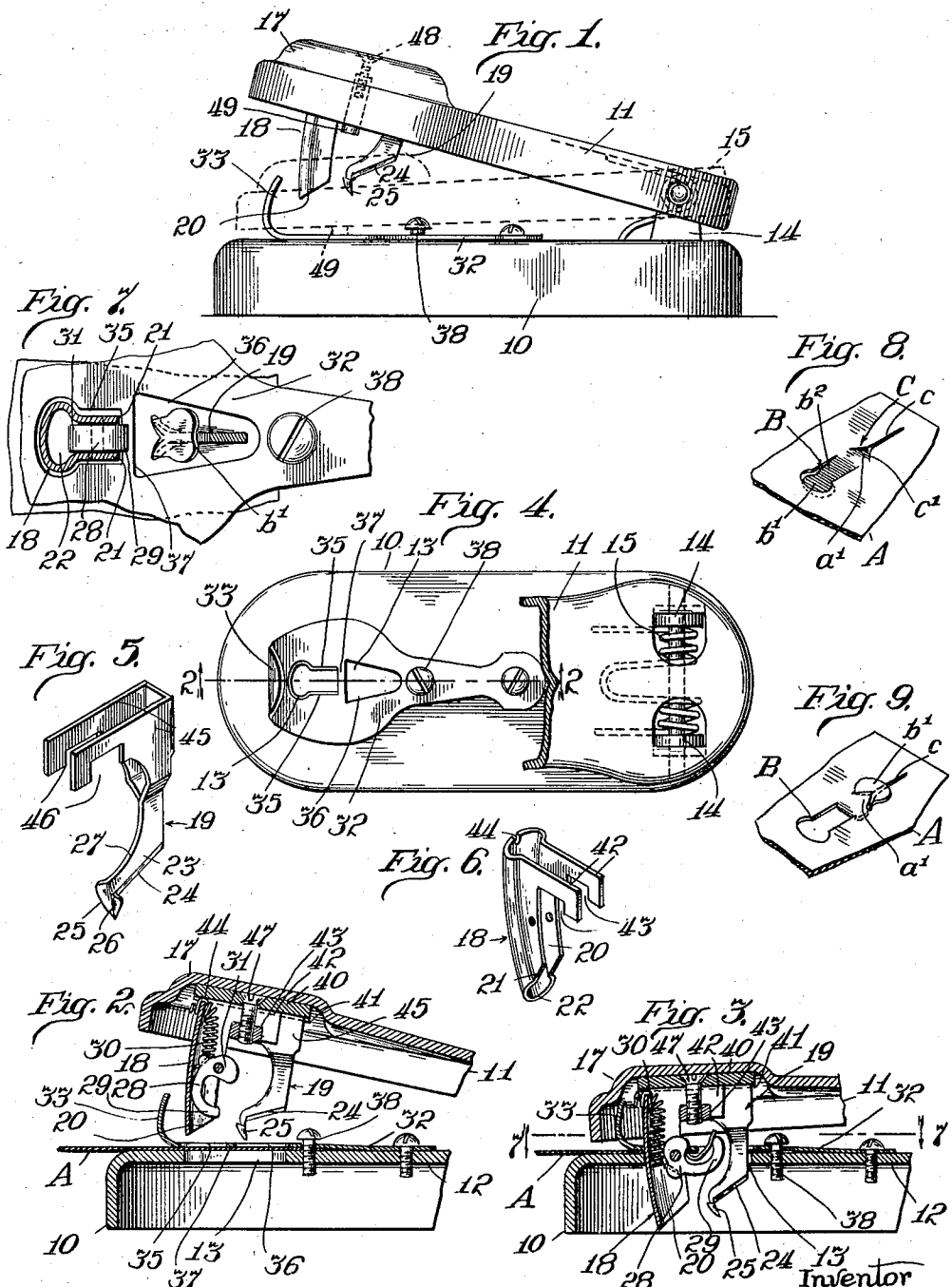


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 PAPER FASTENING MACHINE.  
 APPLICATION FILED DEC. 11, 1917.

1,324,103.

Patented Dec. 9, 1919.



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# UNITED STATES PATENT OFFICE.

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PAPER-FASTENING MACHINE.

1,324,103.

Specification of Letters Patent.

Patented Dec. 9, 1919.

Application filed December 11, 1917. Serial No. 206,592.

*To all whom it may concern:*

Be it known that I, CHARLES S. CONE, a citizen of the United States, residing at La Crosse, in the county of La Crosse and State of Wisconsin, have invented certain new and useful Improvements in Paper-Fastening Machines; of which the following is a specification.

My invention relates to paper fastening machines of the character adapted to punch, from a sheet or sheets of paper operated on, a paper tongue and to force said tongue through a slit formed in the sheet or sheets to receive the same, thus to provide a paper-lock. Among its objects are to provide paper holding, paper cutting and tongue manipulating mechanisms coordinate to produce a novel and advantageous form of lock or inter-engagement of the paper parts; to afford desirable constructions and assembly of the paper cutting means, tongue manipulating means and frame mechanism; and to provide a novel and beneficial arrangement of the paper stripping element.

In the drawings wherein I have illustrated a commercial embodiment of my invention, Figure 1 is a side elevation with parts broken away; Fig. 2 a fragmentary central vertical section therethrough; Fig. 3 is a similar section showing the parts with the operating jaw depressed; Fig. 4 is a plan view with the cutter jaw removed; Fig. 5 is the detail of the slitting blade; Fig. 6 is a detail of the tongue cutter; Fig. 7 is a section on line 7-7 of Fig. 3 and Figs. 8 and 9 are details of the paper-lock in different stages of formation.

In the specific form shown the device is of the "desk" type, intended to be set on a support for operation, but it will be apparent that as to many of the features of my invention it may be embodied in a "hand" device, fashioned like pincers, since either such form will provide two relatively movable jaw-parts, the one part to carry the cutting devices and the other thereof to provide an opening or openings to receive the cutters. Thus 10 and 11 represent two jaws which I term the base and the cutter-jaw respectively, these being relatively movable,

preferably about a pivot for angular displacement. The base is a metal shell, open-bottomed, having a flat top 12 in which is formed a die orifice 13 near its front end. Lugs 14 on the rear part of the base support a pintle 15 on which is pivoted the cutter-jaw 11, the latter being held raised by a spring 16.

The cutter-jaw 11 is preferably a stamped shell having a head-boss 17 at its front end in which is mounted a tongue-cutter 18 and, somewhat in rear of the latter, a slitting blade 19, these being so arranged that when the cutter-jaw is closed toward the base they project through the receptive orifice 13. The tongue-cutter 18 is axially curved on an arc struck from the pivotal axis; has its sharpened bottom edge diagonally disposed as shown at 20; is open as at 21 across its rear face so that a paper tongue cut thereby is left adhering at its root; and the closed front portion of said cutter is broadened as at 22 so that the tongue cut thereby will be headed, or larger at its free end than at its root. The slitter 19 provides a blade proper, 23, having a diagonal slitting edge 24 and has an arrow-head dart 25 integral with the lower extremity of the diagonal blade, this dart being disposed transversely to the line of the cutting edge 24 and folded vertically to a V-section with the crest 26 of the fold toward the rear and about in the line along which the dart moves in operation. The joint effect of the dart 25 and cutting edge 24 is to form in the paper, A, a Y-shaped slit, C, having a relatively long stem *c* and relatively short, widely divergent arms, *e*, the separation of which at their extremities is substantially the same as the width of the stem-cutting part of the tongue-cutter and less than the width of the head-cutting portion thereof. The upper forward part of the blade 23 is cut away as at 27 to provide a clearance for the tongue-tucker 28.

Within the tongue-cutter is pivotally mounted the tongue tucker 28, comprising a curved, small-ended finger 29, normally sheathed within the tongue-cutter 18 and held retracted by a spring 30 also housed

in the cutter, the tucker having a cam-arm 31 that extends rearwardly beyond the open side of the tongue, adjacent to the pivot of the tucker. When this cam is pressed upwardly the curved finger emerges from the rear opening of the cutter, its extremity describing an arc rearwardly and upwardly, close to and above the slit and blade, in the clearance space 27. This tucker is operated in the course of the closing of the jaws by the engagement of the cam-arm 31 with a fixed abutment, in this case a part of the paper-stripper carried by the base 10.

The stripper 32 is a spring leaf normally pressing flat upon the upper surface of the base, upcurled at its front end as at 33 to a point that is above the bottom of the tongue cutter when the device is open and such stripper is provided in register with the orifice 13 of the base, with two orifices 35 and 36 separated by a bridge 37. A stop screw 38 limits the capacity of the stripper spring for upward displacement, such displacement being sufficient to permit the insertion between stripper and base of sheets of paper of a thickness within the working capacity of the cutting and tongue tucking devices.

When the jaw 11 is pressed toward the base 10 the radius-curved tongue cutter 18 and the slitter blade 19 respectively pass through the orifices 35 and 36 in the stripper, and the cam arm 30 of the tongue tucker encounters the bridge 37 and causes the tucker to rotate on its pivot so that the end of the curved finger 28 is projected rearwardly from its sheath and passes upwardly below and in rear of the bridge 37 to emerge above the plane of the bridge in position above the slitter-dart.

In operation the paper A is inserted between the stripper plate and the base (the upcurl of the stripper end guarding device against improper placement of the paper over the stripper) and then depression of the head causes, first the cutting of the headed tongue B and the Y-shaped slit C, and later the movement of the tongue tucker as above described. Resultantly the headed end  $b^1$  of the tongue is forced backward and upward through the receptive slit C to position such that the head of the tongue is above the paper sheet and the stem  $b^2$  lies in the arms  $c^1$  of slit C. As the parts separate the tucker spring 30 retracts the finger 29 into its sheathed position and the tongue cutter and slitter emerge from the tongue aperture and the slit respectively, the point of the slitter incidentally brushing the headed end of the tongue into upright position and thus locating the stem  $b^2$  of the tongue firmly against the V-shaped portion  $a'$  of the paper left between the arms of the Y-slit. During the upward movement of the head, and there-

after, the stripper plate remains spring-pressed in lowest position flush upon the paper, so that as the paper is withdrawn its passage under the stripper plate insures that the head of the tongue will be flattened down to tend to lie substantially flush on the upper surface of the body of the paper with the V-shaped portion  $a^1$  overlying the forward-most end of the head. The Y-slitting form of slitter blade shown is advantageous both as to its slitting function and its resultant effect in the paper-lock formation. Its dart-end penetrates the paper very readily, and its blade-edge, having but a slit to make, follows the dart without necessity for coöperation with any opposing shear-edge, and the resultant Y-formed slit in the paper leaves the bordering paper portions in a shape flexible enough to permit the headed tongue to be tucked through with little resistance and without tearing, the stem of the Y being made long enough to extend well beyond the back-folded head of the tongue to insure this non-tearing flexibility. In removing the paper the V-portion  $a'$  both protects the tongue and tends to hold it down as it is pulled out under the stripper, and in the completed lock the positive retaining effect of the tongue-head is combined with a frictional grip of the slit on the tongue, so that the lock is very secure.

As refinements of construction of value commercially, I prefer that the cutter construction be built as shown. 40 is a disk having in its under-side a fore and aft channel 41. The tongue cutter which is blanked from sheet metal, is provided at its top with integral rearwardly extending arms 42 that have notches 43 formed in their under sides and in the upper end of the cutter there is formed a notch 44 to receive the tucker spring 30. The slitter blade which is likewise blanked from a single piece of metal, has its top formed to provide two parallel arms 45 to embrace the tongue cutter arms 42 and these are notched at 46 in register with the notches 43 of the tongue cutter arms, the slitter arms 45 resting snugly in the channel 41 of the disk. A nut 47 seated in the notches of the arms 42 and 45 is engaged by a bolt passing through the disk 40 and counter-sunk therein, so that the cutter construction is assembled as a unit, the disk then being secured within the recessed head-boss of the cutter-jaw by screws 48, one of which carries a stop-plug 49 that strikes on the stripper plate to limit depression of the cutter-jaw, as shown in dotted lines, Fig. 1. While I have described in detail a particular embodiment of my invention which I have found to be satisfactory and desirable, it will be understood by those skilled in the art that many changes in detail may be made without departure from the spirit

of my invention within the scope of the patented claims.

What I claim is:

1. In a paper-fastening device, the combination of two relatively movable jaw members, one having a cutter-receptive opening, and the other having means for cooperation therewith to form a headed tongue; means, also carried by the last said jaw member, for forming a slit in rear of said tongue, said means comprising a cutting blade having an elongated paper-slitting edge substantially alining with the axis of said opening and a transverse slitting dart at the forward edge of said blade, said blade and dart being in plan smaller than and non-conforming to the portion of said opening through which they pass; and means operable upon closing of said members to tuck the cut tongue through said slit while the slitting means is depressed.

2. A paper-fastening device; wherein two relatively movable parts are provided respectively with a cutter receiving orifice and a cutter shorter than said orifice adapted to strike out a headed tongue, and means are provided to bend said tongue under and upwardly to project its headed end above the paper; characterized by means to cut a paper-slit to receive said tongue comprising a blade with an elongated slitting edge coaxial with the tongue cutter, and a transverse penetrating dart at its forward end of a width substantially corresponding to the width of the root of the tongue cutter, said blade and dart being smaller in plan than and non-conforming to the portion of the cutter receiving orifice through which they pass.

3. A paper-fastening device as set forth in claim 2, wherein the cutting edge of said blade is constructed to form a slit that will extend materially beyond the end of the underbent tongue.

4. In a paper-fastening device, the combination of two relatively movable jaw members, one having a cutter-receptive opening and the other having means for cooperation therewith to form a headed tongue, means, also carried by the last said jaw member, for forming a slit in rear of said tongue, said means comprising a slitting blade having an elongated paper-slitting edge substantially alining with the axis of said opening and a transverse slitting dart at the forward edge of said blade, the upper side of said blade being cut away above the dart, and means operable upon the closing of said members while the blade is in depressed position, and working into said clearance space above the dart, to tuck the headed tongue through said slit, whereby upon retraction of the dart it brushes the tongue into spread position.

5. A paper-fastening device of the type

wherein two relatively movable parts are provided respectively with a cutter receiving orifice and with two cutters adapted respectively to strike out a headed tongue and to provide an opening to receive the tongue, and wherein means are provided to tuck said tongue under and upwardly to project its headed end through the paper opening, characterized by the construction of the cutter which cuts the tongue receptive opening comprising a blade with a downwardly sloping slitting edge and a transverse penetrating dart at its forward end, said dart being of a width substantially corresponding with that of the root of the tongue cutter and said dart being folded, with the crest of its fold toward the blade edge, whereby said cutter member will cut a Y-shaped slit.

6. A paper-fastening device as set forth in claim 5 wherein the blade edge is materially longer than the dart-width.

7. In a paper-locking mechanism, the combination of two relatively movable jaw members, one having an elongated slot and the other having die means for cooperation with said slot to cut a headed tongue, and means to pass freely through said slot to form a slit in the paper in rear of said tongue, the last said means comprising a cutting blade having slit-cutting edges arranged in Y-form, means operable in closing said two jaw members to deliver the cut tongue through the Y-slit above the cutting blade, and a stripper element constantly spring-pressed upon the first said jaw member.

8. A paper-fastening device comprising two relatively movable jaw parts provided respectively with a cutter receiving orifice and with two cutting members adapted respectively to strike out a headed tongue and to form an opening to receive said tongue, means to deliver the cut tongue through the tongue receptive opening to position above the second-mentioned cutter while the latter is depressed, and a stripper plate to hold the paper upon the orificed member constructed and arranged freely to press constantly toward the orificed member to rest constantly on said member or on the paper inserted between said member and stripper.

9. A paper-fastening device as set forth in claim 8 wherein the second-mentioned cutting member comprises a slitting blade, having a Y-formed cutting edge with the stem of the Y materially longer than the length of that portion of the tongue which can interlock with the slit.

10. In a paper-locking mechanism, the combination of two relatively movable jaw members, one having an elongated die slot and the other having means for cooperation therewith to cut a headed tongue, and means freely operable through said die slot to form a slit in the paper in rear of said

tongue, the last said means comprising a slitting blade having its edges arranged in Y-form, said blade being cut away above its edge to provide a clearance, means operable on the closing of said two jaw members to deliver the cut tongue through the Y-slit above the cutting blade, said means working into said clearance of the blade, whereby on

retraction of said blade it brushes the head of the cut tongue into spread position, and a stripper element constantly spring-pressed upon the first said jaw member, whereby, upon retraction of the paper from the mechanism the cut head is flattened; substantially as described.

CHARLES S. CONE.

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