Oct. 13, 1964 H. GOLDBERG 3,152,736

AUTOMATIC POCKET PRESSING MACHINE

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FIG. 1.

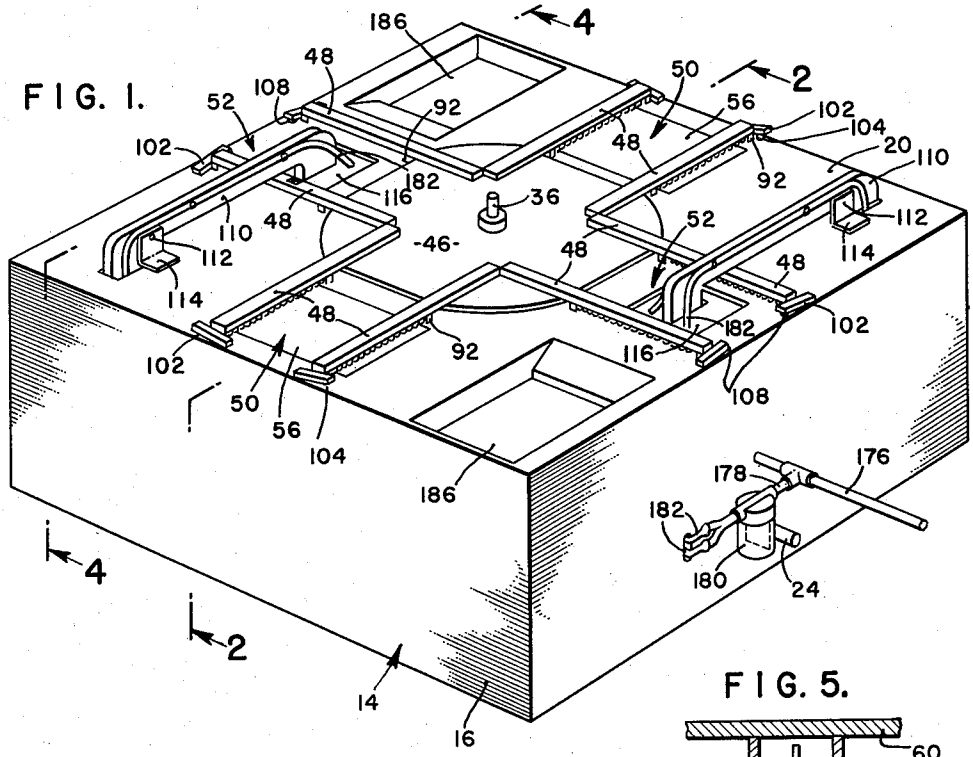


FIG. 5.

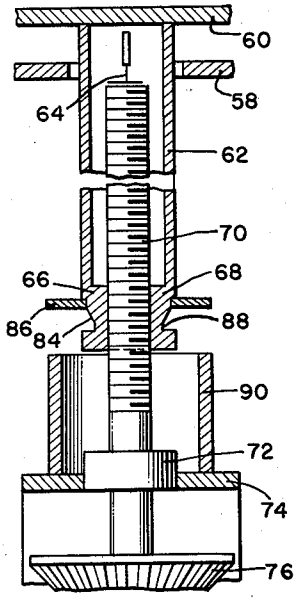
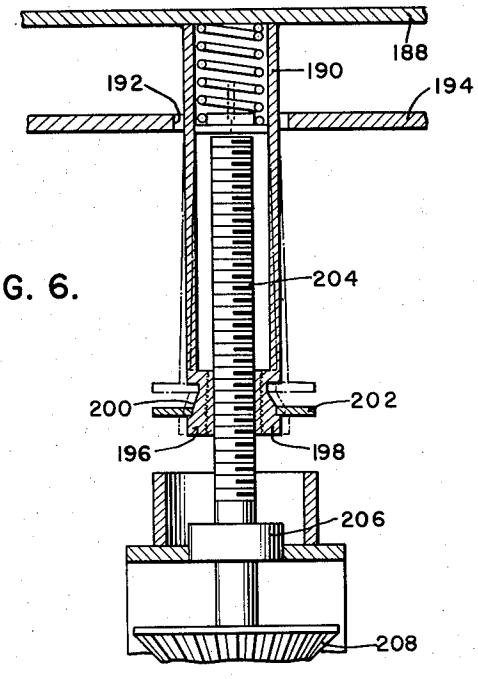


FIG. 6.



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AUTOMATIC POCKET PRESSING MACHINE

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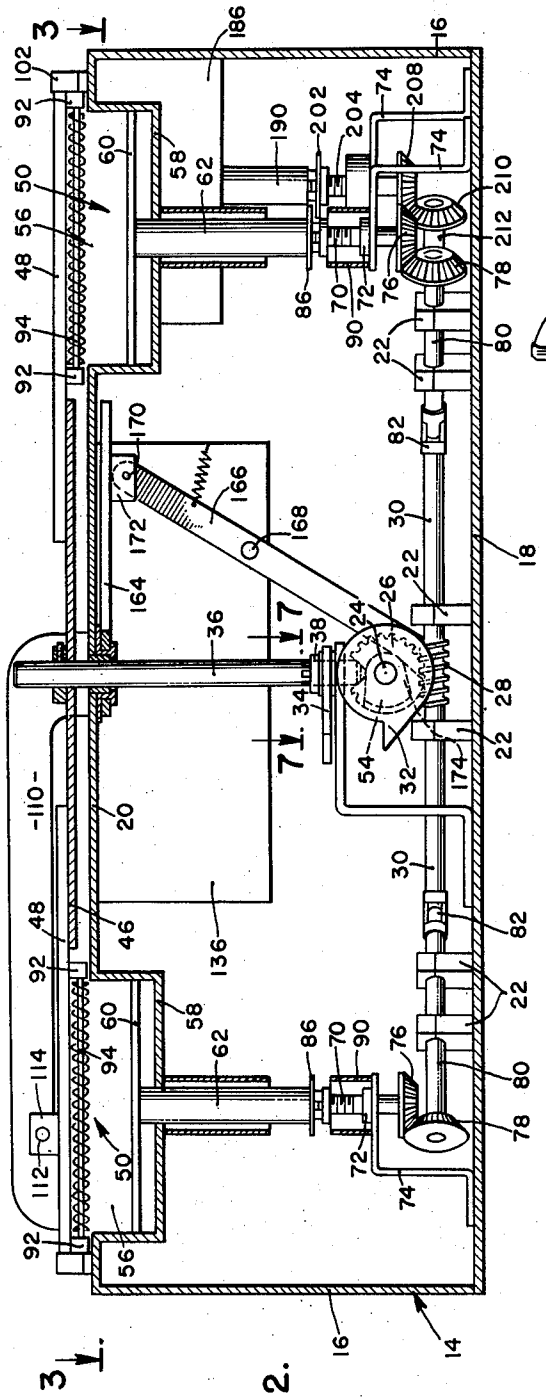


FIG. 2.

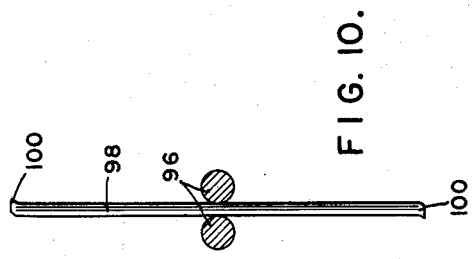


FIG. 10.

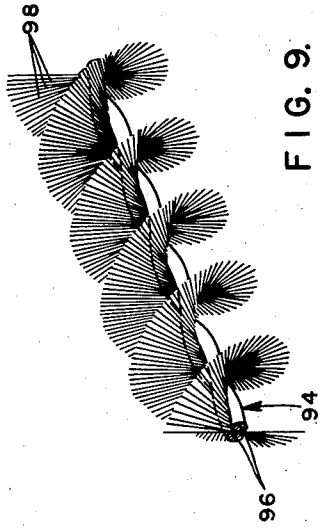


FIG. 9.

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AUTOMATIC POCKET PRESSING MACHINE

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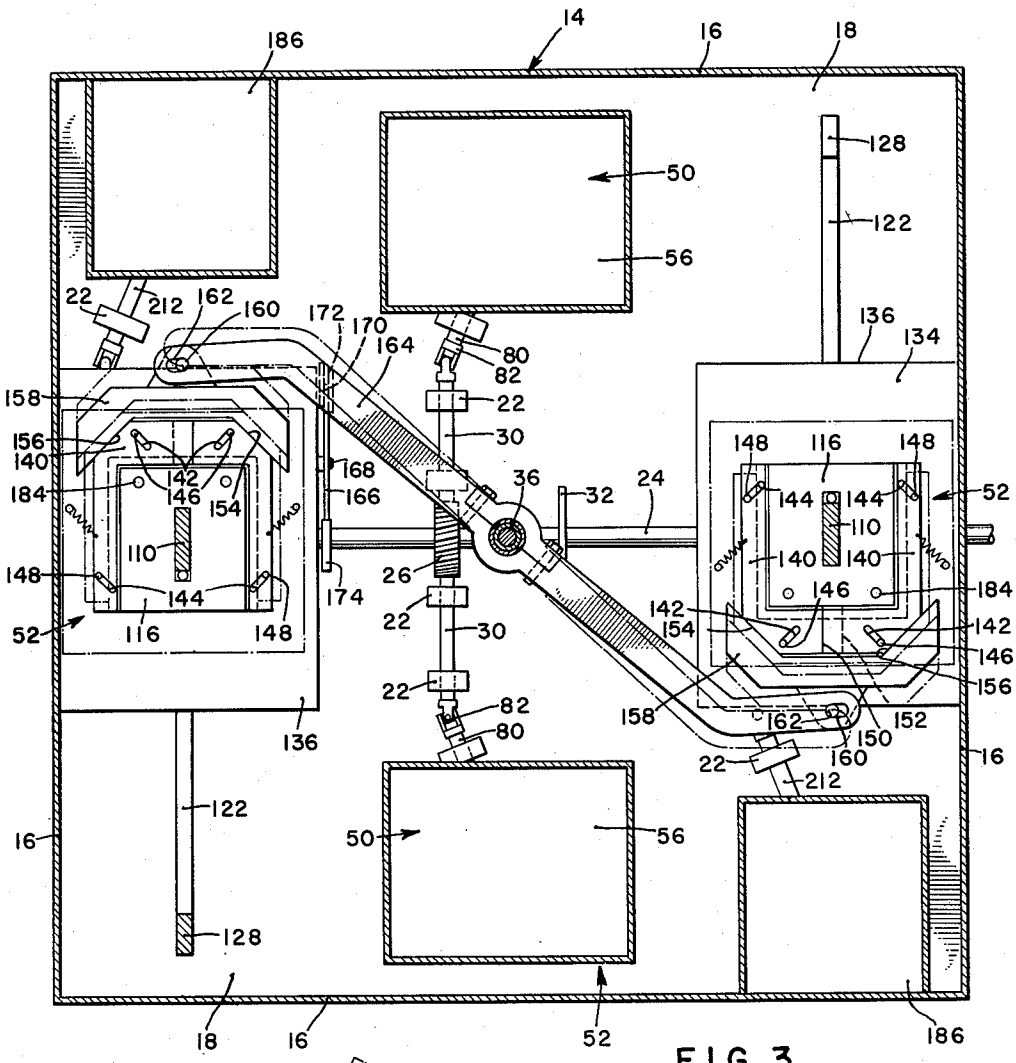


FIG. 3.

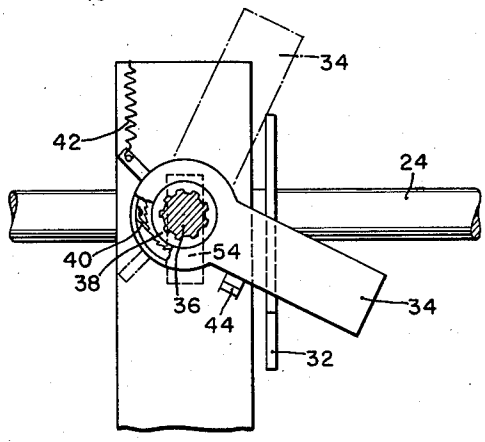


FIG. 7.

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AUTOMATIC POCKET PRESSING MACHINE

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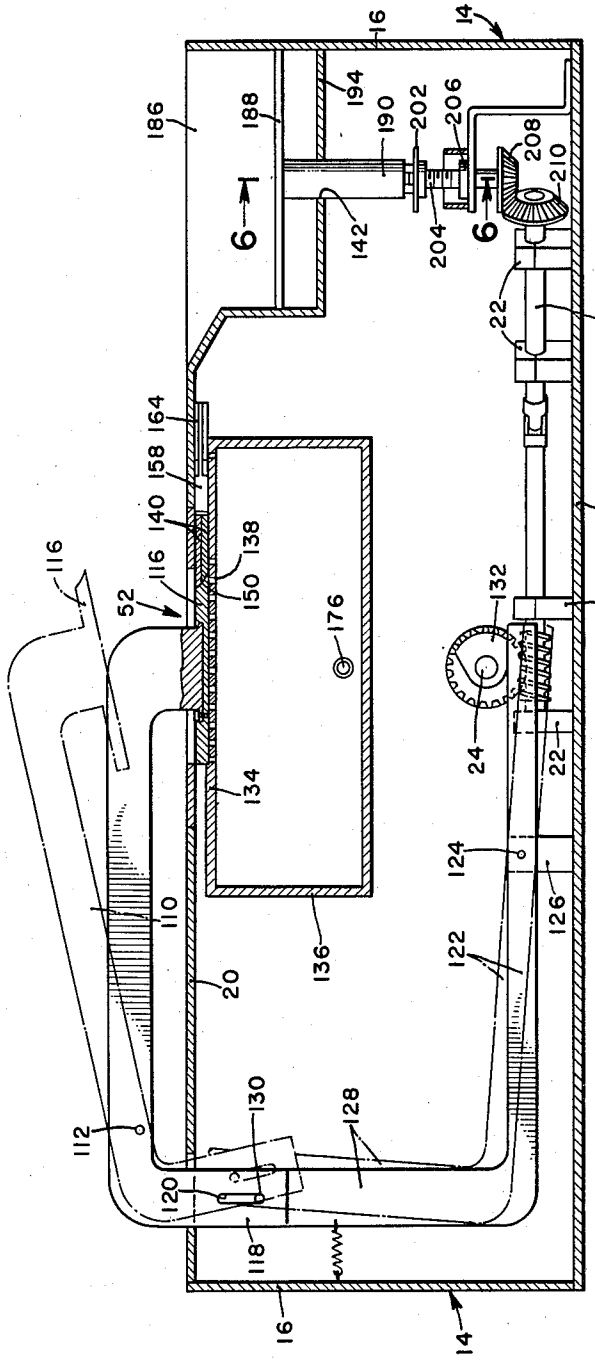


FIG. 4.

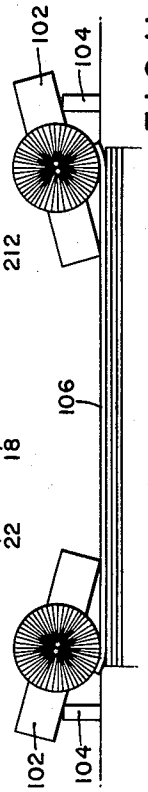


FIG. 11.

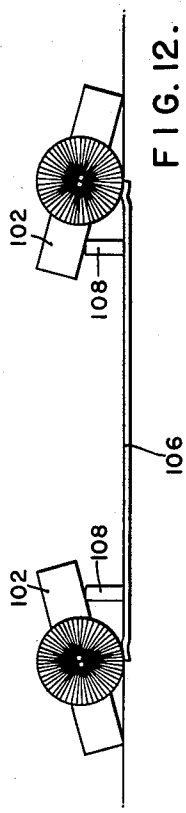


FIG. 12.

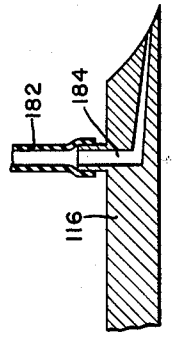


FIG. 8.

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United States Patent Office 3,152,736 Patented Oct. 13, 1964

3,152,736

AUTOMATIC POCKET PRESSING MACHINE

Harry Goldberg, 17408 Stare St., Northridge, Calif., assignor of fifteen percent to Richard Kelton, seven and one-half percent to Hy R. Levin, seven and one-half percent to Grace C. Hashizaki, and one and one-fourth percent to Gordon Evans, all of Los Angeles County, Calif.

Filed May 29, 1961, Ser. No. 113,230
12 Claims. (Cl. 223—38)

This invention relates to a machine for pressing pocket blanks, and more particularly for folding and pressing edges of pocket blanks and pressing them in folded position preparatory to sewing them to shirts, jackets and other articles of clothing.

Heretofore, pocket blanks have been folded by successive hand feeding of the cut-out fabric blanks to a folding and steam pressing mechanism and then removing each pressed blank from the pressing mechanism by hand.

It is an object of the present invention to provide a machine which can be supplied with a stack of flat pocket blanks at a pick-up station, the machine having means for automatically transferring successive pocket blanks from the supply stack to a pressing station, where edges of the blanks are folded upon the blank and pressed, with or without steam, and then removed by the machine from the pressing station and deposited in a stack which can periodically be removed by the operator. This machine completely eleminates the successive feeding and removal of single pocket blanks to and from the pressing apparatus. It speeds up the folding and pressing operation and a single operator can be utilized for a number of machines since it is necessary for the operator only to supply stacks of unfolded blanks and remove stacks of folded blanks.

Another object of the invention is to provide a machine of the type set forth above wherein more than one pick-up station and pressing station can be used and a pocket blank transfer device operated to move pocket blanks simultaneously between more than one set of pick-up and pressing stations.

A further object of the invention is to provide a machine of the type referred to wherein pocket blanks are picked up, deposited at the pressing station, folded and pressed in their folded condition, removed from the pressing station and deposited in a receiver, wherein the several operations can be motivated from a single drive unit and are actuated in synchronism.

A further object of the invention is to provide a pocket blank pressing machine with a pocket blank pick-up and transfer mechanism which will hold individual pocket blanks flat until they are deposited in or on the pressing mechanism and release them for folding and pressing without manual aid.

Still a further object of the invention is to provide a pick-up station having a vertically movable support for a stack of pocket blanks, and a receiver for a stack of folded and pressed pocket blanks having a vertically movable support wherein the support at the pick-up station will maintain the top pocket blank in a stack at a predetermined elevation relative to the transfer device, and wherein the vertically movable support at the receiver for folded and pressed blanks will move vertically downwardly as the support at the pick-up station moves vertically upwardly and at a greater speed than the support at the pick-up station to compensate for the additional thickness of the folded edges of the pocket blanks on the receiver support. In the description and claims where the terms "pick-up station" and "pressing station" are used, such terms are intended to designate those units or portions of the apparatus which respectively hold a stack of pocket blanks to be picked up individually and those portions or units of the apparatus which operate upon the folded pocket blanks to press them.

The above and other objects and advantages will more fully appear from the following description in connection with the accompany drawings:

FIG. 1 is a general view in perspective of an embodiment of the invention showing four pairs of transfer arms, two pick-up stations, two pressing stations and two receivers;

FIG. 2 is an enlarged vertical sectional view taken approximately on the line 2—2 of FIG. 1;

FIG. 3 is a horizontal sectional view taken approximately on the line 3—3 of FIG. 2 and on a more reduced scale;

FIG. 4 is an enlarged vertical sectional view taken approximately on the line 4—4 of FIG. 1;

FIG. 5 is an enlarged vertical sectional detail through the elevator for a stack of pocket blanks at the pick-up station with portions shown in broken lines to indicate the release for returning the elevator to its starting position;

FIG. 6 is a view similar to FIG. 5 of the pocket blank lowering elevator at the receiver for folded and pressed pocket blanks;

FIG. 7 is an enlarged sectional detail taken approximately on the line 7—7 of FIG. 2;

FIG. 8 is an enlarged sectional detail of an edge of the movable presser plate;

FIG. 9 is a perspective view of a portion of one of the oscillating pocket blank pick-up members;

FIG. 10 is an enlarged transverse sectional view through the pick-up element of FIG. 9 showing one of the pick-up fingers;

FIG. 11 is an end elevational view of a pair of spaced pocket blank pick-up members showing them oscillated in opposite directions and engaging a pocket blank at the pick-up station;

FIG. 12 is a view similar to FIG. 11 with the pick-up members oscillated oppositely to each other in the opposite direction from FIG. 11 to release and deposit a pocket blank at the pressing station;

The apparatus includes a frame or housing 14 having sides 16, a bottom 18 and a top 20. Two or more bearing blanks 22 are secured to and extend upwardly from the casing bottom 18 and support for rotation a drive shaft 24, one end of which extends exteriorly of the casing as shown in FIG. 1 and may conveniently be driven by an electric motor, not shown.

The drive shaft 24 intermediate its ends carries a worm 26 meshed with a worm gear 28 on a cross-shaft 30. The drive shaft 24 has a rotary tooth 32 mounted thereon for rotation therewith. Said tooth 32 intermittently engages an arm 34 mounted for oscillatory rotation on a vertical rotary table shaft 36.

A ratchet ring 38 is splined on the shaft 36 for relative movement therebetween axially of said shaft. A spring biased ratchet pawl 40 is carried by the arm 34 and engageable with the teeth of the ratchet ring 38 to rotate the shaft 36 through 90° of movement upon each rotation of the rotary tooth 32.

When the tooth 32 passes the arm 34, a spring 42 connected between said arm 34 and a suitable stationary portion of the mechanism will return said arm in a clockwise direction as viewed in FIG. 7 from the broken to the full-line showing thereof until said arm engages a stop 44 whereupon it is in position for the next succeeding movement thereof by the rotary tooth 32.

The upper end of the vertical shaft 36 has a central table 46 mounted thereon for step-by-step rotation therewith.

Mounted on and extending from the table 46 are pairs of pocket panel transfer arms 48 comprising portions of a

pocket blank transfer device. When the table 46 is rotated in its step-by-step movement, two opposite pairs of arms 48 will each move from a pick-up station 50 to a folding and pressing station 52 and the other two pairs of pick-up arms 48 will move from a folding and pressing station to one each of the pick-up stations 50.

On the cross-shaft 30 is a cam 54 upon which the lower end of the vertical shaft 36 rests. This cam is adapted to elevate the shaft 36, table 46 and pairs of transfer arms 48 when pocket blanks are picked up from the pick-up stations 50 and to lower said table 46 and pick-up arms 48 at the pressing stations 52.

In FIG. 5 there is shown means for elevating unfolded pocket blanks which are stacked at the respective pick-up stations 50. Each pick-up station includes a receptacle 56 as shown in FIG. 1, a portion of the bottom of which is shown at 58 in FIG. 5. Within the receptacle 56 is a vertically movable bottom 60. Welded or otherwise suitably secured to the underside of the vertically movable bottom 60 is a tube 62 having a pair of slits, one of which is shown at 64 and which extend upwardly from its lower end, the tube being sprung so that the two halves thereof will separate laterally when unconfined. On the lower end of each half of the tube 62 are complementary half-nuts 66 and 68 which are threaded to engage a threaded shaft 70 mounted in a bearing 72 carried by a bracket 74, suitably secured to the housing bottom 18, as shown in FIG. 2.

The lower end of the shaft 70 carries a bevel gear 76 which as shown in FIG. 2 is meshed with a complementary bevel gear 78 on a shaft 80. The shaft 80 is connected by a suitable universal coupling joint 82 to the cross shaft 30.

The half-nuts 66 and 68 carried by the tube 62, and engaging the threaded shaft 70, are provided with cam surfaces 84 and a cam follower ring 86. When the gears 76 and 78 and the threaded shaft 70 are rotated, the half-nuts 66 and 68 will follow upwardly on said threaded shaft, raising the tube 62 and the vertically movable bottom 60 of the pickup receptacle 56, gradually raising a stack of pocket blanks within the receptacle so that the uppermost blank will be maintained at an approximately constant level, and permitting the pocket blank transfer device to engage and pick up the uppermost blank.

When the split tube 62 and the receptacle bottom 60 reach their upper limit of movement, the cam follower ring 86 on the half-nuts 66 and 68 will engage the receptacle bottom 58, dislodging the cam ring 86 downwardly until its rests in the notches 88 at the bottom portions of the half-nuts. By reason of the downward taper of the cam surfaces 84, the half-nuts can separate under the spring action of the split tube 62 and said half-nuts will become disengaged from the threaded shaft 70. Thereupon the receptacle bottom 60, split tube 62 and half-nuts 66 and 68 will drop down until the cam follower ring 86 engages the upper edge of an abutment cup 90 on the upper side of the bracket 74. The weighted downward movement of the half-nuts 66 and 68 will cause the cam surfaces 84 to bring the half-nuts together due to the confinement of the ring 86 and said half-nuts will again engage the threaded shaft 70, and the ring 86 will retain them in the engaged position, whereupon, rotation of the shaft 70 will again begin to elevate the vertically movable receptacle bottom 60.

Each pair of spaced parallel pick-up arms 48 has a pair of spaced blocks 92 on its underside, and mounted between them for rotation relative thereto, is a shaft or rocker 94. In FIG. 9 this shaft is shown to be of twisted wires 96 which grip between them helically arranged pick-up fingers 98. One such finger is shown enlarged in FIG. 10 between the wires 96. Each finger 98 is gripped midway by the wires 96 and the end of said pick-up fingers 98 are burred or angularly offset as at 100. As the transfer table 46 is rotated through 90°, it is elevated by the cam 54 on the drive shaft 24 which acts upon the vertical

shaft 36 which supports said table 46. When a pair of pick-up arms 48 comes to a position above a pick-up station 50 and its receptacle 56, the shaft 36 will ride off the high portion of the cam 54 causing the pick-up arms 48 and their pick-up elements comprising the fingers 98 to drop with the elements engaging the uppermost of a stack of flat pocket blanks in each receptacle 56. As the pick-up elements engage the uppermost pocket blank, a T-head 102, on the outer end of each pick-up element shaft 94, will engage an upstanding abutment 104 on the top of the housing 14 and oscillate each pick-up element as best indicated in FIG. 11. In that view the left-hand pick-up element will partially rotate in a clockwise direction and the right pick-up element will partially rotate counter-clockwise. This will cause the burred or angularly pointed ends 100 of the pick-up fingers 98 to dig into the uppermost pocket blank 106 in FIG. 11 and stretch it taut, so that when the cam 54 again elevates the shaft 36, transfer table 46 and transfer arms 48, the uppermost pocket blank will be carried between the transfer arms.

When the transfer table and arms 48 rotate through 90° from a pick-up station 50 to a pressing station 52, the cam 54 will again drop the transfer arms, and the T-heads 102 on the transfer elements will engage upstanding projections 108 at each side of the pressing station. These projections 108 are disposed between the pick-up elements and will engage the T-heads 102 to partially rotate the pick-up elements, as indicated in FIG. 12, in directions oppositely to the partial rotation imparted at the pick-up station, as indicated in FIG. 11. This reverse rotation of the pick-up elements will cause the burred or angularly pointed ends 100 of the pick-up fingers 98 to relax their grip on the pocket blank 106 and deposit it at the pressing station.

Mounted on an arm 110 carried on a pivot 112 between lugs 114 on the housing top 20 is a presser plate 116. The presser plate arm 110 has a downwardly bent end 118 with a slot 120. An actuating lever 122 for the presser plate arm 110 is pivotally mounted at 124 between lugs 126 mounted on the housing bottom 18. The lever 122 has an upstanding end 128 which carries a pin 130 extending through the slot 120 in the downwardly extending arm of the presser plate arm 110. The lever 122 extends to the right, as shown in FIG. 4, beyond its supporting pivot 124 and lies beneath a presser plate actuating cam 132 on the drive shaft 24. When a pair of transfer arms 48 deposits a pocket blank at the pressing station, the cam 132 through the lever 122 and presser plate arm 110 will lower the presser plate 116 and press the pocket blank against the top 134 of a steam box 136 having steam apertures 138 thereabout adjacent its edges. When transfer arms 48 are swinging from one station to another, the preser arms 110 are elevated and the transfer arms swung beneath them.

At the pressing station beneath the housing top 20 is a pair of spring biased L-shaped pocket edge folding members 140 having slots 142 and 144 which receive pins 146 and 148 extending upwardly from the top 134 of the steam box 136. This causes the folding members 140 to move angularly as indicated by the angles of the slots 142 and 144. As shown in FIG. 3, the folding members 140, when in the position of that figure, have their adjacent ends tapering and in overlapping relationship as indicated by the full line 150 which is the end edge of the overlaying member 140, and the broken line 152, which is the end edge of the underlying member 140. This overlap is on a flat angle so that when the portions are overlapped as shown, the folding members 140 lie in a common flat plane.

The folding members 140 have corners 154 cutoff at an angle and are adapted to slidingly abut similarly angled edges 156 of an actuating member 158. When the member 158 is pushed against the angled corners 154 of the folding members 140, said folding members will

move in the direction of the slots **142** as stated above. When a pocket blank is deposited upon top **134** of the steam box **136**, and the folding members **140** are moved as described above, they will slide under the edges of the pocket blanks which extend outwardly a short distance at three sides of the movable presser plate **116** and said edges of the pocket blank will be folded over the edges of the presser plate and steam applied to the folded fabric of the pocket blank in a manner to be described below.

The pocket edge folding member actuator **158** is connected by a pin **160** through a slot **162** to a lever **164** pivoted at its center on the vertical shaft **36**. The opposite end of the lever **164** extends to and is connected with a duplication of the actuator **158** at the other side of the machine.

The lever **164** which moves the actuator **158** is itself moved by a lever **166** shown in FIG. 2 which is pivoted at **168** to one side of the steam box **136**. The upper end of the lever **166** is connected by a pivot **170** to a lug **172** on the underside of the left half of lever **164** as viewed in FIG. 3. The lower end of lever **166** bears against a cam **174** on the drive shaft **24** as shown in FIG. 3. Rotation of the drive shaft and the cam **174** imparts motion through levers **166** and **164** to the actuator **158** which bears against the sliding pocket edge folding members **140**.

The pocket edge forming and pressing mechanism per se is not new. Customarily coupled therewith is some means for supplying intermittent jets of steam to the steam box **136** where it issues through the apertures **138** to the folded pocket edges. For the purpose of this invention I have indicated in FIG. 1 a steam inlet line **176** which leads to the steam box **136**. Suitable means not shown, such as a cam actuated valve, can be operated from the drive shaft **24** to supply steam at the time the edges of the pocket blank are folded over the movable presser plate **116**. There is shown a branch line **178** leading from the steam line **176** to a trap **180** which permits the bypassed steam to condense. Air from the trap **180** is fed through a pair of tubes **182** which lead respectively to conduits **184** in each of the movable presser plates **116**. The conduits **184** in the presser plates extend through an edge of each of said plates, shown in FIG. 8.

When the pocket blank has its edges folded and subjected to steam so that they are pressed in folded condition, the edge formers **140** and their actuator **158** are retracted, the movable presser plate **116** is raised with the pocket folded about three of its edges, and air is supplied through the conduits **184** to blow the pocket with its folded edges from said movable presser plate. The pocket is blown from the presser plate in the direction of and is received in a receiver **186**, a pair of which are shown at opposite corners in FIGS. 1 and 3.

In each receiver **186**, as shown in FIG. 6, is a vertically movable support **188** which is adapted to lower gradually into the receiver as the machine is actuated to accommodate the growing stack of pocket blanks with their folded edges as they are deposited from the movable presser plate **116**. On the bottom of the vertically movable support **188** is a split tube **190** extending through an aperture **192** in the stationary bottom **194** of the receiver **186**. As in FIG. 5, the split tube **190** has half-nuts **196** and **198** on its lower end. The half nuts have tapered cam surfaces **200** and a cam follower ring **202** fits about the half-nuts and is adapted to follow the cam surfaces **200** to cause the half-nuts **196** and **198** to engage and or disengage a threaded vertical shaft **204** in a bearing **206**, and as shown in FIG. 2, the lower end of the shaft **204** is provided with a bevel gear **208** which meshes with a bevel gear **210** on a shaft **212** (FIG. 3) which is suitably geared to the drive shaft **24**. It should be noted that the bevel gears **208** and **210** which drive the vertical shaft **204** in each receiver should have such a ratio that the pocket blank support **188** in the receiver will move approximately twice as fast, or more, than the movable support **60** in each of the receptacles at the pick-up stations. This speed differential is provided because of the added thickness of each pocket blank after its edges have been turned and pressed.

From the foregoing it will be seen that I have provided means for forming and pressing the edges of pocket blanks wherein a stack of flat unfolded blanks can be placed at the pick-up station, single blanks are picked up and transported to the pressing station where the edges are turned and pressed with steam, and the folded and pressed blanks are deposited in the receiver where they are stacked. It is necessary only for the operator to place stacks of unfolded blanks in the pick-up receptacle and remove blanks with their edges folded and pressed in stacks from the receiver. All the operations are sequential and preferably driven in their timed relationship from a cam drive source. The machine eliminates the need for single feeding to and removal from the presser of individual blanks by hand and permits a single operator to take care of a number of machines operating at the same time.

It will of course be understood that various changes can be made in the form, details and arrangement of the various parts without departing from the spirit of the invention.

I claim:

1. In a shirt pocket pressing machine, a power drive unit, a pocket blank pick-up station including a vertically movable pocket blank supporting table connected to said drive unit for vertical actuation of said table, a pocket blank transfer device connected to said drive unit for movement thereby, a pressing station including means for turning and pressing edges of pocket blanks, a connection from said drive shaft to said edge turning and pressing means for actuation of said latter means by said drive unit, the transfer device being movable between the pick-up station and the pressing station, and means having an operating connection with said drive shaft for removing pressed pocket blanks from said turning and pressing means.

2. In a shirt pocket pressing machine, a pocket blank pick-up station having means for supporting a stack of pocket blanks, a pressing station including means for folding and pressing edges of the pocket blanks, a pocket blank transfer device movable from said pick-up station to said pressing station, said transfer device including a pair of elements spaced to engage opposite edge portions of the uppermost of a stack of pocket blanks at said pressing station, said spaced elements having portions movable away from each other first to engage and hold a pocket blank flat between them and then movable toward each other to release the pocket blank, means operatively associated with said pick-up device for effecting movement of said spaced portions of said transfer device away from each other at said pick-up station, and means operatively associated with said spaced elements for moving them toward each other at said pressing station.

3. In a shirt pocket pressing machine, a pocket blank pick-up station having means for supporting a stack of pocket blanks, a pressing station including means for folding and pressing edges of the pocket blanks, a pocket blank transfer device movable from said pick-up station to said pressing station, said transfer device including a pair of spaced elements having fabric-engaging portions movable with said transfer device to engage and pick up successive uppermost pocket blanks from the stack, means at the pressing station for disengaging said fabric-engaging portions of said spaced pick-up elements from said pocket blanks, and a power drive unit having sequential operating connections with said transfer device and said means for folding and pressing edges of said pocket blanks.

4. In a shirt pocket pressing machine, a power drive unit, a pocket blank pick-up station, a pressing station,

means at said pressing station and connected for operation to said power drive unit for turning the edges of successive pocket blanks, a transfer device connected to said power drive unit and movable thereby between said pick-up station and said pressing station, said transfer device including a pair of spaced rockets with pocket blank-engaging elements thereon, and means on said machine for moving said rockets and their blank-engaging fingers in opposition directions.

5. In a shirt pocket pressing machine, a power drive unit, a pocket blank pick-up station including a vertically movable support for a stack of pocket blanks, said support being connected to said power drive unit for vertical movement thereby, a pressing station, an individual pocket blank pickup and transfer device driven by said power drive unit and movable to convey a pocket blank from said pick-up station to said pressing station including means on said transfer device for picking up and depositing pocket blanks.

6. In a shirt pocket pressing machine, a power drive unit, a pocket blank pick-up station including a vertically movable support for a stack of pocket blanks, said support being connected to said power drive unit for vertical movement thereby, a pressing station, a transfer device driven by said power drive unit and movable from said pick-up station to said pressing station, and means adjacent said pressing station for receiving and stacking pressed pocket blanks including a vertically movable support connected to said power drive unit for vertical movement thereby at a speed greater than that of the vertically movable support at said pick-up station.

7. The structure in claim 6 and said vertically movable support for receiving pressed pocket blanks adjacent said pressing station being connected to said power drive unit for vertical movement in a direction oppositely to and at a speed at least twice that of the vertically movable support at said pick-up station.

8. In a shirt pocket pressing machine, a frame having a central area, a pair of spaced pocket blank pick-up stations at opposite sides of said central area, a pair of pressing stations spaced from said pick-up stations about said central area and at opposite sides of the central area, pocket blank transfer arms mounted for rotation at said central area and extending outwardly therefrom, means associated with said transfer arms for moving them successively from one of said stations to the next successive station, means associated with said transfer arms for picking up single blanks from the pick-up stations and depositing them at their respective pressing stations.

9. The structure in claim 8 and means movable in relationship to movement of said transfer arms for folding edges of pocket blanks upon said blanks.

10. The structure in claim 8 and means movable in relationship to movement of said transfer arms for folding edges of pocket blanks upon said blanks, and means movable in relationship to said transfer arms and said means for folding edges of pocket blanks, for pressing the folded edges of said pocket blanks.

11. In a shirt pocket pressing machine, a drive unit, a pocket blank pick-up station, a pocket blank pressing station, a pocket blank transfer device movable from said pick-up station to said pressing station and connected to said drive unit for actuation thereby, said pressing station having a stationary first presser plate, a second presser plate movable toward away from the stationary presser plate and connected to said drive unit for actuation thereby, means adjacent said first presser plate for folding edges of pocket blanks over edges of the movable presser plate, and means for directing a flow of a gaseous medium toward an edge of the movable presser plate and a folded pocket blank edge to remove folded pocket blanks therefrom.

12. In a shirt pocket pressing machine, a power drive unit, a pocket blank pickup station including means for holding a stack of pocket blanks, a pressing station, an individual pocket blank pickup and transfer device having means for sucessively removing single pocket blanks from the stack of blanks and being connected to said power drive unit and movable thereby to convey a single pocket blank between said pickup station and said pressing station, and pocket edge folding and pressing means at said pressing station connected to said power drive unit for actuation thereby in timed relationship to movement of said transfer device.

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