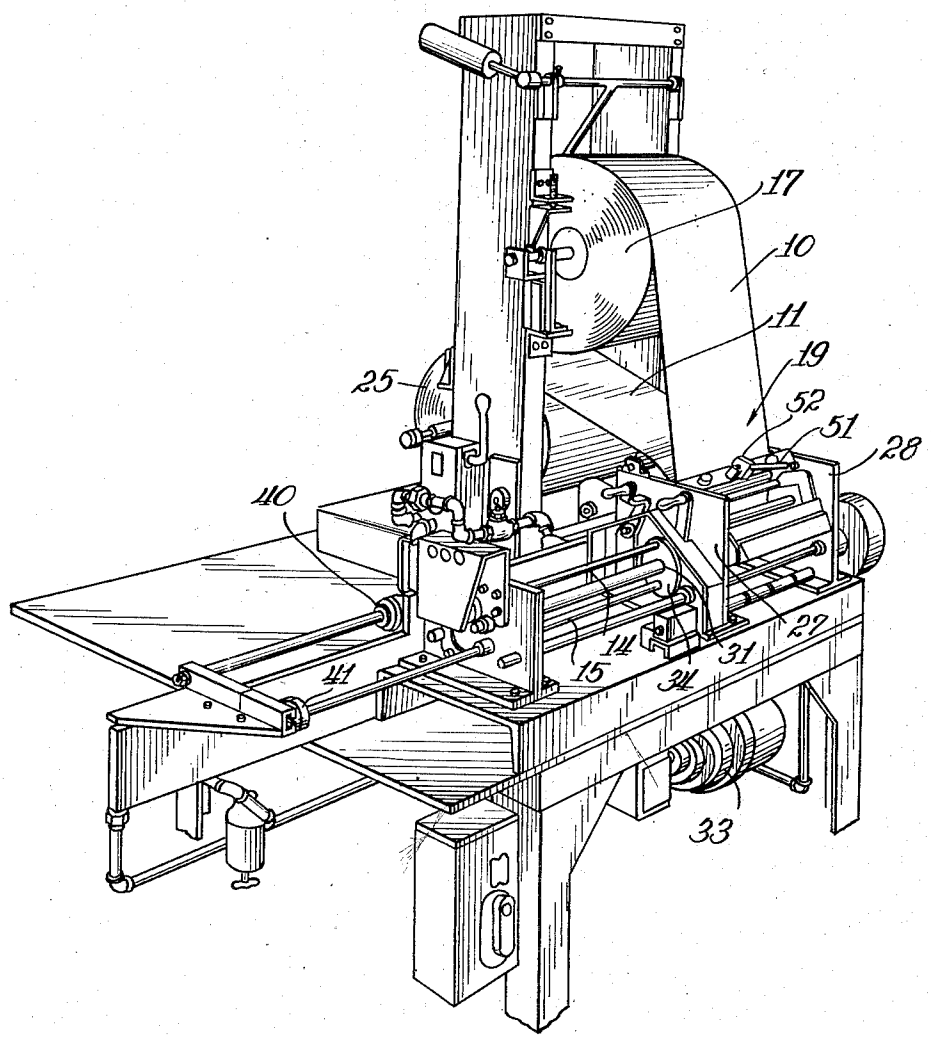
April 13, 1954 L. O. LARSEN 2,675,188

APPARATUS FOR WINDING CONDENSERS

Filed May 28, 1952

3 Sheets-Sheet 1

Fig. 1



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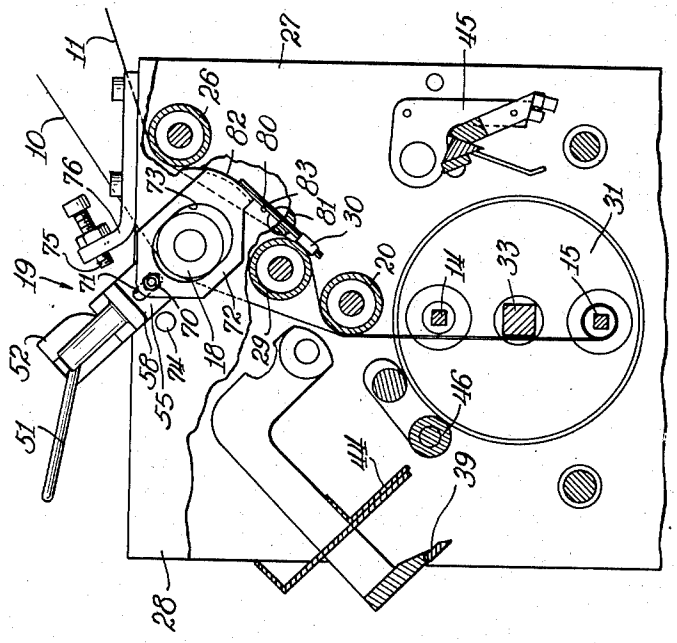


Fig. 2.

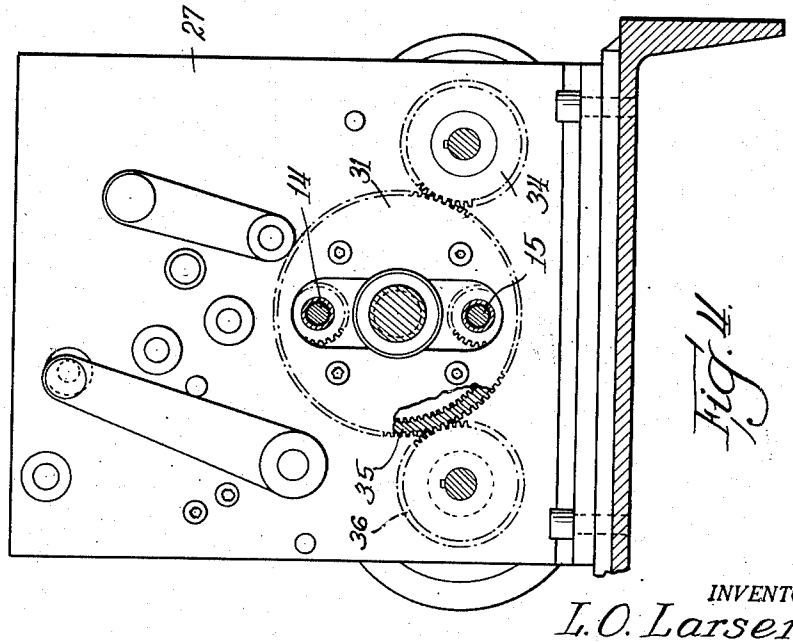


Fig. 4.

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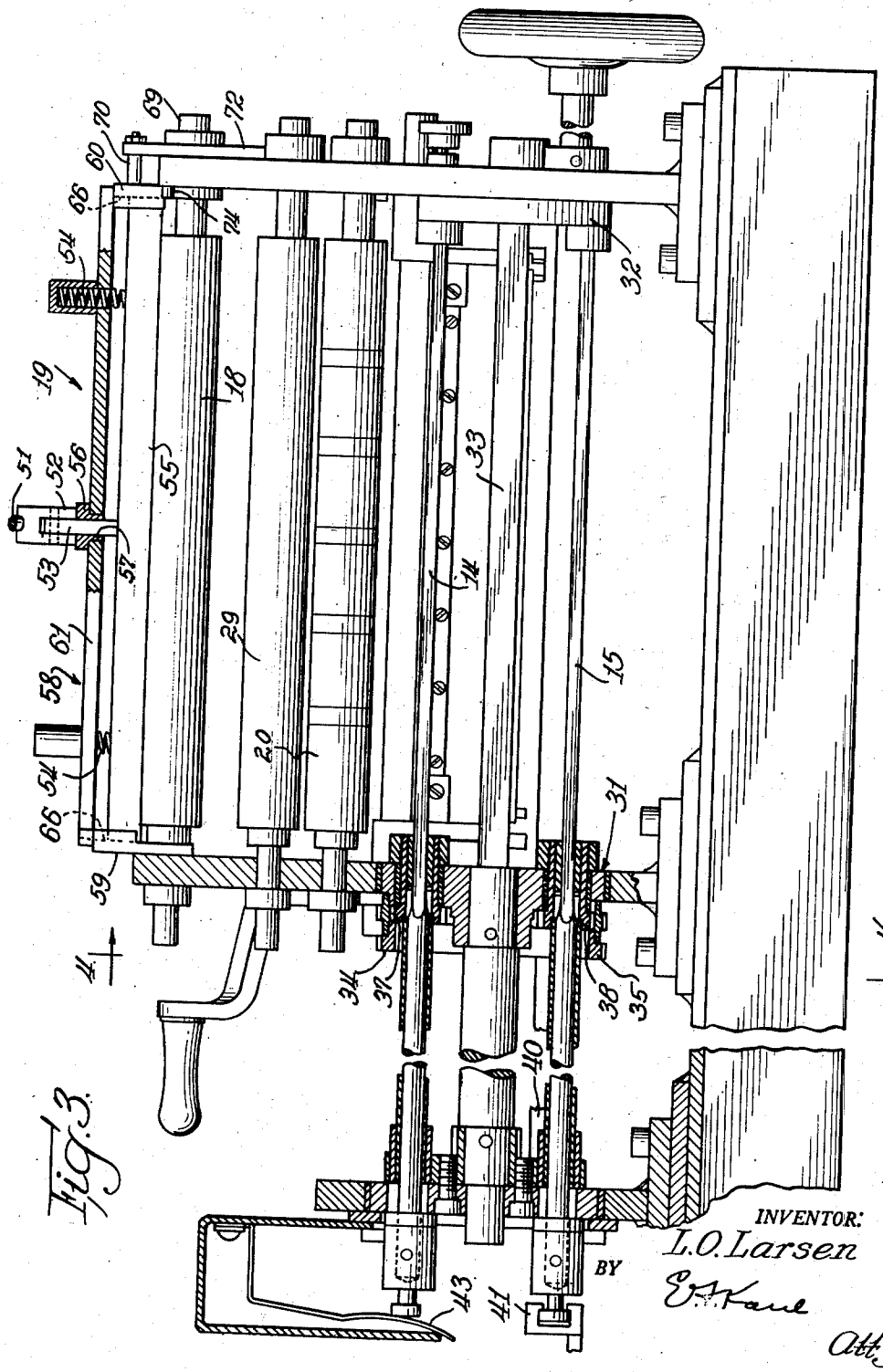


Fig. 3.

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APPARATUS FOR WINDING CONDENSERS

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5 Claims. (Cl. 242—56)

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This invention relates to aparatus for winding condensers, and more particularly to apparatus for winding strips into condensers with the ends of the strips offset one from another.

In the manufacture of condensers by rolling together a plurality of very flexible strips of paper metallized on one side of each, the strips sometimes are rolled together into a roll and then are cut off together, and a new roll is started with the newly formed ends of the strips. However, it has been found to be advantageous to offset the starting ends of the strips to prevent shorts or low insulation resistance paths therebetween. In the past, there has been no apparatus for satisfactorily offsetting the ends of the flexible strips prior to starting the winding of a condenser, and the offsetting has been accomplished with considerable difficulty.

An object of the invention is to provide new and improved apparatus for winding condensers.

Another object of the invention is to provide apparatus for winding strips into condensers with the ends of the strips offset one from another.

An apparatus illustrating certain features of the invention may include means for winding a condenser from a plurality of strips, means for guiding these sheets through the winding means, means for cutting all the sheets at the same point, and means for offsetting the end of one of the sheets from that of the other prior to winding another condenser.

A complete understanding of the invention may be obtained from the following detailed description of an apparatus forming a specific embodiment thereof, when read in conjunction with the appended drawings, in which

Fig. 1 is a fragmentary, perspective view of an apparatus forming a specific embodiment thereof;

Fig. 2 is an enlarged, partially sectional view of a portion of the apparatus shown in Fig. 1;

Fig. 3 is an enlarged, partially sectional view of a portion of the apparatus shown in Fig. 1 with portions thereof broken away to more clearly illustrate the structure thereof, and

Fig. 4 is an enlarged, vertical section taken along line 4—4 of Fig. 3.

Referring now in detail to the drawings, there is shown in Fig. 1 a machine for winding strips 10 and 11 of paper having metallized undersurfaces into elongated rolls alternately on arbors 14 and 15 (Fig. 2). The strip 10 travels from a supply roll 17, between a guide roll 18 and a clamp 19 to a guide roll 20. The sheet 11 travels from a supply roll 25 (Fig. 1) over a guide roll

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26 mounted on walls 27 and 28, between a roll 29 (Fig. 2) and a braking shoe 30 and over the roll 20 between the roll 20 and the sheet 10. The arbors 14 and 15 are mounted rotatably on rotatable frames 31 and 32 (Fig. 3), and are also slidable lengthwise in the frames 31 and 32. A cutting bar 33 also is carried by the frames 31 and 32 in the center of rotation thereof.

The frame 31 may be revolved manually 180° in a counterclockwise direction, as viewed in Fig. 2, through gearing 34 to reverse the positions of the arbors 14 and 15. A ring gear 35 (Figs. 3 and 4) driven by a pinion 36 rotates both the arbors 14 and 15 through gears 37 and 38 splined to the arbors. When the strips 10 and 11 have been wound into a roll of almost suitable capacitance on the uppermost one of the arbors 14 and 15, the frames are actuated manually to revolve the arbors 14 and 15 around the axis of the bar 33 in a counterclockwise direction, as viewed in Fig. 2, to reverse the positions thereof. There is provided a manually operable cutter 39 for cutting the strips 10 and 11 with the cutting bar 33.

A piston 40 always connected to the lower one of the arbors 14 and 15 by a slotted chuck 41 (Fig. 3) may be actuated to pull the lower arbor out of the condenser roll wound thereon. The piston 40 also may be actuated to move the lower arbor back to its original position. The chuck 41 permits lateral movement of the arbor engaged thereby but prevents longitudinal movement of that arbor relative to the chuck. Similarly, a leaf spring retainer 43 keeps the upper arbor seated in the frame 32 while permitting the arbors to be moved laterally into and out of engagement with the retainer. Tuckers 44 and 45 are provided for folding the ends of the strips partially around the upper one of the arbors 14 and 15, and a cushion roll 46 may be swung manually to press the strips against the upper arbor.

After the strips 10 and 11 have been severed, a handle 51 may be swung in a counterclockwise direction, as viewed in Fig. 2, to turn a cam 52 mounted rotatably on a post 53 to a position permitting compression springs 54 to move a presser bar 55 tightly into engagement with the strip 10. The post 53 is mounted slidably in a bushing 56 mounted in a bore 57 in a U-shaped frame 58 having arms 59 and 60 and a plate 61. The bar 55 is mounted slidably in the guideways 66 formed in the arms 59 and 60, which are mounted rotatably on a shaft 69 mounting the guide roll 18. A post 70 secured rigidly to the presser bar 55 for movement therewith projects through a

slot 71 formed in the arm 60 and supports a cam plate 72 provided with an elongated slot 73 therein. The handle 51 also may be actuated to permit the springs 54 to force the presser bar 55 into clamping engagement with the strip 10, and may be actuated to rotate the frame 58 about the shaft 69 in a clockwise direction, as viewed in Fig. 2, away from a stop pin 74 mounted on the wall 28, which movement is limited by an adjustment screw 75 mounted on a bracket 76 secured to the wall 28. This pulls the portion of the strip 10 below the roll 18 upwardly to offset the end of the strip 10 from that of the strip 11.

When the camming plate 72 is moved downwardly by the springs 54, it presses against a leaf spring 80 to turn a shaft 81 in a clockwise direction, as viewed in Fig. 2, to move the braking shoe 30 against the strip 11 positioned below the roll 29. This prevents retraction of the strip 11 with the strip 10, and as the clamp 19 and the roll 18 are revolved to retract the strip 10, the cam plate 72 is revolved, an arcuate groove 82 in the cam plate sliding along a bead 83 of the leaf spring 80 to maintain the pressure on the spring 80.

Operation

Assuming that a condenser roll has just been completed on the arbor 15, the arbor 15 is in the lowermost position and rotation of the arbors 14 and 15 has been stopped, the cutter 39 is actuated manually to engage the portions of the strips 10 and 11 at a corner of the cutting bar 33 and sever both strips. The handle 51 then is moved in a clockwise direction, as viewed in Fig. 2, to hold the frame 58 against the stop pin 74 and swing the cam 52 from its position retracting the presser bar 55 to its position permitting the springs 54 to force the presser bar 55 so as to clamp the strip 10 to the roll 18.

The handle 51 then is actuated to rotate the clamp 19 and the roll 18 about the shaft 69, in a clockwise direction, which movement is limited by the adjustment screw 75. This pulls the portion of the strip 10 below the roll 18 upwardly to offset the end of the strip 10 from that of the strip 11. When the camming plate 72 is moved downwardly by the springs 54, it presses against the leaf spring 80 to turn the shaft 81 in a clockwise direction to move the braking shoe 30 against the portion of the strip 11 positioned below the roll 29. This clamping of the strip 11 prevents retraction of the strip 11 with the strip 10, and as the presser bar 55 and the roll 18 are revolved to retract the strip 10, the cam plate 72 maintains the pressure on the braking shoe 30.

After the end of the strip 10 has been lifted up with respect to the end of the strip 11, the cushion roll 46 is operated to clamp both strips against the arbor and the folder 44 is actuated to fold the strips partially around the arbor 14 and the ends of the strips are secured to the arbor 14 by operating the tucker 45. The handle 51 then is actuated to unclamp the strip 10 and the brake 39, the clamp 18 is permitted to drop by gravity to its normal position against the pin 74, and the machine is started to rotate the arbor 14 to form a condenser roll thereon with the inner ends of the condenser strips offset from one another.

It is to be understood that the above-described arrangements are simply illustrative of the principles of the invention. Numerous other arrangements may be readily devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

1. A condenser winding machine, which comprises supply means for supporting a pair of supply rolls of metallized tissue in positions spaced from one another, an arbor, means for rotating the arbor to wind metallized tissue from the supply rolls onto the arbor, a plurality of guide rolls for guiding one of the metallized tissues to the arbor, a plurality of guide rolls for guiding the other metallized tissue to the arbor, means for simultaneously severing the two metallized tissues at the same points therealong, means for clamping one of the metallized tissues to one of the guide rolls and turning the guide roll in a tissue retracting direction, whereby the tissue passing thereover is retracted with respect to the other tissue, and means for preventing retraction of the last-mentioned metallized tissue while the other metallized tissue is being retracted.

2. A condenser winding machine, which comprises supply means for supporting a pair of supply rolls of metallized tissue strips in positions spaced from one another, an arbor, means for rotating the arbor to wind the strips from the supply rolls onto the arbor, a guide roll for guiding one of the strips to the arbor, a guide roll guiding the other strip to the arbor, means for severing the strips at points therealong equidistant from the arbor, means for clamping one of the strips to the guide roll, guiding it and turning that guide roll in a strip-retracting direction, whereby that strip passing thereover is retracted with respect to the other strip, and means for preventing retraction of the last-mentioned strip while the other strip is being retracted.

3. A condenser winding machine, which comprises an arbor, means for rotating the arbor to wind an inner strip and an outer strip together onto the arbor, a guide roll for guiding the outer strip as it is advanced to the arbor, a second guide roll for guiding the other strip to the arbor, means for simultaneously severing the strips at points equidistant from the arbor, a U-shaped frame pivotally mounted on the first guide roll, a clamp carried by the frame, means for forcing the clamp against the portion of the outer strip engaging the first guide roll to prevent movement of the outer strip relative to the first guide roll, whereby pivotal movement of the frame turns the guide roll, and means responsive to actuation of the clamp forcing means for holding the second guide roll against rotation.

4. A condenser winding machine, which comprises an arbor for winding an outer strip and an inner strip thereon, a guide roll mounted in a position such as to guide the outer strip toward the arbor, a clamp mounted adjacent to the guide roll, means for moving the clamp toward the guide roll and revolving the clamp about the axis of rotation of the guide roll, a second guide roll for guiding the inner strip toward the arbor, a second clamp movable toward the second guide roll, means operable by the clamp-moving means when the first clamp is moved to operable position for pressing the second clamp against the portion of the inner strip engaging the second guide roll, and means for cutting the strips at points therealong equidistant from the arbor and positioned between the guide rolls and the arbor.

5. A condenser winding machine, which com-

prises an arbor for winding an outer strip and an inner strip thereon, a guide roll, a shaft mounting the guide roll in a position such as to guide the outer strip toward the arbor, a U-shaped frame mounted pivotally on the shaft in a position bracketing the guide roll, a clamp mounted slidably on the arms of the frame, means urging the clamp toward the guide roll, manually operable means for rendering the clamp inoperative, a second guide roll for guiding the inner strip toward the arbor, a second clamp movable toward the second guide roll, an arcuate cam carried by the first clamp, resilient means operable by the cam when the first clamp

is moved to operable position for pressing the second clamp against the portion of the inner strip engaging the second guide roll, and means for cutting the strips at points therealong equidistant from the arbor and positioned between the guide rolls and the arbor.

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