

Aug. 18, 1942.

F. L. FOSTER ET AL

2,293,252

FINISHING EDGES OF SHEET MATERIAL

Filed Oct. 11, 1939

2 Sheets-Sheet 1

Fig. 1

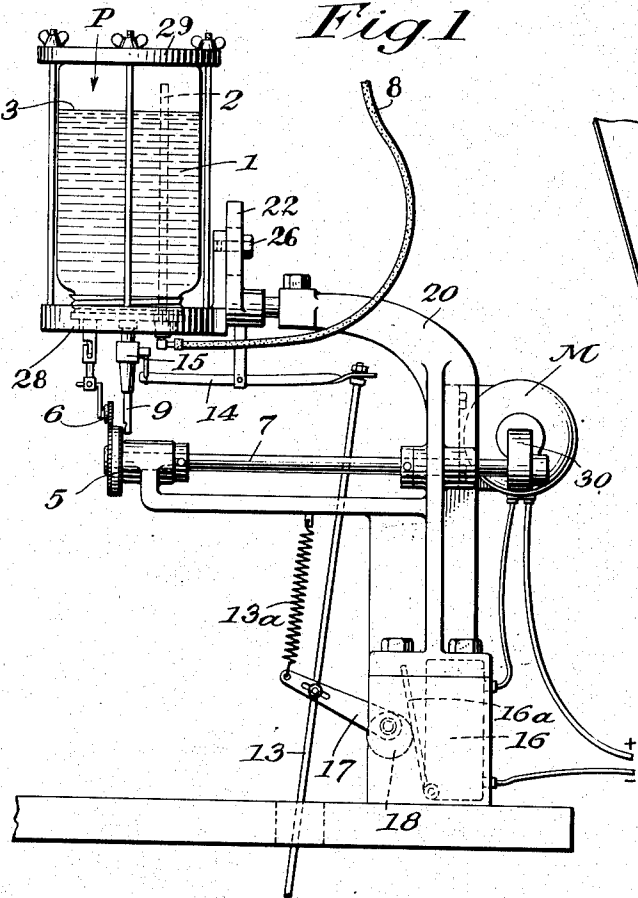


Fig. 2

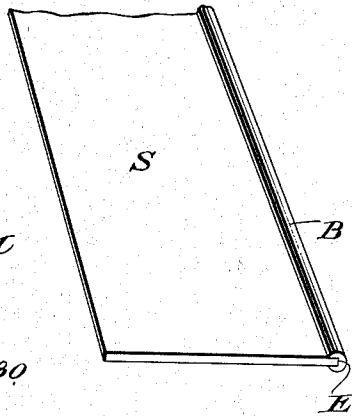


Fig. 3

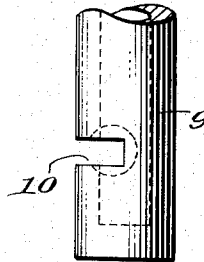


Fig. 4

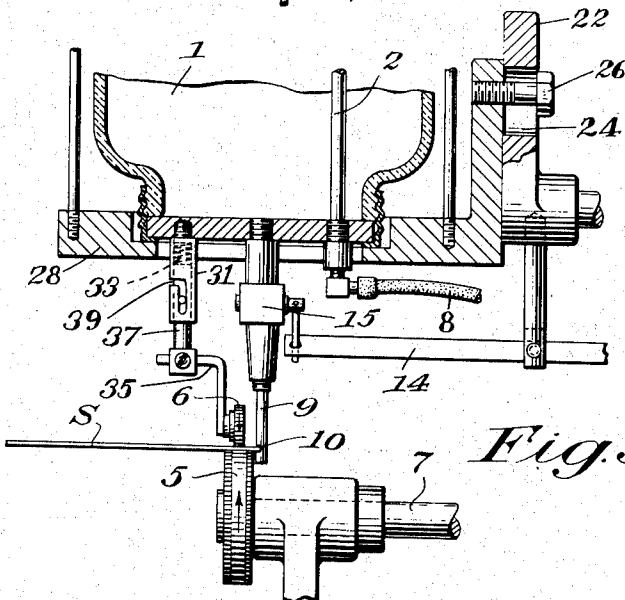
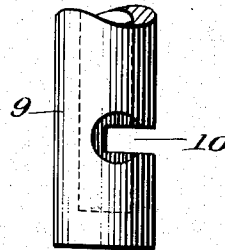


Fig. 5

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2 Sheets-Sheet 2

Fig. 6

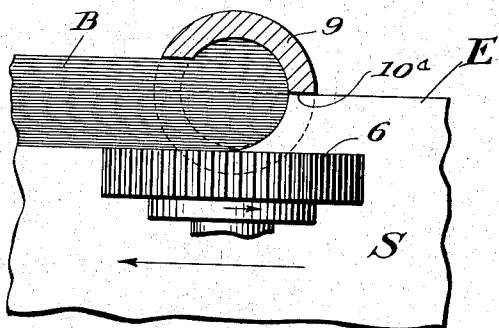


Fig. 7

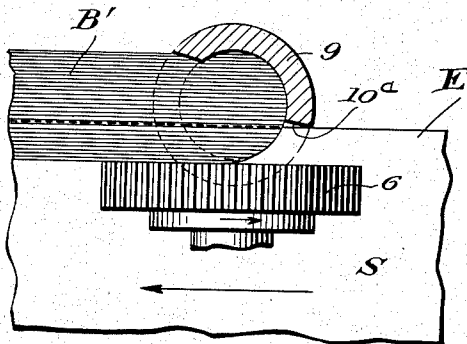


Fig. 8 Fig. 9 Fig. 10 Fig. 11 Fig. 12

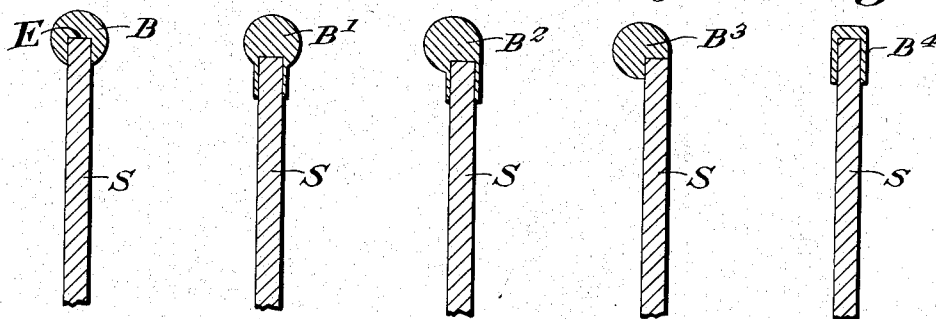


Fig. 13

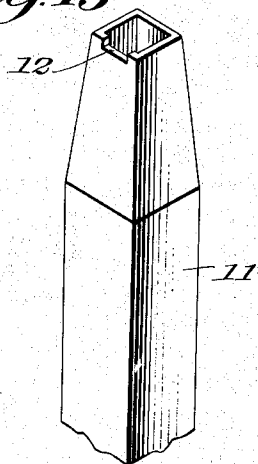
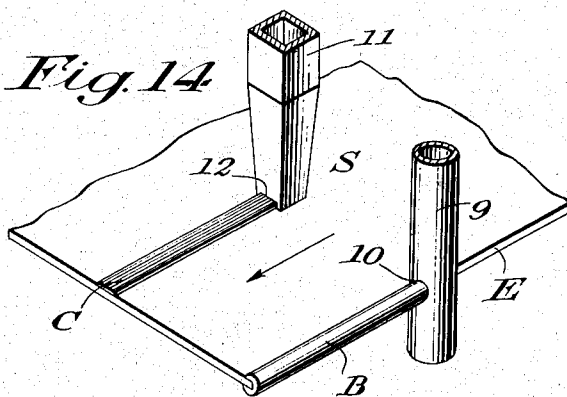


Fig. 14



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UNITED STATES PATENT OFFICE

2,293,252

FINISHING EDGES OF SHEET MATERIAL

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Application October 11, 1939, Serial No. 298,886

9 Claims. (Cl. 18-13)

This invention relates to finishing the raw edge of a piece of sheet material and is herein particularly illustrated in connection with the raw edges of leather or leather-like materials used in shoe uppers. It will be understood, however, that the invention is not limited to shoes and may find application to belts, wallets, bags, and many other similar articles.

It is particularly true of light, flexible leather, such as is used in shoe uppers, that the raw edge formed in even a comparatively thin piece of material is unsightly. This results partly from the fibrous nature of the material, partly from the fact that the leather is likely to rough up and appear thicker than it normally is, and partly from the fact that the raw edge is usually of a color different from the color of the surface of the material. There are numerous known methods of concealing such raw edges, such as folding the edge, covering the edge with a binding, treating the material near the edge to cause the outer surface of the leather to curl, thereby completely covering the raw edge, and other similar methods, each of which is limited in its field of utility; furtherwork, such finishing methods are comparatively expensive and are avoided as much as possible in cheaper grades of shoes.

It will be clear that no matter what sort of an edge finish is provided, it should be substantially as durable as the leather itself; it should be sufficiently flexible so as not to interfere with the natural bending of the material in the article in which it appears; and it should have a decorative appearance. To this end, we have applied to the edge of the sheet material a bead of lacquer or the like which is secured to the sheet material by reason of its adhesive properties and which provides a hard, non-tacky surface of decorative appearance. This bead may have any desired cross-sectional contour, independent of the contour of the edge of the sheet material, and may conceal both the edge and one or more of the adjacent margins of the sheet material.

Accordingly, an important object of the invention is to devise an improved machine for applying such a bead of plastic material to the edge of sheet material, such as shoe upper leather.

In accordance with one feature of the invention, the machine is provided with an extrusion nozzle having a lateral outlet arranged to receive the edge of a piece work, and the contour of this outlet is different on the ingoing and leaving sides in order that it may substantially fit the work at the ingoing side and be spaced from

the work to form a bead thereon at the leaving side of the outlet.

As illustrated and in accordance with another feature of the invention, the machine is provided with work-feeding rolls adapted to support the work at the bite of the rolls in a substantially horizontal plane while the above-mentioned nozzle is positioned with its outlet opening alongside the bite of the rolls and arranged to cooperate with the edge of the work to be coated. The outlet opening of the nozzle receives the edge of the work and is mounted for adjustment with respect to the feed rolls to control the relation of the outlet slot to the edge of the work both laterally and heightwise thereof.

These and other features of the invention will now be more fully described in the following specification taken in connection with the accompanying drawings, in which

Fig. 1 is a side elevation of our machine;

Fig. 2 illustrates a characteristic piece of work, the edge of which has been finished, as by means of said machine;

Fig. 3 is a fragmentary view on a larger scale of the lower end of a nozzle for applying a bead and viewed from the side which the work approaches;

Fig. 4 is a similar view showing the leaving side of the nozzle;

Fig. 5 is a view of the work-engaging parts of the machine and showing the lower part of the supply receptacle in section;

Fig. 6 is a diagrammatic view looking down upon a piece of work and showing the nozzle in section as plastic material is applied thereby to the edge of the work and a portion of the adjacent surface;

Fig. 7 is a similar view with the nozzle turned to permit the application of a bead extending farther out from the work;

Figs. 8 to 12 inclusive are sections through the edges of pieces of work, showing differently shaped and disposed beads applied thereto;

Fig. 13 shows another form of nozzle having a notched delivery end for applying a stripe of material to the surface of the work; and

Fig. 14 indicates the manner in which a stripe and a bead may be applied simultaneously to a piece of work.

The drawings show various pieces of work S in which the edge E has been concealed by the application thereto of a bead B of plastic material, and in the piece shown in Fig. 14 there has also been applied a stripe C for decorative purposes. These work pieces S are commonly of flexible material, such as shoe parts in which

it is desired to conceal the raw edge E, which, partly because of its fibrous nature, usually cannot be made presentable or attractive in appearance by the mere application thereto of a liquid dressing or stain. With our invention, however, the edge is completely concealed because the bead B will commonly be made of opaque material, such as lacquer, the color of which may match the color of the work or contrast therewith. This lacquer-like material clings tenaciously to the pieces of work by reason of its adhesive properties and, when it has become dry, provides a hard, non-tacky surface of decorative appearance. The thickness or viscosity of the material is such that the fibres at the edge of the work do not project through the material, and the cross-sectional contour of the bead is independent of the contour of the edge of the leather. The nature of the material is such that it is resistant to abrasion and is sufficiently flexible after it has dried or hardened so that bending of the sheet material will not break the bead. Such an article, which has been provided with a bead of finishing material, is not claimed herein, since it constitutes the subject-matter of a divisional application Serial No. 341,728, filed June 21, 1940.

For the applications of such a bead of plastic material we have provided a novel machine, illustrated particularly in Figs. 1 and 5, in which the material in liquid form is held within an inverted receptacle 1, which may be a glass jar resting on a support 28 and held in position by a clamp 29. To the upper surface 3 of the material in the jar there may be applied a fluid pressure P delivered through a tube 2 which is threaded in the cap of the inverted jar. To this tube 2, air under pressure may be supplied through a flexible nose 8 to cause the material to be extruded through the outlet slot 10 of a nozzle 9 communicating with the interior of the receptacle. This nozzle 9 is formed as a hollow body, closed except at its inlet, and is here shown as an upright cylinder having a lateral slot 10 which, since it passes through a salient portion of the body, will have an entering side to receive the work and an outgoing or leaving side through which the work passes out of the nozzle. The edge of the work S will be pressed into the outlet slot 10, which, on its entering side, is rectangular in shape and approximately fits the cross-section of the work. The viscosity of the material is such, however, that only an approximate fit is needed because the progressive movement of the work through the nozzle slot drags the material away from the entering side of the slot so that there is little danger of leakage in this direction. At the outgoing or leaving side of the nozzle slot a circular enlargement has been provided, in the form of the nozzle shown in Figs. 3 and 4, the contour of which will be imparted to the bead B of the plastic material as it is applied to the piece of work S, as shown in Fig. 2.

The work piece S is held between the bite of feed rolls 5 and 6 in a substantially horizontal plane, with its edge in the outlet slot 10 of the nozzle, and, as roll 5 is driven the edge will be carried through the slot as rapidly as may be desired. The feed roll 6 is an idler roll, carried in a hollow stud 31 which is attached to the lid of the receptacle 1, and is pressed lightly into engagement with the work by a spring 33 contained within that stud, thus allowing work of varying thickness to pass readily through the machine. It will be noted from Fig. 5 that the

roll 6 is carried at the lower end of an inverted L-shaped arm 35 adjustably mounted in a plunger 37 which is received in the stud, this plunger having a bayonet joint 39 with the stud which permits the roll 6 to be raised and turned to an inoperative position when desired.

The feed roll 5 is mounted on a driven shaft 7 journaled in a frame 20 of the machine, and on this frame there is supported an electric motor M connected to the shaft by reduction gearing 30. The arrangement is such that the speed of rotation of the feed roll 5 may be controlled through movement of a treadle rod 13 connected to an operator-controlled treadle, not shown. This rod is connected at an intermediate point to a lever 17 having a cam 18 which bears against the arm 16a of a rheostat 16 which is inserted in the motor circuit. The lever 17 is normally supported by a spring 13a attached to the frame 20. The upper end of the treadle rod 13 is also connected to a lever 14 pivoted on the frame and having its outer end loosely receiving the arm of a control valve 15 which is interposed between the receptacle and the nozzle 9. Depression of the treadle rod will result in increasing the speed of the drive shaft 7 and in more fully opening the control valve 15 so that the amount of material delivered to the nozzle is proportionate to the speed of movement of the work.

In producing the bead B shown in Figs. 2 and 8, the nozzle 9 will be used in the position illustrated in Fig. 6, with the edge E of the work resting lightly against the end 10a of the outlet slot 10. The circular part of the outlet slot will then control the shape of the bead applied to the work. If, however, the nozzle 9 is turned about its axis to a position such as is shown in Fig. 7, then the bead B' will extend out farther from the edge of the work, and there will be applied to the upper and lower margins adjacent to the edge a thin coating, such as is shown in Fig. 9, the thickness of which will depend upon the width of the outlet slot 10 at its ingoing side measured heightwise of the nozzle.

It will also be noted that the height of the nozzle with respect to the feed roll 5 may readily be adjusted, thereby to control the location of the bead with respect to the edge of the work and, to this end, a bracket 22 is clamped to the frame and is slotted at 24 to receive a screw 26 which is threaded into the support 28 for the receptacle 1. It follows then that it will be possible by means of adjustment 24, 26 to raise the nozzle 9 with respect to the bite of the feed rolls so as to displace the bead with respect to the work S and make it assume the form B², such as is shown in Fig. 10. For this purpose, the nozzle will be turned, as shown in Fig. 7. If, however, the heightwise adjustment is maintained and the nozzle is turned back to the position shown in Fig. 6, then a bead B³, such as shown in Fig. 11, will be produced. If it is desired to produce a rectangular bead, such as is illustrated in Fig. 12, a slot 10 in the nozzle will be rectangular at both ends and will be wider than the work is thick. When it is desired to apply stripe C to the surface of the work, a nozzle 11, such as is shown in Fig. 13, may be employed. This nozzle has an open lower end which rests against the surface of the work and is provided with a groove 12 on one edge, the shape and dimensions of which will control the shape and thickness of the stripe C.

Having thus described my invention, what I

claim as new and desire to secure by Letters Patent of the United States is:

1. In a coating machine, work-feeding means arranged to bite the work, and a nozzle having an outlet opening positioned alongside the bite of said feeding means and designed to cooperate with the edge of a piece of work presented thereto by the feeding means.
2. In a coating machine, an extrusion nozzle having an internal bore and an outlet communicating with said bore and arranged to receive the edge of a piece of work the body of which is positioned outside the nozzle, whereby the work may be moved to carry only its edge portion through the outlet, going in at one side thereof and leaving at another side, the contour of said outlet being different on the ingoing and leaving sides.
3. In a coating machine, an extrusion nozzle having an internal bore and a lateral outlet communicating with said bore and arranged to receive the edge of a piece of work the body of which is positioned outside the nozzle, whereby the work may be moved to carry only its edge portion through the outlet, going in at one side thereof and leaving at another side, said outlet being shaped approximately to fit the work at the ingoing side and being larger than the work at the leaving side.
4. In a coating machine, an extrusion nozzle having an internal bore and a lateral elongated outlet communicating with said bore and arranged to receive the edge of a piece of work the body of which is positioned outside the nozzle, whereby the work may be moved to carry only its edge portion through the outlet, going in at one side thereof and leaving at another side, said outlet being shaped rectangularly at the side which the work approaches and approximately fitting the work, said outlet also being rounded in shape at the side from which the work emerges to control the contour of a bead of coating material applied to the edge of the work.
5. In a coating machine, cooperating work-feeding means arranged to bite the work and move it in a plane, and a nozzle beside the bite of said feeding means having a lateral outlet opening designed to receive the edge of a piece of work passing through said feeding means,

the relation between the nozzle outlet and the bite of the feeding mechanism being adjustable in a direction transverse to the plane of the work at the bite of the feeding means.

6. In a coating machine, cooperating feed rolls for moving a piece of work in a substantially horizontal plane with its edge projecting beyond the feed rolls, an upright nozzle having a lateral horizontal work-receiving outlet slot positioned adjacent to said feed rolls, the nozzle being adjustable heightwise to determine the relation between said outlet slot and the plane of the work at the feed rolls.

7. In a coating machine, means for feeding the work in a predetermined direction, a nozzle coating with the edge of the work comprising a chamber having inlet and outlet openings, said outlet opening being a slot receiving the edge of the work, and supporting means for said chamber permitting adjustment of the relation of the ends of said slot to the direction of feeding movement.

8. In a coating machine, means for feeding a piece of sheet material along a predetermined path, a nozzle for applying a coating to the edge of said sheet material and comprising a closed chamber having an inlet opening and a salient portion having a lateral slot receiving the edge of the work as it passes from the incoming to the outgoing side of the slot which serves as an outlet opening of the nozzle, said slot approximately fitting the work at the incoming side and being enlarged at the outgoing side, and means for supporting the nozzle arranged to permit the relation of the outgoing end of the slot to the edge of the work to be varied, thereby to control the contour of the applied coating without substantially varying the relation of the incoming end of the slot to the edge of the work.

9. In a coating machine, a feed roll, a cooperating presser roll, a resilient means urging said presser roll toward the feed roll to bite the work, a nozzle positioned beside the bite of said rolls and arranged to receive the edge of the work projecting laterally from the rolls, and means for holding said presser roll in inoperative position away from the work.

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