Sept. 3, 1929. O. MITCHELL 1,727,128

ROLL CONSTRUCTION AND FRAME MEMBER THEREFOR

Filed Nov. 4, 1927

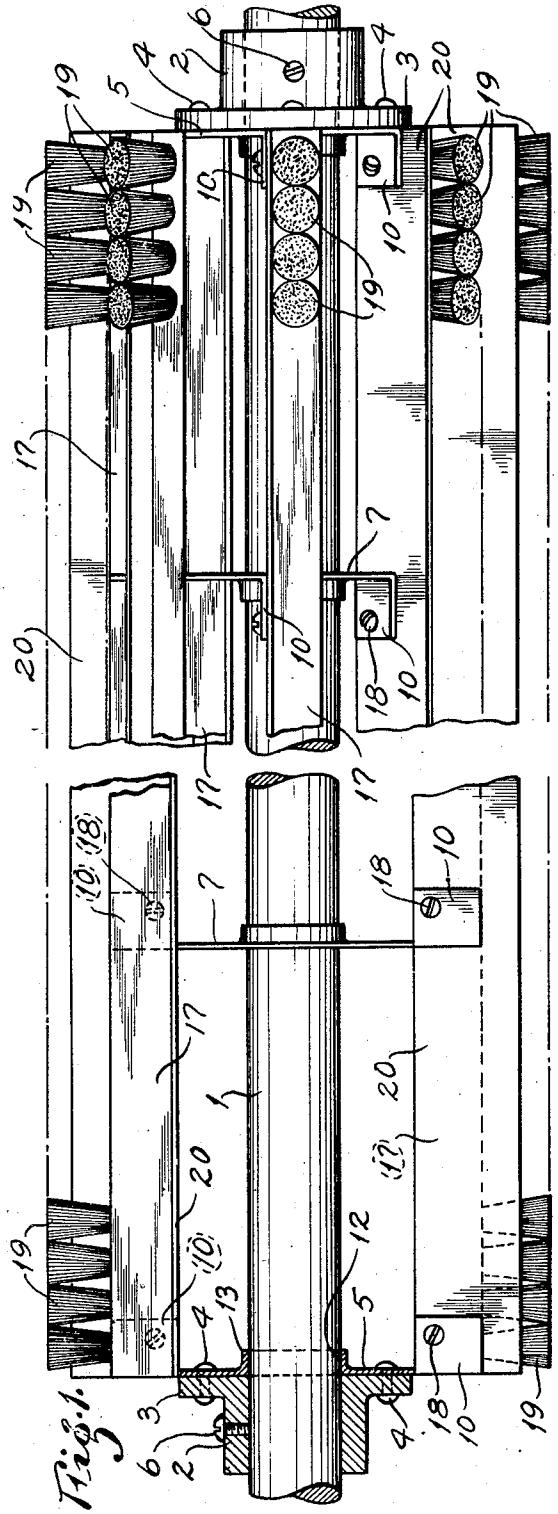


Fig. 1.

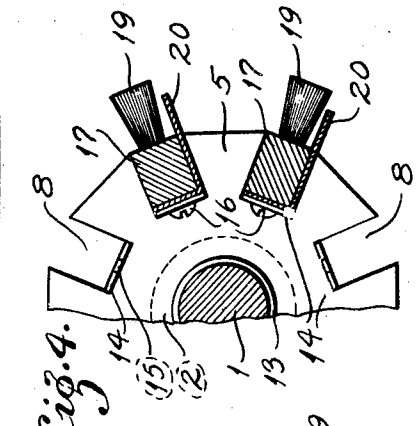


Fig. 4.

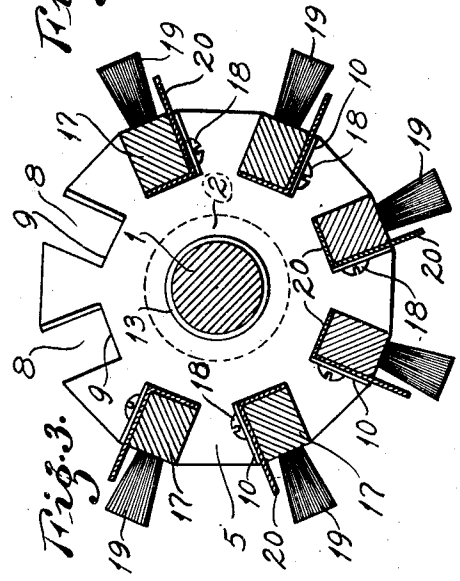


Fig. 3.

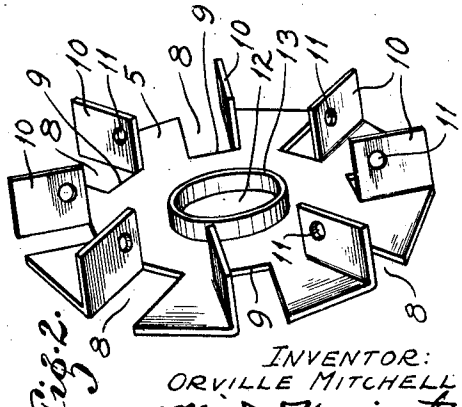


Fig. 2.

INVENTOR:
ORVILLE MITCHELL
BY Elliott Warrington
ATTORNEYS

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UNITED STATES PATENT OFFICE.

ORVILLE MITCHELL, OF ST. LOUIS, MISSOURI.

ROLL CONSTRUCTION AND FRAME MEMBER THEREFOR.

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The general object of my invention is to provide a novel construction of roll which shall be relatively light in weight as compared with rolls as now manufactured, which shall possess equal strength and durability, and which may also be far more economically produced. My improved construction of roll is characterized by the use of a novel frame member which, of itself, is a leading feature of the invention.

My invention is particularly directed to improvements in the type of rolls used in cotton cleaning machines, such, for example, as the saw cylinder, which is in the form of a hollow roll or cylinder having strips of saw-toothed metal secured about its periphery at intervals throughout its length; the kicker roll, which is a revolving member having angle bars or the like extending longitudinally thereof around its periphery for knocking back the hulls carried up by the saw cylinder; and the doffer roll, which is in the form of a skeleton roll having bars containing brushes extending longitudinally thereof around its periphery and the function of which is to remove the cotton from the saw cylinder. Other rolls are employed, but the above illustrations will suffice to indicate generally the character of rolls to which my invention is applied. However, other types of rolls and for other uses than those indicated, and other devices in the nature of rolls, whether of the skeleton type or in the form of cylinders, can equally well be manufactured in accordance with my invention.

The leading feature of the invention consists in substituting formed or stamped frame members of pressed steel for the cast iron frame members, such as the heads and intermediate supports of the roll, thereby, as stated, economizing in the cost of manufacture of the roll and in the weight thereof.

In many machines where the periphery of a roll has to rotate in relatively close proximity to the periphery of another roll, but out of contact therewith, it is necessary that the periphery of the roll, or its working surface, whatever its nature, shall be at a uniform distance from the axis of the roll, and this is particularly true in the class of rolls used in cotton cleaning machines. In former constructions, it has been necessary to machine the cast-iron heads in order to secure an accurate and uniform diameter for the periphery of the roll, and in cases where the heads of the roll contain seats for longitudinal bars, as in doffer rolls, to likewise secure accuracy in the seats by machining, so that they would be of equal distances from the center of the roll.

By employing formed or stamped frame members, constituting the heads and intermediate supports of the roll, I entirely do away with the necessity of machine work, the dimensions are necessarily uniform and accurate throughout, and, as the pressed steel frame members are much more homogeneous than the cast-iron members heretofore employed, a better balanced roll is assured.

I have illustrated my invention as applied to a doffer roll for use, particularly, in cotton cleaning machines, but it will be understood from the above that the invention is not limited to such application.

In the drawing—

Figure 1 is a view partly in side elevation and partly in longitudinal section of a doffer roll constructed according to my invention;

Figure 2 is a perspective view of one of my improved frame members;

Figure 3 is a cross-sectional view of the roll, some of the cross-bars containing brushes being omitted; and

Figure 4 is a similar view broken away illustrating a modification.

Referring now to the drawing, the numeral 1 indicates a shaft which has mounted near each of its ends a cast-iron hub 2 having a circular flange 3 extending at right angles from one of its ends to which is secured by rivets 4 one of my improved frame members 5, the hub 2 and frame member 5 at each end constituting a head, and being secured to the shaft as by means of a set-screw 6. According to the length of the roll, I mount on the shaft 1 at equal distances apart, supporting frame members 7 which are the same in construction as the frame members 5, except that they are not connected to any casting and may be loosely mounted on the shaft.

Each of the frame members 5 and 7 is made from sheet metal which may be blanked out in any desired shape in cross-section, that is, circular, octagonal, hexagonal, square, or the like, and at equal distances around its circumference, or on its sides, has the metal of its body cut out in rectangular or other shape to provide radial recesses 8 affording seats 9. Preferably,

and as shown in Fig. 2, the metal is cut away only on three sides of the seat 8, and the cut-out portion is bent at right angles to the plane of the metal to provide tongues 10, each of which is apertured as indicated at 11 for the purpose of receiving a securing screw. The frame member as a whole is formed by stamping or dieing, and in this process the piece of metal from which the frame is formed is provided with a circular opening 12 which, by a suitable pressing operation, is provided with a circumferential flange 13 on one side of the frame constituting the hub for receiving the shaft 1.

In Fig. 2, each of the tongues 10 is shown as being located at one side of a recess 8. In the modified construction shown in Fig. 4, these tongues are shown as bent outwardly at the bottom of the recess, as indicated by the numeral 14, and they thus may act as supports for bars or the like used in forming the circumferential frame or working surface of the roll, in addition to providing means for securing such bars or frame pieces in position. Each of the tongues or supports 14 is preferably provided with an aperture 15 for receiving a securing screw, such as indicated at 16.

The invention is shown in the drawing as embodied in a doffer roll, in which longitudinal bars 17 are mounted in corresponding recesses 8 of the frame members or heads 5 and the intermediate frame members 7, and secured in position by means of wood screws 18 inserted through the openings 11 and screwed into one side of each bar. Each of the bars 17 is provided with one or more rows of brushes 19. Prior to inserting the bars in the recesses 8 of the frame members, I preferably insert an L-shaped strip 20 in each recess, the foot of which rests on the bottom edge 9 of each recess and the upper end of the leg extending outward to near the outer edge of the brushes 19 to act as a guard or protector for the brushes. The strips 20 are, of course, provided with apertures to permit the screws 18 to pass through them.

By this construction, it will be seen that the bottom edges 9 of the recesses 8 serve to accurately position all of the bars 17 at an exact distance from the center of the roll, and that the tongues 10 provide convenient means for securing the bars in position on the frame members. In Fig. 4, the same advantages obtain as with the construction of frame member shown in Fig. 2, but here, the bent-out pieces 14 also serve as supports for the bars 17.

As will be seen, the essential elements of my roll construction are the stamped-out frame members and the longitudinal bars secured in the recesses thereof to provide either the actual working surface of the roll or a skeleton frame on which a cylindrical covering, or shell, of any desired character may be mounted and secured. As above indicated, however, it is not necessary that my invention be limited to a roll, in the sense that the periphery of the roll should be substantially circular in cross-section. In many adaptations of the invention, as in the case, for example, of a kicker roll used in cotton cleaning machines, the so-called "roll" is usually substantially rectangular in shape. However, the principle of the invention remains the same as, in any case, the roll, whatever its shape in cross-section, would comprise the heads in the shape of stamped frame members with the intermediate frame members where necessary, all of the frame members having mounted at suitable points around their outer edges longitudinal bars which are accurately positioned by means of the recesses in the frame members and are readily secured thereto to form, with the frame members, a unitary structure or roll.

I claim:

1. A doffer roll for cotton cleaning machines, comprising end frame members formed from a piece of flat sheet metal, each of which members is provided around its marginal portion with recesses, each recess having a tongue formed by bending outwardly a portion of the metal at one of the sides of the recess, and longitudinal bars, each of which is provided with a row of brushes, mounted in corresponding recesses of the frame members and secured to said tongues.

2. A doffer roll for cotton cleaning machines adapted to be mounted for axial rotation, comprising end frame members formed from a piece of flat sheet metal, each of which members is provided around its marginal portion with recesses, each recess having a tongue formed by bending outwardly a portion of the metal at one of the sides of the recess, and longitudinal bars, each of which is provided with a row of brushes, mounted in corresponding recesses of the frame members and secured to said tongues.

3. A doffer roll for cotton cleaning machines adapted to be mounted for axial rotation, comprising end frame members, each of which is in the form of a stamped flat metal blank provided around its marginal portion with recesses, each of said recesses having a tongue formed by bending outwardly a portion of the metal at one of the sides of the recess, longitudinal bars provided with brushes mounted in corresponding recesses of the frame members and secured to said tongues, and a hub secured to the outer side of each of said frame members.

4. A doffer roll for cotton cleaning machines adapted to be mounted for axial rotation, comprising centrally apertured end

and intermediate frame members formed of flat sheet metal, each of which is provided around its marginal portion with recesses, each recess having a tongue formed by bending outwardly a portion of the metal from one of its sides, longitudinal bars provided with brushes mounted in corresponding recesses of the frame members and secured to said tongues, a hub secured on the outer side of each of said end frame members, a shaft passed through said hubs and frame members, and means for securing the hubs to said shaft.

5. A doffer roll for cotton cleaning machines adapted to be mounted for axial rotation, comprising end frame members stamped from a blank of flat sheet metal, each of which members is provided with a plurality of integral portions bent outwardly at right angles to the body of the blank, and a plurality of bars provided with brushes extending longitudinally of the roll and mounted upon and secured to said offset portions.

In testimony whereof, I have hereunto set my hand.

ORVILLE MITCHELL.