July 26, 1949. J. P. TRECIOKAS 2,477,101

DEVICE FOR GAUGING THE SETTING OF FASTNER ELEMENTS ON TAPES

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Fig. 1.

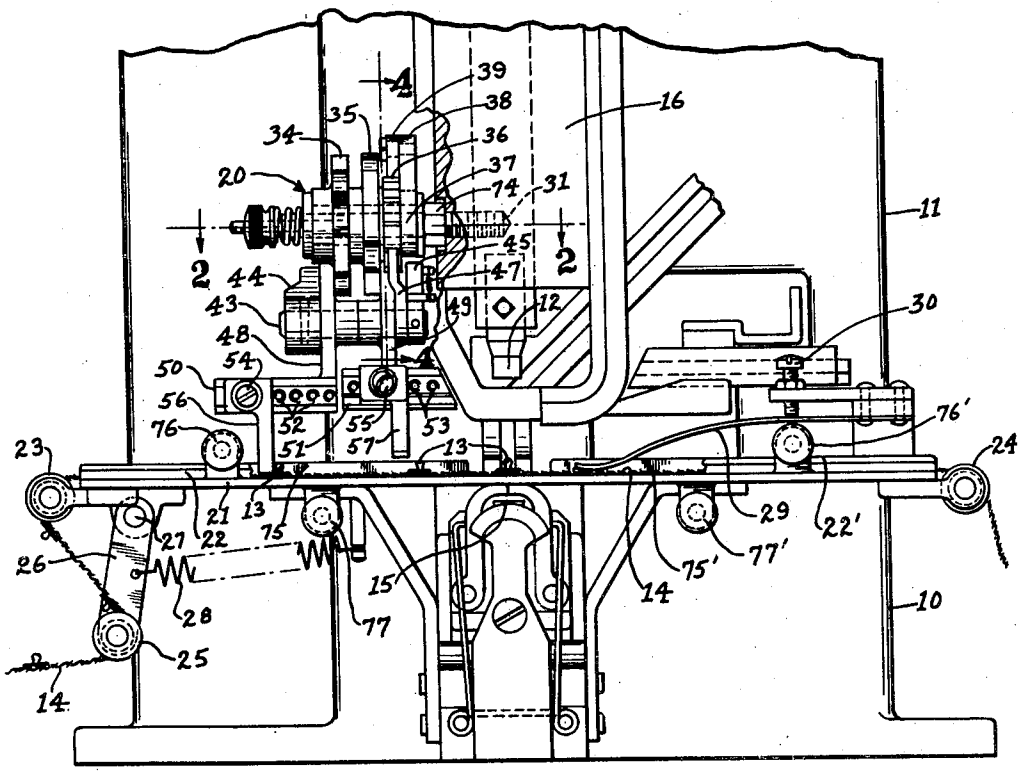
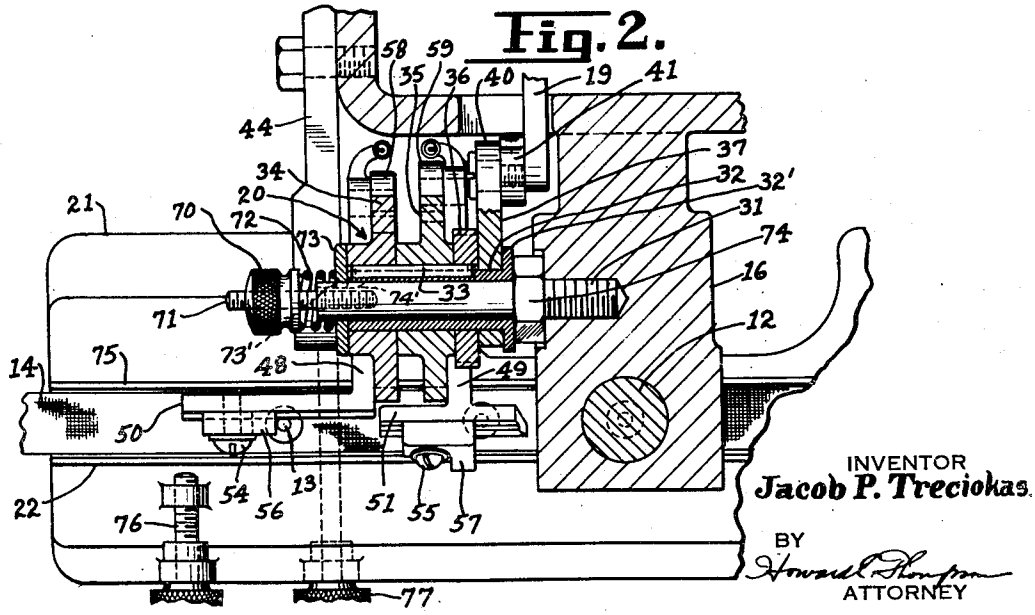


Fig. 2.



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Fig. 3.

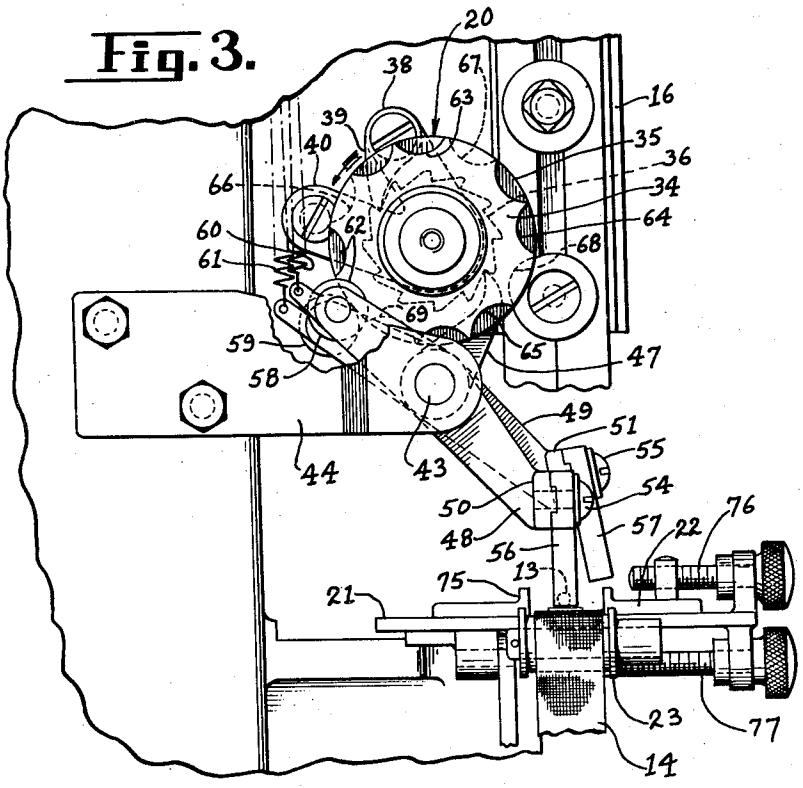
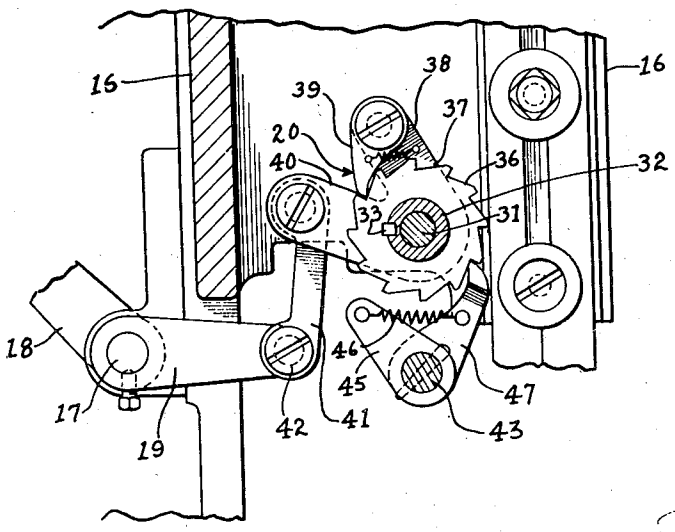


Fig. 4.



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Fig. 5.

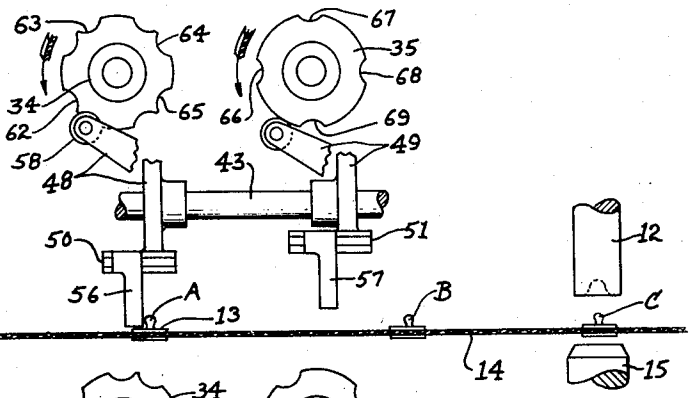


Fig. 6.

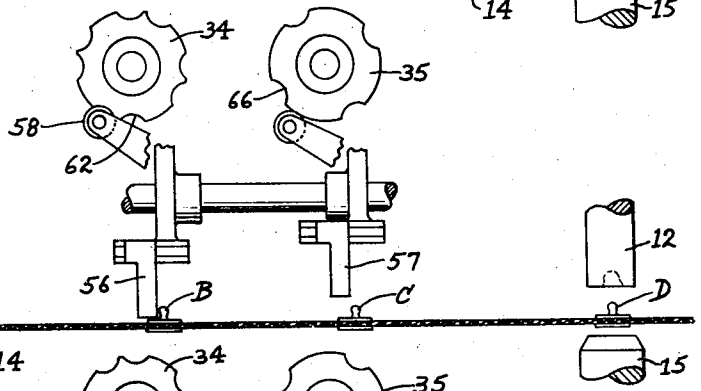


Fig. 7.

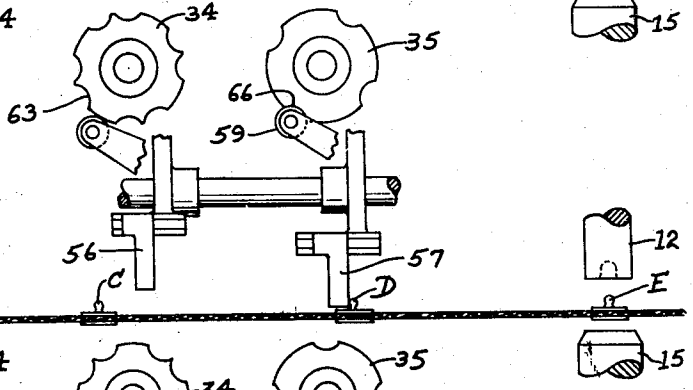
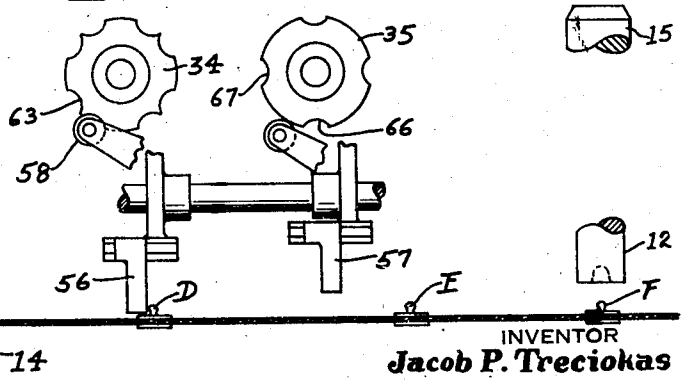


Fig. 8.



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Patented July 26, 1949

2,477,101

UNITED STATES PATENT OFFICE

2,477,101

DEVICE FOR GAUGING THE SETTING OF FASTENER ELEMENTS ON TAPES

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Application June 12, 1946, Serial No. 676,322

17 Claims. (Cl. 218—18)

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This invention relates to machines for setting or securing fastener elements such as snap fasteners to elongated mounting tapes. More particularly, the invention deals with a device or attachment to machines of the kind defined for automatically gauging the positioning of the elements or groups of elements on the tape, particularly in automatically producing what may be termed tape lengths for direct attachment to garments in providing uniform and positive alinement of male and female coupling portions of the fastener elements employed on the separate garment parts to be coupled thereby. Still more particularly, the invention deals with a gauging device or attachment having means adjustably supporting the gauge elements to produce different spacings on a tape, and further in providing control cams regulating the number of fastener elements employed in the resulting tape lengths. The novel features of the invention will be best understood from the following description when taken together with the accompanying drawing in which certain embodiments of the invention are disclosed, and in which the separate parts are designated by suitable reference characters in each of the views, and in which:

Fig. 1 is a front view diagrammatically illustrating a fastener setting machine with my improved gauge attachment or device thereon, part of the construction being broken away and in section.

Fig. 2 is a section on the line 2—2 of Fig. 1, on an enlarged scale.

Fig. 3 is an end view, looking in the direction of the left end of the machine, as seen in Fig. 1, on an enlarged scale.

Fig. 4 is a section on the line 4—4 of Fig. 1; and

Figs. 5 to 8 inclusive are views diagrammatically illustrating successive steps in spacing fasteners on a mounting tape.

In the production of fastener tapes of the kind under consideration, it is desirable to produce fastener tapes of predetermined length and with a predetermined number of fastener devices thereon. It is particularly desirable to accomplish this result without wasting the tape, or in other words, the waste experienced in cutting sections of a tape with standard one dimension spacing of fasteners on it to provide short finishing ends.

It is the purpose of my present invention to provide an attachment to a standard type of fastener setting machine to control and regulate spacing of fastener elements applied to a

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tape or other support, particularly in grouping a predetermined number of elements in definite spaced relationship to each other and in varying spacing of groups of elements one with respect to the other on the mounting member or tape. For purposes of illustration, I have shown diagrammatically, in part, in the accompanying drawing, a fastener setting machine of the general type and kind disclosed in Warner et al. Patent Number 1,499,270, granted June 24, 1924.

In the accompanying drawing, I have diagrammatically shown part of a fastener setting machine, in which 10 represents a base, 11 the upper frame of the machine in which is mounted, for vertical reciprocation, a plunger setting tool or punch 12 for setting a male or female fastener element, such for example, as the male element 13 of a snap fastener onto a tape 14. At 15 is generally shown the lower anvil portion of the machine for supporting the associated part of the element 13 in attachment of the element 13 to the tape 14, as is well known in the art. The plunger or punch 12 is mounted in a plunger head 16. Mounted at the rear portion of the head 16, note Fig. 4, is a shaft 17 actuated through a lever or link 18 to impart reciprocating movement to an arm 19 for actuating my improved automatic gauge device or attachment generally identified by the reference 20.

Extending along the upper portion of the base 10 of the machine is a table 21, along which the tape 14 is passed from right to left, as seen in Fig. 1 of the drawing through the medium of a suitable feed, the tape having suitable guides, as indicated at 22—22' and passing over guide rollers 23 and 24. At 25 is shown a tension roller over which the tape 14 passes, the roller 25 being supported upon an arm 26, pivoted as seen at 27, a spring 28 being coupled with the arm and applying yieldable tension to the tape primarily to take up slack, as in other machines of this kind.

At the right of the machine is a long spring arm 29, tensioned through the medium of an adjustment screw 30 to apply frictional or tensional engagement to the tape to maintain the tape taut as it passes beneath the punch 12 and in compensating for attachment of the fastener elements 13 to the tape.

The unit 20 comprises a stud shaft 31 secured to the plunger head and extending to the left of the head, as seen in Figs. 1 and 2 of the drawing. On the shaft 31 is a rotatably mounted flanged bushing 32, to which is keyed, as seen at 33, two cam wheels 34 and 35 and a ratchet wheel 36. A substantially V-shaped lever 37 is mounted

to oscillate upon the bushing 32 adjacent the flanged end 32' thereof. One arm 38 of the lever 37 carries a pivoted spring actuated detent 39 for actuating the ratchet wheel 36. The other arm 40 of the lever 37 has pivoted thereto a link 41 which in turn is pivoted to the free end of the arm 19, as seen at 42, note Fig. 4 of the drawing.

From the foregoing it will be apparent that in the oscillating movement imparted to the arm lever 19, the link 41 will contribute intermittent rotary movement to the shaft 31 through the detent or pawl 39 and ratchet 36. At 43 is shown a cam lever shaft fixedly supported in a bracket arm 44, note Fig. 3. Secured to the shaft 43 is an arm 45 with which is coupled a spring 46, the free end of which is connected with a pawl 47, also operatively engaging the ratchet 36 in checking said ratchet against rotation in one direction.

On the shaft 43 between the bracket 44 and arm 45 is rotatably mounted two cam levers 48 and 49. At the lower ends of the levers 48 and 49 are elongated key bars 50 and 51, having longitudinally spaced threaded apertures 52 and 53, adapted to receive screws 54 and 55 for adjustably supporting control fingers 56 and 57. The other or upper ends of the levers 48 and 49 carry rollers 58 and 59, note Fig. 3, which operate upon peripheral surfaces of the cams 34 and 35 respectively. Springs 60 and 61 are coupled with the last named ends of the levers 48 and 49 to maintain the rollers 58 and 59 in constant engagement with the surface of the cam.

The cam 34 has on its periphery, four pairs of adjacent recesses, as at 62, 63, 64 and 65, shown in full lines in Fig. 3 of the drawing. The cam 35 has four single recesses indicated in dotted lines, in Fig. 3, at 66, 67, 68 and 69, the latter being disposed in alinement with intersections and spacings between the pairs of recesses in the cam 34.

It will appear from a consideration of Fig. 3 of the drawing, as the cams 34 and 35 are intermittently rotated, the control fingers 56 and 57 are moved into and out of registering position with the path of movement of the fastener elements 13 to operatively engage these elements in the control of the spacing of the elements on the mounting member or tape 14.

In Figs. 1 and 3 of the drawing, the control finger 56 is shown in position engaging one of the elements 13. Now referring to Figs. 5 to 8 inclusive, this element 13 can be considered the element A shown abutting the finger 56 in Fig. 5 of the drawing, at which time, element C has been formed on the tape or other support with element B positioned, for example, two inches from element A, and one and a half inches from element C, element B having previously been formed, as will later appear.

In the next operation of the cams 34 and 35, the next recess of the pair 62 will be engaged by the roller 58, note Fig. 6. In this operation, the finger 56 has been raised to clear element A, allowing element A to pass to the left and then the finger is returned to element stopping position. During the above operation, the tape 14 has been fed to the left and element B now strikes the finger 56, as seen in Fig. 6 of the drawing thus holding the tape in position to attach the next fastener. At this time, element D is formed on the tape at a distance two inches from element C or similar to spacing between A and B.

The next operation of the cams 34 and 35 will cause the finger 56 to be raised out of engagement with element B and held in this raised position as and when roller 59 drops into the recess 66 to lower the finger 57 into position to engage the element D which has been moved to the left in the feed of the tape, both elements B and C passing beneath the raised finger 56, the result of this operation being shown in Fig. 7 of the drawing, finger 57 being placed two inches from plunger 12. In this last named position, element E is formed upon the tape at a distance two inches from element D, or in other words, again similar to the spacing between elements A—B and C—D.

As the cams 34 and 35 are further intermittently rotated, the finger 57 is again moved into, and held in raised position, clearing element D, and the finger 56 is again lowered, forming a stop for element D one and one-half inches from finger 57, as seen in Fig. 8 of the drawing. At this particular time, element F is formed on the tape at a spacing of one and a half inches from element E. In Fig. 8, the same relationship or elements is found as in Fig. 5. In other words, element A of Fig. 5 is the same as D in Fig. 8, B in Fig. 5, same as E in Fig. 8, and C in Fig. 5, same as F in Fig. 8. In this last position of the parts, as shown in Fig. 8, the roller 58 is in the first of the pair of recesses 63. The above operation is again repeated and this continues throughout the four pairs of recesses in the cam 34 and the four single recesses in the cam 35 and then the cycle of operation is again further repeated in the production of predetermined tape lengths.

It will be apparent that by changing the types of cams employed, and further by adjusting relative positions of the fingers 56 and 57 in the cross heads 50 and 51, various combinations of spacings of fastener elements upon a tape can be provided. Using cams of the configurations and relationship shown, spacings above mentioned of two inches, on centers of the fasteners, and one and a half inches, results in producing on the tape, series of three fasteners spaced apart two inches with a tape spacing of an inch and a half of each group of three fasteners. This short tape spacing forms the line of severance of the tape in forming short tape lengths, each containing the three fasteners, as will be apparent.

Considering Fig. 2 of the drawings, it will be apparent that the cams 34, 35 and the ratchet 36 are mounted upon the flanged bushing 32 and operate as a unit by means of the locking key 33. To prevent the above parts in device 20 from over-running, due to momentum, the desired predetermined rotary movement as actuated by the ratchet drive, a friction factor is effected through the medium of a knurled nut 70 adjustably mounted upon a reduced threaded extension 71 on the shaft 31. The nut 70 serves to compress a spring 72 against a washer 73 which in turn bears against the adjacent face of the cam 34. The washer necessarily is held against rotation through a radial lug 73' on its inner diameter engaging in a short key slot 74' in shaft 31. The entire rotatable unit 20 including the bushing 32 is frictionally urged against the nut 74 on shaft 31. The nut 70, spring 72 and washer 73 incidentally serve to maintain all the parts of the unit 20 in assembled position and also provide a means for a quick substitution of the different types of cams in obtaining different settings of the series and spacings of fastener elements.

The tape guide plates 22—22' referred to above, are disposed primarily at the forward edge of the tape, and considering Figs. 1 and 3 of the drawing, it will appear that corresponding plates 75—75' are disposed at the rear edges of the tape. Tapes of different widths can be employed and to

adjust the guide plates for different widths of tapes, adjustment screws are provided for each of the plates, for example, screws 76—76' for the plates 22—22' and screws 77—77' for plates 75—75'.

In the diagrammatic illustration of Figs. 5 to 8 inclusive, it will be apparent that the cams 34—35 and parts of the levers 48 and 49 are shown in a right angle position with respect to showing of fingers 56 and 57, for sake of clarity.

In the diagrammatic showings of Figs. 5 to 8 inclusive, it will be understood that these do not necessarily represent a starting position. In initially starting a machine, one fastener is applied to the tape and then brought into the stop position, for example, the position in fastener D in Fig. 7, after which fastener E is attached as the automatic machine operation is begun and this cycle carries through Fig. 8, Fig. 5, Fig. 6 and then back to Fig. 7.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In machines for setting fastener elements to elongated mounting tapes, an attachment for automatically controlling spacing of the elements attached to the tape, means for guiding a tape fed through the machine in a predetermined path, a pair of control fingers movable into and out of the path of fastener elements attached to and movable with said tape in intermittently holding the tape in position for attachment of the fastener elements thereto at spaced intervals controlled by said fingers.

2. In machines for setting fastener elements to elongated mounting tapes, an attachment for automatically controlling spacing of the elements attached to the tape, means for guiding a tape fed through the machine in a predetermined path, a pair of control fingers movable into and out of the path of fastener elements attached to and movable with said tape in intermittently holding the tape in position for attachment of the fastener elements thereto at spaced intervals controlled by said fingers, supports for said fingers, and cam and spring means for actuating said supports in controlling operation of the supports of each finger for automatically moving the fingers into operative and inoperative position with respect to fastener elements on said tape.

3. In machines for setting fastener elements to elongated mounting tapes, an attachment for automatically controlling spacing of the elements attached to the tape, means for guiding a tape fed through the machine in a predetermined path, a pair of control fingers movable into and out of the path of fastener elements attached to and movable with said tape in intermittently holding the tape in position for attachment of the fastener elements thereto at spaced intervals controlled by said fingers, supports for said fingers, and cam and spring means for actuating said supports in controlling operation of the supports of each finger for automatically moving the fingers into operative and inoperative position with respect to fastener elements on said tape, and each finger and support therefor having means adjustably supporting the finger in control of spacing of said elements on said tape.

4. In machines for setting fastener elements to elongated mounting tapes, an attachment for automatically controlling spacing of the elements attached to the tape, means for guiding a tape fed through the machine in a predetermined path, a pair of control fingers movable into and out of the path of fastener elements attached to and movable with said tape in intermittently holding the tape in position for attachment of the fastener elements thereto at spaced intervals controlled by said fingers, supports for said fingers, and cam and spring means for actuating said supports in controlling operation of the supports of each finger for automatically moving the fingers into operative and inoperative position with respect to fastener elements on said tape, each finger and support therefor having means adjustably supporting the finger in control of spacing of said elements on said tape, and means independent of the first guide means for guiding the tape with respect to said fingers.

5. In machines for setting fastener elements to elongated mounting tapes, an attachment for automatically controlling spacing of the elements attached to the tape, means for guiding a tape fed through the machine in a predetermined path, a pair of control fingers movable into and out of the path of fastener elements attached to and movable with said tape in intermittently holding the tape in position for attachment of the fastener elements thereto at spaced intervals controlled by said fingers, supports for said fingers, and cam and spring means for actuating said supports in controlling operation of the supports of each finger for automatically moving the fingers into operative and inoperative position with respect to fastener elements on said tape, each finger and support therefor having means adjustably supporting the finger in control of spacing of said elements on said tape, means independent of the first guide means for guiding the tape with respect to said fingers, and said last named means being adjustable.

6. In a fastener setting machine, means for guiding an elongated tape fed through the machine, means for attaching fastener elements to the tape, and spaced automatically and sequentially actuated members for engaging fastener elements attached to the tape for positioning points on the tape with respect to the last named means in controlling spacing of fastener elements longitudinally of the tape.

7. In a fastener setting machine, means for guiding an elongated tape fed through the machine, means for attaching fastener elements to the tape, spaced automatically and sequentially actuated members for engaging fastener elements attached to the tape for positioning points on the tape with respect to the last named means in controlling spacing of fastener elements longitudinally of the tape, and said members and fastener attaching means providing on the tape groups of elements defining tape lengths in which all elements of the tape lengths are equally spaced.

8. In a fastener setting machine, means for guiding an elongated tape fed through the machine, means for attaching fastener elements to the tape, spaced automatically and sequentially actuated members for engaging fastener elements attached to the tape for positioning points on the tape with respect to the last named means in controlling spacing of fastener elements longitudinally of the tape, said members and fastener attaching means providing on the tape groups of elements defining tape lengths in which all elements of the tape lengths are equally spaced, and forming different spacings between adjacent elements of each group.

9. In a fastener setting machine, means for guiding an elongated tape fed through the ma-

chine, means for attaching fastener elements to the tape, and spaced automatically and sequentially actuated members for engaging fastener elements attached to the tape, and said members in combination with said element attaching means being adapted to form groups of elements on the tape having common spacing of the elements in the group with a different spacing of end elements of adjacent groups on said tape.

10. In machines for setting fastener devices to a mounting member, means for securing fasteners to a mounting member, automatically actuated means for controlling positioning of points on the mounting member with respect to said first named means in controlling spacing of fastener elements one with respect to the other on said mounting member, and said last named means including means permitting varying spacings of predetermined fastener elements on said mounting member.

11. In machines for setting fastener devices to a mounting member, means for securing fasteners to a mounting member, automatically actuated members for controlling positioning of points on the mounting member with respect to said first named means in controlling spacing of fastener elements one with respect to the other on said mounting member, and means adjustably supporting said members to vary spacing of the fastener elements on said mounting.

12. In machines for setting fastener devices to a mounting member, means for securing fasteners to a mounting member, automatically actuated members for controlling positioning of points on the mounting member with respect to said first named means in controlling spacing of fastener elements one with respect to the other on said mounting member, means adjustably supporting said members to vary spacing of the fastener elements on said mounting, and each member having a control and operating means.

13. A fastener spacing attachment for machines of the class described, said attachment comprising a shaft having means for supporting the same in connection with a machine, a bushing rotatably mounted on the shaft, a pair of cams and a ratchet mounted upon said bushing, an elongated key for keying the cams and ratchet to the bushing, yieldable means at the free end of the shaft for supporting said cams and ratchet against displacement from the bushing while facilitating quick attachment and detachment therefrom, means comprising a lever rotatably mounted on the bushing supporting a detent engaging said ratchet to impart intermittent rotary movement to the ratchet and said cams, means comprising a link and lever for placing the first named lever in operative engagement with the machine to actuate said first named lever, a bracket adapted for attachment to the machine, said bracket supporting another shaft, a spring actuated pawl on the last named shaft for engaging the ratchet to retain the same against rotation in one direction, a pair of levers rotatably supported on the last named shaft, one end portion of the levers operatively engaging said cams, and means adjustably supporting stop fingers in connection with the other end portions of said last named levers.

14. A fastener spacing attachment for machines of the class described, said attachment comprising a shaft having means for supporting the same in connection with a machine, a bushing rotatably mounted on the shaft, a pair of cams and a ratchet mounted upon said bushing, an elongated key for keying the cams and ratchet to the bushing, yieldable means at the free end of the shaft for supporting said cams and ratchet against displacement from the bushing while facilitating quick attachment and detachment therefrom, means comprising a lever rotatably mounted on the bushing supporting a detent engaging said ratchet to impart intermittent rotary movement to the ratchet and said cams, means comprising a link and lever for placing the first named lever in operative engagement with the machine to actuate said first named lever, a bracket adapted for attachment to the machine, said bracket supporting another shaft, a spring actuated pawl on the last named shaft for engaging the ratchet to retain the same against rotation in one direction, a pair of levers rotatably supported on the last named shaft, one end portion of the levers operatively engaging said cams, means adjustably supporting stop fingers in connection with the other end portions of said last named levers, said cams having peripheral surfaces controlling movement of said fingers into operative and inoperative position, and yieldable means supporting the first named end of said levers in constant engagement with said cams.

15. In fastener setting machines employing means for guiding a mounting member through the machine in a predetermined path, the machine having in said path means for securing fastener elements to the mounting member, automatically actuated means spaced with respect to said last named means and engaging fastener elements attached to said mounting member for controlling the positioning of points on the mounting member for attachment of a fastener element, and said automatically actuated means comprising a pair of fingers for sequentially engaging fastener elements secured to the mounting member to control spacing of all of the fastener elements one with respect to the other on said mounting member.

16. In fastener setting machines employing means for guiding a mounting member through the machine in a predetermined path, the machine having in said path means for securing fastener elements to the mounting member, automatically actuated means spaced with respect to said last named means and engaging fastener elements attached to said mounting member for controlling the positioning of points on the mounting member for attachment of a fastener element, said automatically actuated means comprising a pair of fingers for sequentially engaging fastener elements secured to the mounting member to control spacing of all of the fastener elements one with respect to the other on said mounting member, and each of said fingers being adjustable with respect to said fastener securing means.

17. In fastener setting machines employing means for guiding a mounting member through the machine in a predetermined path, the machine having in said path means for securing fastener elements to the mounting member, automatically actuated means spaced with respect to said last named means and engaging fastener elements attached to said mounting member for controlling the positioning of points on the mounting member for attachment of a fastener element, said automatically actuated means comprising independent fingers adapted to control spacing of all of the fastener elements one with respect to the other on said mounting member, each of said fingers being adjustable with respect

to said fastener securing means, and each finger having means controlling movement thereof into operative and inoperative positions.

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