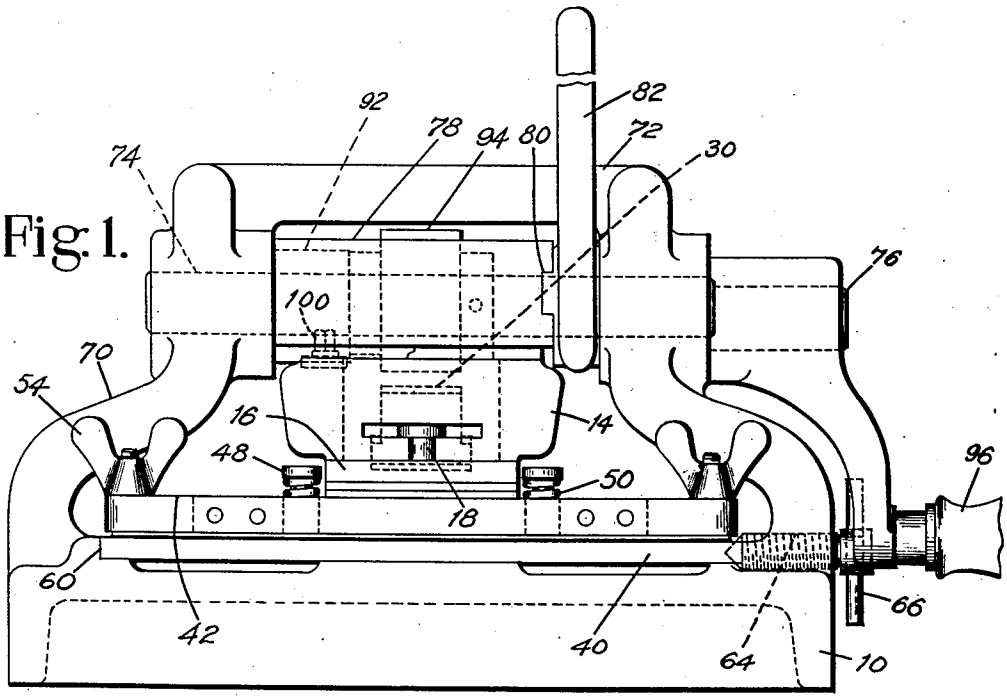
Feb. 25, 1930. W. T. B. ROBERTS 1,748,083

ORNAMENTAION OF LEATHER

Filed April 1, 1927 2 Sheets-Sheet 1

Fig. 1.



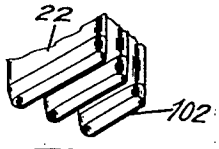


Fig. 11.

Fig. 2.

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ORNAMENTAION OF LEATHER

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Fig. 3.

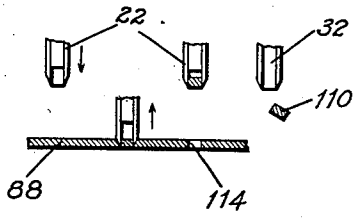


Fig. 4.

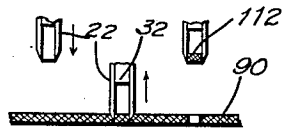


Fig. 5.

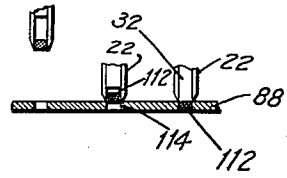


Fig. 7.

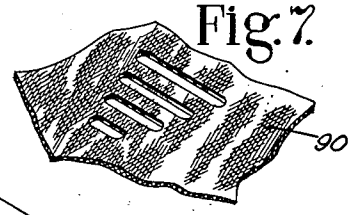


Fig. 6.

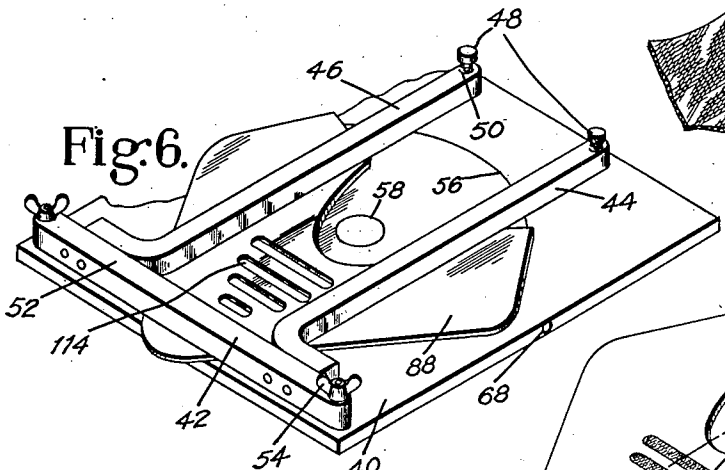


Fig. 9.

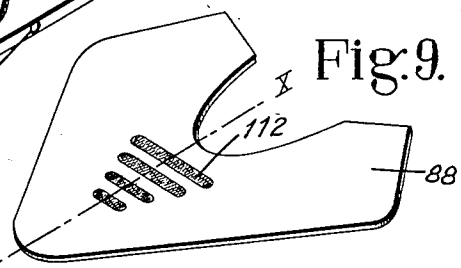
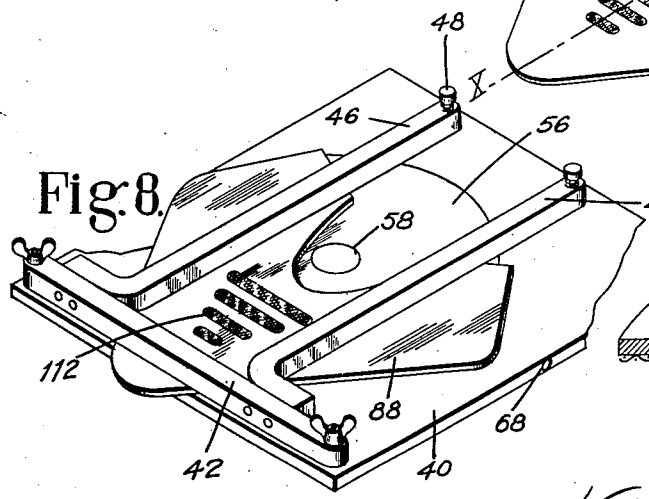


Fig. 8.



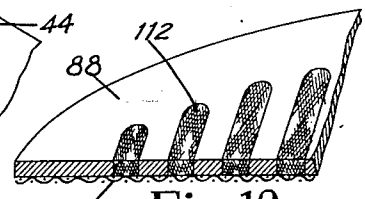


Fig. 10.

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Patented Feb. 25, 1930 1,748,083

UNITED STATES PATENT OFFICE

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ORNAMENTATION OF LEATHER

Application filed April 1, 1927, Serial No. 180,307, and in Great Britain April 14, 1926.

This invention relates to methods and machines for the production of ornamented leather and like material and is particularly concerned with the ornamentation of shoe uppers.

In the various systems of ornamenting leather or similar material used in the manufacture of shoe uppers, such as printing, embossing, perforating, interlacing with strips and the like, the finished product has been subject to the disadvantage that the surface of the material is irregular. As a result, the product has been liable either to uneven wear or was of such a character that it provided recesses in which dirt and the like might accumulate.

In view of the foregoing, the present invention, in its method aspect, provides for the ornamentation of sheet material, such as leather, by punching out a portion of the leather in accordance with a predetermined design and replacing the punched out portion with a correspondingly shaped portion of similar material having a different appearance which has been provided within a tubular member, the tubular member being used for guiding the punching into position with respect to the perforation in the upper from which the punching is expelled directly into the shoe upper. The resulting product has a smooth surface and a striking and attractive appearance and avoids the disadvantages of the methods heretofore employed.

Preferably, and as herein exemplified, a shoe upper or similar part is perforated by means of a punch made up of a plurality of tubular punches. These same tubular punches are then employed for guiding correspondingly shaped pills or punchings, obtained, for example, by punching another piece of leather of constrasting material into the perforations originally provided. Since these pills or punchings have been obtained by the use of the same tubular punches employed in making the original perforations, they will fit exactly in the perforations. The punching may be even more firmly held in position therein by means of a lining secured adhesively both to the shoe upper and to the punchings.

In another aspect, the invention provides an improved punching machine, capable of use either for perforating a piece of sheet material, such as a shoe upper, or for guiding similarly shaped pills or punchings into those perforations. The illustrated machine, in accordance with features of the invention, comprises one or more tubular punches mounted in a punch carrier associated with which are corresponding ejectors for expelling pills from the tubes of the punches into previously provided perforations. To this end, operating mechanism is provided so that the punch carrier may be moved either to cause the punches to perforate the work or to bring them into juxtaposition with the surface of a piece of work which has been previously perforated so that the pills or punchings within the tubes of the punch may be expelled and guided accurately into the openings of the perforated material.

Still other features of the invention reside in work supporting and clamping devices by means of which the pieces of work may be located and relocated in exactly the same position in respect to the punching devices. As illustrated, these work supporting and clamping devices are provided with a sheet of backing material which may be rotated thereon to provide fresh punching surfaces so that the punches may pass completely through the leather or similar material without dulling the edges of the punches.

These and other features of the invention will now be set forth in detail with reference to the accompanying drawings, in which—

Fig. 1 is a front elevation of an improved punching machine;

Fig 2 is a side view, partly in section, of the same machine;

Figs. 3, 4 and 5 are diagrammatic views illustrating certain steps in the sequence of operations with reference to a single tubular punch;

Fig. 6 illustrates the work clamping device holding a previously perforated vamp;

Fig. 7 shows how a punching may be obtained by perforating a piece of leather of similar thickness but of contrasting appearance;

Fig. 8 shows the same work clamping device and vamp after the punchings of contrasting material have been inserted in the previously provided perforations;

Fig. 9 shows the same vamp removed from the work clamping device;

Fig. 10 is a section on the line X—X of Fig. 9; and

Fig. 11 is a perspective view of tubular punches of the type employed herein.

For the sake of illustration, there has been shown a hand operated machine comprising a base 10 providing a work support upon which there is pivotally mounted, upon a rod 12, a wide, forwardly extending lever 14 to which a punch carrier 16 may be secured by means of a stud 18 and a bolt 20. This punch carrier has a plurality of tubular punches 22 arranged in accordance with a predetermined design, so as to cut at a single operation the whole of the desired perforated pattern in the sheet material. These punches are provided not only with the customary stripper plate 24 resiliently mounted upon sliding studs but in addition have an ejecting member comprising a block 30 provided with a plurality of expelling pins 32 corresponding in number and shape to the tubular punches 22 and this block 30 is retained upon the punch carrier, by means of screw studs 34 surrounding which are springs 36 to hold the ejector block 30 normally in elevated position.

In order that pieces of work may be held in smooth position under the punches and may be removed and replaced in exactly the same position with respect to the punching mechanism, there are provided work supporting devices comprising rigid work supporting plates 40 (Fig. 6) together with clamping devices 42 embodying side bars 44 and 46 which are retained in position on the plate 40 by means of headed studs 48 surrounded by springs 50. These side bars 44 and 46 are connected at their front ends by means of a cross bar 52 drilled for the reception of bolts provided with wing nuts 54. Preferably a piece of backing material 56, such as thick paper is mounted upon the plate 40 to receive the cutting edges of the various punches. In order that this piece of backing material may readily be moved to various positions on the work supporting device, it may be circular in form and mounted for rotation upon a central boss 58 so that fresh portions of the backing material 56 may be presented to the punches. To facilitate the ready re-positioning of the work supporting plates 40 in the machine, abutment surfaces 60 (Fig. 1) and 62 (Fig. 2) are provided to co-act with the side and rear edges of said plates. These work supporting plates may be secured in position in the machine by means of a cone-ended screw plunger 64 threaded in the side of the base 10 and provided with an operating handle 66 so that it may be turned into engagement with a conical recess 68 (Fig. 6) in the side of the plate 40. To provide for the operating mechanism of the machine, the base 10 has an upstanding, forwardly projecting bracket 70 having a cross bar 72 and providing bearings at its forward portion for the shafts 74 and 76. The shaft 74 is provided with a cam 78 between the arms of the bracket 70 and interlocked with this cam at 80 (Fig. 1) is an operating handle 82. This cam 78 is arranged for engagement with a hardened steel plate 84 extending across the front of the lever 14, and the design of the cam is such that, upon partial rotation of the lever 82, the punch carrying lever 14 is depressed against the tension of a supporting spring 86 (Fig. 2) to cause the punches to perforate a vamp 88 or other piece of work which may be mounted upon one of the work supporting plates 40.

The machine also provides for the ultilization of the punches as guiding devices by means of which pills, punched from a piece of material 90 (Fig. 7) may be inserted in the previously provided perforations of the work. To this end, cams 92 and 94 are mounted upon the shaft 76 which is provided with an operating handle 96. A wedge-shaped member 98 is adjustably secured in position upon the upper side of the punch carrying lever 14 by means of a bolt 100 for co-operation with the cam 92 so that upon rotation of the handle 96, the punches may be depressed a distance less than that required for the punching operation to bring the sharpened edges 102 (Fig. 11) of the punch tubes 22 just up to the surface of the previously perforated piece of work so that the punches may serve as guides for the insertion of properly shaped pills or punchings in said perforations.

Since, as will be more fully explained later, the pills to be inserted have been obtained by the use of the same punch, they may be readily inserted in the previously provided perforations of the work by actuation of the block 30 carrying the expelling pins 32 and to this end, the cam 94 upon the shaft 76 is arranged for engagement with the upper surface of the pin carrying block 30 and is so designed that upon rotation of the handle 96, the expelling pins 32 will be depressed just far enough to expel the punchings from the tubes 22 into the perforations of the work.

It now remains to describe the manner in which pieces of material may be ornamented in accordance with my novel method, utilizing the improved machine which has been described above, it being understood that the method may be performed without the use of this particular machine.

Preferably, as illustrated, a piece of work 88 is secured in position upon one of the work supporting plates 40, gaging the position of the piece with respect to the bars of the clamping device 42 so that the design will be positioned as desired in respect to the contour of

the piece of work. The work supporting device 40 with its piece of work secured thereon is then inserted in the machine and clamped in position by means of the screw 64, after which the lever 82 is operated to cause the punch device 22 to perforate the work, as illustrated in Fig. 3, to secure a pattern as in Fig. 6 after which the work supporting device 40 is removed from the machine and the handle 96 operated to cause the expulsion of the punchings or pills 110 from the device 22. These steps are illustrated diagrammatically in Fig. 3.

A piece of leather 90 of contrasting appearance is then positioned in the machine and the lever 82 operated as shown diagrammatically in Fig. 4 to fill the tubes 22 of the punch with pills 112 of this contrasting material. Clearly, because the same punch has been used, these pills must be of exactly the same size and shape as the perforations which have been made in the work piece 88. A perforated work piece 88, such for example, as that already described and shown in Fig. 6, is then re-positioned in the machine in exactly the same position which it occupied when the perforations were originally made. To this end, the side and rear edges of the work supporting plate 40 engage the co-acting abutments 60 and 62 of the machine base and, when the screw 64 has been tightened by means of the handle 66, the operator is assured that the piece of work is properly and exactly positioned in the machine, it will be apparent that the punches now contain pills 112 of similar but contrasting material, whereupon these pills may be inserted in the previously provided perforations by rotating the handle 96 to cause the machine to go through the series of steps illustrated diagrammatically in Fig. 5, in accordance with which the punching device 22 is brought into juxtaposition with the upper surface of the work piece shown diagrammatically at 88, and then the pill 112 is expelled from the punch tube 22 by means of the expelling pin 32 into the perforation 114, thus exactly filling said perforation with a piece of similar material, the upper surface of which is flush with the surface of the work piece. The work piece will then assume the appearance of the finished product as shown in Figs. 8 and 9, and having been removed from the work clamping device by releasing the wing nuts 54, it may be provided with a lining piece 120 (Fig. 10) secured adhesively to the surfaces both of the work piece and the pills 112 filling the perforations therein. It will be understood that the pills 112 are frictionally retained within the perforations 114 as the work piece is removed from the work clamping device and prior to the application of the lining piece 120.

The method may be employed with a series of work pieces alternately of different color or appearance, and then it will be understood that a plurality of work supporting plates 40 are provided so that a piece of work taking the place of the material shown at 90 in Fig. 7 may be punched in exactly the desired position when the pills are being obtained for insertion in the preceding adjacent piece of the series. This second work piece is then removed from the machine and the original or preceding work piece replaced so that the handle 96 may be operated to guide the punchings into the previously provided perforations. After having removed the first work piece with its holes thus blocked by the punchings from the second, another work piece clamped on the plate 40 is put in place and inserted in the machine and punched, the plate 40 then being withdrawn, and the second work piece, still clamped on its plate 40 is now returned to its position in the machine and the punchings from the other work piece are then expelled into the perforations of this second work piece. The process may then be repeated as often as desired, each work piece being ornamented with the punchings from the succeeding work piece. When the method is being carried out with a series of work pieces of varying appearance, the expelling step illustrated at the right of the diagram of Fig. 3 is omitted and in its place the operation shown in Fig. 4 is utilized.

It will be apparent that when the punchings are made from pieces of material such as 90 in Fig. 7, scraps of leather of more than one color might be utilized for the different punchings, thereby to secure an ornamentation of even more varied appearance. It will also be clear that two or more punching machines, each carrying identical punches may be employed to carry out the method of the invention, utilizing the pills cut by one machine for insertion into the perforations cut by the other machine.

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

1. A method of producing ornamented sheet leather which comprises punching out a portion of the leather in accordance with a predetermined design, replacing the punched out portion with a correspondingly shaped filling portion of similar material having a different appearance, and attaching a piece of lining material both to the under side of said sheet of leather and to the filling portion.

2. A method of preparing a shoe upper which consists in perforating a design in said upper involving a plurality of perforations, preparing a set of punchings of exactly corresponding shape from a different material, guiding said punchings each to a position directly above the corresponding perforation in the shoe upper and substantially simultaneously forcing a plurality of the

punchings into the perforations of the shoe upper, thereby completely to fill the same.

3. A method of producing an ornamented shoe upper, which consists in forming a perforation of a predetermined design in the shoe upper providing a punching of a shape like that of the perforation but of a different piece of material within a tubular member, guiding said punching into position with respect to the previously perforated upper by means of said same member and expelling the punching from the tubular member directly into the shoe upper to fill the perforation therein.

4. A method of producing an ornamented shoe upper which consists in locating said upper with respect to a plurality of sharp-edged tubular members arranged in accordance with a predetermined design, forcing said members through the work thereby to provide a perforated design in the work, removing the perforated piece of work, filling the tubular members with pills of similar material of different appearance, replacing the piece of work in exactly the same relation with respect to said members, guiding the pills into the perforations of the upper by means of said tubular members, and expelling the pills from the tubular members into said perforations to fill the perforated design of the shoe upper.

5. A machine for punching sheet material, comprising a work support, means for locating pieces of work in predetermined position upon said work support, a punching device including a tubular punch, means for operating said punching device to force it through a piece of work upon the work support, and means for operating said punching device to bring it into position adjacent to the upper surface of the work to serve as a guide.

6. A machine for filling openings in perforated material comprising a work support, a tubular guide, means for producing relative movement between the work support and said guide to bring the latter into juxtaposition to material on the work support, and means movable through the tubular guide for expelling a punching located in the guide into an opening in the previously perforated piece of material.

7. In a machine for producing ornamented sheet material, a support for a perforated work piece, a tubular punch, an expelling device movable through the opening of said tubular punch, and means for producing relative movement between said work support and said punch to bring the end of the punch into juxtaposition with a piece of work on the work support and move the expelling device to force material within the punch into an opening in the piece of work on the work support.

8. In a punching machine comprising a work support, a tubular punch, a punch carrier, and an ejector within said tubular punch, means for locating successive pieces of work in a predetermined position between the work support and the punch, and operating mechanism for producing relative movement between the punch carrier and the work support constructed and arranged to move the punch carrier at one time to cause the punch to perforate the work and to move the punch carrier at another time to bring the punch into juxtaposition to the work without cutting the work and to actuate the ejector mechanism.

9. In a punching machine, a work support, a tubular punch capable of being moved to force the punch through a piece of material on the work support, and adjustable means for moving the said punch toward the work support into a predetermined position farther away from the work support than the punching position.

10. In a punching machine, a work support, punching mechanism, means for locating pieces of work repeatedly in a predetermined position on the work support comprising a plurality of work clamping devices, and surfaces upon the work support providing an abutment against which said clamping devices may be positioned repeatedly in exactly the same relation to the punching mechanism.

11. In a punching machine, a work support, and work clamping devices upon said support, said clamping devices and said support being provided with co-acting surfaces to enable the repeated positioning of the clamping devices in exactly the same position upon the work support.

12. In a punching machine, a work clamping device comprising a removable work supporting plate, means for clamping a piece of work in position thereon and means for adjustably positioning a piece of backing material on the said plate between the piece of work and the surface of the plate to receive the cutting edge of the punch.

13. In a punching machine, work supporting means provided with a flat work supporting surface, and means for rotatably supporting a piece of backing material on said surface to receive the cutting edge of the punch.

14. In a machine for producing ornamented sheet material, a support for a perforated work piece, a punching member having a plurality of tubular punches arranged in accordance with a predetermined design, an ejector device having a plurality of expelling members arranged to fit in and move through the openings of correspondingly positioned tubular punches, and means for producing relative movement between said work support and said punch to bring the end of the

punch into juxtaposition to a piece of work on the work support and to move the expelling devices to force the pills within the punches into previously provided openings in the piece of work on the work support.

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

WILLIAM THOMAS BUCKINGHAM ROBERTS.