Dec. 9, 1969 O. B. REID ET AL 3,482,540

HEMMING AND BUTTON SEWING MODULES

Filed March 18, 1968 5 Sheets-Sheet 1

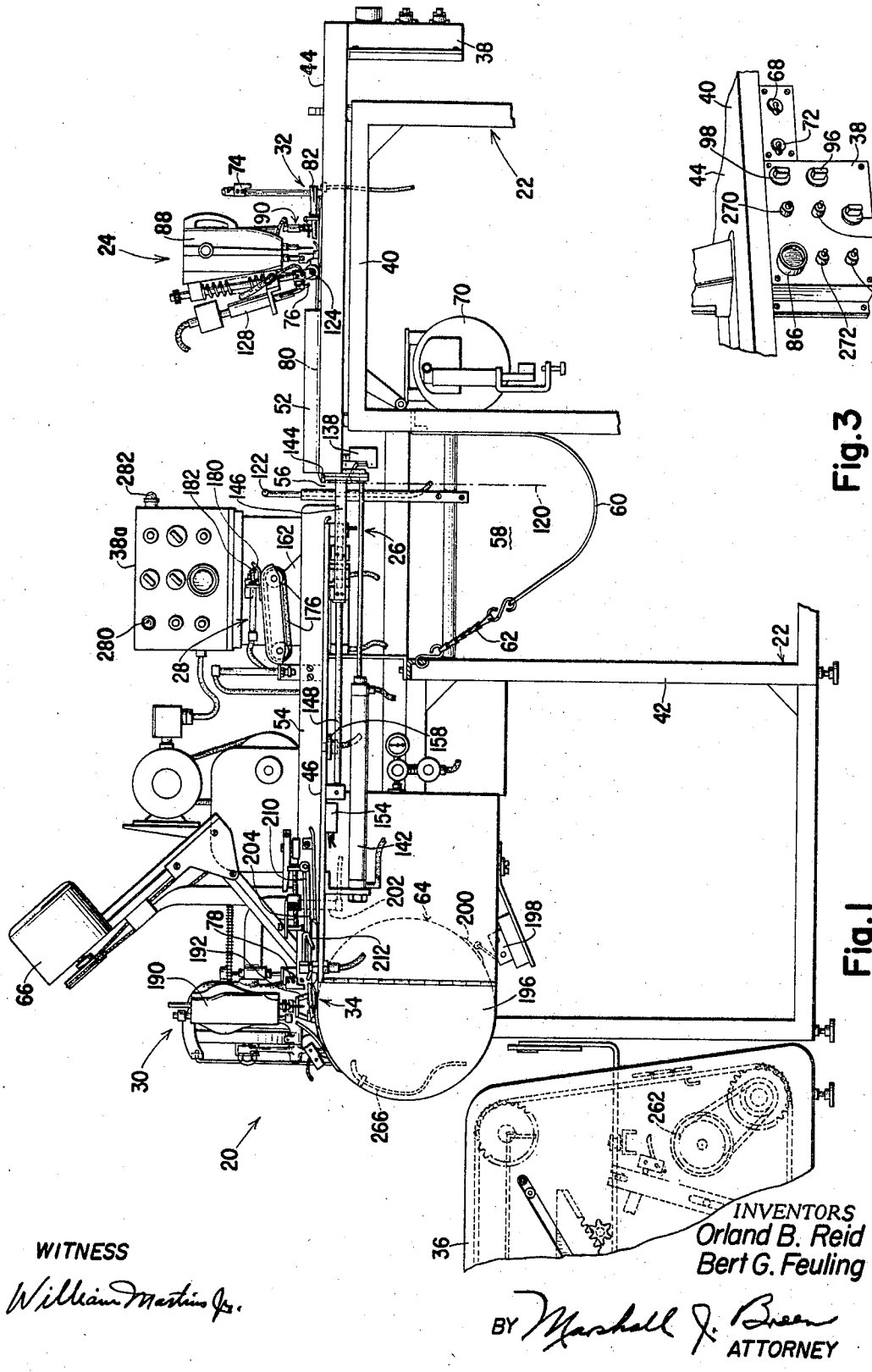


Fig. 1

Fig. 3

WITNESS

William Martin Jr.

INVENTORS
Orland B. Reid
Bert G. Feuling

BY Marshall J. Breen
ATTORNEY

Dec. 9, 1969 O. B. REID ET AL 3,482,540

HEMMING AND BUTTON SEWING MODULES

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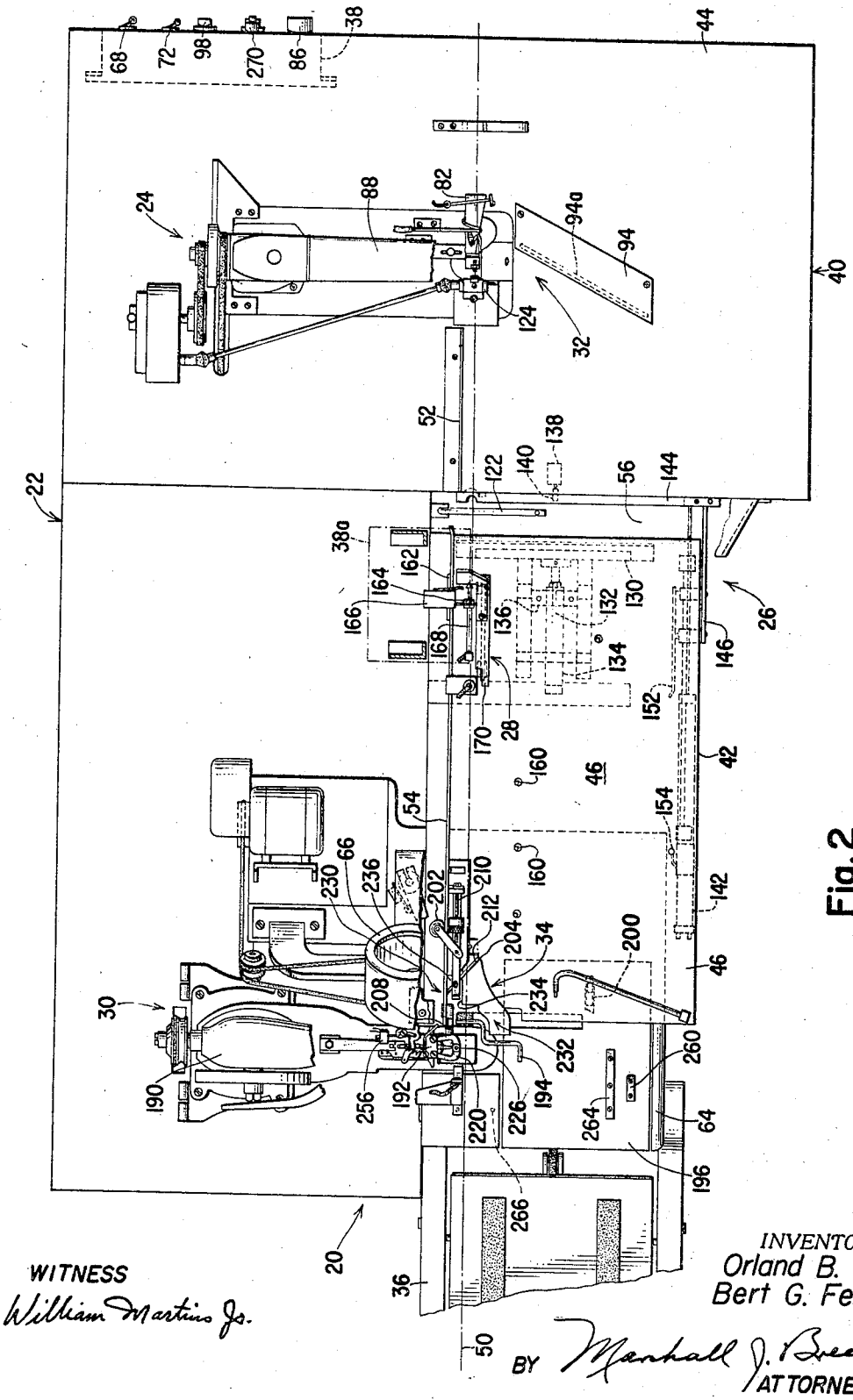


Fig. 2

WITNESS
William Martins Jr.

INVENTORS
Orland B. Reid
Bert G. Feuling

BY Marshall J. Breen
ATTORNEY

Dec. 9, 1969 O. B. REID ET AL 3,482,540

HEMMING AND BUTTON SEWING MODULES

Filed March 18, 1968 5 Sheets-Sheet 3

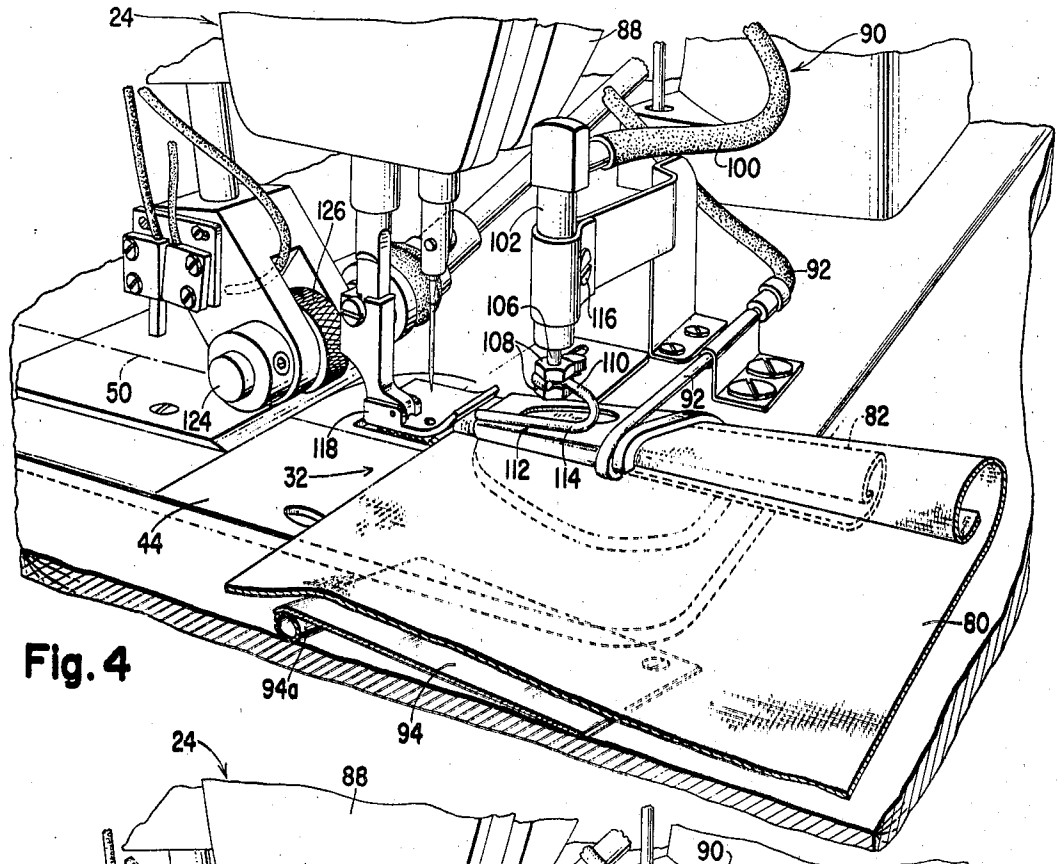


Fig. 4

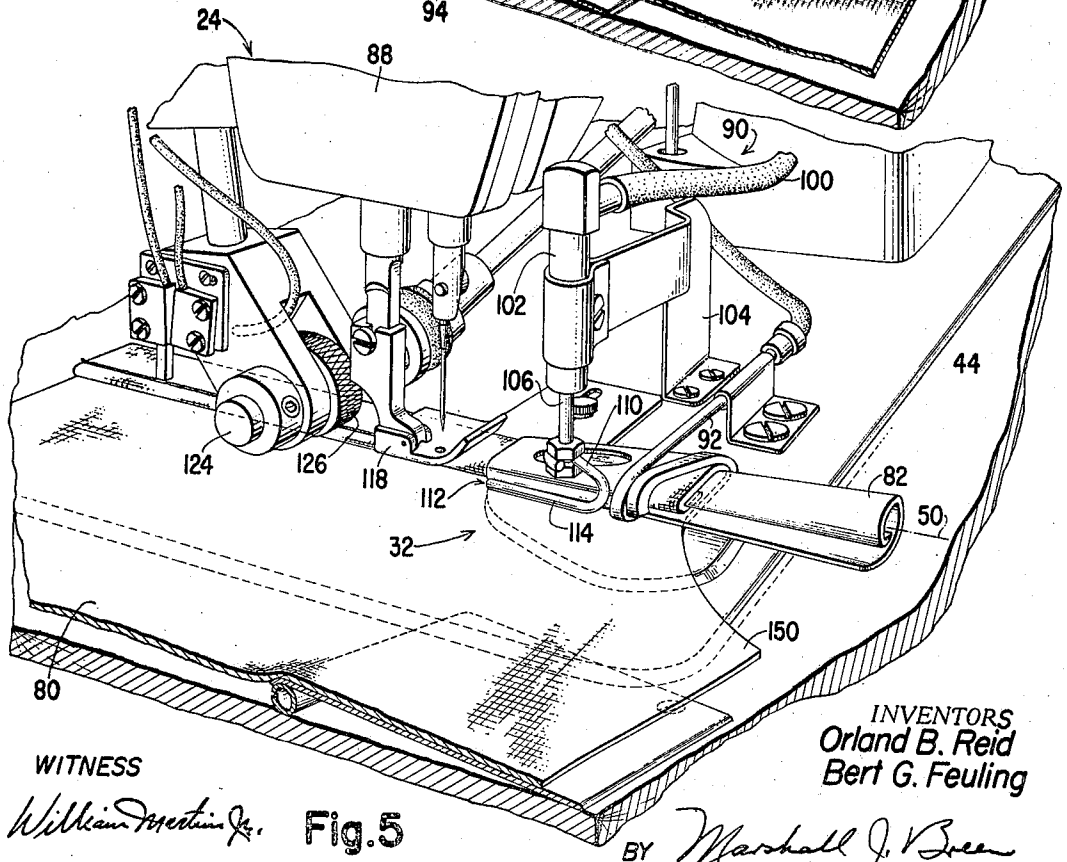


Fig. 5

WITNESS

William Martin Jr.

INVENTORS
Orland B. Reid
Bert G. Feuling

BY Marshall J. Breen
ATTORNEY

Dec. 9, 1969 O. B. REID ET AL 3,482,540

HEMMING AND BUTTON SEWING MODULES

Filed March 18, 1968 5 Sheets-Sheet 4

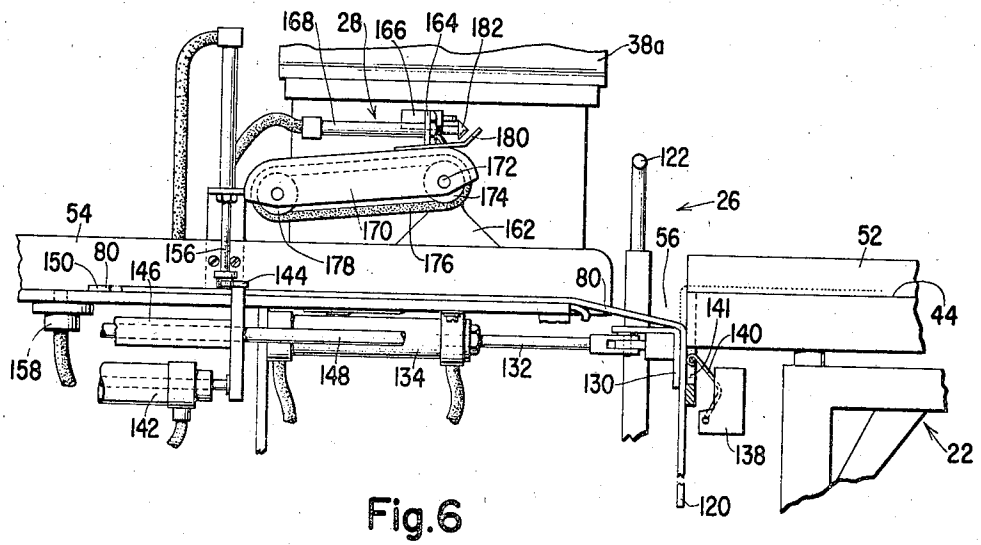


Fig.6

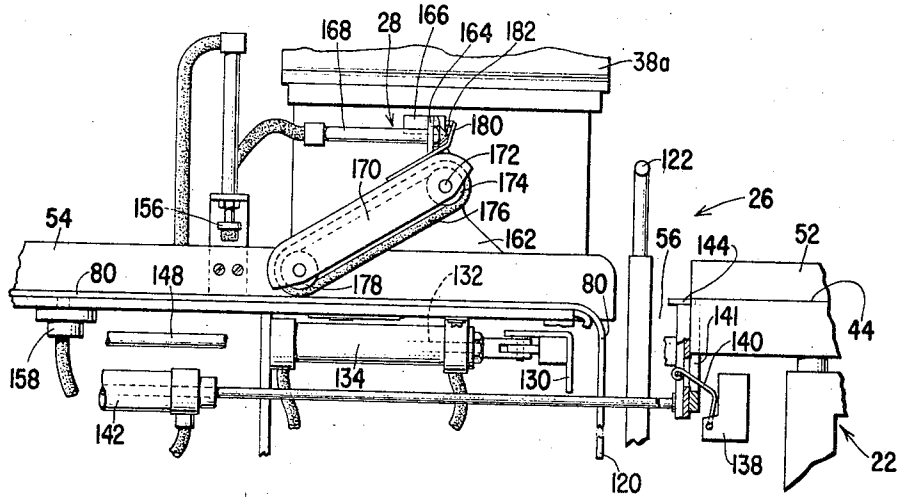


Fig.7

WITNESS

William Martin Jr.

INVENTORS
Orland B. Reid
Bert G. Feuling

BY Marshall J. Breen
ATTORNEY

Dec. 9, 1969 O. B. REID ET AL 3,482,540

HEMMING AND BUTTON SEWING MODULES

Filed March 18, 1968 5 Sheets-Sheet 5

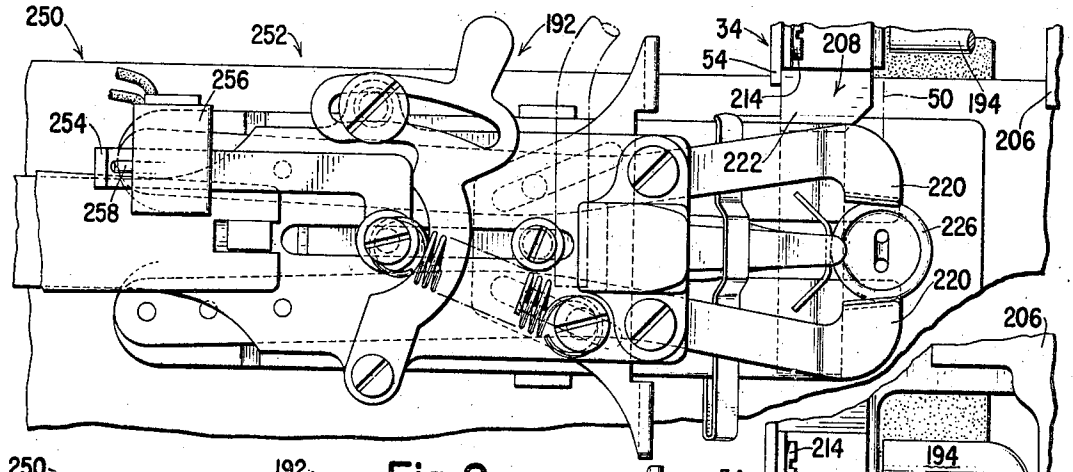


Fig.8

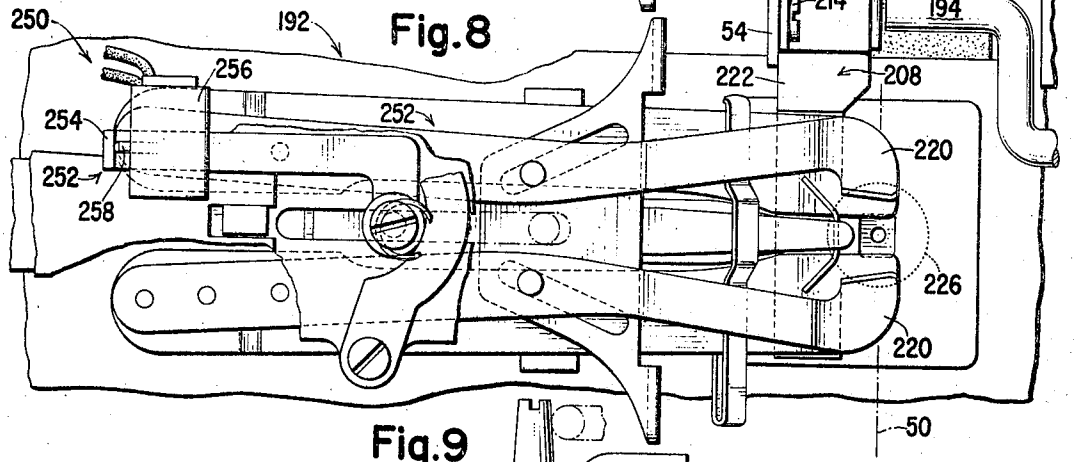


Fig.9

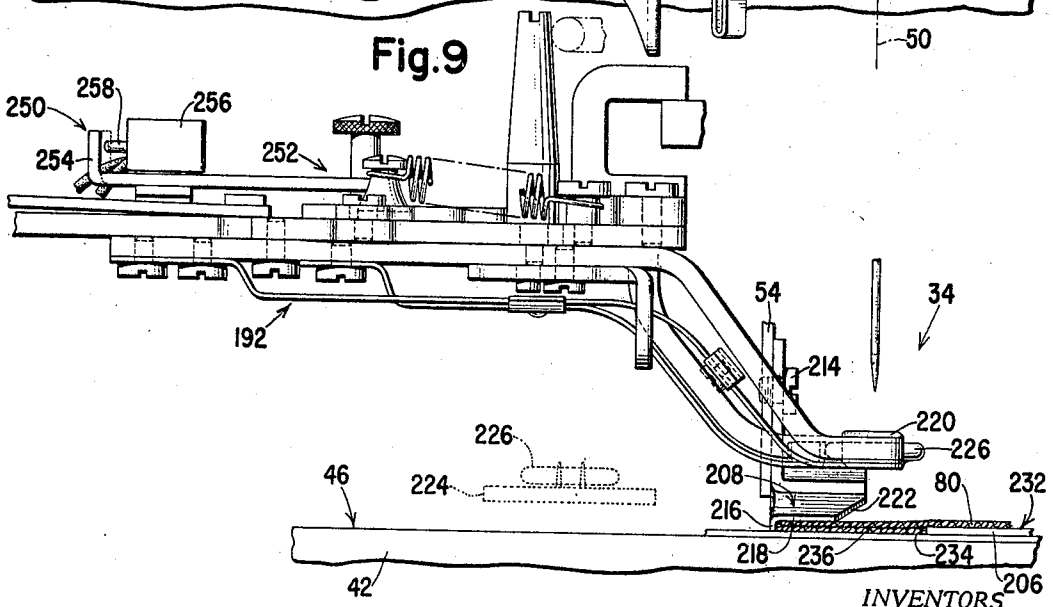


Fig.10

WITNESS

William Martin Jr.

INVENTORS

Orland B. Reid

Bert G. Feuling

BY Marshall J. Breen

ATTORNEY

United States Patent Office 3,482,540 Patented Dec. 9, 1969

3,482,540

HEMMING AND BUTTON SEWING MODULES

Orland B. Reid, Kenilworth, and Bert G. Feuling, Whippany, N.J., assignors to The Singer Company, New York, N.Y., a corporation of New Jersey

Filed Mar. 18, 1968, Ser. No. 713,712
Int. Cl. D05b 3/14, 23/00
U.S. Cl. 112—265 7 Claims

ABSTRACT OF THE DISCLOSURE

This disclosure relates to a method and apparatus by which a piece, such as a shirt front, is passed along a prescribed line of feed for hemming and sewing of a plurality of buttons thereon. The piece is fed tail end first to be hemmed and thereafter the piece is turned over so that the buttons are sewn successively from the collar end.

In order to accommodate the wide range of both natural and synthetic materials a hold down means or guide finger may be selectively actuated to assist in the hemming operation. Other guiding devices may be used to aid in the button sewing operation.

BACKGROUND OF THE INVENTION

Heretofore, whenever a shirt front was to be hemmed and have buttons sewn on it, each operation was done separately, whether manually or by remotely located machines. In any event, the shirt fronts were required to be fed, stacked and transported a plurality of times. The more times the shirt fronts were handled in the separate operations, presumably by different operators, the more likely was the tendency toward non-uniformity in the finished product. In addition, repeated handling of the shirt fronts adds to the cost of producing the finished pieces.

SUMMARY OF THE INVENTION

In accordance with the present invention a mechanism and method has been provided whereby a piece is passed along a prescribed line of feed to be successively hemmed and have a plurality of buttons sewn thereon. The piece is folded prior to hemming thereof, and subsequently turned over whereby the trailing end becomes the leading end.

Thereafter a plurality of buttons are sewn on to the hemmed portion of the piece in an indexed sequence.

It is therefore an object of the present invention to provide an improved hemming and button sewing module which overcomes the prior art disadvantages; which is automatically operated; which is simple, economical and reliable; which includes one or more guide devices to aid in the automatic operation of the module; which permits the piece to be initially fed at the tail end for hemming thereof and subsequently turned over so as to present the collar end for button sewing in an indexed sequence; which includes feeding means actuated on completion of the turning of the piece, and, which has a shut off device for the module that operates whenever the supply of buttons is exhausted.

Other objects and advantages will be apparent from the following description of the invention and the novel features will be particularly pointed out hereinafter in the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

This invention is illustrated in the accompanying drawings in which:

FIG. 1 is a side elevational view of the novel hemming and button sewing module,

FIG. 2 is a top plan view of the improved module,

FIG. 3 is a partial perspective view looking at the front of the improved module,

FIG. 4 is an enlarged perspective view of the pneumatic hold down means in a raised position prior to operation thereof,

FIG. 5 is an enlarged perspectve view of the pneumatic hold down means in operative position, yieldably engaging the work supporting surface,

FIG. 6 is an enlarged partial side elevational view of the turning mechanism subsequent to the piece having been turned and prior to the mechanism endless belt feeding means becoming operative,

FIG. 7 is an enlarged partial side elevational view of the turning mechanism in its unoperative position and the feeding means passing the turned piece to the buttonsewer or assembly,

FIG. 8 is an enlarged top plan view of the shut-off device in an unoperated position with the associated button clamping jaws shown holding a button therein; in addition, guide means are shown adjacent the jaws,

FIG. 9 is an enlarged top plan view of the shut-off device in operated position with the associated button clamping jaws shown in the position they assume in the absence of a button therebetween,

FIG. 10 is an enlarged side elevational view of the shut-off device shown in FIG. 8; in addition a portion of the upper and lower guide means are shown guiding a piece therebetween.

DESCRIPTION OF THE INVENTION

In the illustrated embodiment of the invention the novel hemming and button sewing module, designated generally as **20**, is shown in FIGS. 1 and 2. The module **20** is mounted on a frame **22** and includes a hemmer assembly **24**, a transfer assembly **26**, a feed assembly **28**, a buttonsewer assembly **30**, separate guide assemblies **32** and **34** located adjacent the hemmer and buttonsewer assemblies, respectively, and a separate stacker **36** for collection of the completed pieces. In addition, control boards **38** and **38***a* have many of the operator actuated controls connected in parallel to effect control of suitable electric or pneumatic control circuits (not shown) which will act separately or in combination to operate said module **20** in a single cycle to automatically fold and stitch a hem upon the manually fed piece such as a shirt front, and thereafter, transfer and feed the hemmed shirt front to the buttonsewer wherein a plurality of buttons will be accurately stitched onto the shirt front, after which the shirt front will be automatically collected at the stacker.

The frame **22**, as illustrated in FIGS. 1 and 2, is made of two interconnected tables, namely, a hemmer table **40** for the hemmer assembly **24**, and a transfer table **42** upon which substantially the remainder of the module **20** is mounted. The tables **40** and **42** have work supporting surfaces **44** and **46**, respectively. The work supporting surfaces **44** and **46** each lie in a horizontal plane with the surface **44** slightly higher than the surface **46**. A predetermined line of feed **50** extends across the work supporting surfaces **44** and **46** to generally define the direction along which the shirt fronts **80** will pass. To aid in the travel of the shirt front an upturned edge **52** is mounted upon the work supporting surface **44** downstream of the hemmer assembly **24** and parallel to the line of feed **50**. An upturned edge **54** is connected to the surface **46** of the transfer table **42** parallel to the line of feed **50** and slightly set back from the upturned edge **52** on the hemmer table **40**.

A gap **56** is formed between the two tables **40** and **42** substantially perpendicular to the line of feed **50**. The gap **56** leads to an enlarged opening **58**, the bottom of which is closed by a metal sheet **60** fixedly connected

to the table **40**, and releasably connected to the table **42** by a hooked chain **62**.

The buttonsewer assembly **30** includes a modified space-a-button unit **64** that has an automatic button feeding device **66** associated therewith. The unit **64** and the device **66** may be of the general type shown and described in U.S. Patent No. 3,329,110 granted July 4, 1967.

Switch **68** operates the pneumatic transmitter **70** of the hemming assembly **24**, and switch **72** actuates the motor of the space-a-button unit **64**. The switches **68** and **72** are shown in the "on" position in FIG. 3. Photoelectric cells **74**, **76** and **78** are suitably connected in circuit to initiate and control the operation of the hemming assembly **24**, the transfer assembly **26** the buttonsewer assembly **30** of the module **20**. In addition a plurality of sequentially operated switches, also in circuit are provided as will be more fully set forth hereinafter.

The operator will load a shirt front **80** into the hemfold guide **82** thus covering the light source of the photoelectric cell **74**. To initiate the automatic cycle for the module **20** a cycle arming button **84** located at the front control panel **38** is pressed. Since the control panel **38***a* substantially duplicates the panel **38**, for present purposes only the front panel **38** need be referred to. However, the actual start of the cycle occurs when a job button **86** is pressed resulting in the operation of a lock stitch hemmer sewing machine **88**, which may be of any conventional design, as for example, that shown in U.S. Patent No. 2,848,964, granted Aug. 26, 1958.

Associated with the hemfold guide **82** is a guide assembly **32** which includes a pneumatic device or "O.B. finger" **90**, and air guides **92** and **94**. The air guide **94** has a transversely disposed tube **94***a* with openings through which air is blown in the downstream direction of the line of feed **50**. The air guide **92** is connected to a source of pressure air connected through operator actuated switch **96** to blow to blow air into the longitudinal opening of the hemmer to assist in preventing unruffling of the shirt front **80** therein.

The pneumatic device or "O.B. finger" **90** is illustrated in FIGS. 1, 4 and 5, and is operator actuated by a switch **98**. The "O.B. finger" **90** has a line **100** which will deliver pressurized air from a suitable source to the upper end of air cylinder **102**. A frame **104** is connected to the surface **44** of the table **40** and holds the air cylinder so that the longitudinal axis thereof is disposed in a vertical line. The air cylinder **102** is disposed in superposition to the shirt front **80** and in spaced relation to the hemfold guide **82**. A rod **106** extends outwardly of the lower end of air cylinder **102** with the upper end thereof connected to a spring biased piston (not shown) in the conventional manner. The lower end of rod **106** is threaded to receive a pair of jam nuts **108** between which is clamped portion **110** of a guide bar **112** is locked. A contact finger **114** bends downwardly and away from the portion **110** to extend in the downstream direction of and parallel to the line of feed **50**. The contact finger may be set at a slight incline so that the end thereof adjacent the portion **110** is at a greater vertical distance from the surface **44** than the end remote from the portion **110** when the guide bar **112** is in the unoperated position shown in FIG. 4. The guide bar **112** is made of a resilient metal or plastic, so as the yieldably engage the work supporting surface **44**, and the contact finger **114** will assume a horizontal position upon said surface, as illustrated in FIG. 5, upon operation of the air cylinder **102**. The amount of pressure exerted by the guide bar **112** upon the shirt front **80** may be selectively adjusted to suit the particular material being sewn, and the adjustment may be made in one of three ways. Firstly, since the contact finger **114** yieldably engages the surface **44**, raising or lowering of the air cylinder **102** to which the guide bar **112** is attached will result in a respective decrease or increase of pressure exerted by the guide bar **112** as the movement of rod **10** remains constant. The effective vertical position of the air cylinder **102** may be changed by loosening of the screw **116** that engages the wrap around end of the frame **104** so as to raise or lower the air cylinder **102**. Secondly, changing of vertical position of the clamped portion **110** of the guide bar **112** by suitably turning the jam nuts **108** will effect a raising or lowering of the guide bar **112** so as to produce the same results as the first adjustment. Thirdly, a pressure regulator valve (not shown) may be connected into the line **100** so that the pressure exerted by the guide bar **112** may be directly adjusted.

Once the jog button **86** is pressed and released the sewing machine **88** will continue to operate until a predetermined time after the light source of the photoelectric cell **74** is uncovered so that as the hem is stitched the shirt front **80** will cover the light source of the photoelectric cell **76**. The sewing machine **88** is timed to stop with the end of the shirt front **80** under the back edge of a presser foot **118**.

The hem fold guide **82** may be of any type, as for example, one which makes a top fold, as shown in FIGS. 4 and 5. The shirt front **80** is fed into the hem fold guide **82** tail end first. As the hem is being stitched by the sewing machine **88** the tail end **120** passes over the downstream edge of the work supporting surface **44** to enter the gap **56** in timed relationship to the operation of an air blow down tube **122** that directs a blast of air into the gap **56** to insure that the tail end **120** will drop into the opening **58** and not cross the gap **56** to enter upon the work supporting surface **46**. The air blast from blow down **122** is of short duration and lasts only long enough to insure that the direction of travel of the tail end **120** is toward the opening **58**.

The operator will load the next piece **80** into the hem fold guide **82**, the loading of which acts to cover the light source of the photoelectric cell **74**, as will the loading of each successive piece **80**. The operator actuated jog button **86** is pressed and released to start the sewing machine **88** to stitch the hem on the just loaded piece, and each succeeding piece thereafter. A rotary feed **124** is associated with the sewing machine **88** and has a feed wheel **126**, positioned downstream of the presser foot **118** that operates to pass the pieces **80** along the line of feed **50** simultaneously with the operation of the sewing machine **88**. The operation of the feed wheel **126** passes the first piece **80** sufficiently along the line of feed to uncover the light source of the photoelectric cell **76** which acts to operate the impact cutter **128** located immediately downstream of the rotary feed **124** as shown in FIG. 1. The impact cutter **128** will cut the chain of stitches trailing from the collar end of the piece **80**, thus separating it from the next piece upstream therefrom.

Actuation of the photoelectric cell **76** also sets in motion the clamping means **130** of the transfer assembly **26**, best illustrated in FIGS. 6 and 7. The clamping means **130** is connected to the outer end of a piston shaft **132** extending from an air cylinder **134**, and mounted to a bracket **136** for movement in a horizontal plane. The air cylinder **134** has air delivered to one end or the other thereof for selectively advancing or retracting the clamping means **130**. The clamping means **130** is connected to the bracket **136** on the underside of the work supporting surface **46** adjacent the gap **56**, and is normally in a retracted position as shown in FIG. 7. On actuation of the transfer assembly **26** the clamping means **130** will move across the gap **56** to engage the edge of the table **40** and clamp the down turned piece **80** thereto.

A switch **138** is connected adjacent the edge of the table **40** and has an actuating finger **140** normally extending into the gap **56** through a slot **141** formed in said edge. On the feed clamp **130** engaging the edge of the table **40** the finger **140** will be shifted to actuate the air cylinder **142** which carries a transfer arm **144** on the outer end of the shaft thereof. The transfer arm **144** extends over one side of the table **42**, in cantilevered fashion, in the direction of

the upturned edge **54**. The transfer arm **144** is substantially perpendicular to the line of feed **50** and is disposed with the horizontal feed portion thereof in abutment with and at a height substantially equal to the work supporting surface **44** at the downstream edge thereof. The horizontal feed portion of the transfer arm **44** is normally disposed slightly above the work supporting surface **46** to permit its passing thereover. A vertical portion of the transfer arm **144** extends upwardly from its connection with the shaft of the air cylinder **142** and has connected intermediate thereto a carriage frame **146** journaled for sliding upon a fixed bar support **148**.

The hemmed piece **80**, illustrated in FIG. 1, has passed over the downstream edge of the table **40** and the transfer arm **144** into the opening **58**. After actuation of the photoelectric cell **76** the hemmed piece **80** as shown in FIG. 6 will be clamped by the clamping means **130** against the downstream edge of the table **40**. On actuation of the air cylinder **142** by the operation of the switch **138** the transfer arm will be drawn from its normal gap edge position to travel in the downstream direction of the line of feed **50**, and thus, across the work supporting surface **46**. The horizontal feed portion of the transfer arm **144** travels in a horizontal plane and as it passes, the piece **80**, held adjacent the tail end **120** thereof by the clamping means **130**, is drawn upon the work supporting surface **46** with the collar end **150** now on the downstream side of the line of feed **50**. In effect, the piece **80** has been turned over so that the tail end **120** which was the leading end is now the trailing end, and the top folded portion that was hemstitched by the sewing machine **88** now lies as an underfold adjacent the upturned edge **54**. An extension bar **152** is mounted on the carriage frame **146** to activate a switch **154** shown in FIG. 2, at the downstream end of the travel of the transfer arm **144** as illustrated in FIG. 6.

Actuation of the switch **154** causes a normally upwardly spring biased plunger **156** to be driven downwardly against the surface **46** to clamp the shirt front **80** against said surface. The travel of the transfer arm **144** will bring it in line with the plunger **156** but the horizontal feed portion of arm **144** is recessed, as shown in FIG. 2, near its outer end to permit the plunger **156** to contact the surface **46** by passing through said recess. The actuation of the switch **154** also will effect the restoration of the clamping means **130** and the transfer arm **144** to their respective unoperated positions as illustrated in FIG. 7. The clamping means **130**, the transfer arm **144**, the plunger **156** and the associated mechanisms and actuation elements thereof coact to define a transfer assembly **26**.

The actuation of the switch **154** will initiate the operation of the feeding assembly **28**, and a plurality of air jets **158** having nozzle means **160** disposed parallel to the line of feed **50** in spaced relationship to each other to direct air along the surface **46** in the downstream direction of the line of feed **50**.

The feeding assembly **28**, illustrated in FIGS. 2, 6 and 7, includes a support bracket **162** having an arm **164** which carries a switch **166** at one end thereof and an air cylinder **168** at the other end thereof. A belt drive frame **170** carries a drive shaft **172** suitably journaled in support bracket **162** and connected to be driven by a suitable drive means (not shown) rendered operational upon the actuation of the switch **154**. A pulley **174** is mounted within the frame **170** upon the shaft **172** and is connected by an endless belt **176** to an idler pulley **178** disposed at the opposite end of the belt drive frame **170**. The endless belt **176** extends outwardly from the open bottom of the frame **170**. The drive shaft **172** and the associated endless belt **176** will rotate in a clockwise direction so that upon engagement with the surface **46** the shirt front will be fed along the line of feed **50** in a downstream direction. The drive frame **170** is pivotable about the axis of the drive shaft **172**, and carries an upwardly bent plate **180** at the pivotable end thereof. The feed assembly **28** as illustrated in FIG. 6, is normally in a substantially horizontal position which position is maintained by air being continuously discharged from a nozzle **182** to blow against the bent free end of the plate **180** thereby preventing the unsupported end of the frame **170** from dropping onto the surface **46**. When the switch **154** is actuated the drive shaft **172** begins to rotate but the frame **170** does not pivot as air will continue to be discharged through the nozzle **182** of the air tube **168** for a few seconds until a delayed shut off (not shown) operates. Thus, the endless feed belt **176** remains out of contact with the surface **46** until the air supply is shut off at which time the frame **170** will pivot counterclockwise to swing the free end and belt **176** against the surface **46** and begin to feed the shirt front **80** in the direction of the buttonsewer assembly **30**. Upon the free end of the frame **170** being swung downwardly the plate **180** will be shifted to a position substantially vertically above the axis of the drive shaft **172**, thus, forcing the nozzle **182** into the air cylinder **168** and, als, actuating the switch **166**. Actuation of the switch **166** will cut off the air supply to the plunger **166** and result in its being restored to a raised position, as shown in FIG. 7.

The air jets **160** will aid the endless feed belt **176** in moving the shirt front **80** along the line of feed **50** and help guide the piece to the buttonsewer assembly **30** until the light source of the photoelectric cell **78** is covered to affect raising and stopping of the feed assembly **28** and a shut off of the air being supplied to the air jets **160**. The photoelectric cell **78**, as shown in the FIGURE 1, is positioned slightly upstream of a buttonsewer machine **190**, which machine may be of any conventional design, as for example, that shown in U.S. Patent No. 2,009,560, granted July 30, 1935.

The buttonsewer machine **190** includes a button clamping mechanism, designated generally **192**, which mechanism will be shown and described generally in FIGS. 8, 9 and 10, with the subject matter thereof depicted in detail only insofar as it relates to the present invention. For a more detailed description and understanding of the buton clamping mechanism **192** reference may be had to U.S. Patent No. 2,509,619, granted May 30, 1950, which shows one type of a conventional design thereof.

In addition, the photoelectric cell **78** will actuate a bar clamp **194** of the space-a-button unit **64** which acts to clamp the collar end **150** of the shirt front **80** against the drum **196** which drum thereafter is indexed to the first button position by turning through a predetermined distance in a counterclockwise direction, resulting in the actuation of a switch **198** mounted to the frame **22** adjacent the drum **196** that is normally held in a de-activated position by a cam **200** mounted on the rotary portion of the drum **196**, as illustrated in FIGS. 1 and 2. The actuation of the switch **198** effects a shut off of the air supply to an air cylinder **202** which normally holds a plow guide **204** in a raised position. The plow guide **204** has a counter-balanced plow arm **210** raisable by the air cylinder **202** and lowered by gravity upon being released from its raised position. A loosely connected plow member **212** is mounted at the end of the arm **210** adjacent the sewing machine **190**, and is inclined in the downstream direction of the line of feed **50**.

A height guide member **208**, illustrated in FIGS. 2 and 10 is pivotally connected to the upturned edge **54** at the downstream end thereof by a shoulder screw **214** so as to permit the passage of various thicknesses of the shirt fronts **80** thereunder. The height guide member **208** has a vertical leg **216** and a horizontal leg **218** that is disposed under and slightly behind the jaws **220** of the button clamping mechanism **192**. The legs **216** and **218** extend from a tapered portion **222** that rises upwardly toward the pivotable connection of the height guide member **208**. The vertical leg **216** serves as an extension of the upturned edge **54**, and the horizontal leg **218** though verti-

cally shiftable limits the height of the shirt front **80**. Member **208** serves to flatten the shirt front **80** so that a button transfer arm **224** can pass over the shirt front **80** and under the jaws **220** to deliver a button **226** that is subsequently seized by the jaws **220** without interference from the shirt front **80**.

The upper guide, designated generally as **230**, includes either the plow guide **204**, or the height guide member **208**, or both.

A lower guide, designated generally as **232**, coacts with the upper guide **230** for positioning and guiding each of the successive shirt fronts **80**, and combines therewith to define the guide assembly **34**.

The lower guide **232** includes a horizontal plate **206** illustrated in FIGS. 2, 9 and 10, that has a cut away leading edge that extends over the downstream edge of the transfer table **42** onto the drum **196** of the space-a-button unit **64**. The guide plate **206** has a straight edge **234** spaced from the vertical upturned edge **54** and disposed parallel to the line of feed **50**. The guide plate **206** is connected in a slot in the transfer table **42** and suitably attached to the underside thereof so that the main portion of the guide plate extends along the surface **46** to form an extra thickness on the surface **46** of the table **42**. The distance from the vertical edge **54** to the straight edge **234** is predetermined to be equal to or slightly larger than the width of the hem on the shirt front **80** so that the underfold thereof will lie between the vertical edge **54** and the straight edge **234**. In other words, there is a guide channel **236** formed between upturned edge **54** and the straight edge **234** into which the underfold of the shirt front **80** enters as it is delivered along the line of feed **50** by the feeding assembly **28**, and the associated air jets **160**.

Once the underfold is in the guide channel **236**, the shirt front is positively restrained against possible misalignment prior to delivery to the buttonsewer assembly **30**. To faciiltate the entrance of the underfold at the collar end **150** of the shirt front **80** into the channel **236** both the plow guide **204** and the height guide member **208** are provided with funnel-like inlets. The guide plate **206** does not interfere with feeding the shirt front **80** to the buttonsewer assembly **30**, and cooperates with the upper guides **230**, particularly, the plow guide **204** and to a somewhat lesser extent the height guide member **208**, each of which lightly press upon the shirt front **80** to aid in keeping the underfold thereof in the channel **236**.

Once the bar clamp **194** seizes the collar end **150** of the shirt front **80** to the drum **196** indexes the shirt front **80** into the first button position. The usual shirt front **80** will have five equally spaced buttons sewn thereon in the manner substantially set forth in U.S. No. 3,329,110.

The actuation of the photoelectric cell **78** will effect shut off of the air jets **160**, and stopping of the drive motor rotating the shaft **172** and the endless belt **176**, and reactivate the nozzle **182** of the air cylinder **168** to raise the belt drive frame **150** to its horizontal unoperative position, as shown in FIG. 6. The drum **196** will automatically be indexed through the five successive button sewing operations, having the buttons automatically furnished from the button reserve of the button feeding device **66** and to the button clamping jaws **220** to be successively sewn onto the shirt front **80** by the automatic operation of the buttonsewer machine **190**.

A suitable time delay is provided in the circuit of the module **20** to permit actuation of a safety shut off device **250** which is set off as a result of there being no button between the jaws **220** so that said jaws close beyond the point of normal clamping. The clamping jaws **220** are connected by suitable linkage means **252** which are operable by means (not shown) which open the jaws **220** prior to seizing the button, and release the same to permit calmping of the button **226** for the sewing operation, and threafter, release the sewn button **226**. An arm **254** is connected to the linkage means **252** for movement perpendicular to the line of feed **50** in conjunction with the opening and the closing of the button clamping jaws **220**. The free end of the arm **254** is bent vertically upwardly and positioned behind a switch **256** having a switching element **258** facing the vertical portion of the arm **254**, as illustrated in FIGS. 8, 9 and 10. Opening of the jaws **220** results in the arm **254** moving in the direction away from the switch **256**, and closing of the jaws **220** causes the arm **254** to move toward the switch **256**. The distance of travel of arm **254** is set so that upon the jaws **220** closing upon the button **226** the vertical portion of the arm **254** remains out of contact with the switching element **258**. The switch **256** is connected in circuit in a normally closed position which allows the automatic cycling of the module **20**. However, upon the clamping jaws **220** closing with no button present, the vertical portion of the arm **254** will engage the switching element **258** to actuate the switch **256** which acts to open the circuit of the module **20**, resulting in a shut down of the module **20**. The absence of a button in the jaws **220** indicates a malfunction or an exhaustion of the supply thereof, and in any event, will signal the operator to investigate and correct the cause of the shut down.

There is a predetermined time delay between the button feeding device **66** being signaled to feed a button **226**, via the button transfer arm **224**, to the clamps **220**, and the operation of the button sewer machine **190** so that before the operation of said machine commences the time elapsed would permit the safety set off device **250** to have operated. If a button **226** is present in the jaws **220** the cycle of the module **20** continues uninterrupted. However, if no button is present the jaws **220** will close to activate the switch **256**, and thus, shut down the module **20** before the operation of the buttonsewer machine **190** commences.

The space-a-button unit **64** will control the sewing operation of the buttons upon the shift front **80**. After the last button is sewn the shirt front will automatically be delivered to the stacker **36** for collection therein in a suitable manner well known in the art. The operation of the stacker is initiated by a cam **260** mounted upon the drum **196** in line with a switch (not shown) that controls the stacker motor **262**. The cam is normally out of engagement with the switch and upon rotation of the drum to the position of the last button to be sewn the cam will engage the switch to effect the operation of the stacker motor **262**. Prior to this and in order to assure proper delivery of the shirt front to the stacker **36** an elongated cam **264**, mounted adjacent and inwardly to the cam **260** will engage a switch (not shown) to effect the delivery of air to a stationary tube **266** positioned to pneumatically assist in the shirt front **80** being transferred off of the rotary drum **196** onto the stacker **36**.

As the completed shirt front **80** is stacked the light source of the photoelectric cell **78** is uncovered and the drum **196** continues to rotate until it returns to its start position where it will stop.

Upon the completion of the stacking operation the motor **262** is shut off by a switch (not shown). Return of the drum **196** to its starting position results in the cam **200** engaging the switch **198** to effect operation of the air cylinder **202** and cause the plow guide **204** to be raised above the surface **46**. Hence, the buttonsewer assembly **30** is in position for the start of a new cycle.

Suitable manual controls, are illustrated in FIG. 3 at the control panel **38**, such as a stop button **270**, a raise feed button **272** for the feeding assembly **228**, a control button **274** for the button feeding device **66** to permit the feeding of single buttons, and a control switch **276** which may be set selectively for either manual feeding or automatic feeding of the buttons from the button feeding devices **66**.

Furthermore the control board **38***a*, shown in FIG. 1, may include a power on light **280** which indicates when the module **20** has been turned on, and a light **282** which operates to automatically signal a malfunction related to the buttonsewer or when no buttons are present in the

button reserve of the button feeding device **66**. Suitable additional controls and switches are, or may be, provided to insure the automatic operation of the hemming and button sewing module **20** as set forth hereinbefore.

It will be understood that various changes in the details, materials, arrangements of parts and operating conditions which have been herein described and illustrated in order to explain the nature of the invention, may be made by those skilled in the art within the principles and scope of the invention.

Having thus set forth the nature of the invention, what we claim herein is:

1. A method of successively hemming and button sewing of a piece being passed along a prescribed line of feed, comprising the steps of:

(a) folding a marginal portion of the piece upon the remainder thereof along a line parallel to the line of feed,

(b) hemming the folded piece,

(c) turning the hemmed piece over along the line of feed whereby the trailing end becomes the leading end and the folded portion of the piece lies on the underside thereof, and

(d) sewing a plurality of buttons onto the hemmed portion of the piece along the line of feed.

2. The method claimed in claim **1** wherein the folding of the piece includes:

(a) yieldably holding the piece by a selectively operated guide finger to prevent unruffling of the fold.

3. The method claimed in claim **1** wherein the turning of the piece includes:

(a) clamping the leading edge of the hemmed piece, and

(b) passing a transfer arm along the line of feed underneath the piece to increasingly shift the piece away from the clamped end thereof and turn the same.

4. The method claimed in claim **1** for the piece with a tail end and a collar end wherein:

(a) passing the tail end of the piece along the line of feed to be hemmed in advance of the collar end,

(b) turning the hemmed piece so that the collar end becomes the leading end of the piece, and

(c) sewing a plurality of buttons from the collar end in a predetermined indexed sequence.

5. The method claimed in claim **4** wherein after the piece has been turned the method includes the additional step of:

(a) guiding the piece along the prescribed line of feed by engagement with upper and lower guide members.

6. A method of successively sewing opposite sides of a piece being passed along a prescribed line of feed, comprising the steps of:

(a) performing a first sewing operation on the piece with one side thereof facing upwardly, as said piece is passed along the line of feed,

(b) turning the piece over as said piece is passed along the line of feed, and

(c) performing a second sewing operation on the piece with the other side thereof facing upwardly, as said piece is passed along the line of feed.

7. The method claimed in claim **6** wherein the turning of the piece includes:

(a) holding the leading edge of the piece at a fixed point along the line of feed,

(b) advancing the trailing edge of the piece past the held leading edge thereof to effect turning of said piece as the piece is passed along the line of feed whereby former trailing edge becomes the new leading edge of the piece, and

(c) releasing the held edge of the turned piece.

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RICHARD J. SCANLAN, JR., Primary Examiner

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