these parts when the hopper is swung away from the pan and their union when it is swung back.

The operation of the machine is as follows:

A strand of coated wire is brought from a coating machine (not shown), is given a few turns around the capstan 38, and its end is laid in the pan 80, the bottom of which is first covered with powdered soapstone to form a seating for the first layer of wire. The carriage 12 should be at either the outer or the inner limit of its movement when starting an operation so as to make the first layer of strand continuous across the bottom of the pan.

The machine is then ready to be operated by starting the mechanism which operates the drive wheel 22. This causes the capstan 38 to revolve and feed wire into the pan and also, acting through the variable speed

drive cones 40 and 42 and bevel gears 50 and 52, causes the pan 80 to be rotated by causing the rotation of the wheel 56. Table 76, resting on the other wheel 60, causes this wheel to rotate also, and with it the bushing 62 which is integral with it. The screw thread in this bushing acting in conjunction with the dog 86 in the manner previously described, causes the carriage to be rolled back and forth on the base 10.

Wheel 56 remains in the same position on the shaft 54 at all times, but wheel 60, being integral with the bushing, moves laterally with the carriage, and it will be noted that when the carriage is at the right-hand limit of its travel, the wheel 56 is acting near the periphery of the table, while at the other limit of its travel the reverse is true. The peripheral speed of wheel 56 is regulated by means of the variable speed cones 40 and 42 so as to be the same as the speed of the coated wire as it leaves the capstan, and a change of the speed of the drive wheel 56 necessarily causes a corresponding change in the rate of rotation of the screw 64 which is integral with driven wheel 60.

The wheel 60 being driven by the table will be rotated slowly when wheel 56 is near the periphery of the table and the table is being rotated slowly; and rapidly when it is near the center, since the table is then being swiftly rotated by wheel 56. The mean rate of rotation of wheel 60 may be increased by loosening set screw 15 and moving the wheel along the bushing toward the periphery of the table and decreased by moving it toward the center. This adjustment is for increasing or decreasing the lead for different sizes of strand. The result is clear that when a strand of wire is feeding into the pan near its periphery, the pan is operating at a proper speed to receive it and is slowly moved laterally by the action of the dog 86 in the screw thread 64, since the turns are large here and each one requires a comparatively large amount of strand; while when the strand is feeding into the pan near its center, the pan is still rotating at the proper speed to receive it, but has a faster lateral movement which is necessary since here the turns are small and require a comparatively small amount of strand per turn.

When the carriage reaches either its outer or its inner limit, the wheel 98 rides up on one of the rotating driving members 70, being held in contact therewith by the spring 85, and, acting through the pulley 81 and the belt 77, causes the brush 94 to rotate and deposit a quantity of powdered soapstone into the rotating pan, forming a layer of soapstone over each layer of wire as it is completed. As soon as the advance of the carriage moves the wheel 98 off the driving member 70, the brush ceases to rotate until

the advance of the carriage brings the wheel 70 into contact with the other driving member, when it is again rotated. The positions of the driving members 70 are adjustable on their shaft, by means of set screws 29, to permit regulation of the time at which they shall engage and release wheel 98.

This intermittent deposit of soapstone gives a very desirable seating for the wire and allows operation of the device at a high rate of speed.

Other features of the mechanism disclosed herein are disclosed and claimed in the co-pending applications of C. D. Hart and L. F. Lamplough, Serial Nos. 654,960 and 654,962, filed July 31, 1923, respectively.

What is claimed is:

1. In a machine for storing strand, a platform, a receiver mounted thereon, and means for imparting a combined rotating and lateral motion to said platform to store a strand in the receiver.

2. In a machine for storing strand, means for feeding a strand, a rotatable platform, a receiver mounted thereon, and means for imparting a reciprocatory motion to the platform to store the strand in the receiver in a regular formation.

3. In a machine for storing strand, means for feeding a strand at a predetermined speed, a receiver, means for rotating the receiver around its axis, and means for reciprocating the receiver at a speed to store the strand in the receiver in regular formation.

4. In a machine for storing strand, a receiver, and means for rotating the receiver about an axis and simultaneously therewith moving the receiver in a radial direction to store the strand therein.

5. In a machine for storing strand, means for feeding a strand at a predetermined speed, a rotatable platform, a receiver mounted thereon, means for rotating said platform at a speed to receive the strand, and means for moving the platform reciprocally at a speed to store the strand in the receiver in regular formation.

6. In a machine for storing strand, means for feeding a strand, a rotatable receiver,

means for imparting a movement thereto along a line at an angle to the axis thereof, and means for changing the speeds of both movements of the receiver to store the strand in the receiver.

7. In a machine for storing strand, means for feeding a strand at a constant speed, a rotatable receiver, means for rotating the receiver about its axis and simultaneously therewith moving the receiver in a radial direction, and means for changing the speeds of both movements of the receiver to store the strand therein.

8. In a machine for storing strand, means for feeding a strand at a constant speed, a rotatable receiver, means for imparting a movement thereto along a line at an angle to the axis thereof, and means for changing the speeds of both movements of the receiver to store the strand in the receiver.

9. In a machine for storing strand, a capstan for feeding a strand, a friction driving wheel, means for operating said wheel at a predetermined speed, a rotatable platform engaging the periphery of said wheel, a wheel frictionally driven by said platform, a screw thread integral with the driven wheel, and a carriage supporting said platform and operated reciprocally by the screw thread.

10. In a machine for storing strand, means for feeding a strand at a predetermined speed, a friction driving wheel, means for operating said wheel at a predetermined speed, a rollable carriage, a rotatable platform mounted upon said carriage and engaging the periphery of said driving wheel, a receiver mounted on said platform, a driven wheel also engaged at its periphery by said platform, a reversible screw thread actuated by said wheel, and means engaging the carriage to cause it to be operated reciprocally by the screw thread to change its rate of rotation and its rate of lateral movement.

In witness whereof, I hereunto subscribe my name this 13th day of July A. D., 1923.

HENRY FLEETWOOD ALBRIGHT, Jr.