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WINDING MECHANISM FOR TIGHT WINDING
PAPER TAPE ON SPOOLS
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FIG. 2

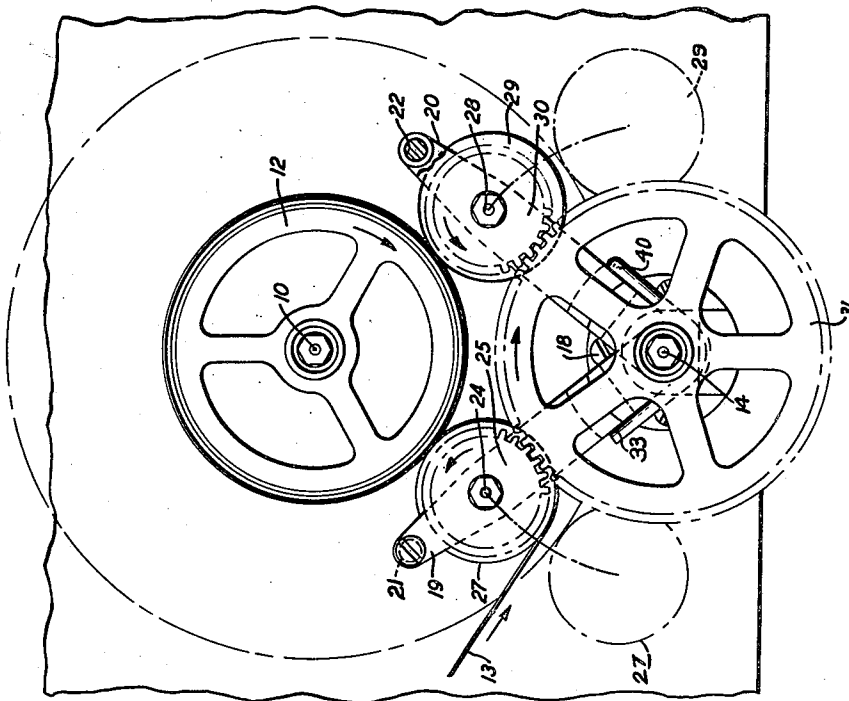
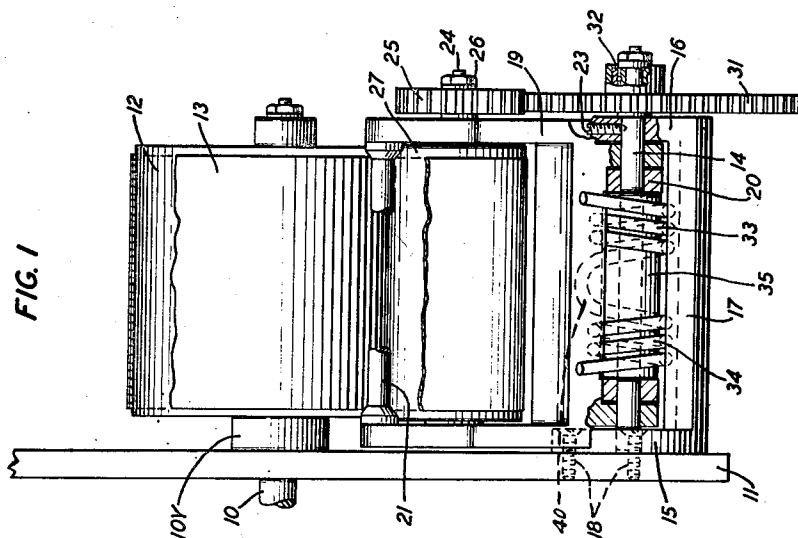


FIG. 1



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WINDING MECHANISM FOR TIGHT WIND-
ING PAPER TAPE ON SPOOLS

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4 Claims. (Cl. 242-75)

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This invention relates to winding machines and more specifically to a mechanism for winding a paper ribbon or tape on a rotating spool.

In connection with the manufacture of a certain type of electrical condenser for example, it is customary to apply a coat of metal directly to one or both sides of a dielectric in the form of a ribbon or tape of insulating material to serve as the electrode for the condenser, the metal coating being applied to the dielectric in a vacuum chamber as the dielectric tape is transferred from a magazine spool to a receiving spool both also placed in the vacuum chamber.

In the transfer operation according to the method used previous to this invention it was not feasible to put the dielectric paper tape under sufficient tension so as to wind the dielectric tight on the receiving spool without avoiding the breaking of the latter during the metallizing operation with the result that a manual winding operation was required for the tightening of the dielectric on the receiving spool when removed from the vacuum chamber with the consequent tearing off or otherwise damaging of a considerable length of the metal coated dielectric.

The object of the present invention is the provision of a simple mechanism whereby metal-coated insulating material in the form of a ribbon or tape is wound uniformly tight on a receiving spool during the metallizing operation of the insulating material.

In the drawing,

Fig. 1 is a side elevation shown with a number of operating parts with portions broken away; and

Fig. 2 is a front elevation view shown with the mechanism in position following the winding of a few turns of the metallized dielectric on the receiving spool preparatory to the starting operation of its supporting motor shaft.

According to the construction of the paper ribbon winding machine of this invention a receiving spool 12 is keyed to one end of a motor shaft 10 which is supported at this end in a bearing 10y secured to a mounting plate 11. A shaft or pivot 14 is journaled at both ends in bearing portions 15 and 16 formed with a spacer bar 17, the bearing portion 15 being in the form of a disc secured to the mounting plate 11 by a plurality of screws 18.

The pivot 14 is held against longitudinal movement in its bearings 15 and 16 by a set screw 23 and on this pivot is mounted for free angular movement thereon in the manner of the flaps of

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a hinge a pair of duplex formed arms or supports 19 and 20 held in spaced relation at their free ends by spacer members 21 and 22, respectively. A spindle 24 is mounted for rotary movement on the duplex formed arms 19 with one end of the shaft projecting beyond one of the arms for securely receiving a pinion 25 held in position thereon as by a nut 26 and on this shaft is mounted for rotary movement therewith a roller 27. Similarly, on the duplex formed arms 20 is rotatably mounted a spindle 28 on which is keyed a roller 29 of a diameter slightly greater than that of the diameter of roller 27, while on the end of spindle 28 which projects beyond one of the duplex arms 20 is keyed a pinion 30 operatively connected to pinion 25 by a gear 31 mounted as on ball bearings 32 fitted on the projecting end of shaft 14 as shown in Fig. 1.

A coiled spring having a left wound portion 33 and a right wound portion 34 is fitted over the periphery of a sleeve 35 on shaft 14 with one end of each portion 33 and 34 bearing against the spacer bar of duplex formed arms 19, while the semiloop 40 formed by the adjacently disposed ends of the left and right wound portions of the spring abut against the spacer bar of duplex formed arms 20 as best seen in Fig. 2 so as to press their respective rollers 27 and 29 in contact with the metallized paper ribbon on the receiving spool 12 while permitting the movement of the hinged arms 19 and 20 from the position shown in full line to the position shown in dotted line in Fig. 2 during the pile-up of the paper ribbon on the receiving spool 12.

In the operation of the metallized paper ribbon winding mechanism of this invention, the ribbon 13 from the magazine spool, not shown, is wound substantially 180 degrees around the roller 27 with its end anchored on the receiving spool 12 on which it is wound tightly a small number of turns manually prior to the starting of the motor shaft 10. The operation of receiving spool 12 and the consequent movement of the paper tape 13 and therefore the rotation of roller 27 is effective to rotate the roller 29 through the intermediary gear 31. Roller 29 because of its greater diameter and therefore its greater peripheral speed in contact with the paper on the receiving spool exerts a continuous tensioning effect on the succeeding convolutions of the paper to the completion of the winding operation when the rollers 27 and 29 reach the position indicated in dotted line in Fig. 2 moving to that position against the tension of spring elements 33-34 such movement

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being effected by the pile-up of the paper tape on the receiving spool as above mentioned.

What is claimed is:

1. In a mechanism for winding condenser dielectric material in the form of a tape tightly on a spool, said mechanism comprising a motor shaft, a receiving spool mounted for rotation with said shaft, a pivot mounted in parallel and spaced relation to said motor shaft, a pair of supports hinged on said pivot, a pair of rollers of different diameter mounted for rotation on said supports, resilient means tensioned against said supports for urging said rollers in frictional contact with the tape during the winding operation thereof on said receiving spool to cause the roller of the large diameter to exert a continuous pulling action on the tape to cause the latter to wind tight on said spool.

2. In a mechanism for winding a tape tight on a receiving spool, said mechanism comprising a motor shaft for actuating said receiving spool, a roller engaged an angular distance of substantially half its circumference by the tape prior to the winding of the latter on said spool, another roller frictionally engaging the tape on said spool, the last-mentioned roller having a greater peripheral speed than the first-mentioned roller for exerting a continuous pulling action on the tape to cause the latter to wind tight on said receiving spool during the operation of the latter by said motor shaft, and a gearing mechanism actuated by the movement of the first-mentioned roller connecting with the second-mentioned roller.

3. In a mechanism for winding condenser dielectric material in the form of a tape tightly on a spool, said mechanism comprising a mounting, a motor shaft for actuating said spool supported at one end by said mounting, a pivot, a support secured to said mounting having bearing portions for receiving said pivot, a pair of duplex formed supports hinged on said pivot, a driving roller

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actuated by the movement of the tape mounted on one of said supports, a driven roller operatively connected to said driving roller mounted on the other of said supports and operating at a greater peripheral speed than said driving roller, spring means tensioned against said supports for urging said rollers against the tape during the winding of the latter on said spool to cause said driven roller to exert a continuous frictional pulling action on the successive convolutions of the tape on said spool.

4. In a tape winding mechanism a motor operated shaft, a spool keyed on said shaft for receiving the tape, a pair of independently movable supports, a roller mounted on one of said supports engaged by the tape a distance of substantially half a turn of its periphery prior to winding on said receiving spool, another roller mounted on the other of said supports having a greater periphery than the first-mentioned rollers frictionally engaging the tape wound on said spool, means actuated by the first-mentioned roller for actuating the second-mentioned roller upon the movement of the tape by the rotation of said spool as effected by said motor shaft to cause the second-mentioned roller to exert a continuous pulling action on the succeeding convolutions of the tape during the winding of the latter on said receiving spool.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
573,229	Metz	Dec. 15, 1896
789,788	Bellamy	May 16, 1905
798,241	Warren	Aug. 29, 1905
1,680,979	Gardner	Aug. 14, 1928