ELECTRICAL TERMINAL APPLICATOR

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This invention relates to a terminal applicator construction for automatically applying an electrical terminal or connector to a conductor wire. More particularly this invention relates to an applicator for applying terminals wherein a plurality of operations or functions must be sequentially performed in effecting the cold-forging or crimping of the terminal to the wire such as is required, for example, in applying the terminals disclosed in the copending application, Serial No. 431,870, filed May 24, 1954, by Kemper M. Hammell or in the copending application, Serial No. 431,871, filed May 24, 1954, by Karlis Dukis.

In the illustrated embodiment of the invention the terminal applicator construction is contemplated to form a part of a press assembly for automatically feeding, severing and crimping the lead terminal of a strip or reel of preformed terminals integrally attached in end-to-end fashion. In the copending applications aforesaid each terminal includes a ferrule-forming portion having a base section and an ear projecting upwardly from one side of the base section, which ear is adapted to be curved around a conductor disposed along the base and threaded through a slot in and directed across the underside of the base, subsequently to be indented into and with the base thereby to produce a voidless and locked crimped connection. Extending from one side of the base section, for example in flag fashion, is a contact portion which typically may comprise a terminal receiving receptacle. Such terminals per se are not a part of this invention and other modifications of preformed terminals susceptible of automatic application may be applied in accordance with the principles of this invention as will readily occur to those skilled in the art.

It is an object, therefore, of the present invention to provide an automatic terminal applying machine for applying in one cycle of operation terminals which require multiple steps or functions to be sequentially performed.

Another object is to provide an automatic terminal applying machine for effecting in one downward stroke of the applicator ram a multiple-action crimping operation. A further object is to provide an automatic applicator machine for applying open-barrel flag-type terminals intermediate or at the end of a conductor.

Still another object is to provide a terminal applicator machine for applying terminals from a reel wherein the strip of terminals forming the reel is positively registered and secured in the crimping region.

Other objects and attainments of the present invention will become apparent to those skilled in the art upon a reading of the following detailed description when taken in conjunction with the drawings in which there is shown and described an illustrative embodiment of the invention; it is to be understood, however, that this embodiment is not intended to be exhaustive nor limiting of the invention but is given for purposes of illustration in order that others skilled in the art may fully understand the invention and the principles thereof and the manner of applying it in practical use so that they may modify it in various forms, each as may be best suited to the conditions of a particular use.

In the drawings:

Figure 1 is a partially exploded perspective view of an illustrative machine embodying the invention;

Figure 2 is a fragmentary sectional view taken at lines 2—2 of Figure 1;

Figure 3 is a view for the purpose of illustrating the action of certain parts of the machine, and is taken generally at section lines 3—3 of Figure 2;

Figure 4 is a view similar to Figure 3, but with the machine being illustrated in a different phase in the operating cycle;

Figure 5 is a fragmentary perspective view taken from the rear of the machine as viewed in Figure 1;

Figure 6 is an enlarged fragmentary sectional view taken generally at lines 6—6 of Figure 5, additionally showing in a different phase in the operating cycle a portion of the terminal strip and ram structure of the machine for purposes of explanation;

Figure 7 is a view similar to Figure 6, but with the machine being shown at another point in the operating cycle;

Figures 8a and 8b are diagrammatic views for the purpose of explaining the operation of certain parts of the machine applicator assembly;

Figure 9 is a fragmentary sectional view taken at lines 9—9 of Figure 2;

Figure 10 is a view similar to Figure 9 with the machine being in a different phase of the operating cycle;

Figure 11 is a fragmentary sectional view taken at lines 11—11 of Figure 2;

Figure 12 is a fragmentary sectional view taken at lines 12—12 of Figure 2;

Figures 13a, 13b and 13c are views sectionally taken through the die parts which support the terminal to be crimped and on an enlarged scale for diagrammatically illustrating various stages in the formation of a closed wire barrel from the ferrule-forming portions of the terminal during the crimping operation;

Figure 14 is a plan view of several of the terminals in strip form adapted to be crimped by the applicator assembly; and

Figure 15 is a fragmentary sectional view taken at lines 15—15 of Figure 2.

With reference to Figure 1 the illustrative embodiment of the terminal applicator includes, in general, a terminal guide and feeding assembly, generally designated at 10, and a terminal strip severing and crimping assembly, generally designated at 12. It is contemplated that assemblies 10 and 12 will be mounted in and driven by a conventional power press (not shown) which commonly includes a press bed, a ram movable along a confined path toward and away from the press bed, and a power unit for driving the ram. Such elements are conventional in the art, but for specific exemplary details of a press adaptable for use with the present invention, reference may be had to Patent No. 2,705,797, issued April 12, 1955, to George J. Handel Jr. The terminal applicator is coupled to the power press by means of a base plate 14 mounted in fixed position on the press bed.

Power is supplied to the applicator by means of the press ram 16, fragmentarily shown in Figure 1, which cyclically reciprocates toward and away from the base plate 14 in response to a triggering mechanism, not shown, such as a micro-switch or foot pedal controlled by an operator.

As will be developed more fully hereinafter, the illustrative machine is so constituted that upon each downward stroke of ram 16 a terminal is separated from a strip of terminals and crimped onto a conductor within the region of terminal application. On each upward stroke
of the ram the terminal strip is advanced so that the leading terminal is accurately disposed in the crimping region to complete a cycle of assembly operation. It is thus to be understood that guiding and feeding assembly 10 and severing and crimping assembly 12 are so coordinated in interaction whereby in every cycle of ram reciprocation the end terminal of the series or strip will be presented without fail in proper position, severed from the strip and crimped ready to be withdrawn by the operator in readiness for the next application cycle.

Figure 14 exemplifies the type of terminals in strip form adapted to be cramped by the actuator mechanism of the present invention. As shown, the terminal strip comprises a series of perforated open-barreled terminals 18 joined in strip fashion by connecting links 20. Each individual terminal 18 comprises a ferrule-forming portion including a base 22 along which a conductor is to be disposed and a pair of upstanding ears 24 and 26 which are adapted to be wrapped around a stripped portion and an insulated portion of the conductor respectively. Extending from one side of base section 22 is a contact portion 28 of a shape designed to meet the requirements of a particular use, typically a tab-receiving receptacle as shown. Ear 26 is adapted to be simply wrapped around the insulation support. Ear 24, as best shown in Figure 13, is also adapted to be wrapped around the conductor, but has an extension 30 for threading through a slot 32 in base 22 so as to be disposed across the underside of and subsequently indented into base 22 thereby locking ear 24 in ferrule-forming position. If desired, a pair of auxiliary tabs 34, one of which is shown in Figure 13, may be struck down from base 22 so as to receive ear extension 30 therebetween for further securing and locking the ferrule upon being coined into the side edges of extension 30, all of which is more particularly described in the aforesaid pending application Serial No. 451,870.

Feeding and guide assembly 10 which serves to position terminals 18 sequentially in the assembly 12 for crimping will now be described. The strip, as it is fed from a reel of terminals, not shown, is advanced to the region of the application across the upper surface of platform 42, to be more completely described. The leading end of the strip is supported from below by platform 42 and is prevented from moving sidewise on the surface of the platform to the left or right as viewed in Figures 11 and 12 by a guide channel 40 which substantially encloses and confines the strip as it moves into the channel at the end of platform 42 to the region of application. The guide channel extends from the forward end of platform 42, on the right as viewed in Figure 1, through a floating drag block assembly 48, to be later described, guide plate 44 and the strip feeding mechanism which is disposed adjacent the region of application on platform 42. In general, the guide channel is shaped to meet the requirements of a particular use and, for the form of terminals chosen to illustrate the present invention, should be generally L-shaped so as to accommodate in an accurate fit the upstanding ears 24 and 26 and the laterally extending contact portion 28. In order to prevent distortion of tabs 34, however, as the strip rides along the surface of platform 42, a groove 46 in platform 42 receives tabs 34 and has a depth such that the strip rides in channel 40 with the tabs free of contact with platform 42. More particularly, in the guide channel in the region of drag block assembly 48, ears 24 and 26 are confined by wall 50 in one direction and end face 52 of the base of L-shaped channel 40 confines the contact portion 28, Figure 12. On advancing beyond drag block assembly 48, guide plate 44, shaped to provide the base part of the L-shaped channel, confines contact portions 28 of the strip against movement in one direction to approximately the region of application. Near the crimping assembly 12 the feeding assembly serves to confine ears 24 and 26 to prevent movement of the strip laterally in the direction away from guide plate 44.

The feeding assembly, Figures 1, 2 and 11, includes a slide 54 mounted for reciprocatory motion above and along the strip by means of a pair of brackets 56 having grooves 58 in which the sides of the slide are received. Slide 54 carries a bifurcated bracket 60 between the leaves of which is pivotally mounted by pivot pin 64 a feed lever 62. Feed lever 62 is driven in coordination with ram 16 to effect a feeding operation in proper timed relationship by any suitable means such as a linkage connection with ram 16 or a separate air-driven unit as desired. Affixed to the underside of slide 54 are ears 66, to one side of channel 40 is a plate 68 provided with a recess 70 defined by leaves 71 between which a strip feed finger 72 is pivotally mounted by pin 74. Finger 72 is disposed horizontally relative to platform 42 and biased counterclockwise (Figure 2) out of recess 70 and into channel 40 by a spring 76 as shown in Figures 2 and 11.

In the position of the feeding mechanism shown in Figure 2 the feed lever has advanced slide 54 to the forward limit of its stroke and, through finger 72 engaging the rear side edge of ear 24, has delivered a measured push along the axis of the pinion on the feed lever to position the lead terminal in the crimping region. On rearward movement of slide 54, to the right in Figure 2, as urged by feed lever 62, feed finger 72 is cammed out of channel 40 back into recess 70 by virtue of a rear cam surface 78 thereof engaging the forward side edge of ear 26 of the terminal on which the next pushing operation is to be effected.

To assure that the terminal strip be firmly held against platform 42 so as to prevent the strip from moving backwardly upon being engaged by cam surface 78 on the rearward stroke of slide 54, floating drag block assembly 48 supplies sufficient downward pressure on the terminal strip to hold it in place by friction. As best shown in Figures 1 and 12, drag block assembly 48 includes a floating drag block 80 which overlies and forms a part of the terminal guide channel. Block 80 is retained in place by a pair of pins 82 which pass vertically through enlarged holes in the block and are rigidly carried by platform 42. A pair of helical springs 84, maintained around pins 82 by washers 86, act on the upper surface of block 80 to provide the required amount of downward pressure for maintaining the terminal strip in place. Preferably pins 82 are screw-threaded in platform 42, as shown, to provide for adjustment of the terminal strip. Springs 84 may be varied to provide an adjustment in the downward pressure on the strip. A lever 88 integrally attached to block 80 serves as a convenient means for lifting the block against the spring pressure when a new strip of terminals is to be threaded into the applicator.

The downward pressure on the strip may be exerted generally on the body of the individual terminals forming the strip. In the illustrated embodiment, however, pre-bending of the more or less delicate upstanding ears 24 and 26 should be avoided, hence it is preferable that block 80 act on the more rugged contact portion 28. Accordingly, the portion of guide channel 40 contoured to receive the terminal ears has sufficient height such that only face 89, overlying the contact portion 28 in the base portion of the L-shaped channel of block 80, engages the terminals.

As the feeding mechanism causes the slide 54 to travel forward and rearwardly, respectively to the left and right in Figure 2, feed finger 72 will ride to and fro within the guiding channel and will deliver the measured feeding stroke on its forward motion to advance the series of terminals in each cycle in the machine by an amount precisely equal to the distance between points of engagement on successive forwardward motion of the feed finger, drag block 80 supplies the holding power for the strip to assure camming of
feed finger out of the guide channel until it has passed beyond the rear side edge of the terminal next to be engaged.

As alluded to above, the applicator mechanism is designed to deliver the compound motion required to crimp the terminals such as have been selected to illustrate the present invention, that is, ear 24 must first be closed to ferrule-forming-position with ear end 30 disposed across the underside of the ferrule base 39 and rigidly affixed across the underside of the terminal next to be engaged. While in a sequential phase of operation the terminal is more fully cramped in voidless connection with the conductor and ear end 30 is locked to maintain ear 24 in ferrule-forming position. To these ears 24 and 26 the crimping assembly 12 is provided with a die set having a plurality of pairs of die parts, separate pairs being sequentially brought into operation to achieve the compound crimping action desired. To form ears 24 and 26 into ferrules surrounding the wire, the first pair of crimping dies includes curling dies 90 and 92 which act in cooperation with supporting die block 94 and are mounted in an open wall or upper die block 96 rigidly affixed to and driven by ram 16. Curling dies 90 and 92 are channelled to provide a pair of rounded faces, such as die face 98 in Figure 1, which serve to curl ears 24 and 26 to have a generally cylindrical cross section and form the insulation and wire barrels respectively on downward movement of ram 16. Preferably, curling dies 90 and 92 are separable plates which are separably secured together and to block 96 by any suitable means whereby substitution of different dimensioned dies is permitted to provide for the crimping of terminals of differing sizes. Supporting die block 94 mainly serves to support the body of a terminal during ferrule formation and is received in well 100 of platform 42 which, more specifically, is the upper surface of an elongated bar 101 pivotally mounted at one end on a pin 102 carried by supporting blocks 104 rigidly mounted on base plate 14, and resiliently supported at the other end by spring 106, platform 42 thus being initially maintained horizontally and spatially disposed relative to base plate 14 for reasons to become more apparent hereinafter. The upper level surface 105, Figure 1, of die block 94 is provided with an elongated concave recess 110 which is contoured to fit the contour of the ferrule and insulating ferrule-forming portion of terminal 16, Figure 13. The wire ferrule-forming portion of terminal 15 is received on anvil surface 112 of upper surface 103 and through which there is provided a slot or channel 114 that serves as a guide for bringing indentor 16, to be later described, into proper position of the wire ferrule-forming portion at tabs 34. In alignment with slot 32 of the terminal, anvil surface 112 is provided with a downwardly inclined camming surface 118 which directs ear end 30 into channel 114 and across terminal base portion 22 during the curling action of ear 24. It will, of course, be understood that curling die face 98 is so proportioned that on downward movement of ram 16 toward platform 42, ear 24 is curled, Figure 13b, such that ear end 30 is threaded through slot 32 and, on striking cam surface 118, is deflected to the position described.

Curling dies 90 and 92 on the initial portion of the downward stroke of ram 16 thus respectively form ear 26 into a ferrule tightly wrapped around the insulated portion of the wire and ear 24 loosely wrapped around the stripped portion of the wire as indicated in Figure 13b. clarifying the illustration of Figure 13 of the curling action involving ear 24, ear 26 has been left in its original upstanding position as the forming thereof will be apparent to those skilled in the art.

With the curling of the terminal ears 24 and 26 the first phase of the compound crimping action is completed. It remains, then, in the second phase of the crimping action to indent the terminal base through the ear end to achieve the desired voidless locked crimp. For this purpose indentor 116 is relatively moved upwardly in channel 114 to coast with curling die 92 engaged by the reduced cross-section to provide access to die block 94 from the underside of elongated bar 101, Figure 9. To effect the relative rise of indentor 116 in channel 114 during the downward stroke of ram 16, the end face 124 of curling die 92 engages the lower level surface 126 of supporting die 94, Figure 10, and depresses or indentor platform 42 about pivot pin 102 against the tension of spring 106. Except for the pressure exerted by spring 106 through unvil 112 on the ferrule as thus far formed thereby counteracting any springback tendency of wrapped ear 24, die block 94 is effectively inactive during the second phase of operation.

It will be understood that spring 106 is sufficiently strong to maintain platform 42 of elongated bar 101 relatively immobile during the initial phase of the crimping operation and curling of ears 24 and 26, but should not require an undue amount of pressure from ram 16 to deflect in the second phase of the indenting operation. Moreover, spring 106 must be sufficiently elastic so as to return platform 42 to precisely the horizontal starting position at the end of each cycle of crimping operation even after a considerable number of application cycles. To assure that platform 42 and die block 94 are precisely positioned relative to curling dies 90 and 92 at the start of each cycle, spring 106 is prepositioned whereby to bias the end of platform 42 against a pair of stops 128 on posts 130 rigidly mounted on base plate 14. In addition, it is to be observed that the point at which force is exerted by ram 16 on die block 94 in lowering platform 42 is intermediate the pivot point 102 and resilient support of elongated bar 101, and hence, spring 106 acts with a mechanical advantage thereby permitting the use of a lighter spring of less stringent qualities. In the illustrated embodiment the pressure point on bar 101 is advantageously placed approximately one-third the distance along platform 42 to spring 106 from pivot point 102 providing a three-to-one mechanical advantage for the spring. The resultant action is best illustrated diagrammatically in Figure 8, Figure 5c showing the position of platform 42 relative to anvil 116, pivot point 102 and spring 106 prior to engagement at the point indicated by the arrow of curling die face 134 with surface 126 of die block 94 and Figure 5b illustrating the relationship of the parts at the end of the downward stroke of ram 16.

In the first phase of crimping most of the pressure imparted to the terminal is directed downwardly along the terminal ears at one side of the terminal base portion. As a result, there is a tendency of the terminals to tilt or cant within the crimping dies. To counteract this tendency there is provided on platform 42 adjacent the crimping region, a positioning plate 132 which restrains the contact portion 28 of the terminal against upward lateral movement relative to platform 42 during crimping. Positioning plate 132 includes an integral overhanging plate 134 which, with the upper face of platform 42, provides a confining channel in which the end of contact portion 28 rides during the movement of the strip through the crimping region. To assure that the end of contact portion 28 enters into the channel defined by plate 134, the initial portion 136 of plate 134, opposed to platform 42, is inclined relative to the plane of platform 42 to enlarge the entering end of the channel, Figure 15.

Preferably prior to the depression of platform 42 and
final crimping of the wire barrel, the leading connecting link 20 of the terminal strip is severed or slugged out to detach the leading terminal 18 from the strip. To this end a shear block 138 which, at the start of the crimping cycle, rests in contact with connecting link 20, as shown in Figure 6, is depressed, Figure 7, by shear block depressor 140 mounted on upper die block 55 with the result that the cutting edges 142 and 144 thereof, cooperating with the cutting edges of shear plates 146 and 148 respectively, sever the ends of the connecting link adjacent the two leading terminals as shown. Shear plates 146 and 148 are received in slots 150 and 152 respectively in platform 42 and secured therein by positioning plate 132 which forcefully bears against the surface of platform 42 and the top surface of the shear plates on urging by threaded bolts 154 set in slots 156 of positioning plate 132 and screwed into platform 42.

Slots 150 and 152 lead into well 100 so that shear plates 146 and 148 traverse the well extension 123 whereby the links 20 on being severed from the strip may drop through elongated bar 101, Figure 7, and be collected for disposal on base plate 14. As best shown in Figure 5, the cutting edge of shear plate 148 is the heel of a relatively thin blade abutted against die block 94 adjacent anvil surface 112 so that the connecting link will be severed as close to the terminal base as is practical thereby avoiding excessive stub lengths on the finished part.

To raise shear block 138 up from between shear plates 146 and 148 to permit the next terminal to be fed to crimping position on die block 94, the shear block is mounted on the end of supporting slide 158 which is received for sliding movement in channel 160 of platform 42. Extending laterally from supporting slide 158 is a pin 162 which is engaged by hooked lever 164 which is pivotally mounted on pin 166 rigidly attached to upper block 96, and raised on the upward stroke of ram 16 thus to elevate shear block 138 during the period in which the terminal strip is advanced by feeding mechanism 10. Advantageously, shear block 138 is returned to position in contact with link 20 prior to the start of the crimping cycle whereby to secure the lead connector in crimping position in readiness for the operator to initiate the next crimping cycle. For this purpose hooked lever 164 is provided with a laterally extending cam block 168 which cooperates with a stationary cam roller 170 to swing lever 164 out of engagement with pin 162 just before ram 16 reaches the limit of its stroke, roller 170 being journaled on a pin 172 carried by a plate 174 fixed to base plate 14. As ram 16 rises on its upward stroke, cam 168 is forced to the right in Figure 5 ultimately to release hooked lever from pin 162 permitting tension spring 176 to withdraw supporting slide 158 down in channel 160 thus to return shear block 138 into contact with connecting link 20. In this connection to assure the proper alignment of shear block 138 with respect to shear plates 146 and 148, the lower sides of shear block 138 are beveled and project below the level of cutting edges 142 and 144, as at 177, whereby to lead or guide the lower half of the shear block in between the slug-out plates. A spring 178 biases hooked lever 164 toward pin 162 to return the pin and lever to latched engagement on the downward stroke of ram 16. In the event shear block 138, or any of the parts associated therewith, jams in operation, it is desirable that the coupling between ram and the shear block be automatically released to prevent damage to the parts. For this purpose hooked lever 164 is formed in two parts, one slidably received in the other and biased to act as a unit only during normal operation. Thus, as best shown in Figure 5, the lower part of lever 164 is pivotable in the upper part, tension spring 179 interconnecting the parts together by connection at one end to the upper part and at the other end to a pin 180 on the lower part extending through a slot 181 of the upper part.
one form of terminal, other terminals similar, for example, to those shown but differing in size, are contemplated for use with the machine by the suitable adjustment or interchange of the parts, permitting the machine to accommodate a range of terminal sizes. For example, it is contemplated that the guide plates 44, positioning plate 132, and curling dies 98, 92 are adjustable or interchangeable in accordance with desired size or size of terminal to be cramped. In addition, other advantageous adjustments of the parts will be apparent to those skilled in the art for facilitating the initial setup of the machine or compensating for wear in the machine after prolonged use. For example, distributor 140 conveniently is screw-threaded into block 96 whereby to vary the time relationship in the applicator cycle when shear block is depressed. The tension in platform spring 106 may also be adjustable, by any suitable means, so as to assure after prolonged use that the spring tension is sufficient to force the end of platform 42 against stops 126 in the rest position of the machine. Furthermore, the form of the crimping dies is exemplary and that die parts of different configurations will be utilized in accordance with the design of the terminals and the crimping operations necessary to effect the formation of the finished connection.

We claim:

1. An applicator mechanism for applying to a conductor a connector having a ferrule-forming ear comprising an anvil resiliently mounted on the press bed of said mechanism and having a die face for supporting the connector in crimping position, guiding means in said die face, a ram movable toward and away from said anvil, a crimping die on said ram for cooperation with said die face on movement of said ram toward said bar to curl the ear to form a ferrule, said guiding means being positioned to deflect the ear end across the bottom of the ferrule, the resilient mounting for said anvil being sufficiently stiff to maintain said die face in fixed position during ferrule formation, an indentor fixed relative to the press bed and relatively slidable in a channel in said anvil for indenting the ferrule bottom, and means coupled to said ram for depressing said anvil after ferrule formation to cause said indentor relatively to slide in said channel.

2. An applicator mechanism for applying to a conductor a connector having a ferrule-forming ear and a slot for receiving the ear comprising an anvil resiliently mounted on the press bed of said mechanism and having a die face for supporting the connector in crimping position, guiding means in said die face, a ram movable toward and away from said anvil, a crimping die on said ram for cooperation with said die face on movement of said ram toward said anvil to curl the ear to form a ferrule and to thread the end of the ear through the slot, said guiding means being positioned to deflect the ear end across the bottom of the ferrule, the resilient mounting for said anvil being sufficiently stiff to maintain said anvil in fixed position during ferrule formation, an indentor fixed relative to the press bed and relatively slidable in a channel in said anvil for indenting the ferrule bottom, and means coupled to said ram for depressing said anvil after ferrule formation to cause said indentor relatively to slide in said channel.

3. An applicator mechanism for applying to a conductor a connector having a ferrule-forming ear and a slot for receiving the ear comprising an anvil resiliently mounted on the press bed of said mechanism, the other end of said bar being resiliently supported in a predetermined position relative to the press bed, an anvil mounted on said bar and having a die face for supporting the connector in crimping position, guiding means in said die face, a ram movable toward and away from said anvil, a crimping die on said ram for cooperation with said die face on movement of said ram toward said bar to curl the ear to form a ferrule and to thread the end of the ear through the slot, said guiding means being positioned to deflect the ear end across the bottom of the ferrule, the resilient support being sufficiently stiff to maintain said anvil in fixed position during ferrule formation, an indentor fixed relative to the press bed and relatively slidable in a channel in said anvil for indenting the ferrule bottom, and means coupled to said ram for depressing said anvil after ferrule formation to cause said indentor relatively to slide in said channel, feeding means for positioning the lead connector of a connector strip on said die face in each cycle of ram operation, and serving means operative in timed relationship with said ram and feeding means to detach the lead connector from the strip.

4. An applicator mechanism for applying to a conductor a connector having a ferrule-forming ear and a slot for receiving the ear comprising an anvil resiliently mounted on the press bed of said mechanism, the other end of said bar being resiliently supported in a predetermined position relative to the press bed, an anvil mounted on said bar and having a die face, a ram movable toward and away from said anvil, a crimping die on said ram for cooperation with said die face on movement of said ram toward said bar to curl the ear to form a ferrule and to thread the end of the ear through the slot, said guiding means being positioned to deflect the ear end across the bottom of the ferrule, the resilient support being sufficiently stiff to maintain said anvil in fixed position during ferrule formation, an indentor fixed relative to the press bed and relatively slidable in a channel in said anvil for indenting the ferrule bottom, and means coupled to said ram for depressing said anvil after ferrule formation to cause said indentor relatively to slide in said channel.

5. An applicator mechanism for applying to a conductor a connector having a ferrule-forming ear and a slot for receiving the ear comprising an anvil resiliently mounted on the press bed of said mechanism, the other end of said bar being resiliently supported in a predetermined position relative to the press bed, an anvil mounted on said bar and having a die face for cooperation with said die face on movement of said ram toward said bar to curl the ear to form a ferrule and to thread the end of the ear through the slot, said guiding means being positioned to deflect the ear end across the bottom of the ferrule, the resilient support being sufficiently stiff to maintain said anvil in fixed position during ferrule formation, an indentor fixed relative to the press bed and relatively slidable in a channel in said anvil for indenting the ferrule bottom, and means coupled to said ram for depressing said anvil after ferrule formation to cause said indentor relatively to slide in said channel.
7. In an applicator mechanism for applying to a conductor a connector having a ferrule-forming ear, a frame, a supporting die on said frame and having a surface shaped to support a connector in position to be crimped, a channel in said supporting die intersecting said surface, a forming die mounted on said frame transversely spaced from said supporting die surface and movable relatively toward said supporting die to cooperate therewith to form the ear into a ferrule, an indenter mounted on said frame on the side of said supporting die surface which is opposite to said forming die, said indenter being slidably receivable in said channel and into cooperation with said forming die to reduce the cross-section of the ferrule after formation, said forming die and supporting die being arranged in said frame so as to be simultaneously movable as a unit relatively toward said indenter, and means operative in a first part of the applicator cycle to move said forming die relatively toward said supporting die to close said forming and supporting dies in cooperative relationship, said operating means further being operative in a second part of the applicator cycle subsequently to move said forming and supporting dies as a unit relatively toward said indenter to cause said indenter to slide in said channel and into cooperative relationship with said forming die.

8. An applicator mechanism according to claim 7 wherein said indenter is fixed in said frame, said operating means being operative to move said forming die toward said indenter in said first and second parts of the applicator cycle, said forming die being arranged to engage and move said supporting die therewith toward said indenter in said second part of the applicator cycle.

9. In an applicator mechanism for crimping to a conductor wire a connector having a ferrule portion and joined to like connectors in a strip, a frame, an anvil mounted in said frame and having a shaped surface for supporting the lead connector during crimping of the ferrule, a ram movable toward and away from said surface and carrying crimping means to cooperate with said surface to crimp the ferrule portion in the toward movement of said ram, feeding means operative in timed relation with said ram to engage and move the connector strip subsequent to the crimping movement of said ram to position the lead connector on said anvil, a severing blade mounted in said frame adjacent said anvil and across which the strip is fed, a severing blade movably mounted in said frame in alignment with said severing blade and movable toward and away from said severing blade to cooperate therewith to detach the lead connector from the strip, said severing bar having a rest position wherein the portion of the strip joining the two leading connectors is engaged between the severing bar and the blade when the lead connector is in crimping position, and actuating means operative in timed relation with said ram to sequentially move said severing bar from said rest position toward said blade during crimping movement of said ram for severing the lead connector from the strip, to move said severing bar away from said blade during feeding operation of said feeding means, and to return said severing bar to said rest position after said feeding operation but before movement of said ram toward said anvil.

10. An applicator mechanism according to claim 9 wherein said severing bar has a surface disposed adjacent and extending substantially transversely to the anvil shaped surface when said severing bar is in said rest position to provide a wire stop to limit insertion of the conductor into the applicator.

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