

[54] **METHOD AND SYSTEM FOR ATTACHING A POCKET TO A PORTION OF A GARMENT**

[72] Inventors: Herman Rovin, Norwalk, Conn.; James W. Cobb, Tarrytown, N.Y.; Theodore Opuszanski, Darian, Conn.; Richard H. Willard, Norwalk, Conn.; Raymond Rigat, Jr., Monroe, Conn.; Joseph Pellicano, Greenwich, Conn.

[73] Assignee: Ivanhoe Research Corporation c/o Robert A. Hack, New York, N.Y.

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 [51] Int. Cl. D05b 21/00
 [58] Field of Search 112/121.11, 121.12, 121.15,
 112/121.29, 2, 102, 262; 270/52, 53, 55, 57,
 58; 271/58, 1

[56]

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Primary Examiner—James R. Boler
 Attorney—Bryan, Parmelee, Johnson & Bollinger

[57]

ABSTRACT

A system and method of fastening a pocket to a portion of a garment is described. Garment working stations are arranged in a preselected manner about a platform with predetermined accurate alignment of their individual garment working operations. Each garment portion is automatically deposited on the platform and aligned with an orientation selected to bring its desired working areas with precision opposite the garment working stations. A garment portion indexer is employed which clamps the panel to preserve its automatically obtained alignment effectively throughout the working operations. The indexer accurately indexes the aligned panel step by step to each of the stations continuously retaining its grip until that is no longer needed. Pockets are deposited on the platform and automatically aligned with a selected indexed panel position. The pocket is attached to the panel at a precisely determined panel location after being transferred thereto with an automatic actuated transfer device. Pocket manipulation is uniquely performed at a garment station to precisely align pocket and panel parts as well as prepare completion of pocket attachment. Aesthetic completion of panel to pocket assembly is obtained with accurate bar tack operations, assuring a repetitively neat product. An automatic panel dart forming station is shown for the attachment of a rear garment panel for a pair of trousers to a back pocket. High speed pocket to garment attachments are obtained.

16 Claims, 43 Drawing Figures

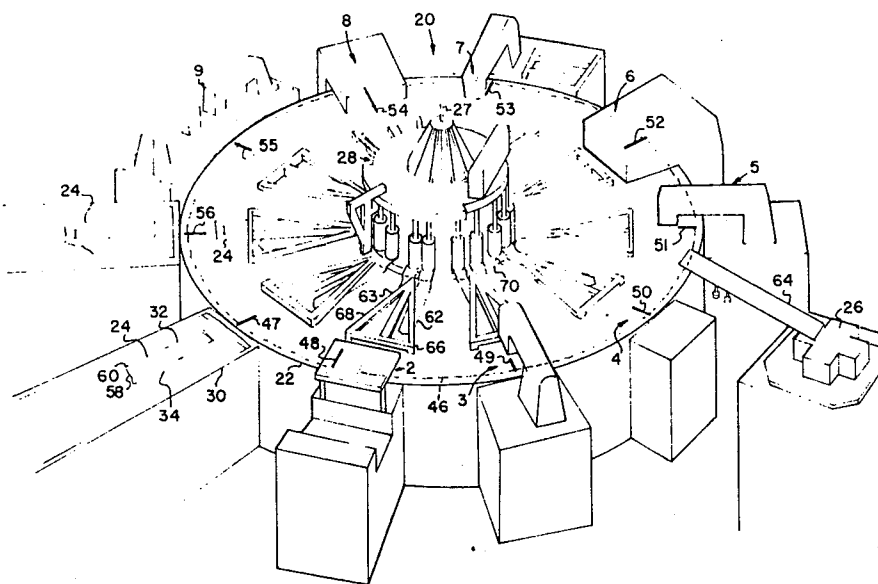
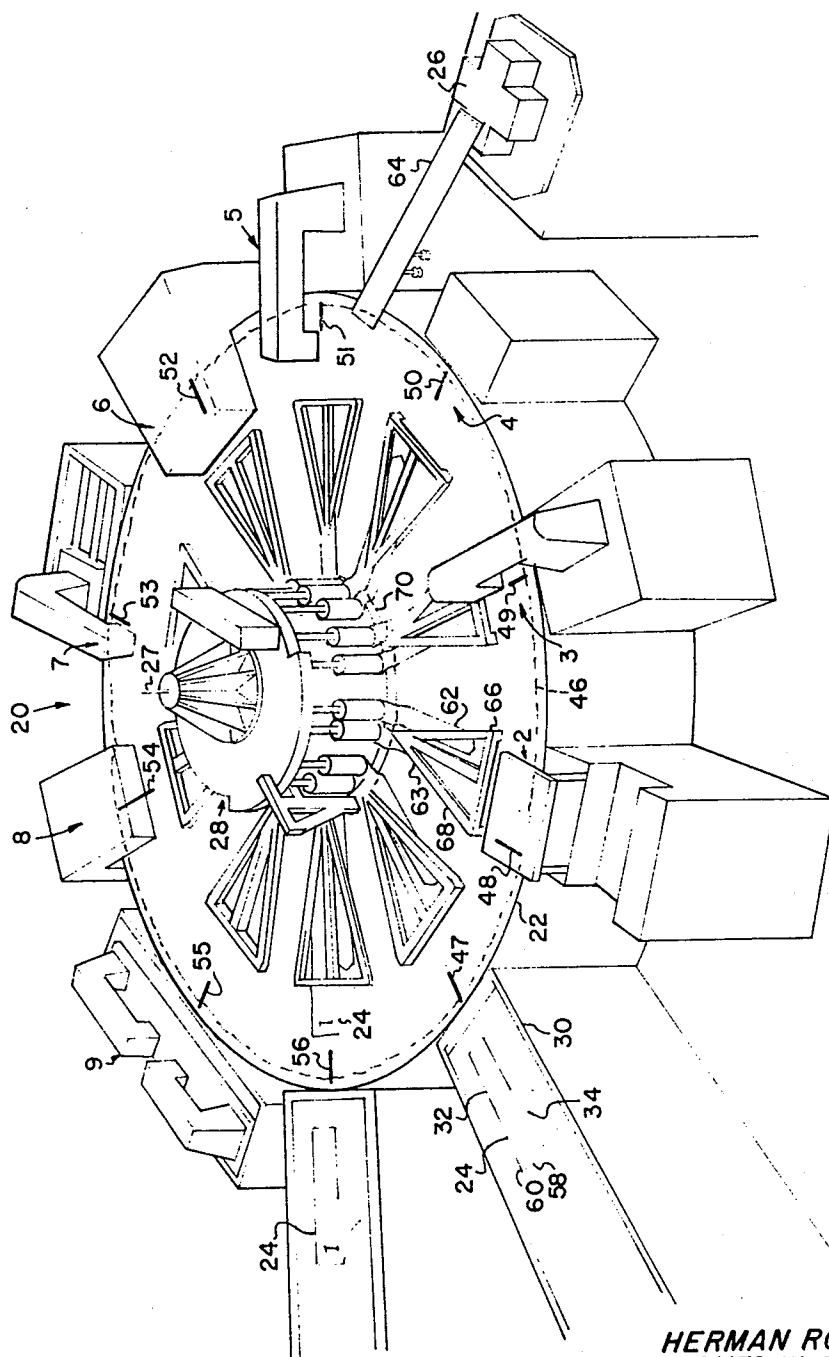


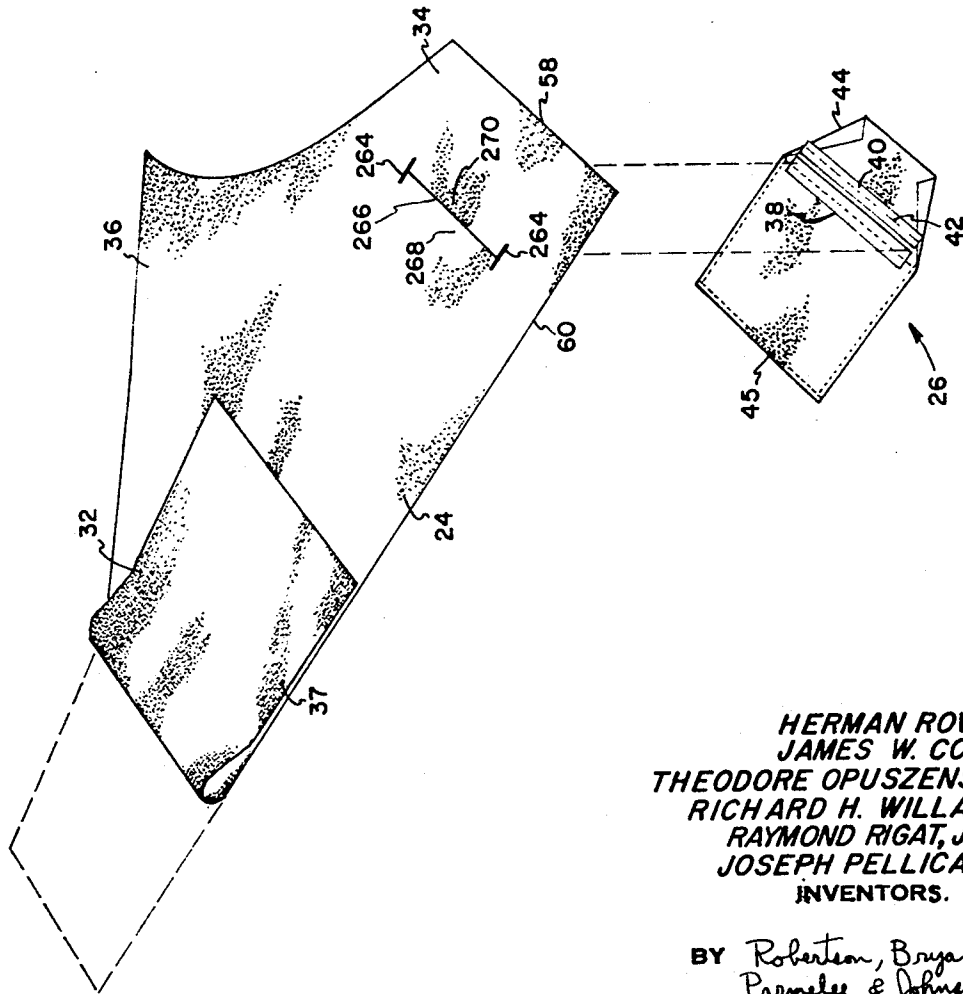
FIG. 1



HERMAN ROVIN
JAMES W. COBB
THEODORE OPUSZENSKI
RICHARD H. WILLARD
RAYMOND RIGAT, JR.
JOSEPH PELLICANO
INVENTORS

BY Robertson, Bryan,
Parnelle & Johnson.
ATTORNEYS

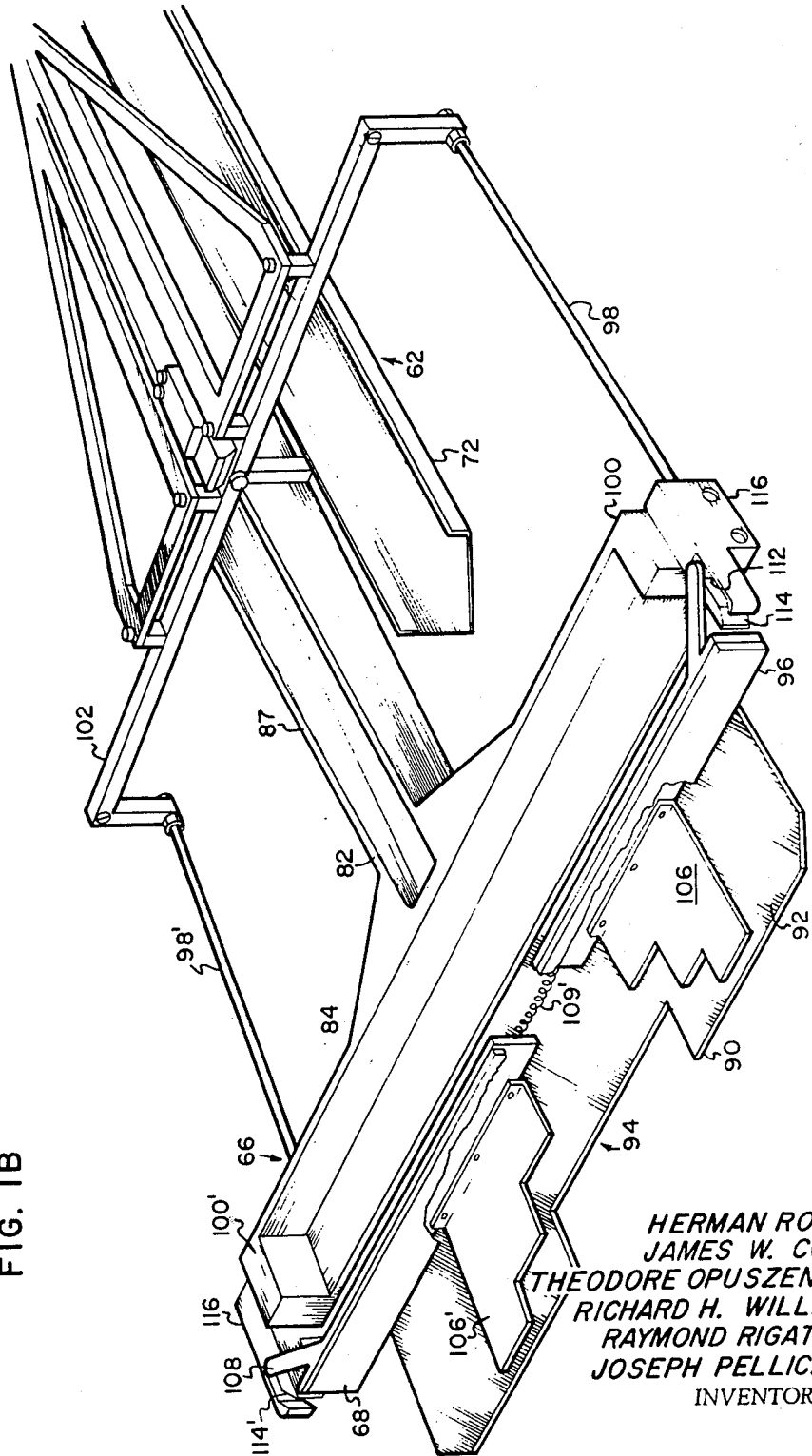
FIG. 1A



HERMAN ROVIN
JAMES W. COBB
THEODORE OPUSZENSKI
RICHARD H. WILLARD
RAYMOND RIGAT, JR.
JOSEPH PELLICANO
INVENTORS.

BY *Robertson, Bryan,
Parmelee & Johnson.*
ATTORNEYS

FIG. 1B



HERMAN ROVIN
JAMES W. COBB
THEODORE OPUSZENSKI
RICHARD H. WILLARD
RAYMOND RIGAT, JR.
JOSEPH PELLICANO
INVENTORS

BY *Robertson, Bryson,
Parnell & Johnson.*
ATTORNEYS

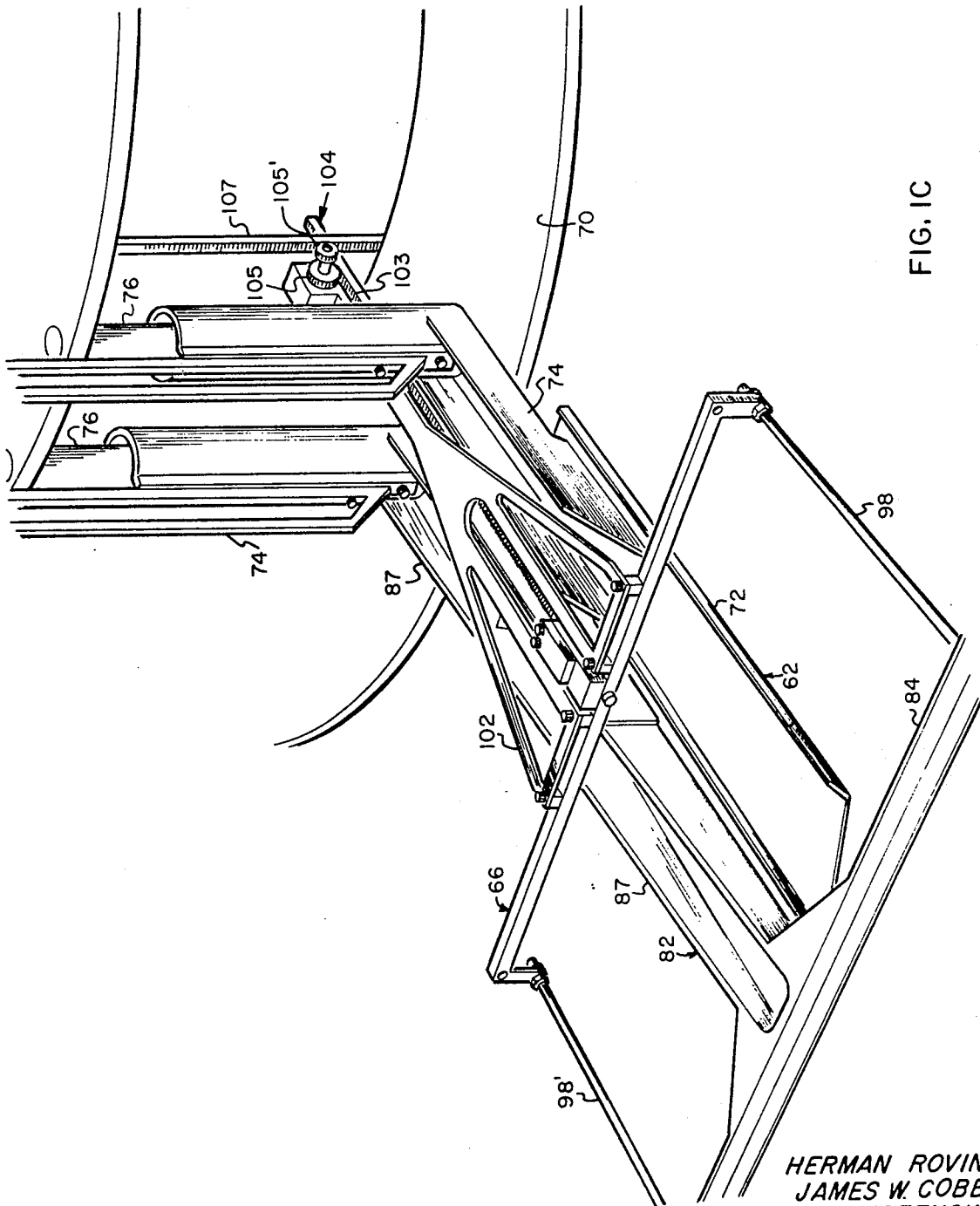


FIG. 1C

HERMAN ROVIN
JAMES W. COBB
THEODORE OPUSZENSKI
RICHARD H. WILLARD
RAYMOND RIGAT, JR.
JOSEPH PELLICANO
INVENTORS

BY
Robertson, Bryan,
Parmelee & Johnson
ATTORNEYS

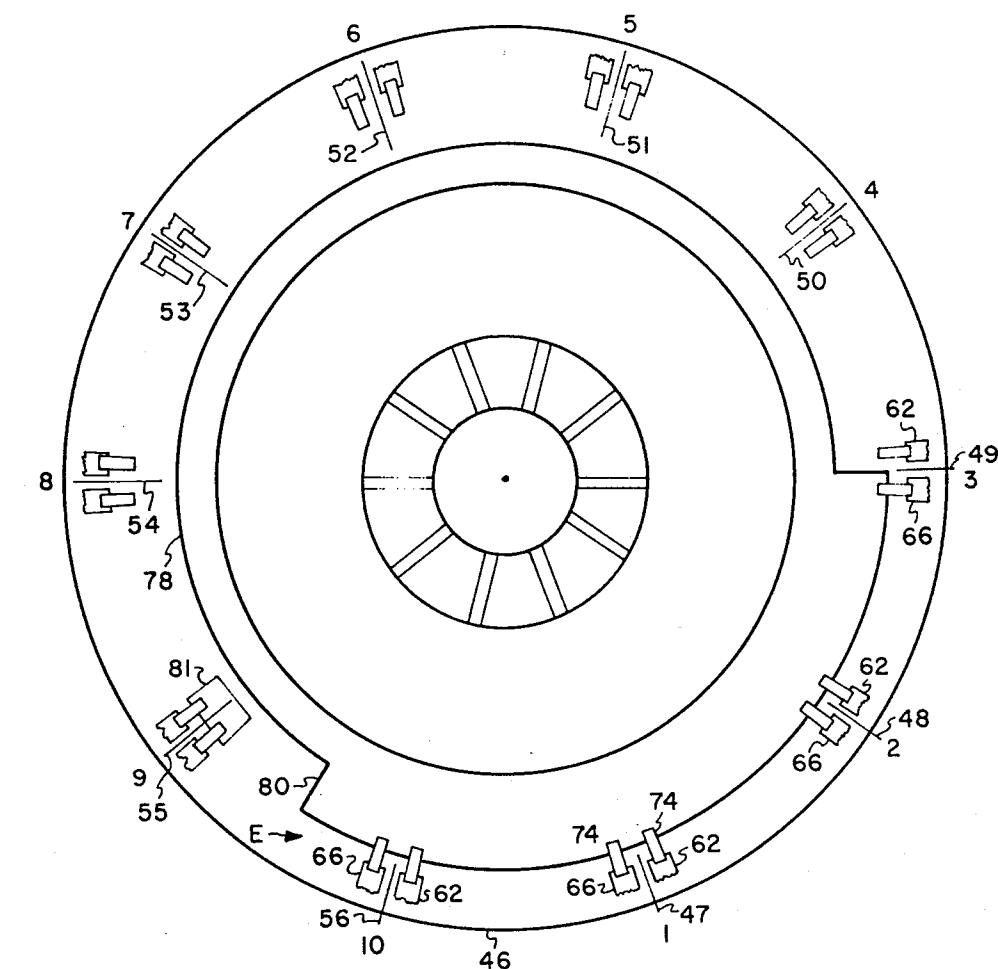


FIG. 1D

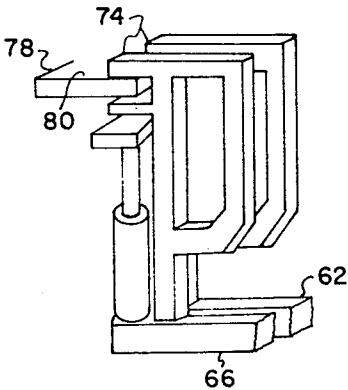
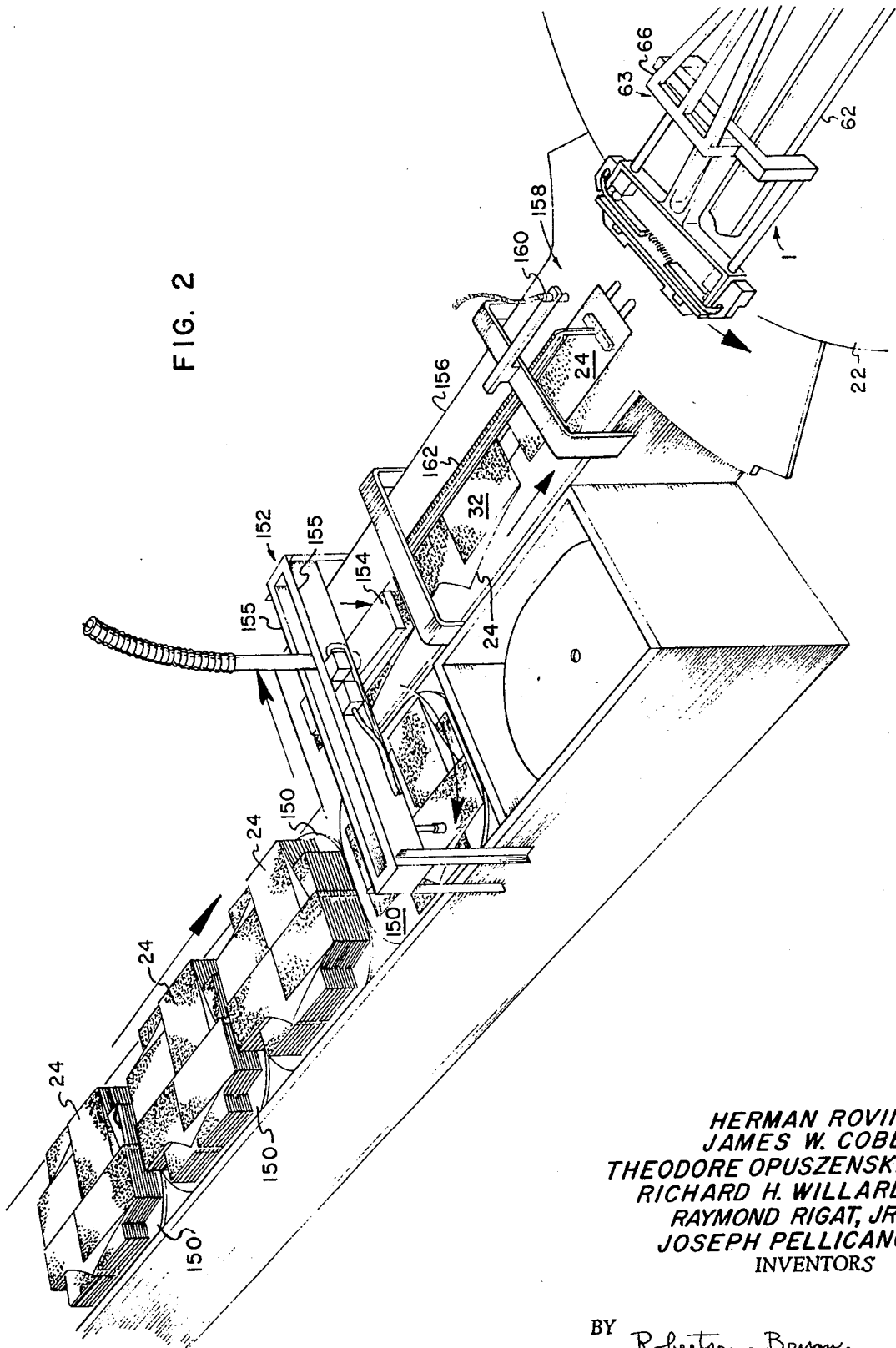


FIG. 1E

HERMAN ROVIN
JAMES W. COBB
THEODORE OPUSZENSKI
RICHARD H. WILLARD
RAYMOND RIGAT, JR.
JOSEPH PELLICANO
INVENTORS

BY Robertson, Bryan,
Parmelee & Johnson
ATTORNEYS

FIG. 2



HERMAN ROVIN
JAMES W. COBB
THEODORE OPUSZENSKI
RICHARD H. WILLARD
RAYMOND RIGAT, JR.
JOSEPH PELLICANO
INVENTORS

BY *Robertson, Bryson,
Parnelle & Johnson.*
ATTORNEYS

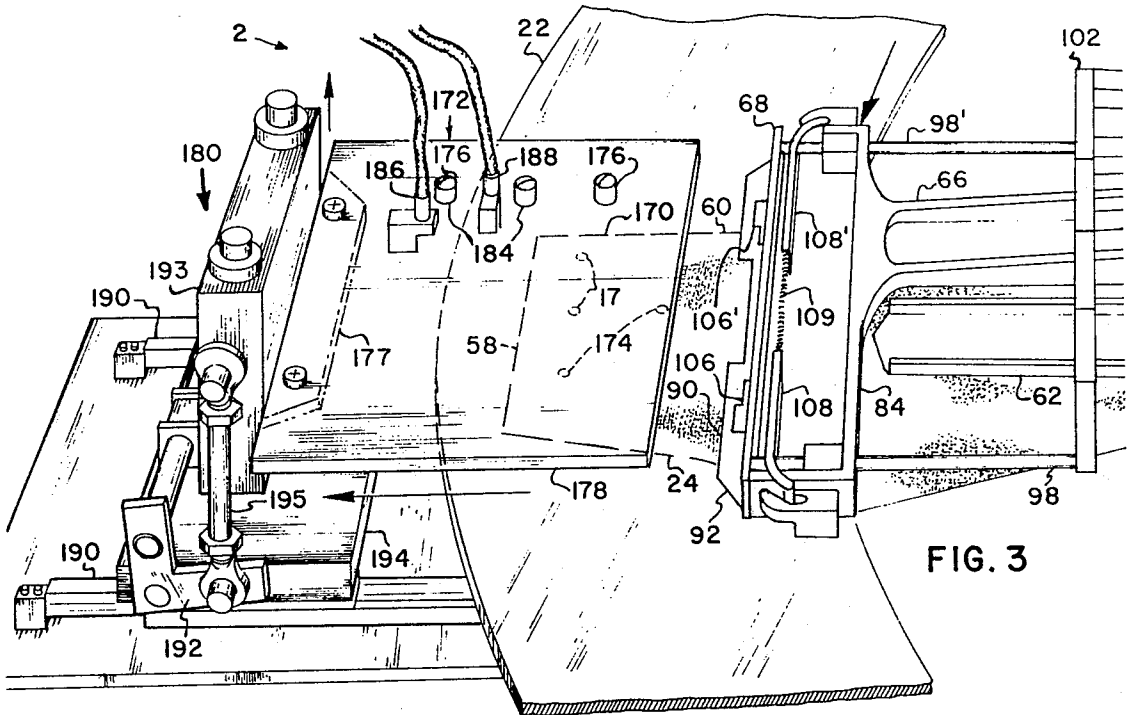


FIG. 3

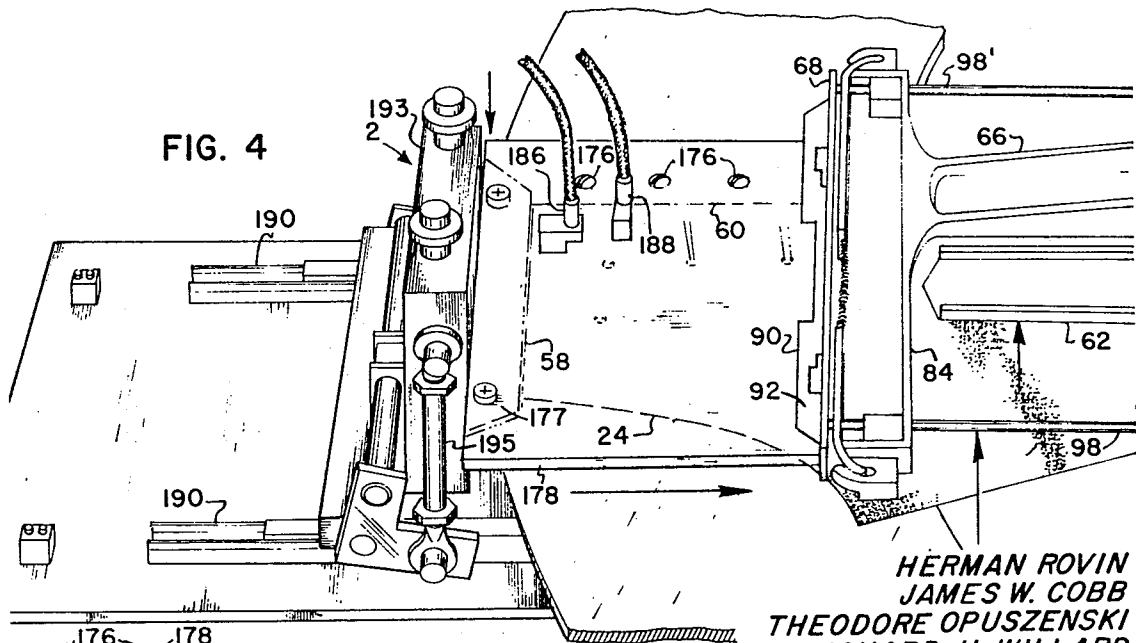


FIG. 4

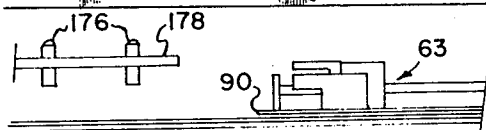


FIG. 4a

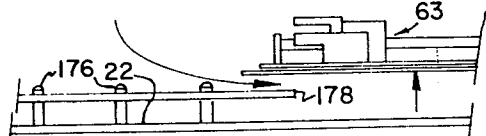


FIG. 4b

HERMAN ROVIN
JAMES W. COBB
THEODORE OPUSZENSKI
RICHARD H. WILLARD
RAYMOND RIGAT, JR.
JOSEPH PELLICANO
INVENTORS

BY Robertson, Bryan,
Parmelee & Johnson
ATTORNEYS

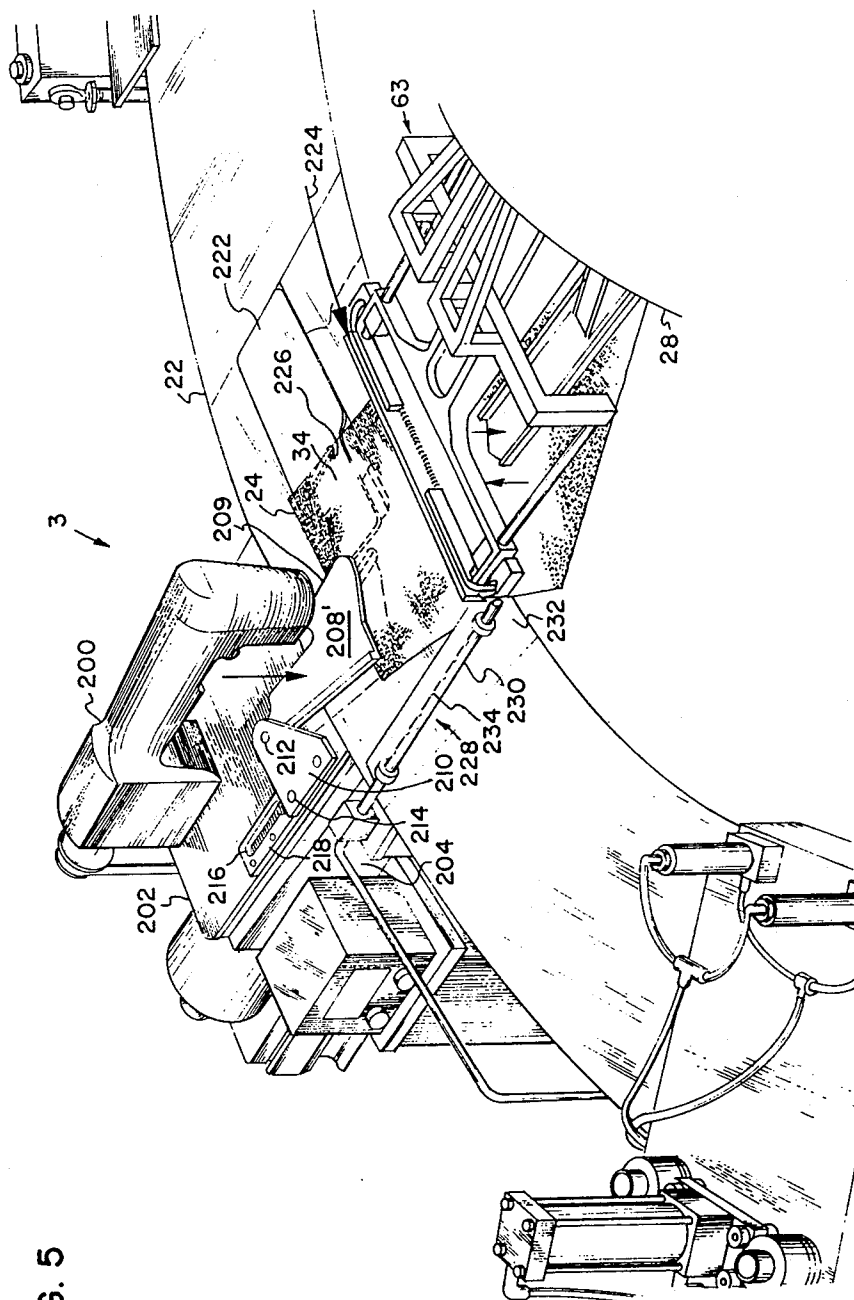
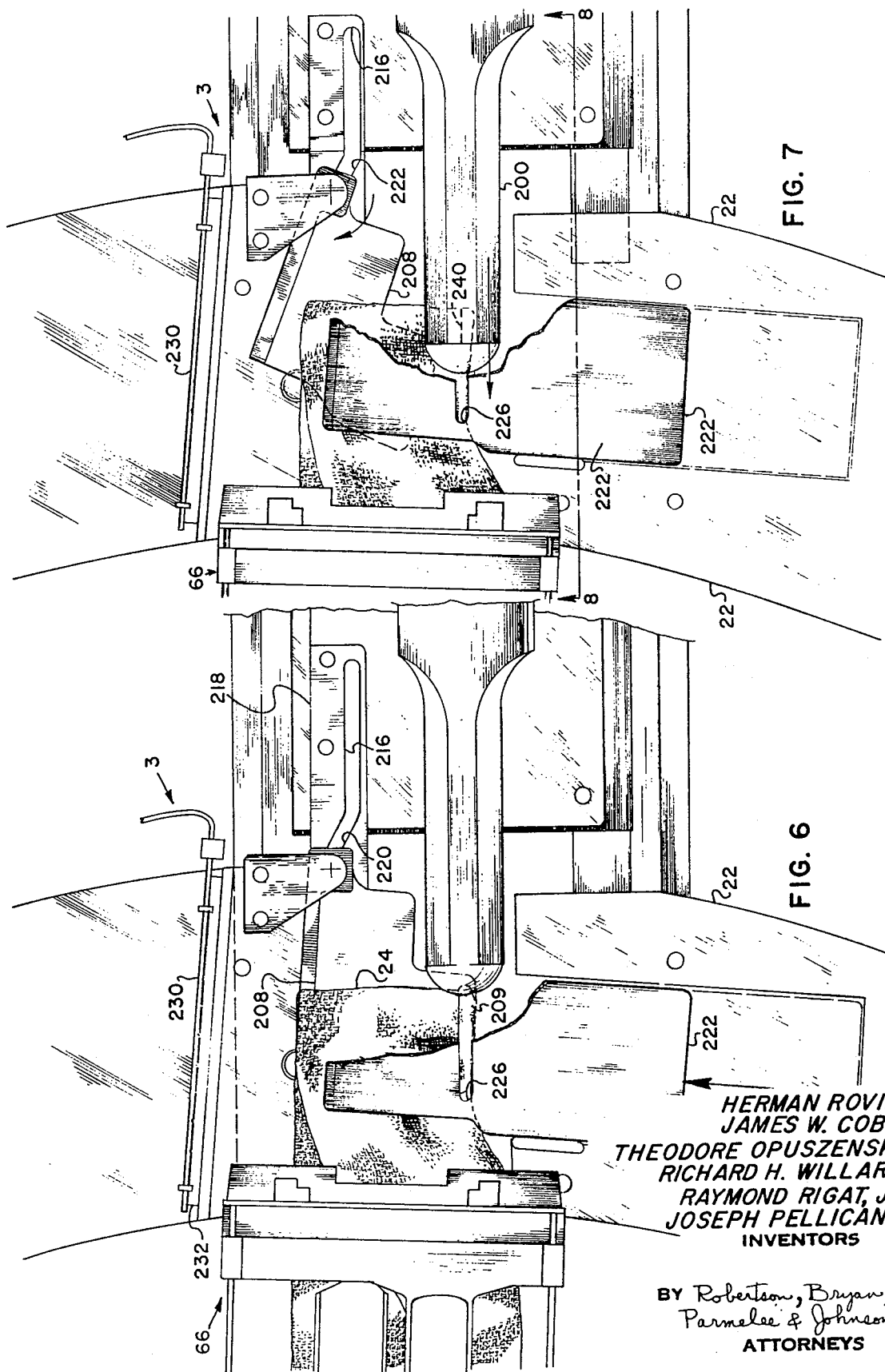


FIG. 5

HERMAN ROVIN
JAMES W. COBB
THEODORE OPUSZENSKI
RICHARD H. WILLARD
RAYMOND RIGAT, JR.
JOSEPH PELLICANO
INVENTORS

BY Robertson, Bryson,
Parmelee & Johnson.
ATTORNEYS



HERMAN ROVIN
JAMES W. COBB
THEODORE OPUSZENSKI
RICHARD H. WILLARD
RAYMOND RIGAT, JR.
JOSEPH PELLICANO
INVENTORS

BY Robertson, Bryan,
Parmelee & Johnson.
ATTORNEYS

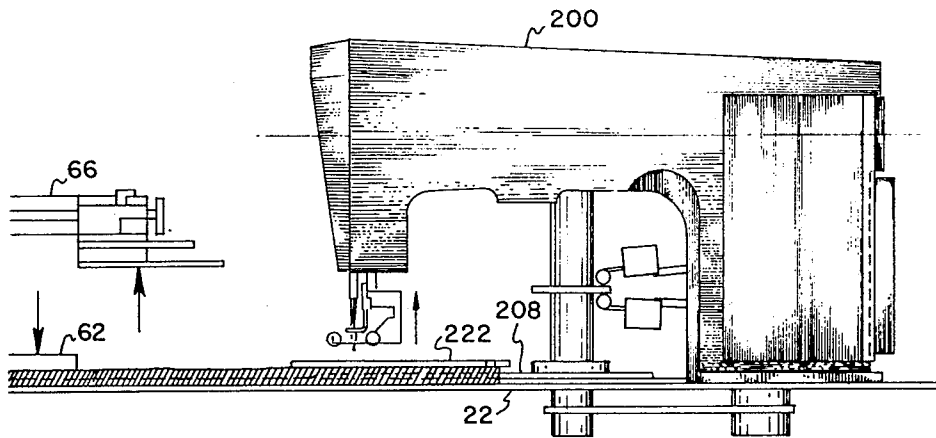


FIG. 8

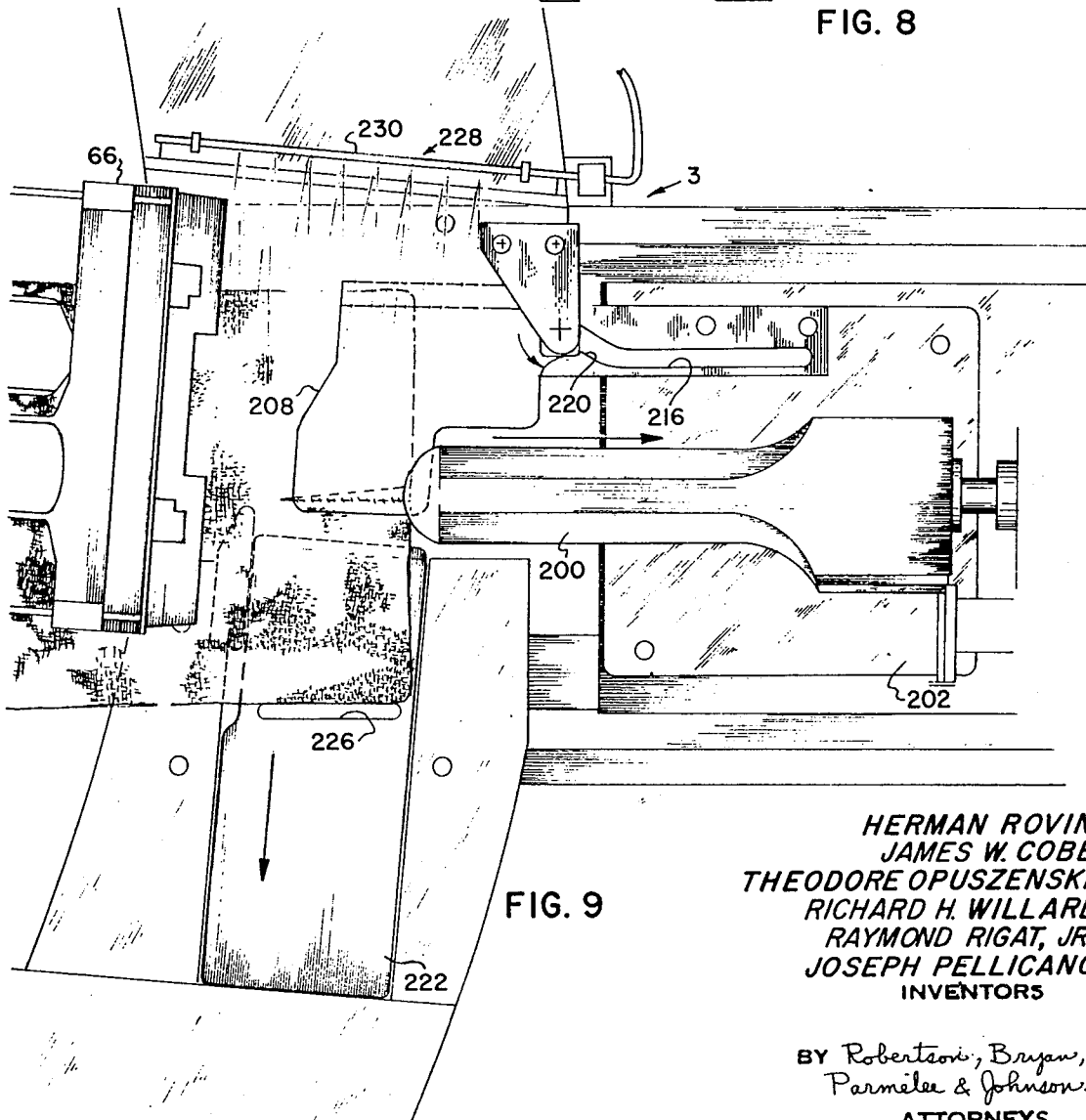
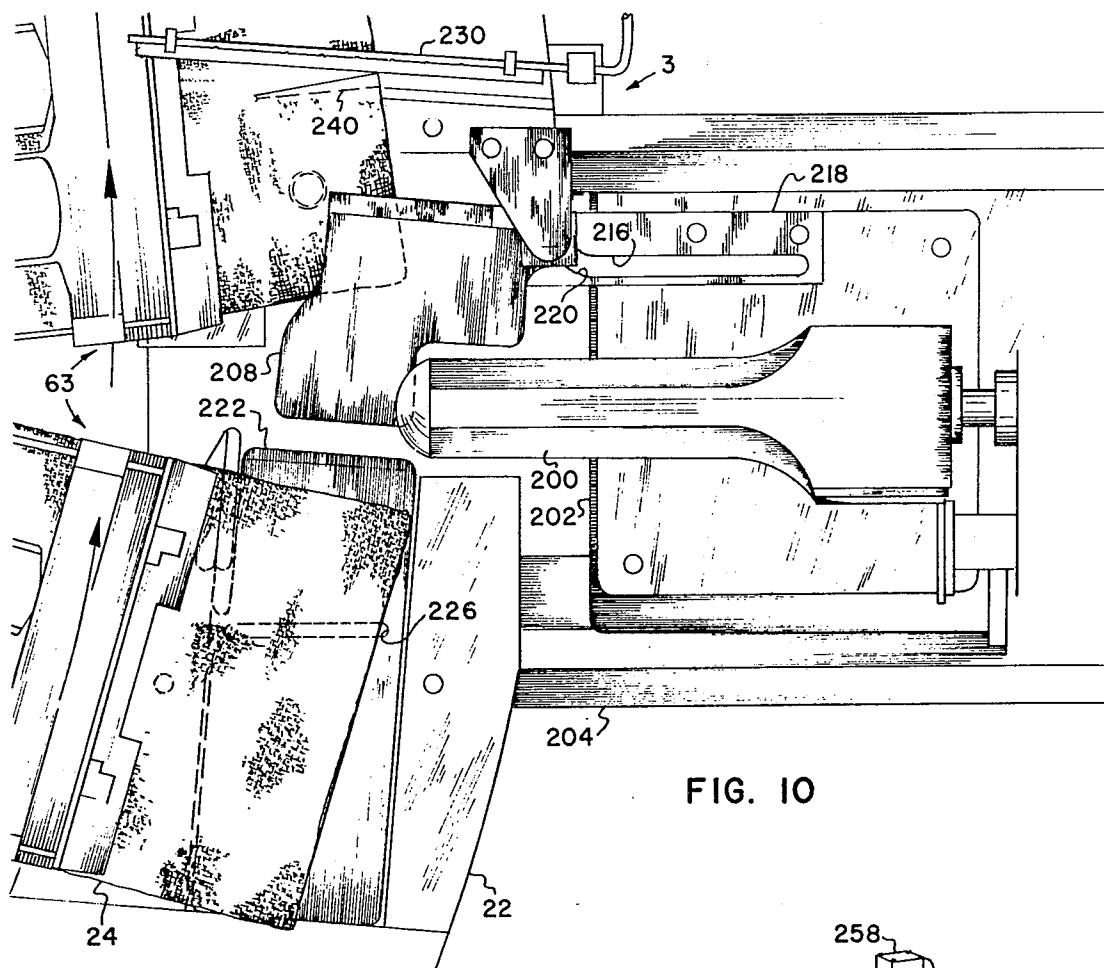


FIG. 9

HERMAN ROVIN
JAMES W. COBB
THEODORE OPUSZENSKI
RICHARD H. WILLARD
RAYMOND RIGAT, JR.
JOSEPH PELLICANO
INVENTORS

BY *Robertson, Bryan,
Parmelee & Johnson.*
ATTORNEYS



HERMAN ROVIN
JAMES W. COBB
TODORE OPUSZENSKI
RICHARD H. WILLARD
RAYMOND RIGAT, JR.
JOSEPH PELLICANO
INVENTORS

BY Robertson, Bryan,
Parmelee & Johnson.
ATTORNEYS

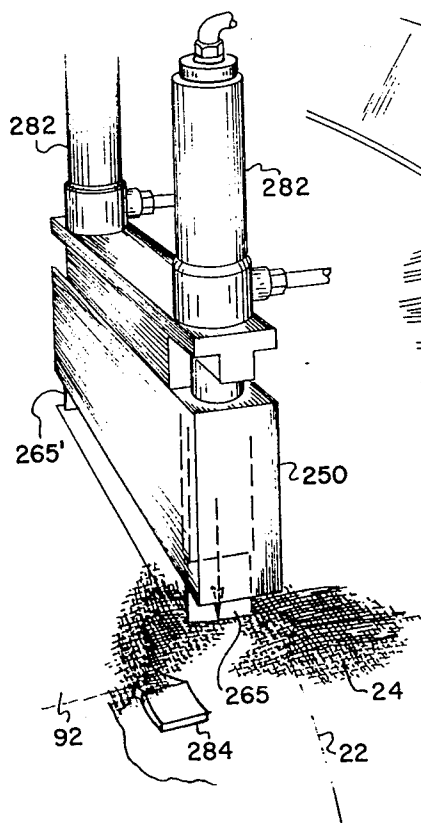


FIG. 13

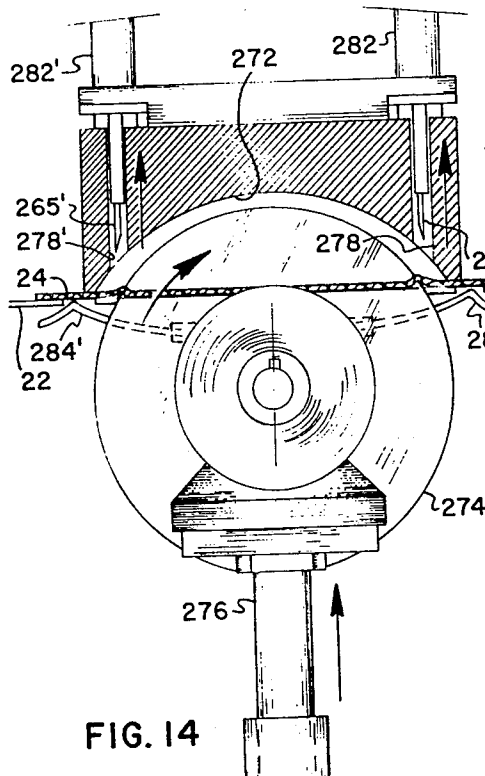


FIG. 14

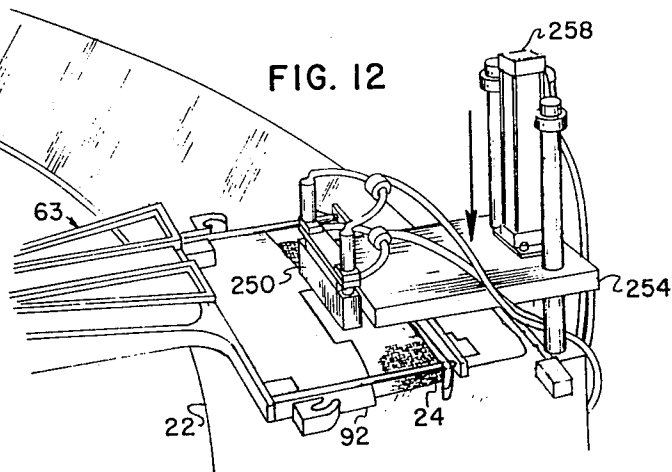


FIG. 12

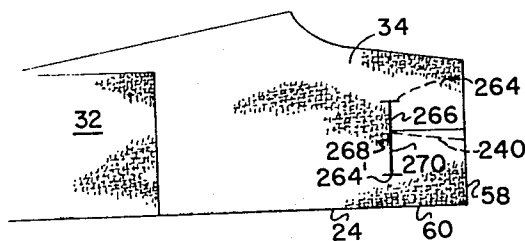


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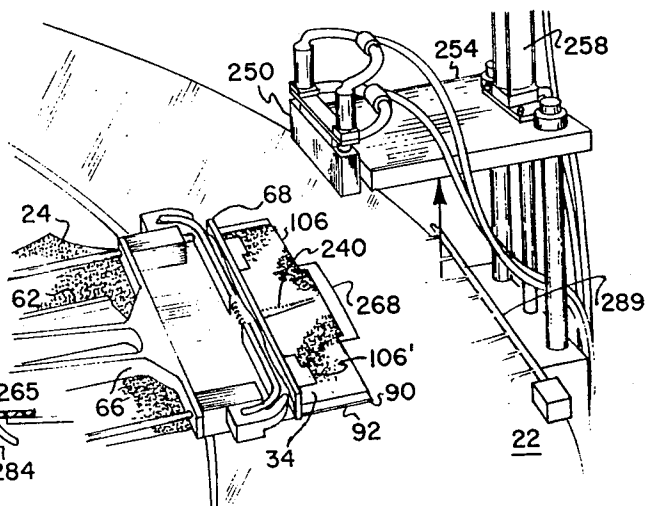
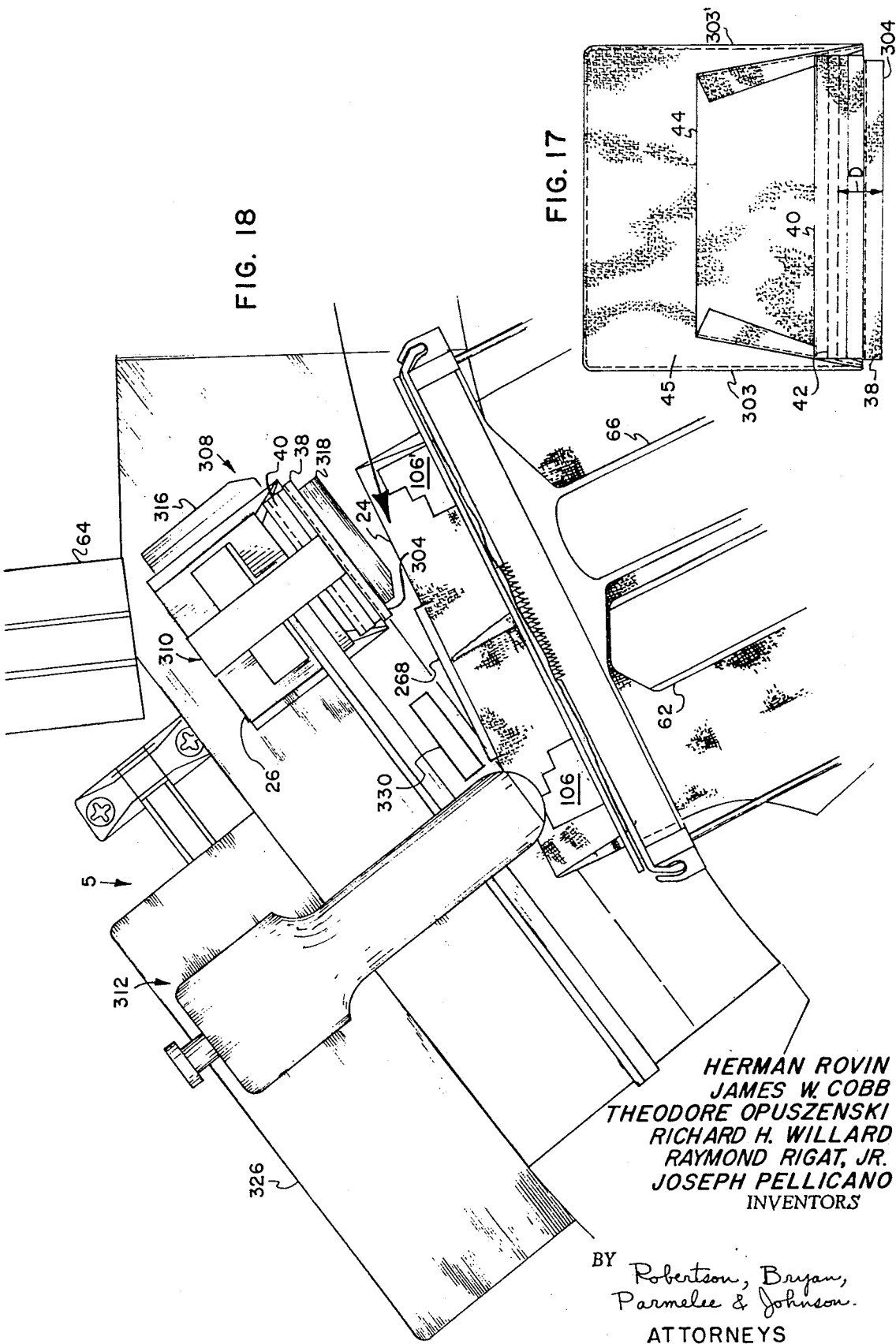


FIG. 16

HERMAN ROVIN
JAMES W. COBB
THEODORE OPUSZENSKI
RICHARD H. WILLARD
RAYMOND RIGAT, JR.
JOSEPH PELLICANO
INVENTORS

BY Robertson, Bryan,
Parmelee & Johnson.
ATTORNEYS



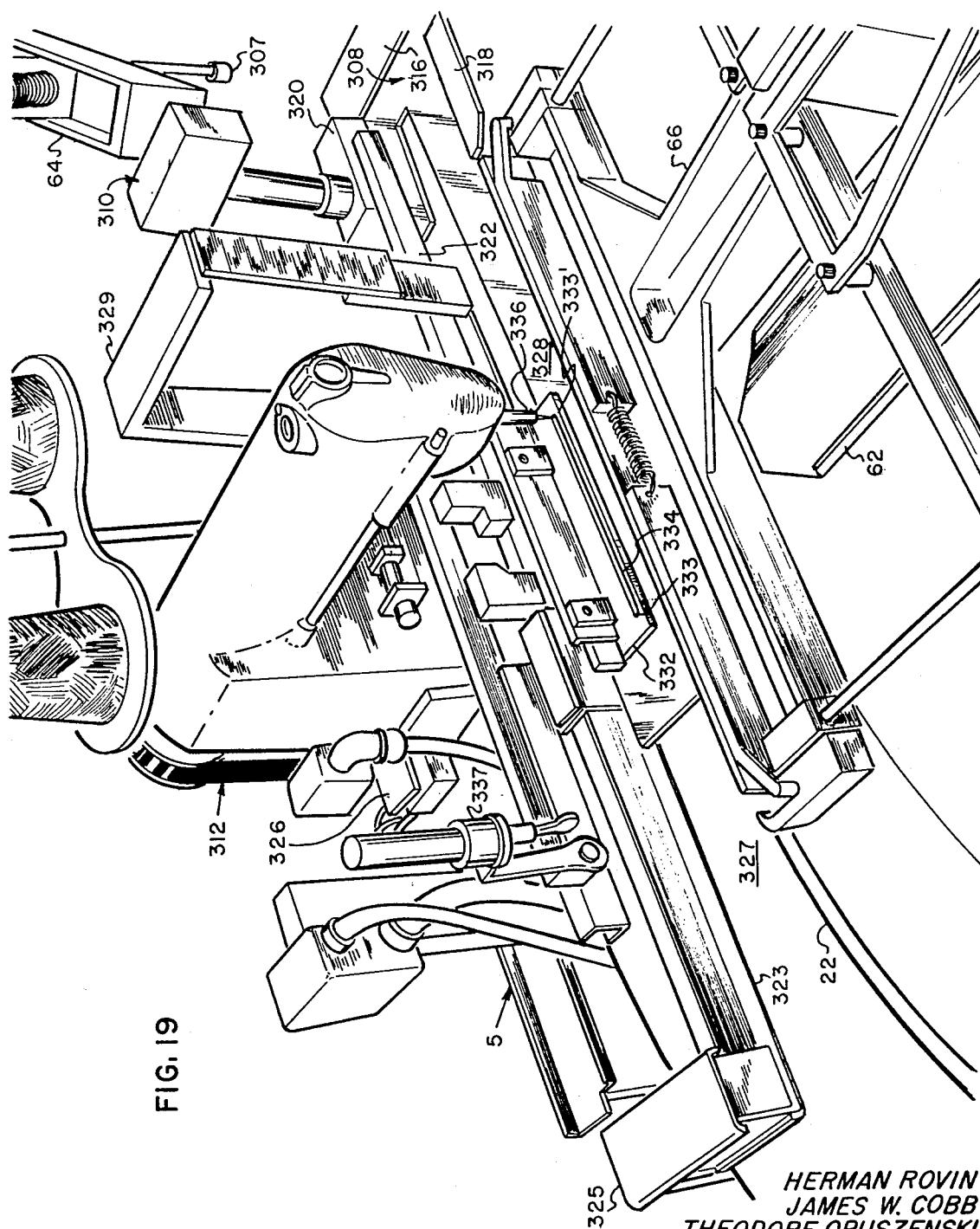


FIG. 19

HERMAN ROVIN
JAMES W. COBB
THEODORE OPUSZENSKI
RICHARD H. WILLARD
RAYMOND RIGAT, JR.
JOSEPH PELLICANO
INVENTORS

BY
Robertson, Bryan,
Parmelee & Johnson.
ATTORNEYS

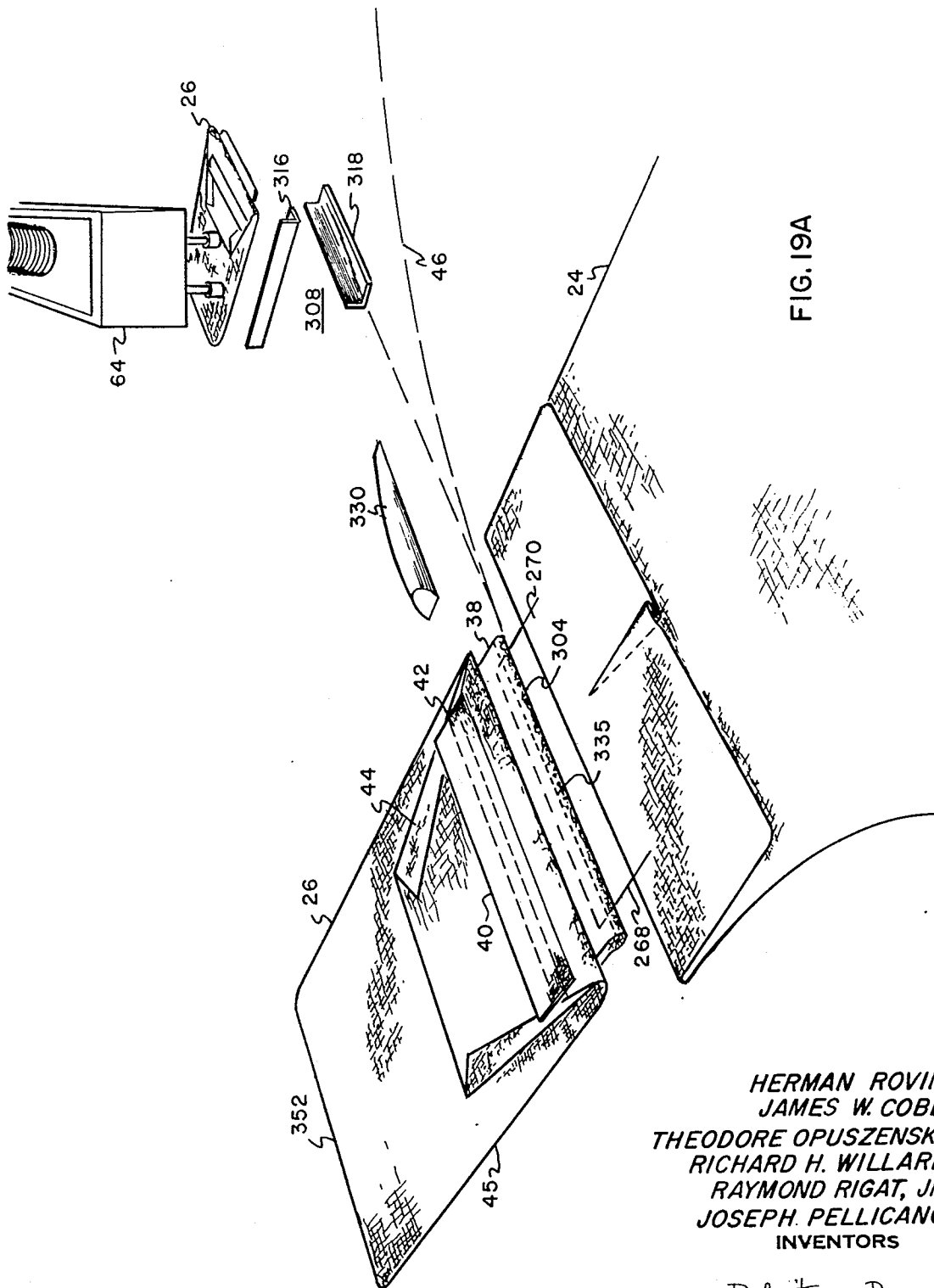
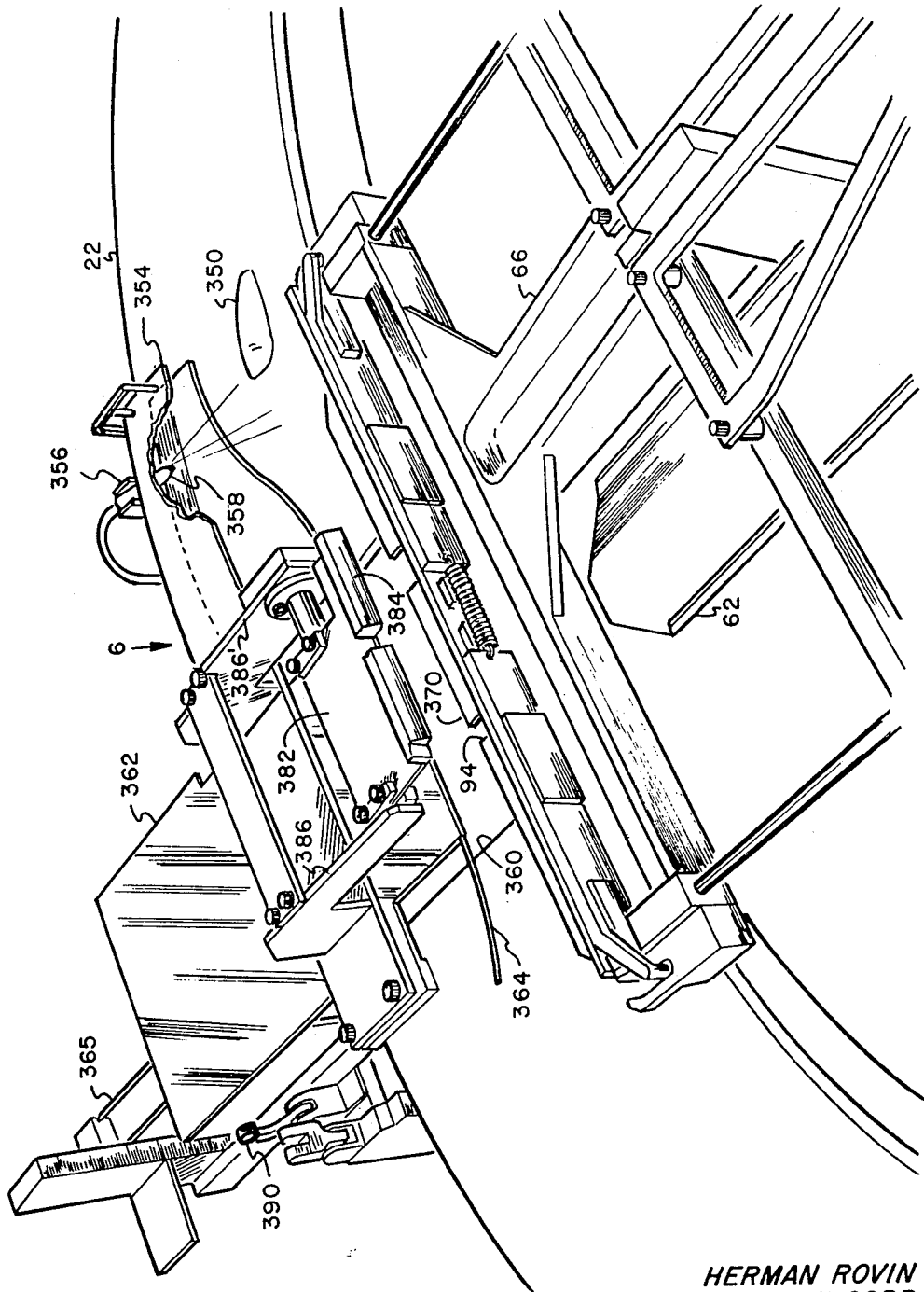


FIG. 19A

HERMAN ROVIN
JAMES W. COBB
THEODORE OPUSZENSKI
RICHARD H. WILLARD
RAYMOND RIGAT, JR.
JOSEPH. PELLICANO
INVENTORS

BY *Robertson, Bryan,
Parmelee & Johnson.*
ATTORNEYS

FIG. 20



HERMAN ROVIN
JAMES W. COBB
THEODORE OPUSZENSKI
RICHARD H. WILLARD
RAYMOND RIGAT, JR.
JOSEPH PELLICANO
INVENTORS

BY *Robertson, Bryan,
Parmelee & Johnson*
ATTORNEYS

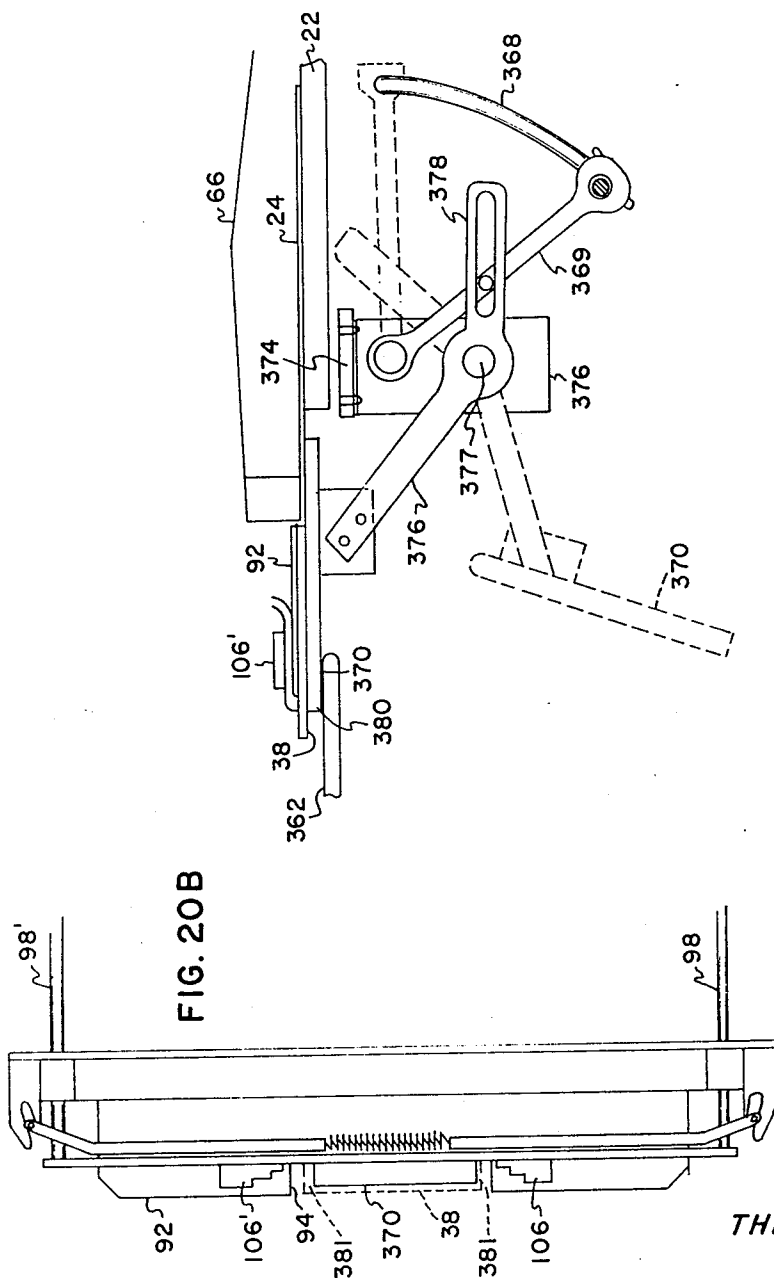


FIG. 20A

FIG. 20B

HERMAN ROVIN
JAMES W. COBB
THEODORE OPUSZENSKI
RICHARD H. WILLARD
RAYMOND RIGAT, JR.
JOSEPH PELLICANO
INVENTORS

BY *Robertson, Bryan,
Parmelee & Johnson.*
ATTORNEYS

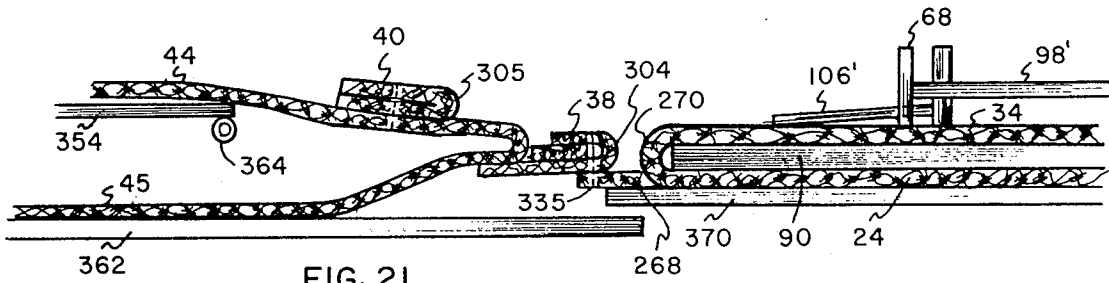


FIG. 21

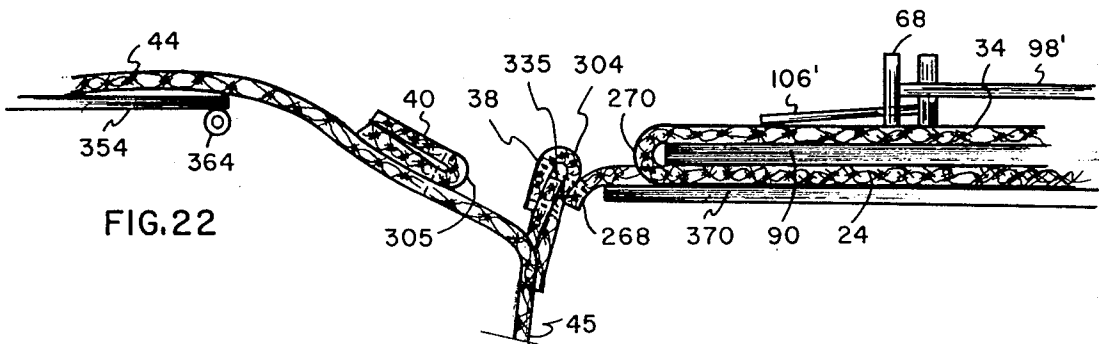


FIG. 22

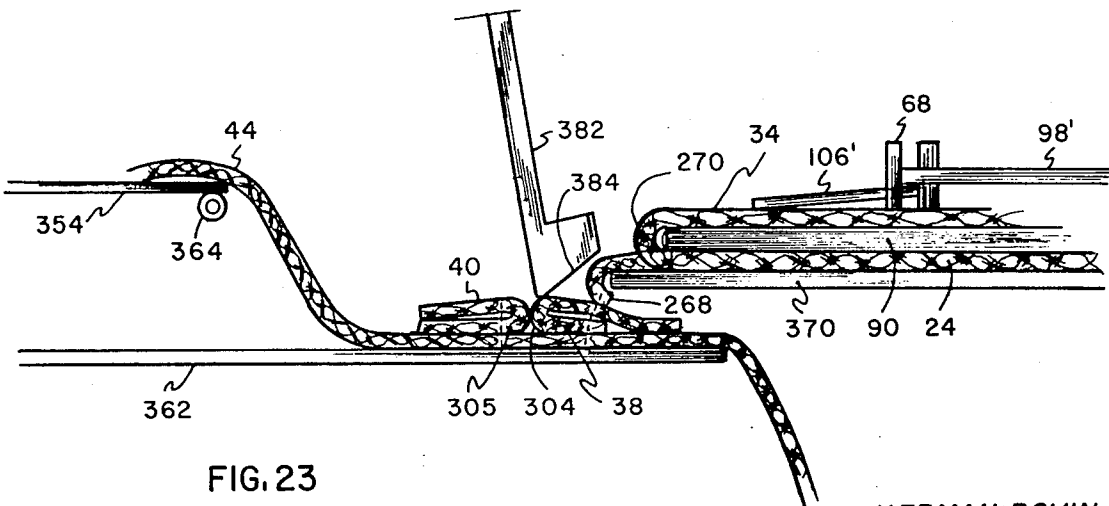


FIG. 23

HERMAN ROVIN
JAMES W. COBB
THEODORE OPUSZENSKI
RICHARD H. WILLARD
RAYMOND RIGAT, JR.
JOSEPH PELLICANO
INVENTORS

BY *Robertson, Bryan,
Parmelee & Johnson.*
ATTORNEYS

FIG. 24

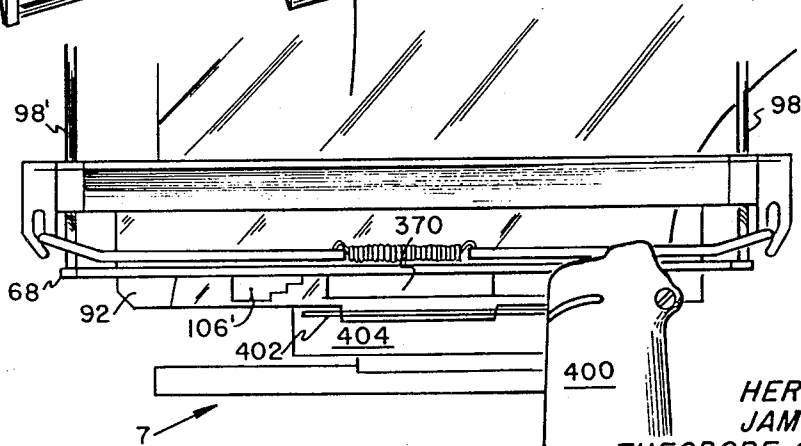
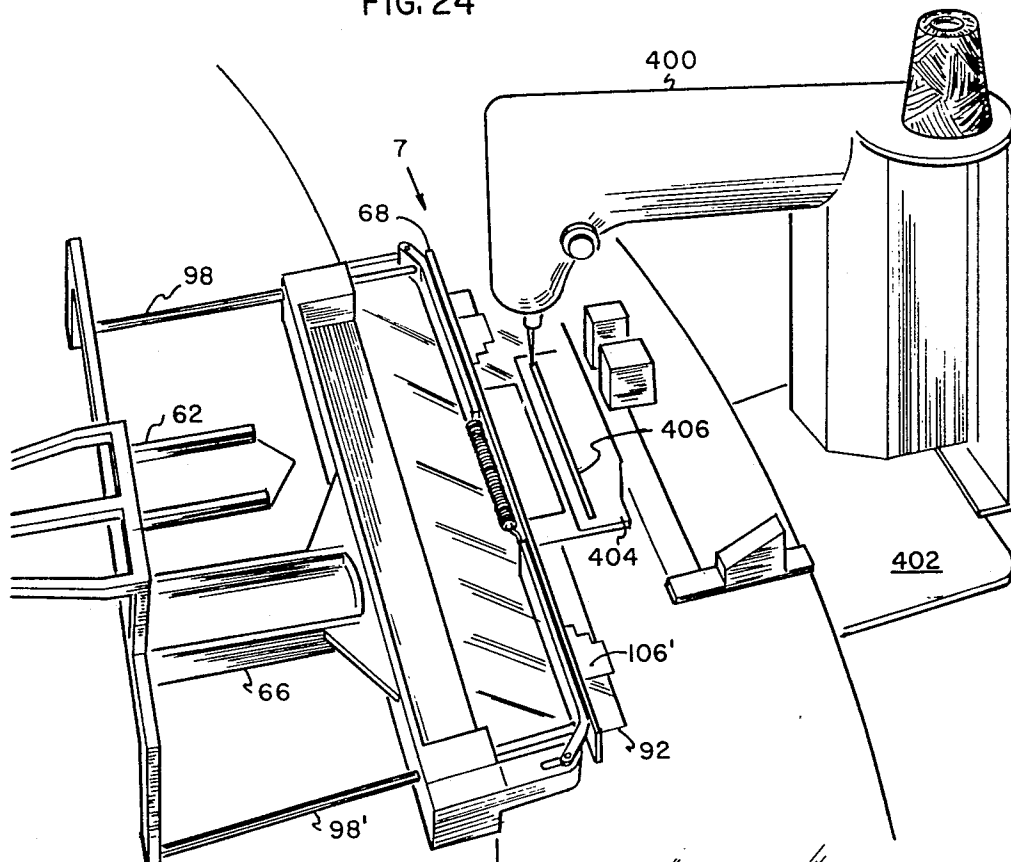
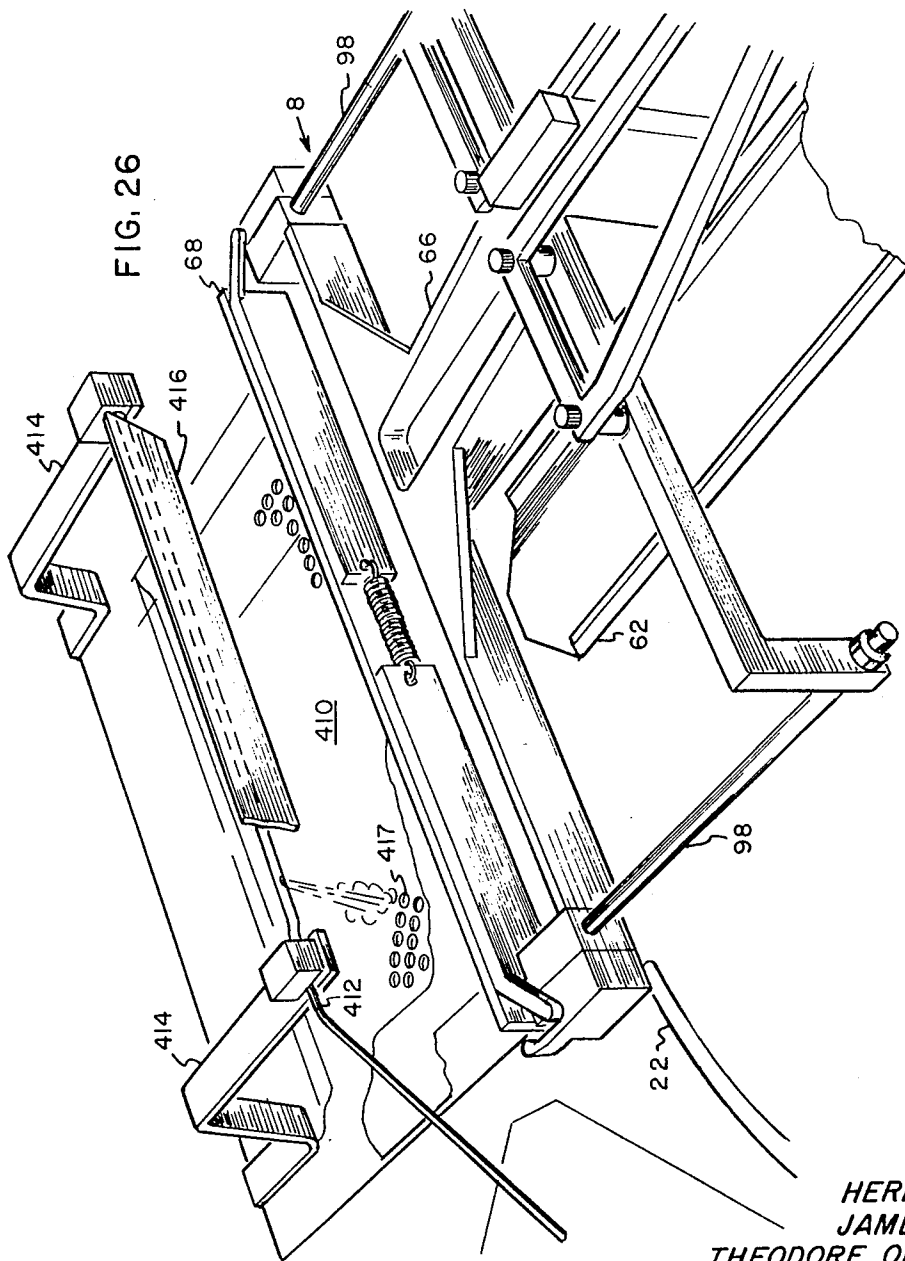


FIG. 25

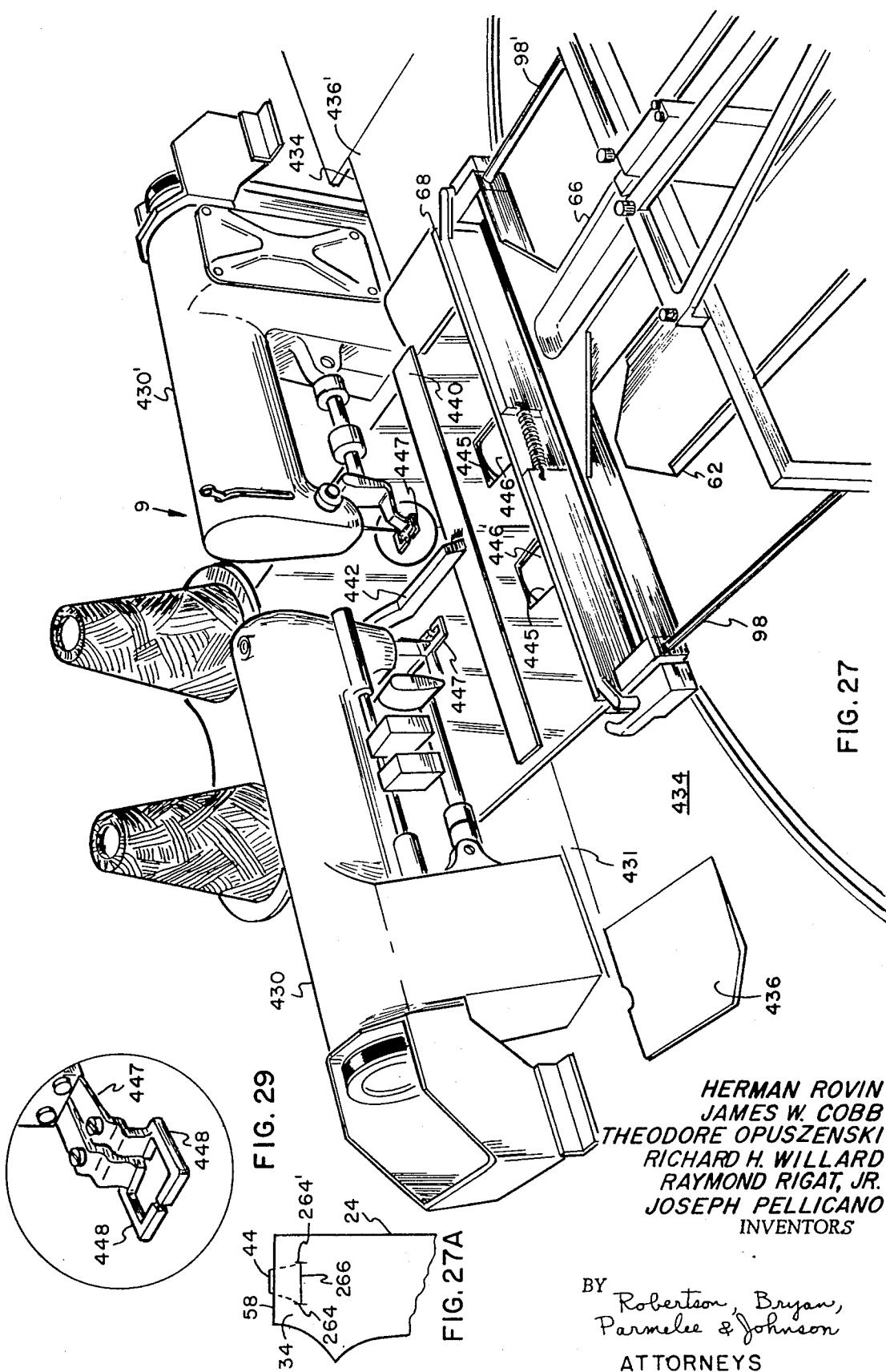
HERMAN ROVIN
JAMES W. COBB
THEODORE OPUSZENSKI
RICHARD H. WILLARD
RAYMOND RIGAT, JR.
JOSEPH PELLICANO
INVENTORS

BY *Robertson, Bryan,
Parmelee & Johnson*
ATTORNEYS



HERMAN ROVIN
JAMES W. COBB
THEODORE OPUSZENSKI
RICHARD H. WILLARD
RAYMOND RIGAT, JR.
JOSEPH PELLICANO
INVENTORS

BY Robertson, Bryan,
Parnelle & Johnson.
ATTORNEYS



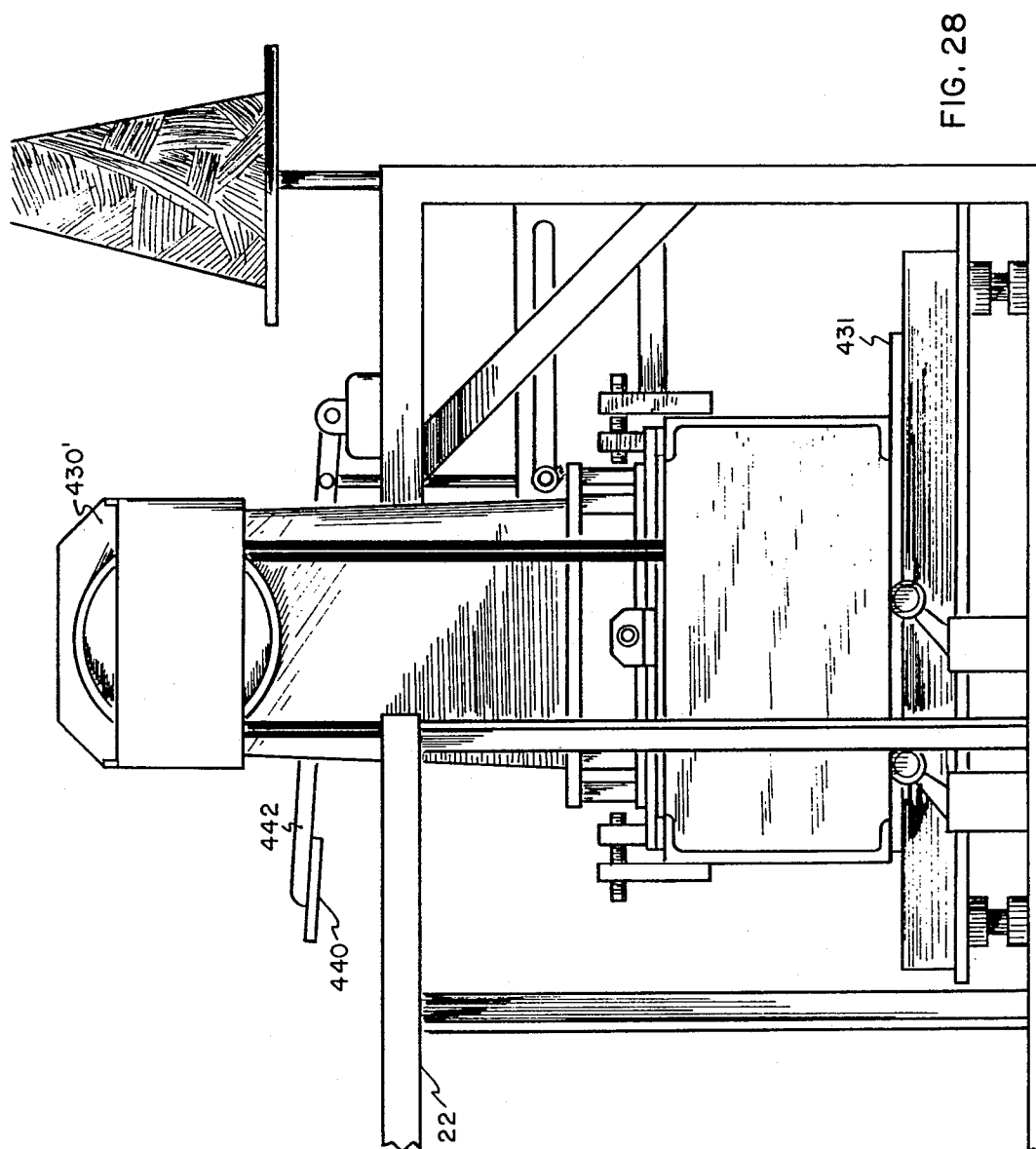


FIG. 28

HERMAN ROVIN
JAMES W. COBB
THEODORE OPUSZENSKI
RICHARD H. WILLARD
RAYMOND RIGAT, JR.
JOSEPH PELLICANO
INVENTORS

BY *Robertson, Bryan
Parnelle & Johnson*
ATTORNEYS

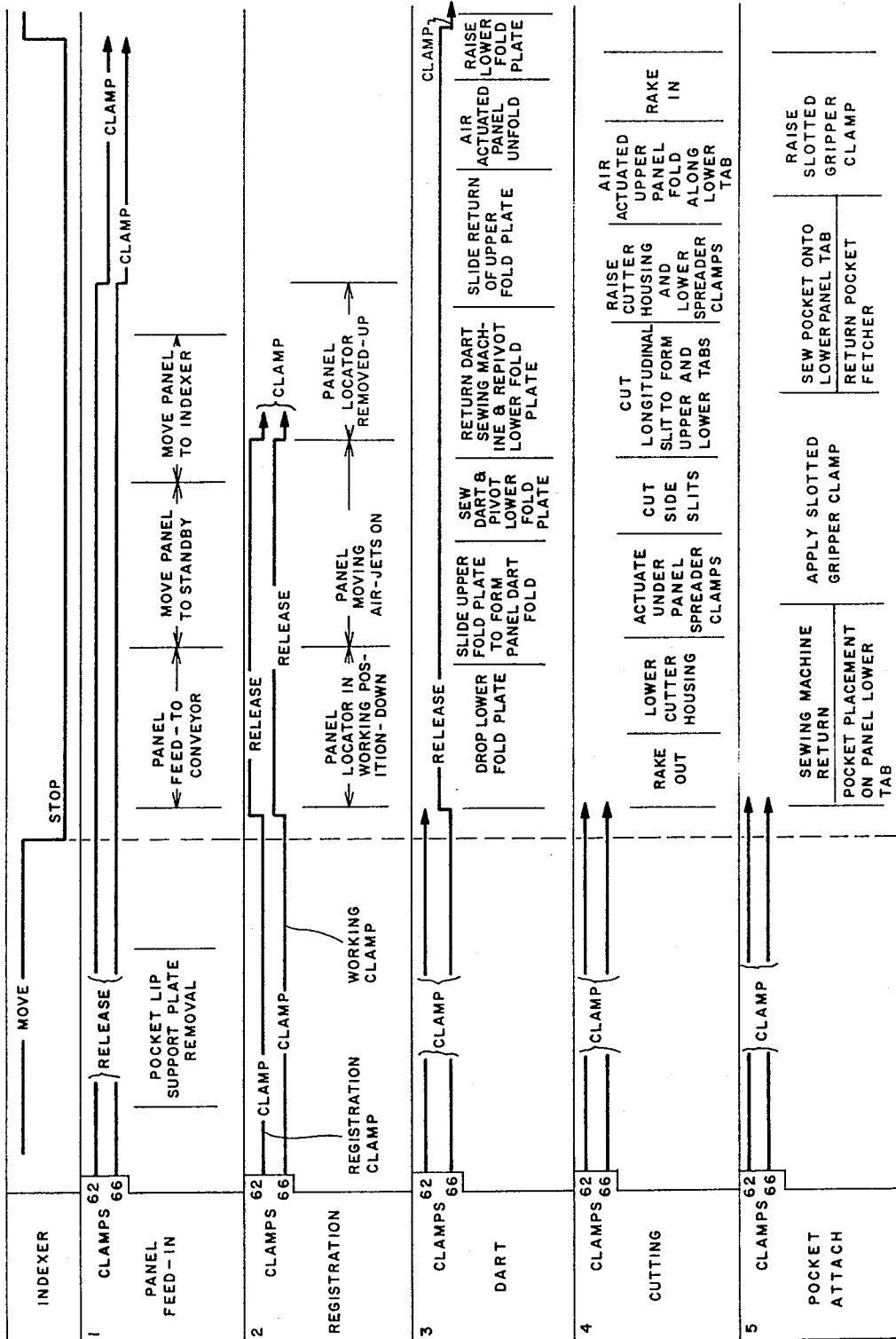


FIG. 31

HERMAN ROVIN
JAMES W. COBB
THEODORE OPUSZENSKI
RICHARD H. WILLARD
RAYMOND RIGAT, JR.
JOSEPH PELLICANO

INVENTORS

BY *Robertson, Bryan,
Parmelee & Johnson.*
ATTORNEYS

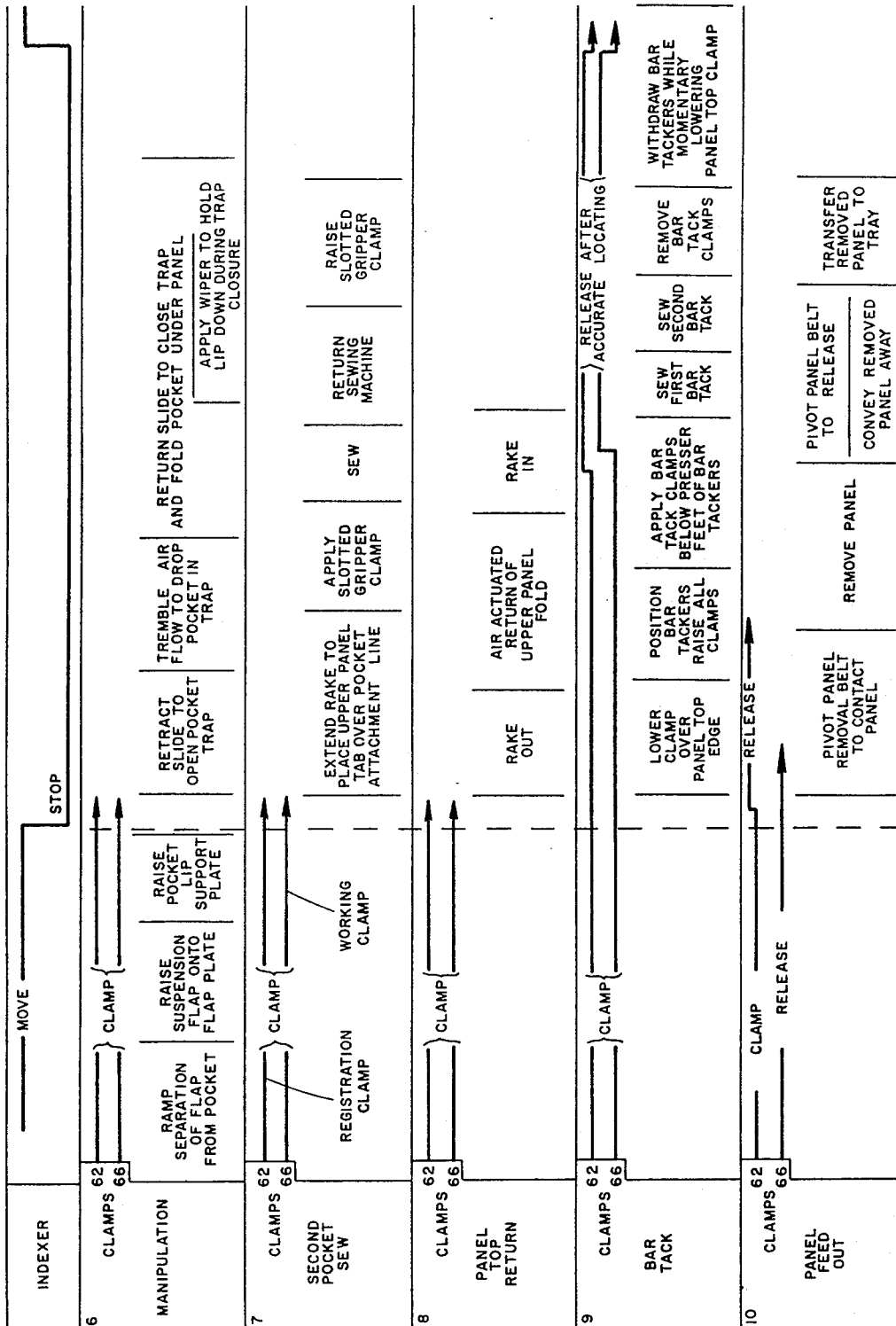


FIG. 32

HERMAN ROVIN
JAMES W. COBB
THEODORE OPUSZENSKI
RICHARD H. WILLARD
RAYMOND RIGAT, JR.
JOSEPH PELLICANO

- INVENTORS

BY *Robertson, Bryan,
Parmelee & Johnson.*
ATTORNEYS'

METHOD AND SYSTEM FOR ATTACHING A POCKET TO A PORTION OF A GARMENT

DESCRIPTION

This invention relates to a method and a system for automatically and accurately attaching a pocket onto a portion of a garment. More specifically, this invention relates to a system and method for attaching a back pocket onto a rear panel for a pair of trousers wherein rear panels and back pockets are simultaneously and continually supplied and brought into precision registration with one another for reliably accurate attachments.

In the fabrication of garments such as trousers several garment portions are preformed prior to their assembly into a pair of trousers. These garment portions are commonly referred to as panels. Four garment panels form a pair of trousers after usually several have been provided with portions such as pockets. One of the rear quarter panels is commonly provided with a back pocket and a dart prior to assembly with the other quarter panels.

A dart is a stitched tapered fold used to shape garments to the curves of the body. A dart in the rear panel for a pair of trousers serves to contour the top or upper panel portion to the contour of the body at the waist, which is usually more narrow than the hip.

The back pocket is usually preformed and composed of a receptacle portion commencing at the pocket opening defined by an outwardly facing lower lip and an upper lip. The upper lip often is merely a predetermined pocket attachment line located as a stitch line on a flap from which the receptacle portion is suspended. The suspension flap is usually sized to extend up to the waist or upper edge of the panel for attachment thereto. The pocket opening is attached around the periphery of a pocket opening slit formed in the rear panel. The flap provides the main support for the pocket receptacle portion in order to preserve a neat appearance of the pocket opening at its attachment lines around the slit in the panel. The flap and receptacle portion of the pocket are often formed of like strong garment material. The area of the flap around the attachment line may then be provided with an attractive weaker facing material. The lower lip may be what is commonly called a welt, i.e. a folded strip of material of a color and pattern selected to appear attractive with the color and pattern of the rear panel. In some pockets a welt is also located along the upper lip to form a double welt pocket. In such latter case the welts are referred to as an upper welt (along the upper lip attachment line) and a lower welt (along the lower pocket lip).

One may appreciate that in the attachment of a pocket to a portion of a garment the formation of the slit, the dart when a rear panel is involved, and the sewing of the pocket around the panel slit involves numerous manual manipulations of the garment portions. These manipulations become quite tedious when a large number of assemblies of garment portions and pockets are to be made. Furthermore, the precision of the assembly as well as appearances tend to deteriorate with highly repetitive manual operations.

An advantage of the invention resides in the automatic attachment of pockets to portions of a garment. The formation of the slit and the sewing of the back pocket around the slit are performed automatically with repeatable accuracy to yield a highly consistent assembly of a pocket to a garment portion.

In an illustrative embodiment of the invention a plurality of garment working stations are arranged about a platform with predetermined registration relative to an indexer used to transport garment portions between stations. At a garment working station effective during an early step in the assembly of a pocket to a garment portion, the latter is automatically and accurately aligned relative to the indexer and in effect also with the other garment working stations so that the indexer may accurately index the garment portion in operative relationship with the garment working stations. Following the alignment of each garment portion a clamp is applied to hold

the aligned garment portion and preserve its registration throughout working operations at several garment working stations and during indexing thereto by the indexer. At an intermediate garment working station, pockets are automatically deposited on the platform and accurately aligned with preselected registration with a garment portion indexed to the intermediate station. The pocket is then brought into attaching relationship with the garment portion and fastened thereto. Further pocket to garment portion attachment steps are carried out following automatic preparatory manipulation of the pocket and garment portion at selected garment working stations.

A significant feature of the method and system of the pocket setting apparatus in accordance with the invention resides in that once the garment portion has been automatically aligned it is firmly held to preserve its now known orientation relative to the various garment working stations and devices. The garment portion is not released until this information is no longer needed.

Other advantages and objects of the invention may be understood from a description of an illustrative embodiment in conjunction with the drawings wherein:

FIG. 1 is a perspective view of a pocket setting system employing precision aligned garment working devices for automatically assembling a back pocket to a rear panel for a garment and an indexer for accurately sliding rear panels with successive index motions to index locations at garment working stations where the garment working devices are located;

FIG. 1A is a perspective view of an assembled rear panel and a back pocket with a dart sewn in the panel;

FIG. 1B is a perspective view of a typical clamping device employed to preserve panel alignment and aid in the manipulation of a panel in preparation for and during attachment to a back pocket at the several garment working stations;

FIG. 1C is a perspective view of a typical clamping device as it is connected to a central control mechanism;

FIG. 1D is a top plan view of a cam employed to control the operation of a clamping device and the cam's operative position relative to the garment working stations;

FIG. 1E is a perspective view of the operative coupling between the cam of FIG. 1D and one of the clamping devices employed and illustrated in FIG. 1C;

FIG. 2 is a perspective view of a panel feed-in mechanism employed to supply panels onto the platform and the system of FIG. 1;

FIGS. 3 and 4, are perspective views of a panel registration mechanism and illustrate respectively the operational positions during alignment of a panel;

FIGS. 4A and 4B are side elevation views of the registration mechanism just prior to actuation and during operation respectively;

FIGS. 5 through 10 are several views of the dart forming station illustrating the apparatus and method steps involved in the formation of a dart on a rear panel;

FIG. 5 is a perspective view of a dart forming station illustrating its position relative to the registration and cutting stations and shows a panel in its operative dart forming position at a time just after being indexed from the registration station;

FIG. 6 is a top plan view of the dart forming station illustrating the relative positions of the dart station elements employed during an initial longitudinal panel folding step prior to sewing of a dart;

FIG. 7 is a plan view similar to that shown in FIG. 5 but with the dart station elements shown in an intermediate position during sewing of the dart;

FIG. 8 is a sectional view of the dart forming apparatus during dart formation as illustrated in FIG. 7 and along the line 8—8 in FIG. 7;

FIG. 9 is a plan view of the dart forming station illustrating the position of its elements just after completion of sewing of the dart and the withdrawal of the sewing element and during the unfolding of a longitudinal panel fold;

FIG. 10 is a plan view of the dart station illustrating the position of its elements during the indexing of a dart provided panel to a cutting station and with the lower fold plate of the dart station shown in a revolved position with another panel simultaneously being indexed from the registration station for dart formation;

FIGS. 11 through 16 are various views of the cutting station illustrating the apparatus and method steps involved in the formation of a panel pocket opening slit to accommodate the pocket opening;

FIG. 11 is a perspective view of the cutting station illustrating the position of its elements just after a dart provided panel is indexed to its operative cutting position;

FIG. 12 is a perspective view of the cutting station showing its elements in panel-clamped position prior to cutting;

FIG. 13 is an enlarged perspective view of the cutter housing and a side cutting element employed in the formation of the slit in the rear panel and side clamping means employed below the rear panel;

FIG. 14 is a sectional view of the cutter housing showing side and longitudinal cutting elements employed to form the slit;

FIG. 15 is a partial top plan view of a panel provided with a slit composed of side located slits and a longitudinal slit to define upper and lower panel tabs for attachment to a back pocket;

FIG. 16 is a perspective view of the cutting station illustrating the position of its elements after cutting and during panel manipulation to fold an upper panel portion above the lower tab radially inwardly over a working clamp;

FIG. 17 is a top plan view of a preformed and prefolded back pocket as it is deposited on the platform prior to attachment to a rear panel;

FIGS. 18, 19 and 19A are several views of the pocket attachment station;

FIG. 18 is a top plan view of the pocket attachment station showing a rear panel being indexed thereto;

FIG. 19 is a perspective view of the pocket attachment station showing the elements of the pocket attachment station in a position just prior to commencing operation, but with the panel deleted for clarity;

FIG. 19A is a perspective view of only the garment portions involved at the pocket attachment station illustrating the deposit of a new back pocket on the platform prior to panel to pocket attachment but after a back pocket has been placed over a lower panel tab;

FIGS. 20 through 23 are several views of a manipulation station used to manipulate a back pocket and a rear panel to isolate the upper lip located on the pocket suspension flap for attachment to the upper panel tab;

FIG. 20 is a perspective view of the manipulation station illustrating its elements and the separation of the back pocket suspension flap from the receptacle portion of the back pocket;

FIG. 20A is a side view of a pocket lip support plate as it is used at manipulation station 6 and is shown with the station elements in a position right after indexing;

FIG. 20B is a partial top plan view of manipulation station 6 without a panel and back pocket to illustrate station element positions right after indexing;

FIG. 21 is a section view of the manipulation station taken along the line 21-21 in FIG. 22 showing the relationship of its elements immediately following the indexing of a panel and pocket from the pocket attachment station;

FIG. 22 is a like section view of the manipulation station as in FIG. 21 showing the relationship of the station elements when the receptacle portion has dropped into a trap;

FIG. 23 is a like section view of the manipulation station as in FIG. 21 showing the relation of the station elements as the trap is about to be closed and a wiper is applied to hold the pocket lower lip;

FIGS. 24 and 25 are several views of a second pocket and panel sewing station used to sew the pocket upper lip at the attachment line to the upper panel tab;

FIG. 24 is a perspective view of the second sewing station illustrating its elements in a position just prior to sewing;

FIG. 25 is a top plan view of the second sewing station illustrating the position of the station elements as indicated in FIG. 24;

FIG. 26 is a perspective view facing radially outwardly of the panel top return station;

FIGS. 27, 28, 29 and 29A are several views of the bar tack station;

FIG. 27 is a perspective view of the bar tack station showing its elements in the return position after completion of the bar tack operation;

FIG. 27A is a partial top plan view of a panel to show locations of the bar tacks;

FIG. 28 is a side view in elevation of the bar tack station showing its elements in operative position but prior to bar tacking;

FIG. 29 is an enlarged perspective view of a presser foot employed at the bar tack station and the clamps used to hold the panel during bar tack operation;

FIG. 30 is a perspective view of the panel feed-out station; and

FIGS. 31 and 32 are operational sequence diagrams indicating the sequence of events at the several garment working stations in relation to panel movements controlled by the indexer.

With reference to the FIG. 1, a system 20 for attaching pockets onto a garment portions such as a panel for a pair of trousers for example is illustrated in perspective. System 20 is composed of a plurality of garment working stations 1 through 10 arranged in a circle about a platform 22 over which rear panels 24 and back pockets 26 are indexed in a counterclockwise direction about a vertical axis 27 by a rotary acting indexer 28.

A panel feed-in mechanism 30 supplies rear panels 24 in an automatic manner with predetermined orientation and preliminary registration to a panel receiving station 1. As shown in FIG. 1, rear panels 24 such as used in fabricating trousers, slacks or the like are supplied with a leg portion 32 folded back over the panel leaving the top 34 of the panel 24 exposed for working by the several stations. Top 34 of the panel is located radially outwardly from axis 27. The folding of leg portion 32 advantageously reduces the radial width of platform 22 thus reducing the size of system 20 and providing excellent positioning accuracy by indexer 28.

Each rear panel 24 is supplied in a precut shape adapted for assembly with other quarter panels to form a pair of trousers. For this reason panel 24 has an outside finished surface 36 to provide an aesthetic appearance and an inside surface 37 where most of the stitch lines are visibly located. Panel 24 is horizontally supplied by feed-in mechanism 30 and is oriented with outside surface 36 of panel 24 facing up and away from platform 22. Thus, top 34 of panel 24 reveals outside panel surface 36 at station 1 and leg portion 32 as folded reveals inside panel surface 37. As will be explained with reference to specific garment panel manipulations at several stations upper portion 34 of the panel 24 will be folded to form "inside" stitch lines at precisely determined locations in an automatic manner.

In order to appreciate the several preparatory garment working operations reference is made to FIG. 1A showing an exploded view of a rear panel 24 to be attached to a back pocket 26. The back pocket 26 illustrated is of the double welt type, i.e. it has a lower welt 38 which is a strip of folded garment material located to form the lower pocket lip and an upper welt 40 located along a predetermined attachment line 42 to form the upper lip (shown as a dashed line). The upper welt 40 determines the upper lip of the pocket opening in the panel when pocket 26 is attached to panel 24. Attachment line 42 is located on a suspension flap 44 which provides strong support for a lower receptacle portion 45. In a finished pair of trousers lower welt 38 and upper welt 40 are accurately aligned with one another about the pocket opening in panel 24 to form a neat, attractive assembly.

The described double welted pocket is indicative of a quality garment. However, single welt pockets may be attached to garment portions such as panels 24 with the system of this invention as will be understood from detailed descriptions of the several garment working stations 1 through 10.

With further reference to FIG. 1, system 20 encompasses ten garment working stations. A first station, the panel receiving stations 1, was previously described. The other stations are briefly mentioned below in the order of the method of assembly of a back pocket to a panel. The stations 1-10 are angularly located about platform 22 with even angular spacings to enable indexer 28 to successively index rear panels 24 to the several stations allowing equal garment working time at each station. The garment working stations are carefully aligned relative to a garment working circular reference line 46 (shown as a dashed line) and garment working radial lines 47 through 56. These reference working lines are predetermined during the installation of the garment working stations and each panel is registered relative to these marking lines at an initial registration station 2. The panel registration at station 2 is obtained by aligning a radially outer precut edge 58 and a circumferential edge 60 of each panel 24 respectively with reference surfaces aligned along circumferential reference working line 46 and radial reference working line 48 respectively.

It should be understood that the radial reference working lines have known angular locations about axis 27 and thus represent an accurate knowledge of the angular position of the panel as it is indexed to the garment working stations. Since the radial and circumferential edges of the panel are aligned at station 2 and the shape of the panel is known, in effect all of the panel working areas, such as its top part 34, are located with precision registration with each of the garment working stations. Once, this panel aligned condition is established it is continuously maintained by holding clamp 62 in operative contact with an aligned panel throughout working operations and indexing motions. Thus as indexer 28 rotationally advances, registration clamp 62 which rests continuously on rear panels 24, successively indexes the panels to the garment working stations. The clamp 62 remains in panel clamping relationship throughout the operations of stations 3 to 9.

The indexer apparatus 28 is composed of a ten panel clamping devices 63 one opposite each garment working station. Each of the clamping devices includes a registration clamp 62 and a garment working clamp 66. These clamping devices 63 are rotationally indexed to slide clamped panels, with or without attached pockets as the case may be, to the successively spaced garment working stations. In this manner the garment working stations may operate simultaneously on different panels.

Following registration, a panel 24 is indexed to a dart forming station 3 where panel 24 is automatically folded, sewn and unfolded. This dart station is particularly applicable for rear panels, but may be dispensed with when other garment positions are provided with a pocket. Next, a pocket receiving slit is formed in panel 24 by indexing the dart formed panel to a cutter station 4 where top 34 of panel 24 is accurately slit to form upper and lower panel tabs to which a pocket 26 may be sewn. The cut panel is then manipulated to expose the lower panel tab for attachment to the lower lip of a back pocket at the next pocket attachment station 5 to which the cut panel is accurately indexed.

The pocket attachment station 5 includes a back pocket feed-in mechanism 64 which automatically feeds back pockets 26 for attachment to indexed panels 24. The fed in back pockets are then automatically transported with predetermined orientation to the exposed lower tab of the panel and the lower lip 38 of the back pocket is placed in sewing relationship with the exposed lower panel tab. The back pocket to panel attachment may be accomplished with other means than sewing, such as by heat bonding or the like.

After assembling the lower panel tab to the lower pocket lip the assembly is indexed to a manipulation station 6 where the

back pocket is readjusted relative to a panel 24 to separate the receptacle pocket part 45 from suspension flap 44. Next, the panel and pocket are indexed to a second sewing station 7 where the panel upper tab is brought in sewing relationship with the upper pocket lip along attachment line 42 on the suspension flap and is sewn thereto.

The now assembled back pocket and panel are next provided with a bar tack operation after being unfolded at a panel top return station 8. The bar tack operation is performed at a bar tack station 9. A bar tack of a pocket opening comprises a pair of stitchings located at the ends of the pocket opening to provided both a high quality strengthening of the pocket opening ends and an attractively appearing assembly.

Following the bar tack operation, the panel and back pocket are indexed to a panel removal station 10 where the assembled panel is removed and stacked for further assembly into a pair of trousers. The now vacated clamping device 63 is indexed to panel receiving station 1 where another rear panel is available to be indexed for attachment to a back pocket.

Before proceeding with a detailed description of the garment working stations, the indexer and its clamping devices 63 as shown in FIGS. 1 through 1E are described. Each clamping device 63 is composed of a pair of clamps, the previously described registration clamp 62 and working clamp 66. The registration clamp 62 primarily serves to preserve registration of the panel after its alignment. The working clamp 66 operates on top 34 of a panel and aids in conjunction with a slidably mounted rake 68 with the folding and manipulation of panels and pockets as will be described.

The several clamping devices 63 are rotatably indexed by use of a main annular frame 70 concentrically located with respect to platform 22. Main frame 70 is rotatably movable with respect to platform 22 and is successively continually indexable in accurate registration with the garment working stations and radial reference working lines 47-56. A motor and timer (not shown) are provided for indexing main frame 70 and determine the working time at the working stations.

Both clamps 62 and 66 are vertically movable relative to the rotatable main frame 70. Each clamp (see FIG. 1B) is provided with a longitudinal weighted flat bottom extending radially outwardly from a clamp frame 74. Each clamp frame 74 is vertically movable along a shaft 76 which in turn is vertically mounted on main frame 70. The vertical motion of clamps 62 and 66 permits a raising and lowering thereof relative to the platform supported panel 24 to respectively release and clamp a panel.

Vertical control of registration clamps 62 and 66 is provided with an annular non-rotating cam 78 (see FIG. 1D) which is coaxial with axis 27 and vertically movably mounted relative to rotating main frame 70. Vertical rise of cam 78 is limited to occur only in between rotary index motions and vertical lifting of the cam 78 is maintained for the time period between index motions. Hence, cam 78 is lowered just prior to the beginning of an index motion to permit clamps 66 and 62 to grip a panel for indexing to the next counterclockwise located garment working station. Following each index motion cam 78 is lifted. Cam 78 is provided with a cam surface 80 located to engage the clamp frames 74 (in the manner shown in FIG. 1E) at garment working stations 9 (after being indexed therefrom), 10, 1 and 2 (for working clamp 66 only). Hence, at all other garment stations except station 9, the clamps 62 and 66 remain operatively and continuously engaged with panels 24. At station 9, as will be described, the clamps 62 and 66 are lifted to permit formation of bar tacks. This lifting motion is obtained with a specially provided pneumatically activated clamp lifter 81. In the event a rocking needle machine is employed to form bar tacks, the clamp lifter 81 may be dispensed with and the clamps 62 and 66 can remain in operative clamping contact with a panel indexed to the bar tack station 9. Each panel maintains its alignment relative to the circumferential and radial reference working lines as it is being worked.

As previously mentioned, each clamping device 63 includes a working clamp 66 located clockwise adjacent a registration clamp 62. The registration clamp 62 is formed of a weighted flat bottomed shoe 72 extending radially outwardly from a clamp frame 74. The working clamp 66 is provided with a T-shaped horizontally disposed flat bottomed frame 82 with the cross bar 84 of the T located radially outwardly from the axis 27 and the radially inner end 86 of the leg 87 of the T vertically extending from a clamp frame 74 slidably mounted to an upright shaft 76. The length of leg 87 is selected so that cross bar 84 is located radially beyond shoe 72 of registration clamp 62.

Working clamp 66 is used to manipulate top 34 of panel 24 by providing a fold edge 90 adjacent platform 22 and along the radially outward extremity of cross bar 84. This edge 90 is formed by a slightly downwardly inclined plate 92 which protrudes radially outwardly from the cross bar 84 to firmly clamp onto a panel top 34. Fold edge 90 is interrupted with a recess 94 having a length commensurate with the desired size of the pocket opening and accommodates a cutter housing and presser feet in a manner as will be explained with reference to garment working stations 4 and 9 respectively. Fold edge 90 is selectively located relative to the circumferential garment working reference line 46 so that the panel top 34 may be folded back over it along a fold line that will protrudingly expose the panel lower tab for attachment to the lower welt 38 of a back pocket 26.

Working clamp 66 as previously mentioned is provided with a rake 68 slidably mounted directly above plate 92. The rake is formed of a longitudinal rake bar 96 oriented parallel with cross bar 84 and connected at ends to horizontal radially oriented slide rods 98—98'. Slide rods 98—98' fit through guideblocks 100—100' mounted on T-frame 82 and connect at the radially inward side of blocks 100—100' to rake frame 102. Rake frame 102 in turn is radially movably mounted on T frame 82 to enable the rake 68 to work a panel as needed at a garment working station. Radial movement or rake 68 is obtained with a rack and pinion mechanism 104 (see FIG. 1C). The rack and pinion mechanism 104 is formed of a horizontally disposed radially inwardly extending rack 103 connected to the rake frame 102 and operatively engaging a pinion 105 coaxially connected to a second pinion 105' which engages a vertical rack 107. Rack 107 is vertically controlled by the indexer 28 and in turn controls the radial position of the rake 68.

Rake bar 96 is located in front of T frame cross bar 84 but is sufficiently vertically spaced above plate 92 to accommodate between the vertical space a pair of rake supported panel clamping feet 106—106'. Clamp feet 106—106 are flat plates which extend in cantilever fashion from the bottom side of a pair of longitudinally aligned slide bars 108—108' slidably located radially inwardly of rake bar 96. Slide bars 108—108' are longitudinally slidably mounted to rake bar 96 between it and T frame cross bar 84 and are urged towards one another with a spring 109.

Clamp feet 106—106' extend over plate 92 with a spacing selected to enable a firm clamping of a garment panel folded back over plate 92 along fold edge 90. The panel clamping feet are notched as shown and spaced from one another along the slide bars and symmetrically located with respect to recess 94 in cross bar plate 92. The slide bars are provided with end located slots 110—110' (only 110 being visible in the view of FIG. 1B) bridged at the slide bar ends with cam follower rods 112—112' (only 112 being visible in the view of FIG. 1B). Cam follower rods 112—112' (only 112 being visible in the view of FIG. 1B) slide onto cam surfaces 114—114 located on suitable blocks 116—116' attached to guide blocks 100—100' respectively. The cam surfaces are so shaped and oriented to cause a separation of the rake slide bars 108—108' and thus also panel clamp feet 106—106' when rake 68 is pulled in towards cross bar 84 by the rack and pinion mechanism 104.

Hence, in the operation of rake 68 its radial extension by operation of the rack and pinion mechanism 104 locates rake

bar 96, slide bars 108—108' and panel clamping feet 106—106' a substantial distance radially outwardly of cross bar 84. The maximum rake extension is determined by slide rods 90—98' and this is selected to place the rake beyond the top radially outer edge 58 of panels 24 thus permitting top portion 34 of the latter to be automatically folded back over plate 92. When the rake is pulled in, for instance after such panel folding, the clamping feet 106—106' grip the panel adjacent to and slightly radially inwardly from and above panel fold edge 90. The slight spreading movement of clamping feet 106—106' when the rake is pulled in assures a firm lateral stretching of the folded panel between the clamping feet to enable an accurate working of the panel.

Continuing with a description of the garment working stations, FIG. 2 illustrates the panel feed-in mechanism 30 in greater detail. Panels 24 are stacked with leg portions 32 folded back as previously described. The panels are alternately stacked in multiple columns arranged in an annular manner on circular trays 150. Trays 150 are conveyed to a transfer mechanism 152 composed of a vacuum lift 154 slidably movable along rails 155. The vacuum lift slides from a location over the tray to a place over a conveyor 156 and cooperates with rotational index movements of tray 150 to deposit folded panels 24 on conveyor 156 with top 34 of the panel facing radially outward. Conveyor 156 is operatively aligned with the panel receiving station 1 and transports the panels to a standby station 158 located radially opposite station 1. A panel 24 reaching the standby station is detected by a photo cell 160 which operates to terminate conveyor 156 movement as well as transfer of panels from tray 150 by vacuum lift 154.

A longitudinal panel feed-in rake 162 is mounted on suitable supports over conveyor 156. Feed in rake 162 is mounted for movement along a radial line as well as vertically movable to grip a panel 24 at the standby station and push it into the receiving station 1. When a panel has been slid under raised clamping device 63 located at station 1 the feed in rake is raised and withdrawn from receiving station 1 and positioned to prepare for feeding in another panel after the previously supplied panel has been indexed to registration station 2.

With reference to FIGS. 3, 4, 4A and 4B registration station 2 elements are shown as well as their positions during alignment of a rear panel 24 along circumferential working reference line 46 and radial working reference line 47. Registration station 2 is composed of a panel position adjuster 170 and a retractable panel locator 172 which when operatively positioned cooperates with the panel position adjuster to align the panel.

Panel position adjuster 170 is formed of a plurality of air nozzles 174 located in platform 22. Nozzles 174 terminate flush with the upper surface of platform 22 and are oriented to eject air jets at an angle selected to both raise the panel 24 and urge it towards radial alignment stops 176 and circumferential alignment edge 177 on panel locator 172. The number of nozzles and their distribution over the platform surface is determined by the weight of panel 24, and the amount of adjustment required.

The panel locator 172 is formed of a flat horizontally disposed alignment plate 178 which as shown in FIG. 2 may be of a transparent plastic material. Plate 178 is sized to overlie nozzles 174 when brought into operative position over panel 24 by a plate actuator 180. Alignment plate 178 is provided with a circumferential alignment edge 177 having a radially inward surface facing the nozzles to locate panel top edge 58 and radial stops 176 located to align the panel circumferential side edge 60.

Alignment stops 176 are adjustably mounted in slots 184 of plate 178. Similarly, alignment edge 177 is adjustably mounted to plate 178. Photocells 186 and 188 are located in suitable apertures in plate 178 to detect proper alignment of a panel.

Plate actuator 180 supports panel locator 178 and controls its vertical and radial position. Radial movement of panel locator 172 is guided by rails 190 and vertical position is con-

trolled with a bell crank 192. Alignment plate 178 is mounted in cantilever fashion to an upright frame 193 and extends radially inwardly therefrom. Frame 193 is vertically slidably mounted above a slide plate 194 adapted to slide back and forth on parallel mounted radially inwardly aligned rails 190. A pair of levers 195 (one only being visible in the view of FIGS. 3 and 4 are provided each having an end connected to opposite sides of frame 193 to control the vertical position of plate 178 with bell crank 192 to which the other ends of levers 195 are pivotally mounted. The pneumatic actuating mechanism employed to control the bell crank 195 and slide plate are of known design and not shown in the figures.

The operation of the registration station 2 may be appreciated with reference to the FIGS. 31, 4A and 4B. FIG. 31 shows the operation sequence of the several garment working stations relative to movements of the indexer 28. Thus while indexer 28 is moved, a panel 24 is being delivered from the panel receiving station 1 to the registration station 2. As indicated in FIG. 31 the registration clamp 62 and the working clamp 66 are both in the panel clamping position during this motion. This dual clamping is controlled by the described annular cam 78. FIG. 4A illustrates the relative position of clamping device 62, panel 24 and the panel locator upon delivery of panel 24 to the registration station 2. When the panel has been delivered to the registration station 2 both clamps 62 and 66 are raised by cam 78 to release their grip on the panel. The panel locator is now moved radially inwardly as well as downwardly to partially insert alignment plate 178 beneath clamping device 63 with the alignment stops resting on platform 22 as illustrated in FIG. 4B. At this time nozzles 174 become operative and eject jets of air towards the alignment stops as well as slightly upwardly to urge panel 24 with its side edge 60 and top edge 58 against alignment stops 176 and 177 respectively. Alignment plate 178 prevents the air jets from ejecting panel 24 from station 2 and aids in guiding the panel to the alignment stops.

When photocells 186-188 detect panel alignment, the air jets are shut off and the panel locator removed from below clamping device 63 to its position as shown in FIG. 3 and both clamps 62 and 66 are lowered onto the panel to clamp it to platform 22. At this time the panel has a "known" position, with respect to each of the garment working stations as well as working clamp 66. Particularly fold edge 90 as defined by plate 92 on cross bar of working clamp 66 is now precisely located over the panel. The panel locator as well as the nozzles are pneumatically actuated from a source of pressurized air (not shown) under control by a timer (not shown).

After registration of the panel, indexer 28 moves the panel to the next dart forming station 3 by rotating the clamping device and associated clamped panel slidably over the platform 22. As depicted in FIG. 5, dart forming station 3 comprises a sewing machine 200 located on a slide mount 202 supported by a housing 204. The sewing machine 200 is movable in generally radial directions and within a horizontal plane as determined by slide mount 202. Motion of slide mount 202 is oriented at an angle relative to a fold line so that sewing machine 200 may sew in a stitch path which is tapered with respect to the folded edge of the panel, thus forming a dart.

Panel 24 is positioned by indexer 28 with a part of its top 34 located below a lower horizontally disposed fold plate 208. Fold plate 208 is pivotally attached to a bracket 210 which is mounted for vertical movement relative to housing 204. The vertical motion of bracket 210 and thus also fold plate 208 is controlled by an actuator located in housing 204. The pivot mount for lower fold plate 208 is a vertical shaft 212 so that the fold plate may be pivoted in a horizontal plane.

Lower fold plate 208 has a fold edge 209 oriented along the desired longitudinal fold of an indexed panel. Lower fold plate 208 is further provided with a cam follower 214 which engages a cam slot 216 formed in a suitable block 218 located on slide mount 202. The cam slot is located below bracket 210 and lower fold plate 208 and oriented so that radial motions of the slide mount cause a pivoting of fold plate 208. Specifically,

cam slot 216 is of longitudinal shape radially oriented with a lateral offset 220 (see FIGS. 6 and 7) shaped to commence a pivoting of lower fold plate 208 away from sewing machine 200 as the latter engages the panel to sew the dart.

A lowering of fold plate 208 presses a portion of top 34 of panel 24 as well as plate 208 itself below an upper fold plate 222. This upper fold plate 222 is mounted effectively flush with platform 22 and in the path of the indexed panel so that as shown in FIG. 5 panel top 34 partially covers upper fold plate 222. Upper fold plate 222 is slidably mounted to the platform for movement in a direction as indicated by arrow 224 to form a longitudinal fold in upper part 34 of the panel. A radially oriented slot 226 is provided in the upper fold plate to receive the stitching needle of the sewing machine when plate 222 is operated to form the longitudinal fold. For this reason, slot 226 is oriented parallel with the direction of motion of the sewing machine and slide mount 202.

A longitudinal air stream generator 228 is located generally parallel to and opposite the longitudinal fold line and horizontally spaced above platform 22. Air stream generator 228 is formed of a longitudinal air line 230 placed on a deflector 232 with airline apertures such as a 234 distributed along the length of airline 230. Deflector 232 and apertures 234 are located to direct a wide air stream onto a longitudinally folded panel with sufficient force to unfold the panel.

The operation of the dart forming station is described as follows in conjunction with FIGS. 5, 6, 7, 8, 9 and 31. Indexer 28 has placed a panel 24 in a position as shown in FIGS. 5, i.e., with part of top 34 overlying upper fold plate 222 and part of it underlying lower fold plate 208. The indexer precisely positions the panel so that fold edge 309 of the lower fold plate is accurately aligned with the desired location of the longitudinal dart fold line of the panel. Working clamp 66 is raised (by cam 78) to permit formation of the longitudinal fold. Registration clamp 62, however, remains in panel clamping relationship to preserve the alignment of the panel. Following the indexing of panel 24 to the dart station 3 lower fold plate 208 is lowered thereby pressing the panel to a level where upper fold plate 222 may be partially moved over lower fold plate 208.

After lowering of lower fold plate 208, upper fold plate 222 is slid over the lower fold plate thereby folding panel top 34 longitudinally and precisely along fold edge 209 of the lower fold plate. As seen in the view of FIGS. 6 and 7, the folding action by upper plate 222 brings stitching slot 226 directly in line with the stitching needle of sewing machine 200. Furthermore the stitching slot is located directly over lower fold plate 208, which being solid must be pivoted out of the way before a dart can be stitched.

When sewing machine 200 has been moved by slide mount 202 towards the panel to position the sewing machine needle over stitching slot 226, cam slot 216 has, by use of its lateral offset 220, pivoted the lower fold plate to permit the sewing to begin. FIG. 7 illustrates the position of the several station elements during the dart sewing operation. Note particularly that the lower fold plate is pivoted an amount desired to provide an unobstructed stitch line 240. Lower fold plate 208 is sufficiently sized and its pivoting is so limited that a portion of plate 208 remains inserted in the longitudinal panel fold. In this manner, the return of the sewing machine after formation of dart 240 may repivot the lower fold plate in the longitudinal panel fold as illustrated in FIG. 9.

Following the return of sewing machine 200, upper fold plate 222 is slid back to its original position and as illustrated in FIG. 9, air stream generator 228 is actuated to direct a stream of air for a limited time at the panel fold overlying lower fold plate 208. The stream of air returns panel 24 to its former essentially horizontal planar position on platform 22. Note that the return or repivoting of lower fold plate 208 shielded the panel top portion located below plate 208 from the air stream while facilitating the air actuated return of the panel top portion overlying plate 208.

After unfolding of panel 24 as seen in FIG. 10 the lower fold plate is raised to permit the darted panel to pass onto the next

cutting station 4 and prepare for the next panel from the registration station. Working clamp 66 is lowered to clamp panel 24 by cam 78 and the dart provided panel is indexed to cutting station 4.

Cutting station 4 is perspectively illustrated in FIG. 11 where the now dart provided panel 24 is accurately located with respect to a cutter housing 250. The cutter housing is mounted to the radially inner side edge 252 of a cutter support plate 254. Cutter support plate 254 is in turn slidably mounted to a pair of parallel spaced vertical shafts 256—256' slidably engaging plate 254 at a radially outward end thereof. As shown, cutter support plate 254 overhangs a portion of platform 22 to locate the cutter housing, which protrudes below the platform facing side of the cutter support plate, accurately over recess 94 in plate 92 of working clamp 66. Cutter plate 254 is vertically moved with the aid of a pneumatic controlled piston located within a vertically oriented cylinder housing 258. Cutter support plate 254 is attached to cylinder housing 258 and both are vertically adjustable along a piston connected shaft 260 downwardly depending from the piston. Shaft 260 is fastened to platform 22 generally midway between shafts 256—256'. An air line 262 provides pressurized air for operating the cylinder piston and control the height of cutter housing 250.

Cutter station 4 serves to slit panel 24 as illustrated in FIG. 15. There the panel is shown provided with an I shaped slit 263 or pocket opening formed of a pair of parallel spaced side cuts 264—264' and joined by a longitudinal cut 266. Side cuts 264—264' are formed with like shaped cutter blades 265—265' (see FIG. 14) vertically movably located in ends of cutter housing 250. The orientation and shape of the I slit 263 define a lower panel tab 268 and an upper panel tab 270 used for attaching panel 24 59 a back pocket.

FIG. 14 illustrates a more detailed construction of the cutting elements employed at the cutting station. The cutter housing is provided with a narrow centrally located chamber 272 in the shape of a segment of a circle. Chamber 272 is oriented parallel with the desired orientation of longitudinal cut 266. The depth or height as well as shape of chamber 272 are selected to receive a circular cutter blade 274 located below platform 22.

Cutter blade 274 is mounted on a vertically movable shaft 276 and when not in use is retracted in the down position below platform 22. A motor, not shown, is used to rotate cutter blade 274.

At ends of chamber 272 are vertical cutter guiding passages 278—278' sized to retain and guide side located blades 265—265' respectively. These side located blades are normally in retracted upward position unless advanced towards the panel by pneumatically actuated pistons 282—282'.

Below panel 24 and platform 22 are a pair of spreader clamps 284—284' formed of triangular frictional material that can grip panel 24 from below the cutter housing and present a firm stretched panel top 34 suitable for forming accurately locatable cuts. Spreader clamps 284—284' operate through platform apertures located below an indexed plate 92 of working clamp 66. The spreader clamps are preferably placed as close as possible to cutter housing 250 when the latter is in the down position. The spreader clamps are mounted on vertically movable bars which when raised present apices of the triangular spreader clamps which as they contact panel 24 move in a direction away from cutter housing 250 stretching the panel portion located between them.

An air stream generator 288 (see FIG. 11) is located adjacent shafts 256—256'. Air stream generator 288 is formed of a tube 289 oriented generally parallel to panel top edge 58 and horizontally spaced from platform 22. Tube 289 is provided with apertures located and distributed to direct, when supplied with pressurized air, an air stream downwardly toward panel top 34 to cause an upward lifting thereof along the fold line slightly radially inwardly of the longitudinal cut 266 as determined by edge 90 of plate 92.

The operation of cutter station 4 is further explained with reference to FIG. 31 and FIGS. 11 through 17. As soon as dart provided panel 24 is indexed to cutting station 4, rake 68 on the working clamp is fully extended as shown in FIG. 11 but terminates short of air stream generator 288. Tube 289 of the air stream generator is mounted somewhat higher than the height of rake 68 to be able to direct the air stream at the top of the panel and lift the latter.

Thereupon cutter housing 250 is lowered onto the panel as shown in FIG. 12 and spreader clamps 284—284' are raised to stretch the panel portion below cutter housing 250 (see FIGS. 13 and 14). Next pneumatic pistons 282—282' are actuated to advance the side located cutters and form side cuts 264—264' (See FIG. 15). Upon withdrawal of the side located cutters, longitudinal rotary cutter blade 274 is actuated and raised to cut longitudinal cut 266. After return of cutter 274 its rotation is stopped, cutter housing 250 is raised and spreader clamps 284—284' are lowered. At this time the panel has been slit as shown in FIG. 15.

Next air stream generator 288 is energized to force top 34 of panel 24 up and away from platform 22 (See FIG. 16). As top 34 lifts up, rake 68 is pulled in and pulls top 34 between it and the plate 92 of working clamp 66 (See FIG. 16). The rake is pulled in all the way so that rake clamping feet 106—106' grip the now folded top 34 and firmly stretch it upon spreading of clamping feet 106—106 when cam followers 112—112' engage cam surfaces 114—114' in the manner previously described with respect to the construction and operation of working clamp 66.

When rake 68 is pulled in, panel 22 is now so folded that the outside surface of panel lower tab 268 is protrudingly exposed and aligned for assembly to a back pocket at the next station 5.

The attachment of a back pocket 26 to exposed protruding lower panel tab 268 is accomplished at pocket attachment station 5. This station is perspectively illustrated in FIG. 19 and cooperates with a back pocket feed-in mechanism 64 shown in FIG. 1. This back pocket feed-in mechanism feeds back pockets 26 in a prefolded state such as illustrated in FIG. 17.

With reference to the latter figure, a back pocket 26 is shown preformed with a suspension flap 44 emerging from the back side of the pocket and folded back over receptacle portion 45 along a fold line selected to protrudingly expose lower welt 38 for attachment to lower exposed panel tab 268. The fold over of suspension flap 44 causes attachment line 42 to overlie receptacle portion 45.

Back pocket 26 in FIG. 17 has clearly defined side edges 303—303' and a substantially straight well defined outer edge 304 on the lower welt 38. These well defined edges enable one to accurately locate welt 38 relative to lower panel tab 268 at station 5. Edge 304 has a known spacing D from attachment line 42 so that panel upper tab 270 may be sewn thereto as will be explained with reference to station 7.

With reference to FIG. 19 pocket attachment station 5 includes a back pocket delivery device 64, a back pocket alignment device 308, a back pocket transfer device 310 and a movably mounted sewing machine 312.

Back pocket delivery device 64 picks up back pockets 26 from a pocket supply and deposits these on pocket alignment device 308. Back pocket delivery device 64 utilizes vacuum activated suction cups such as 307 that are lowered in operative contact with pockets located at the supply. Following a pickup of a pocket 26 it is moved along a guide rail to a location over alignment device 308.

Alignment device 308 is quite similar to the registration station 2 in that air jets are employed to maneuver the pocket against a side stop 316 and a front edge stop 318. Front edge stop 318 has a predetermined alignment with panel lower tab 268 at its indexed position at station 5 so that pocket transfer device 310 may locate pockets 26 in sewing relationship with an indexed panel lower tab 268. The transfer device 310 comprises a flat transfer plate 320 vertically movably mounted on a horizontally movable rack 322 which is suspended above

platform 22. The vertical motion of transfer plate 320 is controlled by a solenoid 323 which when properly actuated lowers the transfer plate onto a back pocket that was aligned along stops 316-318. Rack 322 is spaced above platform 22 and is supported by a horizontally disposed position control rack mechanism 324 located behind rack 322. Rack 322 is horizontally movable and oriented so that its motion as controlled by mechanism 324 will bring the aligned pocket in sewing relationship with lower panel tab 268.

Sewing machine 312 is operatively movable along lower panel tab 268 by means of a slide mount 326 on which the machine is mounted. The sewing machine motion is transferred to rack position control mechanism 324 which is attached to the sewing machine near its sewing needle. Rack position control mechanism 324 positions rack 322 in a direction corresponding with the direction of movement of sewing machine 312 but with an enlargement so that the plate 320 may be moved a greater distance than sewing machine 312. Rack 332 horizontally telescopes under control by the rack position mechanism from a guide rail 323 horizontally affixed by a bridge bracket 329 and end located bracket 325 above the platform 22. Thus as sewing machine 312 sews back pocket lower welt 38 to lower panel tab 268, moving from a position at 327 to a position at 328, rack 322 is moved a distance which will return transfer plate 320 from a location over tab 268 to a location over back pocket alignment device 308. When the sewing machine is returned to its location 327 transfer plate 320 is moved back over panel tab 268. The bridge shaped bracket 329 provides vertical support for rack 322 and permits plate 320 to pass beneath it on its way to deposit an aligned pocket on an indexed lower panel tab 268.

The attachment of back pocket welt 38 to panel tab 268 at station 5 occurs when welt 38 is placed over tab 268. Hence, a ramp 330 (see FIGS. 18 and 19A) is located on platform 22 between alignment device 308 and indexed lower panel tab 268 to elevate back pocket welt 38 for placement over tab 268 as transfer plate 322 moves the pocket into sewing position.

A slotted gripper clamp 332 is horizontally disposed over lower panel tab 268 and vertically movably mounted to guide rail 323. The gripper clamp is provided with a sewing slot 334 sized to receive stitching needle 336 of sewing machine 312. Slot 334 has a length substantially commensurate with the length of a stitch line 335 (See FIG. 19A) needed to attach pocket welt 38 to panel tab 268. The underside of slotted gripper clamp 332 is provided with frictional material adjacent longitudinal sides of slot 334. This frictional material prevents slippage of panel tab 268 and welt 38 due to longitudinal movement of the needle during the sewing. Slotted gripper clamp 332 is vertically movably mounted above indexed panel tab 268 so that a back pocket may be deposited over tab 268 below gripper clamp 332. Vertical motion of slotted gripper clamp 332 is obtained with a pneumatic actuator 337 operatively connected with suitable linkage to clamp 332. Actuator 337 remains stationary relative to platform 22.

The operation of the back pocket attachment station is described below with the aid of FIGS. 17 through 19A and 31.

The previously cut panel 22 is indexed to pocket attachment station 5 at which time sewing machine 312 is located at position 328 where machine 312 came to rest following sewing of a previous panel. After indexing transfer plate 320 is located over an aligned back pocket 28. The transfer plate solenoid is actuated to lower transfer plate 320 onto the aligned pocket and clamp it against platform 22. After transfer plate 320 has engaged a back pocket 26, sewing machine 312, under action from its slide mount 326, is returned to a position at 327 and transfer plate 320 correspondingly moved to position aligned back pocket 22 in sewing relationship with panel tab 268.

As transfer plate 320 vacates its position over alignment device 308, the back pocket delivery device 64 is energized to pick up a new back pocket 26 from a supply and deposit the picked up back pocket on alignment device 308. As soon as the new pocket has been deposited on alignment device 308, the back pocket delivering device is withdrawn.

Upon transfer of the aligned back pocket 26 over lower panel tab 268 transfer plate 320 is raised by solenoid 329. Sewing machine 312 commences to move to an initial sewing position overlaying end 333 of slot 334 which end is reached at a time shortly after transfer plate 320 has vacated the space between gripper clamp 332 and panel tab 268. After the departure of transfer plate 320 and before arrival of sewing machine 312 over slot end 333, gripper clamp 332 is lowered to firmly clamp panel tab 268 and lower welt 38 against platform 22. Sewing machine 312 needle 336 is then positioned over slot 334 and lowered to sew tab 268 to welt 38. Sewing occurs while the sewing machine moves towards alignment device 308 and thus transfer plate 320 continues to move until the sewing is completed at the other slot end 333'. At this time sewing machine movement is stopped and transfer plate is positioned over alignment device 308. The latter is actuated to align the new back pocket against front and side stops 316-318. Following alignment of the new back pocket, slotted panel gripping clamp 332 is raised and the pocket attachment station 5 is ready to sew the aligned new back pocket to the next panel tab 268 following an index motion by indexer 28.

At this time the back pocket to panel assembly appears as illustrated in FIG. 19A. In the latter figure panel 24 is shown with its protrudingly exposed lower tab 268 underneath lower welt 38 of back pocket 26. Welt 38 is fastened to the lower tab along a stitch line 335. The portion of welt 38 extending radially inwardly from stitch line 335 is the visible lower pocket lip of a completed pocket to panel assembly.

The attachment of back pocket 26 to panel 24 was but partially completed at the station 5 since as shown in FIG. 19A upper panel tab 270 has not yet been attached to upper pocket lip 40 along attachment line 42. As may be appreciated from the view in FIG. 19A, the receptacle pocket portion 45 underlying attachment line 42 and upper welt 40 should be moved out from under flap 44 where a sewing attachment is used. Furthermore, in an attractive well formed pocket to panel assembly the lower lip welt 38 (i.e. its edge 304) and the upper lip welt 40 (i.e. its edge 305) welt 40 are oriented facing one another in coplanar relationship with edges 304 and 305 substantially in abutment with one another. The abutment of edge 304-305 and movement of receptacle portion 45 are accomplished with the use of manipulation station 6 to which the assembly as shown in FIG. 19A is indexed.

Manipulation station 6 comprises a ramp 350 located on platform 22 at a radial location selected so that receptacle pocket portion 45 and its overlying suspension flap 44 will pass directly over ramp 350. The ramp elevation above the platform is selected to cause a vertical separation of end 352 (See FIG. 19A) of flap 44 from receptacle pocket portion 45. The circumferential location of ramp 350 is further chosen generally between stations 5 and 6 to obtain a vertical separation of the flap while back pocket 26 and panel 24 are in transit between stations 5 and 6.

At a radially outward location of ramp 350 is a horizontally disposed flap plate 354. This flap plate 354 is elevated above platform 22 with a spacing somewhat less than the elevation of the vertically separated end 352 of the flap 44 but greater than the thickness of receptacle pocket portion 45. Flap plate 354 overhangs the radially outward part of receptacle pocket portion 45 but terminates well before flap end 352. The flap plate further extends in a circumferential direction towards the index position of panel 24 at manipulation station 6 and flap plate 354 also gradually curves radially inwardly towards a location closer to upper welt 40 or attachment line 42. Receptacle pocket portion 45 can pass freely below flap plate 354.

An air stream generator 356 is located generally slightly downstream (counterclockwise) of ramp 350 and provided with a nozzle 358 oriented to direct a stream of air at the elevated flap end 352 with sufficient force to lift flap 44 onto the radially inward curving portion of flap plate 354.

Platform 22 is cut away at the index location of the manipulation station 6 to provide a generally rectangular slot 360 which extends radially inwardly to a location slightly aft of recess 94 in plate 92 of working clamp 66. Slot 360 is filled

with a slidably mounted trap plate 362 located generally flush with platform 22 and radially movable. Trap plate 362 is sized to extend, when moved radially inwardly, to a location aft of recess 94.

A longitudinal air stream generator 363 is provided, bridging slot 360 at a spacing above platform 22 thus permitting passage of receptacle pocket portion 45 below it and below flap plate 354. Air stream generator 363 is formed of a longitudinal tube 364 provided with apertures 366 facing trap plate 362 to direct a stream of air at receptacle pocket portion 45 when this has been indexed to its position at station 6. Radial movement of the trap plate 362 is obtained with a pneumatically controlled piston and cylinder 365.

Below platform 22 (see FIG. 20B) and extending circularly underneath about axis 27 is a cam in the form of a rod 368 whose depth below platform 22 is varied to control the actuation of a pocket lip support plate 370. A cam rod follower 369 slides along the cam rod 368 and is pivotally connected to a bracket 376 depending from below a horizontally disposed rotationally movable plate 374. Plate 374 is moved in rotation in synchronism with the indexer 28 to which plate 374 is attached. Pocket lip support plate 370 is pivotally suspended with a link 376 from bracket 372 about bracket pivot 377. A slotted link extension 378 interconnects link 376 and cam rod follower 368 so that the lowering of the latter below platform 22 causes a lifting pivot action of pocket lip support plate 370. Pocket lip support plate 370 may be located essentially flush with platform 22 to provide with its radially outer edge 380 (see also FIG. 20B) vertical support of pocket lower welt 38 leaving small end portions 381 of welt 38 unsupported for bar tack operations.

Cam rod 368 is arranged to be in the "Up" position (i.e. with lip support plate 370 down) throughout the system 20 underneath stations 1 through 5. At the beginning of station 6, generally about the location of ramp 350, cam rod 368 bends downwardly to cause a raising of pocket lip support plate 370 until the latter comes up flush with platform 22 over trap plate 362 at manipulation station 6. It should be realized that there are as many of these pocket lip support plates 370 as there are garment working stations and each pocket lip support plate is rotationally indexed. Cam rod 368 remains in the down position throughout the following garment stations 6, 7, 8, 9 and 10, after which cam rod 368 rises again to lower pocket lip support plate 370.

Overlying the index position at station 6 is a pivotally mounted wiper 382 to align and hold down pocket welt 38 at a particular time during operation of the manipulation station. Wiper 382 is formed of a rectangular plate provided with a centrally split rounded bottom edge 384. The split in edge 324 receives the dart in a panel 24 when wiper 382 is actuated. Wiper 382 is pivotally mounted between a pair of upright platform mounted brackets 386—386' with the edge opposite the rounded bottom 384 pivotally engaging brackets 386—386'. Wiper 382 is normally horizontally disposed until upon actuation it is vertically oriented against lower pocket welt 38.

The operation of manipulation station 6 is explained below in conjunction with FIGS. 20, 20A, 20B, 21, 22, 23 and 32. Commencing with a just assembled back pocket 26 and panel 24, indexer 28 moves the assembly to manipulation station 6. As back pocket 26 passes over ramp 350 flap end 352 is lifted from receptacle pocket portion 45. When flap end 352 protrudes above flap support plate 354 air stream generator 356 is actuated ejecting a flow of air which raises flap 44 in a generally upright position. Indexer 28 is continuously moving as these events occur thus passing air stream generator 356 whereby suspension flap 44 drops down again but onto the radially inner portion of flap plate 354 at the index position of station 6. At this time suspension flap 44 is separated from receptacle pocket portion 45 which is located on trap plate 362 and below flap support plate 354.

At the same time that indexer 28 moves garment panel 28 and attached back pocket 26 to the manipulation station 6, pocket lip support plate 370 rises to fit below working clamp

66 and its plate 92 with radially outward edge 387 of lip support plate 370 positioned generally within recess 94 of the working clamp plate 92. Lip support plate 370 is sized to vertically support the back pocket lower welt 38 but terminates radially short of attachment line 42 where upper pocket welt 40 is to be sewn to upper panel tab 270.

Hence, when indexer 28 has completed its index motion the vertical composition of the several layers taken is as shown in FIG. 21.

At this time trap plate 362 is pulled radially outward opening a trap, formed by slot 360, for receptacle pocket portion 45 to drop into. As trap plate 362 continues to move out a switch 390 is actuated causing a downward tremble air blast from tube 364 overlying the now opened slot 360 and receptacle pocket portion 45. This tremble air blast assures that receptacle pocket portion 45 will be vertically suspended from the lower panel tab 268 into the trap. This step orients the pocket as shown in FIG. 22. Note that the low welt 38 has pivoted upwardly towards the upper welt 40.

Next trap plate 362 is moved radially inward towards the vertically suspended receptacle pocket portion which is moved back under working clamp plate 92 (see FIG. 23). Just as trap plate 362 commences to move under pocket welt 38, a switch is actuated which energizes the mechanism employed to momentarily pivot wiper 382 vertically down upon welt 38. Wiper 382 folds lower welt 38 over until its edge 304 abuts edge 305 of the upper welt 40. Wiper 382 thus assures that both welts are properly aligned to provide a neat appearance of the double welt pocket opening.

The manipulation of pocket 26 and panel 24 is now complete. Suspension flap 44 is isolated so that it may be sewn to upper tab 270 of panel 24. Hence, the manipulated back pocket 26 and panel 24 are next indexed to second pocket sewing station 7.

Second pocket sew station 7 (See FIG. 24) is formed of a sewing machine 400 located on a slide mount 402 for movement along attachment line 42. A slotted gripper clamp 404 is provided for location over an indexed back pocket 26 and upper panel tab 270. Clamp 404 is vertically movable to grip the back pocket panel longitudinally along attachment line 42 during sewing and release panel 24 thereafter. Gripper clamp 404 is provided with a longitudinal slot 406 sized to overlie the length of attachment line 42. The underside of the gripper clamp, is provided on both sides of slot 406 with a garment gripping material to prevent garment movements during sewing.

The operation of the second pocket sewing station commences after indexing with a limited outward motion of rake 68 selected to position upper panel tab 270 in sewing relationship over attachment line 42 over upper welt 40 on suspension flap 44. Gripper clamp 404 is then lowered and sewing machine 400 actuated to sew upper tab 270 to upper welt 40 along attachment line 42. Thereupon gripper clamp 404 is raised and the garment is ready for indexing to the next manipulation station 8.

Panel top 34 up to this time has been folded back over working clamp plate 92. Since the next desired operation is a bar tack which requires a planar position of the panel a second manipulation station 8 is employed to unfold panel top 34. With reference to FIG. 26 a second manipulation station 8 is provided wherein a recess 410 is located in platform 22 at a radially outer edge thereof opposite the index location. An air stream generator 412 is suspended generally above cross bar section 84 of working clamp 66 with the aid of a pair of parallel spaced brackets 414—414' attached at an edge of platform 22. Brackets 414—414' further support a deflector bar 416 slanted at an angle with the table to deflect a stream of air downwardly and away from cross bar section 84 and provide a reduced pressure region above the folded over panel top 34 sufficient to cause an unfolding of panel 24. The recess 410 is dish shaped with a bottom formed by a perforated plate 417 which slopes up gradually to the level of the platform 22.

The operation of manipulation station 8 commences after indexing with a full extension of rake 68. Air stream generator 412 is actuated for a short time and panel top 34 is flipped back into recess 410. The rake is pulled all the way in and panel 24 and assembled back pocket 26 are indexed to the next bar tack forming station 9.

With reference to FIG. 27 bar tack station 9 is formed of a pair of facing sewing machines 430—430' facing one another across a portion 432 of platform 22. Sewing machines 430—430' are mounted on a common slide mount 431 to move into located on rails 433 (see FIG. 28) to control the radial operating position of the sewing machines. Platform 22 is provided with cut outs 434—434' along both circumferential sides of portion 432. Cut outs 434—434' are sized to receive the radially inward moving sewing machines 430—430' so they may be operatively located respectively over indexed panel side cuts 264—264' (see FIG. 27A). A pair of cover plates 436—436' are mounted on slide mount 431 and are sized and located thereon to cover, at platform level, cut outs 434—434' respectively when slide mount 431 is in its radially outward position. When slide mount 431 is moved radially inward cover plates 436—436' slide underneath platform 22.

A panel top gripping T shaped clamp 438 is located generally midway between sewing machines 430—430' and oriented with a cross bar 440 of clamp 438 located over top edge 58 of panel 24. A leg 442 of clamp 438 is pivotally mounted on platform portion 432 to control the clamping action of cross bar 440. The downward clamping action of clamp 438 is limited to occur only while the sewing machines are moved to reach or withdraw from their operating location over panel side cuts 264—264'. A pair of 445 are formed in platform 22 at a location directly underlying indexed positions of side cuts 264—264'. Apertures 445 are shown covered with smooth covers 446 which enable a panel to smoothly pass over them. The covers 446 in turn pivotally connected to clamps (not shown) located below the platform. Radially inward motion of bar tack machines 430—430' causes pivoting away (downwardly) of covers 446 which are replaced with the below platform located clamps.

Each bar tack forming machine is provided with a presser foot 447 as shown in FIG. 29. The presser feet 447 are each formed of split U shaped bars 448 sized to fit in the space between lower lip support plate 370 and the plate 92 over ends 381 of lower and upper welts 38—40.

In the operation of the bar tack station 9 sewing machines 430—430' are initially retracted and away from platform 22 to permit panel 24 to be indexed from panel top return station 8. Top of panel 24 slides over cover plate 436' to the index position at station 9. At this time slide mount 431 is actuated to move radially inwardly to position bar tack sewing machines 430—430' in respective operative position over panel side cuts 264—264'. Clamp 438 is pressed down during traverse of the sewing machines to prevent panel top edge 58 becoming entangled with the presser feet of sewing machines 430—430'. Covers 446 are pivoted out of the way and replaced with the below platform located clamps. When the sewing machines are in operative position over side cuts 264—264' the registration clamp 62 and working clamp 66 are lifted by clamp lifter 81 (see FIG. 1D) to free the panel. The sewing machines are then actuated to from the bar tacks along side cuts 264—264' with panel 24 substantially free to move.

After bar tacks have been sewn sewing machines 430—430' are retracted away from panel 24 and back pocket panel assembly is completed. The completed assembly is indexed to panel removal station 10 after a lowering of clamps 62 and 66.

Panel removal station 10 is shown in FIG. 30. A conveyor 450 is aligned with radial line 56 and indexed panels to convey these panels to a panel transfer device 452. Panel transfer device 452 vacuum lifts panels from conveyor 450 and transfers them to a rotating tray 454. The tray rotates in correspondence with the delivery of panels by transfer device 452 to form a stack of panels such as on trays 454'.

A pivotally mounted panel gripping device 458 is mounted between upright brackets 460—460' located along conveyor 450 and extending above it. A rotably mounted shaft 462 is cross wise supported by brackets 460—460' to straddle conveyor 450. A beam 464 extends in cantilever fashion lengthwise towards the indexed panel along conveyor 450 from a generally midway location on the shaft 462. The length of beam 464 is selected so that its free end 463 is locatable over top 34 of an indexed panel 24.

A pair of panel gripping belts 465 are operatively located along each lateral side of beam 464 and are mounted on rollers 466, located at the free end 463 of beam 464, and rollers 468 coaxially mounted with shaft 462. Belt rollers 466 and 468 are so sized that the outside of belts 465 protrude and may grip onto panel top 34 when shaft 462 is pivoted down. A motor and drive belt (not shown) for actuating shaft 462 and rotating belts 465 are located below conveyor 450.

The operation of the ejection station commences with a release of panel 24 by registration and working clamps 62, 66 as obtained with cam 78 (see FIG. 1D) after panel 24 was indexed from bar tack station 9. Shaft 462 is then pivoted to move free and 463 of beam 464 down towards platform 22 while belts 465 are rotating in a clockwise direction. When protruding belts 465 contact top 34 of panel 24, the latter is drawn on to conveyor belt 450. Conveyor 450 moves the now removed panel to panel transfer device 452. Transfer device 452 picks up the removed panel and deposits it on the adjacently located tray 454. As additional panels are removed from station 10 tray 454 is rotatably indexed an amount commensurate with the desired stacking arrangement.

Upon removal of a panel and pocket assembly at station 10, the indexer indexes the now vacated clamping device 63 back to panel receiving station 1. As this indexing step occurs, the cam rod 368 rises to drop the lip support plate 370 (see FIGS. 20A and 32).

Having thus described a fully automatic high speed pocket setting machine the many advantages may be appreciated. Garment panels may be worked with excellent accuracy and pockets attached thereto at repeated accurately determined locations. The automatic bar tack forming step assures a high quality pocket to panel assembly with enhanced attractiveness. Both double or single welt pockets, or pockets without welts may be attached to a portion of a garment with the system and method of this invention.

What is claimed is:

1. A method of automatically and accurately attaching a pocket to a portion of a garment comprising the steps of depositing a preformed garment portion having an inside and an outside surface on a platform for transportation thereon to garment working stations with the outside garment portion surface facing up away from the platform, aligning the deposited garment portion along predetermined reference working lines to accurately locate the garment portion relative to successively spaced garment working stations, clamping the aligned garment portion to the platform to preserve alignment during transportation and garment working operations, indexing the clamped garment portion to a garment cutting station, cutting a pocket opening slit in the garment at a location bearing a predetermined position and orientation relative to the reference working lines, said slit being bordered by upper and lower garment portion tabs, folding the cut garment portion to protrudingly expose the lower garment portion tab, indexing the folded garment portion to a pocket attachment station, depositing a preformed and prefolded pocket having a pocket receptacle portion commencing at a lower lip and a predefined upper attachment line located along a pocket flap on the platform with the pocket lower lip protrudingly exposed and the pocket flap folded over the pocket receptacle portion, aligning the deposited pocket with its exposed lower lip in predetermined registration with the indexed protrudingly exposed lower garment portion tab, guiding the aligned pocket to the indexed folded garment portion until the pocket lower lip is in desired attaching relationship with the

protrudingly exposed garment portion lower tab, fastening the pocket lower lip to the garment portion lower tab, indexing the partially assembled pocket and garment portion to a first manipulation station, removing the pocket receptacle portion from under the pocket flap to protrudingly expose the upper attachment line, indexing the partial assembly with the exposed upper attachment line to a second pocket attachment station, fastening the garment portion upper tab to the pocket along the exposed upper attachment line, unfolding the garment portion to expose the outside surface of its pocket opening, indexing the unfolded garment portion to a bar tack forming station, stitching the end locations of the slit in the unfolded garment portion to form bar tacks located at sides of the pocket opening in the assembly and complete an attractive quality pocket, indexing the completed garment portion assembly to a removal station, removing the completed garment portion from the platform.

2. A method of automatically and accurately fastening a pocket to a rear panel for a garment comprising the steps of feeding a preformed rear panel onto an annular horizontal platform along a radially inward direction, said platform being shaped to provide a circular transportation path for rear panels to be indexed to garment working stations angularly arranged at predetermined angular and radial locations, said rear panel being fed in a horizontal position with its outside surface facing up and a top section thereof oriented toward the outer edge of the platform, aligning an angularly located edge and a top edge of the rear panel along radial and circumferential reference working lines respectively to accurately register the panel with the garment working stations, clamping the aligned panel to the platform to preserve its registration during transportation and garment working operations, rotationally indexing the clamped panel to a dart forming station, folding the top section of the panel along a generally longitudinal radial fold line located to form a preselected dart fold, stitching the dart fold along a stitch line bearing a preselected angle relative to the dart fold, unfolding the panel top section to a horizontal position, rotationally indexing the dart formed panel to a cutting station, cutting a pocket opening slit and side located slits in the panel at a preselected radial location on the platform to form upper and lower panel tabs, folding a top part of the panel radially inwardly over the panel along a fold line selected to protrudingly expose the panel lower tab in a radially outward horizontal direction, rotationally indexing the panel to a pocket attachment station, depositing a preformed and prefolded back pocket horizontally on a pocket alignment station located on the platform, said back pocket having a pocket receptacle portion commencing at a frontally located lower lip and a backwardly located upper lip with the upper lip located on a pocket suspension flap along an attachment line, said pocket being deposited with its pocket receptacle portion folded under the upper lip and flap to protrudingly expose the lower lip, aligning the pocket with its lower lip registered along a line effectively tangential to the indexed position of the protrudingly exposed lower panel tab and with the pocket receptacle portion extending radially outwardly from the lower lip, moving the pocket generally along the tangent line to position the lower pocket lip over the lower panel tab at the pocket attachment station with portions of the lip extending beyond the sides of the lower tab, sewing the lower lip to the lower panel tab, rotationally indexing the panel and partially sewn back pocket to a first manipulation station and simultaneously lifting the back pocket flap from the pocket portion, removing the pocket receptacle portion from under the pocket suspension flap and the upper lip, rotationally indexing the manipulated panel and back pocket to a second pocket attachment station, moving the panel inwardly folded top part radially outwardly a distance selected to position the panel upper tab in sewing relationship over the upper lip along the attachment line, sewing the panel upper tab to the upper lip on the suspension flap, rotationally indexing the panel and back pocket to a second manipulation station, returning the inwardly folded top part of the panel to an un-

folded horizontal position with the outside surface of the panel facing upwardly, rotationally indexing the unfolded panel to a bar tack forming station with the end located sides of the pocket opening slip operatively located beneath bar stitching machines, stitching the ends of the pocket opening slit to form attractive bar tacks, rotationally indexing the bar tacked panel and back pocket assembly to a removal station, unclamping the panel and back pocket and radially removing the panel and back pocket from the platform.

3. A method of automatically and accurately fastening a pocket to a portion of a garment comprising the steps of depositing a portion of a garment horizontally on an annular platform arranged about an axis for garment portion transportation to garment working stations located at predetermined angular and radial locations about the platform, said garment portion being horizontally deposited with its outside surface facing up and a top section thereof oriented towards the radially outward edge of the platform, aligning an angularly located edge and a top edge of the deposited garment portion along radial and circumferential reference working lines respectively to accurately register the garment portion with the garment working stations, clamping the aligned garment portion to the platform to preserve its registration during transportation and garment working operations, rotationally indexing the clamped garment portion to angularly successive index locations operatively associated with garment working stations, cutting the clamped garment portion at a predetermined radial location from the axis to form a pocket opening slit bordered by upper and lower tabs, depositing a preformed pocket on the platform, said pocket having a pocket receptacle portion commencing at a front located exposed lower lip and a back located upper lip for respective fastening to the lower and upper garment portion tabs along the pocket opening slit, with the pocket receptacle portion folded under the upper lip to extend radially outwardly towards the platform, aligning the pocket with its lower lip registered along a line effectively tangential to the indexed position of the lower garment portion tab at a pocket attachment station, moving the pocket along the tangential line to position the lower lip over the lower tab in fastening relationship and fastening the lower pocket lip to the garment portion lower tab, indexing the clamped garment portion and the pocket attached thereto to a pocket manipulation station, removing the pocket receptacle portion from under the back located upper lip to isolate the upper lip for attachment to the garment portion upper tab, fastening the upper lip of the pocket to the upper tab of the garment portion, and indexing the assembly of garment portion and pocket to a removal station and removing the assembly from the platform.

4. A system for automatically and accurately assembling a back pocket to a back panel for a garment comprising platform means defining a plurality of successively spaced garment working stations, means for automatically successively indexing a back panel to the garment working stations with predetermined constant registration relative thereto, means for automatically feeding a back panel to said indexing means for indexing to the garment working stations, registration means located at a first garment working station for receiving a fed in back panel and adjusting the position thereof relative to the indexing means to establish said predetermined constant registration prior to further garment working operations, dart forming means located at a second garment working station and operative on said indexed panel to automatically form a dart therein at a station location bearing a predetermined registration with the indexing means, cutting means located at a third garment working station for slitting the dart provided back panel at a location bearing a selected registration with the indexing means, said cutting means forming a pocket opening with upper and lower tabs shaped for fastening to a back pocket, means for automatically feeding a preformed back pocket to a fourth garment working station, said back pocket having upper and lower lips to be respectively sewn onto upper and lower panel tabs, means located in the

vicinity of said fourth garment working station for automatically aligning a lip of a fed in back pocket with predetermined registration relative to a corresponding tab of a back panel indexed to said fourth station by the indexing means, means for automatically positioning the aligned back pocket lip in sewing relationship with the corresponding tab of the back panel at said fourth station, means for sewing said aligned back pocket lip to the corresponding back panel tab, means located at a fifth index station for manipulating the back panel and sewed on back pocket and isolate the other back pocket lip for sewing to the other tab of the back panel, means located at a sixth index garment working station for sewing the other back pocket lip to the other back panel tab along a predetermined attachment line having a preselected registration relationship with the indexing means, means located at a seventh index garment working station for simultaneously forming a back tack at ends of the slit in the back panel and means located at a garment working station for removing bar tacked garment panels from the indexing means.

5. In a system for automatically and accurately attaching a back pocket to a rear panel for a pair of trousers with garment working stations selectively located about a platform comprising means for forming a dart in the rear panel, means for automatically aligning a rear panel on the platform with preselected registration relative to the dart forming means, said dart forming means including a lower fold plate having a dart fold edge having a predetermined orientation relative to the aligned rear panel, said plate being elevated above the platform to receive an underlying rear panel, said lower fold plate being vertically movable to come to rest upon a panel with the dart fold edge located along the rear panel at a desired dart forming location thereon, an upper fold plate having a slot, said upper fold being located effectively flush with the platform to receive a rear panel overlying said upper plate, said upper fold plate being slidably mounted to the platform for positioning over the lower fold plate when the latter plate has come to rest upon a panel, said upper fold plate slot being oriented and sized for placement over a desired dart forming line adjacent the dart fold, and means for forming said dart through said upper fold plate slot.

6. The system as claimed in claim 5 wherein said dart forming means comprises a sewing machine mounted for movement along the upper fold plate slot and means for pivoting said lower fold plate out of the operating path of said sewing machine.

7. In a system for automatically and accurately attaching a pocket having an upper and lower lip to a portion of a garment with garment working stations selectively located about a platform the improvement comprising means for cutting said garment portion to form an accurately located pocket opening therein bordered by an upper tab and a lower tab, means for automatically aligning garment portions on the platform with preselected orientation relative to said cutting means, means for automatically aligning pockets having upper and lower lips relative to the garment portion, means for protrudingly exposing said lower tab, means for attaching the lower lip of a pocket to said protrudingly exposed lower tab for accurate attachment of the pocket lip to the garment portion lower tab by said attaching means.

8. The system as claimed in claim 7 wherein said platform is annular about an axis, and indexing means for successively rotationally moving garment portions about said axis on the platform to said aligning, lower tab exposing and attaching means.

9. The system as claimed in claim 8 wherein said indexing means includes clamping devices each formed of a registration clamp and a garment working clamp, said garment working clamp being provided with a fold plate located over the garment portion along the pocket opening slit, said plate having a fold edge located to protrudingly expose the garment portion lower tab upon a folding of said garment portion over the plate and wherein said exposing means further includes means for

folding said garment portion over the plate.

10. In a system for automatically and accurately attaching a pocket having an upper and lower lip to a portion of a garment with garment working stations selectively located about a platform the improvement comprising means for providing a panel having a pocket opening slit bordered by upper and lower tabs in accurate preselected alignment on the platform with the upper tab folded back over the lower tab to protrudingly expose the lower tab, means for attaching the lower lip of the pocket to the exposed lower tab of the garment portion with the pocket upper lip folding located over the receptacle portion of the pocket to form a preassembly of the pocket and garment portion, means receiving the preassembly for manipulating the pocket to isolate the pocket upper lip and locate the lower and upper pocket lips in desired final relationship with one another, means for bringing the garment portion upper tab and the pocket upper lip in attaching relationship with one another, means for attaching the garment portion upper tab to the pocket upper lip, and means for accurately aligning both said pocket and said garment portion with predetermined orientation relative to each other and said means to provide an accurate assembly of the pocket upper and lower lips about the garment portion pocket opening slit.

11. The system as claimed in claim 10 wherein said pocket upper lip is located on a pocket suspension flap with the flap folded back over the receptacle portion of the pocket, wherein said pocket manipulating means further includes, a pocket flap support plate spaced horizontally above the platform to permit free movement of the receptacle portion therebelow, means for lifting the flap onto the flap support plate with the receptacle portion located below the support plate, means for folding the receptacle pocket portion below the platform under the garment portion and isolate the pocket upper lip.

12. The system as claimed in claim 11 and further including a pocket lower lip support plate operatively located below the platform, means for maintaining said pocket lower lip support plate inoperative at preselected garment working stations and operatively apply said lip support plate at said manipulating means.

13. The system as claimed in claim 12 wherein said manipulating means further includes a wiper operatively located to aid alignment of the lower pocket lip along the upper pocket lip when said pocket receptacle portion is located below the platform.

14. The system as claimed in claim 13 wherein the said manipulating means further includes a tremble air stream generator located along the flap support plate and operatively directed downwardly at said pocket receptacle portion to aid in dropping thereof below the platform.

15. In a system for automatically and accurately fastening a pocket to a garment portion with garment working stations arranged about a platform the improvement comprising an annular platform shaped to provide a garment portion support about an axis, means for aligning a garment portion with preselected orientation on the platform at a location having a predetermined radial and angular position, means located at a preselected angular and radial location with respect to the aligning means for forming a pocket opening slit in the garment portion, means for attaching a pocket around the pocket opening slit in the garment portion, and means for moving said garment portion on said platform about said axis to said slit forming and pocket attaching means with preserved predetermined orientation to form an accurate garment to pocket assembly.

16. The system as claimed in claim 11 and further including bar tack forming means operatively located at a predetermined angular location about said platform, said moving means rotationally positioning ends of the garment portion pocket opening slit with operative precision opposite said bar tack forming means.

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