

Dec. 5, 1961

E. J. BODEK ET AL
WRAPPING MACHINE

3,011,935

Filed Sept. 19, 1958

9 Sheets-Sheet 1

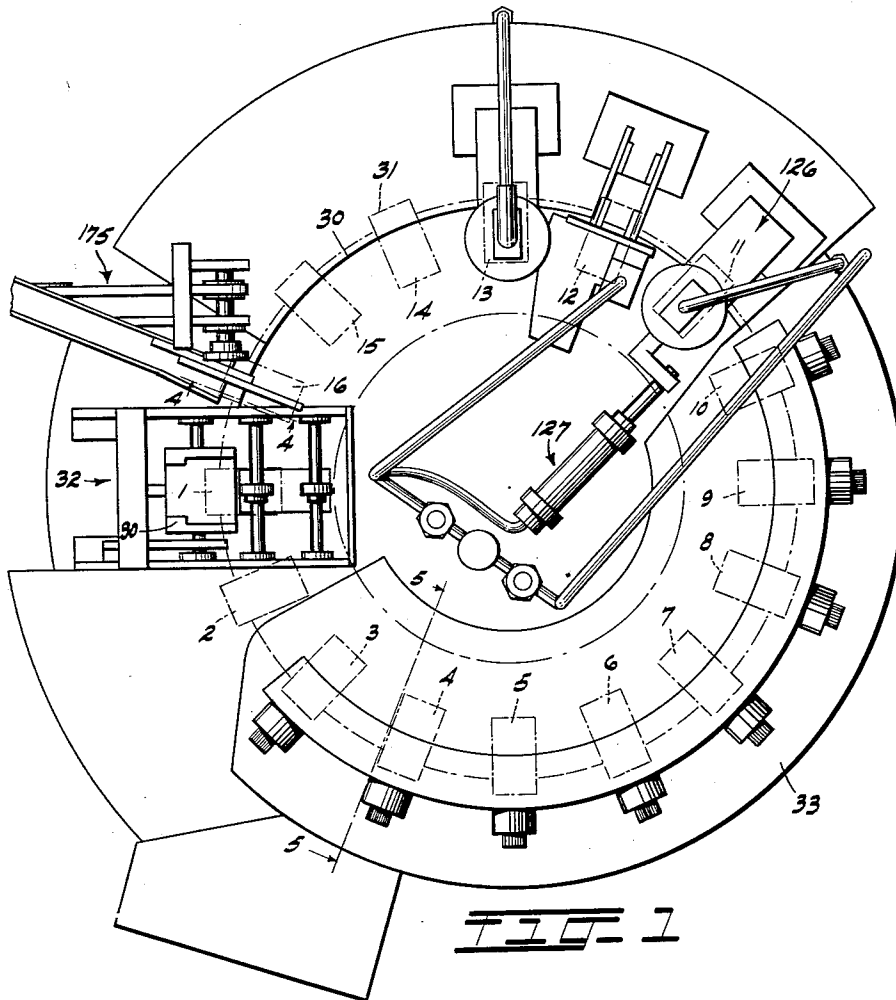


FIG. 1

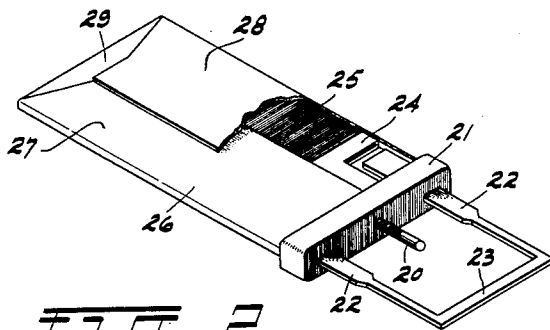


FIG. 2

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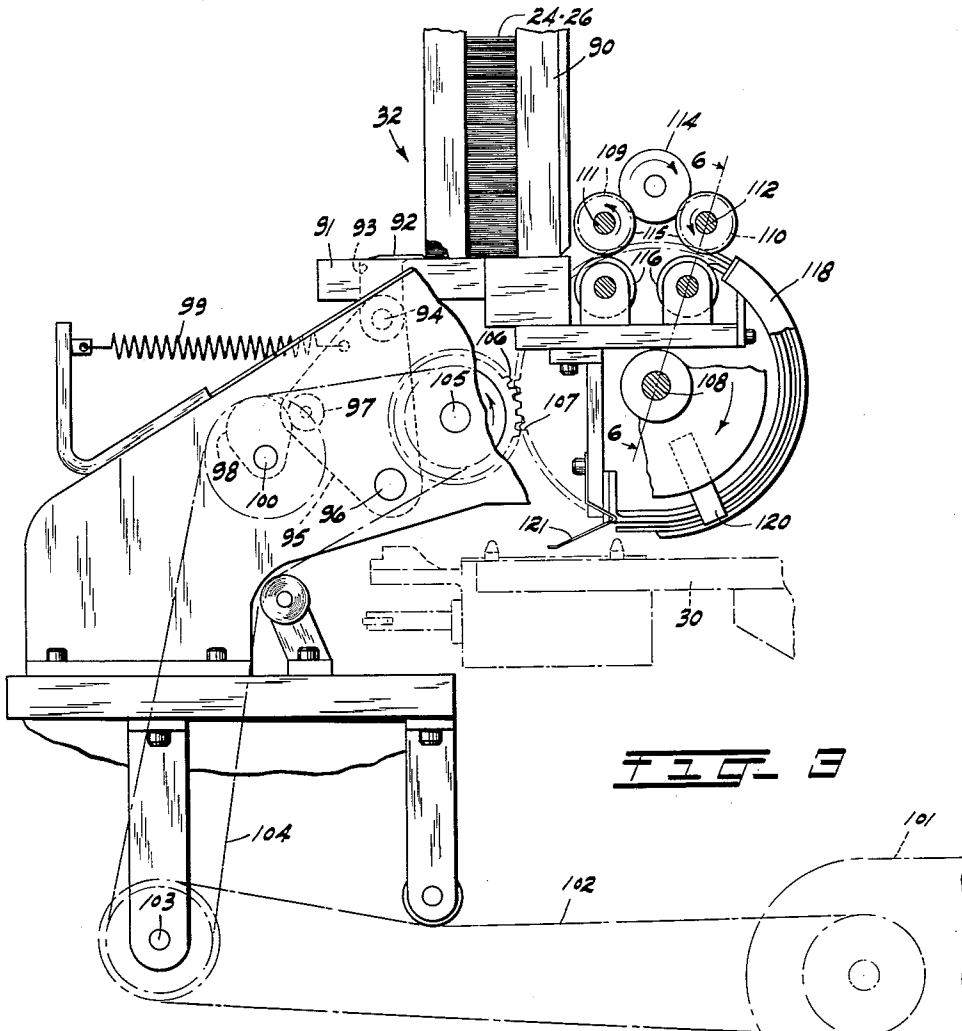


FIG. 3

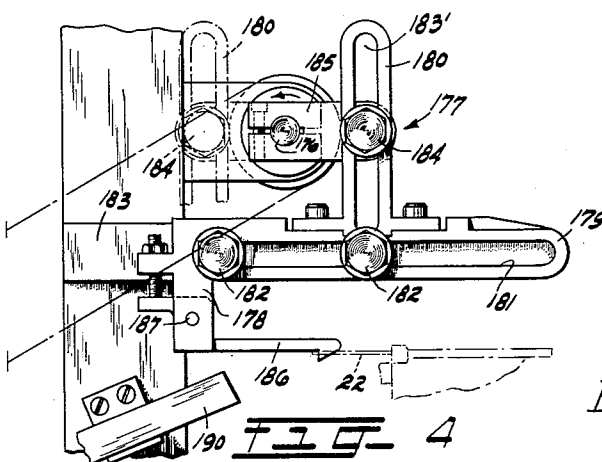


FIG. 4

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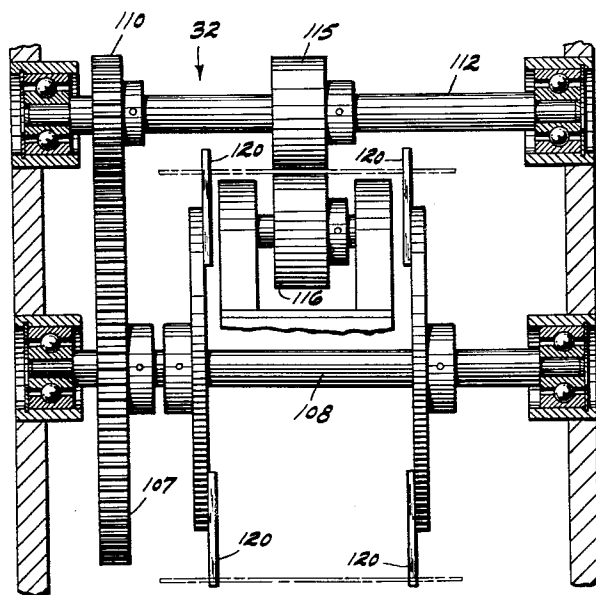
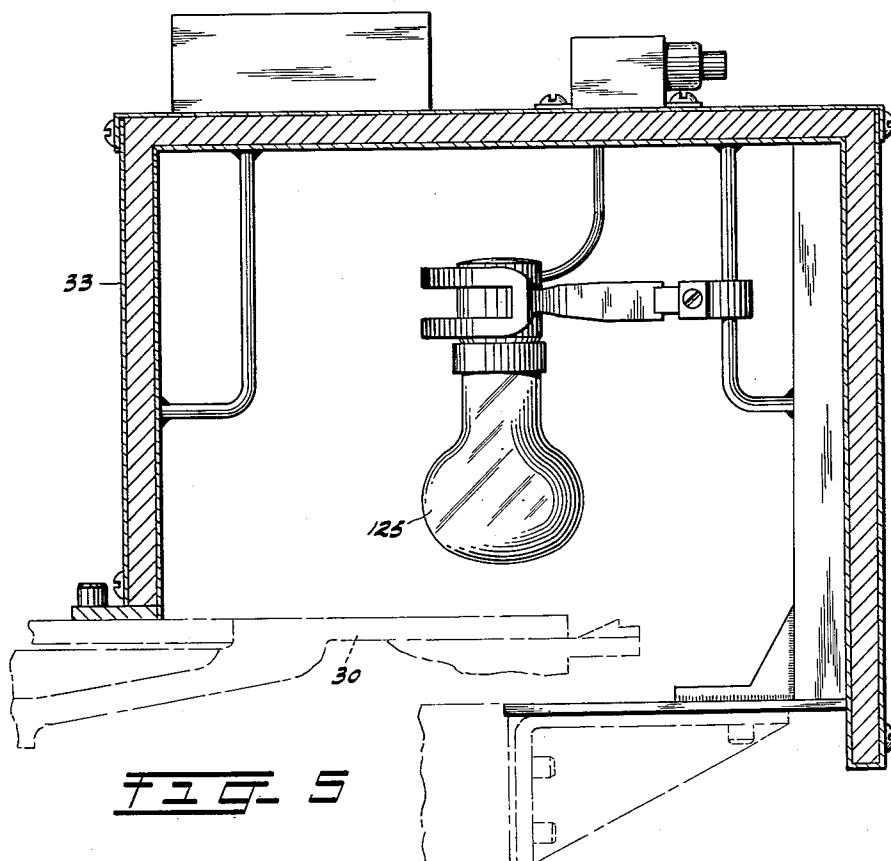
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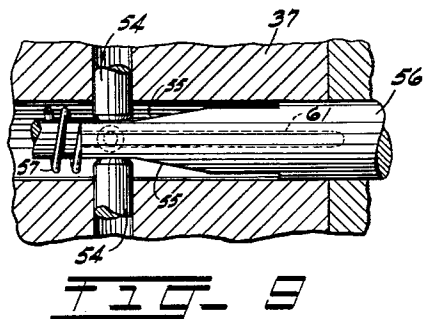
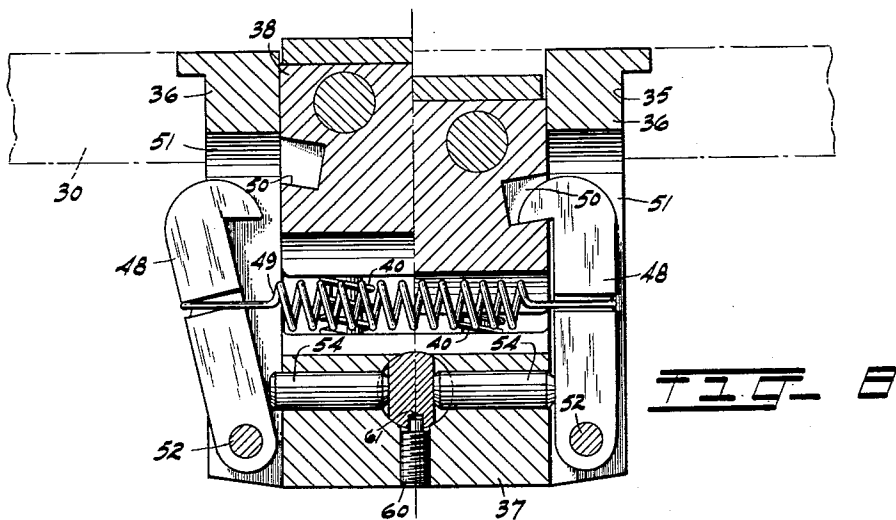
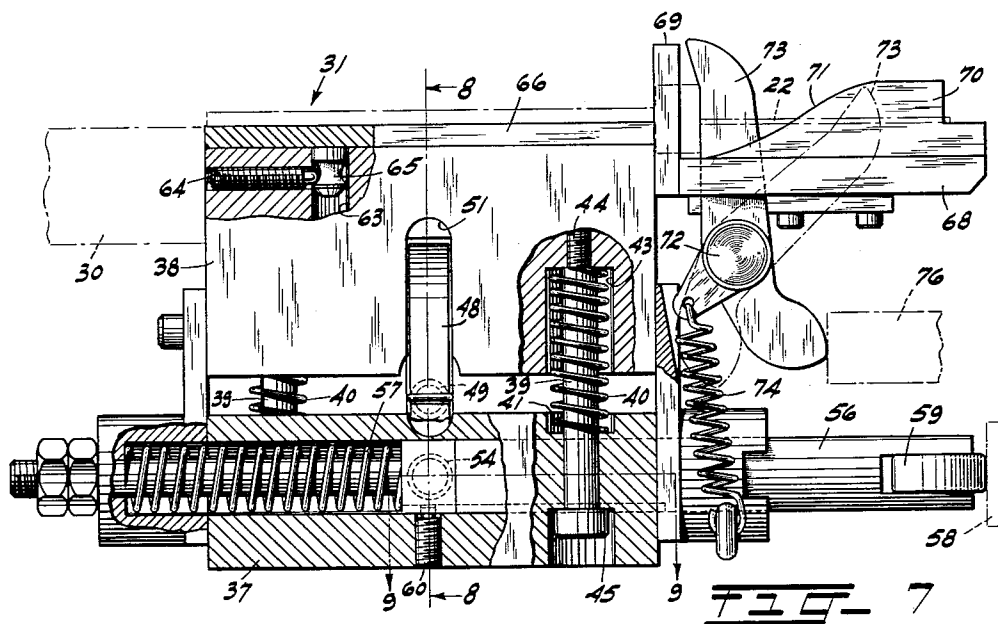
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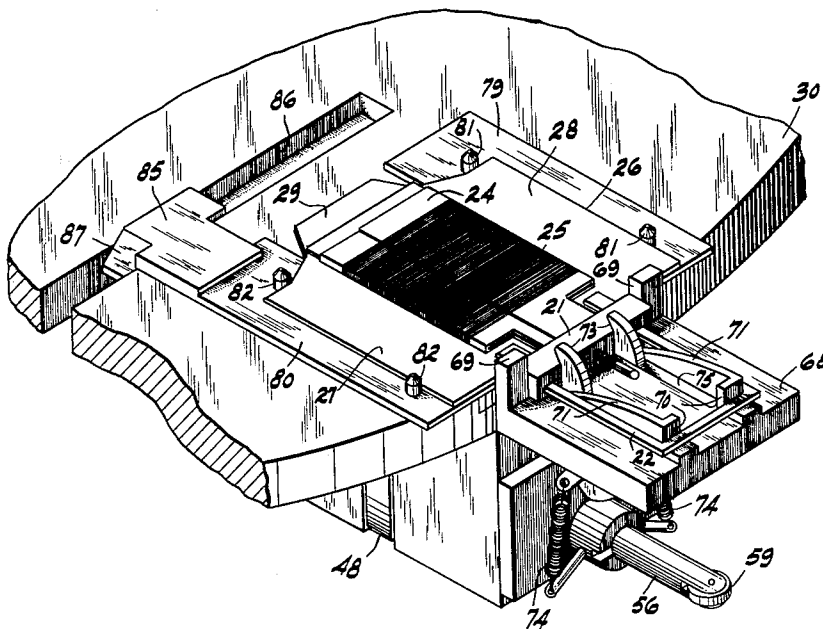


FIG. 10

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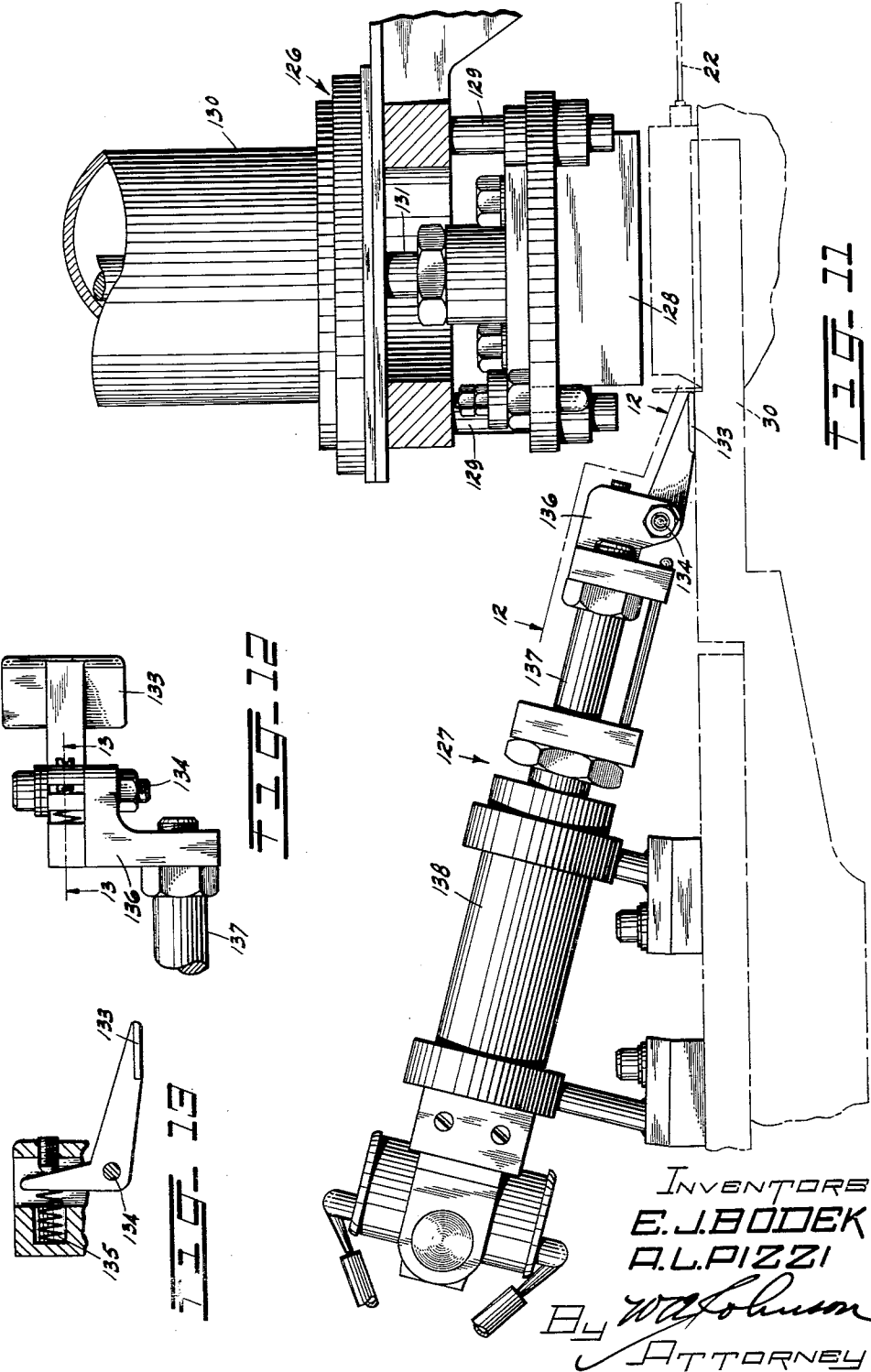
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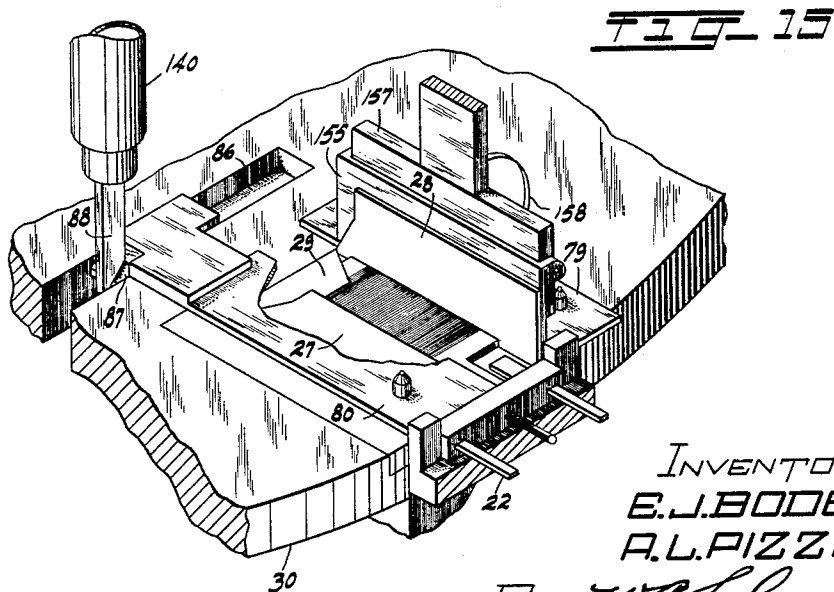
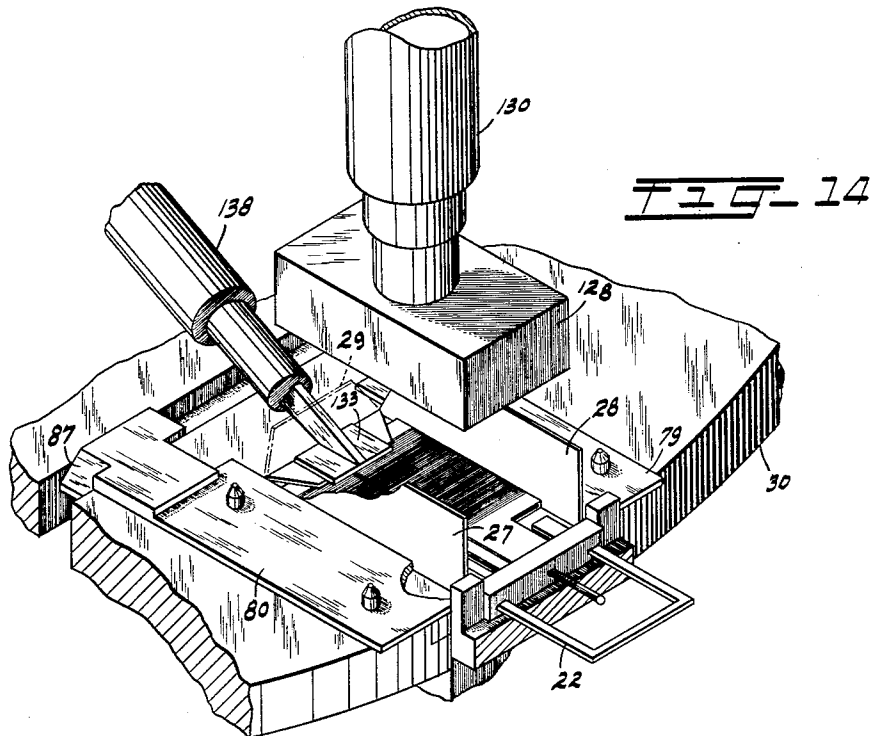
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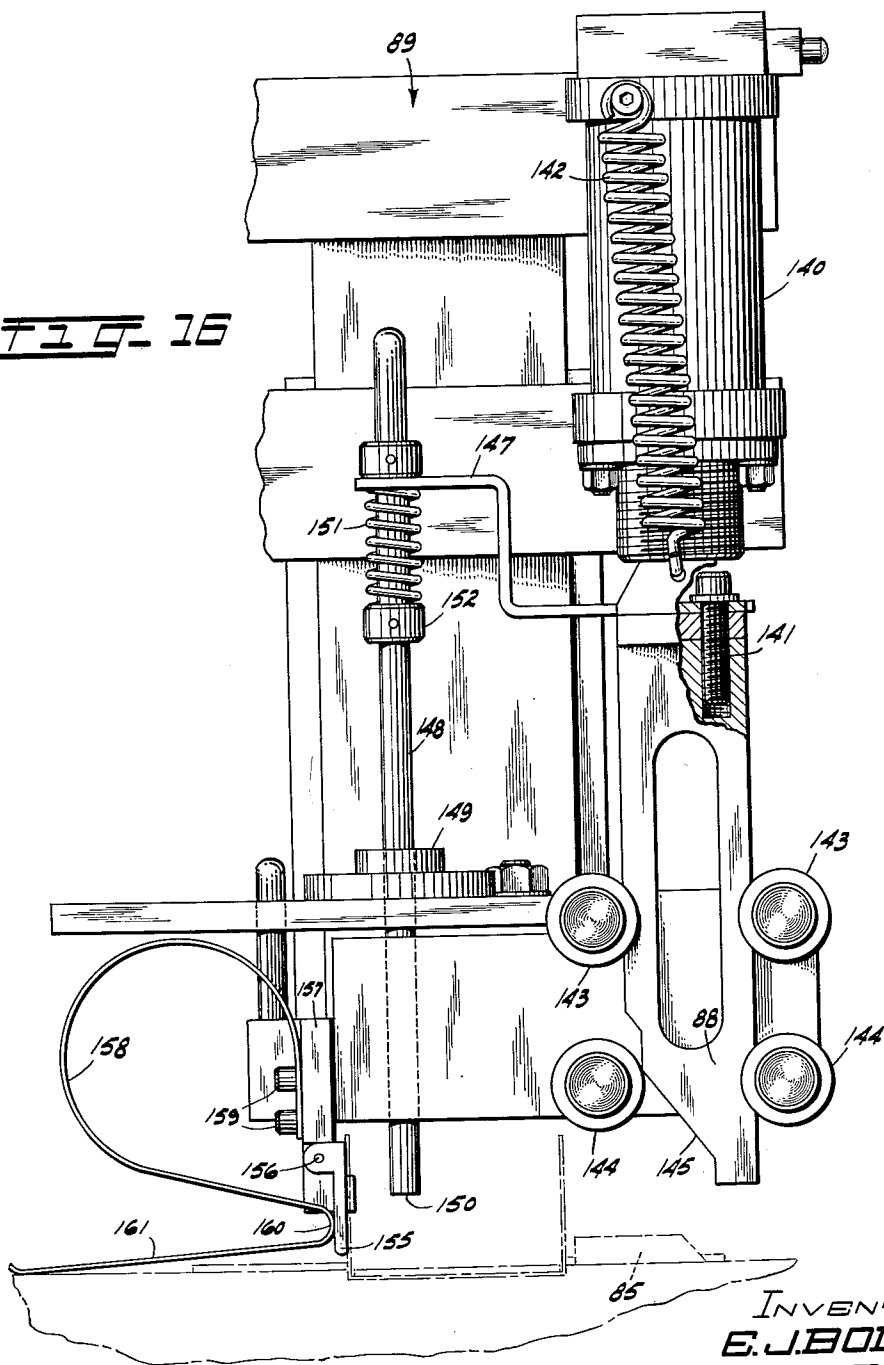
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FIG. 16



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FIG. 17

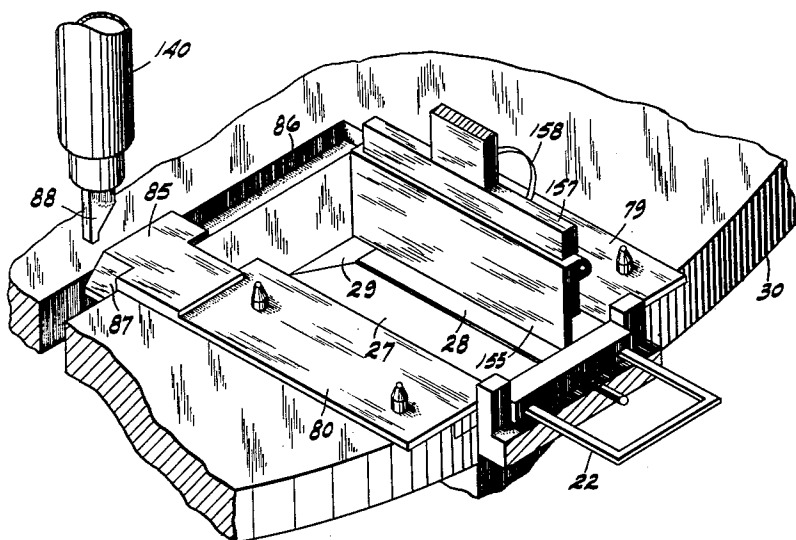
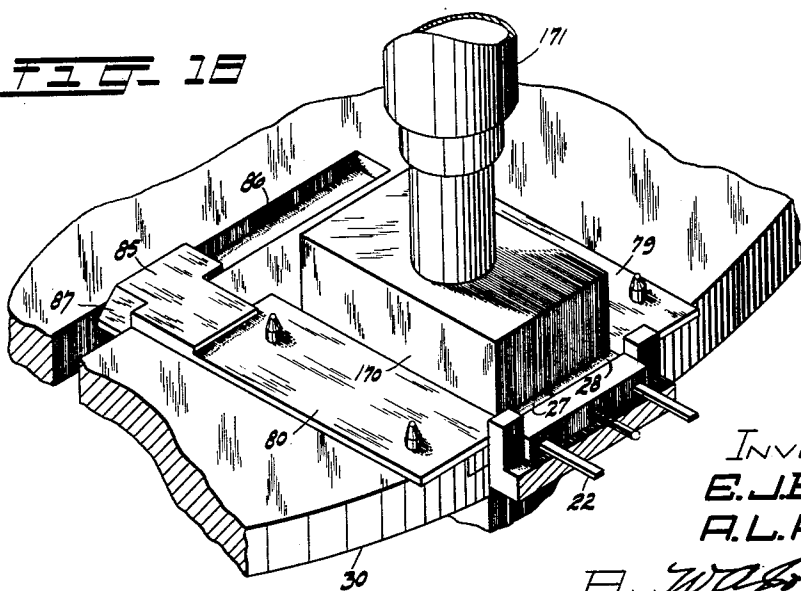


FIG. 18



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16 Claims. (Cl. 156-479)

This invention relates to apparatus for wrapping electrical components with insulating material particularly flat metallic cores for resistors with phenolized asbestos blanks.

In the manufacture of certain types of resistors, sheet metal cores of nickel silver are provided with a central terminal at one end thereof, and this end is embedded in a head of dielectric material. Also embedded in the head are two terminals initially blanked from material similar to the core and connected at their outer ends to produce a U-shaped structure. To make a resistor of this type the core is wrapped with a blank of insulating material having an adhesive coating on the surface thereof to cover the area of the core on which the resistance wire is wound, leaving the inner ends of the terminals and the opposing end of the core exposed for welding the leads of the windings selectively thereto. To finish the resistor, a cover of the same insulating material, formed from a blank of a different size and contour from the first blank, is wrapped about the partially completed resistor to completely cover the resistor winding or windings thereon.

The object of the present invention is an apparatus which is automatic in operation and highly efficient in wrapping both the initial and final covers on an electrical component such as a resistor.

In accordance with the object, the invention comprises a nesting die having fixed position side members and a central member over which a blank of insulating material and a component to be wrapped is placed, the central member being movable from a normal up position to a down position by a punch to cause the sides of the blank to be bent upwardly.

The central member of the nesting die is latched in its down position to hold the blank, thus formed, while means are successively actuated to fold the side portions over the component.

More specifically, the apparatus includes a turret having a plurality of the nesting dies mounted at radially spaced positions therein, and movable intermittently between periods of rest during which time a feeding unit is operated to place the blanks of insulating material with their adhesive coated upper surface in nests of the dies singly, at one of the stations, a component is located manually on the blank at the next station and a series of units such as lamps heat the blanks successively at a number of stations to soften the adhesive coatings. Units are operated in a predetermined order at other stations to move the successive components with their blanks into the down position of the die, fold portions of the blank over the component, press the folded portions firmly to assure sealing of the overlapping portions and eject the wrapped components from the dies.

Other objects and advantages will be apparent from the following detailed description when considered in conjunction with the accompanying drawings, wherein:

FIG. 1 is a top plan view of the apparatus;

FIG. 2 is an isometric view of a wrapped component, a portion thereof being broken away to illustrate both wrappings;

FIG. 3 is a side elevational view of the blank feeding unit;

FIG. 4 is a side elevational view of the ejecting unit taken along the line 4-4 of FIG. 1;

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FIG. 5 is an enlarged fragmentary vertical sectional view taken along the line 5-5 of FIG. 1;

FIG. 6 is an enlarged fragmentary sectional view taken along the line 6-6 of FIG. 3;

FIG. 7 is a vertical sectional view of one of the nesting dies;

FIG. 8 is a vertical sectional view taken along the line 8-8 of FIG. 7, the left half of this figure showing the unlatched position of the central member of the die and the right half showing the latched position of this member of the die;

FIG. 9 is a fragmentary sectional view taken along the line 9-9 of FIG. 7;

FIG. 10 is a fragmentary isometric view of one of the nesting dies with the blank and component located and held therein;

FIG. 11 is a fragmentary side elevational view of the forming punch and one of the folding units mounted at one of the stations about the turret;

FIG. 12 is a fragmentary top plan view of a portion of one of the units taken along the line 12-12 of FIG. 11;

FIG. 13 is a fragmentary sectional view taken along the line 13-13 of FIG. 12;

FIG. 14 is an isometric view of one of the nesting dies after it has been moved with the blank and component to the down position and a tail portion of the blank is folded by one of the units shown in FIG. 11;

FIG. 15 is an isometric view of a nesting die at the station following that shown in FIG. 14 where the side portions of the blank are folded over the component;

FIG. 16 is an enlarged front elevational view of the folding means shown in FIG. 15;

FIG. 17 is an isometric view of the structure shown in FIG. 15 illustrating the folding of the last portion of the blank during movement of the turret, and

FIG. 18 is an isometric view of one of the nesting dies in cooperation with the sealing punch.

In the present instance, the apparatus performs two wrapping operations not at the same time, but at different times to produce flat type resistors as illustrated in FIG. 2. The initial structure of the resistor includes a sheet metal core with a central terminal 20 having one end of the core and part of the terminal embedded in a dielectric head 21 with portions 22 of a U-shaped terminal structure 23. After the resistor is completed, the central portion of the terminal structure will be removed leaving two side terminals with the central terminal. The first wrapping 24 in the present instance is a blank of phenolized asbestos insulating material formed to cover most of the core leaving the end away from the head 21 and the terminal ends 22 exposed so that one or more coils of resistance wires 25 wound on the cover 24 may have their ends welded selectively to the inner terminal portions 22 and the uncovered end of the core. The second and final wrapping 26 is of a blank of insulating material, the same as the blank 24 having a surface coated with an adhesive which, in the present instance is phenolized asbestos insulating material with side portions 27 and 28 to be wrapped in overlapping positions about the wound component after another side or tail portion 29 is moved into position.

The apparatus for performing these wrapping operations includes a turret 30 mounted for movement about an axis intermittently between periods of rest and having a plurality of nesting dies 31 radially spaced about the axis of the turret. In the present instance, there are 16 periods of rest in each cycle of the turret and for this reason there are 16 nesting dies moved successively from a feeding station 1, where a feeding unit 32 for the blanks is mounted, station 2 where the components are placed over the blank, stations 3 to 10 inclusive where an oven

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33 is mounted, station 11 where the units shown in FIG. 11 are mounted, station 12 where the units shown in FIGS. 15, 16 and 17 are mounted, station 13 where the press shown in FIG. 18 is mounted, stations 14 and 15 where the dies may return to their up positions and the components released, and station 16 where the ejecting unit shown in FIG. 4 is mounted.

The nesting dies are identical and a description of the nesting dies shown in FIGS. 7 to 10 inclusive will apply to all of the dies. The die shown in these figures is mounted in a notch 35 in the turret 30 where side members 36 are fixedly mounted. A bottom member 37 is disposed between the side members 36 and fixed thereto. A central member 38 is disposed between the side members 36 guided in its movement by a plurality of rods 39 and supported by springs 40 disposed concentric with the rods and nested in recesses 41 of the bottom portion 37 and the central member 38. The rods 39, in the present instance, are screws having threaded portions 44 mounted in threaded apertures of the central member and heads 45 to stop the central member 38 at its up position. The normal or up position of the central member is illustrated in the left portion in FIG. 8. The central member 38 is movable to a down position where it will be held automatically by latches 48 when urged by a spring 49, connected to both latches, to enter recesses 50 in the sides of the central member. The latches 48 are disposed in slots 51 of the side members 36 and pivotally supported at 52.

The means for unlatching the central member for movement from its down position to its up position includes pins 54, the outer ends of which engage their respective latches 48 while their inner ends engage opposing surfaces 55 of an element 56. The element 56 is normally urged to the right, FIGS. 7 and 9 by a spring 57 and moved to the left by a stationary cam 58 mounted at a fixed position beneath the turret and positioned to engage a cam follower 59 in the form of a roller mounted at the right end of the element. When the element 56 is moved to the left by the cam 58 the tapered surfaces 55 of the element force the pins 54 outwardly to force the latches free of their recesses 50 as illustrated in the left portion of FIG. 8. A threaded member 60 mounted in the member 37 has a reduced portion positioned in a groove 61 of the element 56 to prevent the element from rocking.

The central member 38 has a plurality of apertures 63 with spring pressed plunger units 64 mounted to removably engage pins 65 of an auxiliary central member 66 used to effectively raise the top surface of the central member for the first wrapping operation, that is, the wrapping of the blank 24 on the core portion of the component, this auxiliary member 66 being removed for the wrapping of the cover or final portion 26.

The central member 38 has a shelf 68 integral therewith and extending laterally from the outer edge thereof to support locating and holding means for each component. Part of the locating means includes spaced members 69 for engaging the ends of the head 21 of the component to centrally locate the component on the blank. Also locating elements 70 are formed to cooperate with the U-shaped terminal structure of the component to fit within the U-shaped terminal and thereby assist in locating the component accurately in the nesting die. The upper surfaces 71 of the elements 70 are ramp-like, extending upwardly from the upper face of the shelf 68 to the outer ends of the elements so that, when the ejecting unit shown in FIG. 4 is operated, the completed component is not only moved laterally out of the die but is moved vertically free of the die as it rides up the ramp-like surfaces. The shelf 68 has pivots 72 for supporting a pair of holders 73 which are urged into the holding position shown in solid lines in FIGS 7 and 10 by springs 74 but are moved about their pivots 72 in slot 75 in the shelf, when the nesting die moves relative to a stationary

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cam 76. The holders 73, through the force of their springs 74 engage the head 21 of each component forcing it inwardly a distance limited by the engagement of the U-shaped terminal with the locating elements 70.

Plate-like elements 79 and 80 are disposed upon their respective sides of each nesting die, the element 79 being fixed to the turret 30 and having locating pins 81 mounted thereon. The element 80 is provided with similar locating pins 82 cooperating with the pins 81 of the element 79 to produce a pin-like nest for the blanks 24—26 to be fed to each nesting die. The element 80 has one end fixed to a slide 85 which rests upon the turret 30 and has a portion disposed in an elongate groove or aperture 86 in the turret. A diagonal surface 87 of the slide 85, when at station 12, is positioned beneath an actuating cam 88, FIG. 16, of a unit 89.

Attention is now directed to the feeding unit 32 as shown in FIGS. 1, 3 and 6. The blanks 24 or 26 are stacked in a hopper 90, which is mounted on a support 91 and has an outlet, not shown, wherein an opening is sufficiently large to permit the ejection of only the bottom blank during each feeding cycle. The ejection of the bottom blank is brought about by reciprocation of a selector 92 which is slidable in an aperture 93 of the support and has its lower end connected at 94 to a cam lever 95 which is pivotally supported at 96. A cam follower 97 mounted on the lever 95 is held in engagement with a cam 98 by the force of a spring 99. The cam 98 is mounted on a shaft 100 which is driven by a connection with a power means 101. The power means 101 is driven in synchronism with the means for driving the turret so that during each interval of rest of the turret, the feeding means will be driven through one operating cycle. A belt or pulley connection 102 of the power means 101 drives a shaft 103 and a belt 104 and pulley arrangement, driven by the shaft 103, drives shafts 100 and 105. A pinion 106 mounted on the shaft 105 drives a gear 107 which is mounted on a shaft 108. The gear 107 drives spaced gears 109 and 110 which are mounted on shafts 111 and 112. An idler gear 114 interengaging the gears 109 and 110 and cooperates with the main gear 107 to assure rotation of the gears 109 and 110 in direct relation with each other. Each shaft 111 and 112 has a roller 115 mounted thereon cooperating with a lower roller 116 in each instance to assist in the advancement of the blanks when ejected singly from the hopper 90. The first pair of rollers 115 and 116 adjacent the hopper will receive the leading end of each blank and advance it between the further set of rollers 115 and 116 which will continue the advancement of each blank until the side edges thereof have moved into spaced arcuate guides 118 positioned upon each side of the path of the blank. As the blank leaves the rollers or is moving through the last pair of rollers 115 and 116, one of the two pairs of diametrical fingers 120, mounted on and driven by the shaft 108, will engage the trailing end of each blank and move it through the guides and onto the elements 79 and 80 of the nesting die located therebeneath. A resilient element 121 is mounted adjacent the exit end of the guides 118 to direct each blank downwardly so that the leading edge of each blank will engage the innermost pins 81—82, limiting the forward movement of the blank and causing the blank to come to rest between the outermost pins which determine the lateral position of the blank.

After a blank is fed to the nesting die at station 1, the operator places the component thereon at station 2. The oven 33 covering stations 3 to 10 inclusive is shown in cross section in FIG. 5. The oven surrounds the nesting dies at these stations and has heating units such as infrared heating lamps 125 mounted over the nesting dies at stations 3 to 10 inclusive and supported by adjustable brackets to vary their vertical locations with respect to the nesting dies. While located at these stations, the blank in each instance becomes heated, although the component is covering a portion of each blank, to soften the

adhesive coating or phenol resin on each blank so that at later stations the blanks may be bent and wrapped about the components.

At station 11, there are two units 126 and 127. The unit 126 has a punch 128 supported for accurate vertical movement on guide rods 129 above the turret to position the punch above each central member of each nesting die. A valve, not shown, is actuated automatically during each rest interval to operate air cylinder 130 and cause its piston rod 131, supporting the punch, to move downwardly to engage the component and move the component, the blank and the central portion of the nesting die into the down position where it will be latched. The result of this operation is the forming of the side portions and possible tail portion of each blank upwardly. During wrapping of the initial blank on the core, there is no tail portion and the unit 127 is held unoperated. However, during the final wrapping, the blank has a tail portion 29 which extends vertically after operation of the unit 126.

The unit 127 includes a folding shoe 133 pivotally mounted at 134 and urged clockwise, by a spring 135, relative to its supporting bracket 126 which is mounted on a piston rod 137 of an air cylinder 138. The unit 127 normally is in the position shown in FIG. 11, but when operated into the position illustrated schematically in FIG. 14, the shoe 133 pushes the tail portion 29 over onto the adjacent portion of the component and presses it closely into engagement with the component.

At station 13, the unit 89 is operated during the interval of rest of the turret. This unit includes an air cylinder 140, the piston rod of which is secured to the cam 88 at 141 which is urged upwardly normally by a spring 142. The cam 88, of the contour shown in FIG. 16, moves between pairs of grooved guide rollers 143 and 144 to assure engagement of the tapered surface 145 thereof with the tapered surface 87 of each slide 85. A bracket 147 mounted at 144 carries a pressure pin 148 which is guided vertically in a bushing 149 and has its lower end 150 movable into engagement with the component in the nesting die to hold the component against lateral movement while the wrapping element 80 is moved laterally by the cam 88. A spring 151 interposed between a collar 152 on the rod 148 and the bracket 147 serves as a cushioning means for the hold-down rod. When the cam 88 is moved downwardly, its surface 145 engaging the surface 87 moves the slide 85 in its aperture 86 to move the element laterally over the central portion of the nesting die to fold its side portion of the blank over the component. The cam 81 returns to its up position before the turret moves to advance the die to the next station.

As the turret moves the die from station 12 the blank will have its remaining vertical side portion, as shown in FIG. 16, engaging a folding element 155. The folding element 155 is pivotally mounted at 156 on a stationary member 157. A resilient element 158, having one end fixed at 159 to the stationary member 157, has a knee portion 160 engaging and resisting pivotal movement of the folding element 155, by the adjacent vertical blank portion, and a diagonal leg 161 positioned for the side portion of the blank to ride under as it is folded over the component by the element 155, to force the remaining fold of the blank into position.

At station 13, a punch 170, FIG. 18, similar in structure to the unit 126 and operated by an air cylinder 171 during the interval of rest of the turret, applies a predetermined pressure on the folded portions of the wrapped blank to cause them to adhere to each other and to the component at stations 14 and 15 or in advance of station 16, the holders 73 and the latches 48 are released. At station 16 a driving means indicated generally at 175, connected to or driven by the power means 101, rotates a shaft 176 of the ejecting unit 177. The unit 177 has a carriage 178 with a lateral member 179 and a vertical member 180. The lateral member 179 has an elongate

aperture 181 for receiving stationary screw-like pins 182 supported by a bracket 183 and on which the carriage may slide. The vertical portion 180 has an elongate aperture 183 therein for receiving a screw-like pin 184 of an eccentric arm 185 which is mounted on the shaft 176. A latch 186 pivotally supported at 187 on the carriage 178 is positioned to move into engagement with the central portion of the U-shaped terminal of each component, when the carriage is moved to the right, and to move the wrapped component from the nesting die and cause it to drop in a chute 190 where it will be directed into a receptacle.

Operation

If two or more apparatus are used in wrapping blanks 24 and 26 on the components, the auxiliary member 66, FIG. 7, may be mounted on the central members 38 of the nesting dies of one apparatus, and allowed to remain there permanently to condition this apparatus for wrapping the blank 24 on the core of the component. However, if only one apparatus is used, the central member of each die is conditioned according to the operations to be performed. At the beginning, the auxiliary members 66 are placed on the central members of the nesting dies, and the hopper 90 of the feeding unit 32 is filled with blanks 24. The pins 81 and 82 are positioned with respect to each nesting die to locate the blanks 24 or 26 accurately over the central member of each die.

When the apparatus is in operation, the turret 30 moves intermittently between like periods of rest to advance the nesting dies 31 through a complete cycle beginning with station 1 where the blanks are fed singly to the nesting dies, station 2 where the component is placed on the nesting die, stations 3 to 10 inclusive where the blank is heated to soften the adhesive, station 11 where unit 127 will be held inoperable in this instance and unit 126 will operate to compress the central member to its down position to bend sides of the blank upwardly, station 12 where the sides are bent over the component, station 13 where the overlapping sides of the blank are pressed tightly against the component, stations 14 and 15 where nothing occurs except the possible positioning of the cams 58 and 76 for moving the holders 73 free of each component and the freeing of the latches for movement of the central member to its up position, so that at station 16 the wrapped component may be ejected.

Considering these steps individually, the feeding unit 32, FIGS. 3 and 6, is operated in timed relation with the turret, so that during each interval of rest, the feeding unit will operate one complete cycle beginning with the cam 98 rocking the lever 95 to reciprocate the selector 92 to move the bottom blank 24 from the hopper 90 and move its leading end between its first pair of rollers 115—116. The first pair of feed rollers will cause continued movement of the blank, between the next pair of feed rollers 115—116, continuing movement of the blank into the guides 118, which are arcuate in contour and adapted to receive the side edges of each blank. The fingers 120 disposed in pairs at diametrical positions about the axis of shaft 108 are arranged so that alternately they will engage the trailing ends of the blanks and push them through the guides so that they will drop onto the nesting dies located therebeneath. The resilient member 121 assures downward movement of the leading end of each blank causing it to engage the pair of pins 81—82 nearest the axis and after its forward movement is stopped, it will rest over the nesting die guided into position by the other pair of pins 81—82.

At station 2, the cam 76 moves the holders 73 into open position shown in broken lines in FIG. 7, so that the operator may place a component on the blank with the U-shaped terminal of the component extending about the locating elements 79. As soon as the turret moves the nesting die from station 2 the holding members 73 will be freed by the cam 76 to move by the springs 74 into

closed position to firmly hold the component in place, assisted by the locating members 69 and the locating elements 70.

The blank with the component thereon moves into the oven 33 and during its location at stations 3 to 10 inclusive, it will be heated by the units or lamps 125 at each station to soften the phenolized coating or adhesive. In the present instance, this feature is necessary not only to soften the phenolic resin so that it will adhere to the component but to make the blank flexible so that portions thereof may be bent readily in being wrapped about the component.

As previously stated, during wrapping of the blanks 24 on the component, unit 127 is rendered inoperable, however, unit 126, as shown in FIGS. 11 and 14, is operated to cause its punch 128 to engage the component and move it with the central portion of the blank and a central member of the nesting die downwardly to the down position of the central member where the latches 48, FIGS. 7 and 8 will engage their recesses 50 and hold the central member in its down position. This action of the punch 128 on the nesting die causes side members of the blank to be bent vertically. The unit 126 returns to its normal or up position before the next movement of the turret which brings the partially formed blank from station 11 to station 12.

At station 12, the operation illustrated in FIGS. 15 and 16 is performed by movement of the unit 89 through its operating cycle. The unit 89 causes the cam 88 to move downwardly, following movement of the rod 148 to hold the component and partially formed blank in the nesting die, to move the element 80 with the slide 85. The movement of the element 80 is brought about by the cam surface 145 engaging the diagonal surface 87 of the slide 85 moving it laterally in the groove 86 to cause the element 80 to fold the adjacent side portion of the blank over onto the component. The element 80 will press the side portion of the blank with sufficient pressure against the opponent to cause the adhesive to adhere to the component. When the nesting die leaves station 12 to move to station 13, the other side member of the blank will be folded over onto the component by the element 155, FIG. 16, assisted by the leg 161 of the resilient member 163, FIG. 16, to complete bending of the side portion of the blank onto the component. At station 13, the punch shown in FIG. 18 is operated into its down position to firmly press the overlapping side portions of the blank 24 to finish wrapping of the blank on the component. Before the nesting die with the wrapped blank reaches station 16, cam 58 actuates its plunger 56 to cause the tapered surfaces 55 thereof, FIG. 9, to move the pins 54 outwardly to move the latches 48 free of their recesses 50 to free the central member of the nesting die to move upwardly under the forces of the springs 40. FIG. 8 illustrates two positions of the latches 48, the one at the right showing a central member latched in the down position, the one at the left showing the latch moved free of its recess 50. There is another position where the tongues of the latches engage their respective sides of the central member under the force of the spring 49 to condition the latches to enter the recesses 50 during the next downward movement of the central member and after the plunger 56 is freed of its cam 58 and allowed to move to the right by its spring 57.

With the nesting die in its normal position and the holder 73 free of the component in station 16, a cycle of operation of the ejection unit 177, FIG. 4, will cause the latch 186 to ride over and engage the central portion of the U-shaped terminal and pull the component out of the die, up the ramp-like surfaces of the element 70 and cause the wrapped component to drop down the chute 190.

These operations may continue until the desired number of cores have received the initial wrapping of the blanks 24. At this time the apparatus is conditioned readily for the final wrapping 26 by removing the auxiliary members 66 from each nesting die. At this time,

the hopper 90 is filled with the blanks 26 and the only difference in the operation of the apparatus is what is fed to it and the successive operations of the unit 127. The nesting pins 81 and 82 will receive and locate accurately each blank when fed to the nesting die at the feeding station beneath the feeding unit 32. The component located manually on the blank at station 2 is different in that the core has received the wrapping of blank 24 and the winding of one or more coils of wire 25 thereon. The same action takes place through stations 3 to 10 inclusive and for the first portion of the period of rest at station 11 the punch 128 causes three side portions of the blank to be bent upwardly when the central member of the nesting die is forced from its up position to its latched down position. During this same interval of rest, after the punch 128 returns to its up position, unit 127 is operated through an operated cycle of the air cylinder 138 to cause the shoe 133 to move the central side or tail portion of the blank over the adjacent portion of the component. After leaving station 11, the same actions take place in folding first one side by the element 80 and then folding of the other side by the elements 155 and 161 to finish the wrapping before the final press at station 13 and the ejection of the wrapped component at station 16.

It is to be understood that the above described arrangements are simply illustrative of the application 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. An apparatus for wrapping blanks of insulating material coated on one surface with an adhesive on flat type components having U-shaped terminals extending from like ends thereof comprising a turret moved intermittently between known periods of rest about an axis, nesting dies supported by the turret and located at radially spaced positions about the axis thereon, each nesting die having fixed position side members and a central member movable vertically between a normal up position and an operated down position, a shelf integral with the outer end of each central member of each die and extending laterally therefrom, elements mounted on each shelf and projecting upwardly therefrom to enter the U-shaped terminal of the component to locate the component on the blank over the central die member, a holder movably supported by each shelf and normally forcing the component to cause the U-shaped terminal thereof to closely engage the locating elements, means to feed blanks singly to the successive nesting dies, positioning elements carried by the central members to locate a component on the blank of each nesting die, a punch mounted at a fixed position adjacent the turret and operated during the successive intervals of rest to force the components and blanks with their central die members from the up positions to the down positions so that portions of the blanks which extend beyond the component will be bent at the component and caused to extend vertically, latches operated to hold the central members of the dies in the down positions, and means operated successively to fold the vertical portions of the blank over the components.

2. An apparatus for wrapping blanks of insulating material coated on one surface with an adhesive on flat type components having U-shaped terminals extending from like ends thereof comprising a turret moved intermittently between known periods of rest about an axis, nesting dies supported by the turret and located at radially spaced positions about the axis thereon, each nesting die having fixed position side members and a central member movable vertically between a normal up position and an operated down position, means to feed blanks singly to the successive nesting dies, positioning elements carried by the central members to locate a component on the blank of each nesting die, a punch mounted at a fixed

position adjacent the turret and operated during the successive intervals of rest to force the components and blanks with their central die members from the up positions to the down positions so that portions of the blanks which extend beyond the component will be bent at the component and caused to extend vertically, latches operated to hold the central members of the dies in the down positions, means operated successively to fold the vertical portions of the blank over the components, an ejector mounted for operation through a given cycle during each interval of rest to engage the terminals of the successive components to remove them from their dies, and means to operate the ejector.

3. An apparatus for wrapping blanks of insulating material coated on one surface with an adhesive on flat type components having U-shaped terminals extending from like ends thereof comprising a turret moved intermittently between known periods of rest about an axis, nesting dies supported by the turret and located at radially spaced positions about the axis thereon, each nesting die having fixed position side members and a central member movable vertically between a normal up position and an operated down position, a shelf integral with the outer end of each central member of each die and extending laterally therefrom, elements mounted on each shelf and projecting upwardly therefrom to enter the U-shaped terminal of the component to locate the component on the blank over the central die member, a holder movably supported by each shelf and normally forcing the component to cause the U-shaped terminal thereof to closely engage the locating elements, means to feed blanks singly to the successive nesting dies, positioning elements carried by the central members to locate a component on the blank of each nesting die, a punch mounted at a fixed position adjacent the turret and operated during the successive intervals of rest to force the components and blanks with their central die members from the up positions to the down positions so that portions of the blanks which extend beyond the component will be bent at the component and caused to extend vertically, latches operated to hold the central members of the dies in the down positions, means operated successively to fold the vertical portions of the blank over the components, a plunger for each die actuated by a cam near the completion of each cycle thereof to release the latch thereof, means actuable to move the holders free of wrapped components, an ejector, and means operated to actuate the ejector through a cycle during each rest interval to cause the ejector to engage the terminals of the successive wrapped components and remove the wrapped component from the dies.

4. An apparatus for wrapping blanks of insulating material coated on one surface with a hard adhesive on flat type components having U-shaped terminals extending from like ends thereof comprising a turret moved intermittently between known periods of rest about an axis, nesting dies supported by the turret and located at radially spaced positions about the axis thereon, each nesting die having fixed position side members and a central member movable vertically between a normal up position and an operated down position, means to feed blanks singly to the successive nesting dies, positioning elements carried by the central members to locate a component on the blank of each nesting die, heating units disposed adjacent the blanks on predetermined nesting dies during intervals of rest to soften the adhesive thereon and make it tacky, a punch mounted at a fixed position adjacent the turret and operated during the successive intervals of rest to force the components and blanks with their central die members from the up positions to the down positions so that portions of the blanks which extend beyond the component will be bent at the component and caused to extend vertically, latches operated to hold the central members of the dies in the down

positions, and means operated successively to fold the vertical portions of the blank over the components.

5. An apparatus for wrapping blanks of insulating material coated on one surface with an adhesive on flat type components having U-shaped terminals extending from like ends thereof comprising a turret moved intermittently between known periods of rest about an axis, nesting dies supported by the turret and located at radially spaced positions about the axis thereon, each nesting die having fixed position side members and a central member movable vertically between a normal up position and an operated down position, means to feed blanks singly to the successive nesting dies, positioning elements carried by the central members to locate a component on the blank of each nesting die, a punch mounted at a fixed position adjacent the turret and operated during the successive intervals of rest to force the components and blanks with their central die members from the up positions to the down positions so that portions of the blanks which extend beyond the component will be bent at the component and caused to extend vertically, latches operated to hold the central members of the dies in the down positions, elements operated to fold certain of the vertical portions of the blanks over their components, another folding element mounted at a fixed position in the path of the remaining vertical blank portions to cause folding of these portions successively onto their components, and a resilient member normally holding the last mentioned folding element against movement by the engaging blank portions and urging said blank portions toward their components.

6. An apparatus for wrapping blanks of insulating material coated on one surface with an adhesive on flat type components having U-shaped terminals extending from like ends thereof comprising a turret moved intermittently between known periods of rest about an axis, nesting dies supported by the turret and located at radially spaced positions about the axis thereon, each nesting die having fixed position side members and a central member movable vertically between a normal up position and an operated down position, a hopper for holding the blanks in stacked formation, driven feeding rolls to advance the blanks singly, a selector reciprocated during each rest interval to move the bottom blank from the hopper between the feeding rolls, and guides to direct movement of the successive blanks to successive dies, positioning elements carried by the central members to locate a component on the blank of each die, a punch mounted at a fixed position adjacent the turret and operated during the successive intervals of rest to force the components and blanks with their central die members from the up positions to the down positions so that portions of the blanks extend beyond the component will be bent at the component and caused to extend vertically, latches operated to hold the central members of the dies in the down positions, and means operated successively to fold the vertical portions of the blank over the components.

7. In an apparatus for wrapping blanks of material on components fed to successive nests of dies of a turret moved intermittently about an axis relative to a feeding station, a feeding unit mounted at the feeding station and having a hopper to hold the blanks in stacked formation, a selector supported for reciprocal movement relative to the hopper, means operated between the intermittent movements of the turret to reciprocate the selector to move the bottom blank relative to the other blanks, guides for the successive blanks leading away from the hopper toward each die in the feeding station, and driven rollers positioned to receive the bottom blank from the hopper and move it into the guides.

8. In an apparatus for wrapping blanks of material on components fed to successive nests of dies of a turret moved intermittently about an axis relative to a feeding station, a feeding unit mounted at the feeding station and

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having a hopper to hold the blanks in stacked formation, a selector supported for reciprocal movement relative to the hopper, means operated between the intermittent movements of the turret to reciprocate the selector to move the bottom blank relative to the other blanks, guides for the successive blanks leading away from the hopper toward each die in the feeding station, driven rollers positioned to receive the bottom blank from the hopper and move it into the guides, and driven elements to engage the trailing edge of each blank in the guides and push the blank from the guides onto the nest of the die.

9. In an apparatus for wrapping blanks of material on components fed to successive nests of dies of a turret moved intermittently about an axis relative to a feeding station, a feeding unit mounted at the feeding station and having a hopper to hold the blanks in stacked formation, a selector supported for reciprocal movement relative to the hopper, means operated between the intermittent movements of the turret to reciprocate the selector to move the bottom blank relative to the other blanks, guides for the successive blanks leading away from the hopper toward each die in the feeding station, driven rollers positioned to receive the bottom blank from the hopper and move it into the guides, driven elements to engage the trailing edge of each blank in the guides and push the blank from the guides onto the nest of the die, and a resilient element mounted at exit ends of the guides to engage each blank and direct it to the nest.

10. An apparatus for wrapping hard initially non-wrappable blanks of insulating material coated on one surface with an initially hard adhesive on flat type components having sides, front and back ends, and U-shaped terminals extending from front ends thereof comprising a nesting die having fixed position side members positioned beyond their respective sides of the component and a central member to support the component disposed between the side members and movable vertically between a normal up position and an operated down position, means to return the central member to its normal up position, projections mounted adjacent the side members to locate a blank of the insulating material over the die, positioning elements on the central die member to locate the component between the side members on the portion of the blank resting on the central member, means to heat the blank to soften the blank and the adhesive thereon to render the blank wrappable and the adhesive tacky, a punch actuated to force the component with the blank and the central member of the die downwardly to the down position of the die, the fixed position side members of the die causing side portions of the softened blank to project upwardly, a latch operated to hold the central member of the die in the down position with the component and blank, and means operated successively to fold the side portions of the softened blank over the component.

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11. An apparatus according to claim 10 in which a plunger is operatively mounted adjacent the latch, and means actuated subsequent to the folding of the side portions to operate the plunger to cause the plunger to release the latch.

12. An apparatus according to claim 10 in which a shelf is formed integral with one end of the central member of the die and extends laterally from said end of the central portion, elements mounted on the shelf and projecting upwardly therefrom to enter the U-shaped terminal of the component and thereby locate the component on the blank over the central die member.

13. An apparatus according to claim 12 in which a holder is movably supported by the shelf and normally engages and forces the component in a direction to cause the U-shaped terminal to closely engage the locating elements.

14. An apparatus according to claim 12 in which means is operated subsequent to the folding of the side portions of the blank to release the latch to free the central to return to its normal up position, the locating elements on the shelf having ramp-like upper surfaces extending upwardly from the shelf to the outer ends of the elements, and an ejector operated to engage the terminal of the component and pull the wrapped component laterally from the die while riding vertically of the die on the upper surfaces of the locating elements.

15. An apparatus according to claim 14 in which the ejector has a hook-like end, a carriage pivotally supporting the ejector so that the hook-like end may ride over a connecting portion of the U-shaped terminal and engage said portion, means to support the carriage for movement, and means to move the carriage through reciprocal cycles to cause the ejector to engage the terminal and move the component thereby from the die.

16. An apparatus according to claim 10 in which a fixed position end member of the nesting die is adapted to cause an end portion of the softened blank to project upwardly adjacent the back end of the component when the punch is actuated downwardly, a shoe positioned with respect to the punch to engage the end portion of the blank, and means operable to move the shoe relative to the nesting die to fold the end portion of the blank over the back end and onto the component.

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