May 9, 1939. J. A. WEBB 2,157,874

MACHINE FOR SIZING LEATHER BELTS

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Fig. 1

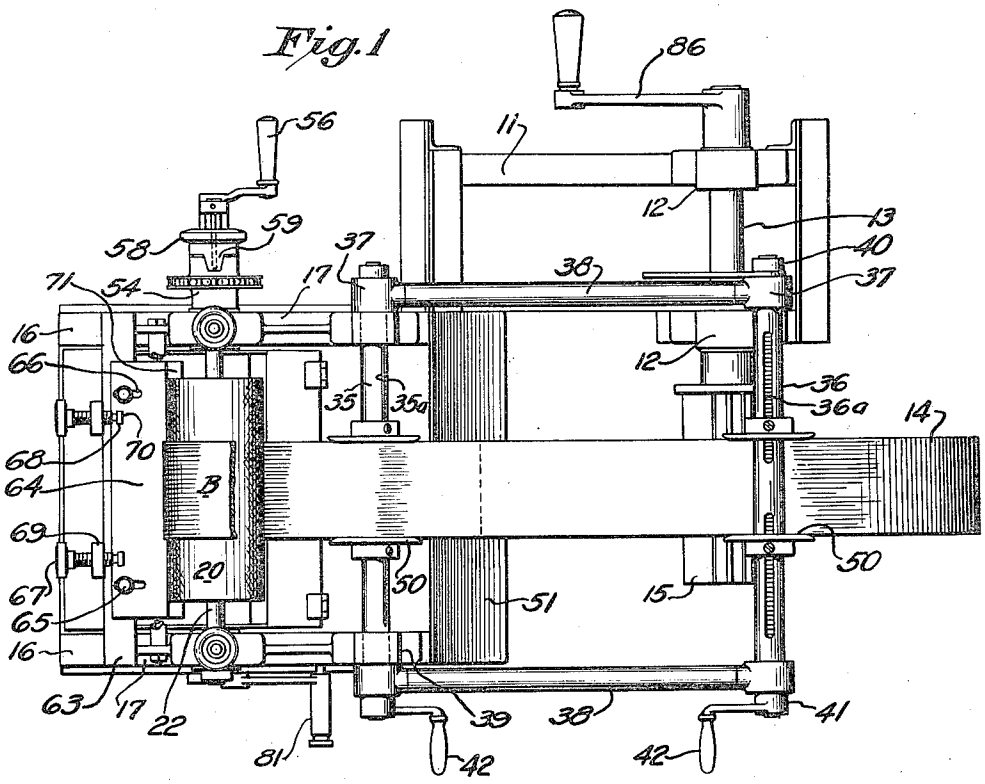
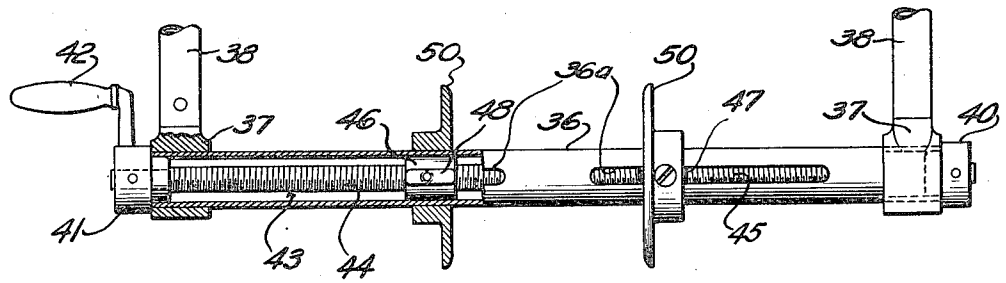


Fig. 5



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Fig. 2

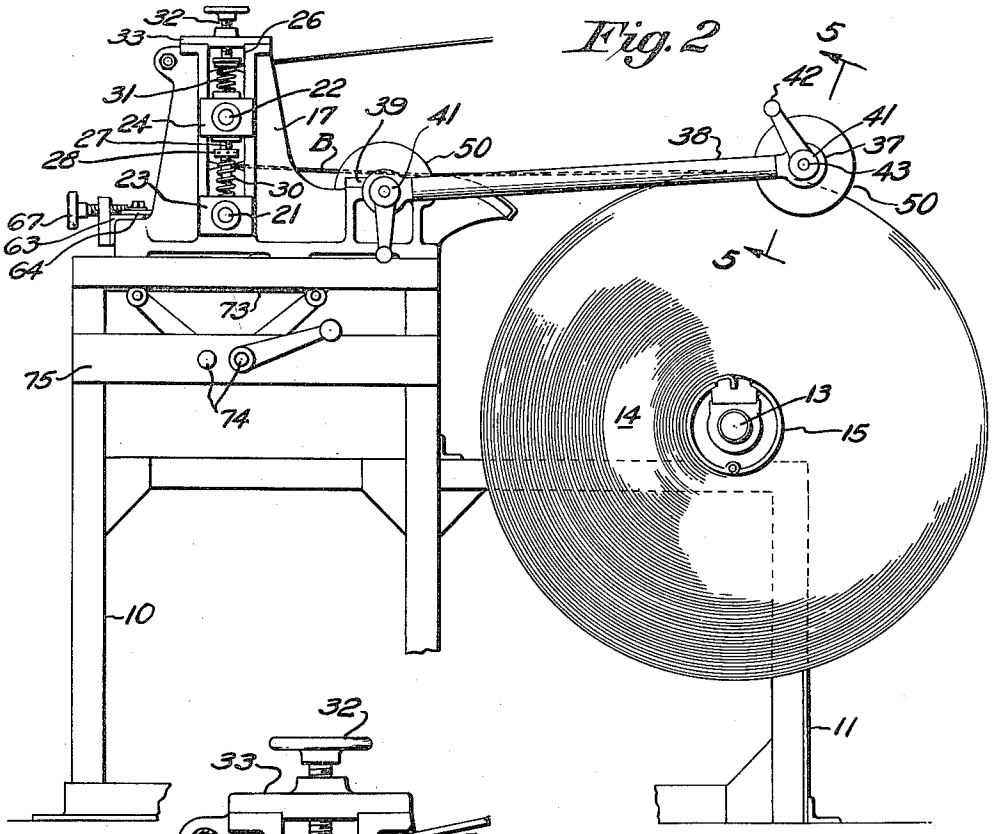
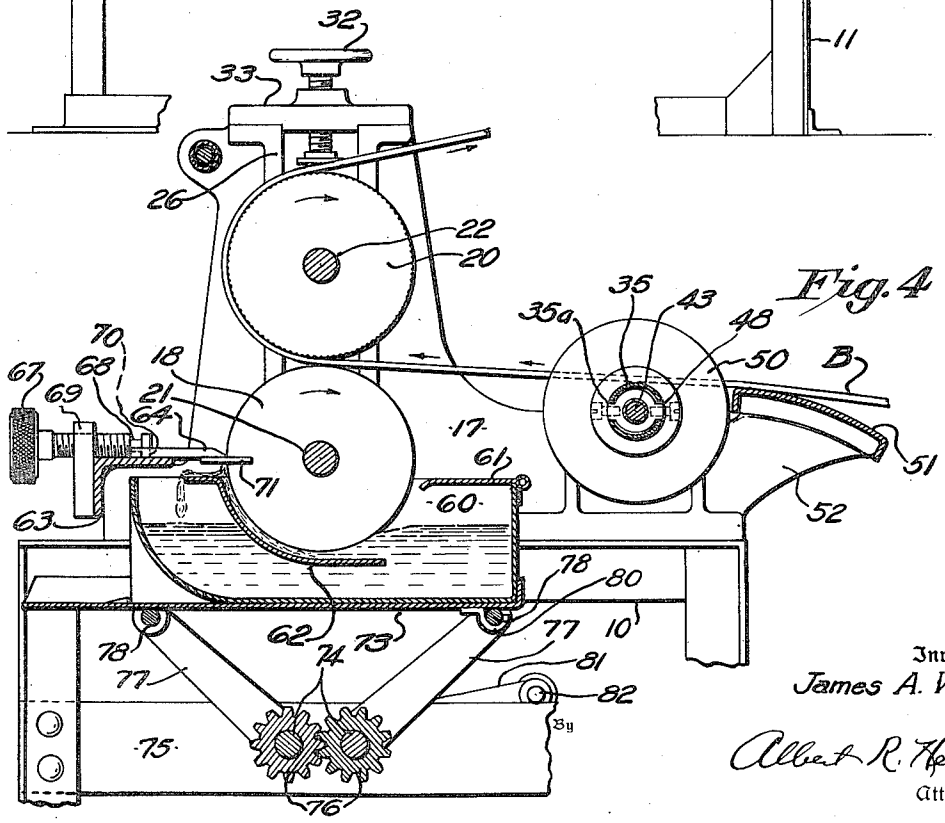


Fig. 4



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Fig. 3

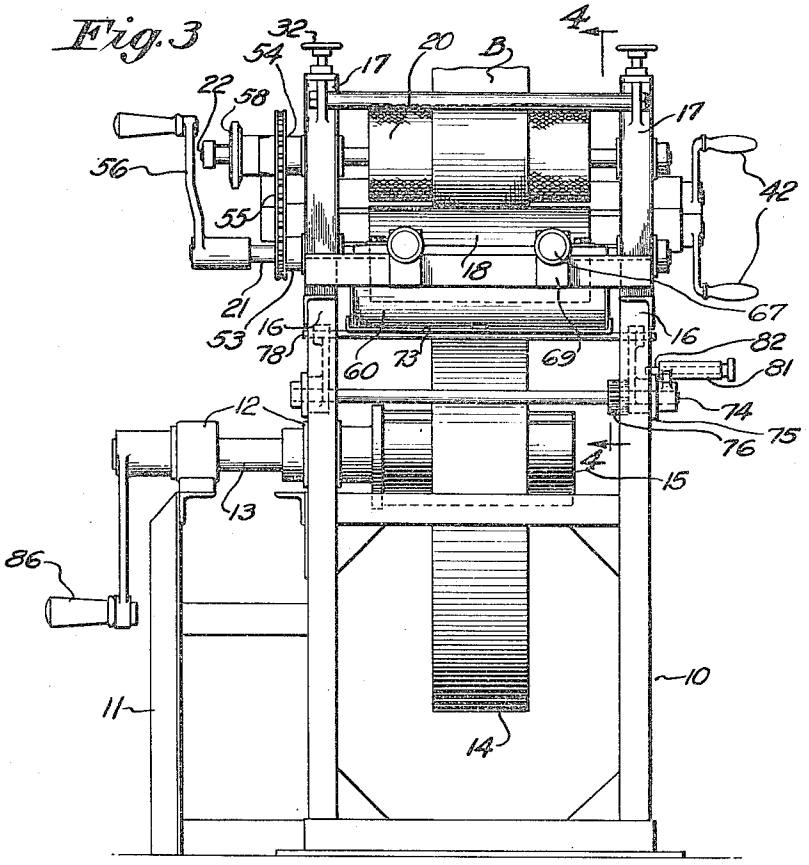
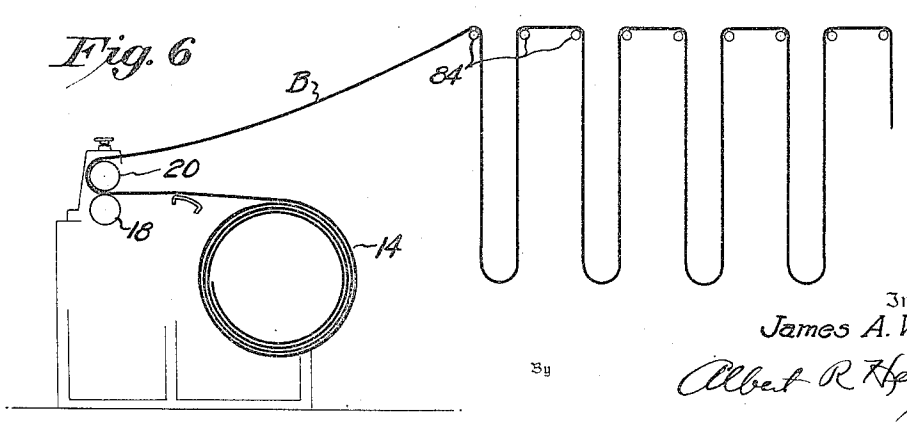


Fig. 6



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UNITED STATES PATENT OFFICE

2,157,874

MACHINE FOR SIZING LEATHER BELTS

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Application February 10, 1937, Serial No 125,104

3 Claims. (Cl. 91—51)

This invention relates to a machine for sizing a leather belt ply, and it has particular reference to the provision of a machine for effectively applying a coating of cement to one surface of the material undergoing treatment.

Heretofore it has been customary, in the manufacture of leather belting, to apply manually a sizing coat or coats to the separate plies of a belt, and later, after the sizing coat has thoroughly dried, to apply a final coating of glue or cement and to unite the plies. The first, or sizing operation is slow and costly, and requires considerable skill to form a coating of uniform thickness. The present invention provides a machine for efficiently conducting this step in the manufacture of the belt.

One object of the invention is to provide a machine in which a roll of belting material may be fed between a pair of rolls, one of which serves to brush the sizing material into the pores of the leather.

Another object is to devise a roll system for such a machine in which the load imposed on the belting passing between the rolls may be finely adjusted so that a uniform coating of sizing cement is applied to the belting.

Still another object of the invention is to provide a sizing machine which may be utilized for rewinding the coated material into neatly formed rolls.

Other objects are the provision of improved instrumentalities making for ease and reliability of operation, and will be made more apparent as this specification proceeds with a detailed description of a preferred embodiment of the invention, illustrated in the accompanying drawings, wherein:

Fig. 1 is a plan view of the sizing machine;

Fig. 2 is a side elevation thereof;

Fig. 3 is an end elevation of the machine as viewed from the left hand side of Fig. 1;

Fig. 4 is an enlarged section on the line 4—4 of Fig. 3;

Fig. 5 is an enlarged section on the line 5—5 of Fig. 2, showing the structure of the outer side guide; and

Fig. 6 is a diagrammatic view showing the belt material in the machine and associated drying rack.

The machine consists of a main frame 10 in front and to one side of which is attached a subframe 11 having affixed thereto aligned bearing blocks 12 which receive a windlass shaft 13. A roll 14 of belt material is adapted to be positioned on a drum 15 which is secured to a projecting extremity of the shaft 13, and which is preferably of the collapsible type, to facilitate application of the roll.

The frame 10 is formed with spaced parallel upper portions 16 upon which elongated bearing pedestals 17 are rigidly secured. A coating or applicator roll 18 and a knurled traction roll 20 are disposed transversely between the pedestals, and their projecting pintles 21 and 22 are received in bearing blocks 23 and 24 respectively. The blocks 23 are secured in position, while the blocks 24 are vertically movable in slide structures 26 formed in the pedestals 17.

A tension adjustment for the blocks 24 and accompanying roll 20 is provided to obtain a control of the pressure exerted on the web of belting material B which is drawn between the rolls (Fig. 2). For this purpose the blocks 24 are each provided with depending threaded studs 27 having adjustment nuts 28 thereon. The nuts support the roll structure by resting on springs 30, which in turn are supported on the lower bearing blocks 23. Balancing springs 31 are disposed on top of the blocks 24, and they are compressed by adjusting screws 32 located in caps 33 secured to the slide structures 26.

The supply roll 14 may be of various diameters, and in some cases may be of relatively narrow belt material which requires accurate lineal guidance into the sizing apparatus, and an equally accurate guide during a re-reeling operation, as hereinafter described. Adjustable side guides are thus provided and they consist of a frame formed of laterally disposed sections of tubing 35 and 36, which are rigidly secured in the eyes of connecting fittings 37, which also receive longitudinally disposed tubes 38 (Fig. 1). The tube 35 is rotatably mounted in bearings 39 forming part of the structure of the pedestals 17, while the remainder of the frame may swing about this axis with the tube 36 being supported on the supply roll 14 as the belting material is reeled or unreeled.

A pair of thrust collars 40 and 41, the latter having handles 42, are rotatably mounted in the open ends of each of the tubes 35 and 36, and they are affixed to adjusting screws 43 which extend axially through the tubes (Fig. 5). The screws 43 are each formed with sections 44 and 45 of right and left hand threads, respectively, which receive nuts 46 and 47 having projecting key portions 48. The key portions project through slots 35a and 36a in the tubes, and are secured to flanged guide members 50, which are slidably mounted on the exterior of the tubes.

The pairs of guide members which are carried by the nuts 46 and 47 may be spaced by manipulation of the adjusting handles 42 to engage and guide the sides of the belt web B in its passage from the supply roll 14 to the rolls 18 and 20 of the sizing device. A bottom guide 51 for the web B is secured to projecting portions 52 of the pedestals 17, and it is of arcuate formation so that the web may pass smoothly thereover, regardless of the angle of approach from the supply roll 14.

The projecting portions of the pintles 21 and 22 of the rolls 18 and 20 carry sprockets 53 and 54, respectively, connected by a chain 55. A handle 56 secured to the pintle 21 of the applicator roll 18 permits the rolls to be driven in the same direction of rotation, the sprockets being proportioned so that the roll 18 is given a considerably greater peripheral speed than the roll 20. The knurled surface of the traction roll 20 offers a sufficient frictional grip on the web B to draw the web without slippage from the supply roll 14, while the applicator roll 18 contacts the web and rotates counter to the direction of movement of the web in a light brushing action.

To prevent rotation of the lower roll 18 during a rewinding process, a clutch member 58 is keyed to the upper pintle 22, and it is formed with teeth 59 which are engageable in complementary sockets in the upper sprocket 54. When the clutch member is slid outwardly, it is disengaged from the sprocket 54, and the roll 20 is then free to rotate without affecting the lower roll 18.

The roll 18, during the sizing operation of the machine, is partially immersed in a tank 60 (Fig. 4) containing the sizing liquid, which may be a somewhat viscous solution of waterproof cement. The tank 60 is located immediately beneath the roll 18 and it is provided with a hinged protective cover 61 at one side of the roll, and a curved shield or partition member 62 following the periphery of, and terminating at the opposite side of the roll. The partition is spaced but a slight distance from the roll, so that, as the roll rotates in the viscous liquid, the contents of the tank are shielded from centrifugal effects which would otherwise tend to cause spillage over the left hand side of the tank.

A transverse angle member 63, connected to the front edges of the pedestals 17, serves as a support for a doctor or scraper 64 for the roll 18. The doctor is rigidly secured to the angle by bolts 65 which extend through slotted holes 66 therein. The bolts may be loosened to permit accurate adjustment of the doctor by an adjusting mechanism consisting of screws 67 mounted in tapped blocks 69 secured to the member 63, and formed with shouldered extremities 68 which engage in T-slots 70 formed in the body of the doctor. Suitable adjustment of the doctor, followed by a tightening of the bolts 65, will permit a film of sizing liquid of any desired thickness to remain on the roll 18 for a subsequent application on the moving web B. Bars 71 are secured to opposite ends of the doctor, and they engage the ends of the roll in a scraping action, to prevent the introduction of liquid to the pintle 21.

The tank 60 is supported on a shelf 73, which may be lowered to remove the tank entirely from the roll 18. The lowering mechanism for the shelf consists of a pair of transverse shafts 74 journalled in straps 75 secured to opposite sides of the frame 10 and connected for mutual rotation by gears 76. Pairs of arms 77 are secured to opposite ends of the shafts, and they are connected by rods 78 upon which the shelf is supported. One rod is secured against relative movement with the shelf by bearing clips 80, while the remaining rod is free to slide along the bottom of the shelf. An operating handle 81 is secured to one of the shafts 74, and it is provided with a pin 82 which may be slid into engagement with the top of one of the straps 75 when the shelf is elevated, thus securing the shelf and accompanying tank in the operative position illustrated. When it is desired to lower the tank, the pin 82 is retracted and the rods permitted to swing downward until they rest on the straps 75, where the tank 60 is completely out of registry with the roll 18, and may be slid forward for total removal from the machine, if desired. During this lowering movement, it will be observed that the level of the tank is undisturbed, due to the parallel supporting action of the rods 78.

As shown in Fig. 6, during the sizing operation of the machine, the web B, as it leaves the traction roll 20, is draped in festoons on the bars 84 of a drying rack, which may extend for a considerable distance in front of the reel end of the machine. After the supply roll 14 is exhausted, and its web thoroughly dried on the rack, it may be re-reeled by the same machine. In this case, the clutch 58 is thrown out to prevent movement of the applicator roll, and the tank 60 lowered, if desired. The web is then reintroduced into the machine by engaging it about the traction roll, connecting its extremity to the drum 15, and by operating the drum by turning the operating crank 86 of the drum shaft 13. During the re-reeling operation, the guiding action of the two side guide structures insures the formation of a neat and properly wound roll on the drum, and its subsequent removal is easily accomplished through the aid of the collapsible drum. In the alternative, a second sizing coat may be desired, whereupon the applicator roll may again be rendered operative, and the web re-drawn through the machine, as before.

Those skilled in the art will appreciate that a machine made in accordance with the principles hereinabove discussed is highly effective in applying a sizing coat to belting material. In the usual form of coating machine, the applicator roll and driving roll rotate in opposite directions under the influence of frictional engagement, and such connection also imposes a substantial load on the material being coated. In the present invention, the mounting for the upper bearing is such that the weight of the upper roll may be released from the belting, or applied in part, thus providing for the control of the load desired. It will also be noted that the applicator roll brushes the sizing material into the pores of the leather, thereby permitting of a strong and uniform coating as acceptable as those applied by hand by skilled workmen.

It will also be noted that the belting, after being sized and dried, may be re-wound on the same machine, thus providing for the easy handling of the roll without danger of the coated surface becoming dirty, as could occur if the belting were dragged over the factory floor. During both the sizing and re-winding operations, the belting is guided in a straight path, to avoid curling of the edges which would injure the sizing coat.

While the foregoing and other features of the invention have been set forth by reference to a single form, it will be understood that the invention is not limited to the precise details of construction and arrangement of parts herein illus-

trated, and it is therefore intended that the invention should not be restricted to such form, but should encompass all such modifications and variations as are included within the scope of the following claims.

I claim:

1. A belt sizing machine comprising a frame, bearing means secured to the frame, a pair of sizing rolls mounted in superimposed relation in the bearing means, a tank containing sizing liquid in which the lower roll is partially immersed, the upper roll being formed to frictionally engage a web of belting material to draw it between the rolls, drive means for the rolls, a rotatable drum mounted on the frame and adapted to support a supply roll of belt material, means for guiding the web from the supply roll to the sizing rolls comprising a frame structure mounted for swinging movement on the machine frame and having transverse tubular portions at opposite ends, one of said portions being supported on the supply roll, and a pair of flanged members mounted on each of the tubular portions and adapted to engage the edges of the belting material.

2. A belt sizing machine comprising a frame, bearing means disposed in the frame, a pair of sizing rolls mounted in superimposed relation in the bearing means, a tank containing sizing liquid in which the lower roll is partially immersed, the upper roll being formed to frictionally engage a web of belting material to draw it between the rolls, drive means for the rolls, a rotatable drum mounted on the frame and adapted to support a supply roll of belt material, means for guiding the web from the supply roll to the sizing rolls comprising a frame structure mounted for swinging movement on the machine frame and having transverse tubular portions at opposite ends, one of the tubular portions being supported on the supply roll, a pair of flanged members slidably mounted on each tubular portion, a screw rotatably mounted within each tubular portion and formed with oppositely threaded portions, a nut on each portion, axial slots in the tubular portions, and means extending from each nut through a slotted portion and being secured to the flanged member.

3. A belt sizing machine comprising superimposed rolls adapted to receive a web of belting material therebetween, means for applying sizing liquid to the lower roll, drive means for driving the rolls in the same direction of rotation, said upper roll being formed with a friction surface to engage and draw the web between the rolls, means on the entrant side of the rolls for guiding the belting web, and rack means on the same side of the rolls for receiving the sized web for drying, said web partially enwrapping said upper roll in being directed therefrom to said rack.

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