D. R. CAMPBELL.

MACHINE FOR TRIMMING THE FIN OR OVERFLOW FROM MOLDED ARTICLES.

APPLICATION FILED MAY 28, 1915.

1,167,976.

Patented Jan. 11, 1916

2 SHEETS—SHEET 1.

Fig. 1.

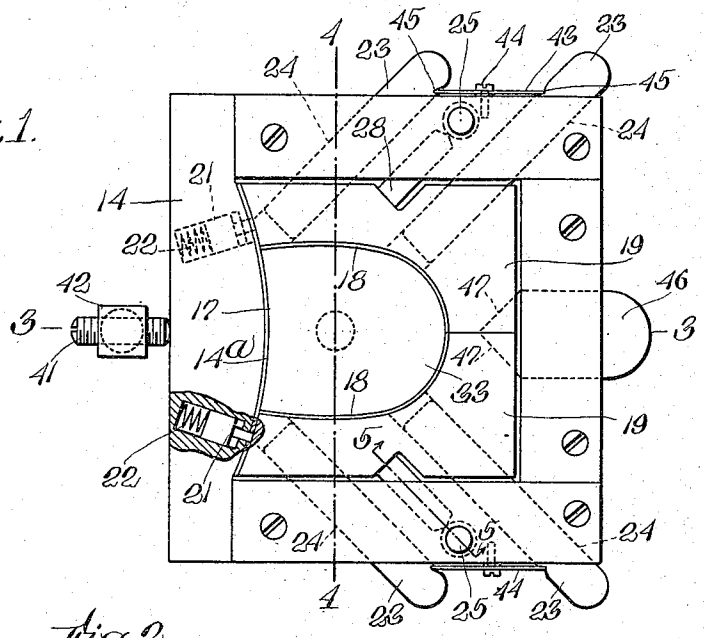


Fig. 2.

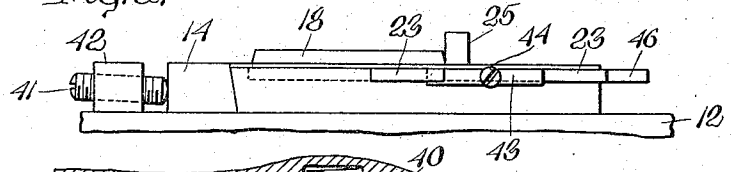


Fig. 3.

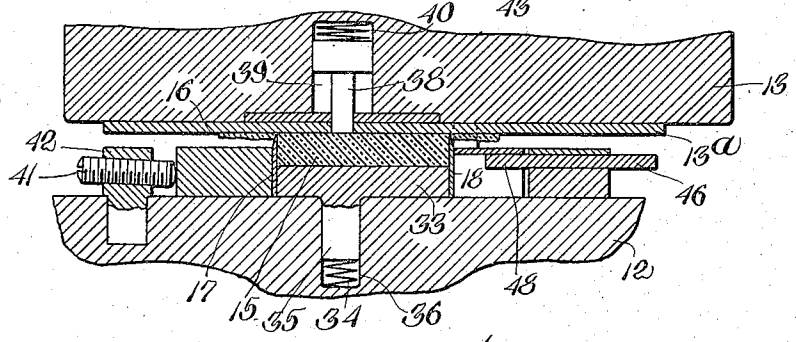


Fig. 5.

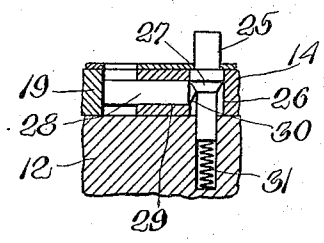
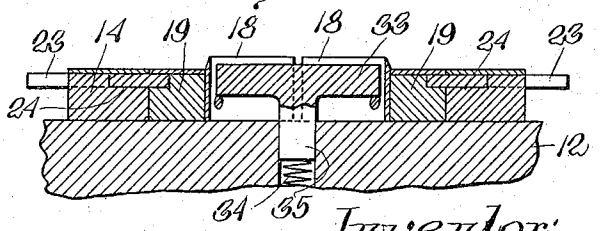


Fig. 4.



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2 SHEETS—SHEET 2.

Fig. 6.

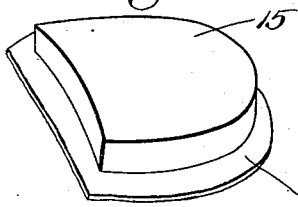


Fig. 8.

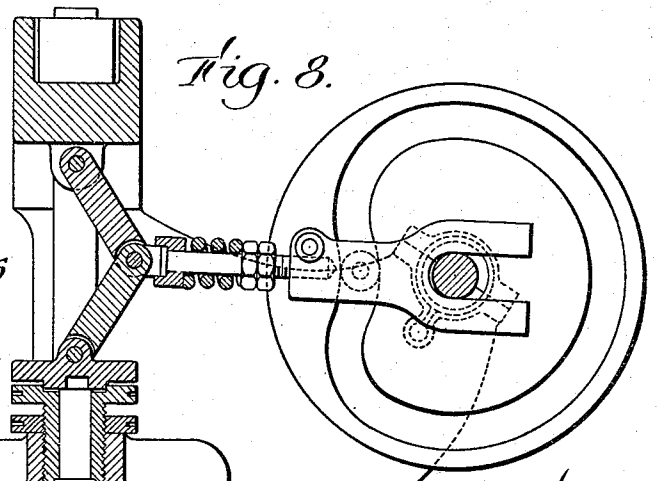


Fig. 7.

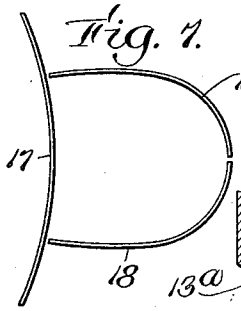
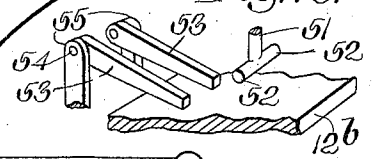


Fig. 10.



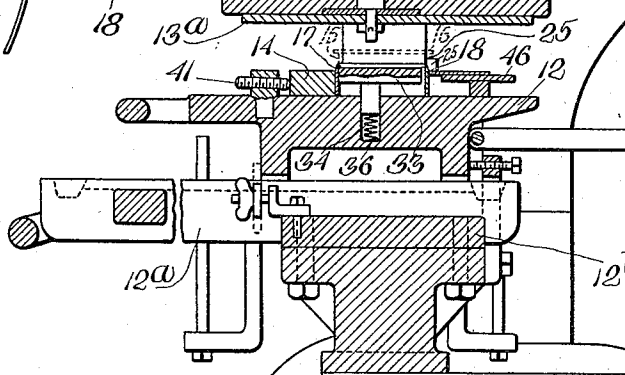


Fig. 11.

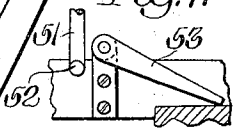


Fig. 12.

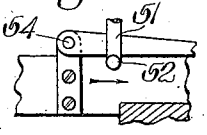
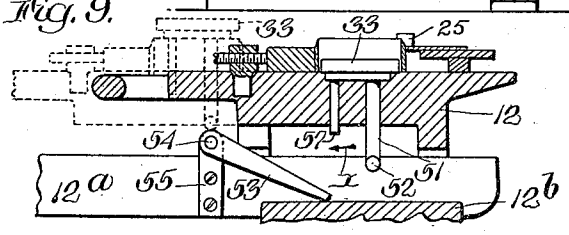


Fig. 9.



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DUNCAN R. CAMPBELL, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO FRANK RUMRILL, OF BOSTON, MASSACHUSETTS.

MACHINE FOR TRIMMING THE FIN OR OVERFLOW FROM MOLDED ARTICLES.

1,167,976. Specification of Letters Patent. Patented Jan. 11, 1916.

Application filed May 28, 1915. Serial No. 30,956.

To all whom it may concern:

Be it known that I, DUNCAN R. CAMPBELL, a subject of the Dominion of Canada, and resident of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Machines for Trimming the Fin or Overflow from Molded Articles, of which the following is a specification.

A rubber heel formed for attachment to a leather shoe heel, when it comes from the mold in which it is formed and vulcanized, has a fin projecting from its corners at one side of the heel, said fin entirely surrounding the side of the heel from which it projects and requiring removal.

My invention has for its object to provide simple, convenient and effective means for cutting away the said fin.

The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings forming a part of this specification: Figure 1 represents a top plan view of an appliance embodying my invention; Fig. 2 represents a portion of a press bed by which the appliance is supported; Fig. 3 represents a section on line 3—3 of Fig. 1, showing portions of the press bed and the platen, which is movable toward and from the same; Fig. 4 represents a section on line 4—4 of Fig. 1, showing the cutting die expanded, and showing a portion of the press bed; Fig. 5 represents a fragmentary sectional view on line 5—5 of Fig. 1; Fig. 6 represents a perspective view of a rubber heel and the fin thereof; Fig. 7 represents a diagrammatic plan view, showing the cutting die expanded; Fig. 8 represents a sectional view illustrating a press, and showing my improved appliance in place on the bed of the press; Fig. 9 represents a sectional view of portions of the press, showing means for positively operating the ejector; Fig. 10 represents a fragmentary perspective view illustrating parts of the ejector operating means shown by Fig. 9; Figs. 11 and 12 represent parts of the ejector operating means somewhat diagrammatically.

The same reference characters indicate the same or similar parts in all the views.

My invention includes an appliance adapted to be interposed between the bed 12 and the platen 13 of a press, which may be of any suitable construction, the press shown by Fig. 8 being of the construction set forth in my application for Letters Patent filed December 26, 1914, Serial Number 879,219. In this type of press the platen is reciprocated vertically by mechanism such as that shown by Fig. 8, the bed 12 being immovable vertically and movable horizontally to withdraw it from under the platen. It will be understood, however, that my invention hereinafter described is not limited to use with this type of press.

The appliance of my invention is embodied in a holder 14, which is preferably composed of rigidly connected members forming a frame which surrounds an opening containing the cutting die hereinafter described. Said die is of sectional construction and adapted to be expanded and contracted, the form of the die being such that when expanded it is adapted to receive the molded body 15 of a rubber heel and allow the fin 16 of said heel to project over the cutting edges of the die.

The die includes a breast-trimming section 17 fixed to one of the members of the holder 14, said member as here shown being provided with a curved seat 14ª conforming to the curvature of the die section 7. The die also includes a plurality of body sections 18, preferably two in number, which are movable relatively to each other and to the breast-trimming sections 17. The body sections 18 are attached to blocks or carriers 19, which are movable in the opening of the holder 14 to permit the die sections to meet, as shown by Fig. 1, thus contracting the die, and to separate, as shown by Figs. 4 and 7, thus expanding the die.

I have provided means for normally and yieldingly holding the carriers 19 retracted to expand the die, said means as here shown comprising plungers 21 movable in sockets in the holder and pressed outwardly by springs 22. The holder 14 is provided with obliquely arranged guide bars 23, the inner ends of which are slidable in oblique guideways in the carriers 19, while their outer end portions extend through obliquely arranged guideways 24 formed in the holder and are detachably secured to the holder by means hereinafter described. The relative arrangement of the plungers 21 and the bars

and guideways is such that the body sections 18 of the die are movable obliquely outward by the plungers 21 to the positions shown by Fig. 7. I have also provided means operated by external pressure, such as that imparted by the platen 13 when it is descending, for forcing the holder 14 and the die sections 18 in the opposite direction to cause the ends of the die sections to abut against each other, as indicated by Fig. 1, thus contracting the die. The preferred embodiment of said means includes vertical plungers 25 movable in vertical sockets 26 (Fig. 5) in the holder 14, each plunger being provided with a frusto-conical shoulder 27 and sliding struts 28 movable in sockets 29 in the holder, each strut having a conical outer end 30 engaging the shoulder 27 of one of the plungers 25, and a blunt inner end bearing on a seat formed on one of the carriers 19. The plungers 25 are normally raised or projected by springs 31 (Fig. 5). The plungers 25 normally project above the cutting edges of the die, as indicated by Figs. 2 and 8, so that they are in the path of the descending platen 13 and are adapted to be depressed by the platen to project the carriers 19 inwardly and contract the cutting die, the arrangement being such that the die is contracted before the fin 16 is trimmed off by the coöperation of the platen with the cutting edges of the die.

In operating the improved appliance in connection with the press shown by Fig. 8, the bed 12 of the press is first withdrawn from under the platen 13, the cutting die being now expanded, and the molded body 15 of the heel is inserted in the cavity surrounded by the cutting die sections, the fin overhanging the cutting edges of said sections. The bed 12 is then pushed inwardly under the platen, as shown by Fig. 8, and the press is operated to depress the platen. The descent of the platen first causes the compression of the cutting die as above described, and then causes a steel face plate 13^a secured to the platen to coöperate with the cutting edges of the die sections in trimming off the fin 16, after which the platen rises, and the bed 12 may then be again drawn outward to permit the removal of the trimmed heel and the insertion of another. Any suitable means may be provided for ejecting the trimmed heel from the cutting die. As shown by Figs. 1, 3, 4 and 8, an ejector plate 33 is located in the cavity surrounded by the die sections, said plate being loose when the die is expanded and normally raised by a spring 34, as shown by Figs. 4 and 8, the ejector plate being provided with a shank 35 which is movable in a vertical cavity 36 in the bed 12, said cavity containing the spring 34. When the die is expanded the ejector 33 is slightly below the cutting edges of the die sections so that a shallow cavity is formed in which the operator places the bottom portion of the heel body. The platen 13 may be provided with a presser adapted to force the heel body and the ejector 33 downwardly to bring the fin 16 to a bearing on the cutting edges of the die sections just before the die is fully contracted. Said presser includes a plunger 38 movable in a cavity 39 in the plunger and a spring 40 backing said plunger. Said spring is stronger than the spring 34 which raises the ejector, so that while the platen 13 is descending the spring 40 and plunger 38 act to depress the heel body and the ejector and compress the spring 34. When the platen rises and the die is expanded, the heel body is released so that it may be easily ejected by the ejector 33 and spring 34. It is obvious that any other suitable means may be provided for ejecting the trimmed heel. The holder 14 may be retained in position on the bed 12 partly by the ejector shank 35 and partly by a stop screw 41 bearing on the front side of the holder and engaged with a tapped ear 42 attached to the bed. The guide bars 23 may be detachably engaged with the holder 14 by means of resilient confining strips 43 pivoted at 44 to the holder and engaging notches 45 in the guide bars. Said strips, when in place, prevent the withdrawal of the guide bars from the holder. When, however, the withdrawal of the guide bars is desirable the strips 43 may be turned out of place, leaving the guide bars free to be withdrawn. 46 represents a plate secured to one of the members of the holder 14 and projecting into slots 48 formed in the carriers 19, said plate having oblique edges 47 bearing against the oblique bottoms of the slots 48. The object of the plate 46 is to prevent vertical displacement of the portions of the carriers 19 engaged by the inner end of said plate.

Figs. 9, 10, 11, and 12 illustrate means for positively operating the ejector to force the heel upwardly from the cutting die when the bed 12 is moved horizontally outward from under the platen. The ejector 33 is provided with a stem or shank 51 extending through and movable vertically in an orifice in the bed 12, and has oppositely projecting lateral ears 52 (Fig. 10) which project into an opening in the fixed bed supporting and guiding base portion 12^a. The supporting base includes a portion 12^b extending across said opening and located below the ears 52. The base is provided with a shank lifting device embodied in two spaced-apart guiding arms 53 pivoted side by side at 54 to ears 55 on the base portion 12^a, their free ends resting loosely on the base portion 12^b. Said arms constitute inclined guides which are in the path in which the ears 52 are moved

by horizontal movements of the bed 12. The arrangement is such that when the bed 12 is moved forward horizontally in the direction of the arrow *x* (Fig. 9) from the position shown by full lines, which is its operative position relatively to the platen 13, the ears 52 contact with the inclined arms 53 and slide upwardly thereon, so that the ejector 33 is positively raised as indicated by dotted lines, and positively ejects a heel from the cutting die. When the bed 12 reaches the extreme of its forward movement, the ears 52 pass over and drop from the higher ends of the arms 53, as indicated by Fig. 11, so that the ejector 33 drops back into the cutting die. During the return movement of the bed 12 to position under the platen, the shank 51 passes between the arms 53, and the ears 52 bear on the under sides of said arms and raise them, as indicated by Fig. 12, until the ears pass from under the arms, whereupon the arms drop back upon the base portion 12^b and are ready to again raise the ejector. A pin 57 fixed to the ejector 33 slides in an orifice in the bed 12 and prevents the ejector from turning.

It is obvious that the shape of the cutting die may be varied to adapt it to trim the fin or overflow from molded articles other than heels.

Having described my invention, I claim:

1. In a machine of the character stated, the combination of a press bed, a platen, a holder supported by the bed under the platen, a sectional trimming die formed to embrace a molded article and composed of a section fixed to the holder and a plurality of sections movable relatively to each other and to the fixed section to expand and contract the die, means for maintaining the die normally expanded, and means operable by the press platen for moving the body sections to contract the die.

2. In a machine of the character stated, the combination of a press bed, a platen, a holder supported by the bed under the platen, a trimming die section fixed to the holder, carriers movable in the holder, a plurality of trimming die sections fixed to said carriers, said sections collectively forming an adjustable trimming die formed to embrace a molded article, means for guiding said carriers to expand and contract the die, means yieldingly holding the carriers retracted to expand the die, and means operable by the press platen for moving said carriers to contract the die.

3. In a machine of the character stated, the combination of a press bed, a platen, a holder supported by the bed under the platen, a trimming die section fixed to the holder, carriers movable in the holder, a plurality of trimming die sections fixed to said carriers, said sections collectively forming an adjustable trimming die formed to embrace a molded article, means for guiding said carriers to expand and contract the die, spring-pressed die-expanding means adapted to yieldingly hold the carriers retracted, and die-contracting plungers projecting from the holder and adapted to be pressed inwardly by the platen to contract the die.

4. In a machine of the character stated, the combination of a press bed, a platen, a holder supported by the bed under the platen, a sectional trimming die formed to receive a molded article, and composed of a section fixed to the holder and a plurality of sections movable relatively to each other and to the fixed section to expand and contract the die, means for maintaining the die normally expanded, means operable by the platen for moving the body sections to contract the die, and automatic means for ejecting a heel from the expanded die.

5. In a machine of the character stated, the combination of a press bed, a platen, a holder supported by the bed under the platen, a trimming die section fixed to the holder, carriers movable in the holder, a plurality of trimming die sections fixed to said carriers, said sections collectively forming an adjustable trimming die formed to embrace a molded article, oblique guide bars engaged with said holder, oblique guideways for said bars in the carriers, means yieldingly holding the carriers retracted to expand the die, and means operable by the platen for moving said carriers to contract the die.

6. In a machine of the character stated, the combination of a press bed, a platen, a holder supported by the bed under the platen, a trimming die section fixed to the holder, carriers movable in the holder, a plurality of trimming die sections fixed to said carriers, said sections collectively forming an adjustable trimming die formed to embrace a molded article, means for guiding said carriers to expand and contract the die, spring-pressed plungers carried by the holder and acting on said carriers to expand the die, and means operable by the platen for moving said carriers to contract the die.

7. In a machine of the character stated, the combination of a press bed, a platen, a holder supported by the bed under the platen, a trimming die section fixed to the holder, carriers movable in the holder, a plurality of trimming die sections fixed to said carriers, said sections collectively forming an adjustable trimming die formed to embrace a molded article, means for guiding said carriers to expand and contract the die, means yieldingly holding the carriers retracted to expand the die, vertical plungers projecting from the holder for movement by the platen and provided with inclined shoul-

ders, and struts movable in the holder by said plungers to move said carriers and contract the die.

8. In a machine of the character stated, the combination of a press bed, a platen, a holder supported by the bed under the platen, a trimming die section fixed to the holder, carriers movable in the holder, a plurality of trimming die sections fixed to said carriers, said sections collectively forming an adjustable trimming die formed to embrace a molded article, oblique guide bars engaged with said holder, oblique guideways for said bars in the carriers, means yieldingly holding the carriers retracted to expand the die, and means operable by the platen for moving said carriers to contract the die, means being provided for detachably confining said guide bars in engagement with the holder.

9. In a machine of the character stated, the combination of a fixed base, a platen movable toward and from the base, a press bed horizontally movable on said base, a holder supported by the bed, a sectional trimming die formed to embrace an article to be trimmed and including a plurality of sections movable relatively to each other to expand and contract the die, means for maintaining the die normally expanded, means operable by the platen for moving said sections to contract the die, an ejector in said die, and means carried partly by the bed and partly by the base and operated by a horizontal movement of the bed for positively operating the ejector.

10. In a machine of the character stated, the combination of a fixed base, a platen movable toward and from the base, a press bed horizontally movable on said base, a holder supported by the bed, a sectional trimming die formed to embrace an article to be trimmed and including a plurality of sections movable relatively to each other to expand and contract the die, means for maintaining the die normally expanded, means operable by the platen for moving said sections to contract the die, an ejector in said die having a downwardly projecting shank, and means carried by the base for raising said shank and the ejector when the bed is moved horizontally from under the platen.

11. In a machine of the character stated, the combination of a fixed base, a platen movable toward and from the base, a press bed horizontally movable on said base, a holder supported by the bed, a sectional trimming die formed to embrace an article to be trimmed and including a plurality of sections movable relatively to each other to expand and contract the die, means for maintaining the die normally expanded, means operable by the platen for moving said sections to contract the die, an ejector in said die having a downwardly projecting shank and a normally inclined shank lifting device pivoted to the base and adapted to operate the ejector when the bed is moved forward, said device being displaceable by the shank when the bed is moved backward.

In testimony whereof I have affixed my signature.

DUNCAN R. CAMPBELL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."