No. 631,507. Patented Aug. 22, 1899.

E. KELLY.

ABRADING AND POLISHING ROLL.

(Application filed Oct. 3, 1898.)

(No Model.)

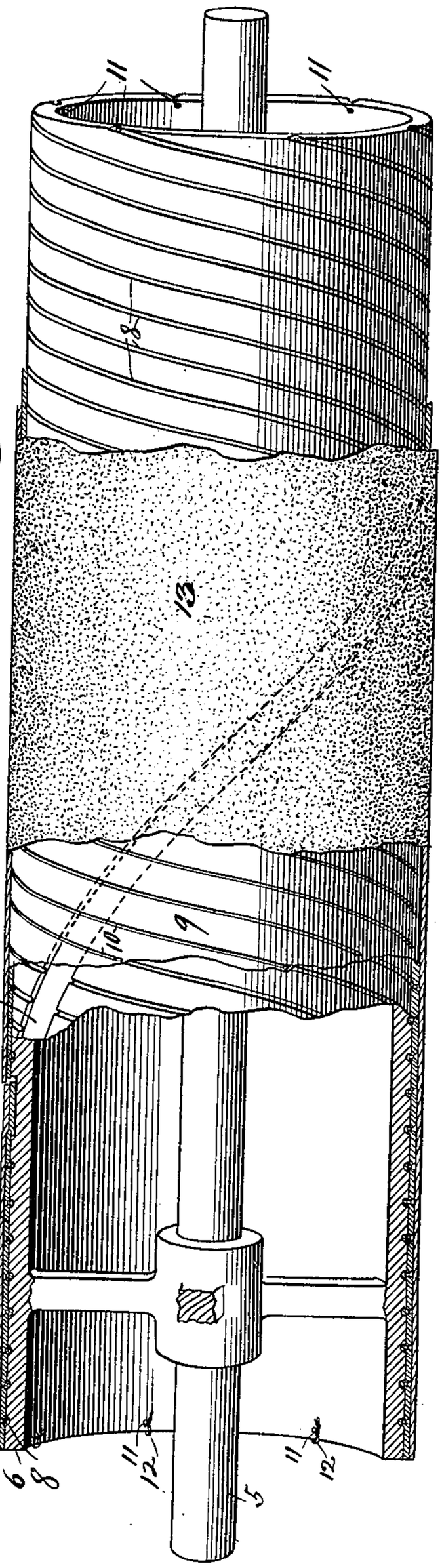

Fig. 1.

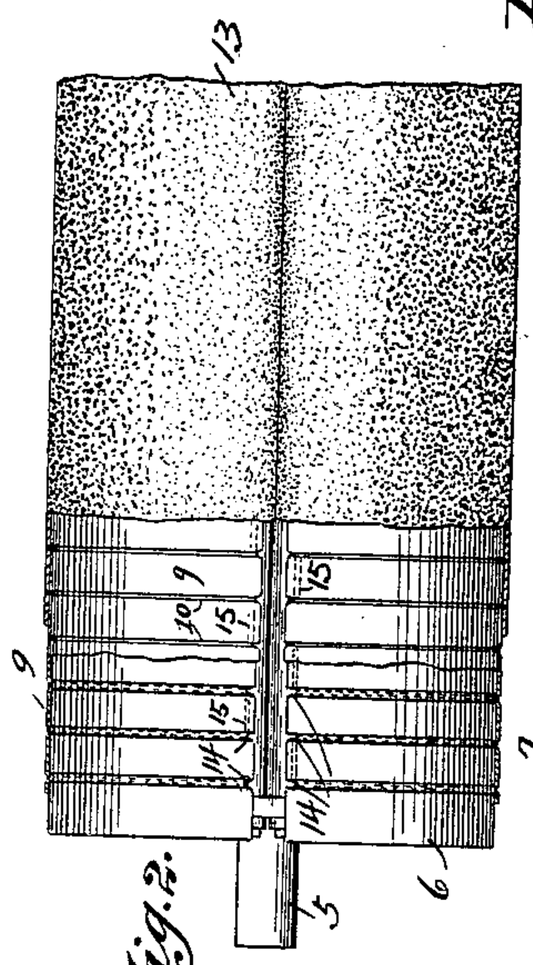

Fig. 2.

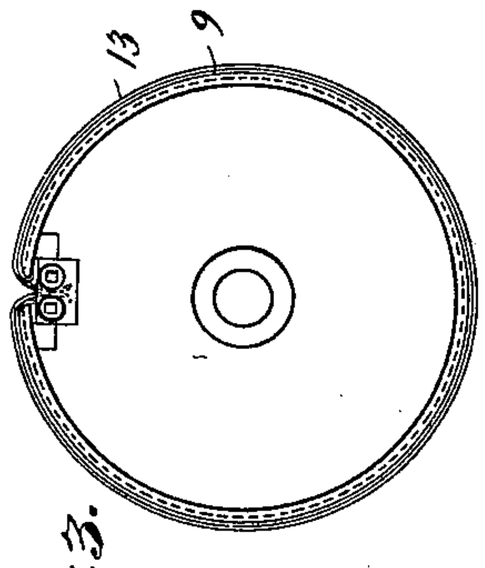

Fig. 3.

Witnesses,
S. E. Mann,
Frederick L. Goodwin.

Inventor,
Edward Kelly,
By Offield, Towler & Linthicum,
Attys.

UNITED STATES PATENT OFFICE.

EDWARD KELLY, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO THE BERLIN MACHINE WORKS, OF BELOIT, WISCONSIN.

ABRADING AND POLISHING ROLL.

SPECIFICATION forming part of Letters Patent No. 631,507, dated August 22, 1899.

Application filed October 3, 1898. Serial No. 692,481. (No model.)

To all whom it may concern:

Be it known that I, EDWARD KELLY, of San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Abrading and Polishing Rolls, of which the following is a specification.

This invention relates to an improvement in abrading and polishing rolls and may be embodied in a roll for finishing, buffing, or polishing wood, metal, or other materials.

I will describe my invention in connection with abrading and polishing rolls for finishing lumber, as this is one of its principal uses, but do not wish to be understood as limiting my invention to use in the specific kinds of rolls or for the special purposes above mentioned.

In the usual method of finishing lumber rolls clothed with sandpaper are employed, and such rolls are of diverse constructions. They are usually constructed of metal as to the shell or body portion of the roll and covered with sandpaper secured to the surface of the roll, and sometimes a cushion of felt or similar fabric is applied to the metal surface of the roll and the sandpaper secured over such cushion material. These metal rolls are sometimes constructed with an unbroken surface, and the cushion is usually applied to such rolls by cementing it to the surface thereof. These rolls are frequently made with a longitudinal slit or opening, and the cushion is sometimes secured by fastening its edges in this slit or opening. When the cushion is cemented upon the metal surface, it is open to the objection that it is likely to become loosened under certain climatic conditions, and the method of securing the cushion by tacking or otherwise fastening its edges in the slit or opening of the roll is also objectionable, because the cushion is secured at but one place, and it will stretch, wrinkle, and require frequent replacement or repair.

The principal object of my invention is to provide a convenient means for adequately securing the cushion to the surface of the roll.

A further object of my invention is to apply the cushion in such manner as to secure the greatest uniformity in the work done by the cylinder, and this may be explained as follows: It has been determined by experience that a perfectly smooth or uniform abrading-surface will not reproduce an equally smooth or uniform surface. For example, if a true cylinder of metal having a perfectly smooth surface be clothed with sandpaper of like uniformity as to surface it will not produce the degree of uniformity in work possessed by the abrading-surface itself. The reason for this is, perhaps, that a perfectly smooth and uniform surface acts simply by direct contact—as, for example, a straight knife acts upon the surface of a board. I so secure the clothing upon the roll as to produce a corrugated or non-uniform surface, and this surface acts in a manner somewhat similar to a spiral or curved knife as compared with the action of a straight knife.

To these ends my invention consists in a roll having surface grooves, in combination with a cushion material and means, such as wires or threads, for securing the cushion material to the roll and depressing the latter into the grooves.

This invention may be embodied in various forms, as shown in the accompanying drawings, in which—

Figure 1 is a perspective view, partly in broken section and showing the preferred construction. Figs. 2 and 3 are views showing a different form of roll in end elevation and broken plan view.

In the drawings, let 5 represent the roll-shaft, and 6 the metal shell or roll-body. This shell or body may be solid or sectional, but is usually made sectional. As shown, it has a spiral groove 7 in its periphery, the purpose of which is to receive the lapped edges of the paper or other clothing, which is spirally wound thereon; but this groove 7 does not constitute any part of my invention. The surface of this shell or body 6 is provided with a series of grooves 8, which, as shown in Fig. 1, are spirally formed therein and which may be of any desired number and varied as to depth and direction. 9 represents a fabric cushion, say felt, applied either spirally or with straight abutting edges. In Fig. 1 the felt is shown applied spirally, the meeting

edges resting within the groove 7. In order to secure this cushion to the roll, I employ a binding means, such as the wires or ligaments 10, and these wires are applied so as to depress the fabric into the grooves, the ends of the wires being secured in any convenient or suitable manner. Any number of wires may be employed, depending upon the number and arrangement of the grooves 8. As shown, six wires are employed, corresponding with the number of the grooves, their ends being passed through apertures 11 in the metal shell or body 6 and knotted, as shown in Fig. 1 at 12. These wires are of such size as to embed themselves with the fabric in the grooves, and thus the fabric is tightly stretched and securely bound upon the roll, and at the same time presents a series of ridges between the grooves, the ridges and grooves constituting, therefore, a corrugated cushioned surface. In practice I have found that the grooves may be made one inch apart on a roll twelve inches in diameter. A roll clothed in this manner may be used for buffing or polishing wood, metal, or other substances, and if clothed with abrading material, such as the sandpaper 13, it may be used also for abrading—as, for example, in dressing and finishing lumber.

In Figs. 2 and 3 a roll having a longitudinal opening or slit in its periphery is shown. In this style of roll the cushion fabric is usually cut in rectangular form and applied by entering its edges through the slit or opening and tacked to the edges thereof or cemented to the surface. In applying my invention to this form of roll the grooves may be straight or circumferential and a single wire be employed for securing the cushion, the wire being wound over the fabric and engaged with the margins of the body or shell at the slot. Thus 14 represents notches or apertures in the lips of the shell or body, and the wire may be secured to a roll of this form by securing one end and then passing the wire from one lip around the shell or body of the roll, through the aperture in the adjacent lip, and then under the lip, as shown by the dotted lines 15 of Fig. 2, thence up through the adjacent aperture and around the roll in the opposite direction, thence down through the opposite apertures, and so on. Of course the grooves may be formed spirally in a roll of this construction, the same as shown in Fig. 1, and a roll of this kind may be covered with sandpaper or other abrading material.

My invention affords a corrugated cushioned roll, the cushion being securely held to the surface of the roll and the corrugations afforded thereby having the effect in use of producing a uniform surface. I prefer the spiral formation of the groove because it produces thereby the spiral corrugated cushioned surface; but as these rolls are usually mounted so as to have endwise reciprocation the corrugations formed by the straight grooves will be found more serviceable than a perfectly plain surface. Obviously this corrugated cushioned surface is preserved when the roll is clothed with sandpaper or other abrading material, because when pressure is applied to the surface of such a roll the paper above the groove will yield, since it meets less resistance than the portion between the grooves, and therefore the effect of the corrugation extends to the paper itself.

Without limiting my invention to the exact details of construction, I claim—

1. A polishing-roll having a metal body provided with spiral grooves in its periphery, a clothing applied to said roll and binding wires or ligaments stretched over the clothing above the grooves, whereby the clothing is depressed into the grooves and affords a corrugated polishing-surface, substantially as described.

2. A roll of the class described, having a metal body, whose surface is traversed by a series of spiral grooves, a fabric cushion applied thereto, means for securing the cushion to the roll, comprising wires or ligaments drawn thereover above the grooves and depressing the cushion material into the grooves and an abrading material clamped over the cushion material out of contact with the binding wires or ligaments, substantially as described.

EDWARD KELLY.

Witnesses:
FREDERICK C. GOODWIN,
JEROME W. MILLINGTON.