April 19, 1960 Q. BERG 2,932,826

MULTIPLE APPLICATOR

Filed Aug. 19, 1955 3 Sheets-Sheet 1

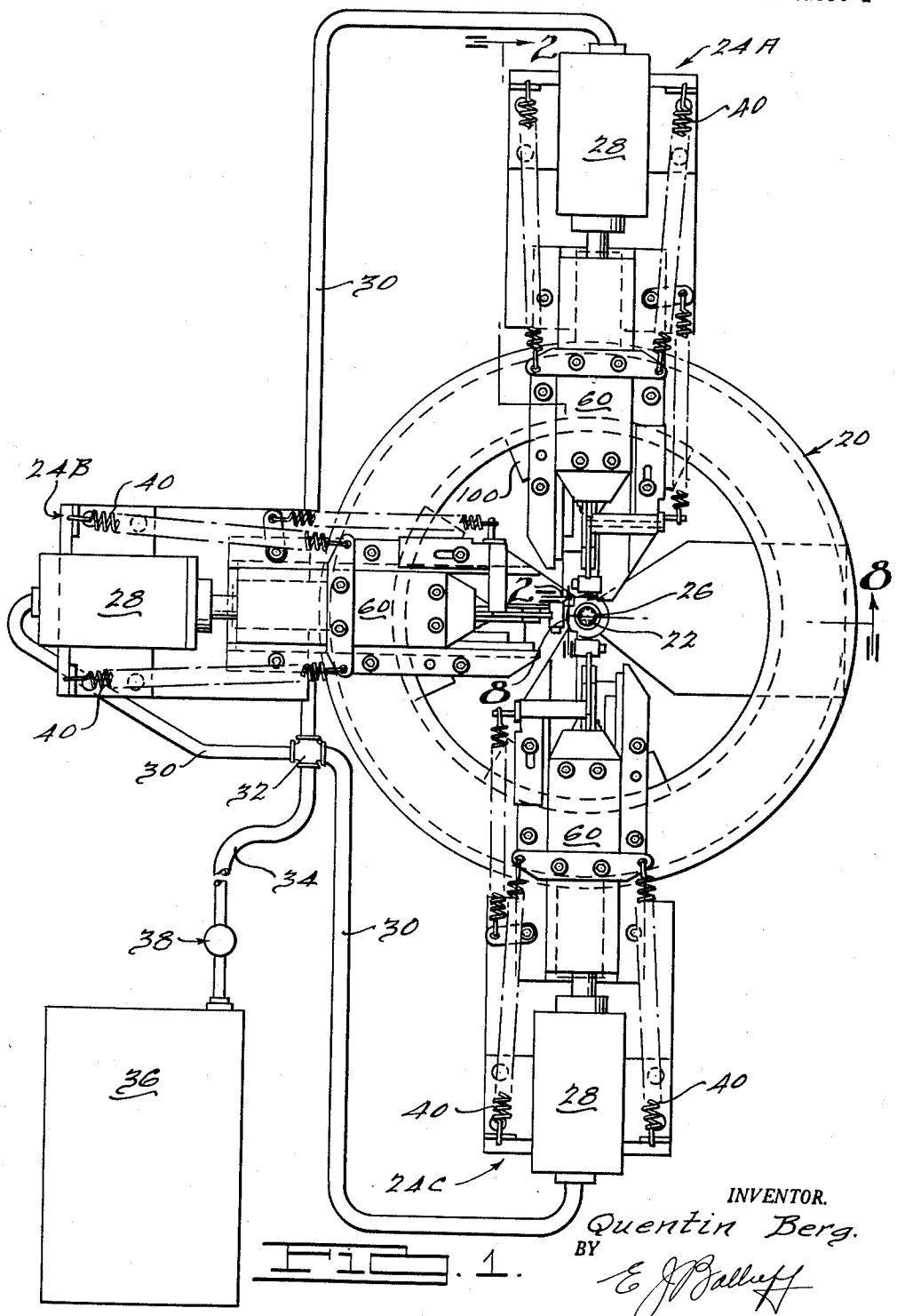


FIG. 1.

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April 19, 1960 Q. BERG 2,932,826

MULTIPLE APPLICATOR

Filed Aug. 19, 1955 3 Sheets-Sheet 2

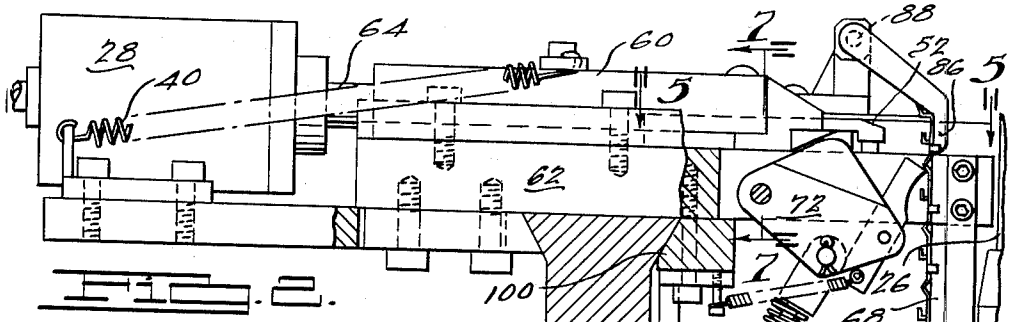


FIG. 2.

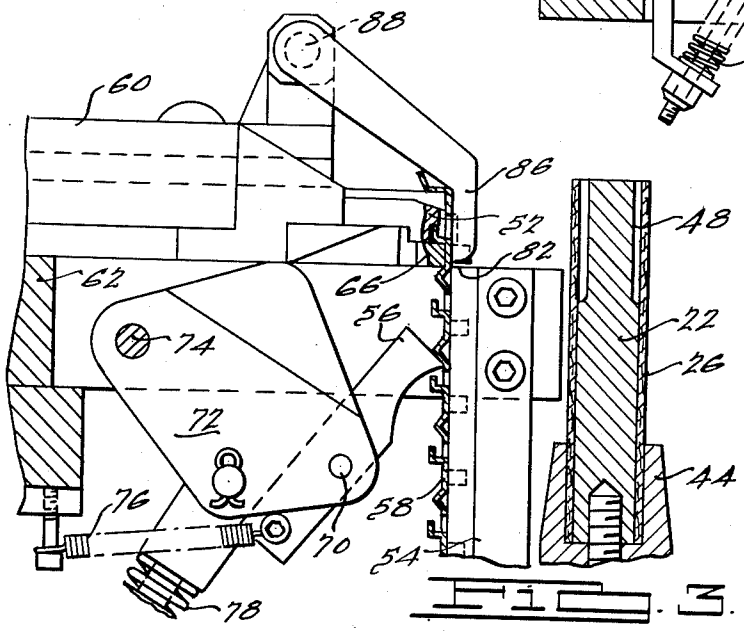


FIG. 3.

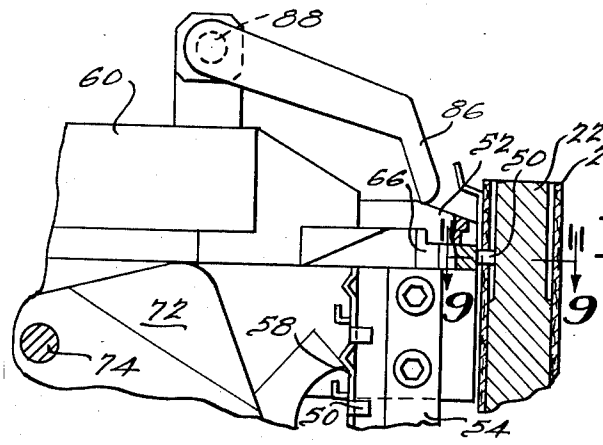


FIG. 4.

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MULTIPLE APPLICATOR

Filed Aug. 19, 1955 3 Sheets-Sheet 3

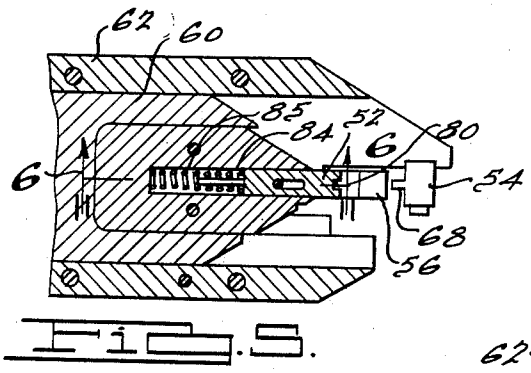


FIG. 5.

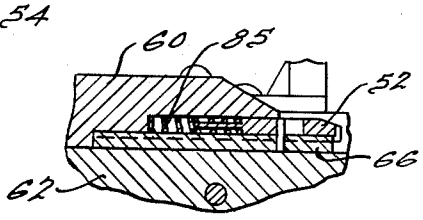


FIG. 6.

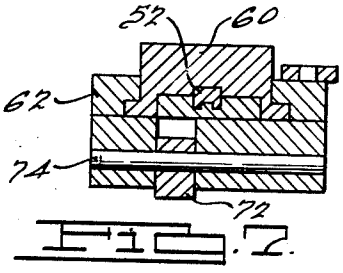


FIG. 7.

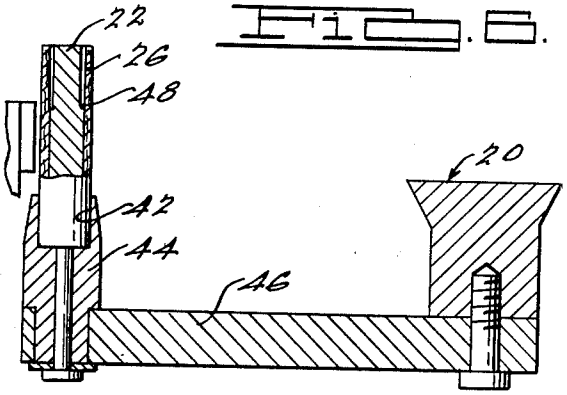


FIG. 8.

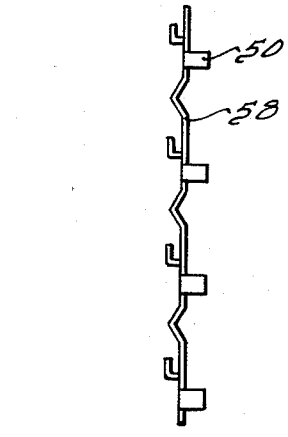


FIG. 10.

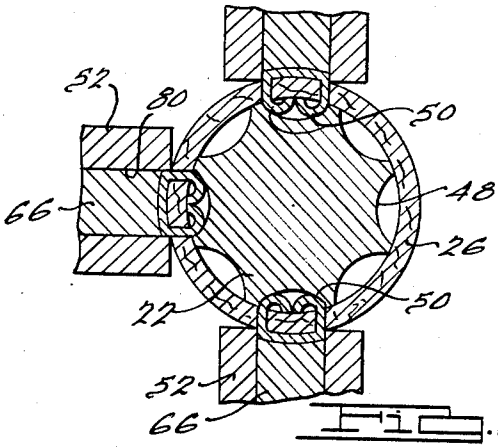


FIG. 9.

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United States Patent Office 2,932,826 Patented Apr. 19, 1960

2,932,826

MULTIPLE APPLICATOR

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Application August 19, 1955, Serial No. 529,531

3 Claims. (Cl. 1—2)

This invention relates to applicators for terminals and the like, and has particular reference to a multiple applicator which is constructed and operable for simultaneously applying a plurality of terminals to a spool or coil form.

As illustrated in the drawings, a machine embodying the invention consists of a ring with a central work holding arbor and a series of applicators adjustably mounted on the ring, each of the applicators being constructed and operable so as to apply a terminal from a strip to the form on the arbor, said machine including provisions for simultaneously effecting the operation of said applicators. The forms to which the terminals are applied may be supplied to and removed from the arbor either manually or automatically by a machine.

A principal object of the invention is to provide a novel and improved machine for applying terminals.

Other and further objects of the invention will be apparent from the following description and claims and may be understood by reference to the accompanying drawings, of which there are three sheets, which by way of illustration show a preferred embodiment of the invention and what I now consider to be the best mode in which I have contemplated applying the principles of my invention. Other embodiments of the invention may be used without departing from the scope of the present invention as set forth in the appended claims.

In the drawings:

Fig. 1 is a plan view, partially diagrammatic, of a multiple applicator embodying the invention;

Fig. 2 is an enlarged fragmentary view of one of the applicators taken along the line 2—2 of Fig. 1;

Fig. 3 is an enlarged fragmentary view illustrating some of the parts shown in Fig. 2 in a different position;

Fig. 4 is another view similar to Fig. 3 but showing the parts in a still different position;

Fig. 5 is a fragmentary sectional view taken along the line 5—5 of Fig. 2;

Fig. 6 is a fragmentary sectional view taken along the line 6—6 of Fig. 5;

Fig. 7 is a fragmentary sectional view taken along the line 7—7 of Fig. 2;

Fig. 8 is a sectional view taken along the line 8—8 of Fig. 1;

Fig. 9 is an enlarged sectional view taken along the line 9—9 of Fig. 4; and

Fig. 10 is an enlarged view of a strip of terminals applied by the machine to the form.

As illustrated in Fig. 1, the machine consists of a ring or annular base 20 provided with a central arbor 22 and a series of identical applicators 24A, 24B, 24C, adjustably mounted on the base 20 and operable for simultaneously applying a plurality of terminals to the form 26 positioned on the arbor 22. Each of the applicators includes an air cylinder and position unit 28 which forms a power means for operating the applicator. The cylinders 28 are connected by fluid pressure lines 30 to a manifold 32, which in turn is connected by fluid pressure line 34 with a source of pressure fluid 36, a valve 38 being provided for controlling the feeding of pressure fluid to the cylinder units 28 so as to effect the operation thereof.

As illustrated, the cylinder units 28 are set up so that the pressure fluid effects the power stroke of the applicator while springs 40 are employed to effect the return stroke thereof. Depending upon the type of valve employed for controlling the supplying of pressure fluid to the cylinders 28 and the release of pressure fluid therefrom at the end of the power stroke, the characteristics of the springs 40, and other relevant factors, the applicators may be operated through a wide range of speeds. Operation of the valve 38 will effect the simultaneous operation of the piston and cylinder units 28 and thereby simultaneously operate the applicators 24A, B and C to apply terminals to the form 26. Upon the return stroke of the applicators the coil form 26 with the terminals secured thereto is removed from the arbor and a new one positioned on the arbor 22 so as to be supplied with terminals upon the next power stroke of the applicators 24A, B and C.

As illustrated in Fig. 8, the arbor 22 may be movably supported by a pin 44 which is carried by an arm 46, which in turn is carried by the ring 20. The coil form 26 is removably positioned on the arbor 22 and within the socket 42 provided in the pin 44. The arbor 22 is provided with a series of axially extending flutes 48 in its outer periphery, the flutes functioning to engage the prongs 50 of a terminal as the prongs pass through the wall of the form 26 and to deflect such prongs so as to bend them back upon themselves, thereby securely affixing the terminal to the form 26.

As shown more clearly in Figs. 2, 3, 4 and 5, each of the applicators is constructed and operable so as to apply a terminal to the form 26, and comprises a terminal holder 52, means including a guide 54 and a reciprocating dog 56 for feeding a strip 58 of terminals one by one to the holder 52. The holder 52 is carried by a slide 60 which is reciprocably mounted on a guide 62, the slide 60 being connected by piston rod 64 to the piston of the cylinder and piston unit 28 so that upon energization of the unit 28 the slide 60 will advance from the position shown in Fig. 2 to that shown in Fig. 4 to apply the end terminal of the strip 58 to the form 26. As the slide advances, the cutting edge of an anvil 66 cooperates with the cutting edge of the guide 54 so as to shear the end terminal from the strip 58. The anvil functions as a means for ejecting the end terminal of the strip 58 from the holder 52 and for driving the prongs 50 through the wall of the form 26, and as previously noted, the arbor 22 is positioned so as to deflect the prongs 50 as they project through the wall of the form to curl the prongs back upon themselves and into the form 26 so as to securely affix the terminal to the form 26.

A strip 58 of terminals or similar elements is supplied from a coil (not shown) to the guide 54 and so as to slide along the rib 68 with the prongs 50 of the terminal straddling the rib 68. The dog 56, as previously noted, cooperates with the guide 54 to form a means for feeding the terminals of the strip one by one to the holder 52. The dog 56 is pivoted at 70 to a cam 72 which is pivoted at 74 to the guide 62. A spring 76 connected to one end of the dog 56 constrains the feeding end of the dog 56 into position to engage portions of the strip 58 for advancing the strip 58 as the cam 72 is reciprocated. A spring 78 reacts on the cam 72 in such a manner as to cause the dog 56 to advance the strip 58 one terminal. A part of the cam 72 is positioned in the path of the slide 60, as shown in Fig. 2, so that as the slide 60 advances toward the form 26, the cam 72 and the dog 56 will be deflected to engage the next terminal

of the strip 58. A weighted drag or shoe 73 pivotally carried on a link 75 pivoted in turn to the guide 54 rides the strip 58 so that upon the retractile stroke of the dog 56 the strip 58 will be held against retractile movement.

Thus, as the slide 60 is retracted by the springs 40 and moves out of the path of the cam 72, the spring 78 will advance the strip 58 so as to position the next terminal in the holder 52. The holder 52 is slotted as indicated at 80 for receiving the lead terminal with the prongs 50 of the terminal facing toward the form 26. The prongs 50 of the terminal flare outwardly sufficiently so as to engage the sides of the slot 80 thereby to position the end terminal in the holder 52. As the slide moves from the position shown in Fig. 2 to that shown in Fig. 3, the anvil 66 which reciprocates in the lower portion of the slot 80 engages one side of the terminal in the holder 52, as shown in Fig. 3, and cooperates with the upper edge 82 of the guide 54 so as to shear the terminal in the holder 52 from the strip 58 as the slide 60 advances toward the form 26. As the slide advances from the position shown in Fig. 3 to that shown in Fig. 4, the lead terminal is moved toward the form 26 and the anvil 66 serves to drive the prongs 50 of the terminal through the wall of the form 26, as shown in Fig. 9. The form 26 usually consists of a paper or fiber tube, although it may take other forms.

As shown in Fig. 5, the holder 52 is yieldably mounted in a guide 84 and biased outwardly by a spring 85 so that when the holder 52, which is bifurcated, engages the form 26, the anvil 66 will continue to move with the slide 60 and drive the prongs of the terminal through the wall of the form 26 (Fig. 9). As the pressure fluid in the unit 28 is released, the springs 40 will retract the slide, thereby restoring the parts to the position as shown in Fig. 2 and permitting the dog 56 to advance the strip of terminals so that the upper terminal of the strip will be positioned in the path of movement of the holder 52. The retracted position of the slide 60 may be set at any desired point, but it should be sufficiently retracted so as to permit the strip 58 to advance the lead or end terminal into a position to be engaged by the holder 52 when the slide 60 is advanced.

A spring pressed finger 86 pivoted at 88 is arranged in line with the rib 68 so as to be straddled by the prongs 50 of the upper terminal, and so as to cooperate with the upper terminal in seating it in the holder 52 as the holder 52 advances toward the form 26. It will be understood that upon the retractile stroke of the slide 60, the holder 52 will move out to a position where it projects beyond the anvil 66, thereby to permit the prongs of the upper terminal to engage the sides of the slot 80 in the holder 52 so that the holder 52 will hold the upper terminal after it has been severed from the strip 58.

It is to be understood that the applicators are adjustably positioned on the ring 20, thereby enabling the applicators to be shifted around the ring so that the terminals may be applied to any particular peripheral portion of the form 26. Obviously, a greater or lesser number of applicators may be employed, and the lugs 100 on the under side of the applicators which define the groove in which the ring 20 slides may be set so as to clamp each applicator in a predetermined position on the ring 20. It should also be noted that the longitudinal flutes 48 in the arbor 22 permit the form 26 with the terminals applied thereto to be slid off the upper end of the arbor.

While I have illustrated and described a preferred embodiment of my invention, it is understood that this is capable of modification, and I therefore do not wish to be limited to the precise details set forth but desire to avail myself of such changes and alterations as fall within the purview of the following claims.

I claim:

1. Apparatus for applying preformed pronged terminals to a form and comprising a base having a work holding arbor adapted for holding the form to which terminals

are to be applied, an applicator mounted on said base to apply a terminal to said form while on said work holding arbor, said applicator comprising a reciprocable terminal holder having a terminal receiving slot in the end thereof, means for feeding a strip of preformed pronged terminals one by one to said holder and operable in a retracted position of said holder for positioning the lead terminal in said slot in said holder with its prong projecting toward said form, a spring pressed finger engageable with said lead terminal for seating it in said slot, reciprocating means for advancing said holder with such lead terminal positioned therein toward said form and for retracting said holder after the discharge of such terminal therefrom, means for severing said lead terminal positioned in said holder from said strip as said holder advances toward said form, said holder advancing means including means operable in the advanced position of said holder for ejecting said terminal from said slot in said holder and for driving the prong of said terminal into said form, said applicator being disposed laterally of said work holding means so that said work holding means is exposed for the application of forms thereto and the removal of forms therefrom without interference from said applicator and without displacing said applicator relative to said work holding means.

2. Apparatus for applying preformed pronged terminals to a form and comprising a ring having a work holding means positioned centrally thereof adapted for holding the form to which terminals are to be applied, an applicator mounted on said ring to apply a terminal to said form while on said work holding means, said applicator comprising a reciprocable terminal holder, means for feeding a strip of preformed pronged terminals one by one to said holder and operable in a retracted position of said holder for positioning the lead terminal in said holder with its prong projecting toward said form, reciprocating means for advancing said holder with said lead terminal positioned therein toward said form and for retracting said holder after the discharge of such terminal therefrom, means for severing said lead terminal positioned in said holder from said strip as said holder advances toward said form, said holder advancing means including means operable in the advanced position of said holder for ejecting said terminal in said holder therefrom and for driving the prong of said terminal into said form, said applicator being disposed laterally of said work holding means so that said work holding means is exposed for the application of forms thereto and the removal of forms therefrom without interference from said applicator and without displacing said applicator relative to said work holding means.

3. Apparatus for applying preformed pronged terminals to a form and comprising a ring having a work holding means adapted for holding the form to which terminals are to be applied, an applicator adjustably positioned on said ring to apply a terminal to said form, said applicator comprising a reciprocable terminal holder, means for feeding a strip of preformed pronged terminals one by one to said holder and operable in a retracted position of said holder for positioning the lead terminal in said holder with its prong projecting toward said form, reciprocating means for advancing said holder with such lead terminal positioned therein toward said form and for retracting said holder after the discharge of such terminal therefrom, means for severing said lead terminal positioned in said holder from said strip as said holder advances toward said form, said holder advancing means including means operable in the advanced position of said holder for ejecting said terminal in said holder therefrom and for driving the prong of said terminal into said form, said applicator being disposed laterally of said work holding means so that said work holding means is exposed for the application of forms thereto and the removal of forms therefrom without interference from said

applicator and without displacing said applicator relative to said work holding means.

References Cited in the file of this patent

UNITED STATES PATENTS

187,843	Goodhue	Feb. 27, 1877
828,842	Craig	Aug. 14, 1906
1,949,377	Meldrum	Feb. 27, 1934
1,958,492	Newhouse	May 15, 1934
2,006,776	Roehm	July 2, 1935
2,540,106	Eichelberger	Feb. 6, 1951
2,643,378	Williamson	June 30, 1953
2,696,612	Rickus	Dec. 14, 1954
2,705,797	Handel	Apr. 12, 1955
2,768,378	Zwick	Oct. 30, 1956