Dec. 23, 1958 P. GOLDSMITH 2,865,143

SHOE UPPER ROUGHING MACHINE

Filed May 28, 1956

FIG.1

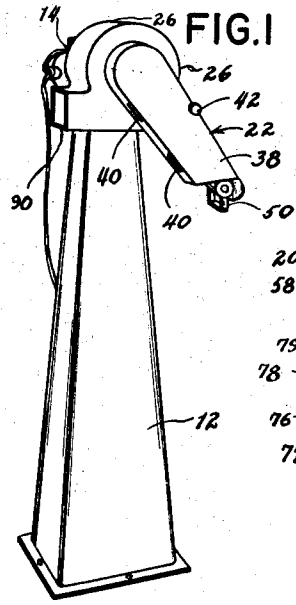


FIG.4

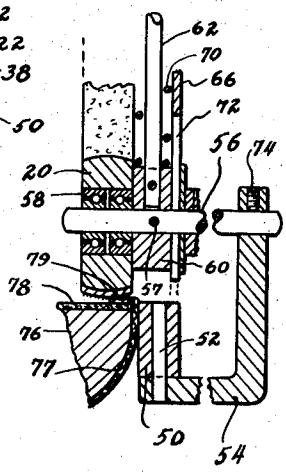


FIG.3

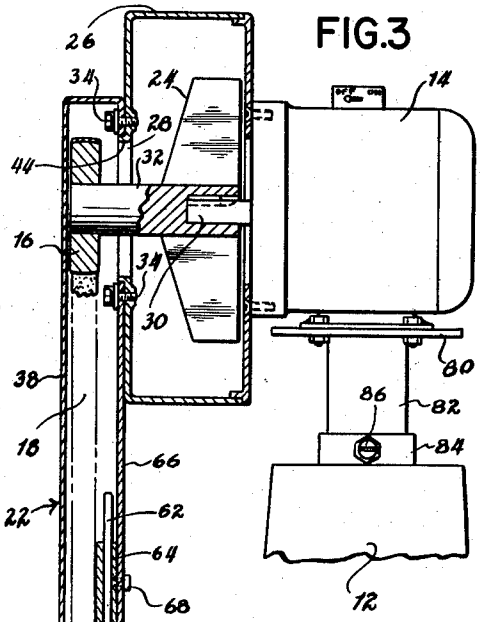
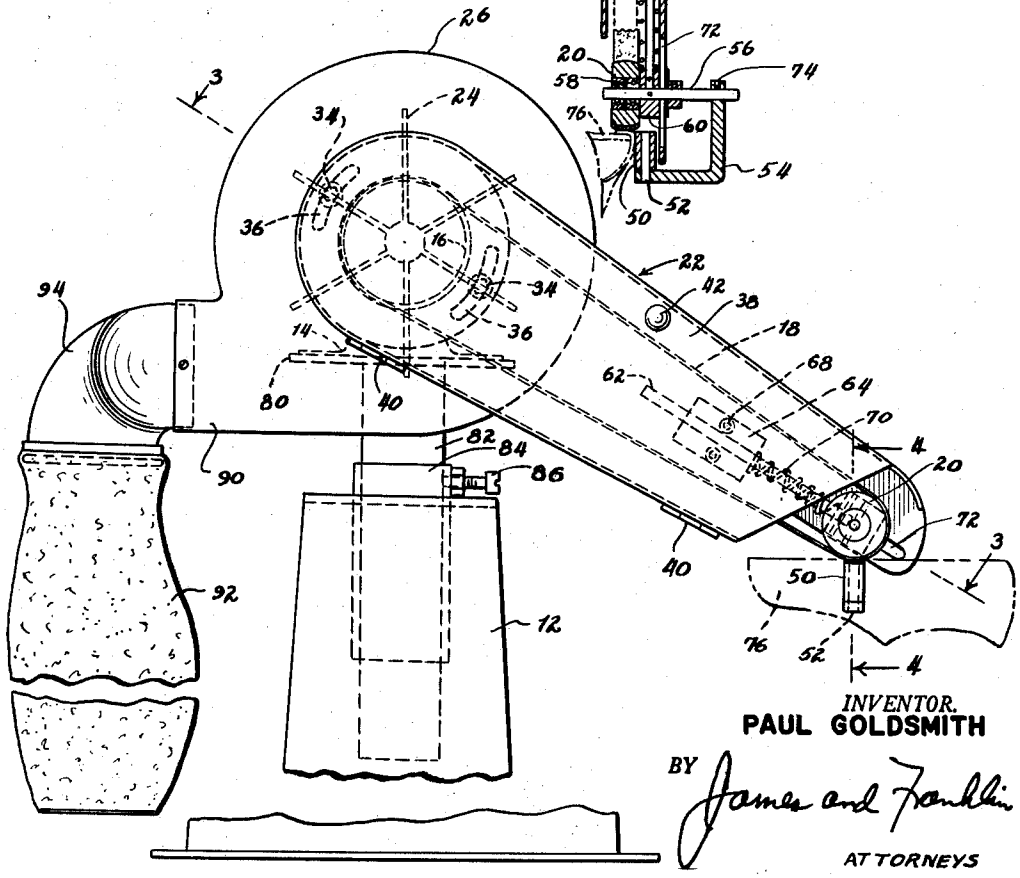


FIG.2



INVENTOR.
PAUL GOLDSMITH

BY James and Franklin

ATTORNEYS

United States Patent Office 2,865,143 Patented Dec. 23, 1958

2,865,143

SHOE UPPER ROUGHING MACHINE

Paul Goldsmith, Los Angeles, Calif.

Application May 28, 1956, Serial No. 587,744

6 Claims. (Cl. 51—141)

This invention relates to machinery used in the manufacture of shoes having a cemented outsole, and relates more particularly to shoe upper roughing machines.

In making one type of shoe the edge of an upper is drawn around and secured to an insole on a last, and an outsole is subsequently cemented to the upper and insole. For this purpose the folded-over edge of the upper is preferably roughened as a preliminary to the cementing operation. It may be desired to provide a margin around the periphery of the last, which margin is not roughened in order to be sure not to mar any part of the upper which might be visible in the finished shoe.

Although machines have already been devised for roughing a shoe upper, such machines have not proved altogether satisfactory, and the primary object of the present invention is to generally improve shoe upper roughing machines.

More specific objects are to provide a machine which is convenient and easy to use, which is relatively simple and inexpensive in construction, which uses a single motor both for drive and for exhaust, and which employs a relatively inexpensive abrasive material, specifically a standard sanding belt.

A further and important object of the invention is to provide a machine in which the entire belt is subjected to a powerful exhaust stream which serves to cool the belt and to prevent "plugging" of the same, thus leading to a long useful belt life. Other objects are to maintain the belt tension at a desired amount, despite possible variation in belt length; and to facilitate changing the belt when necessary.

Still another object is to provide a gauge to help position and guide the shoe as it is being roughened. More specific objects are to so mount the gauge that it moves with the idler, thereby maintaining its position relative to the idler in the event of changes in belt length; and to afford adjustment of the gauge relative to the belt in order to make it possible to provide a margin allowance around the periphery of the upper. The width of the protected margin is adjustable. Another object is to make the height and angular disposition of the belt adjustable to accommodate the convenience and preference of the operator.

To accomplish the foregoing, and other objects which will hereinafter appear, my invention resides in the shoe upper roughing machine elements, and their relation one to another, as are hereinafter more particularly described in the following specification. The specification is accompanied by a drawing, in which:

Fig. 1 is a perspective view showing a machine embodying features of my invention;

Fig. 2 is a front elevation of the machine;

Fig. 3 is a section through the machine taken approximately in the plane of the line 3—3, except that the bracket is shown as though in vertical section; and

Fig. 4 is a fragmentary section taken approximately on the line 4—4 of Fig. 2 and drawn to larger scale.

Referring to the drawing, the machine comprises a

pedestal 12 carrying a motor 14. This drives a pulley 16 for a sanding belt 18. There is also an idler pulley 20 which is spaced at a distance from the motor pulley 16 such as to hold the belt 18 taut. A combined belt guard and cooling duct 22 encloses all of the belt except a short exposed working portion at the idler. There is also a fan or blower impeller 24 and a fan or blower housing 26, the inlet or suction port 28 (Fig. 3) of which is connected to the belt guard 22. The stream of exhaust or dust-collecting air is drawn in at the idler 20, and passes along both sides of the loop of belt over their entire length, back to the driving pulley. Thus the fan acts to cool the sanding belt, in addition to removing the abraded particles. The cooling action is important because it prevents softening of the adhesive, and this helps prevent filling or "plugging" of the belt, apart from the direct suction action, and it also minimizes loss of abrasive particles from the belt. Indeed, the improvement is so marked that I find that the life of the abrasive belt is about fourteen times as great as when using prior machines having sandpaper on a drum or disc. This saves "down time" when the machine is idle for renewal of the abrasive.

It will be noted that the fan housing 26 is mounted at one end of the motor 14, with the impeller 24 mounted directly on the motor shaft, as indicated at 30. The driving pulley 16 is mounted on the motor shaft outside the impeller. In the specific structure here shown the impeller 24 has a shaft 32 which acts as an extension of the motor shaft 30, and the pulley 16 is mounted on the impeller shaft 32, but this is merely for convenience in not having to have motors made with an extra long shaft. With the present construction the impeller shaft is an extension of the motor shaft, and the motor may be standard. For convenience the pulley is referred to simply as being on the motor shaft, meaning that it is coaxial and driven directly by the motor. The combined belt guard and duct 22 is disposed immediately outside of the fan housing 26 and is carried by the fan housing, with the exhaust passage 28 preferably being an annular passage immediately surrounding the shaft 32. The parts may be secured together, as by the use of screws 34, best shown in Fig. 3.

Referring now to Fig. 2, the apertures through which the screws 34 pass are preferably arcuate slots 36, concentric with the motor shaft. This affords angular adjustment of the guard 22 to suit the convenience and wishes of any particular operator of the machine. Access to screws 34 is readily obtained by opening the front cover 38 of the belt guard, which, in the present case, is hinged along its bottom edge, as shown at 40. It is held closed by a suitable catch, not shown, operated by a knob 42. The main purpose of the door 38 is to facilitate changing from one sanding belt to another, but when the door is opened it provides access also to the screws 34. The fan housing 26 is preferably provided with an annular lip or flange 44 (Fig. 3) which acts as a bearing for the guard 22 when it is being angularly adjusted, and such adjustment does not affect the flow connection between the guard 22 and the fan housing 26.

The machine is provided with a gauge against which the shoe may be held while roughing the edge of the upper. In the drawing it will be seen that the gauge here shown is a roller 50, freely rotatable on a generally upright pin 52, carried by a bracket 54, which is itself so mounted as to move with the idler pulley. In the particular construction shown, the bracket 54 is mounted directly on the idler shaft 56. The shaft is non-rotatable, and is held against rotation by a cross pin 57 driven through bearing block 60 and shaft 56. The idler 20 may be provided with an anti-friction bearing 58 for free rotation on shaft 56.

The bearing block **60** is itself mounted on the lower end of a guide rod **62** slidable in a stationary guide block **64**. The latter is fixedly secured to the duct wall **66** by means of screws **68**. A compression spring **70** surrounds the rod **62** and is disposed between the stationary guide block **64** and the movable bearing block **60**. The duct wall **66** is slotted at **72**, and the shaft **56** passes through the slot **72**. The bearing block is guided by the rod, the duct wall, and the slot. Spring **70** serves to keep the sanding belt **18** under desired tension. This tension may be made adjustable, as by making the stationary guide block **64** movable toward and away from the idler by passing the screws **68** through slots (not shown) instead ot through round holes, the said slots being parallel to guide rod **62**.

The mounting of bracket **54** on idler shaft **56** is preferably adjustable, as by means of one or more set screws **74**. Thus the bracket is adjustable angularly, and also axially on shaft **56**. The latter adjusts the position of the sanding belt relative to the periphery of the shoe.

The shoe **76** is held in inverted position, it being understood that the upper **77** (Fig. 4) has already been lasted about an insole **78**, but that the outsole has not yet been added. The inturned edge **79** of the upper is exposed over the insole, and it is this inturned edge which is roughened by the sanding belt. When the gauge roller is disposed at or somewhat within the edge of the sanding belt as in Fig. 3, the inturned edge of the upper is roughened all the way to the periphery of the shoe. However, by moving the gauge roller slightly away from the edge of the sanding belt as in Fig. 4, the upper may be provided with a safety margin, that is, a margin of upper which is not roughened, thereby avoiding any chance of abrading some of the upper which might be visible in the completed shoe.

To suit the comfort of the operator the height of the machine may be adjusted. For this purpose the motor **14** is mounted on a plate **80** (Figs. 2 and 3) which is secured at the upper end of a cylindrical column **82**, which is held in a sleeve **84** secured at the upper end of pedestal **12**. The column **82** is slidable up and down in sleeve **84**, and is locked in position by one or more set screws **86**. Thus by loosening the set screws the height of the machine may be changed, and the column then locked at the new height.

If the machine is used in a plant which is not equipped with a dust collecting system, the outlet **90** of the fan housing is preferably connected to a suitable dust bag **92** (Fig. 2). In such case an elbow or fitting **94** is preferably interposed, thereby changing from a rectangular to a round opening, and permitting the dust bag to hang vertically. Of course, when the plant has a dust collecting system, the bag **92** and elbow **94** are not required, and instead the rectangular outlet **90** (Fig. 1) of the fan housing is connected by a suitable duct to the dust collecting system.

The sanding belt may be conventional. In the present case I employ a belt made by Abrasive Products, Inc. of South Braintree, Mass., and known as their #120 Resinoid Jewelox X. This belt has a canvas back, and is available in quantity at low cost. Because of the thorough cooling and dust-exhaust, operating over the entire length of the belt, it fills or plugs very slowly, and the belt may be used for about fourteen times as long as sandpaper or like material used on known drum and disc machines. The machine is shown with a belt one inch wide, but may be used with belts which are only ½" or ¾" in width, without any other change, because the belt is self-centering on the crowned pulleys.

It is believed that the construction and operation of my improved shoe upper roughening machine, as well as the advantages thereof, will be apparent from the foregoing detailed description. The dust collecting duct provides a cooling action on the belt. The duct acts also as a belt safety guard. Plugging of the belt is minimized.

Abrasive life is increased fourteen to one compared to conventional machines using a sandpaper drum or disc. The saving in operator's time for changing the abrasive is therefore great. There is a self-contained blower and dust collecting system. Cleaning is easy, and there is a minimum of fire hazard. The belt tension spring is constructed for simplicity of design; automatic seating; and uniform belt tension.

The machine is portable and can be used anywhere in the factory. It can rough wedge heels with scoops, which other roughers cannot do. It has an idler edge gauge which is fully adjustable and which can be adapted to various shapes and types of shoe. The machine minimizes rejects of damaged shoes, due to the accuracy of roughing, compared to conventional roughing.

The machine is completely adjustable for height and angle, to suit thre convenience of the operator. The fan impeller and the drive pulley both are mounted on a single motor having a single end shaft.

It will be apparent that while I have shown and described my invention in a preferred form, changes may be made in the structure shown, without departing from the scope of the invention, as sought to be defined in the following claims.

I claim:

1. A shoe upper roughing machine comprising a motor and drive pulley for a sanding belt, an idler pulley, means spacing the same at a distance from said drive pulley such as to hold the belt taut, said means including guide means for the idler pulley to afford movement toward and away from the drive pulley, resilient means urging the same away from the drive pulley in order to keep the belt taut, and a gauge for engaging the periphery of a shoe upper while its folded-over edge is in contact with the sanding belt, said gauge being movable with the idler pulley so as to maintain its position relative to the idler pulley and belt despite movement of the idler pulley toward and away from the drive pulley.

2. A shoe upper roughing machine comprising a motor and drive pulley for a sanding belt, an idler pulley, means spacing the same at a distance from said drive pulley such as to hold the belt taut, said means including guide means for the idler pulley to afford movement toward and away from the drive pulley, resilient means urging the same away from the drive pulley in order to keep the belt taut, a gauge for engaging the periphery of a shoe upper while its folded-over edge is in contact with the sanding belt, said gauge being movable with the idler pulley so as to maintain its position relative to the idler pulley and belt despite movement of the idler pulley toward and away from the drive pulley, and means affording adjustment of the gauge in order to change the adjustment of the gauge relative to the sanding belt.

3. A shoe upper roughing machine comprising a motor and drive pulley for a sanding belt, an idler pulley, means spacing the same at a distance from said drive pulley such as to hold the belt taut, said means including guide means for the idler pulley shaft to afford movement toward and away from the drive pulley, and resilient means urging the same away from the motor pulley in order to keep the belt taut, a gauge roller rotatable on an upright pin for engaging the periphery of a shoe upper while the folded-over edge of the upper is in contact with the sanding belt, and a bracket carrying said gauge roller and pin, said bracket being mounted on and movable with the idler pulley shaft so as to maintain its position relative to the idler pulley and belt despite movement of the idler pulley toward and away from the drive pulley, and means affording adjustment of the bracket in order to change the adjustment of the gauge relative to the sanding belt.

4. A shoe upper roughing machine comprising a driving motor, a fan housing, a fan impeller in said housing, a drive pulley on said impeller shaft outside said housing, a sanding belt driven by said pulley, an idler pulley, means spacing the same at a distance from said drive

pulley such as to hold the belt taut, a combined belt guard and cooling duct enclosing all of said belt except a short exposed working portion at the idler pulley, said duct being disposed immediately outside of and being mounted on the fan housing, with a suction passage from the duct to the housing around the motor shaft, and means whereby the angle of the duct may be changed relative to the housing about the axis of the impeller.

5. A shoe upper roughing machine comprising a driving motor, a fan housing, a fan impeller in said housing, a drive pulley on said impeller shaft outside said housing, a sanding belt driven by said pulley, an idler pulley, means spacing the same at a distance from said drive pulley such as to hold the belt taut, a combined belt guard and cooling duct enclosing all of said belt except a short exposed working portion at the idler pulley, said duct being disposed immediately outside of the fan housing with a passage from one to the other, guide means for the idler pulley to afford movement toward and away from the drive pulley, resilient means urging the same away from the drive pulley in order to keep the belt taut, a gauge for engaging the periphery of a shoe upper while its folded-over edge is in contact with the sanding belt, said gauge being movable with the idler pulley so as to maintain its position relative to the idler pulley and belt despite movement of the idler pulley toward and away from the drive pulley, and means affording adjustment of the gauge relative to the sanding belt.

6. A shoe upper roughing machine comprising a pedestal supporting a driving motor, a fan housing mounted at one end of said motor, a fan impeller in said housing

on said motor shaft, a drive pulley on said motor shaft outside said housing, a sanding belt driven by said pulley, an idler pulley, means spacing the same at a distance from said motor pulley such as to hold the belt taut, a combined belt guard and cooling duct enclosing all of said belt except a short exposed working portion at the idler pulley, said duct being disposed immediately outside of and being mounted on the fan housing, with a passage from one to the other around the motor shaft, whereby the fan acts to cool and to prevent plugging of the sanding belt in addition to removing the abraded particles, guide means for the idler pulley shaft to afford movement toward and away from the motor pulley, resilient means urging the same away from the motor pulley in order to keep the belt taut, a gauge roller rotatable on an upright pin for engaging the periphery of a shoe upper while the folded-over edge of the upper is in contact with the sanding belt, and a bracket carrying said roller and pin, said bracket being mounted on and movable with the idler pulley shaft so as to maintain its position relative to the idler pulley and belt despite movement of the idler pulley toward and away from the motor pulley, and means affording adjustment of the bracket in order to change the adjustment of the gauge relative to the sanding belt.

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