Nov. 5, 1929. J. J. HEYS ET AL 1,734,294

PRESSING FORM AND METHOD OF MAKING IT

Filed July 3, 1925

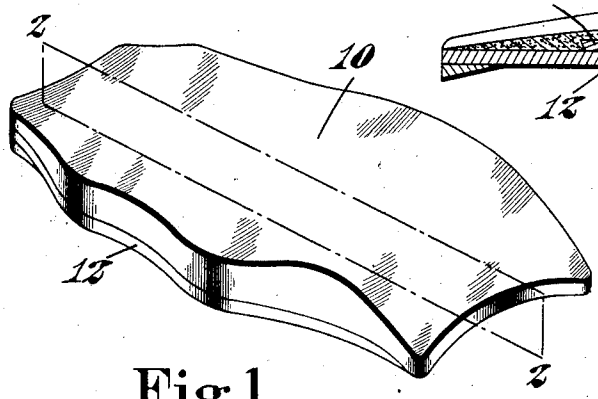


Fig.1.

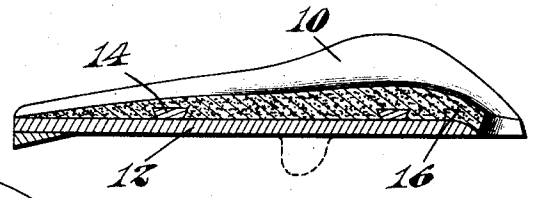


Fig.2.

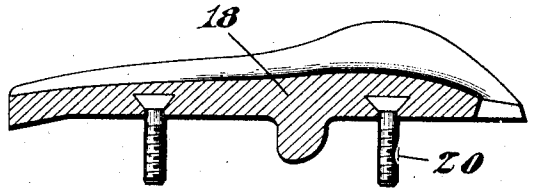


Fig.3.

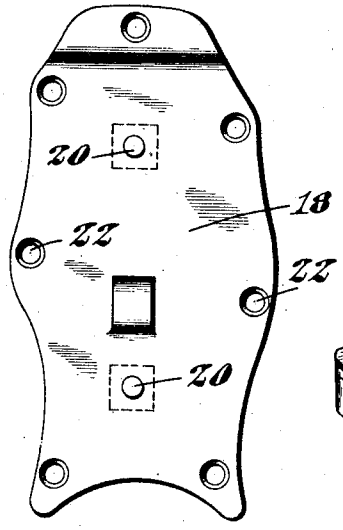


Fig.4.

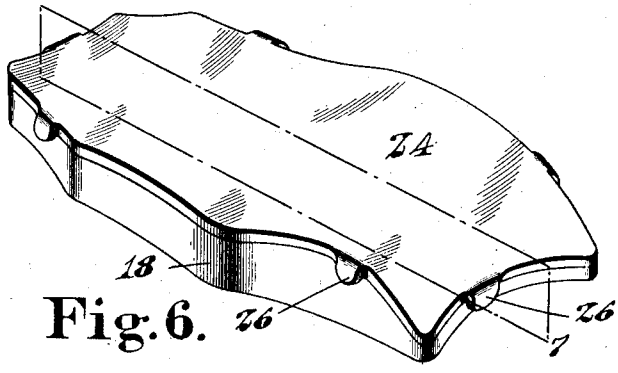


Fig.6.

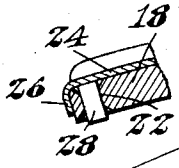


Fig.5.

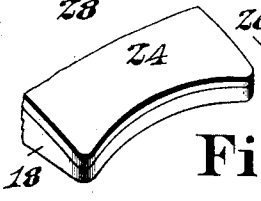


Fig.8.

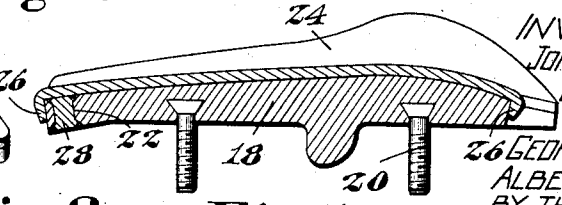


Fig.7.

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UNITED STATES PATENT OFFICE

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PRESSING FORM AND METHOD OF MAKING IT

Application filed July 3, 1925. Serial No. 41,362.

This invention relates to forms and methods of making forms for pressing machines and is illustratively disclosed in its application to the manufacture of forms for use in a so-called direct pressure leveling machine.

In machines of this type the shoe is placed on an iron last and its bottom is pressed between this last and a so-called form which contacts with the outsole of the shoe and is shaped to give the desired contour to the outsole. The pressure used is very great, several hundred pounds per square inch, and a substantial portion or all of the sole is under pressure at once, and remains so during an appreciable time. The specific form disclosed herein is for use in the so-called "Hercules" leveling machine, in which there is a rocking movement between the shoe and the form, the latter rolling slowly from one end of the shoe to the other. Such a machine, generally, is shown in United States Letters Patent No. 861,746, granted July 30, 1907, on the application of B. F. Mayo.

Such forms have been made heretofore of cast-iron, the use of steel being not feasible on account of the prohibitive cost of the large number of such forms required for a shoe factory output, a considerable number of forms of different sizes being necessary for each style of shoe.

Difficulty has been experienced in the use of such forms in leveling nailed shoes, in that the nails by means of which the soles are attached wear channels in the cast-iron forms, and thus cause unsatisfactory leveling. It is an object of this invention to obviate this difficulty and to provide a more durable form by providing it with a face sufficiently hard to resist satisfactorily the wear incidental to the leveling of shoes and especially nailed shoes without, however, undesirably increasing the cost of the form.

In its method aspect, the invention provides for rigidly fastening to a cast-iron body a plate having the desired pressing contour and formed of metal of different characteristics from the cast-iron, such as steel. Preferably the body of the form is made as has been the practice in making forms heretofore, except that its thickness or height is scant, that is, less than the desired thickness of the completed form by the thickness of the steel face plate to be used, and the steel plate is then shaped to it and welded to steel pins embedded in the body with their ends flush with the lowered surface of the body. The body and steel plate then constitute, together, a form of the ordinary contour. Preferably countersunk holes are formed in the body, advantageously at the time of casting it, and the steel pins are placed in these holes and electrically welded to the steel plate under pressure sufficient to upset the ends of the pins in the countersunk ends of the holes. Thus there is provided a pressing face properly shaped and of proper hardness, and at the same time the face plate is so strongly and rigidly attached to the cast-iron form body as to withstand the very rigorous usage to which such forms are subjected, such, for example, as to tend to strip the plate from the body of the form, especially in the rolling action between the form and the shoe such as that characteristic of machines of the Hercules type above referred to.

In another aspect, the invention consists in a novel steel-faced pressing or leveling form comprising a cast-iron body having steel pins embedded in it and a steel face-plate fastened to the pins. Preferably the steel pins are upset in countersunk ends of holes in the cast-iron body, the pins substantially fitting the holes and having their outer ends flush with the surface of the body of the form. Preferably, too, and as herein illustrated, the cast-iron body part of the form presents a surface contour like the desired leveling or pressing surface, the steel plate being of uniform thickness and being shaped to the contour of the body part of the form.

In the drawings, which illustrate a preferred way of practising the novel method.

Fig. 1 shows the pattern from which the cast-iron body of the form is cast.

Fig. 2 is a cross-section in the plane 2—2 of Fig. 1.

Fig. 3 is a cross-section of the cast-iron body.

Fig. 4 is an inverted plan of the same

showing the holes used in attaching the face-plate.

Fig. 5 is a detail section showing the method of attaching the steel face-plate, before the welding operation.

Fig. 6 shows the completed form.

Fig. 7 is a cross-section in the plane 7—7 of Fig. 6.

Fig. 8 is a detail of an alternative form of the product shown in Fig. 6.

The cast-iron body of the form is made from a pattern 10 which comprises a wooden base 12 having dovetailed ribs 14 to support and retain a mass of plastic material 16 (we have successfully used beeswax and clay for this purpose), the upper face of which is shaped to the contour required in the completed form, but is too scant or low everywhere by the preferably uniform thickness of the steel face plate to be used, $\frac{3}{16}$ inch as disclosed. From this complete pattern the cast-iron body 18 is cast, which will also be "scant" on its upper surface by the $\frac{3}{16}$ inch. Bolts 20 are cast into the body 18 to be used in fastening the form in a leveling machine.

The body 18 is provided with holes 22 around its periphery either by using cores in the casting flask, or by subsequent drilling. (The form shown in Fig. 3 is to be drilled.) The holes 22 are countersunk at their lower ends and preferably at both ends as shown in Fig. 5.

A steel face plate 24 is preferably made of low-grade open-hearth hot-rolled steel plate and is hammered while hot to fit the body 18. It may have fingers 26 to assist in holding it to the body, the upper edge of which is made slightly overhanging; or the edge of the plate may be plain as shown in Fig. 8. It is then spot-welded in two or three places to attach it lightly to the body and ground to give it just the shape desired, then annealed to remove internal stresses and then packed to carbonize its surface, and hardened to the proper degree.

Short steel pins 28, which are conveniently of ½ inch diameter, are then inserted in the holes 22, substantially filling them, and a heavy electric current is then passed for a very short time between two electrodes, one mounted at the lower end of a pin and the other on the steel plate just over the upper end. A heavy pressure is delivered by these electrodes, which upsets both ends of the heated pin 28 in the countersunk ends of the hole 22, and strongly welds the pin and the plate together, at the same time anchoring the pin firmly in the body.

The pins 28 are located well outside the contour of the nail track of the sole which is to be treated by the form, so that that part of the plate which comes in contact with the nails will not be softened by the welding. The welding is performed very rapidly and the soft spots extend not more than about $\frac{3}{16}$ inch beyond the peripheries of the pins.

The pins 28 can be cast into the body 18 in the first place, by putting them in the flask as cores, but we regard the first procedure described as the better.

In the preceding specification and in the claims, we have used the words "upper" and "lower" as referring to the form as shown in the drawing, but the form is actually inverted, with its steel face down, when in use.

While the invention has been illustrated in relation to forms for leveling machines, it is also of value in other relations. For example, a metal shank is sometimes riveted to a shoe sole before the sole molding operation, the heads of the rivets appearing on the outside of the sole. The present invention may, among other uses, advantageously be employed in the production of forms for pressing machines such as sole molding machines, to prevent undue wear of the molding machine forms under circumstances such as just referred to.

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

1. That improvement in methods of making sole-pressing forms which consists in providing a cast-iron body having on its upper face the sole-shaping contour desired in the completed form but everywhere deficient in thickness by a predetermined amount, embedding steel pins in it with their upper ends at the upper surface of the body, forming a steel face plate having a contour corresponding substantially to that of the upper face of the cast-iron body and having a thickness predetermined to supply the deficiency in thickness of the cast-iron body, and welding said face-plate to the pins.

2. That improvement in methods of making sole-pressing forms which consists in providing a cast-iron body everywhere scant in thickness by a predetermined amount, and having therein pieces of steel extending to its upper face shaping to the upper face of the body a steel plate having a thickness predetermined to make up the deficiency in thickness of the cast-iron body, hardening the plate, and welding it to the pieces of steel.

3. That improvement in methods of making sole-pressing forms which consists in providing a cast-iron body having on its upper face the sole-shaping contour desired in the completed form but everywhere low by a predetermined amount and having steel pins embedded in it with their upper ends at the upper surface of the body, shaping to the upper face of the body a steel plate having a thickness predetermined to make up the deficiency in thickness of the cast-iron body, and welding said plate to the pins.

4. That improvement in methods of making sole-pressing forms which consists in providing a cast-iron body having an upper

surface shaped to receive a face-plate and having holes in it extending downwardly from said surface and countersunk at their lower ends, inserting steel pins in the holes, and electrically welding to the pins under an upsetting pressure a steel face plate having the desired sole-shaping contour.

5. That improvement in methods of making sole-pressing forms which consists in providing a cast-iron body having on its upper surface the sole-shaping contour desired and having holes in it extending downwardly from said surface and countersunk at both ends, inserting steel pins in the holes, forming a steel face plate to fit the upper surface of the cast-iron body, and electrically welding said face-plate to the pins under an upsetting pressure.

6. That improvement in methods of making sole-pressing forms which consists in providing a cast-iron body having holes in it, inserting steel pins in the holes, forming an imperforate steel face plate having the desired sole-shaping contour, and electrically welding said face-plate to the end face of the pins.

7. That improvement in methods of making sole-pressing forms which consists in providing a cast-iron body having its upper face shaped to the desired form-contour but low everywhere by a predetermined amount, providing steel members in the cast-iron body, shaping a steel plate of a thickness predetermined to supply the deficiency in thickness of the cast-iron body to the upper face of the body, hardening the plate, and electrically welding it to the steel members.

8. That improvement in methods of making sole-pressing forms which consists in providing a cast-iron body having its upper face shaped to the desired form-contour but low everywhere by a uniform thickness and having embedded in it a plurality of steel pins with their upper ends flush with the upper face of the body, shaping a steel plate having the said uniform thickness to the upper face of the body, hardening the plate, and fastening it to the pins.

9. A sole-pressing form comprising a cast-iron body having steel pins embedded in it, and a steel face plate having the desired sole-shaping contour welded to the pins.

10. A sole-pressing form comprising a cast-iron body having holes countersunk at their lower ends, steel pins substantially fitting the holes, and an upper steel face plate having the desired sole-shaping surface welded to the pins, the pins being upset in the countersunk ends of the holes.

11. A sole-pressing form comprising a cast-iron body having steel pins embedded in it, and a steel face plate having the desired sole-shaping contour fastened to the pins.

12. A sole-pressing form comprising a cast-iron body equivalent to a complete form of the total shape desired minus a uniform thickness all over its surface on its operative side, steel pins embedded in the body with their upper ends flush with the surface of the body on its operative side and a steel plate having the said uniform thickness and shaped to the desired sole-pressing contour welded to the upper ends of the pins.

13. That improvement in methods of making sole-pressing forms which consists in producing an imperforate metal face plate having the desired sole-shaping contour and a form body of less expensive metal than that of the face plate, and securing the face plate to the form body by welding it to members previously inserted in the form body and of the same kind of metal as the face plate.

14. That improvement in methods of making sole-pressing forms which consists in producing a metal face plate having the desired sole-shaping contour and a form body of less expensive metal than that of the face plate and having on one face a contour corresponding to that of the face plate with a plurality of openings terminating at said face, inserting in said openings pins of the same kind of metal as the face plate, and securing the face plate to the form body by welding it to said pins.

15. That improvement in methods of making sole-pressing forms for use on shoes having nailed soles, which consists in producing a cast-iron body having therein a plurality of steel members so located as not to be opposite the row of sole nails, forming a steel face-plate of the desired sole-shaping contour, and welding the face-plate to said members.

In testimony whereof we, the said LUCY A. HEYS and GEORGE H. HEYS, have signed our names to this specification.

LUCY A. HEYS,
GEORGE H. HEYS,
Executors of the Will of John J. Heys, deceased.

In testimony whereof I, the said ALBERT R. BRADEN, have signed my name to this specification.

ALBERT R. BRADEN.