

July 8, 1941.

J. W. PRATT ET AL

2,248,192

ABRADING MACHINE

Filed May 2, 1939

2 Sheets-Sheet 1

Fig 1.

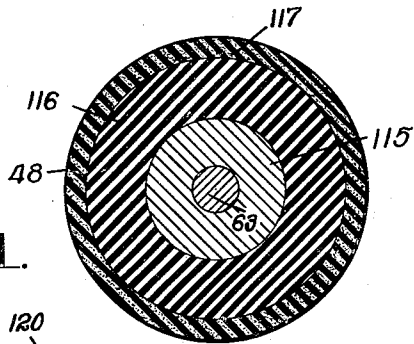


Fig 5.

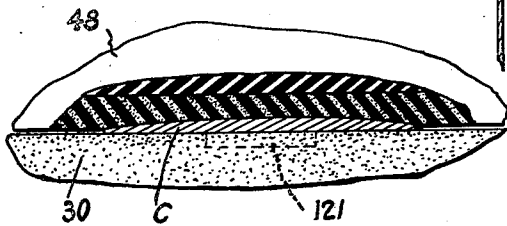
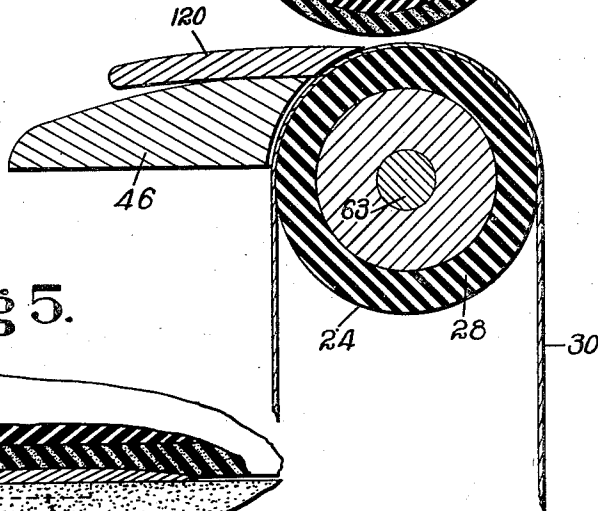
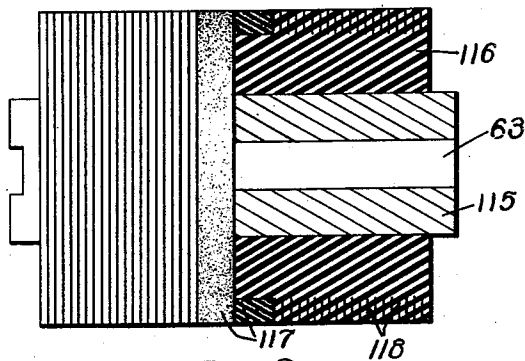


Fig 2.

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2 Sheets-Sheet 2

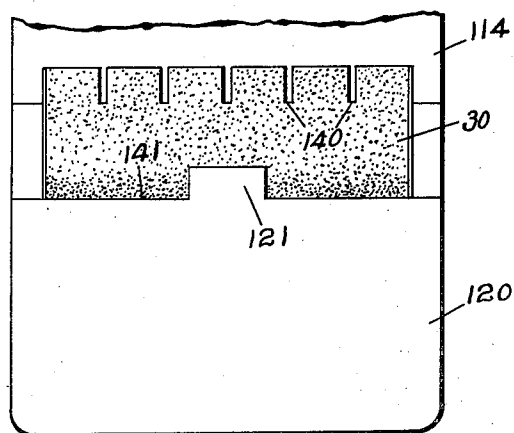


Fig. 3.

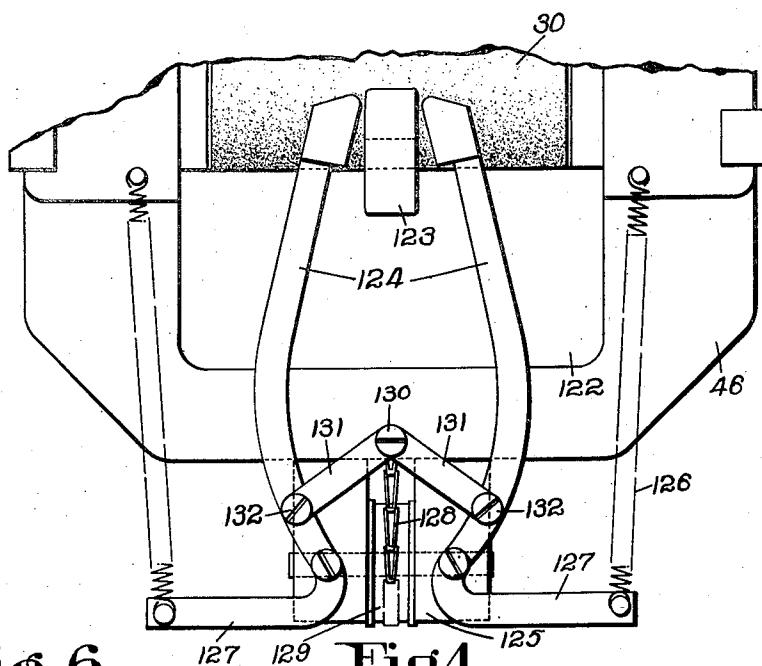


Fig. 4.

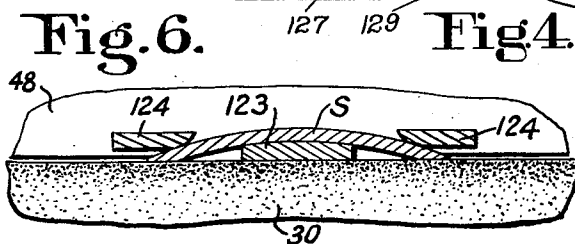


Fig. 6.

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UNITED STATES PATENT OFFICE

2,248,192

ABRADING MACHINE

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Application May 2, 1939, Serial No. 271,320

In Great Britain July 13, 1938

9 Claims. (Cl. 51—139)

This invention relates to abrading machines and is herein illustrated and described as embodied in a machine suitable for scouring or buffing work pieces of sheet material such as leather or rubber outsoles or insoles, box toe pieces, counter stiffeners, or other shoe parts. The machine illustrated herein is an improvement upon a machine disclosed in an application for United States Letters Patent No. 267,119 filed on April 10, 1939 in the name of John W. Pratt and is particularly adapted to operate upon skived articles. The illustrated machine, like the machine disclosed in the above-mentioned application, is arranged to enable the work piece to be fed along a table to a scouring roll against which the work is pressed by a feed roll.

It is an object of the invention to provide an improved machine for scouring skived articles. In accordance with a feature of the invention, the illustrated machine is provided with a feed roll having a peripheral cushion of relatively solid texture adjacent to the end portions of the roll and of softer sponge rubber at the middle portion of the roll to enable the thicker portion of the skived work piece to be embedded more deeply in the sponge rubber and thus to enable the feed roll to hold the relatively thin marginal portions of the work piece with adequate pressure against the scouring roll. In the illustrated machine the end portions of the feed roll are slit annularly to divide the surface of the cushion into sections lengthwise of the roll which are yieldable independently of each other. In accordance with a further feature the work table along which the work is fed has an extension directed toward the feed roll to embed the thicker portion of the skived work piece more deeply into the feed roll than the thinner skived marginal portions. The machine may further be provided with a presser on each side of the extension on the feed plate to hold the skived marginal portions of the work piece against the scouring roll.

These and other features of the invention, including certain details of construction and combinations of parts, will be set forth in connection with an illustrative machine and will be pointed out in the appended claims.

Referring now to the accompanying drawings—

Fig. 1 is a sectional view on a vertical plane extending from front to rear of a machine in which the invention is embodied;

Fig. 2 is a view partly in longitudinal section of an improved feed roll;

Fig. 3 is a plan view of the work table and abrading tool;

Fig. 4 is a plan view similar to Fig. 3 showing a modification; and

Figs. 5 and 6 are sectional views in front elevation illustrating the arrangements shown in Figs. 3 and 4 respectively.

The illustrated machine, like the machine disclosed in the above-mentioned application of John W. Pratt, comprises a feed roll 48 (Fig. 1) mounted on a driven shaft 63 and positioned above and slightly (about three-eighths of an inch) in advance of a roll 24 mounted upon a driven shaft 14 around which travels an abrading belt 30. The roll 24 has a peripheral portion 28 of relatively hard rubber. The feed roll shaft 63 is journaled in a carrier which is urged by springs to an adjustable stop position wherein the feed roll is close to the roll 24. The machine is provided with a work table comprising a supporting member 46 upon which is secured a plate 120 having a smooth upper surface along which the work is fed. This upper surface of the plate 120 faces the feed roll 48 and is nearly tangent that portion of the abrading belt 30 which is curved around the roll 24, the belt as supported by the roll extending slightly above the plane of tangency. The plate 120 extends toward the bite of the rolls terminating, except for a portion 121 presently to be described, in an edge 141 spaced some little distance in advance of the bite of the rolls. The portion 121 extends as close to the abrading belt 30 as reasonable clearance permits, the section shown in Fig. 1 being taken through this portion. The under surface of the extension 121 is beveled to provide clearance for the roll 24 and the abrasive band 30. The extension 121 is about one and one-quarter inches wide and projects about one-half inch beyond the edge 141. After passing the rolls 48 and 24 the work may be permitted to drop into a suitable receptacle, or may be passed through a cleaning mechanism like that disclosed in the above-mentioned application of John W. Pratt.

The feed roll 48 (Fig. 2) comprises a metal hub 115 about two and one-quarter inches in external diameter on which is fixed a sleeve 116 of rubber of a medium degree of resiliency (for example having a durometer scale reading of about 30). The sleeve 116 is about six and one-half inches in length and about five inches in external diameter. The outer surface of this rubber sleeve constitutes the work engaging surface of the feed roll but centrally thereof it has an annular groove cut in it, this groove being about one and one-quarter inches in width and

about three-eighths of an inch deep. The groove is filled by an annulus 117 of relatively soft sponge rubber, the outer surface of the sponge rubber being flush with the outer surface of the said rubber sleeve. The annulus 117 and the extension 121 are of the same width and in register with each other. The rubber sleeve (except at the central part thereof occupied by the sponge rubber) is provided with a number of circumferential slits 118, these slits being about three-eighths of an inch deep and being spaced from each other by three-thirty-seconds of an inch.

When a skived counter blank C (Fig. 5) or skived box toe blank passes through the machine it will normally be fed centrally of the feed roll so that its central unskived part (i. e. its part of greatest thickness) is pressed by the extension 121 into the sponge rubber annulus 117 while its skived marginal portions are engaged by the slitted surface of the rubber sleeve 116. The sponge rubber being relatively soft, the thicker central part of the blank embeds itself up into the sponge rubber to a greater degree than the marginal portions embed themselves into the rubber sleeve. Thus the marginal portions of the blank are pressed against the abrasive band sufficiently to be properly scoured while the thickest part of the blank is held against the abrasive band without undue pressure. The pressing of the tapering skived portions of the blank into proper contact with the abrasive band appears to be considerably assisted by the slitted nature of the rubber sleeve since adjacent portions of the sleeve surface, being separated by the slits, are enabled each to yield to the degree required by the thickness of the particular portion of the work being engaged at any instant with a greater degree of independence than would be the case were the slits not present. The portions of the work at either side of the tongue or extension 121 have more ready access to the band to be operated upon thereby since less of the surface of the band is masked by the plate 120 at either side of the tongue. Thus when a work piece such as a skived counter blank or a skived box toe blank is fed through the machine the tapering portions at either side of the central part of the blank (which portions ordinarily are more difficult to scour than is the central part) are given a better opportunity to be brought into the desired contact with the abrasive band by the pressing action of the feed roll.

An alternative mechanism to the tongued plate 120 above described that may be employed with advantage when work pieces such as molded rubber soles which have tapered margins are being treated is shown in Fig. 4. In this alternative mechanism the tongued cover plate 121 above described is replaced by a plate 122 which does not closely approach the abrasive band 30 but which supports a central tongue piece 123, of substantially the same width as the tongue 121. This tongue piece 123 has an upper face that slopes upwardly toward the rear of the machine. At either side of the tongue piece are mounted two spring-pressed fingers 124 pivoted on a bracket 125 projecting from the plate 122 so that their rearwardly pointing ends can move laterally across the table and pass over the opposite margins of a work piece such as a sole S (Fig. 6) and press them down into contact with the abrasive band 30, while the central part of the work piece is passing over the tongue piece 123, in advance of the position at which the

margins would be pressed by the feed roll into contact with the band. Springs 126 connect outwardly extending tail pieces 127 of the fingers 124 to the work table and thus pull the rear ends of the fingers toward one another, while the fingers can be separated by the operator to allow a work piece to be placed between them with its margins under the finger ends by pulling downwards on a chain 128 which passes over a pulley 129 pivoted in the bracket 125 and is connected to the pivotal connection 130 of two links 131 which are pivoted to the fingers by screws 132. The springs 126 allow the fingers 124 to open as the work piece increases in width and by their action above indicated ensure that the marginal parts receive as thorough a scouring as the thicker central part of a work piece.

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

1. A machine for scouring skived articles such as soles, comprising a scouring roll, a feed roll arranged to hold a work piece against said scouring roll and having a peripheral cushion which is more yieldable at one locality along its length than at another locality, and a plate for pressing a work piece against said feed roll as the work piece is fed to said scouring roll, said plate extending closer to the bite of the rolls at the more yieldable portion of the feed roll than at the less yieldable portion to cause the thicker portion of a skived work piece to be embedded more deeply in the feed roll than the thinner marginal portion and thereby to insure adequate pressure of the thinner edge portion against the scouring roll.

2. A machine for scouring skived articles such as soles, comprising a scouring roll, a feed roll arranged to hold a work piece against said scouring roll and having a peripheral cushion which is more yieldable at the middle portion of the roll than at the end portions, and a plate for pressing a work piece against said feed roll as the work piece is fed to said scouring roll, said plate extending closer to the bite of the rolls at the more yieldable middle portion of the feed roll than at the less yieldable end portions to cause the thicker middle portion of the work piece to be embedded more deeply in the feed roll than the thinner edge portions and thereby to insure adequate pressure of the thinner marginal portions of the work piece against the scouring roll.

3. A machine for scouring skived articles such as soles, comprising a scouring roll, a feed roll arranged to hold a work piece against said scouring roll and having a yieldable peripheral cushion, and a plate for pressing a work piece against said feed roll as the work piece is fed to said scouring roll, said plate having a tongue extending close to the bite of said rolls to mask the thick central portion of a skived work piece from the action of the scouring roll and to embed that portion of the work piece in the yieldable cushion, said plate on each side of said tongue terminating a greater distance in advance of the bite of said rolls to expose the skived marginal portions of the work piece to the scouring roll while the thick central portion is masked by the tongue.

4. A machine for scouring skived articles such as soles, comprising a scouring roll, a feed roll arranged to hold a work piece against said scouring roll, said feed roll being more yieldable at one locality along its length than at another locality, a plate for pressing a work piece against said feed

roll as the work piece is fed to said scouring roll, said plate extending relatively close to the bite of the rolls at the more yieldable portion of the feed roll and extending less closely at the less yieldable portion to cause the thicker portion of a skived work piece to be embedded more deeply into the feed roll than the thinner edge portion, and a presser between the less closely extending portion of the plate and the scouring roll for pressing the thinner marginal portion of the work piece against the scouring roll before the thicker portion of the work piece is pressed against the scouring roll by said feed roll.

5. A machine for scouring skived articles such as soles, comprising a scouring roll, a feed roll arranged to hold a work piece against said scouring roll, said feed roll being more yieldable at one locality along its length than at another locality, a presser substantially coextensive with the more yieldable portion of the feed roll for embedding the thicker portion of a skived work piece into the more yieldable portion of the feed roll as the work piece is fed to the rolls, and a presser for holding the thinner marginal portion of the work piece against the scouring roll before the feed roll presses the work piece against the scouring rolls.

6. A machine for scouring skived articles such as soles, comprising a scouring roll, a feed roll having a yieldable peripheral cushion and arranged to hold a work piece against said scouring roll, a presser for embedding the relatively thick central portion of a skived work piece into said cushion, a pair of pressers on opposite sides of the first-mentioned presser for holding the thinner marginal portions of the work piece against the scouring roll, a pivotal mounting for each of the pressers of said pair to enable them to swing toward and from each other, resilient means for urging the pressers of said pair toward each other to a normal stop position, and operator controlled means for separating the pressers of said pair to facilitate the introduction of a work piece.

7. A machine for scouring skived articles such

as soles, comprising a scouring roll, a feed roll arranged to hold a work piece against said scouring roll, said feed roll having a peripheral cushion of rubber which adjacent to the end portions of the roll is of a relatively solid texture and is slit annularly to divide the surface of the cushion into sections lengthwise of the roll which are yieldable independently of each other, the cushion at the middle portion of the feed roll being composed of relatively softer sponge rubber, and a presser plate constructed and arranged to embed the thick central portion of a skived work piece deeply into the relatively soft middle portion of said cushion as the work piece is fed to said rolls, thereby enabling the end portions of the feed roll cushion to hold the thinner skived margins of the work piece against the scouring roll with adequate pressure.

8. A machine for scouring skived articles such as soles, comprising a scouring roll, a feed roll arranged to hold a work piece against said scouring roll and having a yieldable peripheral cushion, a work table having a smooth surface extending toward and terminating considerably short of the bite of said rolls and facing said feed roll, along which surface work may be fed to said rolls, said work table having a portion continuous with said surface and inclined to said surface in the direction of said feed roll and extending close to said feed roll at a locality spaced from the ends of the feed roll to embed the thick central portion of a skived work piece into said cushion, and a pair of pressers on opposite sides of said inclined extension and between the termination of said work table surface and the scouring roll for holding the thin marginal portions of the skived work piece against the scouring roll.

9. In a scouring machine, a feed roll having a peripheral cushion of rubber of relatively solid texture adjacent to the end portions of the roll and of softer sponge rubber at the middle portion of the roll.

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CHARLES HAROLD HEATHER.