Aug. 27, 1946. J. P. TRECIOKAS 2,406,516

FASTENER SETTING MACHINE

Original Filed March 18, 1943 2 Sheets-Sheet 1

Fig. 1.

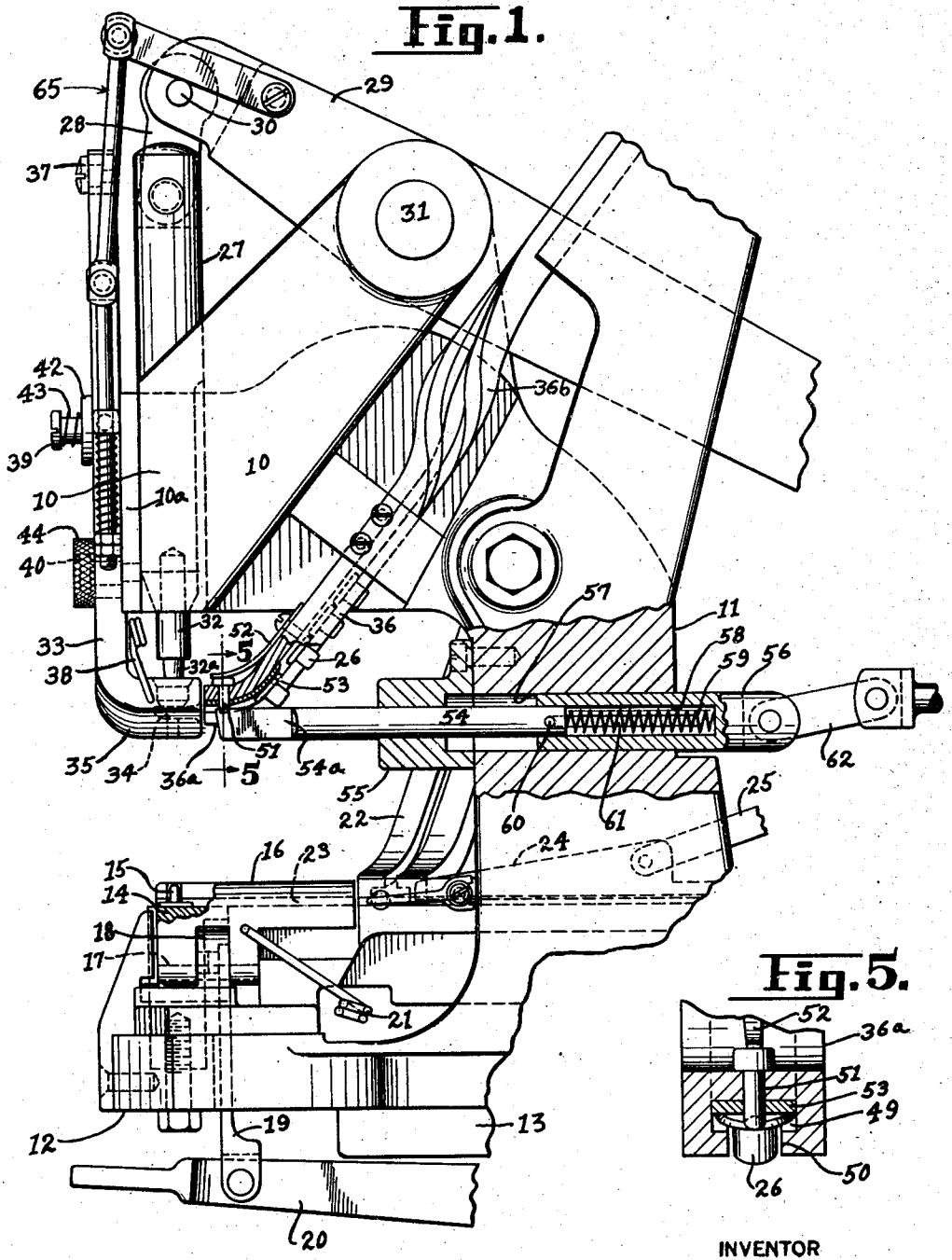


Fig. 5.

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Fig. 2.

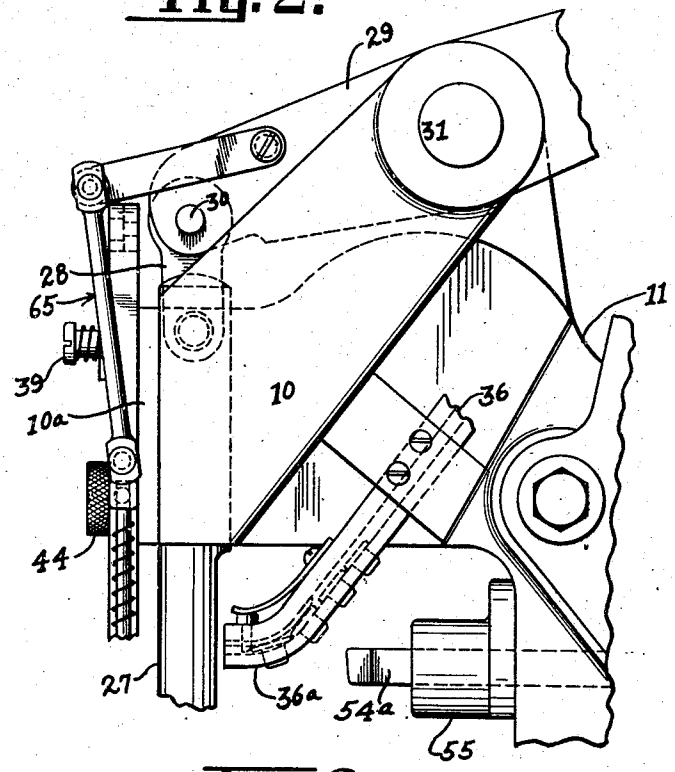


Fig. 3.

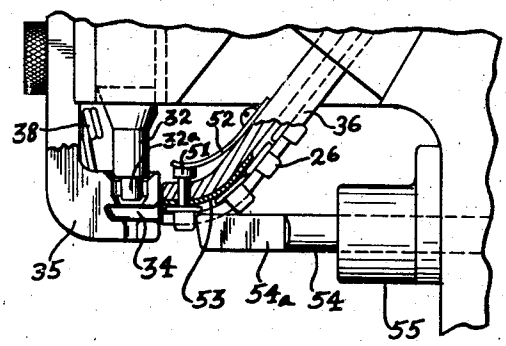
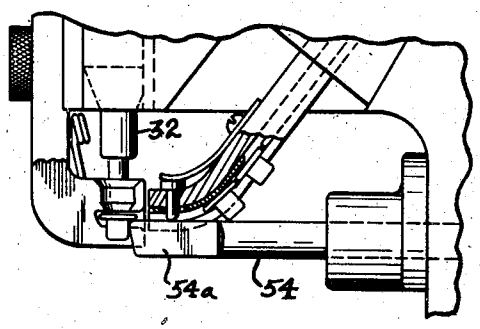


Fig. 4.



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UNITED STATES PATENT OFFICE

2,406,516

FASTENER SETTING MACHINE

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Original application March 18, 1943, Serial No. 479,563. Divided and this application June 30, 1944, Serial No. 542,925

5 Claims. (Cl. 218—6)

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This invention relates to improvements in fastener setting or attaching machines adapted for use in securing together parts of buttons or fastener elements upon a supporting structure such as garments or other articles of fabric material. As herein disclosed the fastener elements may consist of an eyelet member and a hollow button member within which the shank end of the eyelet member may be upset when attaching the fastener members to their support.

This application is a division of an earlier application, Serial No. 479,563 filed March 18, 1943, now Patent No. 2,373,436, granted April 10, 1945, which pertains to a mechanism associated with the operation of the upper jaws.

The machine in general comprises an anvil upon which the eyelet member may be positioned with the shank projecting upwardly, a pair of jaws by which the button member may be positioned over the eyelet shank, and a setting tool in the form of a plunger by which the button may be released from the jaws and the button and eyelet secured together by relative movement between the tool and anvil.

Heretofore, it has been the more common practise in machines of the above nature to feed the fastener element, which in this case is the button member, to the upper jaws through feed tracks from a hopper depending entirely upon the force of gravity. In practise in conventional machines in resorting to gravity as a feeding means, where the operator is working upon a garment or some device to which fasteners are to be set relatively close together, it has been found that the operator can work faster than the speed in which the fasteners could be fed into the jaws by gravity, and, therefore, resulted quite frequently in a missing fastener or in a deformed fastener. This has been particularly true in machines that are either foot-operated, such as disclosed in the Veillette Patent No. 1,836,887, or operated by a crank connection attached to a clutch operated drive shaft, such as disclosed in the Warner Patent No. 1,575,596.

In order to overcome the above faults, it is one of the prime objects of this invention to provide a positive means for feeding the button elements into the upper jaws of the machine directly from the end of a raceway or feed track.

Another object of this invention is the arrangement of the positive feeding means and a raceway through which the button elements are fed to the jaws such that the axis of the button elements are arranged in a radial fan-like position and located so that the pusher means selectively

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engages the hub of the foremost button element in the raceway and forces it past a releasable detent and into the jaws of a fastener setting machine.

Another object of this invention is to use the feed means as a temporary cut-off for the next succeeding button element and others backed up thereby in the raceway during the period of feeding the foremost button into the receiving jaws.

Further objects and advantages of this invention will appear more fully from the following description particularly when taken in connection with the accompanying drawings illustrating the preferred form of the invention wherein:

Fig. 1 is a side view of a portion of the machine embodying the improvements, parts of which are broken away to show better the structural details, with the upper jaws and setting punch shown in retracted position and the means for feeding the fastener elements into the upper jaws in partially retracted position.

Fig. 2 is a similar view of the upper portion of the machine, showing the mechanism for operating the jaws in an advanced position, and the button feeding plunger in a retracted position.

Fig. 3 is a fragmentary view of the upper jaw feeding means and showing a button element in the process of being picked up from its track and fed into the jaws.

Fig. 4 is a similar view showing the feeding means having advanced the button completely into its receptive socket in the jaws, and

Fig. 5 is an enlarged sectional view taken transversely at the end of the button feed track on line 5—5 of Fig. 1.

The invention to be described is applied to a portion of the machine comprising a bearing block 10 supported by a head 11 extending upwardly and forwardly from a portion of the machine bed plate 12 which in turn may be mounted upon a suitable pedestal or support 13, a portion of which is shown in Fig. 1. Mounted upon the bed plate 12 is an anvil 14 for the purpose of receiving a fastener element herein described as an attaching eyelet 15.

As a means for properly positioning and retaining the attaching eyelet or fastener element 15 upon the anvil 14 a pair of lower jaws 16 may be provided between which the eyelet may be thrust prior to a setting operation. These jaws 16 may be pivotally connected as at 17 to a vertical movable slide 18 connected by means of a link 19 with the forward end of a lever 20, which is adapted to be pivotally mounted upon the ped-

estal 13 and actuated by suitable mechanism of the machine to move the link 19 downwardly and cause the lower jaws to spread so as to remove them from the fastener element during the setting operation. The jaws may be yieldingly held in their normal fastener receiving position by a spring 21.

The attaching eyelets 15 are fed from a hopper (not shown) and stacked in a raceway 22 leading to a guideway 23, and prior to each setting operation a single eyelet is picked up from the end of the raceway 22 and thrust forwardly through the guideway 23 to its proper position upon the anvil, as by means of a feed slide 24. The feed slide 24 in turn is actuated by a link 25 operated from any suitable mechanism of the machine.

In order to supply a complementary fastener element for the attaching eyelet 15, such as a button member 26, and carry it into alinement therewith for the purpose of attaching the same upon a supporting member, means is provided in the form of a plunger 27 mounted in the bearing block 10 and adapted to move longitudinally with its axis in alinement with the anvil 14. To provide for the endwise movement of the plunger 27, it is connected by means of a link 28 to the forked end of a main lever 29 through a connecting pin 30. The lever 29 is pivoted as at 31 to the head 11. The lower end of the plunger 27 is provided with a setting tool or punch 32 having a reduced portion 32*a* for fitting into the hollow of the button member and serving to upset the end of the eyelet 15 coincident with the setting operation.

As a convenient means for positioning the button element 26 in alinement with the setting tool 32, a pair of upper jaws 33 are provided and slidably mounted upon an integral portion 10*a* projecting from the front face of the bearing block 10. The lower ends of the jaws 33 are provided with inturned portions 35 that are adapted in normal position to be alined with the terminal end of a feed track 36 through which the button elements 26 are fed from a suitable hopper (not shown) in a manner as will be more fully explained later and forms the subject matter of this invention. The upper ends of the jaws 33 are suitably hinged together as by a pivot screw 37 in order to allow the lower inturned portions 35 thereof to swing outwardly for releasing the button therefrom and allow the setting tool 32 to pass therethrough coincident with the setting operation, and the jaws are normally held in a clamped closed position by means of a spring 38. The inturned ends 35 of the jaws have their adjacent faces cut out to provide a suitable recess or socket 34 for the reception of the button element 26 when fed thereinto from the feed track 36 and also to allow for clearance for the descending setting tool 32 when removing the button from said jaws. The jaws 33 are held in slidable and frictional relation to the face of the block projecting portion 10*a* as by means of screws 39 and 40 secured thereto. The upper screw 39 supports a friction washer 42 that is compressed against the face of the jaws 33 by means of a coil spring 43. The lower screw 40 supports a spreading cam member operated by means of an integral knurled head 44 for the purpose of spreading the jaws 33 manually in case it is desired to remove a fastener from the jaw ends. The jaws and associated attaching parts form no part of the present invention except inasmuch as they cooperate therewith, and are functionally operated with the inventive features of the machine.

As was pointed out in the objects of this invention in order to speed up the feed of the button elements into the upper jaws 33 provision is made for positively feeding the buttons directly into said jaws from the feed track 36. As best shown in Figs. 1, 2, 3 and 4, the lower end of the feed track 36 is formed with a rather abrupt bend or arcuate portion 36*a* that positions the discharge end of the track 36 in a substantially horizontal position and directly in alinement with the inturned jaw ends 35 when the latter are in their normal retracted position.

The feed track 36 is provided with a T-shaped slot or guideway, the central wider portion 49 of which is adapted to accommodate the enlarged head of the button elements, and the narrow portion 50 of which opens through the lower side of the feed track 36 and is adapted to accommodate the shank of the buttons (see Fig. 5).

The buttons are adapted to slide by gravity from a suitable hopper (not shown) down to the arcuate portion 36*a* of the track where the foremost button will be stopped by a stop pin 51 slidably mounted in the feed track 36, and the following buttons will stack up in the T-shaped guideway 49, 50 of the feed track. The pin 51 is held normally in a depressed position by means of a leaf spring 52 secured to the upper face of said feed track. The depth of the guideway 49 is somewhat greater than the normal thickness of the button head so as to allow the buttons to be readily guided around the twisted portion of the track as is indicated at 36*b* (Fig. 1) without jamming therein. To prevent the button heads from overlapping each other when they approach the stop pin 51 a restrictive plate 53 is secured to the arcuate portion 36*a* of the feed track within the upper part of the guideway 49, as best shown in Fig. 1.

The purpose of the abrupt bend or arcuate portion 36*a* of the feed track is to cause the button shanks in that part of the track to assume a radially spread fan-like position to allow for the flattened portion or feed finger end 54*a* of a reciprocatory rod 54 to advance in alinement with the narrow recess 50 of the T-slot and engage the shank of the foremost button only and feed the same past the stop pin 51, and thence into the jaw recess 34. In forcing the button past the stop pin 51, the latter will be forced upwardly against the influence of the spring 52. The act of feeding the foremost button past the stop pin 51 is best shown in Fig. 3, and it will also be noted in this figure that the upper surface of the feed finger also serves as a stop for the next succeeding button during the time that it is feeding the foremost button into the jaw ends 35. When the feed finger rod 54 has been retracted to its starting position the next succeeding button will then by gravity be caused to slide into engagement with the stop pin ready to be picked up by the feed finger on the next stroke. The feed finger rod 54 is slidably mounted in a bracket bearing 55 secured to the head 11.

In order to provide a safety feature in case the button elements should become stuck or jammed within the jaws 33 or feed track 36 during the feeding operation, the feed finger rod 54 is operated through a cushioned plunger 56. Specifically the plunger 56 is slidably mounted in a suitable recess 57 in head 11 and is provided with a hollow interior 58 into which is received a relatively heavy compression spring 59, one end

of which is abutted against the base of the hollow interior and the other end against the adjacent end of the feed finger **54**. Outward movement of the feed finger relative to the plunger **56** is prevented by means of a transverse pin **60** secured to the inner end of the feed finger rod **54** and slidably operated in a pair of opposed longitudinal recesses **61** formed axially in the plunger **56** as shown in the sectional portion of Fig. 1. The plunger is adapted to be reciprocated through a link **62** tied into a suitable operating part of the machine.

Since it is the purpose of this machine to positively feed the fastener buttons into the recesses **34** of the jaws at a speed greater than can be attained by gravity, it is essential that the recesses **34** of the jaws **33** be alined with the end of the feed track **36** in proper time relation to the feeding stroke of the feed finger rod **54**. The operation of the jaws **33** by a special linkage mechanism generally indicated by the numeral **65** for connecting to and operating said jaws off of the main operating lever **29** is used here to effect this result. A more complete description of this linkage mechanism is not considered necessary here as it forms no part of the present invention and is fully disclosed in the aforementioned application of which this is a division.

Operation

In the operation of this machine during the time that the jaws **33** and plunger **27** are being returned to their normal uppermost position, a fastener element **15** will be fed into the jaws **16** by means of the slide **24** in the usual manner and held in place upon the anvil by the lower jaws **16**. The feed finger end **54***a* of the rod **54** will next move in to pick up the foremost button **26** in the discharge end of the feed track **36**, force it to cam past the stop pin **51** and into the recesses **34** of the inturned jaw ends **35**, and immediately start to retract before the plunger **27** descends. During the time that the feed finger end **54***a* is advancing to deliver the foremost button to the jaws the upper surface thereof will serve as a temporary stop for the next succeeding button and the others backed up thereby in the feed track **36** in a manner as shown in Figs. 1, 3 and 4. When the feed finger end **54***a* has cleared out of the pathway of the buttons **26**, the stack of buttons will feed down the raceway with the next succeeding button, which now becomes the foremost button, engaging against the pin **51** as a stop in line with the feed finger end **54***a*, completing the cycle of operations.

While there has been illustrated and described a machine that has been built and successfully operated embodying the inventive concepts of my invention, it should be understood that the invention is not intended to be limited to the specific form disclosed in this application, but should be regarded as including modifications and variations thereof within the scope of the appended claims.

I claim:

1. In a feeding mechanism for feeding fastener elements having a head and a shank from the hopper to the setting station of a fastener attaching machine, said mechanism comprising a guideway leading downwardly from said hopper and terminating in an arcuate portion adjacent the setting station, the fastener elements being disposed in said guideway with their shanks directed outwardly and downwardly and in the arcuate portion with their shanks directed in a radially diverging position, the discharge end of said arcuate portion having a releasable stop means to limit the travel of said elements, and a slide means having its forward end operating tangentially of the discharge end of said arcuate portion, the position of said stop means and of the pathway of the forward end of the slide means relative to the arcuate portion and the bend of the arcuate portion of said track being sufficient to dispose the shank of the foremost element only of a series of normally configurated fastener elements in direct alignment with the forward end of said slide with the next successive elements disposed in edge-to-edge contact of their heads and their respective shanks out of alignment with the forward end of said slide and wherein the foremost element only of the series of elements will be fed into the setting station by the feed slide upon one cycle operation of the machine.

2. In a feeding mechanism for feeding fastener elements having a head and a shank from a hopper to the setting station of a fastener attaching machine, said mechanism comprising a guideway terminating at its discharge end in an arcuate portion, said arcuate portion having an opening through which the shanks of said elements project in a downwardly radial position, a releasable stop means adjacent the discharge end of said guideway serving to check the travel of said elements and cause them to stack up in said guideway, and a rectilinearly operated feed finger operating tangentially of said guideway, said guideway terminating in its arcuate portion and said arcuate portion being of sufficient curvature and the feed finger being so positioned relative to the arcuate portion that with normally configurated fastener elements the feed finger will engage the shank of only the foremost fastener element to force said element past said stop means and into said setting station upon each cycle operation of the machine.

3. In a feeding mechanism for feeding fastener elements having a head and a shank from a hopper to the setting station of a fastener attaching machine, said mechanism comprising a guideway terminating at its discharge end in an arcuate portion, said arcuate portion having an opening through which the shanks of said elements project in a downwardly radial fan-like position, a releasable stop means adjacent the discharge end of said arcuate portion serving to check the travel of said elements and cause them to stack up in said guideway with their heads in edge-to-edge contact, and a rectilinearly operated feed finger operating tangentially of the discharge end of said guideway, said guideway terminating in its arcuate portion and said arcuate portion being of sufficient curvature and the feed finger being so positioned relative to the opening in said arcuate portion that with normally configurated fastener elements the feed finger will engage the shank of only the foremost element in said guideway and force said element past said stop means and into said setting station, said feed finger acting as a cut-off for the next succeeding element and those supported thereabove in the guideway during the period of feeding the foremost element and returning toward retracted position.

4. In a feeding mechanism for feeding fastener elements having a head and a projecting shank from a hopper into the setting station of a fastener attaching machine, said mechanism

comprising a feed track leading downwardly from said hopper and serving to hold the elements in uniform stacked position, the discharge end of said feed track having an arcuately bent portion of a character to dispose the adjacent elements in the feed track with their axes in radial relationship and their shanks in a generally depending and diverging position, a rectilinearly advanceable and retractable feeding means operating tangentially of the arcuate portion of said track, a releasable stop means located adjacent the discharge end of said arcuate portion for releasably maintaining the foremost radially positioned element within the end of said track, the position of the stop means and of the pathway of the feeding means relative to the arcuate portion and the bend of the arcuate portion of said track being sufficient to dispose the shank of the foremost element only of a series of normally configurated fastener elements in direct alignment with said feeding means with the next successive elements stacked in said arcuate portion by edge-to-edge contact of the element heads such as to dispose their respective shanks out of alignment with said feeding means and so that the next succeeding element will be ready to assume the position of the first element with the minimum amount of travel in said track immediately upon the retraction of the feeding means.

5. In a feeding mechanism for feeding fastener elements having a head and an axial projecting portion from a hopper to the setting station of a fastener attaching machine, said mechanism comprising a feed track leading downwardly from said hopper and terminating in a relatively short arcuate portion, said feed track providing a pathway of a shape complementary to the elements and opening through one side thereof, a releasable stop means operating within the pathway to check the foremost of the elements passing through said pathway directly from said hopper and hold any succeeding elements with their heads in stacked edge-to-edge contact relationship in said feed track, and a rectilinear feed finger operating tangentially of and through the opening in the discharge end of the arcuate portion of the feed track, said feed track terminating in its arcuate portion and the arcuate portion being of sufficient curvature and the feed finger being so positioned relative to the opening in said arcuate portion that with normally configurated fastener elements the leading end of said finger during forward motion will engage the axial projecting portion of the foremost element and clear the projecting portion of the next succeeding stacked elements in said feed track, and said feed finger acting as a cut-off for said succeeding elements in the feed track during the advancing and retracting stroke.

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