March 1, 1932. E. W. STACEY 1,847,273

MACHINE FOR OPERATING UPON SHEET MATERIAL

Filed March 22, 1929 2 Sheets-Sheet 1

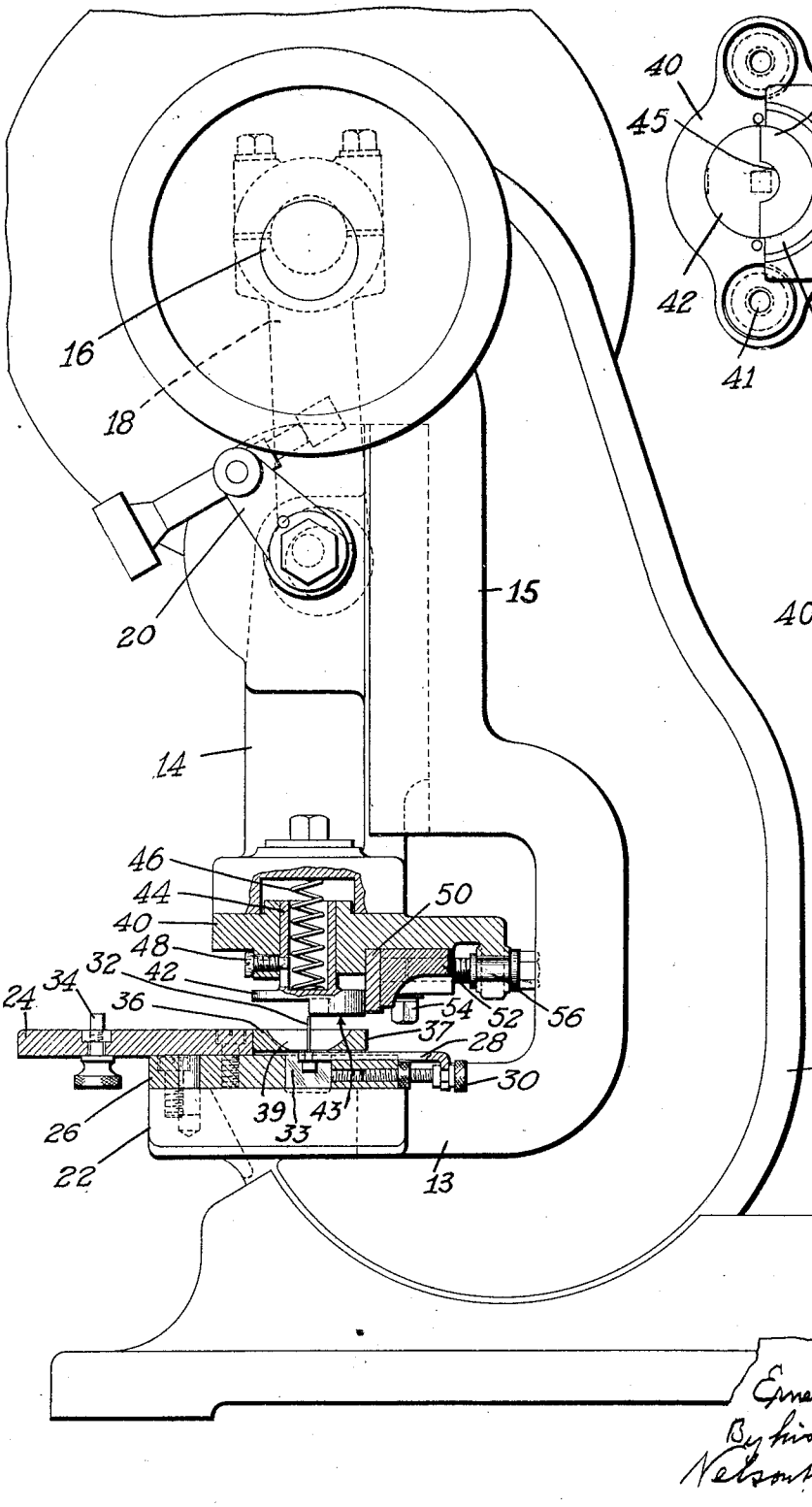



Fig. 1.




Fig. 2.

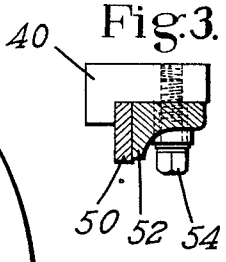



Fig. 3.

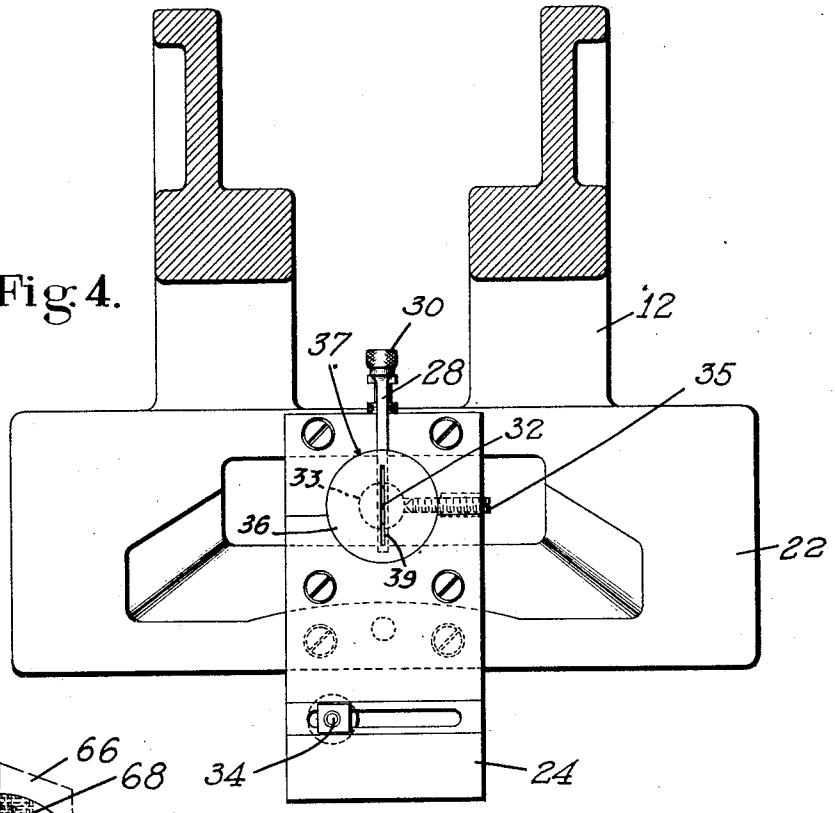
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Fig. 4.



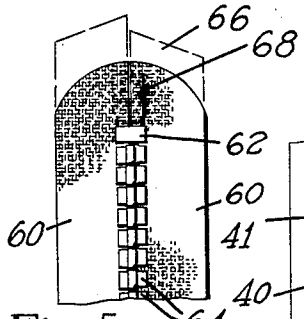




Fig. 5.

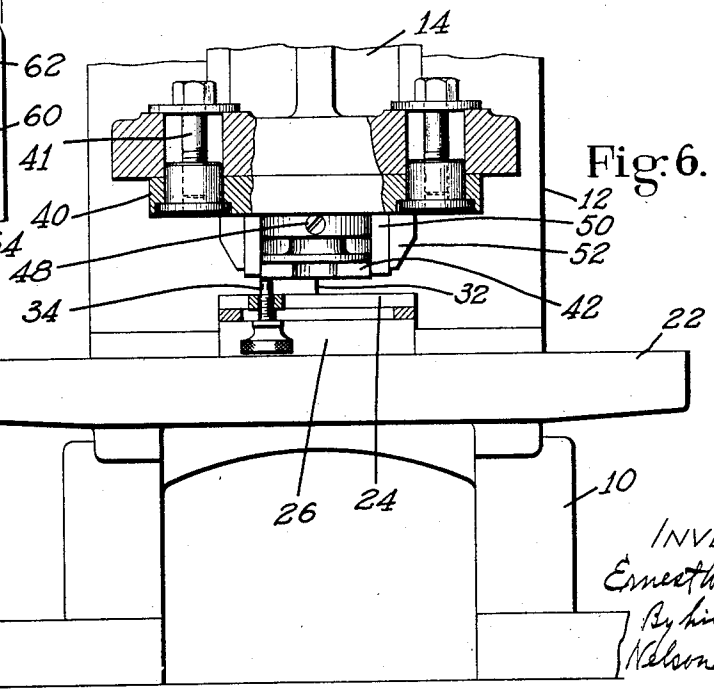



Fig. 6.

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# UNITED STATES PATENT OFFICE

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## MACHINE FOR OPERATING UPON SHEET MATERIAL

Application filed March 22, 1929. Serial No. 349,167.

This invention relates to machines for operating upon sheet material, and more particularly to machines for trimming and pressing forked or two-part blanks.

As an example of one field in which this invention may be usefully employed, I will refer to the connected strips which comprise parts of overshoe fasteners of the type commonly known in the trade as "slide fasteners" or "hookless fasteners." Such strips are secured together near one end with their edges meeting to form a vertex, and are beaded along their adjacent edges. In such slide or hookless fasteners, the beaded edges carry a series of metallic fastener elements arranged to be intercalated with each other by a sliding member which embraces both series of fastener members, bringing them into engagement when moved in one direction and disengaging them when moved in the other direction. It is important to locate the vertex or the point of permanent connection of the strips accurately in the finished overshoe and it is desired, therefore, to trim both branches of the forked or two-part blank at a predetermined distance from the vertex. It is also desirable to flatten the beaded edges of the forked strips in an area adjacent to the vertex so that the fastener strip may be smoothly incorporated in the shoe structure. In one aspect, the present invention consists in a machine for trimming and pressing such a forked fastener strip, although its use is not limited to that or to any specific shape of blank.

While it is usually preferable to perform both the trimming and pressing operations upon a fastener strip, I contemplate employing the machine of my invention for the trimming operation alone, if desired. With this in view, an important feature of the invention consists in cooperating trimming tools and a gauge pin positioned on the near side of one of said tools for positioning a forked or two-part blank by engagement with its vertex, so that the branches extend past the gauge pin and beyond the trimming line whereby the vertex may be located a predetermined distance from the trimming line. The blank is thus positively and accurately located with reference to the part thereof, which must be disposed most accurately in the assembled shoe structure. Moreover, the vertex of the blank forms a definite and positive gauging point in the blank with respect to which effective contact may be readily made so that uncertainty and variations in its position of presentation are obviated and a uniform product is secured.

In another aspect, my invention provides a machine having cooperating dies for flattening the beaded edges of a forked or two-part blank, in combination with positive operating means for moving said dies and a gauge associated with one of said dies for positioning a blank by engagement with its vertex, to locate the vertex a predetermined distance from the area to be flattened by the dies. While any suitable gauge might be utilized, I prefer to employ a gauge pin since the vertex of the forked blank may be brought conveniently into gauging relation therewith without displacing substantially the connected parts of the blank.

As herein shown, the trimming tools and the pressing dies are so associated that the operations of trimming the blank and of flattening its beaded edges are carried out substantially simultaneously and at a single presentation of the work. In still another aspect, therefore, the present invention provides a machine comprising, as herein illustrated, cooperating pressing dies constructed and arranged to flatten the beaded edge of a blank as they are positively brought together until separated by a predetermined minimum distance, gauges for positioning the blank, and trimming means operating upon the blank in a predetermined relation to its flattened area.

These and other features of the invention will be best understood and appreciated from the following description of a preferred embodiment thereof, selected for purposes of illustration and shown in the accompanying drawings, in which

Fig. 1 is a view of the machine in side elevation, partly in section;

Fig. 2 is an inverted plan view of the upper pressing and shearing dies and associated parts;

Fig. 3 is a fragmentary sectional view of the upper shearing die and clamping parts;

Fig. 4 is a plan view of the work plate with the machine frame in section;

Fig. 5 is a fragmentary plan view of a fastener strip; and

Fig. 6 is a view in front elevation, partly in section, of the operating parts of the machine.

The invention is herein shown as embodied in a press of commercial construction, which comprises a base casting 10 in which is mounted, for angular adjustment, a machine frame 12. This is shaped with a jaw portion 13 and an upwardly-extending portion 15 having ways in which a tool-carrying plunger 14 is arranged for vertical reciprocation. In the upper part of the machine frame 12 is journaled a driving shaft 16 which includes an eccentric portion operating an eccentric rod 18 which is adjustably connected to the upper end of the plunger 14. The connection comprises an eccentric stud and an adjusting lever 20 by which the ecentric stud may be rotated to adjust the location of the path of travel of the plunger 14 and, accordingly, the point of nearest approach of the plunger to the work plate. The shaft 16 carries a driving pulley and clutch mechanism and these, together with the elements of the machine thus far referred to, will not be described in detail as they are old and well-known in the art.

To the jaw 13 of the machine frame 12 is secured to laterally-extending plate 22 to which is bolted an intermediate plate 26. A work supporting plate 24 is, in turn, rigidly bolted to the intermediate plate 26. The work plate 24 as herein shown is designed particularly for use in connection with slide fastener strips and to that end is extended substantially in front of the intermediate plate 26. Near its rear end the intermediate plate is provided with a rearwardly-extending slot in which is mounted a slide carrying an edge gauge pin 34.

At its rear end, the work plate 24 is recessed to receive a circular disk 36 having a centrally disposed shank or projection 33 extending into a recess in the intermediate plate 26, where it is engaged by a retaining screw 35, as shown in Fig. 4. The disk 36 has a centrally-disposed diametrical slot 39 through which projects a gauge pin 32 carried in the forward end of a slide 28 guided in ways in the intermediate plate 26 and adjusted by a screw 30 having collars engaging the slide 28 and a lock nut for clamping the gauge pin slide 28 in position of adjustment. The disk 36 constitutes a lower die which presents a pressing surface supporting the work as later described. This surface covers the complete circle of the disk, except for the slot 39. The rear curved edge 37 of the disk 36 comprises a hardened shearing member which cooperates with an upper shear member 50, to be presently explained.

The plunger 14 is chambered in its lower end and has secured thereto a carried member 40 by means of bolts 41. The carrier member 40 is recessed in line with the axis of the plunger to receive the stem 44 of the upper pressing die 42, the head of which is circular and of the same dimensions as the disk 36, above and in line with which it is disposed. The stem 44 is tubular and surrounds a compression spring 46, tending normally to hold the die member 42 downwardly and spaced from the carrier 40. The stem 44 is slotted to receive the end of a retaining screw 48, which thus limits the downward movement of the presser die. The forward part of the upper pressing die 42 (shown at the left in Figs. 1 and 2) is cut away to avoid the metal fastener parts, leaving a semi-circular pressing surface 43. The remaining portion of the die, on the lower face of which this pressing surface 43 appears, is notched at 45 (Fig. 2) to avoid the gauge-pin 32 as the latter is adjusted.

Encircling the rear portion 37 of the presser die 42 is the upper shearing die 50, which comprises a hardened semi-circular ring held in place between a flange in the carrier member 40 and a clamping block 52. The clamping block 52 is retained in place upon the carrier 40 by clamping bolts 54 which extend into the carrier 40 through clearance holes in the clamping block 52 as shown in Figs. 3 and 4. The clamping block is forced into clamping engagement with the shearing die member 50 by a bolt 56 threaded into the clamping block and having a pair of spaced collars between which is engaged a depending ear on a rearwardly-extending portion of the carrier 40. When it is desired to remove the shearing die 50 for resharpening or replacement, the clamping bolts 54 are loosened and the bolt 56 is turned reversely to retract the clamping block 52, whereupon the shearing die 50 is freed from the holder.

The operation of the machine will be apparent from the foregoing description. The manner of using it for trimming the fastener strip of an overshoe will be explained as illustrating one field in which it is particularly useful. Such a fastener strip is shown in Fig. 5 and consists of two rubberized strips 60 of ducking or other textile material having a folded or corded bead 68 formed in each of their adjacent edges. The two strips are permanently secured together by a metallic clip 62 clenched over both pieces so that the edges are brought together in a vertex at the clip. On the near side of the clip 62, as the strip is presented by the operator, the two beaded edges are provided with a series of fastener members 64 which are arranged to be brought

into intercalated relation with each other by a slide member, not shown. The two-part blank or forked strip comprising the fastener extends unevenly beyond the clip 62. It is important, however, that the fastener should be assembled in the shoe structure with the clip 62 accurately located at a predetermined distance from the throat of the vamp and that the ends of the beaded edges 68 should be flattened so that they may be firmly united as sheet material to the other parts of the shoe.

The machine herein described may be used to trim off the uneven end 66 of the fastener strip a predetermined distance from the clip 62 and upon a smooth continuous curve, as suggested in Fig. 5. For this operation the fastener strip is located upon the work plate 24 with the gauge pin 32 in engagement with the vertex formed by the junction of the beaded edges 68 at the metal clip 62 and with the outer edge of the left-hand strip 60 in engagement with the edge gauge 34. The fastener strip is thus positively located longitudinally by the gauge pin 32 and located angularly with respect to the gauge pin as a center by the edge gauge 34. The clip 62 determining the vertex is thus located at a predetermined distance from the shearing edge 37 of the lower die member 36 and this distance may be regulated and adjusted by moving the gauge pin by the screw 30. When the blank has been thus positioned, the operator trips the machine and the plunger 14 moves downwardly. The surface 43 of the pressing die 42 first engages the fastener strip between itself and the pressing surface of the lower die 36. As the plunger continues to descend, the spring 46 is compressed and the pressure upon the beaded edges 68 is increased. If desired, the path of the plunger 14 may be so adjusted by manipulation of the lever 20 that the upper pressing die after a limited movement will contact with the carrier 40, thereby providing positive pressure for said pressing die to cause the approach of the two pressing dies until they are separated by a predetermined minimum distance and increasing the pressure upon the work to any desired amount.

After the fastener strip has been engaged by the pressing dies 36 and 42 and flattened between them and the upper pressing die 42 has yielded upwardly, the shearing edge of the upper shearing die member 50 cooperates with the shearing member edge 37 of the lower die 36 to trim off the end 66 of the fastener strip on a curve having its center in the axis of the strip and in the path of adjustment of the gauge pin 32. At the conclusion of the operation, the plunger 14 is elevated and the upper die member 42 acts also as a stripper to remove the trimmed and pressed work from the inner face of the shearing die 50 so that it will be retained upon the work plate.

It will be noted that the forward portion of the upper pressing die 42 is cut away and that the rear portion thereof is centrally recessed so as to clear the blank except in the area where it is to be flattened.

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

1. A machine for trimming waste material from the ends of forked strips, comprising cooperating trimming tools, a slender gauge pin associated with one of said tools and projecting from a work supporting surface thereof for positioning a strip by engagement with its vertex so that said vertex is located a predetermined distance before the trimming line, and means for relatively moving said tools for trimming both branches of the strip while so located.

2. A machine for trimming forked strips, comprising a pair of cooperating shearing dies, a gauge pin positioned on the near side of one of said dies for positioning a strip by engagement with its forked vertex so that the branches thereof extend beyond the gauge pin and across the shearing edge of one of said dies, and means for relatively moving the dies to trim the strip while so positioned.

3. A machine for trimming forked strips, having in combination, a curved die member having a gauge pin arranged within its periphery for positioning a strip upon the die by its forked vertex, and a cooperating die member relatively movable to trim both branches of the strip while so positioned upon the curved die member.

4. A machine for trimming forked strips, having in combination, a die member having a convex shearing edge and a gauge pin disposed within the curve of said edge for positioning a strip by its forked vertex with reference to said edge, and a die member having a concave shearing edge and being relatively movable to trim both branches of the strip in cooperation with the die member first mentioned.

5. A machine for trimming a slide fastener strip having a forked end of sheet material beyond a metallic fastener, having in combination, a pair of trimming tools cooperatively formed to trim the branches of the forked end upon a defined continuous curve, a gauge pin associated with one of said tools for positioning a strip by engaging its vertex with the branches overlying said curve, said pin being adjustable in a path intersecting the curve of the trimming line, and means for relatively moving the tools.

6. A machine for trimming a blank having parts connected at a vertex, comprising relatively movable trimming tools cooperatively shaped to trim both parts of the blank upon a continuous curve, a gauge pin for positioning the blank by engaging said vertex, and a separate adjustable gauge supplementing

said gauge pin and engaging the blank for determining the angular position of the blank about the gauge pin as a center.

7. In a trimming machine, cooperating shearing dies of circular contour, one of said dies comprising a disk having a shearing rim and a center portion with a diametrical slot therein, and a gauge pin projecting through said slot and adjustable therein.

8. A machine of the class described, having in combination, cooperating dies having pressing surfaces for flattening the beaded edges of a forked blank, a gauge pin at one side of and closely adjacent to the pressing surfaces of said said dies for positioning a blank by engagement with its vertex to locate said vertex a predetermined distance from the portions of the blank to be flattened by the dies, and means cooperating with one of the aforesaid dies for simultaneously trimming both branches of the blank on a line at the other side of said portions.

9. A machine of the class described, having in combination, cooperating dies having pressing surfaces for flattening the beaded edge of a blank, means for effecting positively relative movement of said dies to cause their approach until separated by a predetermined minimum distance, gauge devices located on one side of the pressing surfaces of the dies for positioning the blank with respect to the dies to locate the area to be flattened in the blank, and means located at the other side of the pressing surfaces of the dies operable simultaneously with the dies for trimming the blank in predetermined relation to its flattened area.

10. A machine of the class described, having in combination, a combined pressing and shearing die having a pressing surface, a gauge pin associated therewith and projecting through said surface for positioning the work with respect thereto, and a plunger carrying a yieldingly mounted cooperating pressing die and a distinct shearing die.

11. A machine of the class described, having in combination, a disk cut away to present a pressing surface and having a peripheral shearing edge, a cooperating segmental pressure member movable relatively thereto, a curved shearing die cooperating with the shearing edge of the disk, and a gauge arranged in the cut-away portion of the disk.

12. A machine of the class described, having in combination, a combined pressing and shearing die having a work gauge associated therewith, a plunger carrying a pressing die, means for moving said plunger a predetermined distance, said die being mounted to yield a predetermined amount less than said distance and then become rigid, a shearing die carried also by said plunger, and means for adjusting said plunger to vary its point of nearest approach to said combined pressing and shearing die.

13. A machine for trimming and pressing forked slide-fastener strips, having a work plate with an adjustably mounted gauge pin for positioning a strip by engagement with its forked vertex, a cooperating edge gauge and a combined pressing and trimming die, the pressing portion of said die lying between the gauge pin and the trimming line, together with a reciprocatory plunger carrying a yieldingly mounted presser die and a rigidly mounted trimming die, each die cooperating with the corresponding dies upon the work plate.

14. A machine for trimming and pressing slide-fastener strips for use in overshoes and the like, which strips have beaded edges at the forked end beyond the slide-fastener, said machine having in combination, cooperating dies having pressing surfaces for flattening a predetermined portion of the beaded edges of the strip, positively operating means for said dies, gauge devices on one side of the pressing surfaces of the dies for positioning the strip with respect to the dies to locate the area to be flattened, and means operable simultaneously with the operation of the dies in flattening the edges of the strip for trimming the end of the strip on a line beyond its flattened area.

In testimony whereof I have signed my name to this specification.

ERNEST W. STACEY.