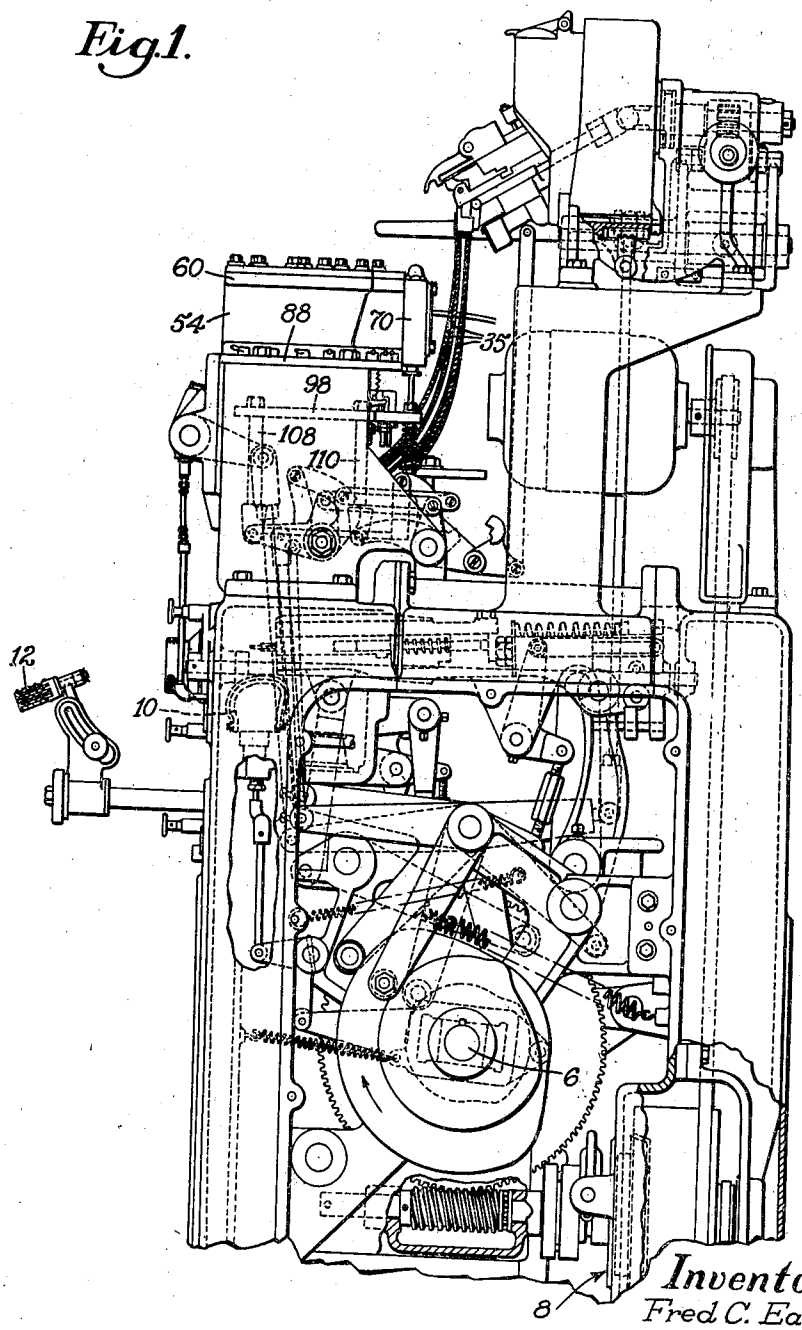
Dec. 13, 1949 F. C. EASTMAN ET AL 2,490,901

FASTENING-INSERTING MACHINE

Original Filed March 6, 1946 5 Sheets-Sheet 1

Fig. 1.



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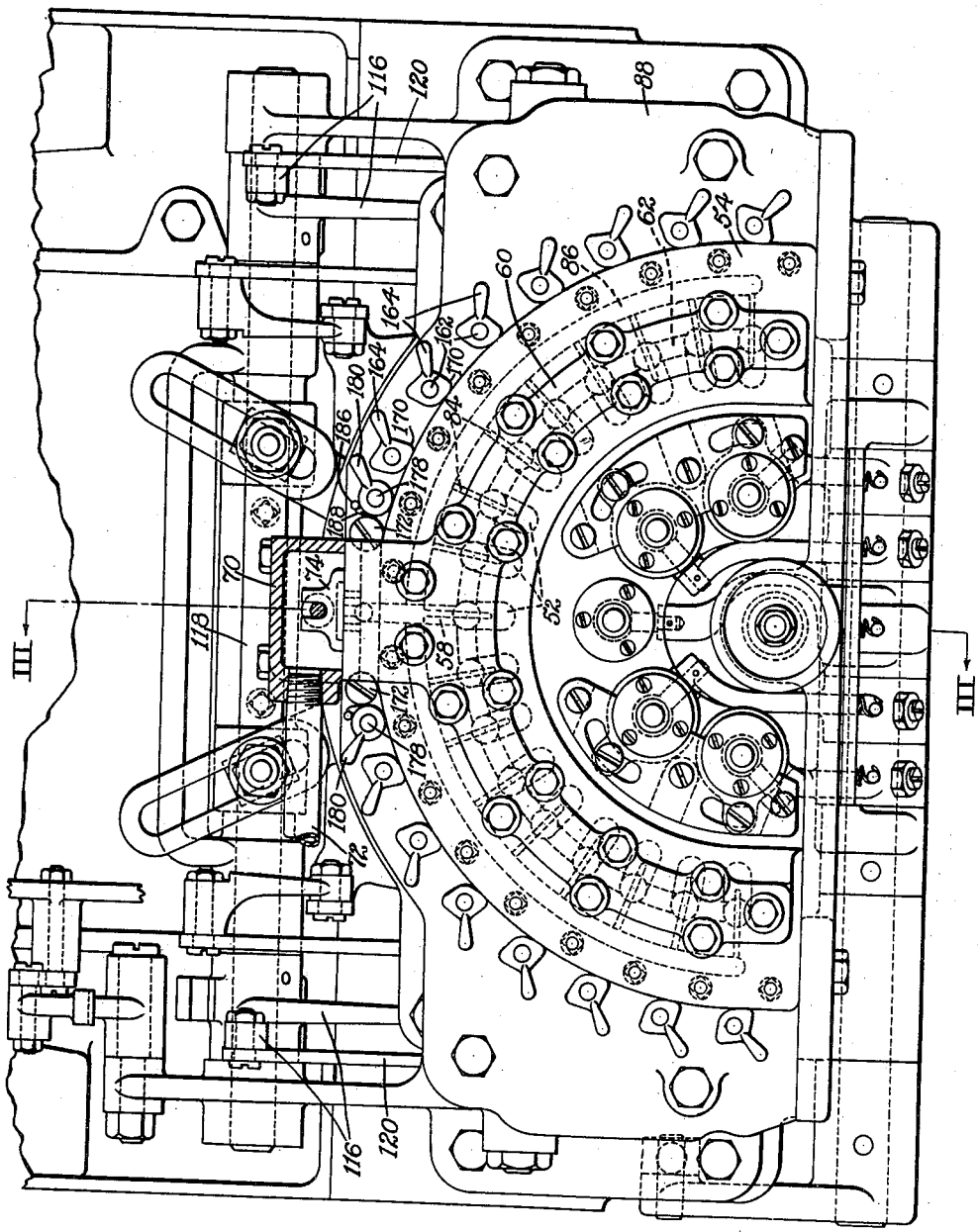


Fig. 2.

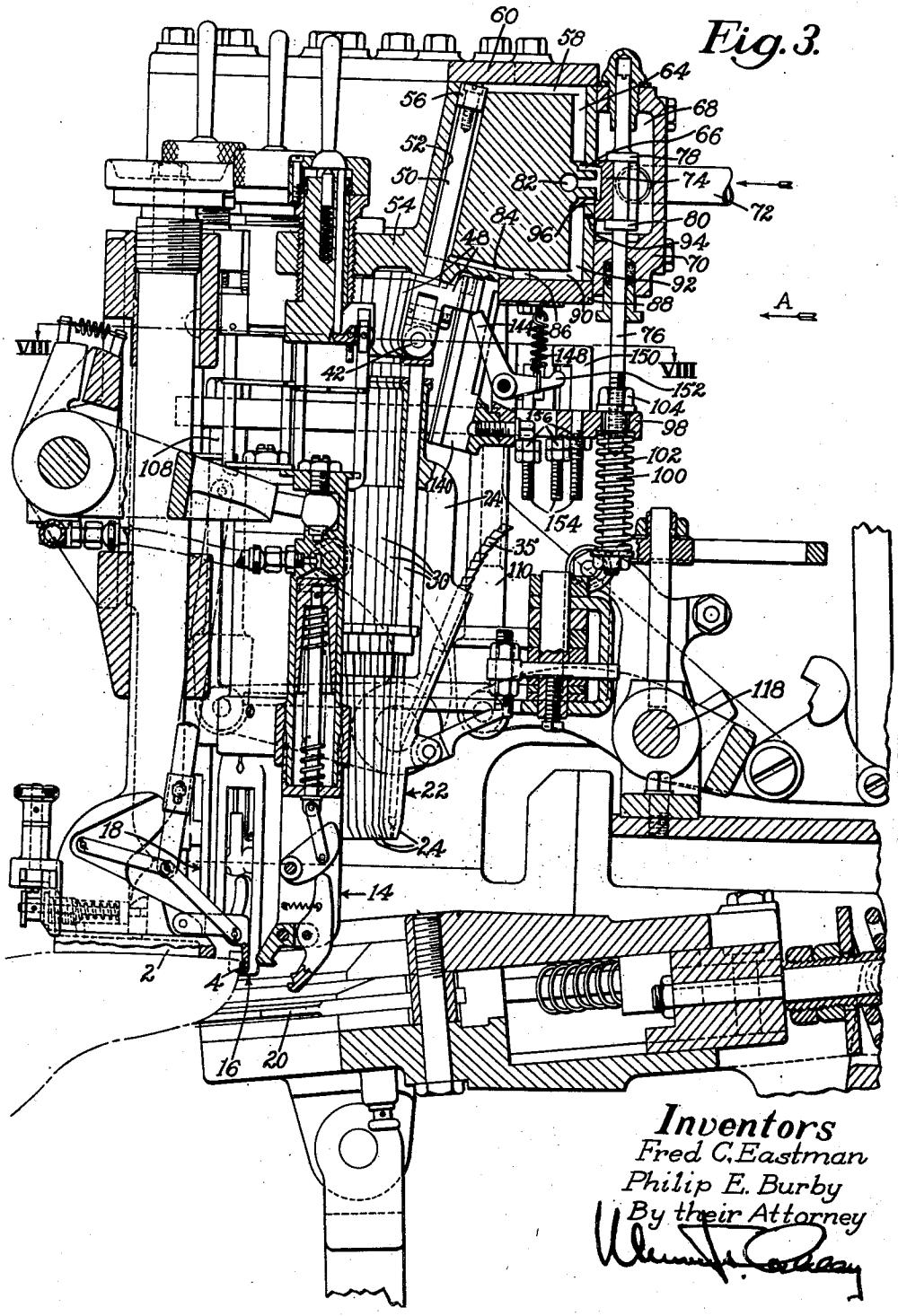
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FASTENING-INSERTING MACHINE

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Fig. 3.



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FASTENING-INSERTING MACHINE

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Fig. 7

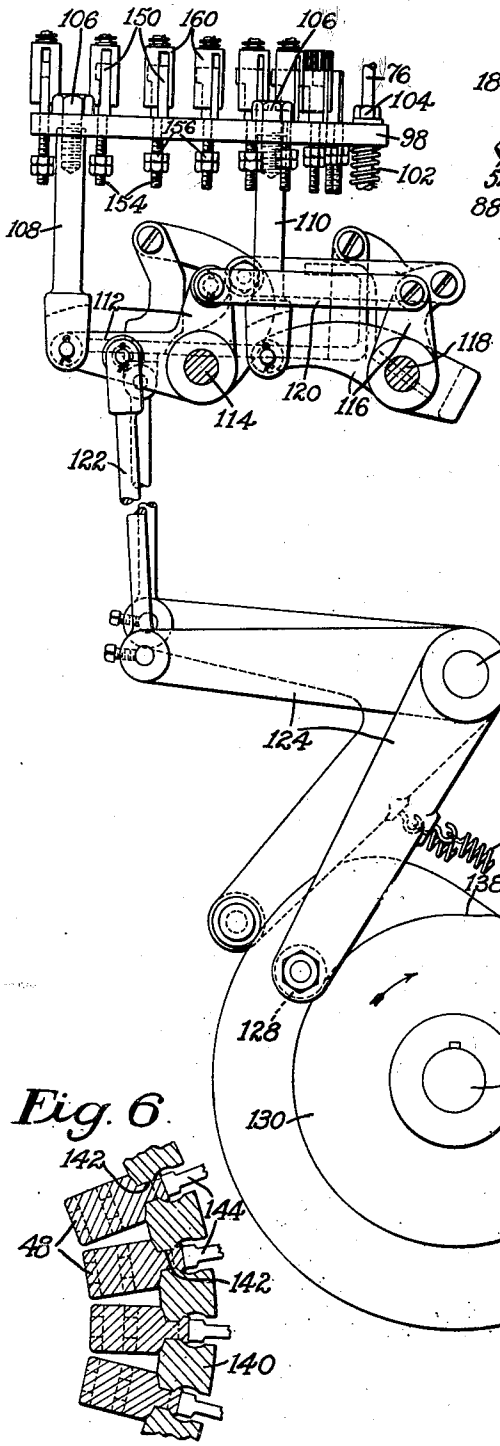


Fig. 4

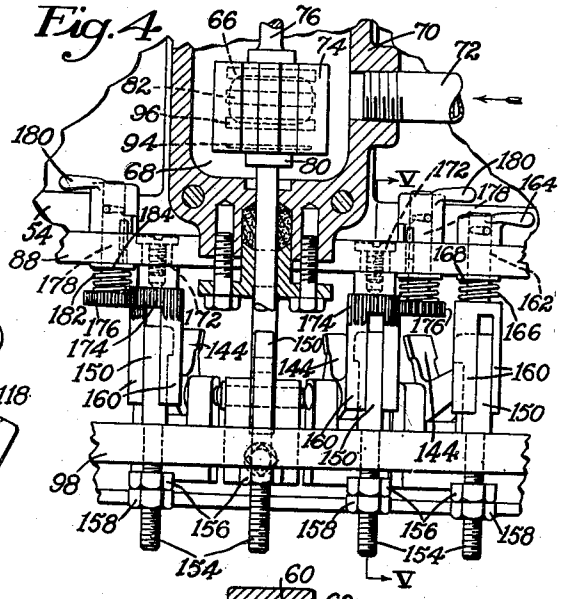


Fig. 5

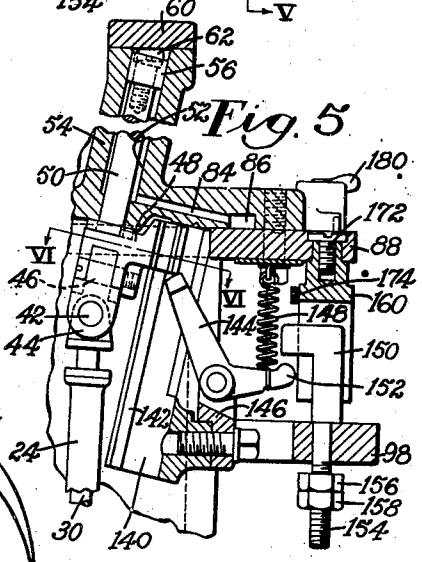


Fig. 6

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Fig. 8

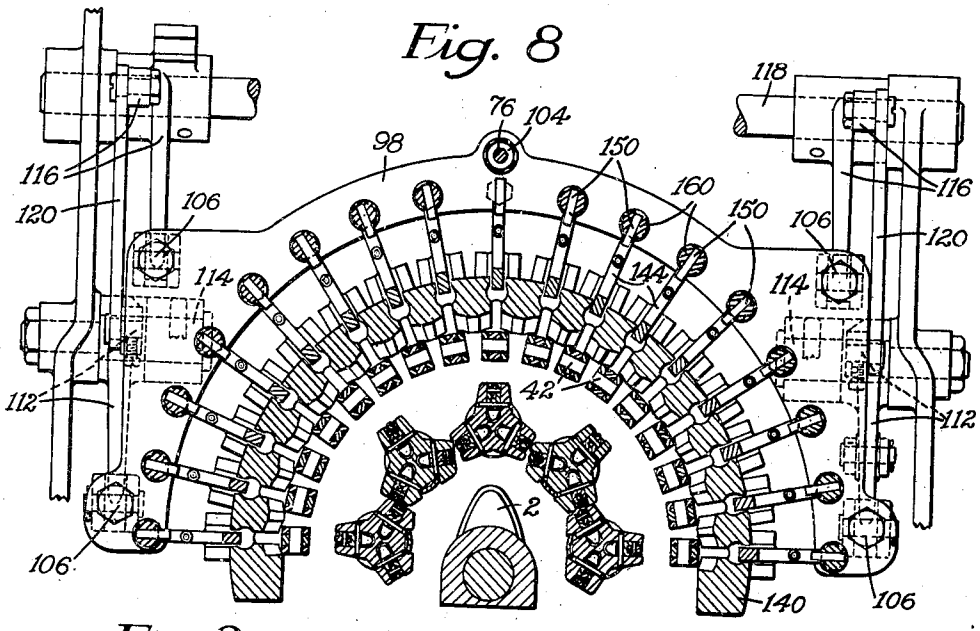


Fig. 9

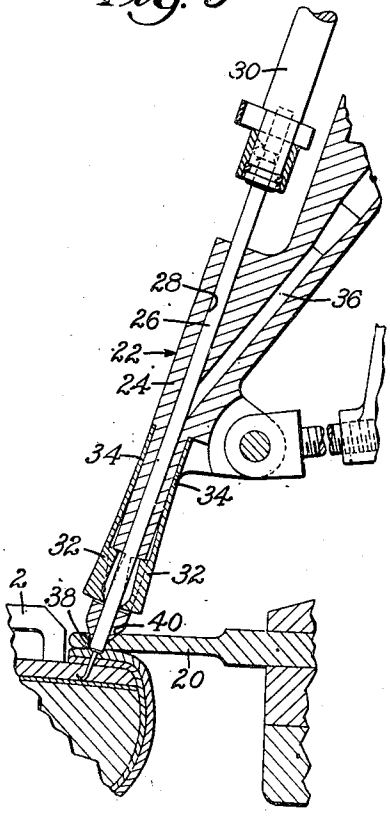
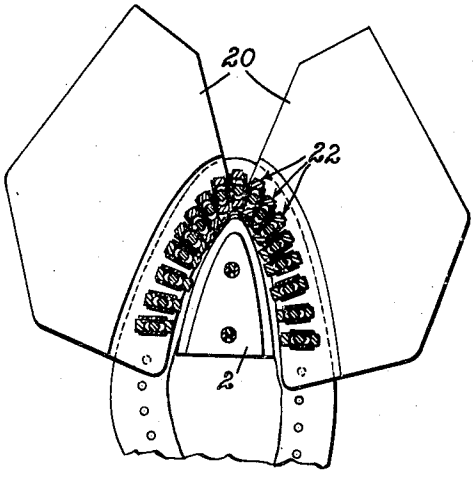


Fig. 10



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Patented Dec. 13, 1949

2,490,901

UNITED STATES PATENT OFFICE

2,490,901

FASTENING-INSERTING MACHINE

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Original application March 6, 1946, Serial No. 652,472. Divided and this application January 24, 1947, Serial No. 723,912

18 Claims. (Cl. 1—18.1)

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This invention relates to fastening-inserting machines, the present application being a division of a copending application for Letters Patent for improvements in Shoe machines, Serial No. 652,472, filed on March 6, 1946. The invention is shown as applied to a toe-lasting machine having means for driving a plurality of fastenings around the toe end of the shoe bottom to fasten the upper in lasted position, but it will be understood that it is not limited to machines of that kind or, in some aspects, to machines for operating on shoes.

The machine herein shown includes in its organization a plurality of fastening-inserting devices having fluid-operated drivers movable independently of one another to drive a corresponding number of fastenings. As applied to such an organization, the invention provides novel means to cause different drivers to operate respectively at different times. In the construction shown the drivers are operated by pistons all of which are subjected at one time to the pressure of the operating fluid, and associated with the pistons are devices which hold them initially against movement by the fluid but are operated to release them in a variably predetermined order, the order of their release being preferably such that, for the most part, different pairs of fastenings are driven in succession. In this manner the application of excessive pressure to the work in the driving of the fastenings is avoided and insurance also is afforded against any undesirable drop in the presence of the operating fluid such as might result if all the drivers were operated simultaneously. Provision is further afforded, as herein shown by control of the above-mentioned releasing devices, for varying the number and arrangement of the fastenings driven by preventing selectively the operations of different drivers.

The above and other features of the invention, including various novel details of construction and combinations of parts, will now be more particularly described with reference to the accompanying drawings and thereafter pointed out in the claims.

In the drawings,

Fig. 1 is a view in right-hand side elevation of the greater portion of the machine in which the invention is herein shown as embodied, with parts broken away;

Fig. 2 is a plan view on an enlarged scale of the upper front portion of the machine, with parts broken away;

Fig. 3 is a section on the line III—III of Fig. 2;

Fig. 4 is a view mainly in rear elevation of the

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portion of the structure toward which the arrow A points in Fig. 3;

Fig. 5 is a section on the line V—V of Fig. 4;

Fig. 6 is a section on the line VI—VI of Fig. 5;

Fig. 7 is a view in right-hand side elevation of a portion of the means for controlling the driving of the fastenings;

Fig. 8 is a section on the line VIII—VIII of Fig. 3;

Fig. 9 is a vertical sectional view on an enlarged scale showing one of the fastening-inserting devices with the driver at the end of its operative movement; and

Fig. 10 is mainly a plan view, with parts in section, showing the fastening-inserting devices in positions for driving the fastenings around the toe end of the bottom of a shoe.

As more fully disclosed in the above-mentioned copending application, the toe-lasting machine to which the present invention is shown as applied is provided with a plate 2 for positioning a shoe heightwise in the machine by engagement with the bottom face of the toe end of the insole, the position of the shoe lengthwise being determined by an end gage 4 arranged to serve as an abutment in contact with the toe-end face of the last and so formed that it also centralizes the toe end of the last and shoe laterally. Early in a cycle of automatic operations of the machine, corresponding to one revolution of a cam shaft 6 driven through a clutch 8, the end gage 4 is swung upwardly away from the shoe after the shoe has been clamped against the plate 2 by upward movement of a toe rest 10 shown in Fig. 1. A heel rest 12 also is moved rearwardly into engagement with the heel-end face of the shoe to assist in holding it against lengthwise displacement. Shortly after the beginning of the cycle the margin of the upper about the toe end of the last is gripped by a plurality of grippers, three of which are identified generally by the reference characters 14, 16 and 18 in Fig. 3, and these grippers are operated to pull the upper in directions heightwise of the last. In proper time relation to the movements of the grippers a pair of toe-embracing wipers 20 (Figs. 3, 9 and 10) are advanced and closed to engage the upper about the end and along the sides of the toe and are moved upwardly to wipe the upper heightwise of the last. Thereafter the wipers are further advanced and closed to wipe the marginal portion of the upper inwardly over an insole on the last, the grippers being opened to release the upper and being moved to positions such as not to interfere with

means for thereafter fastening the margin of the upper to the insole.

For fastening the upper the machine is provided with a plurality of fastening-inserting devices each identified generally by the reference character 22, these devices being hereinafter frequently referred to as tackers since they are constructed to drive tacks. As shown in Fig. 10, these tackers are seventeen in number for driving a maximum of seventeen tacks about the end portion of the shoe bottom. Each tacker (Fig. 9) includes a tack holder 24 and a tack driver 26 movable in a driver passage 28 in the tack holder to drive the tack, the driver being detachably secured to a driver bar 30 which, as shown in Fig. 3, is guided by an upwardly extending portion of the tack holder and may be considered a part of the tacker. Near its lower end each tack holder 24 is provided with a pair of tack fingers 32 arranged to extend inwardly through openings in its opposite sides to support the tack in the driver passage prior to the tack-driving operation. The tack fingers have integral therewith upwardly extending leaf springs 34 the upper ends of which are secured to the tack holder. When the driver 26, therefore, is operated to drive the tack it forces the tack fingers apart to permit it to pass between them, as shown in Fig. 9. Tacks are fed at the proper time in the cycle through flexible tubes 35 (Fig. 1) into tack-receiving passages 36 in the several tack holders by means fully described in the previously mentioned copending application, and when the drivers are retracted above the lower ends of these passages the tacks are admitted into the driver passages 28 where they are supported by the tack fingers in positions to be driven.

One of the tackers, which may be termed the end tacker, drives its tack in the V-shaped recess between the wipers 20 when the latter are at the limits of their inward wiping movements over the shoe bottom, as will be evident from Fig. 10. The other tackers drive their tacks through holes 38 in the wipers, one of which holes is shown in Fig. 9, the tapering lower ends of the tack holders 24 being seated in recesses 40 in the upper faces of the wipers when the tacks are driven. In order, however, to provide room for the operation of the several grippers on the upper, the tack holders occupy initially positions in which they are both upwardly and outwardly retracted substantial distances from their tacking positions, as shown in Fig. 3. To permit such outward retractive movements of the tack holders and to provide further for adjustments of the tackers relatively to one another, each driver bar 30 is pivotally mounted at its upper end on a pin 42 (Fig. 5) supported in a block 44 which is pivotally mounted on a pin 46 at right angles to the pin 42 and supported in a block 48 fast on the lower end of a piston rod 50 through which the driver bar is operated. This piston rod extends upwardly into a cylindrical bore or cylinder 52 formed in a casting 54 on the frame of the machine and has fast on its upper end a piston 56 operated preferably by compressed air as hereinafter described, the several cylinders and pistons being arranged in a semi-circular series (Fig. 2). By means also hereinafter described each piston 56 is held initially at the upper end of the cylinder in which it is mounted. It will be evident that the above-described connection between each driver bar 30 and block 48 provides a universal joint permitting the tacker to be swung laterally in any direction. By mechanism fully disclosed in the above-mentioned copending application, which need not be herein described in detail, the several tackers are swung automatically at the proper time in the cycle of operations to positions over the recesses 40 in the wipers and the tack holders 24 are moved downward relatively to the driver bars 30 to position their lower ends in the recesses 40 with the tack drivers in alinement with the holes 38 in the wipers.

Compressed air is conducted to the upper ends of the several cylinders 52 to operate the tack drivers through a passageway 58 (Figs. 2 and 3) formed in the casting 54 and closed above by a cover plate 60 on the casting, this passageway leading directly to the middle cylinder and communicating also with the upper ends of the other cylinders through a semi-circular passage 62 in the casting. The passageway 58 communicates at its rear end with a vertical passageway 64 arranged to communicate at times through a port 66 with a valve chamber 68 formed in a casing 70 secured to the casting 54 and receiving compressed air through a pipe 72 leading from any suitable source of supply. Such source of supply may be an extraneous source or the machine may be provided with an air compressor and with suitable storage means. Movable in the valve chamber 68 is a slide valve 74 mounted on a rod 76 and confined between flanges 78 and 80 on the rod. When the rod is moved downwardly, as hereinafter described, to a position determined by engagement of the flange 80 with the casing 70 it opens the port 66 to the chamber 68 to admit compressed air to the upper ends of the several cylinders 52, and when it is moved upwardly from that position it closes communication between the chamber 68 and the port 66 and opens communication between this port and an exhaust passage 82 in the casting 54 to permit exhaust of the air from the upper ends of the cylinders. For returning the pistons 56 and thereby retracting the tack drivers air is admitted to the lower ends of the cylinders through passageways 84 in the casting 54 from a semi-circular passageway 86 which is closed underneath by a plate 88 on which the casting 54 rests. Air is conducted to this semi-circular passageway through a horizontal passageway 90 and a vertical passageway 92, the latter being arranged to communicate with the valve chamber 68 through a small port 94 when the valve 74 is moved upwardly beyond the position in which it is shown in Fig. 3. The valve also controls an exhaust port 96 through which air is conducted from the lower ends of the cylinders to the exhaust passage 82. The port 94 is smaller than the port 66 leading to the upper ends of the cylinders to prevent the tack drivers from being retracted so rapidly as to involve danger of breakage of parts.

The valve 74 is operated by downward and upward movements of a substantially semi-circular horizontal plate 98 (Figs. 3, 7 and 8) through which an enlarged lower section 100 of the rod 76 extends, the valve being moved downwardly through a spring 102 by downward movement of the plate and moved upwardly by engagement of the plate with a nut 104 on the rod. The plate is secured by screws 106 (Figs. 7 and 8) on the upper ends of a pair of rods 108 extending downwardly from the front ends of the plate and of another pair of rods 110 extending downwardly at the rear of the rods 108 (see also Fig. 3). The rods 108 are pivotally connected at their lower ends to forwardly extending arms of a pair of bell-crank levers 112 mounted to swing on studs

114 on the frame, and the rods 110 are pivotally connected at their lower ends to forwardly extending arms of another pair of bell-crank levers 116 fast on a rockshaft 118. Upwardly extending arms of the front and rear bell-crank levers at each side of the machine are connected together by a link 120. Accordingly the several levers swing in unison and the plate 98 is kept horizontal as it is moved downwardly and upwardly. The forwardly extending arm of the right-hand bell-crank lever 112 is connected by a link 122 to one arm of a bell-crank lever 124 mounted to turn on a shaft 126 on the frame, and the other arm of the bell-crank lever 124 carries a roll 128 in engagement with the periphery of a cam 130 on the cam shaft 6. A spring 132 connected to the bell-crank lever 124 holds the roll against the cam and, when permitted by a drop 134 on the cam, moves the plate 98 downwardly to move the valve 74 into position to admit compressed air through the port 66 to the upper ends of the cylinders 52 for operating the tack drivers. The spring 102 (Fig. 3) permits the plate 98 to be moved farther downwardly, for a purpose hereinafter explained, after the valve has been stopped in the proper position by engagement of the flange 80 on the rod 76 with the casing 70. After the driving of the tacks a rise 136 on the cam 130 moves the plate 98 and the valve upwardly to open the upper ends of the cylinders 52 to the exhaust passage 82 and to admit air to the lower ends of the cylinders through the port 94 to retract the drivers, the valve closing the exhaust port 96. Thereafter a short drop 138 on the cam causes the valve to return to the position in which it is shown in Fig. 3, in which the port 94 is covered by the valve and both ends of the cylinders are open to the exhaust passage 82.

The blocks 48 on the lower ends of the piston rods 50 are guided in their downward and upward movements by a substantially semi-circular extension 140 (Figs. 3, 5 and 6) of the casting 54, portions of the blocks lying in guideways 142 in the extension. Pawls 144 pivotally mounted on holders 146 which are secured to the extension 140 are normally held by springs 148 with their upper ends under the blocks 48 and against the extension 140 adjacent to the guideways. Even though compressed air is admitted, therefore, to the upper ends of the cylinders 52, operation of the tack drivers is prevented by the pawls until they are moved out from under the blocks 48. For thus operating the pawls to release the blocks the plate 98 carries a plurality of L-shaped members 150 arranged to engage tail portions 152 of the pawls and thus to swing the pawls out from under the blocks in response to continued downward movement of the plate 98 after the valve 74 has opened the port 66 to the chamber 68. In order to avoid such increase of pressure of the toe end of the shoe on the toe rest 10 as would result from simultaneous operation of all the tack drivers, and also to restrict the amount of compressed air needed at any one time to operate the pistons 56, the construction shown is such that some of the drivers are operated respectively at different times. Each of the L-shaped members 150 is provided with a stem 154 extending downwardly through a hole in the plate 98, and threaded on the stem below the plate is a nut 156. As illustrated, the member 150 controlling the pawl associated with the end tacker, i. e., the one which drives the tack at the extreme end of the toe, is held by its nut 156 in fixed relation to the plate 98 (Figs. 3 and 4), while the nuts associated with the other members 150 are spaced more or less below the plate. Accordingly, the end tacker is the first to drive its tack, the driving of the other tacks being delayed until such times as the plate 98 engages the corresponding nuts 156 and operates the respective pawls. The springs 148 are of sufficient strength to support the other members 150 while still maintaining the pawls in their operative positions until the plate 98 has moved downwardly along the stems 154 to engage the nuts 156. It will be evident that these nuts may be so adjusted as to cause the tacks to be driven in any desired order. Preferably, as illustrated, the two tackers located at opposite sides respectively of the end tacker drive their tacks simultaneously after the driving of the end tack, after which the next two tackers operate simultaneously, and so on until all the tacks are driven. Also threaded on all the stems 154 except the middle one are lock nuts 158 for holding the nuts 156 in adjusted positions.

All the L-shaped members 150 except the one associated with the end tacker are maintained in proper relation to the corresponding pawls 144 by forked members 160 (Figs. 4 and 5) supported by the fixed plate 88 and extending downwardly at opposite sides of the L-shaped members. All the forked members except the two members associated with the tackers which are next adjacent to the end tacker are provided with stems 162 extending upwardly through the plate 88 and having fast on their upper ends handles 164 (see Fig. 2). A spring 166 (Fig. 4) confined between each of these forked members and a washer 168 engaging the lower face of the plate 88 provides sufficient friction between the plate and the washer and also between the plate and the hub of the handle 164 to prevent the member 160 from turning too freely. In this manner the corresponding L-shaped members 150 are maintained in proper relation to the respective pawls 144, the hub of each handle 164 having thereon a projection 170 (Fig. 2) arranged to engage the side of the casting 54 to determine the proper position of the forked member 160. Each of the two forked members 160 associated with the tackers which are next adjacent to the end tacker has an upwardly extending portion mounted to turn in a bearing in the plate 88, and in this upwardly extending portion is threaded a screw 172 (Fig. 5) the head of which is mounted in a recess in the plate 88 to support the member rotatably. Formed on this member are gear teeth 174 engaged by a gear 176 (Fig. 4) from which a stem 178 extends upwardly through a bearing in the plate 88, a handle 180 being fast on the upper end of this stem. A spring 182 between each gear 176 and a washer 184 engaging the plate 88 provides friction for holding the corresponding member 160 in proper relation to the pawl 144 which it controls, the proper position of the forked member 160 being determined by a pin 186 (Fig. 2) in engagement with a lug 188 on the hub of the handle 180. In addition to maintaining the members 150 in operative relation to the pawls 144 which they control, the forked members 160 may be turned by the handles 164, 180 associated therewith to move any of the corresponding members 150 selectively into such positions that they will not operate the pawls to release the corresponding tack drivers when the plate 98 is moved downwardly. The member 150 associated with the end tacker may, however, be turned and held in such a position that it will not operate the correspond-

ing pawl. In this manner the number and arrangement of the tacks which are driven may be varied at will by rendering different tack drivers selectively inoperative. It will be evident that when any such drivers are rendered inoperative delivery of tacks to the corresponding tack holders also should be prevented. This may be done, for example, by disconnecting the flexible tack-delivery tubes 35 from those tack holders and providing a suitable receptacle to catch the tacks delivered from those tubes.

The manner of operation of the machine, in so far as it is of interest with reference to the present invention, will now be briefly summarized, the operation of the machine as a whole being more fully described in the previously mentioned copending application. The operator presents the shoe to the machine in the position determined by the plate 2 and the end gage 4, positioning the margin of the toe end of the upper in the several grippers, and then starts the machine by actuation of the clutch 8 through a treadle (not shown). Substantially at the beginning of the cycle of operations the toe rest 10 is moved upwardly to clamp the shoe against the plate 2, and near the beginning of the cycle also the heel rest 12 is moved rearwardly into engagement with the heel-end face of the shoe. Substantially as soon as the shoe is engaged by the toe rest the grippers are closed on the margin of the upper and they are then moved upwardly to pull the upper, the end gage 4 being withdrawn from operative position. In proper time relation to the movements of the grippers the wipers 20 are advanced and closed to engage the upper about the toe end of the last and are moved upwardly to wipe the upper heightwise of the last. Thereafter the wipers are further advanced and closed to wipe the marginal portion of the upper inwardly over the insole, the grippers releasing the upper and being moved to positions where they will be out of the way of the tackers. Before the completion of the inward wiping movements of the wipers the mechanism hereinbefore referred to for positioning the tackers begins to swing them inwardly toward positions over the shoe bottom and to move the tack holders 24 downwardly, these movements of the tackers being completed and the lower ends of the tack holders being seated in the recesses 40 (Fig. 9) in the wipers after the completion of the movements of the wipers. At this point the machine preferably comes to a stop for reasons explained in the previously mentioned application. If the operations thus far have been satisfactorily performed, the operator again starts the machine to cause it to complete its cycle and drive the tacks. Immediately after such starting of the machine the tacker-controlling plate 98 begins to move downwardly, first operating the valve 74 to admit compressed air through the port 66 above all the driver-operating pistons 56, the lower ends of the cylinders 52 being open to the exhaust passage 82, and then by its engagement with the nuts 156 causing the L-shaped members 150 to operate the pawls 144 and thereby to release the driver-operating pistons in the order predetermined by the adjustments of the nuts 156. If any of the members 150 have been turned to such positions as to prevent them from acting on the pawls, the corresponding drivers remain idle. As herein illustrated, the end tacker is first operated and thereafter different pairs of tackers in succession in the manner previously explained. It will be understood that each piston, upon its release by the corresponding pawl, is immediately forced downward by the compressed air above it to drive the corresponding tack and to clinch it on the usual metal plate on the bottom of the last (Fig. 9). After the driving of the tacks the parts of the machine are returned in the proper order to starting positions. In this portion of the cycle the valve 74 is moved upwardly by the plate 98 far enough to admit compressed air through the restricted port 94 to cause the return of the pistons 56 into positions where they are again held by the pawls 144, the upper ends of the cylinders 52 being simultaneously put into communication with the exhaust passage 82. The valve 74 then receives a short downward movement to cover the port 94 and to leave both ends of the cylinders in communication with the exhaust passage. It will be understood that in the return of the tackers to starting positions the several tack holders 24 are lifted clear of the wipers before the latter receive their retractive movements.

Having described the invention, what we claim as new and desire to secure by Letters Patent of the United States is:

1. In a fastening-inserting machine, a plurality of fluid-operated drivers movable independently of one another to drive fastenings, means for holding said drivers initially against movement by the fluid, and additional means for releasing the drivers in such order as to drive different fastenings respectively at different times.

2. In a fastening-inserting machine, a plurality of fluid-operated drivers movable independently of one another to drive fastenings, devices associated respectively with said different drivers for holding them initially against movement by the fluid, and means for operating said devices to release the drivers in such order as to drive different fastenings respectively at different times.

3. In a fastening-inserting machine, a plurality of fluid-operated drivers movable independently of one another to drive fastenings, means for holding said drivers initially against movement by the fluid, and additional means for releasing the drivers in such order as to drive different pairs of fastenings in succession.

4. In a fastening-inserting machine, a plurality of drivers for driving fastenings, fluid-operated members associated respectively with different drivers for operating them, means for subjecting all said members to the pressure of operating fluid at one time, means for holding the members initially against movement by the fluid, and additional means for releasing the members in such order as to cause different fastenings to be driven respectively at different times.

5. In a fastening-inserting machine, a plurality of drivers for driving fastenings, fluid-operated members associated respectively with different drivers for operating them, means for subjecting all said members to the pressure of operating fluid at one time, devices associated respectively with said different members for holding them initially against movement by the fluid, and means for operating said devices to release the members in such order as to cause different fastenings to be driven respectively at different times.

6. In a fastening-inserting machine, a plurality of drivers for driving fastenings, fluid-operated members associated respectively with different drivers for operating them, means for subjecting all said members to the pressure of operating fluid at one time, means for holding the members initially against movement by the fluid, and addi-

tional means for releasing the members in a variably predetermined order.

7. In a fastening-inserting machine, a plurality of drivers for driving fastenings, fluid-operated pistons associated respectively with different drivers for operating them, cylinders in which said pistons are movable, means providing a passage in open communication with all said cylinders, a valve for admitting operating fluid to said passage, means for holding the pistons initially against movement by the fluid thus admitted, and additional means for releasing the pistons in a predetermined order.

8. In a fastening-inserting machine, a plurality of drivers for driving fastenings, fluid-operated pistons associated respectively with different drivers for operating them, cylinders in which said pistons are movable, means providing a passage in open communication with all said cylinders, a valve for admitting operating fluid to said passage, devices arranged to hold said pistons initially against movement by the fluid thus admitted, and means for operating said devices to release the pistons in such order as to cause different fastenings to be driven respectively at different times.

9. In a fastening-inserting machine, a plurality of drivers for driving fastenings, fluid-operated pistons associated respectively with different drivers for operating them, cylinders in which said pistons are movable, means providing a passage in open communication with all said cylinders, a valve for admitting operating fluid to said passage, devices arranged to hold said pistons initially against movement by the fluid thus admitted, and a member movable to operate said valve to admit the fluid and further movable thereafter to operate said devices to release the pistons in a predetermined order.

10. In a fastening-inserting machine, a plurality of drivers for driving fastenings, fluid-operated pistons connected respectively to the different drivers, cylinders in which said pistons are movable, means for admitting operating fluid to opposite ends of said cylinders to operate and to return the drivers respectively, devices for holding the pistons against operative movements after the drivers have been thus returned, and means for operating said devices to release the pistons in a predetermined order for the driving of the next fastenings.

11. In a fastening-inserting machine, a plurality of fluid-operated drivers movable independently of one another to drive fastenings, and means for preventing the fluid from operating one or more of said drivers selectively to vary thereby the number of the fastenings driven.

12. In a fastening-inserting machine, a plurality of drivers for driving fastenings, fluid-operated members associated respectively with different drivers for operating them independently of one another, and means for holding one or more of said fluid-operated members selectively against movement by the fluid to vary thereby the number of the fastenings driven.

13. In a fastening-inserting machine, a plurality of fluid-operated drivers movable independently of one another to drive fastenings, controlling means for holding said drivers initially against movement by the fluid, and additional means for thereafter releasing the drivers to render the fluid effective to operate them, said additional means being adjustable to prevent such release of one or more of the drivers and thus to vary the number of the fastenings driven.

14. In a fastening-inserting machine, a plurality of fluid-operated drivers movable independently of one another to drive fastenings, devices associated respectively with said drivers for holding them initially against movement by the fluid, and members movable to operate said devices in a predetermined order to release the corresponding drivers, said members being mounted for movements selectively into positions to prevent them from thus operating said devices.

15. In a fastening-inserting machine, a plurality of drivers for driving fastenings, fluid-operated members associated respectively with different drivers for operating them, means for subjecting all said members to the pressure of operating fluid at one time, controlling means for holding the members initially against movement by the fluid, and additional means for releasing the members in a predetermined order, said additional means being adjustable to prevent such release of different members selectively.

16. In a fastening-inserting machine, a plurality of drivers for driving fastenings, fluid-operated members associated respectively with different drivers for operating them, means for subjecting all said members to the pressure of operating fluid at one time, devices arranged to hold said members initially against movement by the fluid, and controlling members for operating said devices in a predetermined order to release the corresponding fluid-operated members, said controlling members being mounted for movements selectively into positions to prevent them from acting on the corresponding devices.

17. In a fastening-inserting machine, a plurality of drivers movable independently of one another to drive a corresponding number of fastenings into the bottom of a shoe in a group extending around an end portion of the shoe bottom, and means for selectively preventing operative movements of any of said drivers to vary thereby the number and arrangement of the fastenings driven.

18. In a fastening-inserting machine, a plurality of drivers arranged to drive a corresponding number of fastenings into the bottom of a shoe in a group extending around an end portion of the shoe bottom, fluid-operated members associated respectively with said different drivers for operating them independently of one another, and means for holding any of said members selectively against movement by the fluid to vary thereby the number and arrangement of the fastenings driven.

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Certificate of Correction

Patent No. 2,490,901 December 13, 1949

FRED C. EASTMAN ET AL.

It is hereby certified that errors appear in the printed specification of the above numbered patent requiring correction as follows:

Column 1, line 33, for the word "presence" read *pressure*; column 5, line 42, after "semi-circular" insert *downward*; column 6, line 74, for "however" read *moreover*; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 2nd day of May, A. D. 1950.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.