United States Patent

Winston et al.

[15] **3,670,673**

[45] **June 20, 1972**

[54] BUTTON FEED DEVICE

[72] Inventors: **Eric Winston**, Melrose Park; **Herbert V. Jacobs**, Lower Merion, both of Pa.

[73] Assignee: **Jacobs Machine Corporation**, West Conshohocken, Pa.

[22] Filed: **Aug. 25, 1970**

[21] Appl. No.: **66,777**

[52] **U.S. Cl.** **112/113**

[51] **Int. Cl.** **D05b 3/22**

[58] **Field of Search** 112/113, 114, 107, 115, 112, 112/106, 110

[56] **References Cited**

UNITED STATES PATENTS

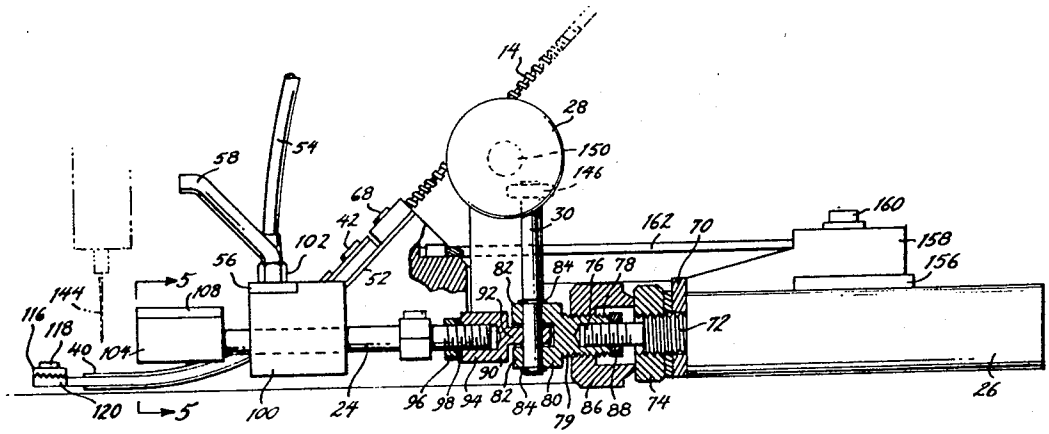
1,940,229	12/1933	Rawnsley	112/113
2,207,077	7/1940	Stott	112/113
3,343,508	9/1967	Pedersen et al.	112/113
3,382,824	5/1968	Brontman	112/113
3,483,833	12/1969	Conner	112/113
3,494,311	2/1970	Hopkins	112/113
3,499,405	3/1970	McKee et al.	112/113

Primary Examiner—Patrick D. Lawson
Assistant Examiner—Geo. V. Larkin
Attorney—Caesar, Rivise, Bernstein & Cohen

[57] **ABSTRACT**

A button feed device comprising insert arm means to orient and transfer buttons from an engaging station to a sewing station, lifting means to sequentially raise and lower the insert arm means, pin means extending from the insert arm means and adapted to move relative to each other in a first direction to an orienting position when contacting the surface of a button to engage certain of the sewing holes of the button with the pin means again returning to a normal position, but engaged in the button holes in order to orient the button by no later than the time drive means transport the insert arm and engaged button to the sewing station.

14 Claims, 22 Drawing Figures



PATENTED JUN 20 1972

3,670,673

SHEET 1 OF 5

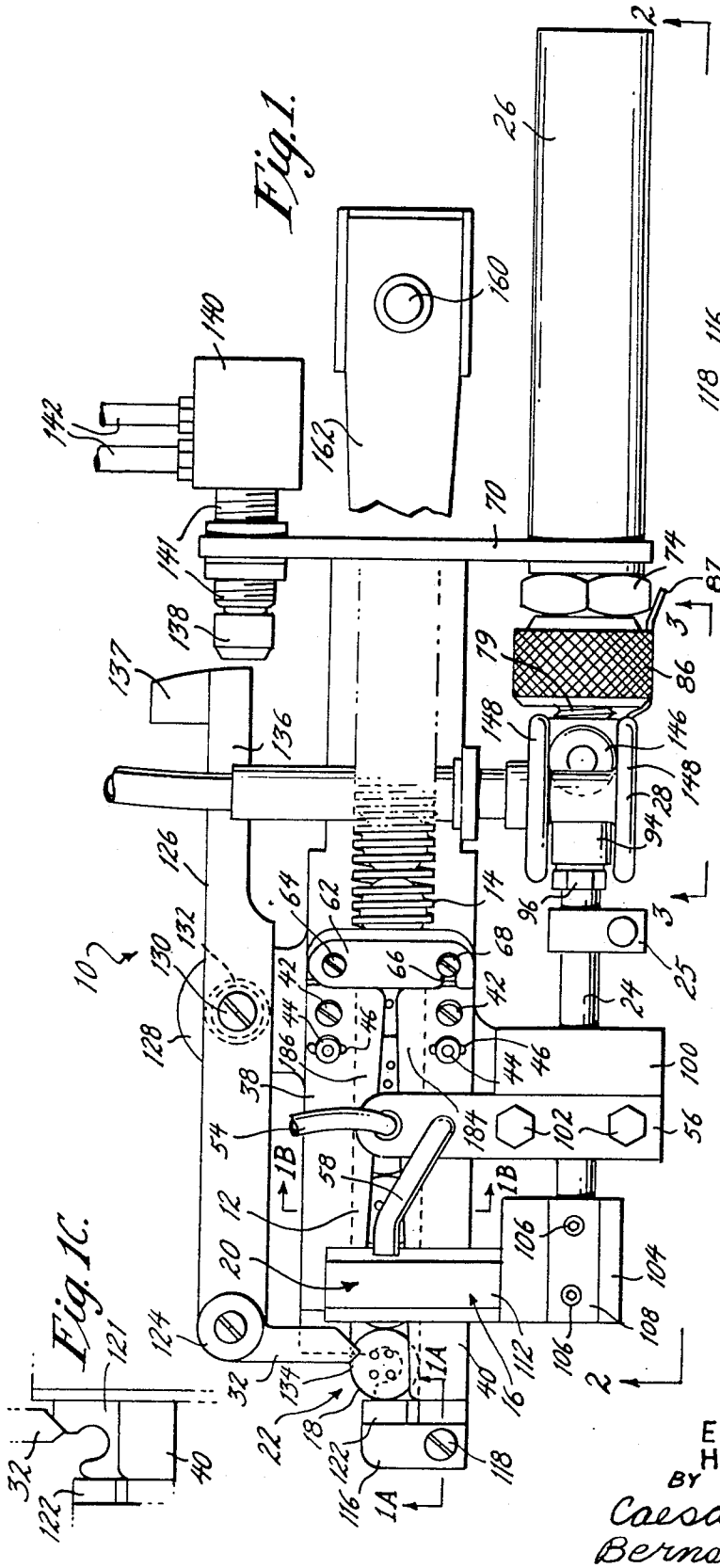


Fig. 1.

Fig. 1C.

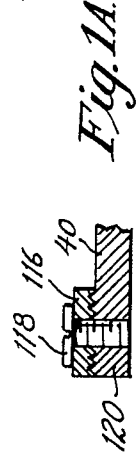


Fig. 1A.

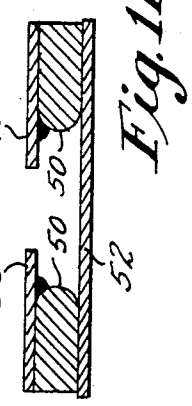


Fig. 1B.

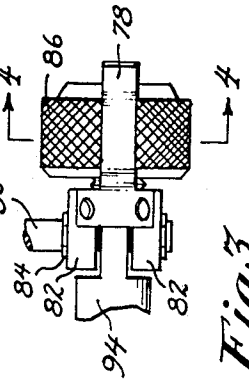


Fig. 3.

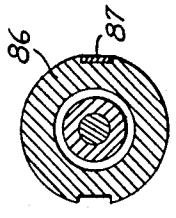


Fig. 4.

INVENTORS.
ERIC WINSTON
HERBERT V. JACOBS
BY
Caesar, Rivise,
Bernstein & Cohen
ATTORNEYS.

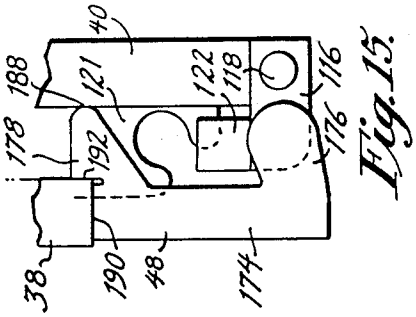


Fig. 15.

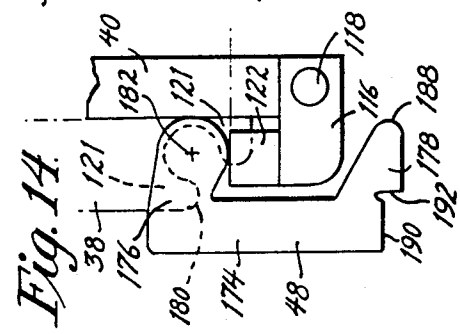


Fig. 14.

Fig. 2.

INVENTORS.
ERIC WINSTON
HERBERT V. JACOBS
BY
Cesar, Rivise,
Bernstein & Cohen
ATTORNEYS.

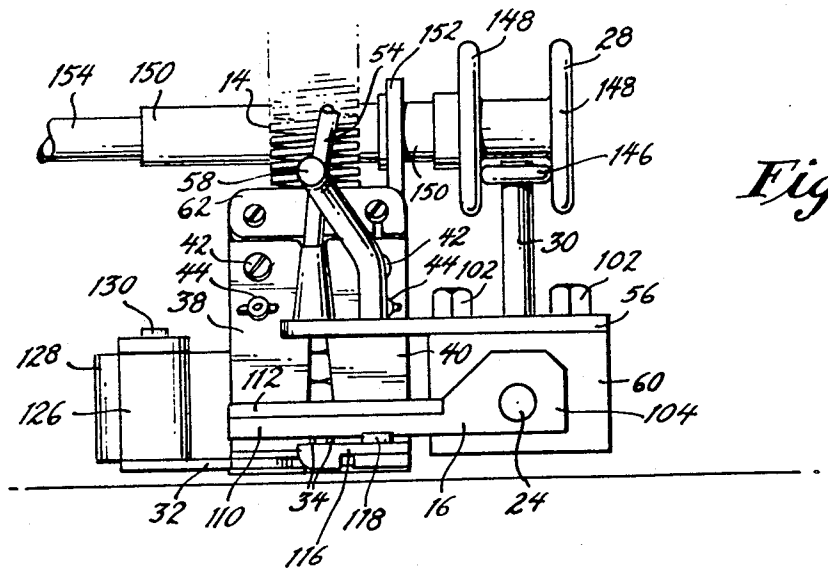


Fig. 2A.

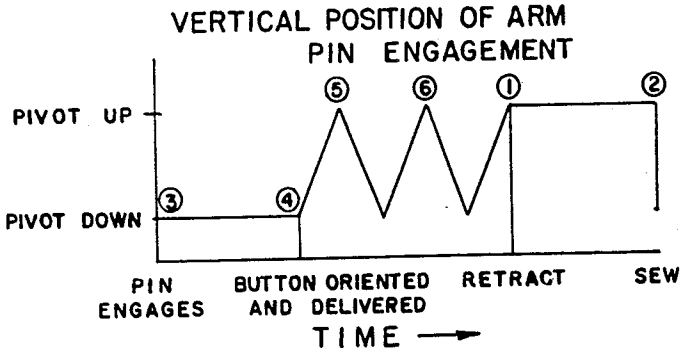


Fig. 12.

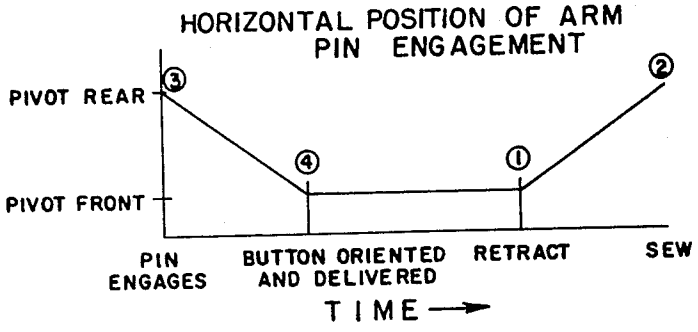


Fig. 13.

INVENTORS.
ERIC WINSTON
HERBERT V. JACOBS
BY
Caesar, Rivise,
Bernstein & Cohen
ATTORNEYS.

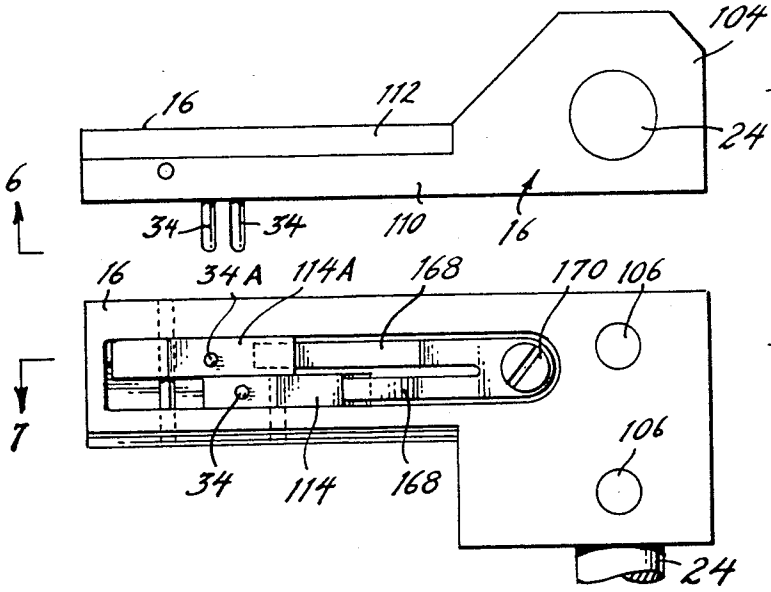


Fig. 5.

Fig. 6.

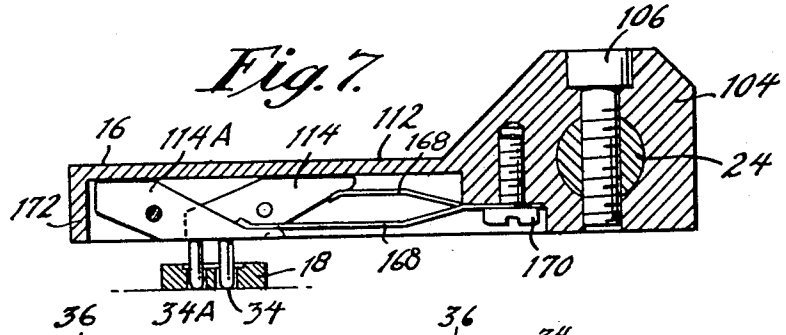


Fig. 7.

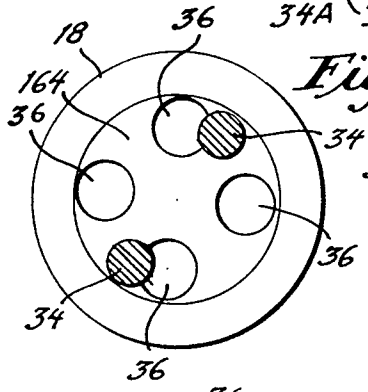


Fig. 8.

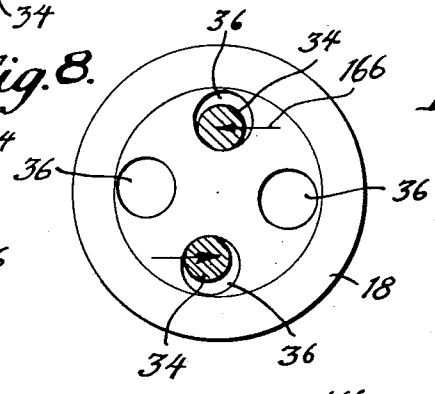


Fig. 9.

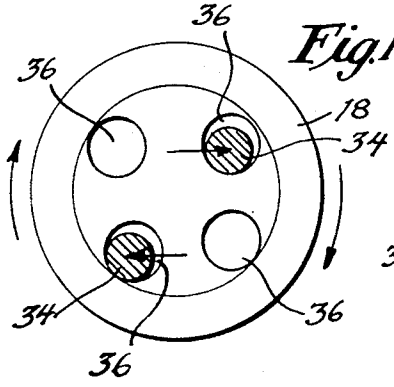


Fig. 10.

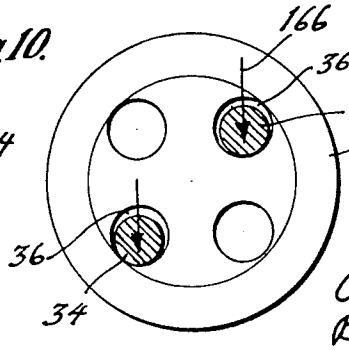


Fig. 11.

INVENTORS.
ERIC WINSTON
HERBERT V. JACOBS
BY
Caesar, Rivise,
Bernstein & Cohen
ATTORNEYS.

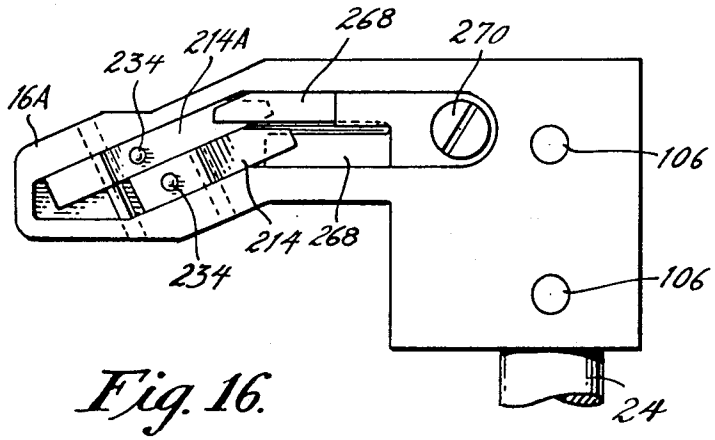


Fig. 16.

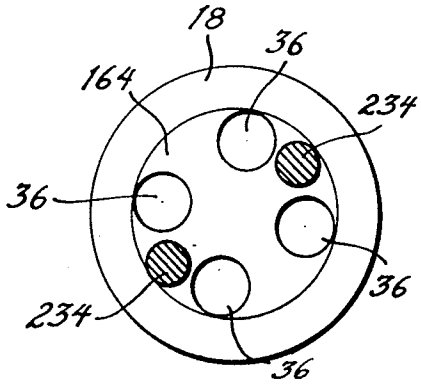


Fig. 17.

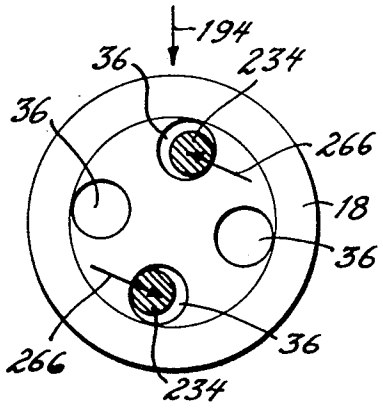


Fig. 18.

INVENTORS.
ERIC WINSTON
HERBERT V. JACOBS
BY
Caesar, Rivise,
Bernstein & Cohen
ATTORNEYS.

BUTTON FEED DEVICE

This invention relates to a button feed device and more particularly to a new and improved device of this general class.

Button feed devices are in wide use in the garment industry to enable the sewing of one or more buttons to a garment at predetermined times. Exemplary of such button clamps is the one disclosed in Hopkins U.S. Pat. No. 3,494,311, the actuating mechanism of which is hereby incorporated by reference.

A button feed device is relied upon in order to provide a steady and reliable source of buttons under the sewing head, with the buttons properly oriented so that the sewing needle will pass through the holes in the button. Otherwise the sewing needle will normally break if it contacts the button material itself.

It is important that the button feed device feeds buttons to the sewing head rapidly since otherwise the button clamp will constitute a bottleneck in the sewing process, and thereby defeat the high speeds achieved by modern feeding and sewing equipment.

In order to assure high speed in the button feed device function, prior orienting techniques such as disclosed in Hopkins U.S. Pat. No. 3,494,311, have provided a rotating button engaging head in order to achieve proper button orientation. The provision of a rotating head has been achieved only by providing somewhat complex control and actuating mechanism, and furthermore such orienting means may not function properly when used for a long time.

It is therefore an object of the present invention to provide a button feed device wherein the necessity to rotate the orienting head is eliminated.

Yet another object of the present invention is to provide a button feed device which will deliver properly oriented buttons at high speeds consistent with the high speeds of automated pick-up and sewing heads.

Still another object of the present invention is to provide a button feed device that is reliable in operation, particularly over long periods of time.

The foregoing as well as other objects of the invention are achieved by providing a button feed device which comprises means to deliver buttons having a plurality of sewing holes to an engaging section, insert arm means to orient and transfer the buttons from the engaging station to a sewing station, drive means to transport the insert arm means from the engaging station to a sewing station, lifting means to sequentially raise and lower the insert arm means, pin means including at least two pins assuming a normal position and extending from the insert arm means, the pin means being biased to move relative to each other in a first direction to an orienting position when contacting the surface of a button to engage certain of the sewing holes of the button with the pin means again returning to the normal position, but engaged in said button holes to orient the button by no later than the time the drive means transports the insert arm and engaged button to the sewing station.

Other objects and many of the attendant advantages of the invention will become more readily apparent by reference to the attached drawings wherein:

FIG. 1 is a top plan view of a button clamp constructed in accordance with the present invention;

FIG. 1A is an enlarged sectional view taken along the lines 1A — 1A of FIG. 1;

FIG. 1B is an enlarged sectional view taken along the lines 1B — 1B of FIG. 1;

FIG. 1C is a top plan view of the button sewing area of FIG. 1 (with button omitted);

FIG. 2 is a side elevational view taken along the lines 2—2 of FIG. 1;

FIG. 2A is a front elevational view of the button clamp of FIG. 1;

FIG. 3 is an elevational view, with certain internal parts revealed, taken along the lines 3—3 of FIG. 1;

FIG. 4 is a sectional view taken along the lines 4—4 of FIG. 3;

FIG. 5 is an enlarged sectional view taken along the lines 5—5 of FIG. 2;

FIG. 6 is a bottom plan view taken along the lines 6—6 of FIG. 5;

FIG. 7 is a sectional view taken along the lines 7—7 of FIG. 6;

FIGS. 8, 9, 10 and 11 show various stages of insert arm pin engagement into the sewing holes of a button for orientation purposes;

FIGS. 12 and 13 are diagrams showing movement of the insert arm both in a vertical sense as well as forwardly and backwardly between the engaging station and the sewing station;

FIGS. 14 and 15 are top plan views showing the use of a gauge in order to locate the left and right rails that define the path of button movement through the clamp and toward the engaging station; and

FIGS. 16, 17 and 18 are views similar to FIGS. 6, 8 and 9, but showing another embodiment of the insert arm.

Referring now in greater detail to the various figures of the drawing wherein like reference characters refer to like parts, there is shown generally at 10 in FIG. 1 a button clamp constituting an embodiment of the present invention.

With reference to FIG. 1 it will be seen that the button clamp 10 basically comprises delivery slot 12 to which buttons are fed through spring chute 14 that is connected to a vibratory hopper (not shown) in a manner well known in the art. In the vibratory hopper the buttons are oriented right side up so that they will be sewn in this desirable condition.

The button clamp 10 further includes the insert arm 16 whereby the buttons 18 are oriented at engaging station 20 and delivered to button sewing station 22.

The insert arm 16 is moved to and from the button sewing station by back and forth movement of rod 24 that is driven by piston 26. The insert arm also pivots to and from the buttons 18 by the action of spool 28 that causes vertical rod 30 (FIG. 2) to oscillate.

The forward delivery action of the insert arm 16 occurs as soon as a first button 18 has been sewn and is removed from the button sewing station, such that button feeler member 32 senses the absence of a button. This causes the insert arm 16 to be driven forwardly from the retracted position of FIG. 1 in order to provide a new button 18 in the sewing station.

As soon as the new button has been delivered to the sewing station the insert arm lifts and moves back to the retracted position of FIG. 1. As can be seen from the diagrams of FIGS. 12 and 13, the retracted insert arm now drops down to position 2 of FIG. 12 in order to engage a button. At this time the insert arm pins 34 will drop onto or walk into appropriate sewing holes 36 in a button 18. Once a button is oriented (see FIGS. 8 to 11) it is ready to be fed from the engaging station to the sewing station, and this will occur as soon as the button in the sewing station has been removed. When the button is delivered to the sewing station (position 4 of FIG. 13) the insert arm will raise and lower twice (positions 5 and 6 of FIG. 12) in order to be certain that the button is properly oriented. The insert arm 16 then is held in the raised position and retracted so that the sewing action can take place at the sewing station.

As can be seen in FIGS. 1 and 2 the buttons 18 are fed from a vibratory hopper (not shown) through the spring chute 14 by gravity and then down into the delivery slot 12. It will be seen that the delivery slot 12 is defined by adjustable left and right rails 38 and 40, with the right rail 40 being a bit longer as can be seen in FIG. 1. The adjustment of the rails 38 and 40 is achieved through the loosening and retightening of screws 42 in conjunction with studs 44 that ride in slots 46. The adjustment of the right and left rails is shown in FIGS. 14 and 15 through the use of a gauge 48 as will be discussed hereinafter.

In order to assure that the gravity flow of the buttons 18 will proceed smoothly, the internal walls 50 of the rails are rounded (FIG. 1B). It can also be seen in FIG. 1B that the left and right rails are movable toward or away from each other since such rails are both slidable on base 52.

The gravity flow of the buttons is further promoted by the dispensing of compressed air into the delivery slot **12** through air hose **54** which passes through an opening in strut **56** to which is also secured the lift **58** that is of well known construction. As shown in FIG. **2A**, the strut **56** is secured to a block **60** through which the rod **24** passes, with the rod **24** being slidable and pivotable with respect to the block **60**. If desired, suitable bearings may be provided. Furthermore, a latch **62** may be provided to allow access to delivery slot **12**. The latch **62** is pivotally secured immediately above the left rail **38** through bolt **64** with the latch **62** having a slot **66** that releasably receives another bolt **68**.

As previously stated, the insert arm **16** is moved to and from the button sewing station **22** by back and forth movement of rod **24** as initiated by the piston **26**.

From an inspection of FIG. **2** it will be seen that the piston **26** (which may be air driven on signal) is secured within a crossplate **70** by means of a threaded stud **72** to which is secured a nut **74**. A threaded pin **76** is anchored in the stud **72**, with the pin **76** extending forwardly to be secured within leg **78** (having threads **79**) of a yoke **80** having vertically spaced arms **82** that receive the vertical rod **30**, with the unit being held together by fasteners **84**. A knurled knob **86** is threaded on the leg **78**, with a nut **88** being provided for rearward adjustment.

It will be seen that the turning of the knob **86** on threads **79** will have the effect of advancing the entire rod **24** either forwardly or backwardly in order to make a change in the position of the insert arm **16** in a forward or backward sense. Also, the forward stroke of rod **24** is limited by stop **25** (FIG. **1**). It will be further seen that clip **87** (FIGS. **1** and **4**) prevents unwanted rotation of knob **86** on threads **79**, with the clip **87** being biased to lie in a complementary slot (FIG. **4**). It follows that the clip **87** is pulled away from the slot whenever it is desired to rotate the knob **86** on the threads **79**.

Another yoke **90** is provided with a leg **92** secured by fasteners (not shown) to the arms **82**. The yoke **90** further includes arms **94** which receive the threaded rear end of the rod **24**. A nut **96** and washer **98** are provided.

As can be seen in FIGS. **1** and **2**, the strut **56** is secured to the rod **24** by being held on the block **100** with bolts **102**.

The forward end of the rod **24** is held in a block **104** using fasteners **106**. It will be seen that the block **104** constitutes a part of the insert arm **16**. As seen in FIG. **1** the fasteners **106** pass through a strap **108**.

It will be seen from FIG. **2A** that the block **104** further includes a leg **110** as well as an upper strap **112**. It will be seen from FIG. **5** that the pins **34** depend from the leg **110**. Furthermore, as seen in FIGS. **6** and **7**, the interior portion of the leg **110** is hollow in order to receive the leaf members **114**, from which the pins **34** depend.

As seen in FIG. **1** the buttons **18** are eventually fed one by one to the sewing station **22** that is partly defined by the longer right rail **40** (FIG. **1A**) to which is secured right angle arm **116** by means of a bolt **118**. As further shown in FIG. **1A** the arm **116** has a serrated lower surface which mates with the serrated upper surface of a similar extension **120** of the right rail **40**. The bolt **118** may be loosened so that the arm **116** can be slid back and forth in order to accommodate varying sizes of buttons **18**. As shown in FIG. **1**, the arm **116** terminates in a button engaging tip **122**. As seen in FIG. **1** and apron **121** is provided to support a button at the sewing station.

The absence of a button at the sewing station **22** is sensed by the button feeler member **32** which preferably has a pointed tip as shown in FIG. **1**. The button feeler member **32** extends inwardly from cylinder **124** to which is attached backwardly extending arm **126** that is pivotally secured to post **128** by bolt **130**. A torsion spring **132** is associated with the pivotal attachment of the arm **126** in such a way that the arm **126** is always urged in a counterclockwise sense as viewed in FIG. **1**, and thus the button feeler member **32** is always urged inwardly so that its tip **134** will be urged against a button **18** at all times when a button **18** is in the sewing station **22**.

Should there be no button **18** in the sewing station **22**, then the button feeler member **32** will be urged into the sewing station **22** by the spring **132**. When this occurs, the rear portion **136** of arm **126** is urged away from the button clamp, and this has the effect of exposing air exhaust **138** of sensor member **140** that is secured to the crossplate **70**. An extension **137** of rear portion **136** is provided for use with larger buttons that causes a greater outer deflection of feeler member **32**.

The sensor member **140** is fed by air inlet members **142** which include appropriate wiring so that when the air exhaust **138** is exposed, a signal will be sent to actuate the insert arm **116** through actuation of the rod **24**. As further indicated in FIG. **1** the air will pass from the inlet members **142** through the tubing **141** and then to the exhaust **138**.

It is to be understood that the signal actuating the rod **24** is timed to occur when the insert arm **16** is at position **3** of FIGS. **12** and **13**, or in other words, when the insert arm **16** is in the retracted and down position. In such a position the button has already been oriented and the pins **34** are in engagement with the openings **36** in the button hole. Thus, the insert arm **16** is caused to deliver a button into the sewing area **22**. This has the effect of urging the button feeler member **32** back to its original position to that the rear portion **136** again covers the air exhaust **138**. However, the insert arm **16** continues through its cycle of movements automatically, and in particular moves through positions **4**, **5**, **6**, **1** and **2**. This occurs because it is necessary for the insert arm **16** to be withdrawn to the retracted position of FIG. **1** since it otherwise would block the sewing action of needle **144** (FIG. **2**).

The pivoting of rod **24** (which causes raising and lowering of the insert arm **16**) is effected through movement of spool **28** and engaged vertical rod **30**. As seen in FIG. **2** an enlarged head **146** is attached to the top of rod **30** and held captive between walls **148** of spool **28**.

It will be seen from FIG. **2A** that the spool **28** is secured to a shaft **150** that passes beneath the chute **14**, with the shaft **150** being journalled in a plate **152**. The shaft **150** is moved in a sideward sense under fluid pressure in hose **154**. Where desired the shaft **150** may move against the pressure of a spring (not shown) so that the shaft **150** will return to its original position whenever the fluid pressure is relieved. It can be seen from FIG. **2A** that fluid pressure in the hose **154** will cause the spool **28** to move from left to right, and this in turn carries vertical rod **30** in a clockwise sense as viewed in FIG. **2A**. This in turn causes clockwise rotation of rod **24** which will lift the insert arm **16** away from the button.

The button clamp **10** is secured to sewing machine base **156** (FIG. **2**) through the provision of a cast block **158** and a bolt **160** that passes through both the block and the sewing machine base. A tongue **162** is provided which passes into the block **158** and is also held in place by the bolt **160**.

As previously discussed, the pins **34** extend from the insert arm **16** in a first or normal position with the pins being biased to move relative to each other from the first position to an orienting position. This occurs when the pins are urged against a button **18** that will be the next button to move into sewing station **22**. As soon as a new button has been delivered to the sewing station **22** the insert arm **16** lifts and moves back to the retracted position of FIG. **1**. With reference to FIGS. **12** and **13** the retracted insert arm now drops down to position **2** of FIG. **12** in order to engage a button **18**. The retraction action is caused by the piston **26** and the dropping down action of the insert arm is caused by movement of the spool **28** from right to left as viewed in FIG. **2A**.

When the insert arm drops down the pins **34** will contact the upper surface of button **18**, as shown in FIG. **8**. Further downward pressure exerted by pivoting of rod **30** will now cause the pins **34** to approach each other as viewed in FIG. **9**. This movement of the pins **34** under downward pressure of the insert arm **16** is made possible by the provision of the leaf members **114** that will be discussed shortly.

In many cases the pins **34** will find their way immediately to sewing holes **36** as soon as they contact the upper surface **164**

of the button 18. In certain other case the pins 34 will have to move toward each other or walk a very short distance before they enter the sewing holes 36. In a few cases the pins 34 will have to move or walk the maximum distance toward each other in order to find the sewing holes 36. However, it can be shown that with the button having four sewing holes as shown in FIG. 9, that the pins 34 should find complementary sewing holes by a simple linear movement or walk, and this is the case even where the button has only three sewing holes. The action of pins 34 can be further improved by having them move or walk at an angle of 22½° with respect to a straight line as indicated by the tail of arrow 166, and this will be covered in more detail hereinafter.

As soon as the pins 34 enter complementary sewing holes 36 the downward pressure of the insert arm 16 is no longer effective on the pins 34 since they now have moved down by at least the thickness of the button 18. Hence, the pins 34 immediately move back to their initial position as indicated in FIG. 10. In so doing the pins 34 will cause rotation of the button 18 to an oriented position. Finally, as shown in FIG. 11, the button will be fed forwardly into the sewing station upon signal as sent out by button feeler member 32.

It will be seen from FIG. 7 that each of the pins 34 is secured to a leaf member 114 which in turn is secured to an extensible member 168 that is held in place by a bolt 170. With reference again to FIGS. 6 and 7 it will be seen that the letter "A" has been added to one of the leaf members 114 as well as to its attached pin 34A in order to understand the reason why the pins 34 and 34A will move toward each other when the insert arm 16 is urged downwardly. It will be seen that the leaf member 114A will be urged against end wall 172 of the insert arm 16 upon the application of downward pressure, such that with continued downward pressure the pin member 34A which is attached to leaf member 114-A will be forced to move toward pin 34. On the other hand, the pin 34 is secured to its leaf member 114, but the leaf member 114 is not restrained from moving to the left as viewed in FIG. 7, and hence pin 34 will move toward pin 34A in the manner as discussed in connection with FIGS. 8 and 9.

The adjustment of the right and left rails 38 and 40 of the delivery slot 12 is shown in FIGS. 14 and 15 through the use of a gauge 48. It will be seen from FIGS. 14 and 15 that the gauge 48 is essentially U shaped and includes main stem 174, rounded leg 176 and tapered leg 178.

It will be seen from FIG. 14 that the rounded leg 176 is sued to set or locate right rail 40. FIG. 15 shows the use of the gauge 48 and in particular the use of the tapered leg 176 to set or locate the left rail 38 with respect to the right rail 40.

It will be seen from FIG. 14 that the right rail 48 is located with respect to dead center 122 of apron 121 by positioning the tip 180 upon the opening in the apron 121. The right rail is then brought into contact with tip 180 as shown in FIG. 14, and then the screw 42 and the stud 44 are tightened to hold the right rail in place. It will be seen that the right rail can be moved prior to tightening as allowed by slot 46 (FIG. 1). It should also be noted from FIG. 1 that the right rail 40 possesses an overhang 184 that partly covers the buttons that are being fed downwardly toward the sewing station. The left rail 38 possesses a similar overhang 186.

After the right rail has been set the gauge 48 is then turned over in order to set the left rail. This is done as shown in FIG. 15 by allowing tip 188 of tapered leg 178 to contact the right rail. At the same time the left rail is allowed to make line contact with straight edge 190 and wall 192. When contact is established with the straight edges 190 and 192 with tip 188 contacting the right rail 40, the screw 42 and stud 44 with the left rail may be tightened in order to complete the location of the left rail.

By virtue of the foregoing it is possible to widen or narrow the delivery slot 12 in accordance with the size of the buttons being fed from chute 14, and a separate gauge for each button size is provided. Thus, a button clamp constructed in accordance with the present invention can be adjusted to accommodate a large range of button sizes.

Another embodiment of the insert arm 16 is shown in FIGS. 16, 17 and 18 wherein the pins 34 move or walk at an angle of 22½° with respect to the eventual path of button delivery into the sewing station as indicated by 194 in FIG. 18.

It will be seen from FIG. 16 that pins 234 extend from the insert arm 16A in a first or normal position with the pins being biased to move relative to each other from the first position to an orienting position in the manner as discussed in connection with FIGS. 7 to 11 inclusive. However, in the embodiment of FIGS. 16 to 18 the leaf members 214 and 214A are inclined at a 22½° angle with respect to the position of the leaf members 114A and 114 of FIG. 6.

It will be seen that FIGS. 16 to 18 use reference numerals either identical to FIGS. 8 and 9 or similar to such reference characters to that the description of FIGS. 8 and 9 generally applies to FIGS. 16 to 18.

The normal position of the pins 234 is shown in FIG. 17, with the pins 234 just about to contact the surface 164 of button 18.

As previously discussed in many cases the pins 234 will find their way immediately to sewing holes 36, but the laws of probability dictate that at certain other times the pins 234 will land at various distances with respect to sewing holes 36.

FIGS. 8 and 9 showed a movement of the pins 34 in a direction generally perpendicular to the eventual feeding of the pins 18 one by one into the sewing station 22.

By virtue of the inclined orientation of the leaf members 214 and 214A of the insert arm 16A of FIG. 16 the pins 234 will walk at a 22½° angle from their former position. As seen in FIG. 18 the pins 234 walk in the direction of arrown 266.

It follows that the angle between the direction of arrow 266 and the direction of arrow 194 (path of eventual button movement) is an acute angle, preferably of 67½°. This angle is considered to be a good compromise between the original angle of 90° of FIG. 9 and 45 degrees which is considered to be the minimum necessary angle of pin movement. The term "acute angle" as used in the claims will also cover obtuse angles depending upon whether the insert arm head is inclined as shown in FIG. 16 or is inclined in another quadrant.

It will be seen that an acute angle as described hereinabove will create an even greater assurance that the pins 234 will enter the nearest sewing hole 36. In this way the fastest possible action of the pins 234 orienting the button 18 is achieved. However, it is to be understood that the acute angle between the direction of button delivery and the direction of pin movement can vary to the considerable degree, depending upon the size of the button, the number size, and layout of the button sewing holes and the general geometry of the button.

In operation the buttons are fed from the vibratory hopper to the spring chute and then to the delivery slot 12 of the button clamp 10, with the buttons already being fed with the correct side up.

For the sake of further description of the operation of the invention it will be assumed that a properly oriented button is already in the sewing station 22 with the insert arm 16 raised and in the process of moving rearwardly toward the next button 18. The retracted insert arm now drops down to position 2 of FIG. 12 in order to engage the button 16 that is the next button to be fed into the sewing station 22.

The foregoing retraction action is caused by the piston 26 and the dropping down action of the insert arm is caused by movement of the spool 28 from right to left as viewed by FIG. 8 wherein the spool 28 actuates the vertical rod 30 which in turn pivots the rod 24.

When the insert arm drops down the pins 34 will contact the upper surface of button 18, and further downward pressure causes the pins to walk or approach each other as allowed by leaf members 114.

When the pins enter the sewing holes 36 the downward pressure is relieved and the pins return to their initial position and in so doing rotate the button 18 to an oriented position. However, the entry of pins 34 in holes 36 is not necessarily simultaneous.

When the feeler member 32 senses the absence of a button at the sewing station, the insert arm delivers the next button into the sewing station. After delivery of a button to the sewing station, the insert arm will raise and lower twice to be sure that the button in the sewing station is properly oriented.

While the insert arm has been described as having two pins, it is clear that more than two pins may be utilized if conditions so demand. Furthermore, while the pins have been described as moving purely in a linear sense, it is also possible that the pins may be cammed or biased to move in an arcuate or an irregular path under certain conditions, although the linear path is usually quite satisfactory.

Without further elaboration, the foregoing will so fully illustrate our invention that others may be applying current or future knowledge readily adapt the same for use under various conditions of service.

What is claimed as the invention is:

1. A button feed device comprising an orienting station and a sewing station, means to feed buttons having sewing holes to said orienting station, insert arm means to orient and transfer buttons from said orienting station to said sewing station, said insert arm means including pin means that have a normal relationship to each other corresponding to the desired orientation of said buttons with said pin means moving with respect to each other when said insert arm means is urged against a button in said orienting station, means to move said insert arm means towards and against a button in said orienting station whereby said pin means enter said sewing holes in said button to orient said button, means to move said insert arm means from said orienting station to said sewing station while said pin means are engaged in said sewing holes and means to raise and return said insert arm means to said orienting station.

2. The button feed device of claim 1 wherein said pin means moves in a linear path after having contacted said button in the orienting station.

3. The button feed device of claim 2 wherein there are two pin means having a normal position with respect to each other, and are biased to move away from each other, but will move toward each other upon being urged against said button in the orienting station, whereby when said pin means enter said sewing holes, the pressure urging said pin means upon said button is alleviated whereby said pin means return to their normal position and rotate said button to orienting position as they return to said normal position.

4. The button feed device of claim 3 including sensing means to sense the absence of a button at said sewing station and control means to actuate said insert arm to deliver the button from said orienting station to said sewing station.

5. The button feed device of claim 3 wherein said insert arm means moves away from and returns to said button at said sewing station at least once in order to assure proper button orientation of said sewing station.

6. The button feed device of claim 5 wherein movement of said insert arm means between said orienting and sewing stations is achieved through a first rod means and means to move said rod back and forth.

7. The button feed device of claim 6 including spool means moved laterally back and forth and second rod means connected to said spool means and to said first rod means whereby lateral movement of said spool means causes said rod to oscillate and whereby said insert arm means is caused to pivot toward and away from said button.

8. The button feed device of claim 1 wherein said pin means contact said pin and at times move in a path across a portion of said button prior to entering said sewing holes, said path being generally perpendicular to the feed direction of said buttons.

9. The button feed device 8 of claim 4 wherein said path is at an acute angle with respect to said feed direction.

10. The button feed device of claim 9 wherein said angle is 67½°.

11. In a button feed device comprising right and left rails defining a delivery slot wherein buttons pass toward a sewing station, the improvement comprising means to adjust said right and left rails either closer or further apart from each other, at least one of said rails being mounted in slots and being capable of movement as allowed by said slots.

12. The button feed device of claim 11 including tightening means to secure at least one of said rails in a desired position.

13. The button feed device of claim 11 including a gauge having a round leg to locate on of said rails.

14. The button feed device of claim 12 wherein said gauge has a tapering leg to locate the other of said rails.

* * * * *