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POSITIONING DEVICE
FOR BUTTON SETTING MACHINES

The present invention relates to a device for positioning a garment fabric with respect to a clinching die of a button setting machine.

There are known various button setting machines
5 generally including a punch and a die coacting together to clinch a button body and a tack with a garment fabric sandwiched therebetween, and an indicator for designating a position of the die with which a predetermined portion of the garment fabric is to be
10 registered. The indicator comprises a slender rod or needle reciprocally movable, in timed relation to the movement of the punch, into and out of a position where a downwardly bent end of the needle is held in registry with the die. The bent end of the needle must be
15 spaced a considerable distance from the die not to damage the garment fabric during reciprocation of the needle and setting operation of the garment fabric onto the die. The needle indicator thus arranged has a significant drawback that visual positioning operation

would require highly experienced dexterity on the part of an operator. Due to the reliance on eye measurement, another drawback is that positioning operation would be rendered time consuming and precise
5 attachment of the button to the garment could not be expected.

According to the present invention, there is provided a button setting machine comprising a device for positioning a garment fabric with respect to a clinching die mounted
10 on a frame of the button setting machine, said device comprising:

(a) a support table reciprocally mounted on the frame and having a surface extending in a plane above the clinching die for supporting thereon the garment fabric, said table having a recess and reciprocally movable between
15 an advanced position where said recess is registered with the clinching die, and a retracted position remote from the clinching die;

(b) a first guide member mounted on said surface of said table and positionally adjustable in a first direction
20 perpendicular to the direction of movement of said table for positioning the garment fabric in respect of said first direction;

(c) a second guide member mounted on said surface of said table in perpendicular relation to said first guide
25 member and positionally adjustable in a second direction parallel to the direction of movement of said table for

positioning the garment fabric in respect of said second direction; and

(d) a vertical support block mounted on the frame and having at least one horizontal bore extending therethrough, a shaft
5 slidably fitted in and extending through said bore, said support table having a vertical lug disposed on and depending from one end of said table, said shaft being connected at one end to said lug, and at least one spring acting between said support block and said table to urge the
10 latter into said retracted position.

It is believed possible by means of the invention to provide a button setting machine with a positioning device which incorporates structural features to enable speedy and accurate positioning of a garment fabric with respect to a climbing die of a button setting machine.

15 It is also believed possible by means of the invention to provide a button setting machine with a positioning device having a guide means which is positionally adjustable accurately and easily to thereby vary a position on a garment fabric to which a button is attached.

20 The invention will be described by way of example with reference to the accompanying drawings, wherein:-

Figure 1 is a schematic perspective view of a positioning device embodying the present invention;

Figure 2 is a plan view of the positioning device shown in
25 an advanced position;

Figure 3 is a front elevational view of Figure 2; and

Figure 4 is a side elevational view of Figure 2.

As shown in Figure 1, a positioning device 10 is provided in a button setting machine 11 for positioning a garment fabric (not shown) with respect to a clinching die 12 of the machine 11. The clinching die 12 is mounted on a frame 13 of the machine 11 for supporting a button body A which constitutes one part of a button (not shown).

The positioning device 10 generally comprises a substantially rectangular support table 14 movably mounted on the frame 13 for supporting thereon the garment fabric, and a pair of guide members 15, 16 positionally adjustably mounted on an upper surface 14a of the table 14 in perpendicular relation to one another, the upper surface 14a extending in a plane above the die 12 as shown in Figures 3 and 4.

The device 10 further includes a vertical support block 17 secured to the frame 13 on one side of the die 12 by means of a pair of screws 18, 18. The support block 17 has a pair of laterally spaced horizontal bores 19, 19 into which a pair of shafts 20, 20 is slidably fitted, respectively. Each of the

shafts 20 is fixed at one end to a vertical lug 21 depending from a corresponding one of two adjacent corners at one end or a rear end of the rectangular support table 14. The support table 14 has a
5 substantially rectangular recess 22 opening toward the other end or a front end of the table 14.

With this arrangement, the support table 14 is reciprocally movable between an advanced position (Figures 2 and 4) where the recess 22 is in registry
10 with the clinching die 12, and a retracted position (Figure 1) remote from the die 12. The support table 14 is normally held in the retracted position of Figure 1 by means of a pair of tension coil springs 23, 23 each of which is connected at opposite ends to a pair
15 of pins 24, 25 secured respectively to the support table 14 and the support block 17.

One of the guide members 15 comprises an elongated plate disposed on one side of the recess 22 and having a sidewall 26 extending parallel to the
20 shafts 20, the sidewall 26 serving as a guide surface for one of two adjacent edges of the garment fabric. The guide plate 15 has a pair of parallel spaced oblong holes 27, 27 extending perpendicularly to the sidewall 26 and hence to the shafts 20. A pair of screws 28, 28
25 is threaded through the respective holes 27, 27 into the support table 14 to secure the guide plate 15 to the support table 14. Thus, the guide plate 15 is

positionally adjustable in a direction perpendicular to the axis of each shaft 20 and hence to the direction of movement of the support table 14.

The other guide member 16 comprises an elongated plate disposed along a front edge of the support table 14 across the recess 22. The guide plate 16 has a sidewall 29 extending normal to the sidewall 26 of the guide plate 15, and a pair of parallel spaced oblong holes 30, 30 extending perpendicularly to the sidewall 29. The sidewall 29 serves as a guide surface for the other edge of the garment fabric. A pair of screws 31, 31 is threaded through the respective oblong holes 30, 30 into the support table 14 to thereby secure the guide plate 16 to the support table 14. Thus, the guide plate 16 is positionally adjustable in a direction parallel to the axis of each shaft 20 and hence to the movement of the support table 14.

An actuator lever 32 is secured to the front end of the support table 14 and projects laterally outwardly from a side edge of the table 14. A limit switch 33 is mounted on a bracket 34 secured to the frame 13, in horizontal alignment with the lever 32. When the support table 14 is brought into the advanced position of Figure 2, the lever 32 engages the limit switch 33 to actuate the latter to send a command signal to an actuator (not shown) for driving a clinching punch (not shown) of the machine 11 toward

the die 12.

For attaching buttons to a garment fabric, at least one of the guide plates 15, 16 is adjusted in position such that the respective sidewalls 26, 29 are spaced from the central axis of the clinching die 12 by respective distances $\delta 1$, $\delta 2$ as shown in Figure 2. This adjustment ensures an accurate positioning of a portion of the garment fabric with respect to the clinching die 12. Then a button body A is set on the clinching die 12 by a suitable parts supply unit (not shown). Substantially at the same time, a tack member not shown is delivered by another parts supply unit (not shown) and held below the clinching punch. Both the parts supply units are operative in timed relation to the movement of the clinching punch.

Then an operator places the garment fabric on the support table 14 while the latter is at rest in the retracted position of Figure 1, then properly positions the garment fabric by putting two adjacent edges of the garment fabric into guided engagement with the respective sidewalls 26, 29, and finally moves the support table 14 into the advanced position of Figures 2 and 4 while keeping the garment fabric locked in position. Arrival of the support table 14 at the advanced position causes the actuator lever 32 to actuate the limit switch 32 to send a command signal to the actuator whereupon the punch is driven to descend

toward the die 12, thereby attaching the button body and the tack in clinched condition to the garment fabric between the punch and the die 12. During that time, the punch can move through the recess 22 into
5 coaction with the die 12.

With the positioning device 10 thus constructed, a speedy and accurate positioning of the garment fabric with respect to the die 12 can be achieved by simply putting two adjacent edges of the garment fabric into
10 guided engagement with the sidewalls 26, 29 of the respective guide plates 15, 16. The guide plates 15, 16 are positionally adjustable in two directions crossing at right angles to thereby enable to vary a position on the garment fabric to which the button is
15 attached.



(19)

CLAIMS:-

1. A button setting machine comprising a device for positioning a garment fabric with respect to a clinching die mounted on a frame of the button setting machine, said device comprising:

5 (a) a support table reciprocally mounted on the frame and having a surface extending in a plane above the clinching die for supporting thereon the garment fabric, said table having a recess and reciprocally movable between an advanced position where said recess is registered with
10 the clinching die, and a retracted position remote from the clinching die;

(b) a first guide member mounted on said surface of said table and positionally adjustable in a first direction perpendicular to the direction of movement of said table
15 for positioning the garment fabric in respect of said first direction;

(c) a second guide member mounted on said surface of said table in perpendicular relation to said first guide member and positionally adjustable in a second direction
20 parallel to the direction of movement of said table for positioning the garment fabric in respect of said second direction; and

(d) a vertical support block mounted on the frame and having at least one horizontal bore extending therethrough, a shaft
25 slidably fitted in and extending through said bore, said support table having a vertical lug disposed on and

depending from one end of said table, said shaft being connected at one end to said lug, and at least one spring acting between said support block and said table to urge the latter into said retracted position.

2. A device according to claim 1, said spring comprising tension coil spring connected at opposite ends to the other end of said table and said support block.

3. A device according to claim 1 or 2, said first guide member comprising an elongated guide plate having a first sidewall extending parallel to said second direction, a pair of first oblong holes extending parallel to said first direction, and a pair of screws extending respectively through said first oblong holes and threaded into said table, said second guide member comprising an elongated guide plate having a second sidewall extending parallel to said first direction, a pair of second oblong holes extending parallel to said second direction, and a pair of screws extending respectively through said second oblong holes and threaded into said table.

4. A device substantially as described with reference to and as illustrated in Figures 1 to 4 of the accompanying drawings.

