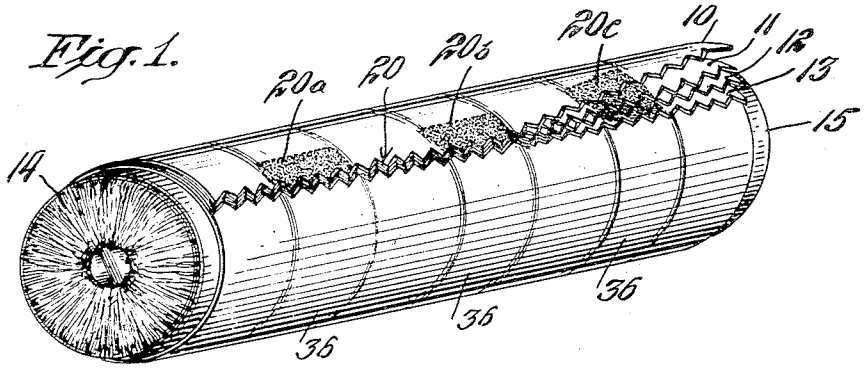
Dec. 11, 1956 F. WEISS 2,774,018

CONDENSERS

Filed Sept. 29, 1952 2 Sheets-Sheet 1

Fig. 1.



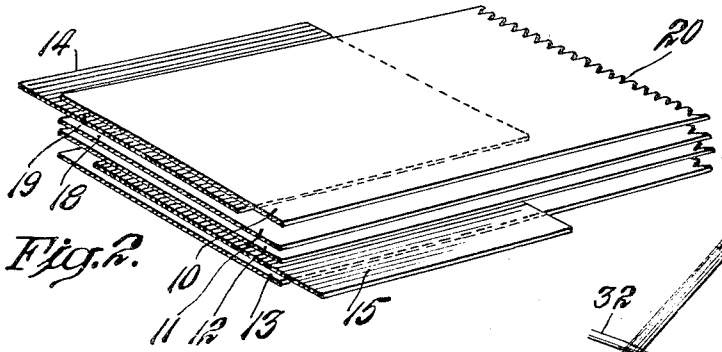




Fig. 2.




Fig. 11.




Fig. 3.

INVENTOR.
FELIX WEISS

BY Frank C. Bauer
ATTORNEY

Dec. 11, 1956 F. WEISS 2,774,018

CONDENSERS

Filed Sept. 29, 1952 2 Sheets-Sheet 2

Fig. 4.

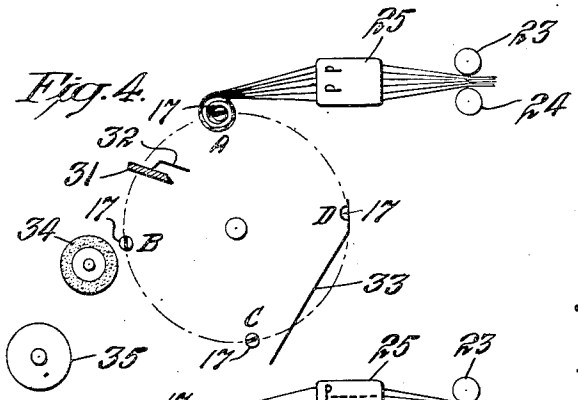



Fig. 5.

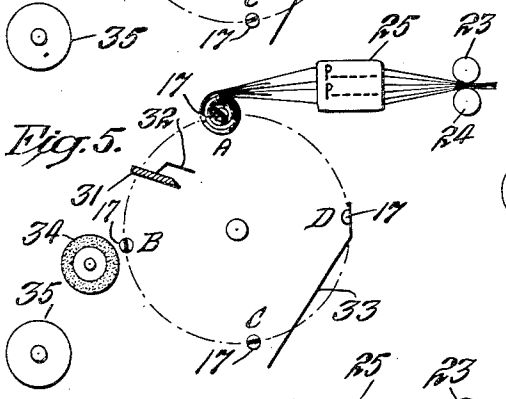



Fig. 6.

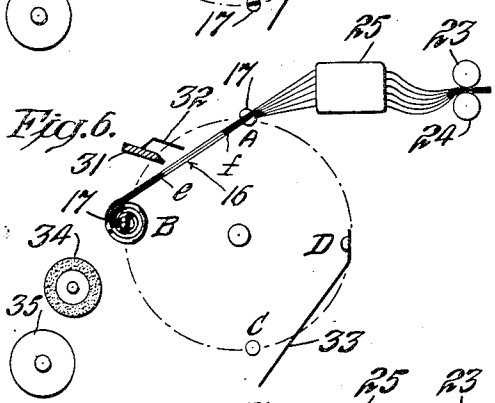



Fig. 7.

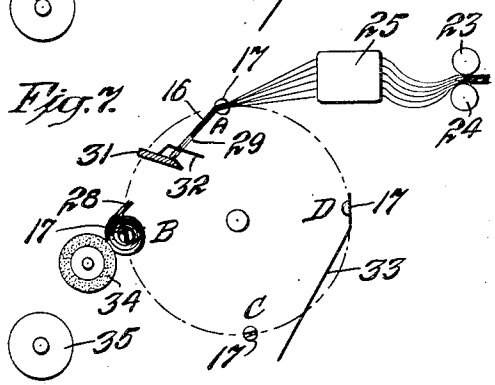



Fig. 8.

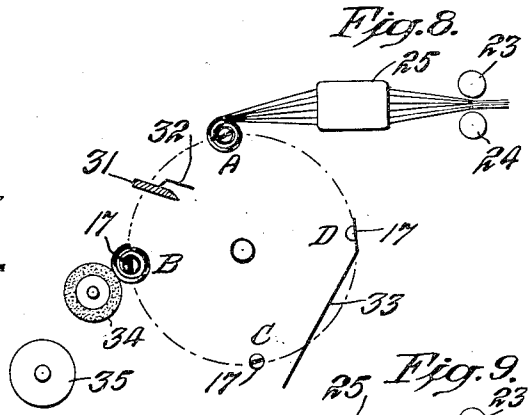



Fig. 9.

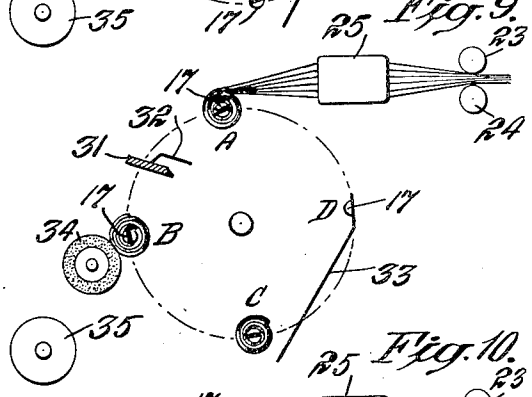
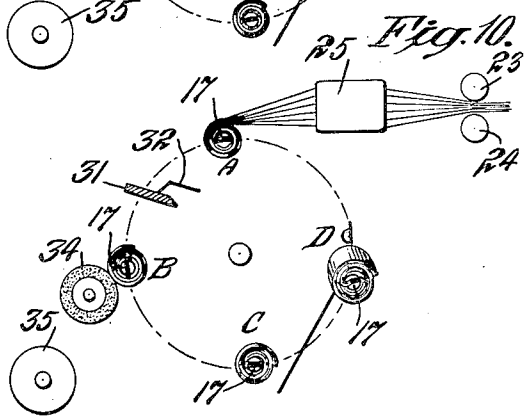



Fig. 10.




INVENTOR.
FELIX WEISS

BY Frank A. Bower
ATTORNEY

United States Patent Office 2,774,018 Patented Dec. 11, 1956



2,774,018

# CONDENSERS

Felix Weiss, Brookline, Mass., assignor to Cornell-Dubilier Electric Corporation, a corporation of Delaware

Application September 29, 1952, Serial No. 312,975

3 Claims. (Cl. 317—260)

This invention relates to a rolled paper condenser and particularly to the interleaving of the insulating and conductive strips and the securing of the outer ends of the insulating strips to prevent the roll from unravelling.

This application is a continuation-in-part of my copending application, Serial No. 616,825, filed September 17, 1945, and issued on November 11, 1952, as Patent No. 2,617,605, which is a division of application, Serial No. 553,776, filed September 12, 1944, and issued on September 18, 1945, as Patent No. 2,384,983.

An object of the invention is to provide a condenser roll that remains tightly and permanently wrapped.

Another object of the invention is to provide a condenser roll that is easily secured against unravelling.

A still further object of the invention is to provide a condenser roll that utilizes a minimum amount of adhesive or cementing material to secure a condenser roll.

Other and further objects of the invention will be apparent from the following description taken in connection with the accompanying drawings in which:

Fig. 1 is a perspective view of a condenser roll;

Fig. 2 is a side view of the outer end of the roll unravelled with the interleaved strips spaced to show the relation of the ends of the insulating and conductive strips;

Fig. 3 is a top view of the unravelled portion of the insulating and conductive strips;

Figs. 4 to 10 illustrate the steps of forming the condenser roll; and

Fig. 11 illustrates the severance of the composite condenser strip.

The condenser roll shown in the drawings is fully set forth in the aforementioned patent application 616,825 on the method of making the condenser roll and aforementioned Patent No. 2,384,983 on the machine for making the condenser roll. The condenser roll has interleaved insulating strips **10**, **11**, **12**, **13** and conductive strips **14**, **15** to form a composite condenser strip **16**. The strips are wound on a split mandrel **17** in a series of steps and ejected as diagrammatically illustrated in Figs. 4 to 10. The conductive strips **14**, **15** are shorter than the insulating strips so that the ends of the insulating strips extend beyond the ends of the conductive strips at both ends of the composite strip. The insulating strips **10**, **11**, **12**, **13** are evenly laid with the edges substantially even while the conductive strips **14**, **15** are offset from the insulating strips so that the conductive strip **14** protrudes out from one edge of the roll and conductive strip **15** protrudes out from the other edge of the roll. The conductive strips are of approximately the same width as the insulating strips so that there are insulating areas **18**, **19** between the inside edges of the conductive strip and the edges of the insulating strip. The two conductive strips are thereby isolated from one another to prevent shorting of the conductive strips or puncturing of the insulating paper. The exposed rolled edges of the conductive strips **14**, **15** form bases for attaching terminal leads to the condenser roll.

The outer or peripheral end **20** is fastened to the preceding layer of the composite strip by cementitious material pressed at spaced points **20***a*, **20***b*, **20***c* into the end of the insulating strips. The cementitious material penetrates the outer layer of insulating material to form a firm solid adhering mass.



The insulating strips and conductive strips are unreeled from their respective supply rolls (not shown) and are fed through feed rollers **23**, **24** (Figs. 4 to 10) to form the composite condenser strip. The composite condenser strip passes through the foil severing mechanism **25** and is wound on the mandrel **17**. The mandrel comprises two halves with a slot **26** in between. The forward or inner end of the composite strip is passed through this slot to form a gripping portion to wind the remainder of the strip on the mandrel. The conductive strips extend through the slot **26** as well as the insulating strips. The insulating strips being longer than the conductive strips have their forward or inner ends passed through slot **26** and are folded or rolled back on the forward or inner portion of the composite strip to form an initial inner roll core around which the composite condenser strip is wound. The mandrel forms a passage extending axially through the condenser roll. The portion of the composite condenser strip held between the halves of the mandrel **17** in slot **26** traverses this passage.

The foil severing mechanism **25** temporarily separates the conductive strips from the insulating strips and then the foil and insulating strips are recombined into a composite strip. When the strips are separated, the cutting means in severing the conductive strips forms the ends *e* and *f*.

The insulating strips pass continuously through the foil severing mechanism **25** while the foil or conductive strips are severed into lengths to provide the proper capacitance. The foil supply reels are stopped on each severence for an interval of time to space the ends *e* and *f* of successive inductive strips apart so that a portion **27** (Fig. 11) of the layers of insulating strips are free of conductive material to provide end flaps **28**, **29** to serve as a relatively short inner flap **29** as a gripping portion on the mandrel and a longer outer fastening flap **28** to secure the condenser roll as a unit. The condenser strip **16** is severed into desired lengths by the knife **31** cutting through the insulating strips **10**, **11**, **12**, **13**. The mandrel **17** moves from station A to station B to position the portion of the strip free of conductive material opposite the knife **31** and needle **32**. The succeeding mandrel is positioned at station A to receive the forward inner end of the strip **16** of the following condenser. The condenser strip **16** is then held between a wound condenser roll on the mandrel at station B and the succeeding mandrel at station A. The clear portion **27** thus held is severed by the cutting means **31**. The needle **32** holds the inner end of the succeeding condenser taut until it is wound on the mandrel. At station B, the forming of the condenser roll is completed with flap **29** wound into the core and flap **28** with its strip ends **20** at the periphery.

The adhesive material is applied by the grooved roller **34** (Figs. 4 to 10). The grooved roller is moved down to momentarily contact the glue roller **35** and the adhesive or cementitious material is daubed on a short arcuate portion of the grooved roller. The roller **34** returns to firmly engage the condenser roll and hold it tightly wound on the mandrel and apply the glue on the end of flap **28**. The roller **34** and the condenser roll are synchronized so that the adhesive bearing portion of the roll will come in contact with the ends of the insulating strips and apply the cementitious material or adhesive to the ends **20** of the insulating strips. The insulating strip ends **20** are dry and absorb the adhesive. On the next turn, the clean surface of the grooved roller presses the strips together, squeezing the adhesive between the strips and cements

the ends of the strips to the preceding completely wrapped layer to fasten the condenser roll in a tightly wound condition. The adhesive penetrates the ends of the strips and the outer strip of the preceding layer to form a mass of impregnated adhesive. The adhesive is applied at spaced areas along the roll with intervening uncemented areas in between. The grooved roller **34** presses against the condenser roll and deforms at **36** the peripheral surface to tightly hold the wound condenser roll and cement the insulating strips together these deformed annular portions **36** are pressed into the outer periphery of the roll and hold the strips together.

The mandrel remains at station A until the condenser roll is almost completed. The mandrel is then moved to station B for severing and securing of the free end **20**. At station C the halves of the mandrel are parted and at station D the arm **33** swings along the mandrel removing the finished condenser roll.

The sequence of operation can be readily perceived by reference to Figs. 4 to 10. In Fig. 4, condenser *a* is in the course of being rolled at station A and before the foils **14**, **15** are severed by the severing mechanism **25**. The foils or conductive strips have been cut and the gaps between the ends of successive foil strips are being formed. The condenser roll is then moved to station B where it is stationary. The cutting knife **31** and needle **32** are in a retracted position to permit the condenser roll to move to the next station.

In Fig. 6, the mandrel with the unsecured condenser roll is at station B and the retractable half of the mandrel is slid in place to grip the composite strips on both sides at station A for a succeeding roll. The grooved roll **34** is moved into contact with the roll, needle **32** pierces the insulating strip to hold the unwound composite strip taut after cutting and the knife **31** then cuts the insulating strip in Fig. 7. The ends **20**, **29** of the insulating strip overlap the foil ends *e* and *f* respectively. In Fig. 8, the end **20** is wound onto the condenser roll and the end **29** is folded about the mandrel **17** to form a basis for a succeeding roll.



The grooved roller **34** moves down in Fig. 6 to contact the adhesive bearing roller **35** and received a daub of cementitious or adhesive material. The roller **34** then returns to its original position and engages the roll to turn with it, and deposit the glue on the end **20** of the condenser strip in Figs. 7 and 8 and press the adhesive into the insulating layers. In Figs. 8, 9 and 10, succeeding rolls are wound at station A while between stations C and D in Fig. 10 the roll is ejected by the arm **33**.

Various modifications and changes may be made without departing from the scope of the invention.

I claim:

1. An electrical condenser comprising a wound composite roll of interleaved insulating and conductive strips with the ends of the insulating strips extending beyond the ends of the conductive strips to form a peripheral binding portion, and deposits of cementitious material along the ends of siad insulating strips penetrating said ends and adsorbed by the material thereof so as to form masses of impregnating adhesive cementing the strip ends to each other and to the preceding underlying layer and fastening the condenser roll in wound condition.

2. An electrical condenser as set forth in claim 1 in which the deposits of cementitious material are transversely spaced apart in regular manner so as to be separated by intervening uncemented spaces.

3. An electrical condenser as set forth in claim 1 in which the condenser roll has a series of transversely spaced, pressure deformed annular portions acting to tightly hold the wound condenser roll.

**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 1,726,343 | Danziger | Aug. 27, 1929 |
| 1,986,680 | Marcalus | Jan. 1, 1935 |
| 2,333,570 | Hild | Nov. 2, 1943 |