April 21, 1925. 1,534,813

A. D. SCOTT

WINDING MACHINE

Filed Oct. 3, 1923 3 Sheets-Sheet 1

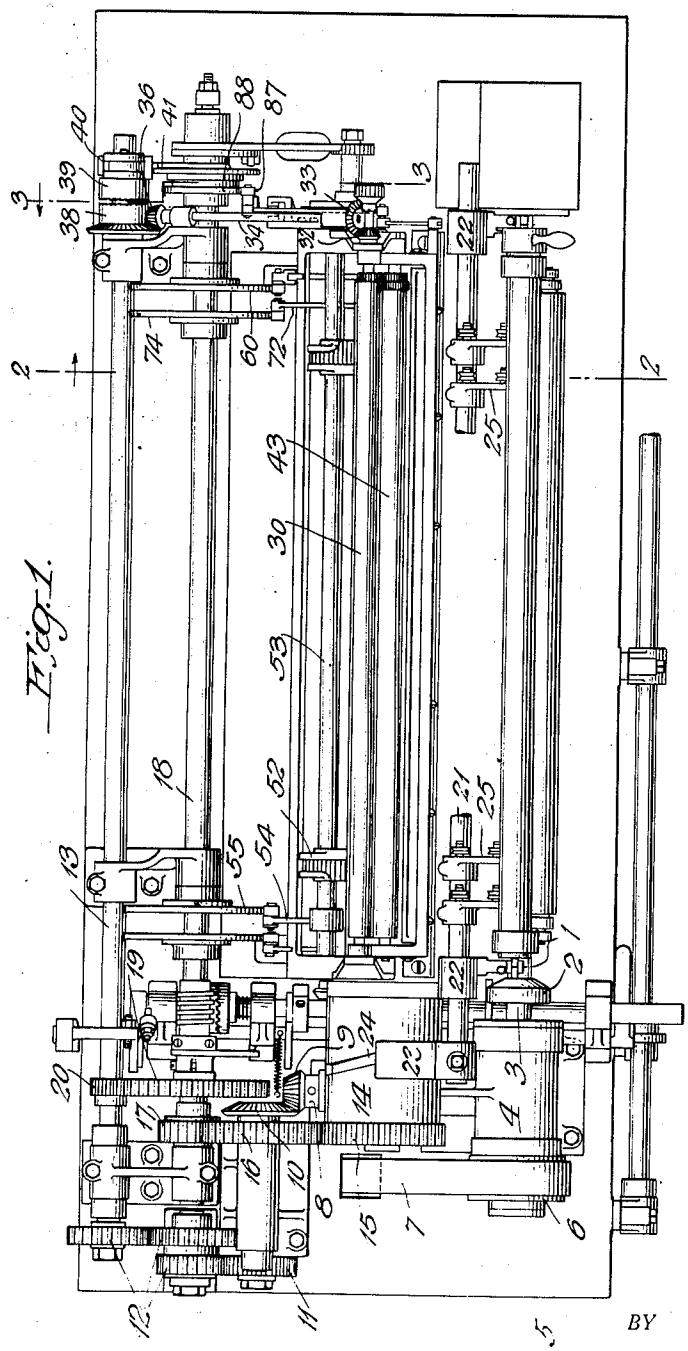

Fig. 1.

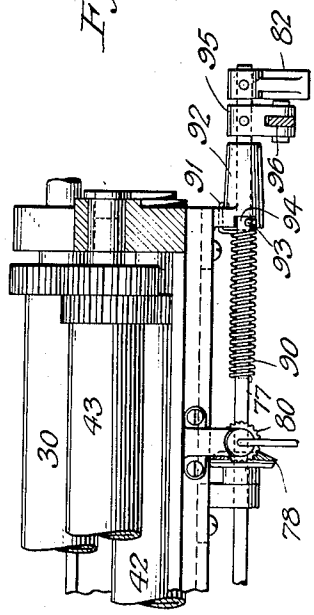

Fig. 6.

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WINDING MACHINE

Filed Oct. 3, 1923

3 Sheets-Sheet 2

Fig. 2.

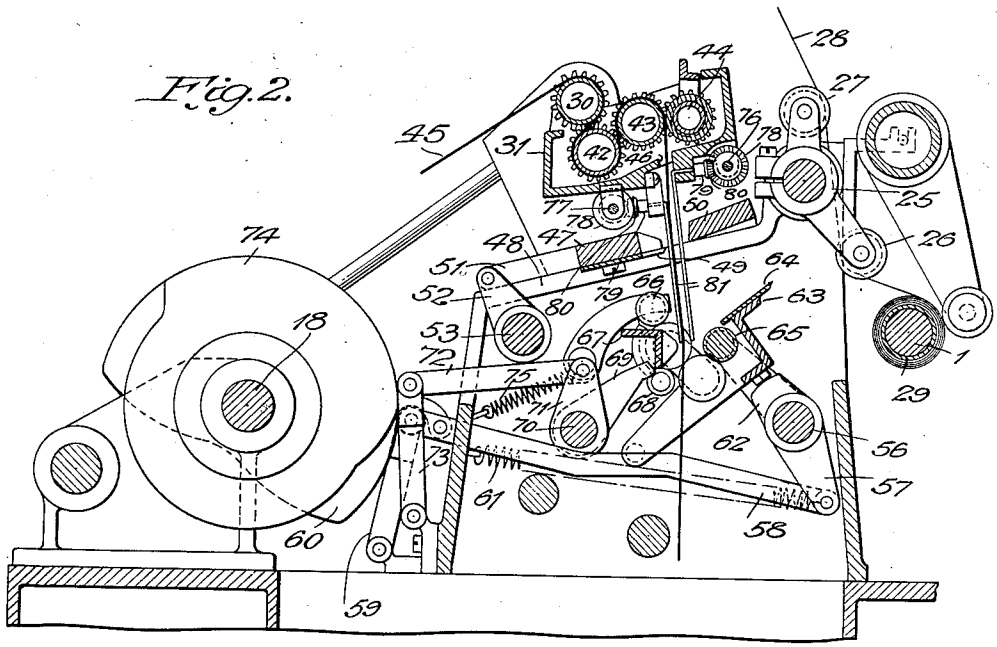
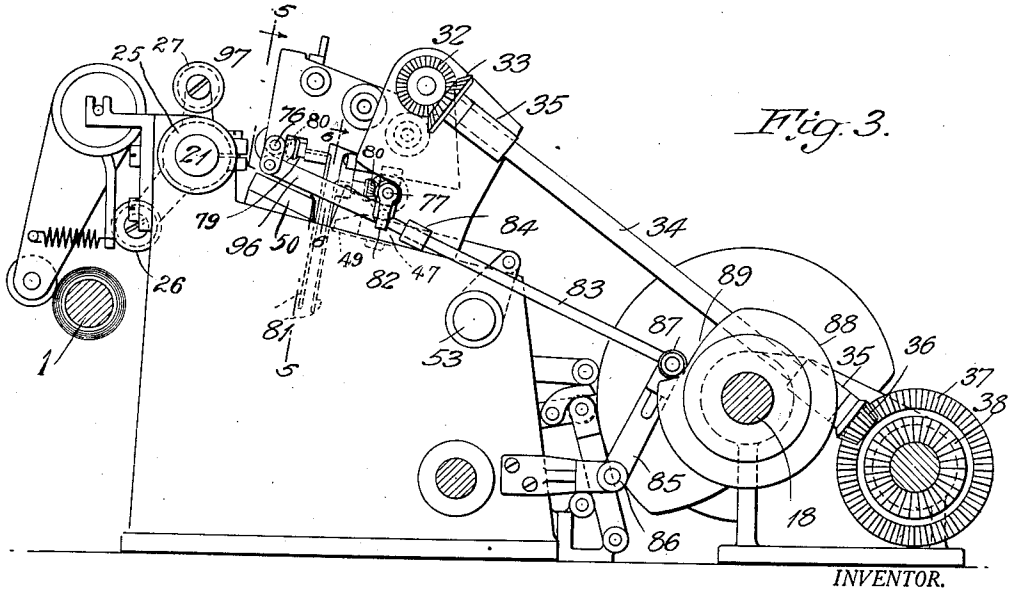


Fig. 3.



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3 Sheets-Sheet 3

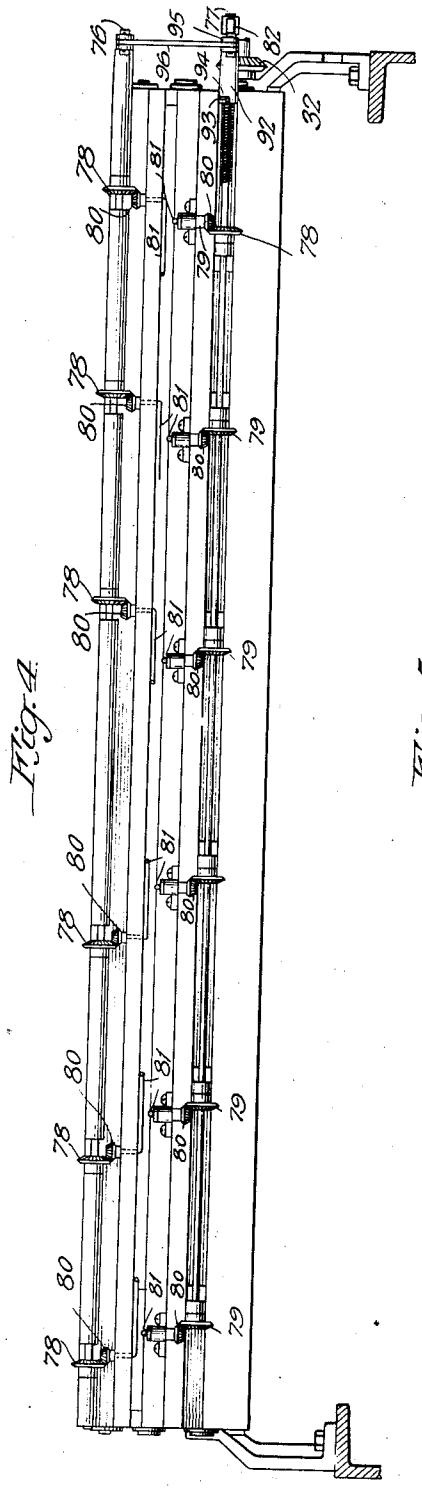

Fig. 4.

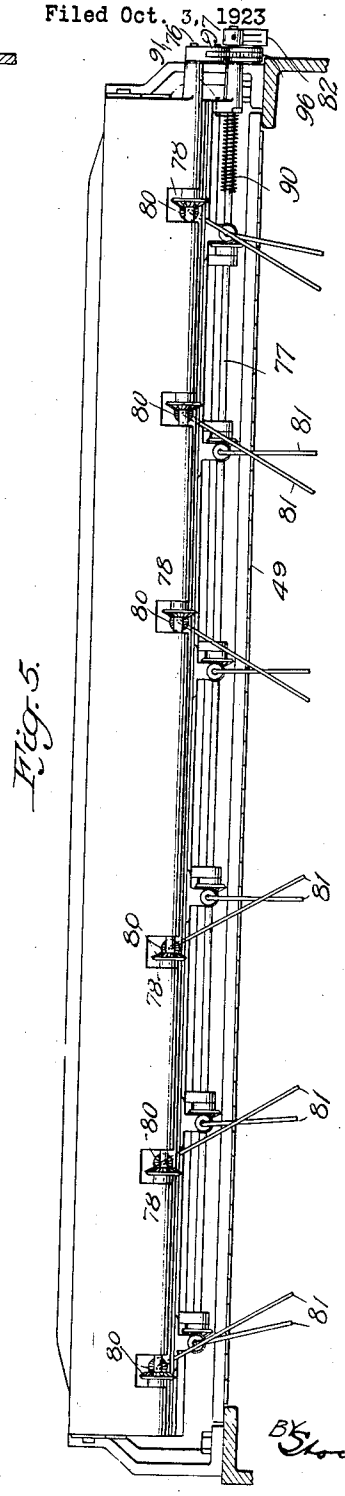

Fig. 5.

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UNITED STATES PATENT OFFICE.

ARCHIBALD D. SCOTT, DECEASED, LATE OF JERSEY CITY, NEW JERSEY; BY MARY V. SCOTT, EXECUTRIX, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO VARLEY DUPLEX MAGNET COMPANY, A CORPORATION OF NEW JERSEY.

WINDING MACHINE.

Application filed October 3, 1923. Serial No. 666,270.

To all whom it may concern:

Be it known that ARCHIBALD D. SCOTT, deceased, late a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, invented certain new and useful Improvements in Winding Machines, of which the following is a full, clear, and exact description.

This invention relates to machines for winding strands of material such as wire, thread, ribbon or filaments and the like into coils, helices or bobbins, and particularly to machines for winding copper wire into electric coils or helices for use in various kinds of apparatus. Such a machine is illustrated by way of example in U. S. Patent #1,368,536 granted February 15, 1921 to James C. Anderson. The machine disclosed in that patent is adapted to wind simultaneously a plurality of coils in separated zones upon a spindle or mandrel, the convolutions of wire of each coil being wound in layers, superposed one upon the other, with sheet material interposed between successive layers. The machine includes mechanism for measuring lengths of the sheet material, severing it, and inserting the severed lengths between the layers at the proper periods during their formation. The sheet material commonly employed is highly glazed paper which has a tendency to curl, and therefore when the advance edge leaves the measuring mechanism, it does not always follow the desired path into the mechanism for transferring it to the spindle.

The present invention is in the nature of an improvement upon the type of machine disclosed in said prior patent hereinbefore referred to, and has for an object to provide an improved mechanism for positively guiding the sheet material from the measuring mechanism to the transferring mechanism without interfering with the operation of the severing mechanism; and which will be relatively simple, durable, and inexpensive. Other objects and advantages will be apparent from the following description of an embodiment of the invention, and the novel features will be particularly pointed out hereinafter in claims. In the accompanying drawing:

Fig. 1 is a plan of a machine constructed in accordance with the invention;

Fig. 2 is a transverse sectional elevation of the same, taken substantially along the line 2—2 of Figure 1;

Fig. 3 is another sectional elevation of the same taken substantially along the line of 3—3 of Figure 1;

Fig. 4 is an elevation of the paper guiding portion of the machine swung upwardly to show the bottom thereof;

Fig. 5 is a sectional elevation of a portion of the machine the section being taken substantially along the line 5—5 of Figure 3; and

Fig. 6 is a sectional elevation on a larger scale of a portion of the machine illustrated in Figure 5, the section being taken substantially along the line 6—6 of Figure 3,

In the illustrated embodiment of the invention, the machine is of the type illustrated in the prior patent hereinbefore referred to. In this machine a winding spindle 1 (Fig. 1) is suitably mounted for rotation between a stationary bearing (not shown) and a chuck 2 carried by a power shaft 3. The power shaft 3 is rotatably mounted in a bearing 4 supported upon the machine frame 5, and carries a pulley 6 which is driven through a belt 7 from any suitable source of power (not shown). A shaft 8 has a worm and worm wheel driving connection (not shown) to the power shaft 3, and carries a bevel gear 9 which meshes with a bevel gear 10 provided upon a shaft which also carries a gear 11. The gear 11 acts through a gear train consisting of gears 12 to drive a main driving shaft 13 which extends from side to side of the machine across the rear thereof.

A cylindrical cam 14 carries a gear 15 which is driven by gears 16 and 17. The gear 17 is mounted upon a cam shaft 18 which is driven by gears 19 and 20 from the main drive shaft 13. A traverse rod 21 is disposed parallel with the winding spindle 1 and is suitably mounted for reciprocation in bearings 22 of the frame 5. The traverse rod carries a shoe 23 having a follower pin (not shown) which runs in the cam groove 24 provided in the peripheral surface of the cylindrical cam drum 14. Thus during the rotation of the winding spindle, the cam drum 14 will be rotated through the train of gearing described, and through the cam groove 24 and the shoe 23 will reciprocate the traverse rod 21. The

traverse rod carries a plurality of wire guiding devices 25 which are adjustable along the same into different spaced relations, and each guiding device is provided with a plurality of pulleys 26 which serve to guide the wire or thread 28 to a suitable form 29 which is removably mounted upon the winding spindle 1. Owing to the reciprocation of the guides 25 with the traverse rod during the winding of the wire or thread upon the spindle, the wire or thread will be guided to the spindle in such a manner as to be laid spirally thereon in successive superposed layers.

The roller 30 is rotatably mounted in the machine frame so as to extend substantially parallel with the winding spindle 1, and a frame 31 is rotatably mounted upon the pivots of the roller 30 so as to swing upwardly about the axis of the roller 30 for a purpose to be hereinafter explained. The roller 30 has an axial extension carrying a bevel gear 32 (Figs. 1 and 3) which meshes with and is driven from a bevel gear 33 provided upon a shaft 34. The shaft 34 is rotatably mounted in bearings 35 so as to extend rearwardly into proximity to the main drive shaft 13, and carries a bevel gear 36 which meshes with a bevel gear 37 forming part of a clutch element 38 which is rotatably mounted upon the shaft 13. A cooperating clutch element 39 is keyed to the shaft 13, and is operable endwise into and out of clutching engagement with the element 38 by suitable operating mechanism 40 which is controlled by a cam 41 mounted upon the cam shaft 18. A plurality of rollers 42, 43, and 44 are rotatably mounted, in parallel relation to one another and to the roll 30, in the frame 31, and are respectively geared to one another and to the roller 30 so that all of them will be driven from the roller 30. These rollers 30, 42, 43 and 44 together may be considered as the measuring and feeding rollers for a strip of sheet material 45, the sheet material being conducted successively around the rollers 30, 42 and 43 and downwardly between the rollers 43 and 44. The sheet material 45 commonly employed is paper and in leaving the rollers 43 and 44 it passes downwardly through an aperture 46 in the frame 31. As the sheet material such as paper passes downwardly from the aperture 46, its free edge drops vertically in front of severing mechanism and proceeds downwardly through the machine for a distance depending upon the length fed out by the rollers.

The proper length of paper having been fed out, it must next be severed and one edge presented to the winding spindle to be wound thereon at the proper time. For accomplishing this, the machine includes a transfer mechanism, disposed below the severing mechanism, which grips the paper before it is cut or severed, applies a tension thereto to facilitate the cutting or severance, and thereafter transfers the severed edge to a position where it can be injected beneath the wire strands leading to the spindle and thereafter wound around the finished layers of wire.

Immediately beneath the frame 31 in which the measuring and feeding rollers are mounted, a substantially horizontal bar 47 (Fig. 2) is mounted for edgewise movement upon flanges 48 of the frame of the machine. The bar 47 carries upon its under face a suitable knife or other severing device 49 which is adapted to move slightly beneath and have a shearing action in conjunction with the abutting edge of an auxiliary bar 50, towards and from which the bar 47 may move. The paper strip 45 passes from the aperture 46 downwardly between the bars 47 and 50 so that when the bar 47 is moved toward the bar 50 the knife or severing device 49 will force the paper against the forward edge of the bar 50 and effect a shearing severance of the paper. The bar 47 is connected by extensions 51 to crank arms 52 carried by a crank shaft 53. The shaft 53 is oscillated from time to time by means of a link 54 (Fig. 1) which is connected to an arm of the shaft and coacts with a cam 55 provided upon the cam shaft 18 in the manner explained in connection with the prior patent heretofore referred to.

Below the severing means just described, transfer mechanism is provided for receiving the measured and severed lengths of sheet material and transferring them at the proper time to the coils being wound upon the spindle. This mechanism may be of any suitable construction, such as that described in the prior patent hereinbefore mentioned. A shaft 56 (Fig. 2) which is rotatably mounted in the machine frame parallel with the winding spindle 1, carries an arm 57 connected to a link 58. The link 58 is connected to an oscillating arm 59 carrying a follower cooperating with a cam 60 of the shaft 18. A suitable spring 61 serves to hold the follower against the cam periphery and, when the cam presents a depression to the follower, serves to rotate the shaft 56 in one direction, the cam serving to positively rotate the shaft in the other direction when the follower is forced out of the depression. The shaft 56 is provided with two arms 62, one at each end thereof, between and at the upper ends of which is pivotally hung a transfer frame 63 carrying an apron 64.

Immediately in the rear of the apron are two gripping rollers 65 and 66, the former extending across the machine and having a bearing at each end in the frame 63 and the latter immediately above and in contact with the former, but mounted in a supple-

mental frame 67 which extends across the machine and is pivoted at its extremities in the frame 63. When the auxiliary or supplemental frame 67 swings upon its pivot, the upper gripping roller 66 will either separate from or approach the lower roller. The movements of the auxiliary frame 67 are controlled through a roller 68 thereon which coacts with an arm 69 carried by a shaft 70. The shaft 70 carries an arm 71 which is connected by a link 72 to an arm 73 which carries a follower cooperating with a cam 74 of the cam shaft 18. A spring 75 serves to hold the follower of the arm 73 against the periphery of the cam.

The shaft of the roller 65 carried by the transfer frame is provided with a driving connection to a gear train (not shown) which is carried by the transfer frame 63, the gear train having a member which may be brought into frictional driving engagement with the chuck 2 by a slight additional forward movement of the transfer frame after it has been brought forwardly to the desired extent into a position to present the paper between the layers. This gear train is not illustrated in order to simplify the disclosure, but reference may be had to the prior patent hereinbefore referred to for its construction.

The sheet material, which is commonly a highly glazed paper, has a tendency to curl, and therefore when it is being measured and fed by the rollers 43 and 44 the advance edge does not always enter between the gripping rollers of the transfer mechanism. In order to positively guide the paper into the transfer mechanism between the two gripping rollers 65 and 66, mechanism to be presently described has been devised. To this end a pair of shafts 76 and 77 (Figs. 2, 3 and 6) are rotatably supported on the under face of the roller frame 31 in positions parallel to one another and to the rollers 43 and 44. These shafts 76 and 77 are disposed upon opposite faces of the descending strip of sheet material 45, and each shaft carries a plurality of bevel gears 78 arranged therealong at spaced intervals. A plurality of auxiliary or stub shafts 79 are rotatably supported by the roller frame 31 so as to extend transversely of the shafts 76 and 77 upon opposite faces of the sheet material. Each auxiliary shaft 79 carries a bevel pinion 80 which meshes with one of the bevel gears 78 so as to be driven therefrom. Each auxiliary shaft 79 also carries an arm or finger 81, which when rotated with the auxiliary shaft, will pass downwardly through the space between the bars 47 and 50 of the spacing mechanism into the space between the open gripping rollers 65 and 66.

One of the shafts 76 and 77, preferably the shaft 77, is provided with a depending arm 82 which lies within the path of one end of a rod 83. The rod 83 is supported for reciprocation and slight lateral rocking movement in a bearing block 84 on the machine frame, and is connected to a lever 85 which is pivotally mounted at 86 on the machine frame. The lever 85 is provided with a follower 87 which is adapted to ride against the periphery of a cam 88 carried by the cam shaft 18. The cam 88 is provided with a dwell 89 into which the roll 87 may enter during the rotation of the cam shaft. When the roller 87 is forced out of the dwell by the rotation of the cam, the link or rod 83 will engage and rotate the arm 82 of the shaft 77. This rotation of the shaft 77 is yieldingly resisted by a helical torsion spring 90 (Figs. 4, 5 and 6) which is secured at one end to the shaft, and at its other end 91 to a suitable bearing block 92 which supports the shaft for rotation. A pin 93 carried by the shaft 77 moves in a slot 94 in the bearing block 92 for limiting the rotation of the shaft beyond practical limits.

The shaft 77 is also provided with an arm 95 which is articulately connected to one end of a link 96, the other end of the link being articulately connected to an arm 97 carried by the shaft 76, so that the two shafts 76 and 77 will rotate concomitantly. When the shafts 76 and 77 rotate in one direction they will cause movement of the fingers 81 downwardly through the severing mechanism into the space between the open gripping rollers of the transfer mechanism, so as to guide the measured length of paper positively into the space between the gripping rollers. During rotation of the shafts in the opposite direction the fingers will move upwardly through the severing mechanism so as to be out of the path of movement of the knife 49 when a severance of the measured length of paper is to be affected. The bevel gears 78 upon the shaft 76 preferably face oppositely to those of the shaft 77, so that the fingers 81 will always rotate in opposite directions and have a more perfect control of the paper between them.

In the operation of the machine it will be assumed that the strip of sheet material such as paper is wound around the measuring and feeding rollers 30, 42, 43 and 44, it being understood that the roller frame 31 may be swung upwardly about the axis of the roller 30 in order to facilitate the placing of the paper between and around the rollers. The strands of wire, thread, filament, or other materials to be wound, are passed over the respective guide rollers 26 and 27 and suitably attached in spaced relation to one another to the form 29 upon the winding spindle 1. The machine is then placed in operation and the cylindrical cam

14 will reciprocate the guides for the wires 28 while the spindle 1 is rotating, so that each wire will be placed upon the spindle form in successive superposed layers. During the windings of the wires 28 upon the spindle, the cam shaft 18 will be rotated and through the cam 41 carried thereby will, at the proper time while a layer is being wound, operate the measuring and feeding rollers to advance a measured length of the paper downwardly through the severing mechanism and into the transfer mechanism between the gripping rollers.

At the beginning of the operation of the measuring rollers, the follower 87 will enter the dwell 89 of the cam 88, and the spring 90 will rotate the shafts 76 and 77 to carry the guide fingers 81 downwardly through the severing mechanism and into close proximity of the transfer mechanism so that the advance edge of the measured length of paper will be compelled to pass between the gripping rollers of the transfer mechanism. During the continued rotation of the cam shaft and after the advance edge of the paper has passed between the gripping rollers of the transfer mechanism, the cam 88 will positively operate the link 83 to effect a corresponding positive operation of the shafts 76 and 77 and rotate the fingers 81 upwardly through the severing mechanism out of the path of movement of the knife 49.

When the desired length of paper has been measured off by the measuring rollers, the controlling cam 41 therefor effects a disconnection of element 39 from element 38 and thus stops the operation of the measuring rollers. The controlling mechanism for the transfer mechanism also effects an operation of the gripping rollers to positively grip the paper that passes between them and hold it under tension. Immediately following the engagement of the paper by the gripping roller the cam controlled operating mechanism for the severing mechanism causes an operation of the knife 49 toward the bar 50 and effects a severance of the measured length of paper. Immediately following the severance of the paper, the cam controlled mechanism for the severing mechanism effects a withdrawal of the knife 49 and the transfer mechanism is operated to present the severed edge of the measured length of paper to the winding spindle. These operations are completed before the layer being formed upon the spindle is completed.

At approximately the instant of reversal of travel of the traverse rod 21, which causes the starting of a new layer of each coil the cam controlling mechanism of the transfer mechanism will impart to the transfer mechanism a slight forward movement which brings into play for an instant the gear train for rotating one of the gripping rollers and feeding forwardly the severed sheet sufficiently to cause it to engage between the previously formed layers upon the winding spindle and the wires which are leading thereto for the formation of the new layers. The sheet is then automatically wound around the winding spindle in a manner common in this art, and the transfer mechanism is returned to its normal position shown in Fig. 2, by the operation of its cam controlled mechanism. It will be observed that with a machine constructed in accordance with this invention the measured lengths of papers will be positively conducted or guided through the path of operation of the severing mechanism and into the transfer mechanism, the guiding means being automatically and positively withdrawn out of the path of operation of the severing means prior to the operation of the latter.

It will be obvious that various changes in the details and arrangements of parts, herein described and illustrated for the purpose of explaining the nature of the invention, may be made by those skilled in the art within the principle and scope of the invention as expressed in the appended claims.

Claims:

1. In a machine for winding strand and sheet material, a winding spindle, means for continuously winding thereon a windable body, means for measuring and feeding lengths of said sheet material, means for severing the measured lengths, transfer means for receiving the severed lengths of material and then inserting the same between the layers of the wound body on said spindle during their formation, and means normally out of the path of the severing means and operable at the beginning of each measuring operation for positively guiding the sheet material from the measuring means to the transfer means.

2. In a machine for winding strand and sheet material, a winding spindle, means for continuously winding thereon a windable body, means for measuring and feeding lengths of said sheet material, means for severing the measured lengths, transfer means for receiving the severed lengths of material and then inserting the same between the layers of the wound body on said spindle, and a plurality of fingers arranged on opposite faces of the sheet material leaving the measuring and feeding means, normally out of the path of the severing means and operable into close proximity to the transfer means for guiding the sheet material from the measuring means to the transfer means.

3. In a machine for winding strand and sheet material, a winding spindle, means for continuously winding thereon a windable body, means for measuring and feed-

ing lengths of said sheet material, means for severing the measured lengths, transfer means for receiving the severed lengths of material and then inserting the same between the layers of the wound body on said spindle and means for positively guiding the sheet material from the measuring means to the transfer means.

4. In a machine for winding strand and sheet material, a winding spindle, means for continuously winding thereon a windable body, means for measuring and feeding lengths of said sheet material, transfer means for receiving the measured material and then inserting it between the layers of the wound body on said spindle during their formation, severing means for said sheet material interposed between the measuring means and the transfer means for severing the measured lengths of the sheet material before their transfer to the spindle, and means normally out of the path of the severing means and operable at the beginning of each measuring and feeding operation into position between the measuring means and the transfer means for positively guiding the sheet material to said transfer means.

5. In a machine for winding strand and sheet material, a winding spindle, means for continuously winding thereon a windable body, means for measuring and feeding lengths of said sheet material, transfer means for receiving the measured material and then inserting it between the layers of the wound body on said spindle during their formation, severing means for said sheet material interposed between the measuring means and the transfer means for severing the measured lengths of the sheet material before their transfer to the spindle, and means normally out of the path of the severing means and operable at the beginning of each measuring and feeding operation into position between the measuring means and the transfer means for positively guiding the sheet material to said transfer means, said guiding means being automatically operated out of the path of operation of the severing means before operation of the latter.

6. In a machine for winding strand and sheet material, a winding spindle, means for continuously winding thereon a windable body, means for measuring and feeding lengths of said sheet material, means for severing the measured lengths, transfer means for receiving the severed lengths of material and then inserting the same between the layers of the wound body on said spindle, during their formation and means normally out of the path of the severing means and operable automatically at the beginning of each measuring operation for positively guiding the sheet material from the measuring means to the transfer means, said guiding means being operable automatically out of the path of the severing means prior to the operation of the latter.

7. In a machine for winding strand and sheet material, a winding spindle, means for continuously winding thereon a windable body, means for measuring and feeding lengths of said sheet material, transfer means for receiving the measured material and then inserting it between the layers of the wound body on said spindle, during their formation, severing means for said sheet material interposed between the measuring means and the transfer means for severing the measured lengths of the sheet material before their transfer to the spindle, and a plurality of fingers arranged on opposite faces of the sheet material leaving the measuring means, normally disposed entirely between the path of operation of the severing means and the measuring means, and rotatable to carry their free ends through said path of operation into close proximity to the transfer means for positively guiding the measured sheet material to the transfer means.

8. In a machine for winding strand and sheet material, a winding spindle, means for continuously winding thereon a windable body, means for measuring and feeding lengths of said sheet material, transfer means for receiving the measured material and then inserting it between the layers of the wound body on said spindle, during their formation, severing means for said sheet material interposed between the measuring means and the transfer means for severing the measured lengths of the sheet material before their transfer to the spindle, a plurality of fingers arranged on opposite faces of the sheet material leaving the measuring means, normally disposed entirely between the path of operation of the severing means and the measuring means, and rotatable to carry their free ends through said path of operation into close proximity to the transfer means for positively guiding the measured sheet material to the transfer means, and automatic means operable in timed relation to the operation of the measuring, severing, and transfer means, for rotating the fingers into position to guide the sheet material to the transfer means at the beginning of the measuring operation and then out of the path of the severing means prior to the operation of the latter.

9. In a machine for winding strand and sheet material, a winding spindle upon which the material is to be wound, means for continuously winding thereon in superposed layers a windable body, means for measuring lengths of said sheet material, means for severing the measured lengths,

transfer means for receiving the severed lengths and inserting them between the layers of the wound body on the spindle during their formation, cam controlled mechanism for timing and controlling the operations of the measuring means, the severing means, and the transfer means, and means for receiving the measured sheet material and guiding it to the transfer means, said last named means being also operable by the cam mechanism out of the path of the severing means during the operation of the latter.

10. In a machine for winding strand and sheet material, a winding spindle upon which the material is to be wound, means for continuously winding thereon in superposed layers a windable body, means for measuring lengths of said sheet material, means for severing the measured lengths, transfer means for receiving the severed lengths and inserting them between the layers of the wound body on the spindle during their formation, cam controlled mechanism for timing and controlling the operations of the measuring means, the severing means, and the transfer means, a plurality of guiding fingers rotatably mounted out of the path of movement of the severing means and rotatable to carry their free ends through the path of movement of the severing means for guiding the measured sheet material to the transfer means, and means also controlled from the cam controlled mechanism for operating the fingers into sheet guiding positions at the beginning of a measuring operation and for withdrawing the fingers from the path of the severing means prior to the operation of the latter.

11. In a machine for winding strand and sheet material, a winding spindle upon which the material is to be wound, means for continuously winding thereon in superposed layers a windable body, means for measuring lengths of said sheet material, means for severing the measured lengths, transfer means for receiving the severed lengths and inserting them between the layers of the wound body on the spindle during their formation, means including a plurality of cams for timing and controlling the operations of the measuring means, the severing means, and the transfer means, a pair of shafts arranged on one side of the path of movement of the severing means, a plurality of guide members rotatably mounted and connected for operation by said shafts through and out of the path of movement of the severing means, said guide members being arranged on opposite faces of the sheet material leaving the measuring means, so that when moved through the path of movement of the severing means, they will guide the sheet material to said transfer means, and means including a cam operated in timed relation to the other timing and controlling cams for operating the guide members into guiding position at the beginning of a sheet material measuring operation, and out of the path of movement of the severing means prior to the operation of the latter.

12. In a machine for winding strand and sheet material, a winding spindle upon which the material is to be wound, means for continuously winding thereon in superposed layers a windable body, means including a plurality of rollers for measuring lengths of the sheet material, transfer means in spaced relation to the measuring means for receiving the measured lengths of sheet material and inserting them at the proper instant between the layers of the wound body on the spindle during their formation, severing means for the sheet material movable transversely across the sheet material between the measuring rollers and the transfer means when a severance of the measured sheet material is to be effected, a pair of shafts arranged on opposite faces of the sheet material leaving the measuring rollers and extending substantially parallel to the rollers, a plurality of bevel gears on each of said shafts in spaced relation therealong, a plurality of spaced stub shafts arranged along and transversely to each shaft, each stub shaft having a bevel pinion meshing with a bevel gear on one of the shafts, and a guide finger carried by each stub shaft for rotation therewith in planes parallel with the adjacent stretch of the sheet material and through and out of the path of movement of the severing means, and means for operating the shafts to effect a movement of the guide fingers into positions for positively guiding the measured lengths from the measuring rollers to the transfer means and out of the path of movement of the severing means prior to the operation of the latter.

13. In a machine for winding strand and sheet material, a winding spindle upon which the material is to be wound, means for continuously winding thereon in superposed layers a windable body, means including a plurality of rollers for measuring lengths of the sheet material, transfer means in spaced relation to the measuring means for receiving the measured lengths of sheet material and inserting them at the proper instant between the layers of the wound body on the spindle during their formation, severing means for the sheet material movable transversely across the sheet material between the measuring rollers and the transfer means when a severance of the measured sheet material is to be effected, a pair of shafts arranged on opposite faces of the sheet material leaving the measuring

rollers and extending substantially parallel to the rollers, guide members arranged on opposite faces of the stretch of sheet material leaving the measuring rollers and connected for operation by said shafts into and out of positions in which they form a positive guide for the sheet material between the measuring rollers and the transfer means through the path of movement of the severing means, a cam shaft, a plurality of cams on said shaft, and means controlled by the cams for effecting relatively timed operations of the measuring rollers, the guide members, the severing means, and the transfer means.

14. In a machine for winding strand and sheet material, a winding spindle upon which the material is to be wound, means for continuously winding thereon in superposed layers a windable body, means including a plurality of rollers for measuring lengths of the sheet material, transfer means in spaced relation to the measuring means for receiving the measured lengths of sheet material and inserting them at the proper instant between the layers of the wound body on the spindle during their formation, severing means for the sheet material movable transversely across the sheet material between the measuring rollers and the transfer means when a severance of the measured sheet material is to be effected, a pair of shafts arranged on opposite faces of the sheet material leaving the measuring rollers and extending substantially parallel to the rollers, guide members arranged on opposite faces of the stretch of sheet material leaving the measuring rollers and connected for operation by said shafts into and out of positions in which they form a positive guide for the sheet material between the measuring rollers and the transfer means through the path of movement of the severing means, a cam shaft, a plurality of cams on said shaft, and means controlled by some of the cams for effecting relatively timed operations of the measuring rollers, the severing means, and the transfer means, an arm on one of said shafts operating the guide members, means including a member operated by another of the cams for oscillating the arm, and the shaft carrying it, and a driving connection between the two shafts operating the guide members for insuring their concomitant operation.

15. In a machine for winding strand and sheet material, a winding spindle, means for continuously winding thereon a windable body, means for measuring and feeding lengths of said sheet material, means for severing the measured lengths, transfer means for receiving the severed lengths of material and then inserting the same between the layers of the wound body on said spindle during their formation, and guiding means normally out of the path of the severing means and at the beginning of each measuring operation automatically extensible across the path of the severing means to positively guide the sheet material from the measuring means to the transfer means and removable out of the path of the severing means before the operation of the latter.

In witness whereof, I hereunto subscribe my signature.

MARY V. SCOTT,
Executrix of Archibald D. Scott, deceased.