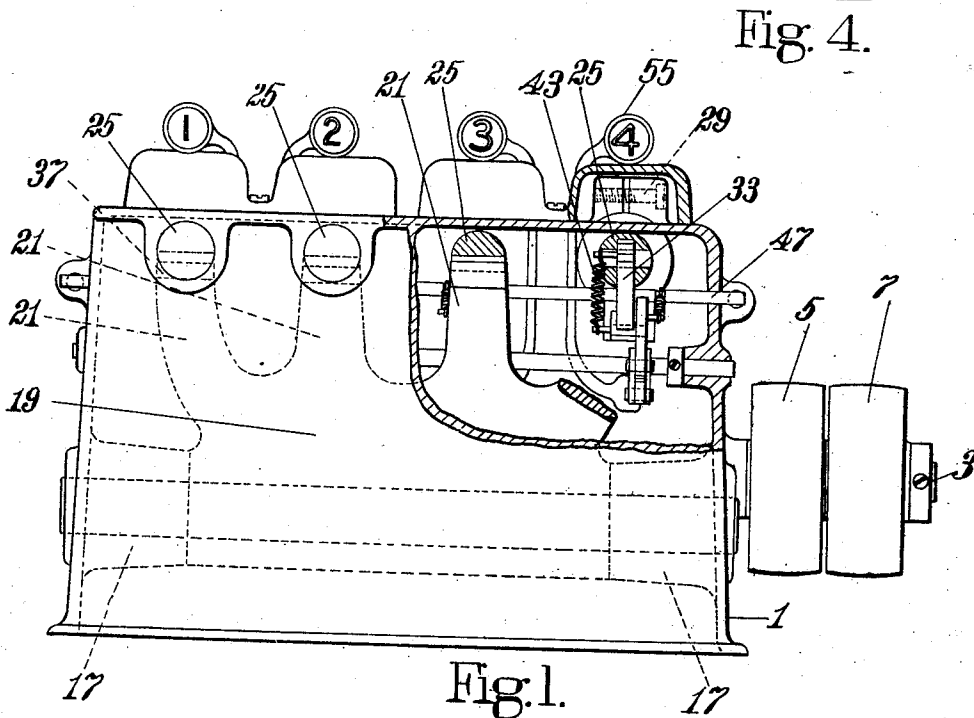
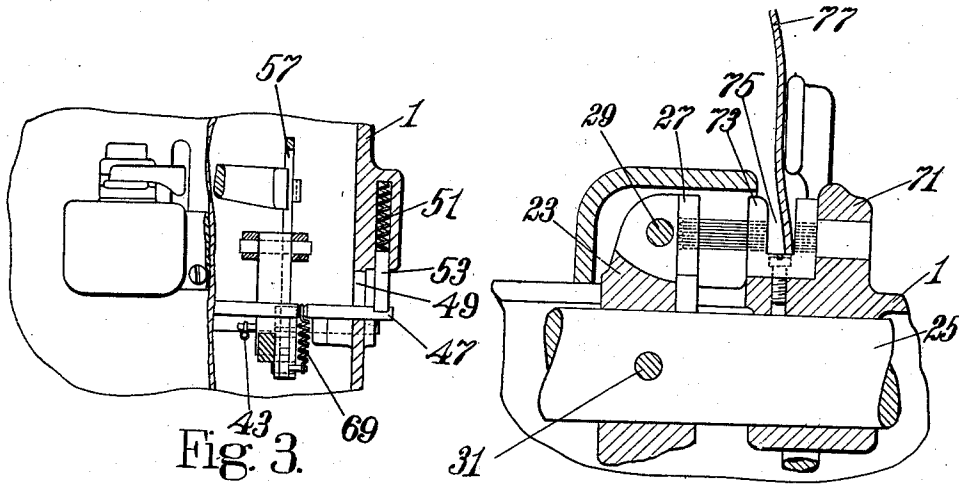


A. BATES.
PUNCHING MACHINE.
APPLICATION FILED JULY 2, 1909.

994,298.

Patented June 6, 1911.

2 SHEETS—SHEET 1.



WITNESSES:

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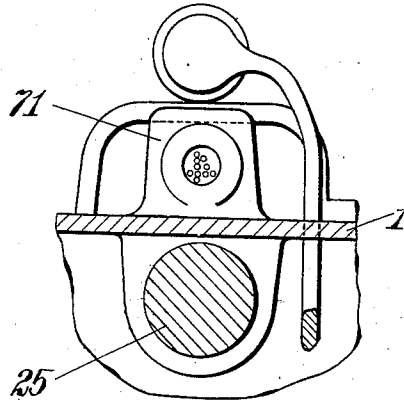


Fig. 5.

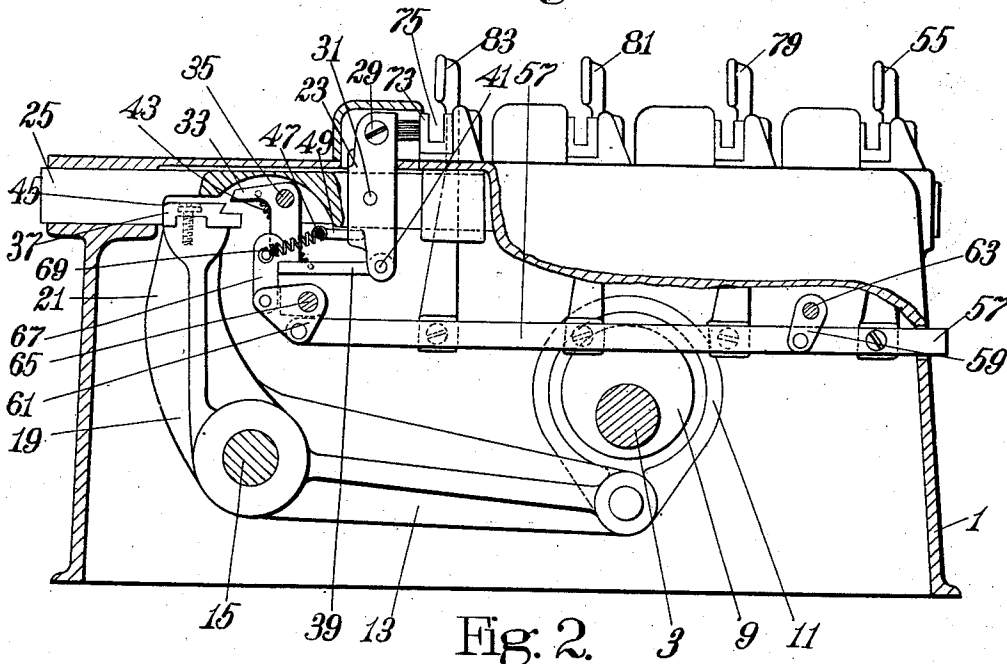


Fig. 2.

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UNITED STATES PATENT OFFICE.

ARTHUR BATES, OF LEICESTER, ENGLAND, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

PUNCHING-MACHINE.

994,298.

Specification of Letters Patent.

Patented June 6, 1911.

Application filed July 2, 1909. Serial No. 505,589.

To all whom it may concern:

Be it known that I, ARTHUR BATES, a subject of the King of England, residing at Leicester, Leicestershire, England, have invented certain Improvements in Punching-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to machines provided with a plurality of tools any one of which or any group of which may be selected to operate upon stock and is herein shown as embodied in a machine for punching size numbers in the uppers of boots and shoes.

In certain constructions of machines of this type hitherto employed the individual tools have all been operated in unison whenever one tool has been operated. These constructions have been found disadvantageous by reason of the comparatively slow operation of the machines and the unnecessary wear upon the parts. In other constructions wherein separate operation of the tools has been possible it has been necessary after presentation of the work to the machine that some more or less remote part be manipulated in order to select the desired tool.

In order to obviate the disadvantages of these machines one object of this invention relates to the provision in machines of this class of means whereby presentation of work to a given tool causes a certain number of tools to operate independently of the remaining tools. This may be accomplished in any convenient manner, and in the illustrated embodiment of the invention a plurality of triggers are provided adjacent the several punch blocks or dies, said triggers being adapted as the work is presented to any particular punch to connect that punch with a constantly moving actuator.

It is desirable in machines of this class that the given tool operate upon the work but once, and accordingly a further object of this invention relates to the provision of means whereby the selected tool is automatically disconnected from its actuator at the end of its effective stroke.

A further object of this invention relates to a construction whereby after the tool has been automatically disconnected from its actuator it is prevented from becoming

again connected therewith until after the work has been removed from the machine.

A further object of the invention relates to the provision in a machine for operating upon superimposed parts of means whereby the juxtaposed parts may be held vertically during the operation of the tool so that in case the parts are identical in outline the operator may observe the upper margins and judge from their alinement whether or not the lower margins are in similar alinement.

These and other features of the invention including certain details of construction and combinations of parts will be explained in connection with the following description of a machine and will be pointed out more definitely in the claims.

Referring to the drawings:—Figure 1 is a front elevation partly in section of a machine for punching numerals or other distinguishing marks in the uppers of boots and shoes; Fig. 2 is a side elevation also partly in section; Fig. 3 is a part plan and part horizontal section of a portion of the machine showing in particular a plan view of the mechanism for connecting each punch with the actuator; Fig. 4 is an enlarged sectional view of one of the punches and the adjacent parts, the plunger on which the punch carrier is mounted being shown in full lines. In this figure a piece of stock is shown in position to be punched. Fig. 5 is a view at right angles to Fig. 4 of the parts shown therein, the plunger being shown in section.

Mounted in bearings in the frame 1 is a driving shaft 3 which carries the usual fast and loose pulleys 5 and 7. An eccentric 9 fast to this shaft is encircled by a strap 11 which is pivoted to one arm 13 of a bell crank lever fulcrumed on a rod 15 which is sustained in bearings 17 in the frame. The upright arm 19 of the bell crank lever is provided with as many branches 21 as there are punches in the machine. From the description thus far it will be clear that rotation of the shaft 3 will cause the bell crank lever to oscillate about its fulcrum and thereby cause reciprocation of the branches 21. In the operation of the machine this arm 19 with its branches constitutes a continuously moving actuator.

The tool holders 23 are mounted respectively on a plurality of plungers 25, four being shown in the illustrated machine,

which are capable of longitudinal reciprocation in bearings in the frame 1. The tools in the illustrated embodiment are shown as punches consisting of a plurality of members arranged in the form of numerals as shown in Fig. 5 wherein the punch illustrated is adapted to produce the numeral 4. The members of the punches may be fixed to the tool holders in any convenient manner, as, for example, by mounting them in dove-tailed blocks which are adapted to fit into corresponding grooves in the tool holders 23, said tool holders being split and provided with clamping screws 29. The tool holders 23 are fixed to the plungers 25 by any convenient means, as, for example, pins so that reciprocation of any given plunger causes reciprocation of the tool carrier associated with it.

The mechanism for connecting the several plungers with the actuator, and for controlling these connecting mechanisms are identical and therefore only one will be described.

In order to connect the plunger with the actuator a pawl 33 pivoted to the plunger at 35 is adapted to coact with a detent plate 37 fastened to the upper part of the actuator. In a recess in the lower part of the pawl 33 a retainer bar 39 is adapted to fit, said bar being pivoted to the tool carrier 23 by a pin 41 and being yieldingly connected with said pawl by a spring 43. With the construction thus far described it is clear that by depressing the free end of the retainer bar 39 the operative arm of the pawl 33 will be drawn into engagement with the actuator to produce forward movement of the plunger and with it the punch, backward movement being produced by engagement of the actuator with an abutment 45 on the plunger.

It is desirable that the connecting means between the punch and actuator be automatically disengaged at the end of the operative stroke of the plunger so that the punch shall make a single reciprocation and then come to rest. Accordingly a rod 47 mounted in slots 49 in the frame is held normally in that end of the slot adjacent the pawl 33 by means of springs 51 which act upon plungers 53. With this construction, as the pawl engages the actuator and is moved forward the springs 51 are compressed to such an extent that as the actuator makes its return stroke the pawl 33 is forced from engagement with the detent 37, and the plunger comes to rest at the position from which it started.

In machines of this class it is convenient to cause the tool to operate by moving a lever of some sort which is suitably connected to the remaining mechanism and it is desirable that the tool be automatically caused to come to rest whether or not the said lever is released, so that it will be necessary to release said lever and press it again in order to

bring about a second operation of the tool. In the illustrated embodiment of the invention the lever or trigger corresponding to the particular mechanism described above is indicated at 55. This trigger is fast to a rod 57 which is suspended from links 59 and 61 pivoted to the frame of the machine at 63 and 65, respectively. To an extension of the link 61 is pivoted a catch 67, said catch being adapted to lower the end of the retainer bar 39 when actuated, and in order to return said catch to its initial position a spring 69 connects it with the rod 47. It will be clear, therefore, that until the lever is released the catch 67 will not engage the retainer bar 39 and further operation of that particular punch will be prevented.

Projecting from the upper part of the frame 1 are brackets 71 which carry the seats for the tools, herein shown as dies 73, through which the perforating punches pass, the arrangement of the holes or perforations in the dies corresponding with the arrangement of the members of the punches as shown in Fig. 5. Each die is provided with a recess 75 in which the work, indicated in Fig. 4 by 77, is placed; and these recesses are formed with flat floors so that the operator can judge by the outer edges of a plurality of superimposed sheets of the same contour as they are placed in position to be operated upon whether the inner edges are in proper alinement.

In order that presentation of the work to any given punch may cause that punch to operate independently of the remaining punches the triggers 55, 79, 81 and 83 are mounted adjacent their respective dies in such a manner that as the margin of the work is placed in the selected recess and pressed back into place against the wall thereof the corresponding trigger will be actuated to cause the corresponding punch to operate. In order to aid the operator in selecting the desired punch the upper portions of the triggers may conveniently be formed with faces upon which are indicated the numerals or other characters corresponding to the punches, as shown in Fig. 1.

The operation of the machine is as follows:—The operator having superimposed several pieces of stock, if he desires to punch several at once, places their lower margins in the recess of the die which corresponds to the desired punch and presses said pieces forward against the wall of said recess and necessarily against the adjacent trigger (for example that numbered 55). This causes the rod 57 to move toward the right in Fig. 2, swings the link 61 on its pivot and thereby pulls down the free end of the pivoted retainer bar 39 and through the medium of the spring 43 brings the operative end of the pawl into the path of the continuously moving detent plate 45. The plunger together

with the punch is then moved forward to mark the stock, and the retainer bar 39 is disengaged from the catch 67. During this forward movement the spring 51 becomes
 5 compressed, and as the actuator makes its return movement the force of this spring disengages the pawl from the detent plate and brings the recess in its lower end once
 10 39 so that only one reciprocation is accomplished. It should be noticed that so long as the work remains in the machine the catch 67 remains in its lower position and that a second reciprocation of the punch
 15 can not be brought about until the work has been removed and the catch returned by the spring 69 to the position shown in Fig. 2.

The machine has been described as adapted to operate upon a plurality of
 20 pieces of stock at one reciprocation and as being so constructed that presentation of stock to any given tool causes that tool alone to operate, but it should be understood that the number of pieces operated upon by a tool
 25 at each reciprocation and the number of tools caused to operate by presentation of stock to any given tool is immaterial. And although the invention has been shown and described in connection with a particular
 30 machine nothing herein contained is to be construed as limiting the invention in the scope of its application to the particular machine shown and described.

The invention having been thus set forth
 35 what is claimed and desired to be secured by Letters Patent is:—

1. A machine of the class described having, in combination, a plurality of tools, and means whereby presentation of work to
 40 a given tool causes a certain number of tools to operate independently of the remaining tools.

2. A machine of the class described having, in combination, a plurality of tools
 45 capable of independent operation, and means whereby presentation of work to any given tool causes that tool to operate independently of the remaining tools.

3. A machine of the class described having
 50 in combination, an actuator, a series of tools, and means whereby presentation of work to any particular tool effects operative relationship between that tool and the actuator independently of the remaining tools.

4. A machine of the class described having, in combination, an actuator, a series of
 55 tools and seats for said tools, said seats being constructed to receive that portion of the work upon which the tools are to operate, and means adjacent said seats and adapted to be engaged by the work whereby the tool to which the work is presented is caused to operate independently of the remaining
 60 tools.

5. A machine of the class described hav-

ing, in combination, a plurality of dies, a plurality of punch bars, punches mounted on said bars and cooperating with said dies, a single actuator for said punch bars, and
 70 means for selectively connecting said actuator with any one of said punch bars, said means including a plurality of members adjacent said dies.

6. A machine of the class described having, in combination, an actuator, a plurality
 75 of tools, a trigger adjacent each tool, and means whereby pressure upon any trigger causes the adjacent tool to be connected with the actuator.

7. A machine of the class described having, in combination a plurality of tools, a
 80 continuously moving actuator therefor, and means for connecting any given tool with said actuator independently of the remaining tools.

8. A machine of the class described having, in combination a plurality of tools, an
 85 actuator therefor, means whereby presentation of work to a given tool causes that tool to make one complete reciprocation, and
 90 means for preventing a second reciprocation until the work has been removed.

9. A machine of the class described having, in combination, a plurality of tools, an
 95 actuator therefor, means for selectively connecting said tools with said actuator, and means for controlling said connecting means, said controlling means including a member capable of manual operation to cause said
 100 connecting means to become operative, and automatic means for rendering said connecting means inoperative at the end of a single reciprocation.

10. A machine of the class described having, in combination, a plurality of normally
 105 stationary tools, a continuously moving actuator therefor, means for connecting a selected tool independently with said actuator by presenting work to said tool, and means for controlling said connecting means, said
 110 controlling means being constructed and arranged to render said connecting means operative during one reciprocation of said tool and then to lock said connecting means in inoperative position until said work is removed.

11. A machine of the class described having, in combination, a tool, an actuator
 120 therefor, a connecting member, a retainer bar normally engaging said member, yielding means connecting said member and bar, and means for withdrawing said bar from engagement with said member.

12. A machine of the class described, having in combination, a tool, a reciprocating
 125 actuator therefor, a connecting member, a retainer bar normally engaging said member, yielding means connecting said member and bar, a spring-pressed catch normally engaging said bar, and means for operating
 130

said catch to disengage said bar from said connecting member whereby said tool is caused to make one reciprocation and then come to rest.

5 13. A machine of the class described, having, in combination, a plurality of tools, means for operating any given tool independently of the rest, and a plurality of dies for said tools, said dies being formed with
10 recesses having flat floors whereby the outline of the outer edges of a plurality of superimposed pieces of work of similar contour when placed with their lower edges resting on said floor will serve as an indication of the state of alinement of said lower
15 edges.

14. A machine of the class described having, in combination, a plurality of tools for marking stock with different characters, a
20 member adjacent each tool having inscribed thereon the character marked on said stock by said tool, and means whereby presentation of stock to any given tool causes that tool to operate independently of the others.

25 15. A machine of the class described having,

in combination, a plurality of tools, a continuously moving actuator therefor, means for causing any given tool to make one reciprocation, and means for preventing a second reciprocation until the work has
30 been removed.

16. A machine of the class described having, in combination, a plurality of tools, a continuously moving actuator therefor, means for connecting a selected tool with the
35 actuator and means for controlling said connecting means, said controlling means being constructed and arranged to render said connecting means operative during one cycle of movement of said tool and then to hold
40 said connecting means in inoperative position.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ARTHUR BATES.

Witnesses:

ARTHUR ERNEST JERRAM,
JOHN RICHARD LAW.