Jan. 20, 1931. F. E. BERTRAND 1,789,298

ABRADING ROLL

Filed March 26, 1928

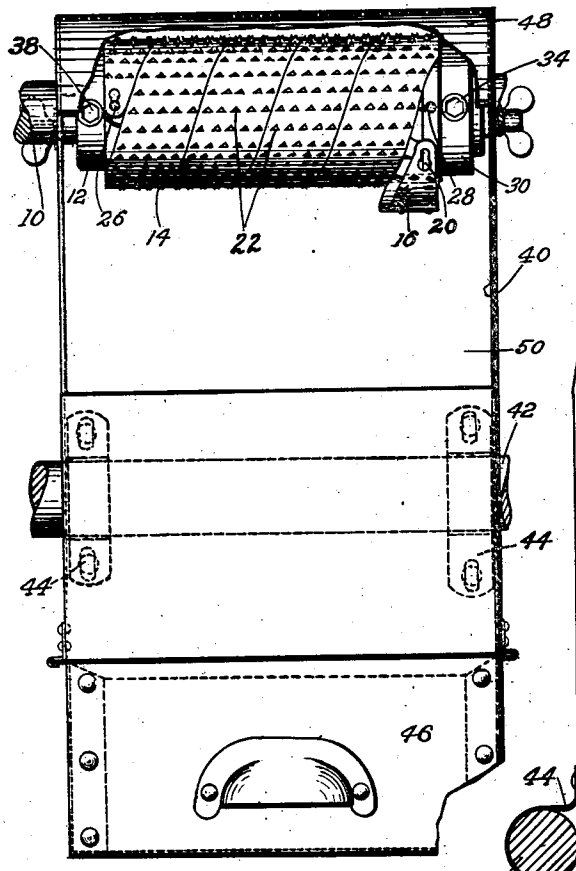


Fig. 1.

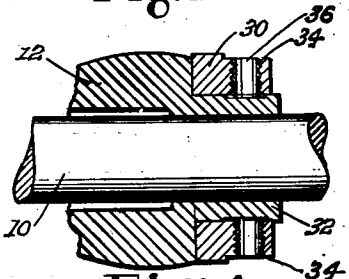


Fig. 4.

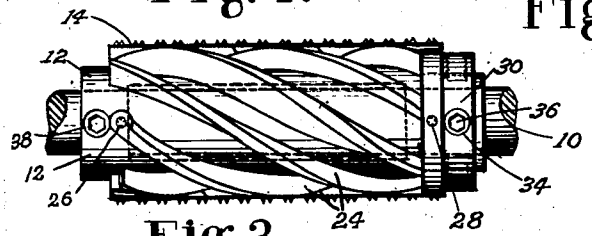


Fig. 3.

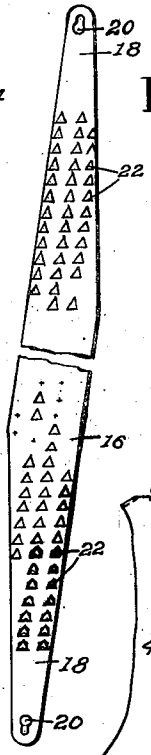


Fig. 5.

Fig. 2.

INVENTOR

Frederic E. Bertrand

By his Attorney,

Nelson A. Howard

Patented Jan. 20, 1931 1,789,298

UNITED STATES PATENT OFFICE

FREDERIC E. BERTRAND, OF LYNN, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY

ABRADING ROLL

Application filed March 26, 1928, Serial No. 264,892, and in Great Britain March 29, 1927.

This invention relates to abrading rolls and is herein illustrated as embodied in an abrading machine for removing surplus material from shoes or shoe parts.

Abrading machines, such, for example, as machines employed for removing surplus material from shoe bottoms or for roughening soles prior to the application of cement for attaching the soles to uppers of shoes, commonly comprise a rotatable roll provided with an abrading strip of paper, cloth or metal stretched over the roll to form a cylindrical abrading shell. Considerable difficulty has been experienced in the use of such rolls, as heretofore constructed, by reason of the fact that in many instances the abrading shells become clogged with waste material removed from the work thereby necessitating frequent cleaning or replacement of the shells. Furthermore, it has been found to be difficult to stretch the abrading strips as tightly over the rolls and to support the shells as firmly as is necessary to secure and maintain the substantially cylindrical abrading surfaces requisite for smooth operation of the rolls.

In view of the foregoing, it is an object of the present invention to provide an improved abrading roll which, while retaining all the characteristic advantages of such rolls as heretofore constructed, will be less liable to clogging and is so constructed that it can be readily assembled and is particularly smooth in operation. To this end, and in accordance with one feature of the invention, there is provided a strip of metal having abrading projections thereon and wound in the form of a spiral to form an abrading shell. Preferably and as shown, the metal strip is wound around a core, the ends of the strip being secured to the core to hold it in position in order that the strip will provide a substantially cylindrical abrading surface. The ends of the illustrated strip are tapered and are provided with keyhole slots which respectively engage a stud on the core and a similar stud on a collar mounted on a reduced end of the core, the collar being movable in a direction to tighten the strip around the core. By constructing the abrading roll as above described, the assembly of the strip upon the core is facilitated, and the strip can readily be replaced when necessary without removing the core from the machine.

In accordance with another feature of the invention there is provided an abrading roll having an abrading shell and a core provided with spiral ribs for supporting the shell so constructed that the ribs serve to remove from the shell waste material passing through openings in the shell. As illustrated, the abrading roll comprises a cylindrical core having spiral ribs on the outer surface thereof and a perforated abrading strip wound spirally around the core in a direction opposite to the direction of the spiral ribs on the core. The spiral ribs referred to engage the abrading strip and serve as supports for the strip throughout its length to maintain it substantially in the form of a cylinder, thus insuring smooth operation of the abrading shell until it is worn out.

These and other features of the invention will be described more fully in connection with the accompanying drawings and will be pointed out in the appended claims.

In the drawings,

Fig. 1 is a front elevation, partly in section, of a machine embodying the invention;

Fig. 2 is an end view, partly in section, of the machine;

Fig. 3 is a side view of the abrading roll and shaft;

Fig. 4 is a view showing in cross-section details of the core; and

Fig. 5 is a view illustrating the construction of the abrading strip.

As shown in Figs. 1, 2 and 3, the illustrated machine comprises a shaft 10 upon which is mounted an abrading roll comprising a cast-iron core 12 secured to the shaft 10 and carrying an abrading shell 14. The shell 14 consists of an abrading strip 16, preferably, and as illustrated, formed from a thin sheet of metal, such as steel, spirally wound around the core 12. As illustrated in Fig. 5, the strip 16 consists of an elongated sheet of material having ends 18 which are op-

positely tapered or cut upon the bias so that when the strip is tightened around the core 12 until the side edges of the strip abut each other the strip will form a shell substantially cylindrical in shape with the tapered ends 18 conforming to the ends of the core. In the ends 18 of the strip are keyhole slots 20 positioned for co-operation with portions of the core 12 for retaining the strip in position on the core. The strip 16 is provided with rows of abrading teeth 22 produced by perforating the strip by means of punches, the projections or burrs surrounding the perforations forming the teeth.

To provide for supporting the strip 16 the central portion of the core 12 (Fig. 3) has integral therewith a plurality of spiral ribs 24 extending substantially the full length of the core and so spaced that when the strip 16 is spirally wound around the core in the direction opposite to that of the ribs 24, the strip is supported at frequent intervals throughout its length by one or another of the ribs. Thus the ribs 24, by firmly supporting the strip 16, operate to maintain it in the form of a cylinder after it has been tightened upon the core and prevent distortion of the strip during use. By preventing distortion of the shell, a uniform abrading surface is provided, thereby insuring smooth operation of the roll during the life of the shell.

In order to secure the abrading strip 16 in operative position and to facilitate the tightening of the strip upon the ribs 24, the core 12 has a headed stud 26 (Figs. 1 and 3) for engagement with the keyhole slot, 20 in one end of the strip, a similar stud 28 being carried by a collar 30 and adapted for engagement with the slot in the other end of the strip. The collar 30, best shown in Fig. 4, is loosely mounted upon a reduced end 32 of the core 12, and is normally secured thereto by means of set-screws 34, which have sockets 36 for co-operation with a suitable socket wrench conveniently used for turning the collar 30 on the core as well as for tightening the set-screws. A similar set-screw 38 serves to secure the core 12 to the shaft 10.

In assembling the strip 16 on the core 12, one end of the strip is placed over the stud 26 and the strip is then wound around the core 12 and ribs 24 in a direction opposite to that of the ribs, the other end of the strip being secured to the collar 30 by means of the stud 28 thereon. The set-screws 34 are loosened and the collar 30 is turned in a direction to tighten the strip around the ribs 24 until the edges of the strip abut each other, as shown in Fig. 1. The set-screws 34 are then tightened, securing the collar 30 in position with the strip 16 forming substantially a cylindrical shell supported throughout its length by the ribs 24 and spaced thereby from the cylindrical surface of the core 12. Because of the fact that the supports for the strip 16, namely the ribs 24, do not present a continuous surface engaging with the strip, the latter can be tightened with less effort than if the supporting surface were in the form of a cylinder.

In addition to acting as supports for the shell 14, the ribs 24 during rotation of the shell operate to move waste material, which passes through the perforations in the shell, to the left in Fig. 3 and out through the openings between the core 12 and the shell. Thus, accumulations of material between the shell 14 and the core 12, which would tend to clog the abrading teeth 22, are prevented.

The shaft 10, which is suitably driven in a clockwise direction (Fig. 2) by means not shown, preferably forms part of a line shaft with which are connected various machines and apparatus for operating upon shoes. Surrounding a portion of the shaft 10 and the abrading roll is a receptable 40 for collecting waste material removed from the work by the roll, the receptacle 40 being supported upon a bracket 42 by straps 44. The lower portion of the receptacle 40 is provided with a drawer 46 to facilitate disposal of waste material. The upper portion of the receptacle 40 has a removable hood 48 arranged to permit access to the abrading roll for purposes of repair or replacement. The side of the receptacle below the hood 48 is provided with an opening 50 through which the work is presented to the abrading roll. In order to prevent waste material in the form of dust from being thrown out into the room by the shell 14 as it revolves, a plate 52 is mounted in the upper portion of the receptacle 40 in position adjacent to the shell and is so arranged as to deflect such material downwardly.

In the operation of the machine, the work, such as a shoe, is inserted through the opening 50 in such manner that the portion of the work to be roughened is brought into contact with the surface of the abrading shell 14 which operates to remove portions of the material as required. Some of the material removed by the teeth 22 is forced through the openings in the abrading strip and drops into the spaces between the spiral ribs 20 and, as the roll continues to rotate, the ribs will force the material to the left (Fig. 3) until it drops out of the open end of the abrading shell 14 into the receptacle 40.

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

1. An abrading roll comprising a cylindrical core having spiral ribs thereon, and a perforated metal abrading strip spirally wound around the core.

2. An abrading roll comprising a cylindri-

cal core having spiral ribs thereon, and a metal strip spirally wound around the core and having thereon abrading teeth.

3. An abrading roll comprising a cylindrical core having spiral ribs thereon, and a perforated abrading strip spirally wound around the core in a direction opposed to the direction of the spiral ribs.

4. An abrading roll comprising a cylindrical core having rigid spiral ribs thereon, and a cylindrical perforated abrading shell supported on the spiral ribs.

5. An abrading roll comprising a core, an abrading shell comprising a perforated metal strip wound around the core, and spiral ribs integral with the core for supporting the shell.

6. An abrading roll comprising a core, a perforated abrading shell surrounding the core, and rigid spiral ribs extending between the core and the shell for supporting the shell and for carrying away waste material which passes through the perforations in the shell.

7. An abrading roll comprising a cylindrical core having a reduced end, spiral ribs on the core, a collar mounted on the reduced end of the core, studs carried by the core and the collar, and a perforated abrading strip spirally wound around the core and having slots for engaging the studs to hold the strip in position.

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

FREDERIC E. BERTRAND.