

June 22, 1937.

G. F. ROBARGE

2,084,411

ASSEMBLY MACHINE AND METHOD

Filed May 29, 1936

3 Sheets-Sheet 1

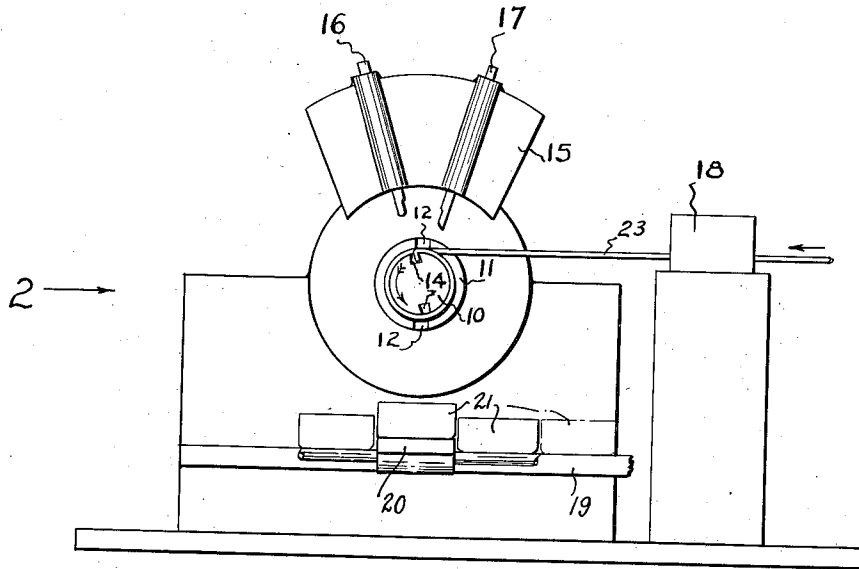


Fig. 1

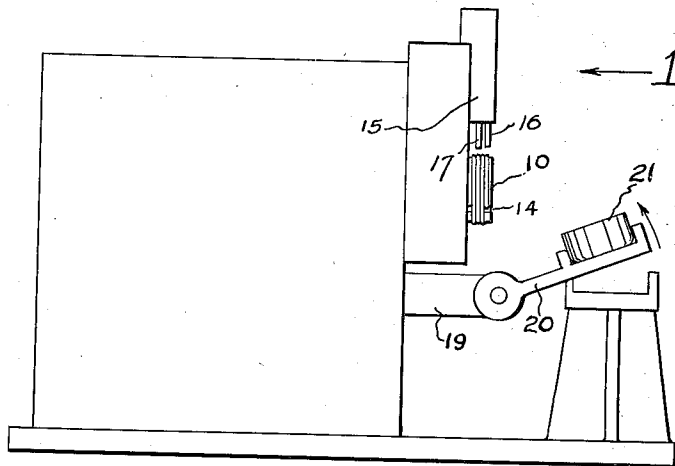


Fig. 2

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3 Sheets-Sheet 2

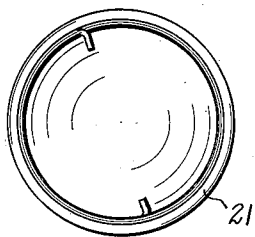


Fig. 3

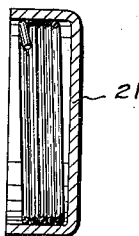


Fig. 4

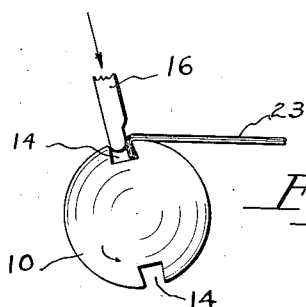


Fig. 5

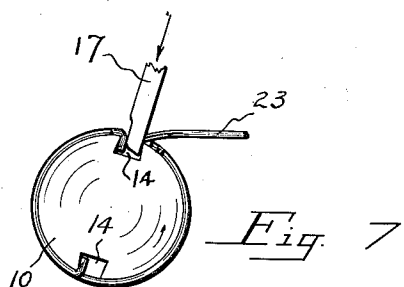


Fig. 7

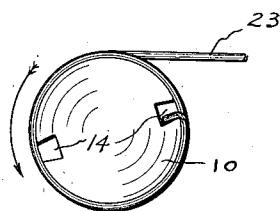


Fig. 6

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3 Sheets-Sheet 3

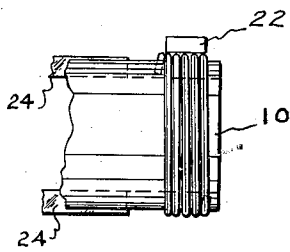


Fig. 8

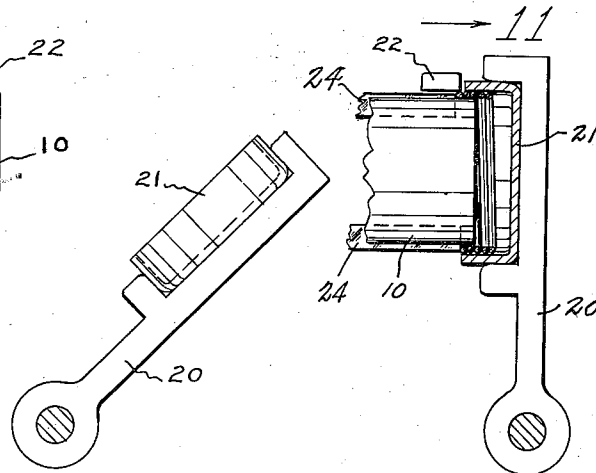


Fig. 10

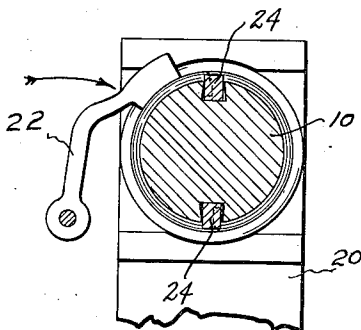


Fig. 11

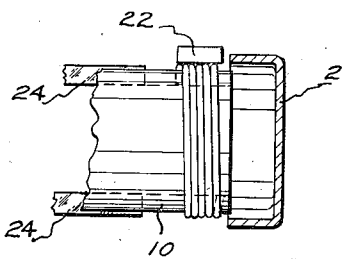


Fig. 9

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UNITED STATES PATENT OFFICE

2,084,411

ASSEMBLY MACHINE AND METHOD

George F. Robarge, Toledo, Ohio

Application May 29, 1936, Serial No. 82,431

3 Claims. (Cl. 153-67)

This application relates to assembly machines and methods.

The machine herein disclosed operates to form a coil spring from a spool of wire and insert the same into a cup, thus forming the assembly of a cup containing a coiled spring.

For an understanding of the machine herein disclosed reference should be had to the accompanying drawings. In these drawings,

Fig. 1 is a front view of the machine as if in the direction of the arrow 1 of Fig. 2;

Fig. 2 is a left side view of the same as if in the direction of the arrow 2 of Fig. 1;

Figs. 3 and 4 are elevation and section views of the assembly of a cup and spring;

Figs. 5, 6 and 7 show different steps in the forming of the coil spring;

Figs. 8, 9 and 10 show different steps in the assembling of the coil spring in the cup;

Fig. 11 is a view as if in the direction of arrow 11 of Fig. 10.

The machine disclosed comprises a rotating spindle 10 telescoped within a stationary collar 11 having diametrically opposed slots 12 adapted to register, when the spindle is at rest, with diametrically opposed slots 14 of the spindle. Above the spindle and collar is a stationary head 15 having radially disposed blades 16 and 17 operatively associated with means for causing the blades to move radially towards and away from the axis of the spindle. Adjacent to the spindle is a pedestal upon which is supported a feed guide 18, and also adjacent to the spindle is pivotally mounted on a pedestal 19 a flap 20, upon which are adapted to be disposed successively, cups 21 into which are to be inserted coil springs. Also adjacent to the spindle is a coil holder 22 pivotally mounted to move towards and away from the spindle.

The operation of the machine is as follows:

Wire 23 is fed in the direction indicated on Fig. 1 from a spool through the feed guide 18 until the leading end of the same registers with a slot 14 in the spindle. Thereupon the operating mechanism causes the blade 16 to advance towards the spindle so that it will bend the leading end of the wire into the slot 14 and interlock it to the spindle in the manner shown. The spindle is then caused to rotate several turns so that it will coil the wire into a coil around the spindle as a mandrel, after which the operating means of the machine will cause the blade 17 to advance and cut off the coil from the remainder of the wire being fed into the machine, and the blade 17 is so formed that in cutting off the coil

it will also bend the trailing end of the coil into the other one of the two slots 14 of the spindle so that when the coil is completely formed on the spindle it will have both of its ends tucked into the slots 14 of the spindle and the coil will thus be interlocked into the spindle. At this time the coil holder 22 will be moved towards the spindle, so as to engage the coil and prevent it from expanding when the coil is pushed off the spindle axially by means about to be described.

With the coil so held the flap 20 is rotated to the spindle so that its cup 21 will telescope over or be disposed in registry with the end of the spindle, in position to receive the coil; thereupon blades 24 disposed in the slots 12 of the collar, which are then registered with the slots 14 of the spindle, are advanced towards the coil and operate to push the coil off the spindle and into the cup, whereupon the coil will expand and frictionally hold itself in the cup. Thereafter, the flap 20 is rotated back to its original position, so that the cup 21 containing the coil may be moved therefrom and replaced by another cup, empty for receiving a coil.

I claim:

1. A machine for forming a coil from a supply of stock sufficient to provide many coils and inserting it into a cup which comprises a spindle having a free end, means for feeding stock tangentially across the spindle, means for securing the leading end of stock fed across the spindle to the spindle, means for rotating the spindle to coil the leading end of the stock, means for severing the stock after the spindle has come to rest with the coil formed thereon and for securing the trailing end of the coil to the spindle, and for securing the leading end of the stock to the spindle for the next coil winding, means for disposing a cup in registry with the end of the spindle in position to receive the coil, and means for pushing the coil off the spindle and into the cup, and means for removing the assembled cup and coil from in registry with the free end of the spindle, and means for causing the coil pushing means to operate only after the coil is completely wound and cut off the stock and after the leading end of the stock for the next coil to be wound is secured to the spindle.

2. A machine for forming a coil from a supply of stock sufficient to provide many coils and inserting it into a cup which comprises a spindle having a free end, means for feeding stock tangentially across the spindle, means for securing the leading end of stock fed across the spindle to the spindle, means for rotating the spindle to

coil the leading end of the stock, means for severing the stock after the spindle has come to rest with the coil formed thereon and for securing the trailing end of the coil to the spindle, and for
5 securing the leading end of the stock to the spindle for the next coil winding, means for disposing a cup in registry with the end of the spindle in position to receive the coil, and means for causing relative axial movement between the
10 spindle and the coil so that the coil will leave the spindle and dispose itself freely within the cup, and means for removing the assembled cup and coil from in registry with the free end of the spindle, and means for causing the relative axial
15 movement causing means aforesaid to operate only after the coil is completely wound and cut

off the stock and the leading end of the next coil to be wound is secured to the spindle.

3. A method for forming a coil from a supply of stock sufficient to form many coils and inserting it into a cup which comprises securing a leading end of the stock to a spindle of the machine, forming a coil on the spindle, cutting the coil off the stock and again securing the leading end of the stock to the spindle, disposing a cup in registry with the spindle, and thereafter causing relative axial movement of the completed coil and spindle to cause the completed coil to leave the spindle and dispose itself in the cup free of the spindle.

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