

Oct. 21, 1952

W. A. ERHARDT, JR.
MACHINE FOR MOUNTING SNAP FASTENERS OR THE LIKE
HAVING TAPE ADVANCING MEANS

2,614,714

Filed Dec. 19, 1946

3 Sheets-Sheet 1

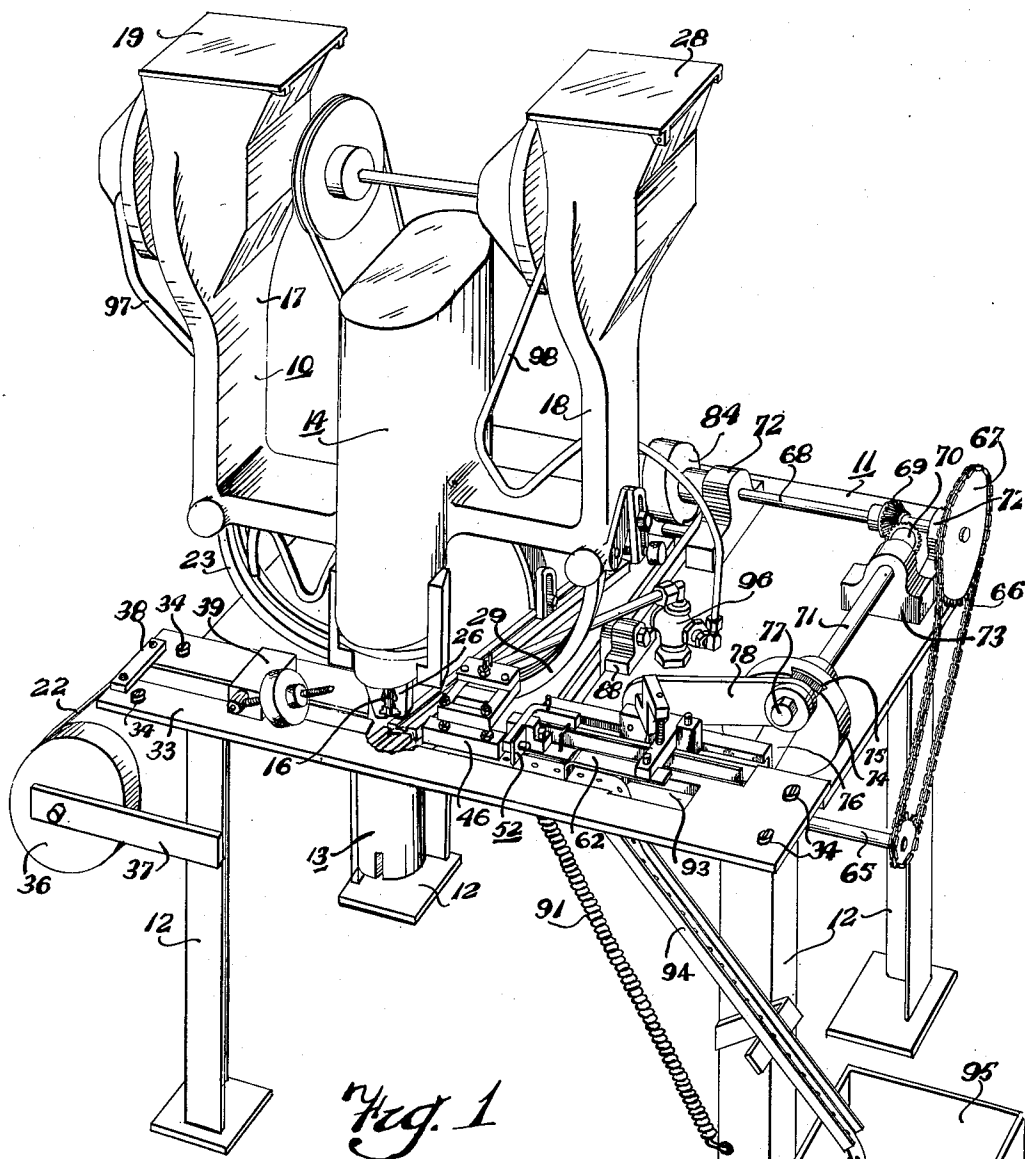


Fig. 1

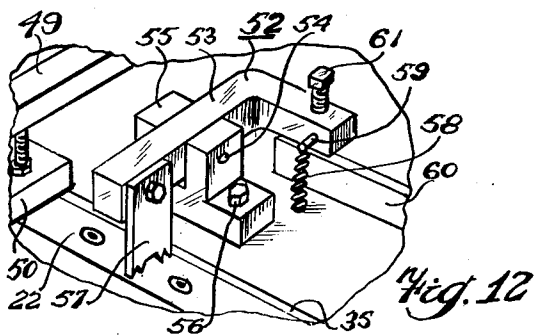


Fig. 12

INVENTOR
William A. Erhardt Jr.
BY
Leonard L. Kalish
Attorney

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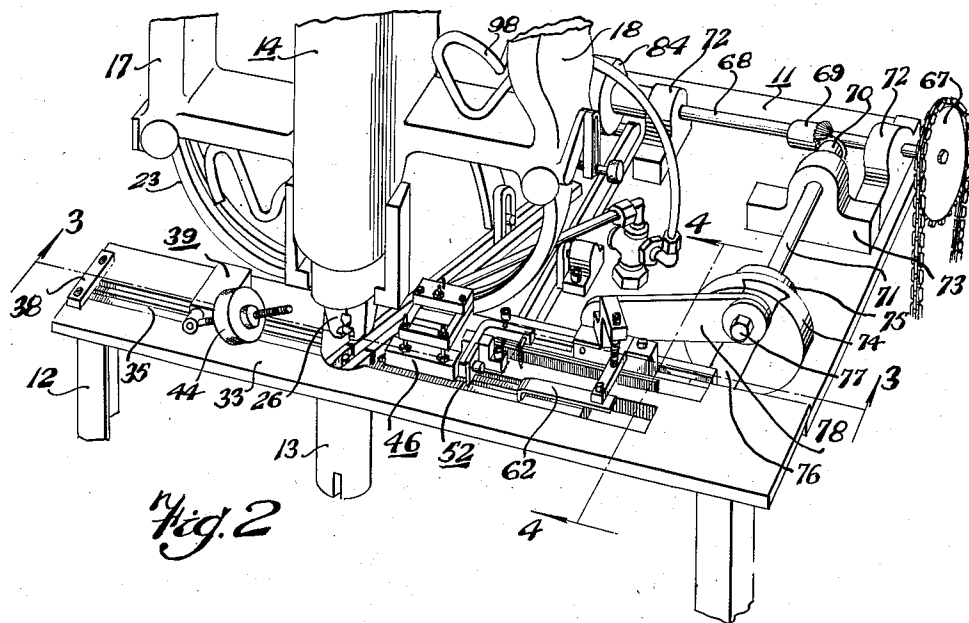


Fig. 2

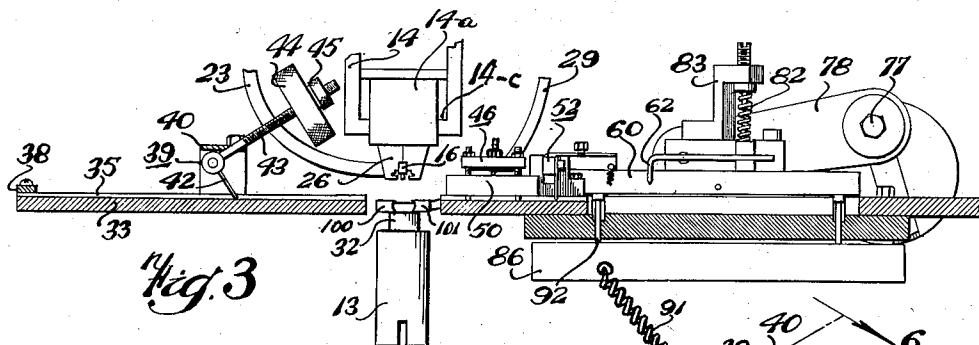


Fig. 3

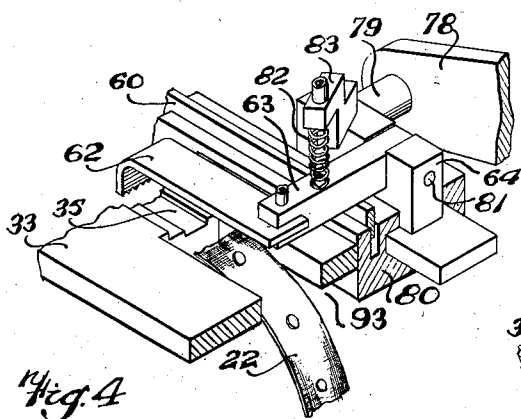


Fig. 4

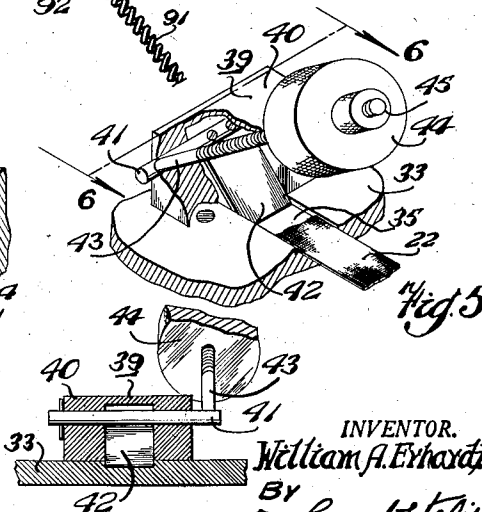
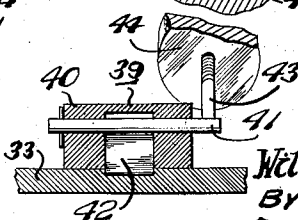


Fig. 5



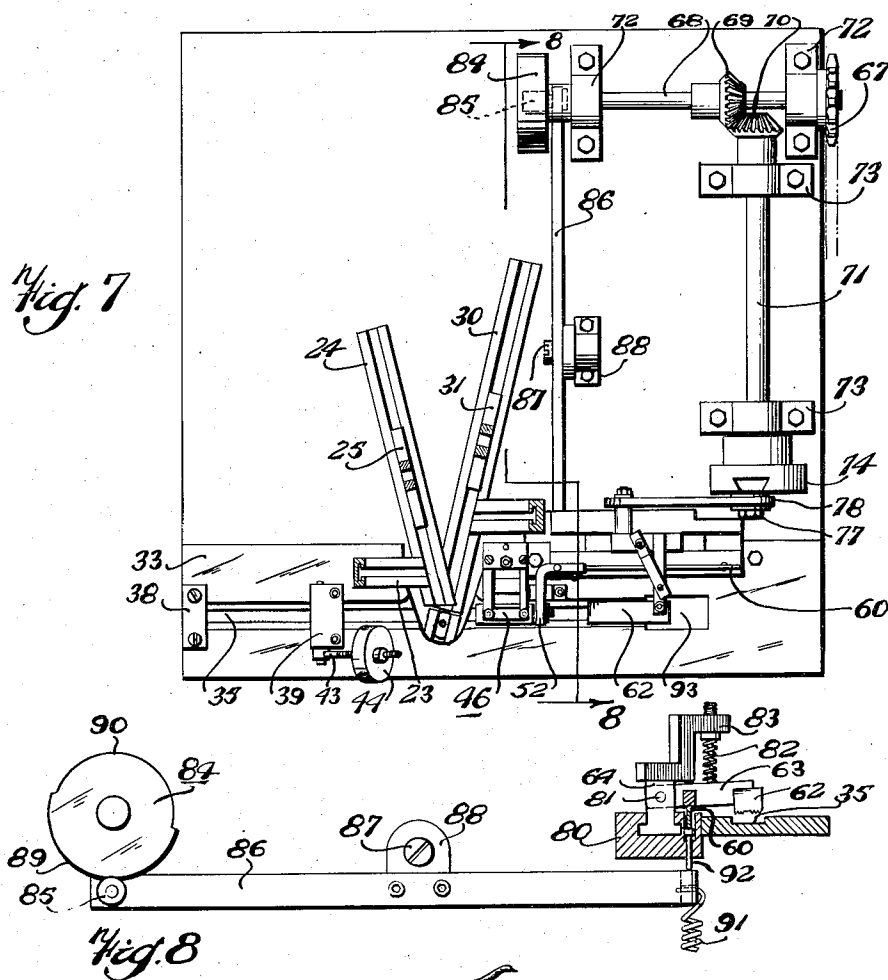
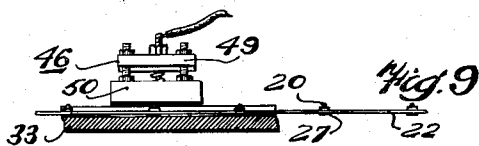
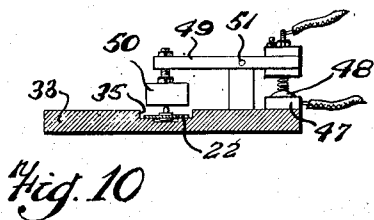
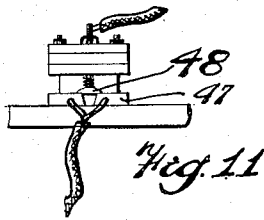
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William A. Erhardt Jr.
BY
Leonard L. Kalish
Attorney

UNITED STATES PATENT OFFICE

2,614,714

MACHINE FOR MOUNTING SNAP FASTENERS OR THE LIKE HAVING TAPE ADVANCING MEANS

William A. Erhardt, Jr., Philadelphia, Pa., assignor to Conso Fastener Corporation, Philadelphia, Pa., a corporation of New York

Application December 19, 1946, Serial No. 717,223

6 Claims. (Cl. 218—6)

1

The present invention relates to certain new, useful and improved tape, sheet or strip feeding and controlling apparatus or mechanism for use in conjunction with or attached to snap-fastener-attaching or grommet-attaching or eyelet-attaching machines, as, for instance, the fastener-attaching machines of the United-Carr Fastener Corp., of Cambridge, Mass., exemplified by their Model M-245 and also illustrated in their Patents Nos. 1,944,510; 2,028,704; and 1,873,890.

An object of the present invention is to effect an intermittent and automatic feeding of the tape, strip or sheet material (or the like) between the anvil and punch of a fastener-attaching machine, in timed relation to the cycle of operation of the fastener-attaching machine, so that successive snap-fasteners, grommets or eyelets (or similar elements) may be attached to successive spots on the fed tape, strip or band of fabric or other sheeting, at predetermined and selectable spaced intervals, and so that a failure of the strip, or of the attachment, will automatically stop the attaching machine.

Other objects of the invention are to provide such automatic tape-feeding, spacing and controlling apparatus which will be dependable in operation and will require a minimum of attention or supervision, and which may be adjustable for the maximum range which may be required in respect to the spacing and in respect to other dimensional or quantitative aspects of the operation.

With the above and other objects in view, the present embodiment of my invention consists of a tape-guide plate with a guide-slot or guide-channel formed therein, in which slot or channel the strip material passes; a reciprocating finger to move said tape or strip-material a predetermined distance in said channel during each cycle of the fastener-attaching machine; a locking gate to keep the tape from moving at the moment the machine is attaching a snap-fastener (or the like) to the tape or strip; a tension-control gate to stretch the tape or fabric tightly between the punch and anvil while a snap-fastener (or the like) is being attached to the tape or fabric; a feeler mechanism to shut off the fastener-attaching machine if no snap-fastener (grommet or the like) attaches to the tape or strip; timing means to operate the tape-feeding or strip-feeding and controlling means in timed relation to each other and to the cycle of the fastener-attaching machine; and stripping means to remove the strip-and-fastener assembly from the ascending punch at the end of each cycle of the attaching machine.

2

For the purpose of illustrating the invention, there is shown in the accompanying drawings a form thereof which is at present preferred, although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized and that the invention is not limited to the precise arrangement and organization of the instrumentalities as herein shown and described.

The above and other objects in view will appear more fully from the following description and accompanying drawings.

Referring to the accompanying drawings, in which like reference characters refer (throughout) to like parts:

Figure 1 represents a perspective view of a fastener-attaching machine, having one embodiment of the present invention applied thereto.

Figure 2 represents a perspective view of the table of the fastener-attaching machine, with the embodiment of the present invention applied thereto.

Figure 3 represents a vertical sectional view along line 3—3 of Figure 2.

Figure 4 represents a vertical sectional view along line 4—4 of Figure 2.

Figure 5 represents a perspective view, partly in section, of the tension control gate.

Figure 6 represents a vertical sectional view along line 6—6 of Figure 5.

Figure 7 represents a top plan view of the table of the snap-fastener-attaching machine, with the ram and hoppers removed therefrom so as to better view the apparatus of my invention.

Figure 8 represents a vertical sectional view along line 8—8 of Figure 7.

Figure 9 represents a front elevational view of the feeler mechanism assembly.

Figure 10 represents a side elevational view of the feeler mechanism assembly.

Figure 11 represents a rear elevational view of the feeler mechanism assembly.

Figure 12 represents a perspective view of the locking-gate assembly.

The present invention may be applied to any fastener-attaching or similar machine, as exemplified, for instance, by Model M-245 of the United-Carr Fastener Corporation of Cambridge, Massachusetts, or to any machine adapted to fasten eyelets, grommets, snap-fasteners or the like to fabric or other material, wherein a feeder system automatically and intermittently supplies the elements of the snap-fastener, eyelet or grommet to the punch and anvil of the machine and which attaching machine (if so desired) can be

adjusted for automatically repetitive, intermittent operation.

The attaching machine may be set or adjusted to operate automatically in such manner that grommets or eyelets or fasteners will be applied in rapid succession to any material placed between the punch and anvil of the machine. Although the present embodiment of my invention is shown applied to a United-Carr Fastener Corp. snap-fastener attaching machine Model M-245, it is to be understood that my invention can be applied to other attaching machines. Insofar as any part of the construction or of the mode of operation of the fastener-attaching machine (generally shown in the drawings) is not described in detail, it may be assumed to be generally that described in the United States patents of United-Carr Fastener Corp. on their Model M-245 machine (as, for instance, Patents 1,944,510; 2,028,704; 1,873,890) or of any conventional form or construction or as described in my co-pending divisional application Serial No. 85,008, filed April 1, 1949.

Referring to Figure 1, numeral 10 represents, generally, the fastener-attaching machine, including a table 11 supported by legs or frame 12, with table 11 supporting an anvil 13 and ram-housing 14. Ram-housing 14, encloses the reciprocable punch 16 and the member 14-a (Fig. 3) for mounting the reciprocable element-gripping jaws 26 for gripping one of the elements of a 2-piece fastener unit; the ram housing also carrying the hopper-supporting arms 17 and 18. A quantity of the fastener elements 20 of the fastener unit is placed in the hopper 19 which is supported by an arm 17. These elements eventually will be secured to the upper side of fabric-strip, tape (or the like) 22, by the prongs of a complementary fastener-element 27.

The fastener-element 20 is fed from the hopper 19 down a chute 23 to tucker-track 24 where a reciprocating tucker 25 pushes it along the tucker-track 24, and finally between gripping-jaws 26. In like manner, the complementary fastener-element 27 of the fastener unit is fed from hopper 28, down chute 29, to tucker-track 30, where the reciprocating tucker 31 pushes it along tucker-track 30, and finally places it between jaws 100 and 101 on the head 32 of anvil 13. The disposition and operation of these jaws and anvil is better seen in United States Patent No. 1,944,510. At the proper moment, jaws 26, carrying upper fastener-element 20, are forced downward by the punch 16 until stopped by the limiting flanges 14-c; whereupon the punch 16 continues its descent and forces the fastener-element 20 from between the jaws 26 and places it on top of tape or fabric-strip 22. Punch 16 pushes the element 20 against the tape 22 with sufficient force to cause the prongs of element 27 to pierce the tape 22, and to clinch themselves in fastener-element 20 (with the tape 22 between the elements 20 and 27), to form the assembly shown in Figure 9.

Further details of the fastener-attaching machine are not material to the full understanding of the operation of my present invention, but such details of the fastener-attaching machine are more fully described in the United States Patents Nos. 1,944,510; 2,028,704; 1,873,890 of the United-Carr Fastener Corp., and are exemplified by the Model M-245 machine, of United-Carr Fastener Corp.

The present embodiment of my invention includes a tape-guide plate 33, which may be fas-

tened by suitable brackets (not shown) and bolts 34 to the table 11 of the fastener-attaching machine, and which has a slot, channel or passageway 35 therein, to guide the fabric or tape 22 while traveling from the supply-roll 36 across the plate 33. The roll 36 may be mounted on any suitable bracket 37, which may be fastened to one leg of the frame of the fastener-attaching machine, or may be supported in any other manner permitting the fabric or tape 22 to freely unroll from the supply-roll 36 into the channel 35.

Across the channel 35 on the plate 33, at the point where the tape 22 first enters groove or channel 35, a barrier 38 may be placed, to direct tape 22 at all times into channel 35.

The tape 22 (in channel 35) next passes between tension-control gate 39 and the bottom surface of the channel 35. This is best shown in Figures 3, 5 and 6. The tension-control gate may include an inverted U-shaped housing 40, through which passes a horizontal pivot 41 (Figure 6), which pivot has screwed (or otherwise affixed) to it (in the space within the housing 40) a tape-contacting blade 42. The pivot 41 carries a screw-threaded arm 43 at its outer end, to which arm an internally screw-threaded weight 44 and locking nut 45 are attached. The weight 44 can be adjustably moved along the length of screw-threaded arm 43, thereby changing the clockwise moment which presses blade 42 against the surface of tape 22. The pressure of blade 42 against the tape 22 can be thus adjusted so as to stretch tape 22 across the anvil 13 when the fastener-elements are being attached to the tape, but, which also permits tape 22 to be moved beneath blade 42 by the pulling action of finger 62. The tape 22 next passes between the punch 16 and anvil 13, where a fastener-member is attached to the tape in the manner described in United States Patent No. 1,944,510.

After a fastener is affixed to the tape, the fastener and tape assembly pass along channel 35 under the feeler mechanism 46. This is best illustrated in Figures 9, 10 and 11. The mechanism may be an electrical switch consisting of a fixed contact 47 and a movable contact 48. The movable contact 48 is fastened to one end of arms 49, and to the other end of said arm is affixed an adjustable contacting-block or planar element 50. This contacting-block rides on the tops of the fasteners passing along channel 35, and if no fastener appears in its predetermined position on the tape 22, the contacting block 50 drops, causing the arms 49 to move about the pivot 51 and lift contact 48 away from contact 47. The breaking of this contact opens the electrical circuit which provides power to operate the motor of the fastener-attaching machine, and as a result the entire machine ceases to operate. The failure of the machine to operate indicates to the operator that a fastener has not been attached in its proper place on the tape, or that the tape has completely passed from roll 36, or that fastener-elements are not being supplied to the anvils. Thus, the mechanism operates as an automatic signal to indicate to the operator that the machine needs attention.

After passing beneath the feeler mechanism, the fastener-carrying tape travels under a locking gate 52, best seen in Figures 1, 3 and 12. The locking-gate 52 may consist of an arm 53, pivoting about a pin 54 which is held in support 55. This support is fastened to the tape-guide plate 33 by a bolt 56. The arm 53 carries at one end a serrated-edged portcullis 57 which toothed edge is designed to fall on the surface of the tape 22

5

(preventing said tape from moving in channel 35 of tape-guide plate 33) when the punch 16 and the anvil 13 are attaching a fastener to the tape. The portcullis 57 is held up and away from the tape 22 by a spring 58 attached to the pin 59 on the opposite end of arm 53. Therefore, portcullis 57 does not contact the tape 22 (arresting the motion thereof) until a lifting-bar 60 rises to contact the adjustable screw 61, pivoting arm 53 about pin 54, and forcing portcullis 57 into contact with the tape 22.

The tape 22 is moved along channel 35 in tape-guide plate 33 by a reciprocating finger 62. This finger 62 is carried by an arm 63 attached to the spacer bracket-block 64. The finger, and its associated parts, is best seen in Figures 1, 3, 4, 7 and 8. The source of power which is used to drive this spacer bracket-block back and forth is the same as is used to operate the rest of the fastener-attaching machine, and is a motor (not shown), beneath the table 11, which drives the power take-off shaft 65. The use and arrangement of this motor and the attachment thereto of the power take-off shaft 65 is well known to those skilled in the art.

The power take-off shaft 65 drives a chain belt 66 which turns a gear-wheel 67 and the shaft 68 attached hereto. Affixed to one end of the shaft 68 is bevel-gear 69 which engages, and causes to revolve, a mating bevel-gear 70 and the shaft 71 attached thereto. Shafts 68 and 71 revolve in bearing blocks 72 and 73 respectively.

A crank 74 is attached to the end of the shaft 71 opposite the bevel-gear 70. This crank has a slot 75, wherein is fitted slide 76. With the unscrewing of pin-bolt 77, slide 76 is free to move in slot 75, and the diameter of a circle described by the revolving pin-bolt 77 can thereby be increased or decreased.

Crank-arm 78 is attached to crank 74 by pin-bolt 77. This crank-arm 78 has, at its end opposite from the end attached to the crank 74, a connecting pin 79 which is fastened to the sliding spacer bracket-block 64. A reciprocating motion is thereby transmitted to the spacer bracket-block 64 by the revolving crank and crank arm, causing spacer bracket-block 64 to travel back and forth in the slide-bearing 80.

Arm 63 is pivotally fastened by pin 81 to spacer bracket-block 64, carrying at its end the finger 62. Arm 63 and the finger 62 are forced downward by the spring 82 which is supported by the bracket 83 attached to the block 64. Thus, spring 82 tends, at all times, to push finger 62 down against the tape 22. During certain periods of the reciprocating travel of spacer-bracket block 64, however, the lifting bar 60 lifts the arm 63 and the finger 62 away from the tape 22. Because the length of the lifting-bar 60 exceeds the maximum travel of the block 64, this lifting motion can be imparted to the arm 63 at any position of the block 64 in the bearing 80. One end of lifting-bar 60 strikes and moves locking gate 52 as heretofore described.

Referring to Figures 3, 7 and 8, shaft 68 (revolving in bearing blocks 72) turns the cam 84 and causes a roller 85, attached to one end of the rocker-arm 86, to turn about pivot pin 87 carried in the support 88. As can be seen in Fig. 8, the roller 85 is forced downward when in contact with edge 89 of cam 84, and said roller will rise when in contact with edge 90 of the cam 84. A spring 91 tends to move the arm 86 in a clockwise direction about pin 87, thereby forcing the roller 85 into contact with the surfaces of the cam 84 at all times.

6

One end of the arm 86 (the end opposite from that which carries roller 85) is bent at a 90° angle and lies directly beneath pins 92 carried in suitable holes in the bearing-block 80. When the cam 84 forces the roller 85 (and the end of the arm 86 to which said roller is attached) downward, the opposite end of arm 86 moves upward, pushing the contacting pins 92 against the bar 60. It is this action which causes bar 60 to move up or down as heretofore described.

After tape 22 is moved along channel 35 beyond the finger 62, it passes through a hole 93 in the tape-guide plate 33, and then down a trough 94 into a receiving box 95.

The timing of gears, chain drives, cams and cranks moves the locking gate and finger in proper timed relation to the cycle of the jaws and punch.

The operation of the fastener-attaching machine, with the present embodiment of my invention applied thereto, is as follows:

The hoppers 19 and 28 and the chutes 23 and 29 are filled with fastener-elements in such manner that the reciprocating punch 16 and anvil 13 will attach fastener-elements to the tape placed between said punch and anvil. The tape 22 is unrolled from the spool 26, passed beneath the barrier 33 into the channel 35, moved beneath the tension control-gate blade 42, between the punch 16 and anvil 13, under the feeler mechanism 46, beneath the locking gate 52 and finally under the finger 62. With the block 50 of the feeler mechanism lifted manually by the operator, the motor is started and the machine is set in motion. The bar 60 is raised by the arm 86, forcing serrated edge of the locking-gate portcullis 57 against the tape 22. The same upward movement of the bar 60 lifts the finger 62 away from the tape 22 while crank 74 moves the spacer bracket-block 64 and finger 62 toward the punch. Meanwhile the tension control gate 39 has stretched the tape 22 between itself and the locking gate 52, whereupon the punch and anvil of the machine attach a fastener member to the tape. When the spacer bracket-block 64 and finger 62 have reached the end of travel toward the punch (said limit of travel having been predetermined by the position of the slide 76 in the slot of the crank 74), the fastener has been attached to the tape, the bar 60 falls, finger 62 drops into contact with the tape 22, and the locking-gate portcullis 57 rises. Then the finger 62 moves away from the punch, pulling along with it the tape 22, until the finger 62 reaches the limit of its travel in this direction. Thus the fastener, attached to the tape, is carried under the block 50 of the feeler mechanism 46. Then the above cycle is repeated, and other fasteners are attached to the tape 22. It is obvious that the distance between the fasteners when attached to the tape will be equal to the distance that the sliding bracket-block 64 travels in the bearing 80, and this distance can be regulated and changed by properly adjusting the position of the bolt 77 and the slide 76 on the crank 74.

Therefore, fasteners can be attached to a strip of fabric in proper spaced relation to each other without any operator in attendance at the machine. The failure of any fastener to be properly attached will open the feeler mechanism 46, and the machine will fail to operate, thus saving time and the expense of improperly fabricated products.

In order to insure a constant supply of fastener elements to the anvils, I may direct streams of compressed air, from any convenient source,

75

through a valve 96 and hoses 97 and 98 to hoppers 19 and 28 respectively. These streams of compressed air force a supply of elements down chutes 23 and 29. I may also arrange hoses so as to suitably direct streams of compressed air along said chutes 23 and 29, and also along tucker-tracks 24 and 30 to prevent fastener elements from "jamming" in the carrier-grooves of said tracks and chutes.

Because the aforementioned cycle of operation is rapid and because there is a tendency for the fastener to adhere to the tip of the punch as said punch ascends, I may provide a "stripper" which will disengage the fastener element from the punch after the fastener elements have been attached to the tape. This "stripper," which is covered by my divisional application Serial No. 85,008 referred to above, is best illustrated in said application.

Instead of attaching female fastener-elements 20 and 27 to a fabric, I may prefer to attach male fastener-elements to the tape, or any other style or type of grommet or eyelet or the like. To fasten these other types, I need only change the conformation of the surfaces of punch 16 or anvil 32 in a manner well known to those skilled in the art.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and it is therefore desired that the present embodiment be considered in all respects as illustrative and not restrictive, reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

Having thus described my invention, I claim as new and desire to protect by Letters Patent:

1. For use with an automatic-feed machine having a self-stripping reciprocable punch for attaching grommets, eyelets, snap-fasteners or like elements to an elongated tape or the like; mechanism constructed and arranged to provide uniform and accurate spacing of said elements upon said tape, said mechanism comprising a guide-plate for said tape, an oscillating tape-advancing finger for momentarily gripping said tape at a point spaced from said punch and longitudinally intermediate the affixed elements and for moving said tape a predetermined distance between punching operations, a reciprocable locking-gate disposed in operative juxtaposition to said guide-plate between said finger and said punch, said locking-gate being constructed and arranged to move downwardly against said tape into the path of each successive affixed element and thereby to stop further movement of said tape at the end of each tape-advancing step, and yieldable means disposed on the other side of said punch from said locking-gate for frictionally restraining the forward movement of said tape thereby to keep said tape relatively taut during and after each punching operation.

2. For use with an automatic-feed machine having a self-stripping reciprocable punch for attaching grommets, eyelets, snap-fasteners or like elements to an elongated tape or the like; mechanism constructed and arranged to provide uniform and accurate spacing of said elements upon said tape, said mechanism comprising a guide-plate for said tape, an oscillating tape-advancing finger for momentarily gripping said tape at a point spaced from said punch and longitudinally intermediate the affixed elements and for moving said tape a predetermined distance between punching operations, a reciprocable

locking-gate disposed in operative juxtaposition to said guide-plate between said finger and said punch, said locking-gate being constructed and arranged to move downwardly against said tape into the path of each successive affixed element and thereby to stop further movement of said tape at the end of each tape-advancing step, means for maintaining said tape relatively taut during and after each punching operation, and mechanism constructed and arranged to indicate failure of the machine to affix an element in proper predetermined position on said tape, said mechanism including a movably mounted planar element disposed in operative juxtaposition to said guide-plate between said locking-gate and said punch and having a longitudinal dimension slightly greater than the predetermined distance between successive affixed elements, said planar element being normally adapted to rest upon the tops of successive affixed elements and to be held in an elevated position thereby but being free to move to a lowered position in the absence of a correctly spaced affixed element.

3. For use with an automatic-feed machine having a self-stripping reciprocable punch for attaching grommets, eyelets, snap-fasteners or like elements to an elongated tape or the like; mechanism constructed and arranged to provide uniform and accurate spacing of said elements upon said tape, said mechanism comprising a guide-plate for said tape, an oscillating tape-advancing finger for momentarily gripping said tape at a point spaced from said punch and longitudinally intermediate the affixed elements and for moving said tape a predetermined distance between punching operations, a reciprocable locking-gate disposed in operative juxtaposition to said guide-plate between said finger and said punch, said locking-gate being constructed and arranged to move downwardly against said tape into the path of each successive affixed element and thereby to stop further movement of said tape at the end of each tape-advancing step, means for maintaining said tape relatively taut during and after each punching operation, and means for automatically stopping the machine when it fails to affix an element in proper predetermined position on said tape, said last-mentioned means including an on-off switch operatively connected in the power-line leading to the machine, said switch having a fixed contact and a movable contact, and an elongated feeler block extending longitudinally for somewhat more than the predetermined distance between successive affixed elements, said feeler block being operatively connected to the movable switch element and being movably mounted in juxtaposition to said guide plate, said feeler block normally resting upon the tops of successive affixed elements and being maintained in elevated position thereby but being free to move downward, so as to open the switch in the absence of a properly-spaced affixed element.

4. For use with an automatic-feed machine having a self-stripping reciprocable punch for attaching grommets, eyelets, snap-fasteners or like elements to an elongated tape or the like; mechanism constructed and arranged to provide uniform and accurate spacing of said elements upon said tape, said mechanism comprising a guide-plate for said tape, an oscillating tape-advancing finger for momentarily gripping said tape at a point spaced from said punch and longitudinally intermediate the affixed elements and for moving said tape a predetermined distance

between punching operations, a reciprocable locking-gate disposed in operative juxtaposition to said guide-plate between said finger and said punch, said locking-gate being constructed and arranged to move downwardly against said tape 5 into the path of each successive affixed element and thereby to stop further movement of said tape at the end of each tape-advancing step, means for maintaining said tape relatively taut during and after each punching operation, and 10 means for automatically stopping the machine when it fails to affix an element in proper predetermined position on said tape, said last-mentioned means including an on-off switch operatively connected in the power-line leading to the machine, said switch having a fixed contact and a movable contact, a feeler block disposed in operative juxtaposition to the guide-plate and having a longitudinal dimension somewhat greater than the predetermined distance between successive affixed elements, and a supporting arm pivotally interconnecting the feeler block and the movable switch contact, said feeler block normally bearing against the tops of successive affixed elements but being constructed and arranged to move toward the tape in the absence of a properly spaced affixed element thereby to move the movable switch contact to open position.

5. For use with an automatic-feed machine having a self-stripping reciprocable punch for attaching grommets, eyelets, snap-fasteners or like elements to an elongated tape or the like; mechanism constructed and arranged to provide uniform and accurate spacing of said elements upon said tape, said mechanism comprising a guide-plate for said tape, tape-advancing means for moving said tape a predetermined distance between punching operations, a reciprocable locking-gate disposed in operative juxtaposition 40 to said guide-plate between said tape-advancing means and said punch, said locking-gate being constructed and arranged to move downwardly against said tape into the path of each successive affixed element and thereby to stop further movement of said tape at the end of each tape-advancing step, and yieldable means disposed on the other side of said punch from said locking-gate for frictionally restraining the forward movement of said tape thereby to keep said tape relatively taut during and after each punching operation, said tape-advancing means including a horizontally-reciprocable block, a tape-gripping finger pivotally mounted upon said block with its free end vertically movable relative thereto, spring-means tensioning said finger in the direction of the tape, and a vertically-recip-

rocable bar constructed and arranged intermittently to move the free end of said finger away from said tape against the action of said spring-means.

6. For use with an automatic-feed machine having a self-stripping reciprocable punch for attaching grommets, eyelets, snap-fasteners or like elements to an elongated tape or the like; mechanism constructed and arranged to provide uniform and accurate spacing of said elements upon said tape, said mechanism comprising a guide-plate for said tape, tape-advancing means for moving said tape a predetermined distance between punching operations, a reciprocable locking-gate disposed in operative juxtaposition to said guide-plate between said tape-advancing means and said punch, said locking-gate being constructed and arranged to move downwardly against said tape into the path of each successive affixed element and thereby to stop further movement of said tape at the end of each tape-advancing step, and yieldable means disposed on the other side of said punch from said locking-gate for frictionally restraining the forward movement of said tape thereby to keep said tape relatively taut during and after each punching operation, said tape-advancing means including a horizontally-reciprocable block, means for adjusting the extent of horizontal movement of said block, a tape-gripping finger pivotally mounted upon said block with its free end vertically movable relative thereto, spring-means tensioning said finger in the direction of the tape, and a vertically-reciprocable bar constructed and arranged intermittently to move the free end of said finger away from said tape against the action of said spring-means.

WILLIAM A. ERHARDT, JR.

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