June 6, 1967 M. KASS 3,323,476

AUTOMATIC SEQUENTIAL UNIT

Filed July 1, 1964 7 Sheets-Sheet 1

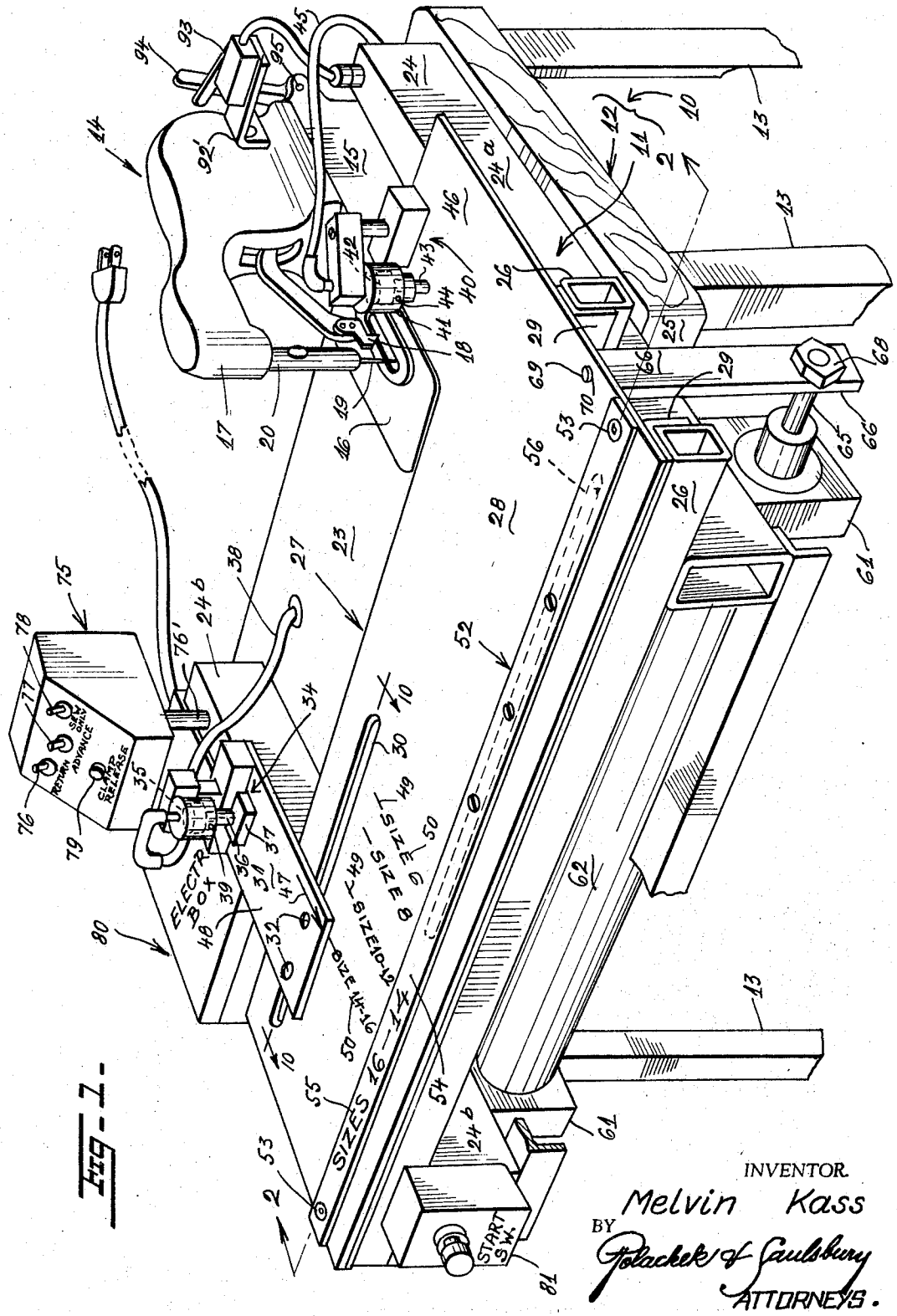


Fig. 1.

INVENTOR.
Melvin Kass
BY
Polacheck & Saulsbury
ATTORNEYS.

June 6, 1967 M. KASS 3,323,476

AUTOMATIC SEQUENTIAL UNIT

Filed July 1, 1964 7 Sheets-Sheet 2

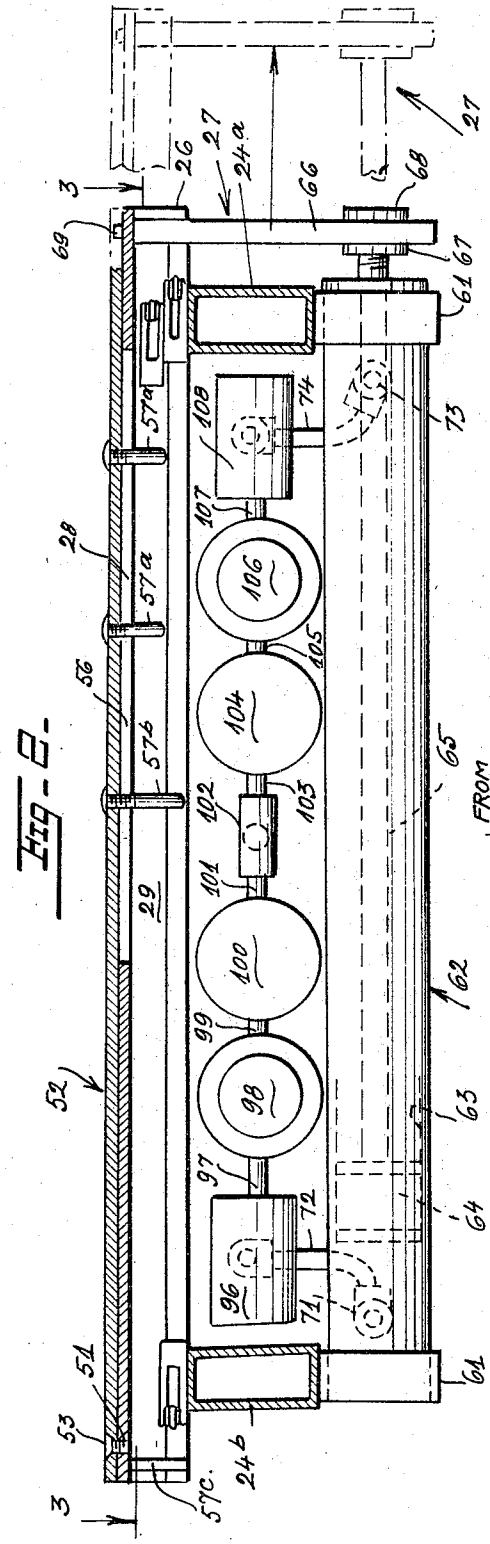


Fig - 2.

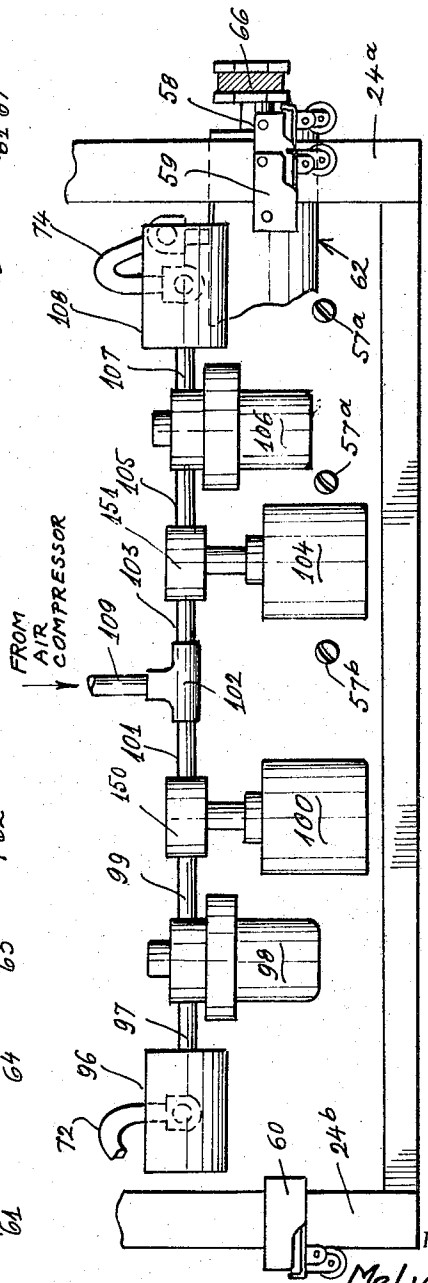


Fig - 3.

INVENTOR.
Melvin Kass
BY
Polachek & Saulsbury
ATTORNEYS.

June 6, 1967 M. KASS 3,323,476

AUTOMATIC SEQUENTIAL UNIT

Filed July 1, 1964 7 Sheets-Sheet 3

Fig-4-

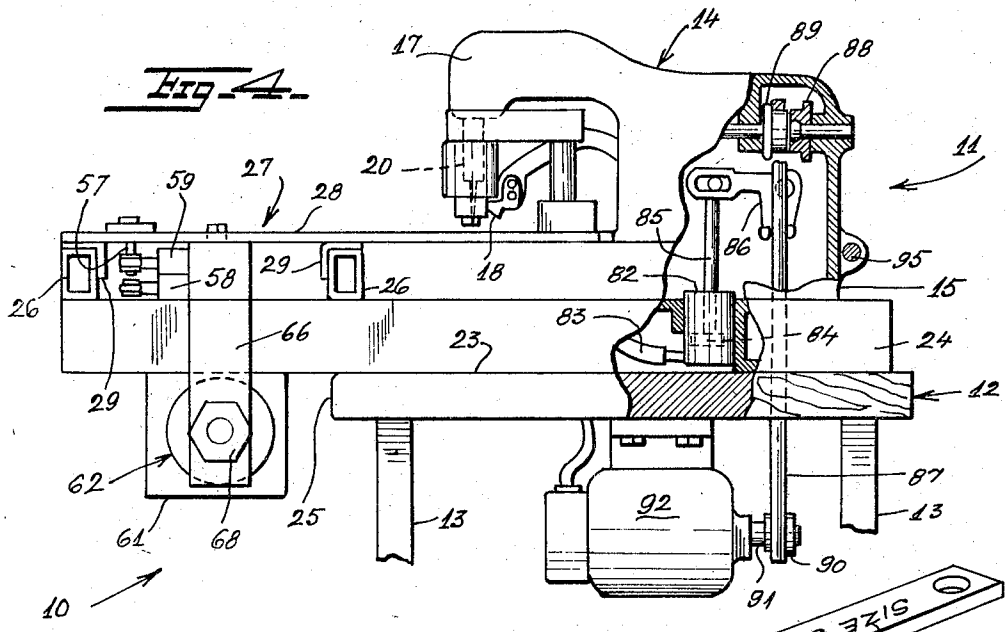


Fig-5-

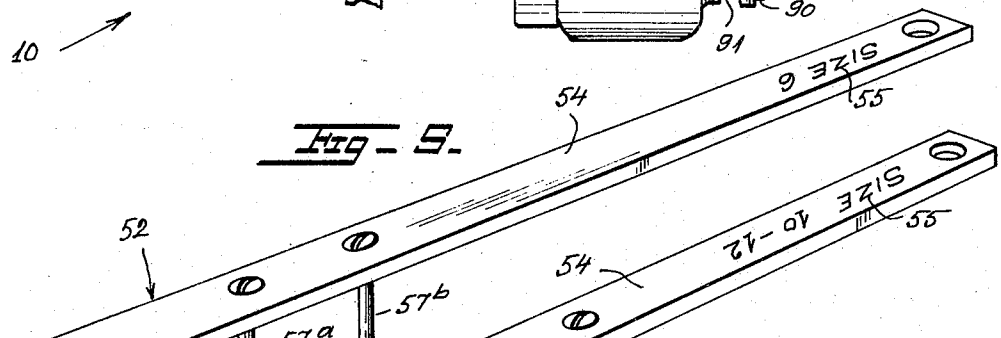


Fig-6-

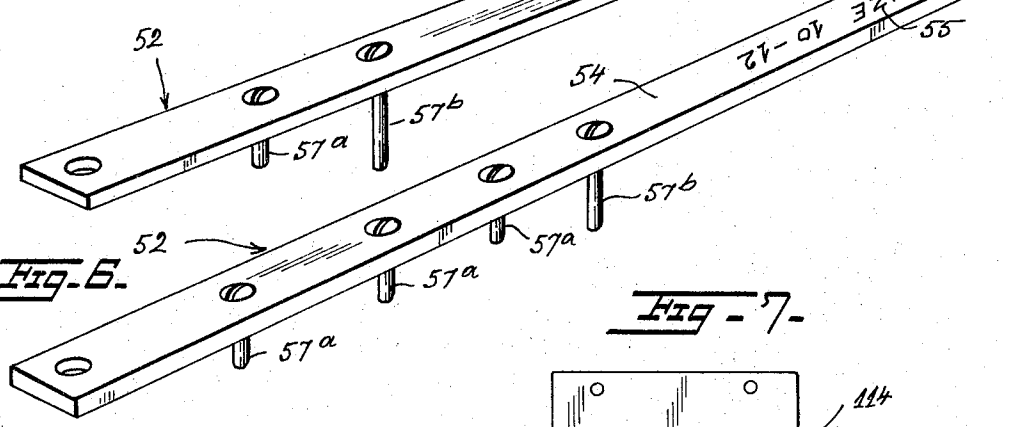


Fig-7-

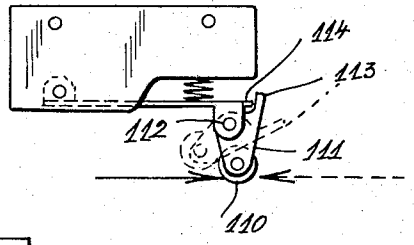
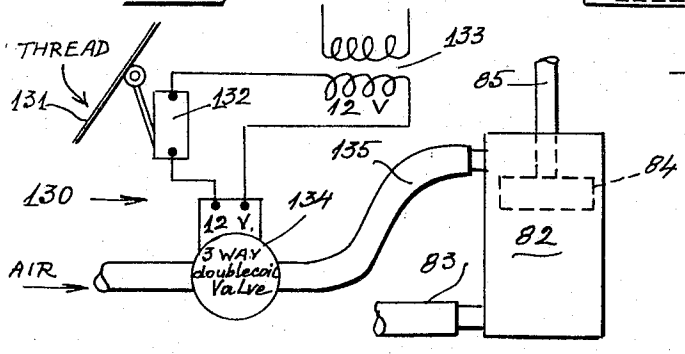


Fig-4A-

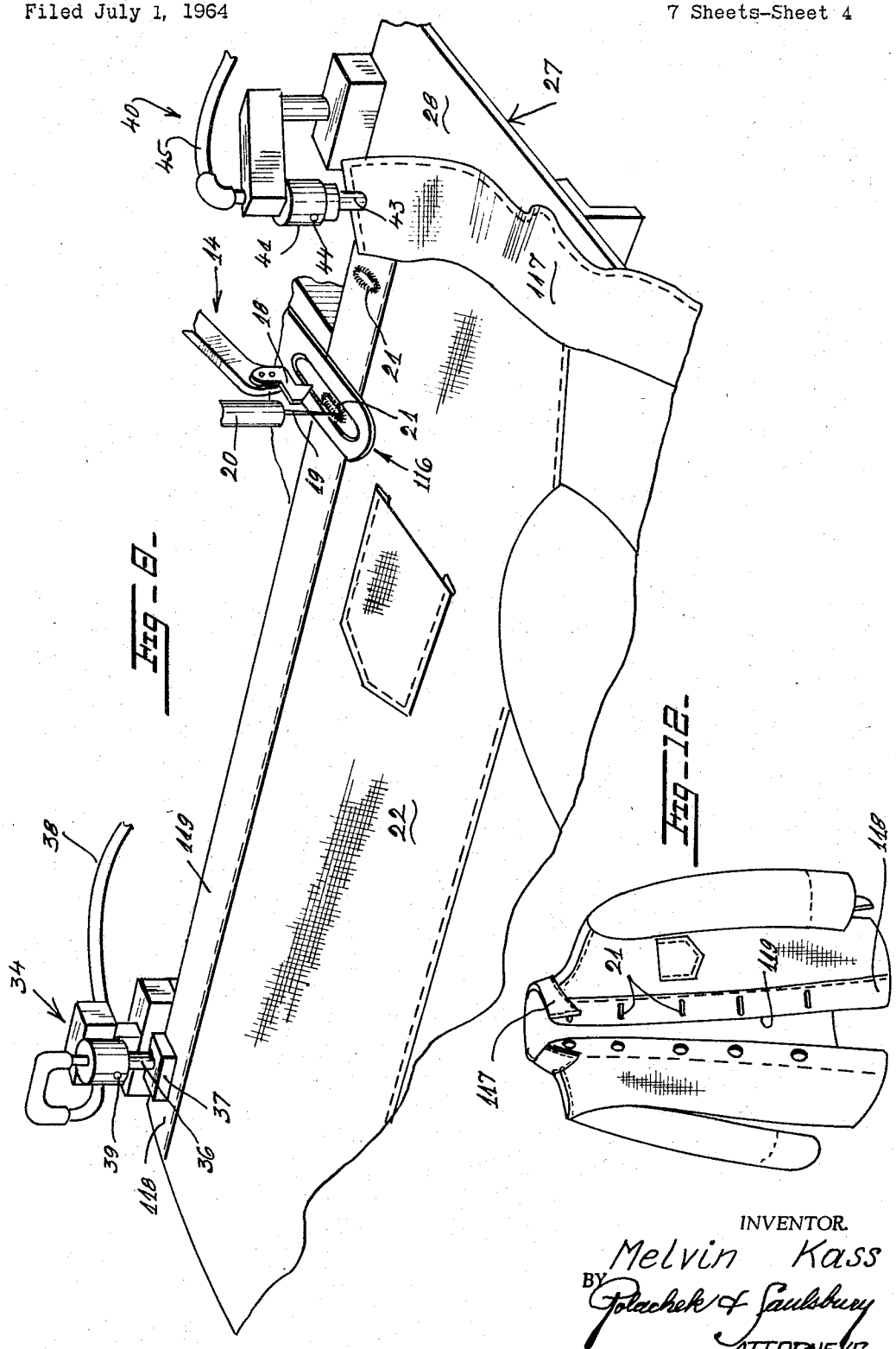


INVENTOR.
Melvin Kass
BY Blackek & Saulsbury
ATTORNEYS.

June 6, 1967 M. KASS 3,323,476

AUTOMATIC SEQUENTIAL UNIT

Filed July 1, 1964 7 Sheets-Sheet 4



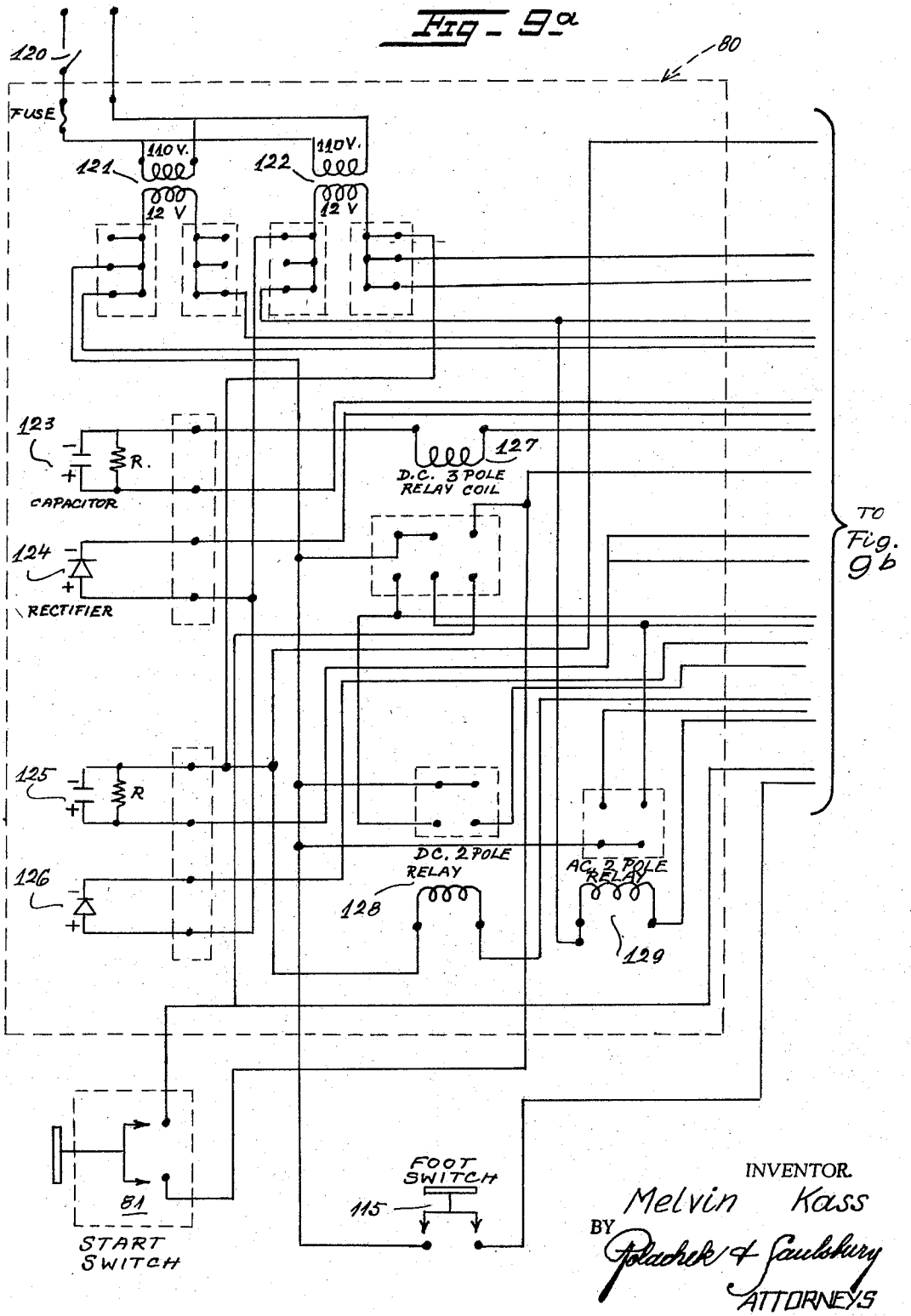
INVENTOR.
Melvin Kass
BY Golachek & Saulsbury
ATTORNEYS.

June 6, 1967 M. KASS 3,323,476

AUTOMATIC SEQUENTIAL UNIT

Filed July 1, 1964 7 Sheets-Sheet 5

Fig. 9a



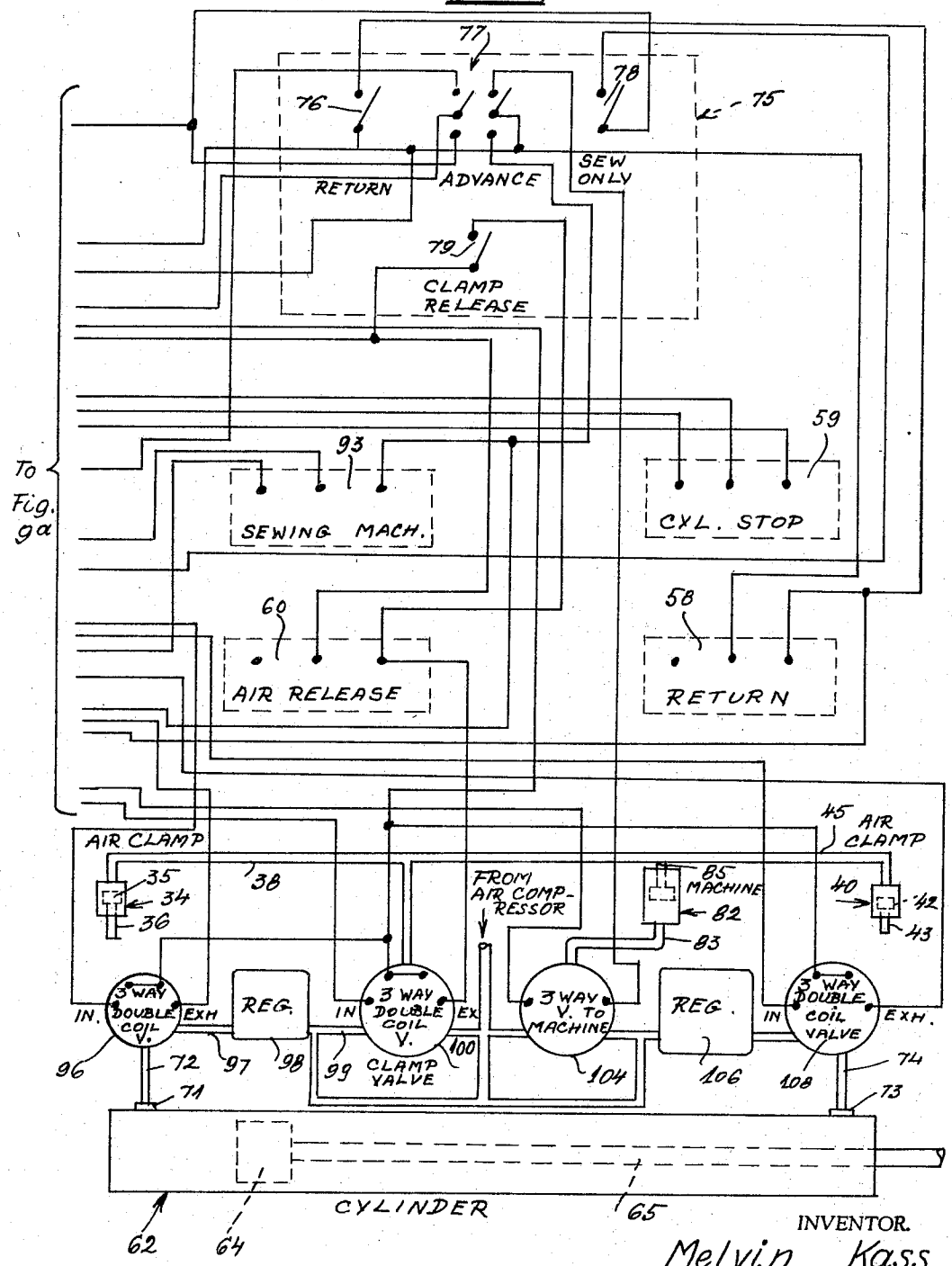
INVENTOR.
Melvin Kass
BY Polachek & Saulsbury
ATTORNEYS

June 6, 1967 M. KASS 3,323,476

AUTOMATIC SEQUENTIAL UNIT

Filed July 1, 1964 7 Sheets-Sheet 6

Fig. 9b



INVENTOR.
Melvin Kass
BY Polachek & Saulsbury
ATTORNEYS.

June 6, 1967 M. KASS 3,323,476

AUTOMATIC SEQUENTIAL UNIT

Filed July 1, 1964 7 Sheets-Sheet 7

Fig. 10.

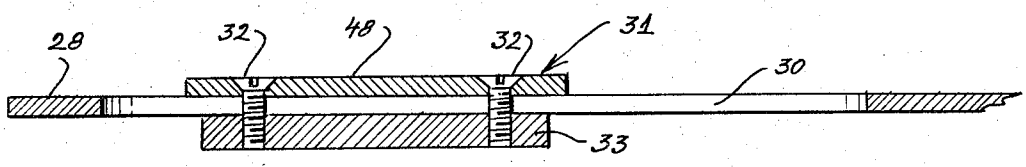
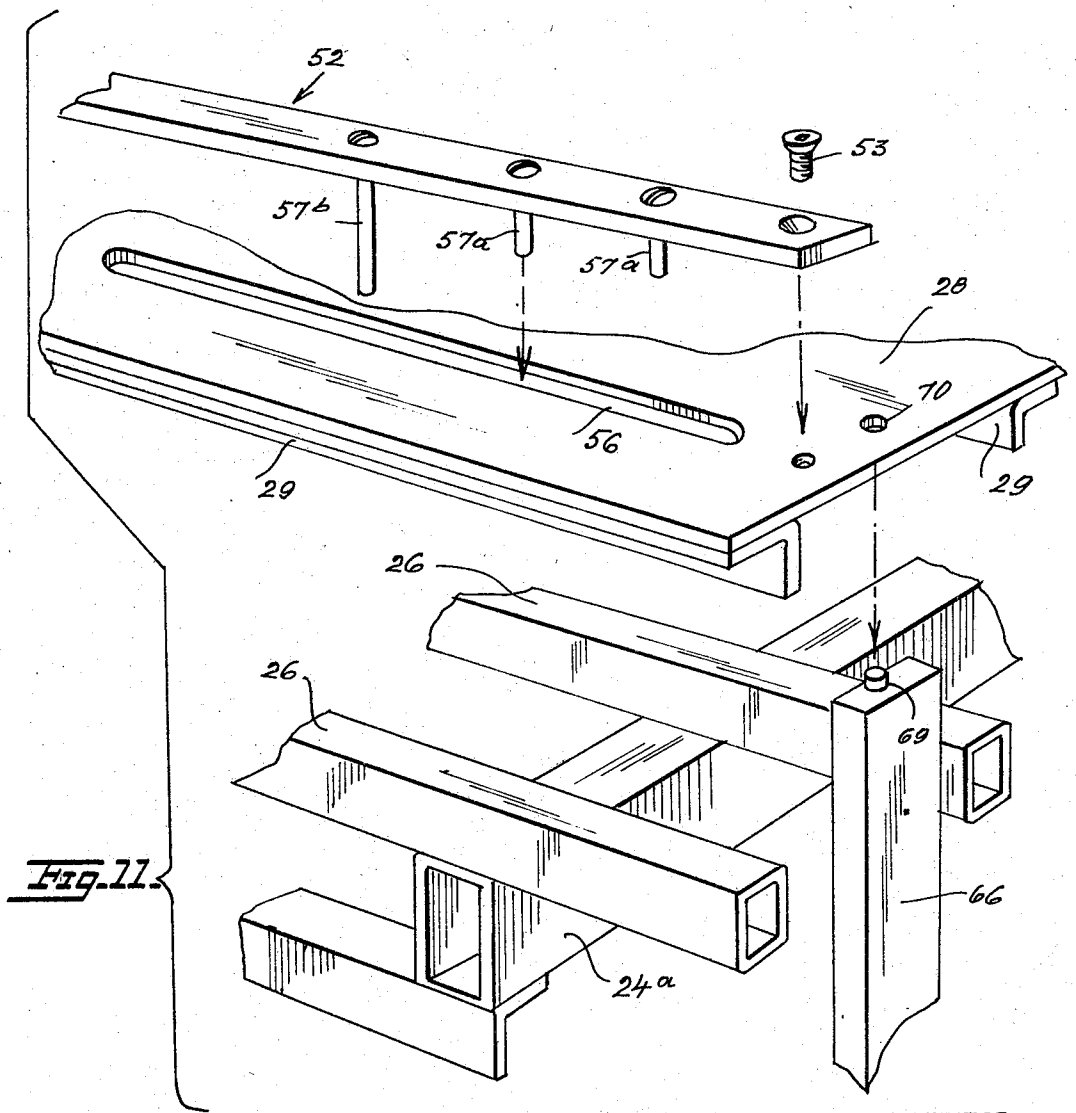


Fig. 11.



INVENTOR.
Melvin Kass
BY Polachek & Saulsbury
ATTORNEYS.

United States Patent Office

3,323,476

Patented June 6, 1967

3,323,476

AUTOMATIC SEQUENTIAL UNIT

Melvin Kass, New Hyde Park, N.Y., assignor to Selden Manufacturing Corporation, Selden, N.Y., a corporation of New York

Filed July 1, 1964, Ser. No. 379,547

8 Claims. (Cl. 112—65)

This invention relates generally to automatic sequential units, such as sewing machines, button sewing machines, bar tacking machines, snap fastening machines, punch press machines, and similar machines requiring sequential operations. More specifically it relates to button hole sewing machines of the type used in the garment production industry.

It is generally well known to those skilled in the art that labor costs and production time are vital factors in the mass production of garments; and accordingly various operations on the garments are attempted to be rapidly accomplished by minimum persons so that the garment can be profitably sold in a highly competitive industry.

Until the present time the stitching of button holes upon shirts, coats and the like has been accomplished in a semi-automatic manner wherein the operator manually moves the garment into position under the sewing machine needle, after which a switch is depressed for the sewing machine to automatically stitch the button hole. Such procedure still relies upon an individual's dexterity in repositioning the garment under the needle in minimum time after each button hole is sewn, and continuous repetition of so frequent an operation is certain to tire and slow down the operator after awhile, resulting in lower production quantity and relatively higher production costs. Additionally such procedure under such continuously rapid manual relocation of the garment is certain to occasionally result in an erroneous relocation thereof and production of a faulty garment which must then be sold as "irregular" and at lower price thus cutting into the profit. This situation still in practice is objectionable.

Attempts have in the past been considered for using a battery of individual button hole sewing machines for sewing simultaneously all the button holes on a garment, each machine being properly positioned respective to another. However such solution is not practical in view that conventional button hole sewing machines are too large to permit their stitching needles to get sufficiently close enough together to produce conventionally spaced apart button holes upon a garment. Furthermore, even if it were possible, the machines would require laborious relocation for various size garments wherein the button holes are spaced a different distance apart. Additionally, the cost of such device employing a plurality of sewing machines would become prohibitive, and in case of a break down of any one thereof, all the machines would be tied up.

Accordingly, it is a principal object of the present invention to provide a button hole sewing machine having self contained means to automatically stitch a plurality of button holes in a garment and thus eliminate the need of an operator's attention to reposition the garment manually for each button hole.

Another object of the present invention is to provide a button hole sewing machine wherein the button holes are progressively made one after another thereby eliminating the requirement of more than a single button hole sewing machine mechanism.

Still another object of the present invention is to provide a button hole sewing machine wherein the operator needs only to affix the garment in a single position upon the machine, then depress a start button for the machine to automatically sew a plurality of button holes progressively and unattended, during which time the operator is free

to likewise affix a garment to other similar machines and start the other machines operating, after which the operator can return to the first machine, remove therefrom the button hole-finished garment and affix another garment therein to repeat the process. Thus a single operator can handle many machines and substantially increase his production quota within any period of time.

Yet another object is to provide a button hole sewing machine having means to sew a plurality of button holes along a singular straight line upon the garment.

Other objects are to provide an attachment for a button hole sewing machine, button sewing machine, bar tacking machine, snap fastening machine, punch press machine, and similar machines requiring sequential operations, which is simple in design, inexpensive to manufacture, rugged in construction, easy to use and efficient in operation.

These and other objects will be readily apparent upon a study of the following specification and the accompanying drawings, wherein:

FIGURE 1 is a perspective view of the present invention.

FIG. 2 is a cross sectional view taken on line 2—2 of FIG. 1.

FIG. 3 is a cross sectional view taken on line 3—3 of FIG. 2.

FIG. 4 is an end elevational view of the apparatus shown partly in cross section.

FIG. 4*a* is an auxiliary electro-pneumatic circuit of a sewing machine cut off mechanism incorporated in the present apparatus.

FIG. 5 is a perspective view of a gauge.

FIG. 6 is a similar view only of a different size gauge.

FIG. 7 is a side elevational view of a microswitch used in the present apparatus.

FIG. 8 is a fragmentary perspective view of the apparatus shown in operative use.

FIGS. 9*a* and 9*b* in combination are an electrical-pneumatic circuit of the invention.

FIG. 10 is a cross sectional view through 10—10 of FIG. 1.

FIG. 11 is an exploded perspective view of a portion of the carriage and associated supporting structure, and

FIG. 12 is a perspective view of a finished shirt made upon a machine as is herein described.

Referring now to the drawings in detail the numeral **10** represents an automatically progressive button hole sewing machine according to the present invention wherein there is an apparatus **11** mounted upon a table **12** having legs **13**.

The apparatus includes a conventional button hole sewing machine **14** which may be of any suitable make and model, and which includes a base **15** having a base plate **16**, a head **17** mounted upon the base, a knife **18** for slotting a garment material, a needle **19** on a needle bar **20** carried on the head, and a mechanism (not shown) within the base and head for stitching a button hole **21** upon the garment material **22** (see FIG. 8). The sewing machine **14** is mounted upon the top side **23** of table **12**.

A pair of tubular members **24** of rectangular cross sectional configuration are mounted in parallel spaced apart relation upon the table top, the members **24** extending beyond the forward edge **25** of the table. A pair of secondary tubular members **26** are mounted across the top of tubular members **24** and serve as track rails for a carriage **27** supported slidably free thereupon.

The carriage **27** includes a flat panel **28** having a pair of parallel spaced apart angle-shaped guides **29** rigidly affixed upon its underside; the guides being in sliding contact with the track rails. A longitudinal slot **30** through panel **28** extends in a direction parallel to the direction of travel of the carriage. This travel direction

may be assumed as transverse upon the apparatus in view that it is parallel to the forward edge of the table. Thus it is understood that the guides and track rails extend in a transverse direction. A slidable plate **31** is supported upon the panel **28** by means of a pair of screws **32** passing through circular openings in the plate and through the slot **30**; the screws carrying a bar **33** on the underside of the panel which permits drawing the plate tightly against the panel and frictionally securing the plate in a predetermined position respective to the panel.

Upon the plate there is mounted an air clamp unit **34** comprised of a cylinder enclosing a piston **35** having a downwardly extending piston rod **36**. A block **37** is secured to the lower end of the piston rod, the block being in selective clamp engagement with the upper side of the plate. An air hose **38** communicates between the upper portion of the cylinder and a compressed air source. A vent opening **39** on the lower portion of the cylinder serves to exhaust any air in the cylinder chamber under the piston to permit rapid descent thereof into clamping position when so desired.

A second air clamp unit **40** is mounted upon the panel **28** in alignment along an imaginary transverse line passing through air clamp unit **34**. The air clamp unit **40** likewise has a cylinder **41**, piston **42**, downward extending piston rod **43**, vent opening **44**, and air hose **45**. The lower end of the piston rod **43** abuts with the upper side **46** of the panel when in clamping position.

The plate **31** has an arrow indication **47** engraved upon its upper side **48**, the arrow being selectively aligned with graduations **49** engraved upon the uppper side **46** of the panel. Each of the graduations has legend **50** engraved adjacent thereto indicating various garment sizes. In the case illustrated, the garment represents a shirt and the sizes shown in FIG. 1 represent shirt sizes.

A pair of threaded openings **51** are provided in panel **28** and one of a plurality of control bars **52** are removably attached upon the upper side of the panel by means of screws **53** passing through the control bar and secured in openings **51**. Each control bar has engraved upon its upper side **54** a legend **55** indicating a shirt garment size which corresponds to one of the legends **50** on the upper panel. The panel **28** has a second transverse slot **56** located directly under a portion of the control bar, and each control bar has a plurality of downwardly extending studs **57** passing through the slot **56**. As shown in FIG. 2 all the studs **57***a* are of same length except the left-most stud **57***b* which is of greater downward length.

Three microswitches **58**, **59** and **60** are secured in stationary position upon the apparatus and are in the path of travel of the studs **57** for purpose of operating various electrical circuits. The microswitch **58** is secured upon the top of right tubular member **24***a* and the microswitch **59** is secured above microswitch **58**, whereby the switch **59** is in the path of every study **57***a* and **57***b* while the switch **58** is in the path of stud **57***b* only which extends sufficiently downward to reach the tripping mechanism of switch **58**. It is to be noted that the switch **58** is mounted slightly more to the right side of the apparatus than the switch **59** (as shown in FIGS. 2 and 3) for a reason which will be explained hereinafter. The microswitch **60** is mounted upon the top of left tubular member **24***b* (see FIGS. 2 and 3) and is accordingly on the same elevation as microswitch **58** and thus is activated by a stud **57***c* only.

Upon the under side of each tubular member **24** there is mounted a pillar block **61** which supports a main pneumatic cylinder **62** therebetween. Within the chamber **63** of the cylinder there is a slidable piston **64** having a piston rod **65** extending out of one end of the cylinder, the piston rod carrying an upwardly extending post **66** secured between nuts **67** and **68** threadedly mounted on the piston rod. A stud **69** protrudes upwardly from the upper end of the post, the stud **69** being engaged within an opening **70** in the panel **28**.

An air intake and exhaust post **71** at one end of the cylinder communicates with an air hose **72**, and an air intake and exhaust post **73** at the opposite end of the cylinder communicates with an air hose **74**, each of the hoses leading to a compressed air source via a pneumatic circuit shown in FIGS. 3 and 9*b*.

Additionally the present apparatus includes an electrical control box **75** mounted in elevated position upon an upstanding post **76'** over the tubular member **24***b*, where it may be conveniently manually operated by a person. The controls carried by box **75** comprise a "return" switch **76**, an "advance" switch **77**, a "sew only" switch **78** and a "clamp release" push button **79**. The electrical wiring from the control box extends through post **76'** into the tubular member **24***b*. It is to be noted that the tubular members **24** serve to carry electrical wiring therethrough thereby maintaining an orderliness and preventing loose wires scattered about (see FIG. 1).

An electric box **80** is mounted upon the table top and it contains transformers, relays and the like parts which form elements in the electrical circuit of the apparatus.

A start switch **81** is conveniently mounted upon the forward end of tubular member **24***b*.

Various pneumatic valves associated with operation of the air clamps, main pneumatic cylinder and a sewing machine clutch cylinder are located in the area bounded by the forward edge of the table, between the tubular members **24** and above the main cylinder (see FIGS. 2 and 3).

The clutch cylinder **82** (FIG. 4) on the sewing machine **10** is powered by air from hose **83**. The piston **84** of the cylinder has a piston rod **85** that operates a bell crank **86** to slip an endless belt **87** between an idler pulley **88** and a pulley **89** that drives the button hole sewing mechanism of the machine. The belt **87** is passed around a pulley **90** mounted on shaft **91** of a motor **92**. The above sewing machine drive forms a standard part of such machines generally.

A bracket **92'** is attached to the sewing machine head **17** as shown in FIG. 1, and a microswitch **93** is mounted thereupon to be engaged by a lever **94** pivotable about shaft **95** of the sewing machine **10**.

The pneumatic valves of the apparatus are shown in FIGS. 2, 3 and 9*b* and include a three way double coil valve **96** attached to end of hose **72**. Valve **96** is connected by air tube **97** to regulator **98** which is connected by an air tube **99** to T **150** to three way double coil valve **100**, which in turn is connected by air tube **101** to one cross arm end of T-fitting **102**. The other end of the cross arm is connected to air tube **103** leading to T **151** three way valve **104** and air tube **105** leads to a regulator **106** connected by air tube **107** to three way double coil valve **108** which in turn is connected to end of hose **74**. The T fitting **102** is also connected by means of a hose **109** to an air compressor (not shown in the drawing).

It is to be noted that the three way double coil valve **96** controls movement of air in one end of the main cylinder **62** while three way double coil valve **108** controls movement of air in the opposite end of the main cylinder. The three-way double coil valve **100** controls the air movement to air clamp valve units **34** and **40**. The three way valve **104** controls movement of air to the sewing machine cylinder **82**.

As shown in FIGS. 5 and 6, the control bars are each designed to regulate the positions of the button holes respective to the size of the shirt. In the smaller shirts the button holes are most probably closer together and there may be a lesser number of button holes.

In FIG. 7 there is shown a typical microswitch employed in the present apparatus. The microswitch is of the type that permits over-riding of a stud in one direction only without the switch being operated. Thus movement of a stud **57** into the direction indicated by

the solid arrow will trip the switch wheras a stud approaching the switch from the direction indicated by the broken line arrow will override without actuating the switch. This is due to contact roller **110** being supported on an arm **111** pivotable in one direction about pin **112** but restrained from pivoting in the opposite direction because a spur **113** on the arm **111** abuts end of arm **114** of the switch. A spring (not shown) normally keeps the arm in the position indicated by solid lines.

Additionally the apparatus includes a conventional foot switch **115** (shown on drawing *9a*) for operating the air clamp units in a manner as will be shown in the circuit.

It is to be noted that this apparatus can be designed to accommodate a pneumatic cylinder fitted with a hydraulic checking device or a hydraulic system instead of the main air cylinder in the application.

The electrical circuits of the apparatus passing through the various switches operate the various electrically controlled valves to direct movement of the compressed air. The electrical circuit additionally includes a main switch **120**, transformers **121** and **122**, capacitor **123**, rectifier **124**, capacitor **125**, rectifier **126**, a D.C. pole relay **127**, D.C. relays **128** and **129** of the two-pole type, to correspond to drawing *9a*, a D.C. two pole relay **128**, and an A.C. two pole relay **129**, all of which are contained in the electric box **80**.

In FIG. *4a*, cut off mechanism **130** is shown which is incorporated in the present apparatus and which is for the purpose of immediately stopping the button hole sewing machine operation in case the stitching thread **131** accidently breaks. This mechanism includes a microswitch **132** which is maintained in normally open position due to the thread being in tension. Should the thread break, the switch closes an electrical circuit through a transformer **133** and a 12-volt three-way solenoid switch **134** which opens allowing movement of air through hose **135** into the upper end of cylinder **82**, causing downward movement of the piston **84** and transfer of belt **85** from operating pulley **89** to inoperating idler pulley **88**, thus immediately shutting off operation of the sewing machine **14**.

In operative use the proper control bar is selected for the size and style of shirt, the control bar determining where the button holes will be made on the shirt. The control bar is secured upon the panel as shown in FIG. 1 and the plate **31** is adjusted in slot **30** so that the arrow **47** is aligned with the particular graduation **49** which carries the same legend **50** as the legend **55** upon the particular control bar being used. The motor **92** is turned on. The air clamp units are now in open position and the operator inserts a shirt under the air clamp units **34** and **40** and also under the button hole sewing machine clamp **116** (as shown in FIG. 8). The air clamp unit **40** receives the collar **117** whereas the air clamp unit **34** receives the lower edge **118** of the shirt. As shown in the drawing, the shirt is stretched flat between the clamp units with the shirt edge **119** therebetween upon which button holes are to be sewn for the purpose of matching buttons sewn on a mating edge (see FIG. 12) of the shirt. The operator now depresses the foot switch causing the air clamps to hold the shirt in position during the full cycle of the operation. The operator then depresses the button of the start switch **81** after which the operator is free to attend another machine. When the start switch button is depressed it activates the full apparatus cycle for sewing all the required button holes along edge **119** of the shirt.

During this cycle the following mechanical movements take place. The pneumatic valve **104** actuates valve **82** causing the belt **87** to move into engagement with the button hole sewing mechanism of the machine which thus immediately sews the uppermost button hole near the shirt collar. When this is completed the button hole sewing mechanism pivots lever **94** to trip microswitch **93** which in turn activates electrically operated valves **96** and **108** causing air to be delivered into the left side of the main cylinder **62** and exhausted from the right side thereof thus causing the piston **64** to move toward the right and carrying along therewith the carriage **27** which is attached by means of post **66** to the piston rod **65**. As the carriage moves toward the right, the stud **57***a* which is closest to the right trips microswitch **59**. This causes the carriage movement to be halted, by putting air into both ends of cylinder **62**, and the button hole sewing mechanism to again repeat a button hole sewing operation, after which the carriage is again moved further toward the right due to additional air delivered into the left side of the main cylinder and release of air from the right side thereof. The next stud now trips the microswitch **59** causing a third button hole to be sewn in the new position of the shirt under the sewing machine needle. Thereafter the carriage advances again further right until the longer stud **57***b* trips switch **59** and again causes a button hole to be sewn in the newly advanced position of the shirt under the needle. Thereafter the carriage advances further to the right, however in a relatively short distance the lower portion of stud **57***b* trips microswitch **58** which activates a pneumatic circuit causing air to be delivered into the right side of the main cylinder and removed from the left side thereof. Thus the carriage is now made to return to its starting position. During this leftward travel the studs override the switches **58** and **59** preventing actuation thereof. At the extreme leftward travel of the carriage, the stud **57***c* trips microswitch **60**, oppositely mounted, causing the air clamp units to open releasing their hold upon the shirt. The operator now returns to the machine, removes the finished shirt, inserts another and repeats the operation.

During the individual cycle of the button hole sewing mechanism operation, the lever **94** releases the microswitch **93** causing the capacitor pack **123** to charge. When this cycle is finished, the lever depresses microswitch **93** causing the capacitor to discharge and trip relay **127** which in turn allows the carriage to advance or move to the right. The carriage moves until a stud trips microswitch **59** causing capacitor **125** to discharge, tripping relay **127** which trips valves **96** and **108** placing air into both ends of main cylinder **62**, causing the carriage to stop its travel, and also tripping the valve **104** which starts the button hole sewing cycle again into operation.

It is to be noted that the control box provides manually operative switches whereby a person may vary the normal cycle operation. Thus the switches designated "return," "advance," "sew only" and the push button designated "clamp release" will provide complete adjustment of the apparatus operation for any particular situation.

While various changes may be made in the detail construction, it is understood that such changes will be within the spirit and scope of the present invention as is defined in the appended claims.

Having thus set forth my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In an automatically sequential unit for button hole sewing mechanisms and the like, the combination of a button hole sewing mechanism, said button hole sewing mechanism being stationarily mounted, a carriage, means for moving said carriage respective to said button hole sewing mechanism, means on said carriage to carry a garment, means for releasably securing said garment to said carriage, automatic means for intermittently moving and intermittently stopping said carriage respective to said button hole sewing mechanism, automatic means operating said button hole sewing mechanism to sew a button hole upon said garment during the time said carriage is intermittently stopped, a table, said button hole sewing mechanism being securely mounted on said table, a motor means, said table supporting said motor means for driving said button hole sewing mechanism, said table hav-

ing a framework affixed thereto upon which said carriage is movable, said framework comprising a pair of spaced apart tubular members affixed upon the top of said table, said table having a forward edge, said tubular members projecting forwardly beyond the said forward edge, a pair of secondary tubular members affixed in parallel spaced apart relation across the projecting portion of the first said tubular members, said secondary tubular members forming track rails for said carriage, said carriage having a pair of spaced apart longitudinal extending portions in sliding contact upon said track rails, a main fluid cylinder securely mounted on the underside of said forwardly projecting portions of said tubular members, said main cylinder having a piston and piston rod, said piston rod extending out of one end of said cylinder, an upwardly extending post affixed to the outer end of said piston rod, said post being secured at its upper end to said carriage, said fluid cylinder providing a means for moving said carriage respective to said button hole sewing mechanism, said carriage comprising a panel having a flat upper side and a flat bottom side, said longitudinal extending portions being secured on said bottom sides, said top side having a longitudinal first slot, a plate carried upon the upper side of said panel, said plate having openings therein, screws extending through said openings and slot, a threaded block on the underside of said panel receiving said screws for securing said plate in longitudinally selected position to said panel, said plate carrying a first air clamp unit and said panel carrying a second air clamp unit, both of said air clamp units being on an imaginary line which is parallel to the travel direction of said carriage, said panel providing said means for carrying said garment, and both said air clamp units providing said means for securing said garment to said carriage.

2. In an automatically sequential unit for button hole sewing mechanisms and the like, the combination as set forth in claim **1**, wherein one of a plurality of longitudinal control rods is selectively attached upon said panel, said control rod having a row of a plurality of downwardly extending studs at predetermined distances apart, said panel having a second longitudinal slot therethrough, through which said studs protrude downwardly, and said tubular members which project forwardly beyond the forward edge of said table having microswitches secured thereupon, said studs engaging said microswitches during said intermittent travel in a rightward and leftward direction of said carriage mechanisms actuated by said microswitches to intermittently halt and start said carriage in both travel directions and sew said button holes.

3. In an automatically squential unit for button hole sewing mechanisms and the like, the combination as set forth in claim **2**, wherein all except one of said studs are of relatively short length and the said one stud is of relatively longer length, and said microswitches comprise a first microswitch for activating mechanism for halting the travel of said carriage and starting the button hole sewing mechanism to sew a single button hole on said garment, said first microswitch being located at relatively higher elevation than the other of said microswitches and being in the patch of contact by all of said short and longer downwardly extending studs, a projecting right tubular member, a second microswitch located on said projecting right tubular member, said second microswitch activating said mechanisms to halt a right direction travel of said carriage and start a leftward return travel thereof, and a third microswitch located on a projecting left tubular member, said third microswitch activating said mechanisms to stop a leftward direction travel of said carriage and release of said air clamp units freeing said garment from said carriage, said longer stud being at the left end of said row of studs, said second and third microswitches being in the path of contact by said longer stud only.

4. In an automatically sequential unit for button hole sewing mechanisms and the like, the combination as set forth in claim **3**, wherein a fourth microswitch is located adjacent the button hole sewing mechanism, said button hole sewing mechanism having a pivotable lever, means on said lever being pivotally moved at the end of a button hole sewing cycle, said lever activating said fourth microswitch at said end of said sewing cycle in order to resume the travel of said carriage in a rightward direction.

5. In an automatically sequential unit for button hole sewing mechanisms and the like, the combination as set forth in claim **4**, including a pneumatic system, source means delivering compressed air into said pneumatic system, said system including said main cylinder, said air clamps and further including a pneumatic cylinder on said button hole sewing mechanism for clutching said mechanism into operating position, said system further including a plurality of electrically controlled pneumatic valves, pneumatic lines between said compressed air source and said cylinders, and said valves intercepting said pneumatic lines.

6. In an automatically sequential unit for button hole sewing mechanisms and the like, the combination as set forth in claim **5**, including an electrical circuit between said microswitches and said electrically controlled valves, a foot pedal switch, said foot switch adapted to close said air clamps, a start switch, said starting switch adapted to initiate initially a mechanism to start operation of said button hole sewing mechanism, and a control box, said control box having a plurality of switches for selective movement of said carriage for selective sewing only and selective clamp release.

7. In an automatically sequential unit for button hole sewing mechanisms and the like, the combination as set forth in claim **6**, wherein said electrical circuit includes a first relay, a first capacitor, a second capacitor and a three pole relay coil, said fourth microswitch being released by said button hole sewing mechanism lever during the sewing cycle of said mechanism, said fourth microswitch causing the said first capacitor to charge, and when said sewing cycle is finished, said lever depressing said fourth microswitch, causing said first capacitor to discharge and trip said first relay allowing said carriage to travel rightward, and one of said carriage studs tripping said first microswitch causing said second capacitor to discharge and trip said three pole relay coil causing said three way valves controlling air movement on each end of said main cylinder to lock air therewithin.

8. In an automatically progressive button hole sewing machine, the combination as set forth in claim **7**, a cut off mechanism for immediately stopping the button hole sewing machine upon a stitching thread being broken, said mechanism including a microswitch adapted to be maintained in an open position by a tensioned thread and adapted to be closed upon the thread being broken, a relay open valve in circuit with said microswitch and cylinder device, said sewing machine having a pulley and drive belt, and lever means operable upon drive belt upon actuation of cylinder device to disengage the belt from the sewing machine pulley.

References Cited

UNITED STATES PATENTS

2,899,919	8/1959	Myska	112—102 X
2,944,496	7/1960	Gardner	112—65
3,001,489	9/1961	Bond et al.	112—2
3,082,719	3/1963	Zeitlin	112—65
3,224,393	12/1965	Adams et al.	112—2

JORDAN FRANKLIN, *Primary Examiner.*

H. H. HUNTER, *Assistant Examiner.*

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,323,476 June 6, 1967

Melvin Kass

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

In the heading to the printed specification, lines 3 to 5, strike out ", assignor to Selden Manufacturing Corporation, Selden, N. Y., a corporation of New York", and insert instead -- (Selden, Long Island, N. Y.) --.

Signed and sealed this 9th day of January 1968.

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents