April 21, 1931. R. E. DUPLESSIS 1,801,336

BUFFING ROLL

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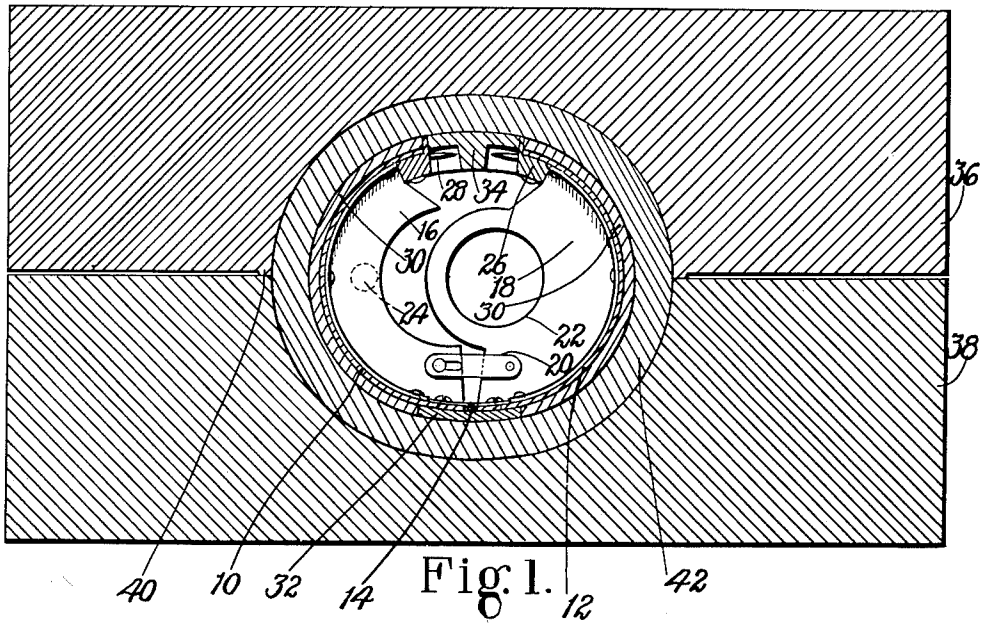



Fig. 1.

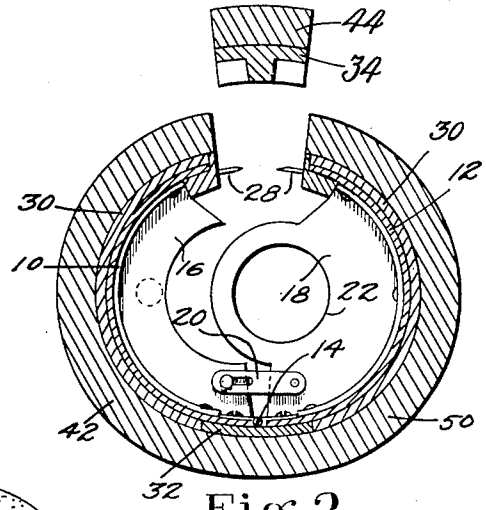



Fig. 2.

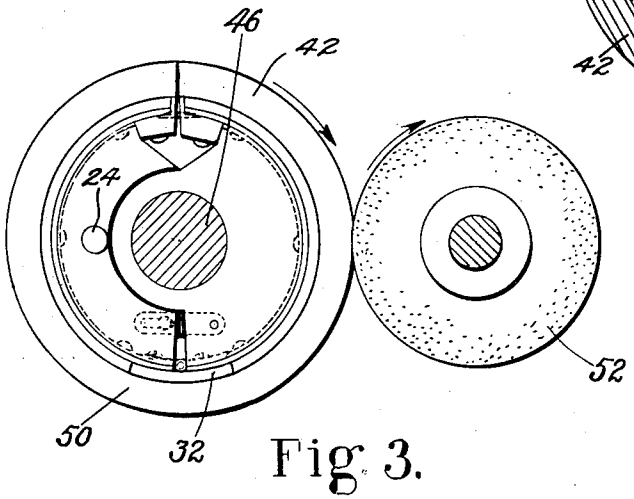



Fig. 3.

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# UNITED STATES PATENT OFFICE

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## BUFFING ROLL

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This invention relates to the manufacture of finishing tools such as buffing and scouring rolls and wheels. The invention is herein illustratively exemplified with relation to the application of resilient coverings to such rolls and to novel rolls embodying such resilient coverings.

In the manufacture of buffing and finishing rolls of a large variety of shapes, of which the cylindrical shape may be taken as an example, the body portion of the roll is made in two segments hinged together so that the roll may be opened to allow the application of a covering of abrasive material. The segments of such rolls are commonly provided with a resilient covering to underlie the abrasive covering, and felt, rubber and other materials have been utilized for this purpose. During the use of such rolls it is necessary to open and close them frequently for the removal and the application of abrasive coverings and consequently the portion of the resilient covering which overlies the hinge between the segments is apt to become detached from the supporting segments owing to its repeated tensioning and release from tension. When this covering does become detached from the supporting body over the hinge, there is a serious tendency toward ballooning of the resilient covering under the pressure of the abrading operation with the result not only that the abrasive coverings are worn out too quickly or become torn but that the buffing roll itself may be speedily destroyed.

Accordingly, an object of the invention is to provide an improved roll having a resilient covering which will remain closely attached to the supporting segments of the roll so that ballooning is avoided and which will open automatically, when released, to allow the application of an abrasive cover. Another object of the invention is to devise a method of manufacturing buffing rolls in accordance with which a soft resilient covering may be so attached to a roll that the danger of ballooning or the separation of the resilient cover from the supporting body segments will be avoided.

In accordance with the more complete disclosure of the accompanying description, the illustrated novel roll is made by an improved method of manufacture whereby, as herein illustratively exemplified, the body segments are moved to open position, a spacer is inserted between the open edges of the roll, the body and spacer are inserted in a mold, a soft rubber covering of substantially uniform thickness is molded upon the segments, a portion of the covering overlying the spacer is cut out, the roll is moved to closed position, and a true cylindrical surface is formed upon the roll, as by grinding it, when it is in closed position. By the practice of this method there is provided a novel buffing roll having a soft resilient cover which may be of substantially uniform thickness and of which a portion is tensioned immediately overlying the hinge between the supporting segments. Accordingly, when it is desired to open the roll for the replacement of the abrasive covering, the usual end clamps are released whereupon the portion of the rubber covering overlying the hinge will contract, opening the roll automatically, and there will be no tendency for the rubber covering to push itself away from the supporting segments.

For a more complete understanding of the present invention, reference may be had to the following specification taken in connection with the accompanying drawing in which:

Fig. 1 is a sectional view showing the molding of the covering over the opened segments of the buffing roll;

Fig. 2 is a similar section of a buffing roll after it has been removed from the mold and a portion of the molded cover cut out over and between the meeting edges of the roll; and

Fig. 3 is an end view of the roll shown in Fig. 2 in closed position upon a supporting shaft and indicating the grinding of the surface of the resilient covering to form a true cylinder.

It has been found that a soft rubber covering does not adhere well if applied directly to the outside of the metallic segments of a buffing roll. On the other hand, the application of heat to vulcanize the two together

properly would harden the rubber covering excessively. Accordingly, a thin rubber covering is first applied to the supporting body segments of the buffing roll, a large part of which is vulcanized tightly to the roll and allowed to reach a considerable degree of hardness. Inasmuch, however, as the portion overlying the hinge of the roll would soon become broken and disintegrated if it were of the same degree of hardness, it has been found desirable to use a strip of similar thickness overlying the hinge of the roll which strip has been vulcanized to a lesser degree of hardness. According to the common practice heretofore employed, such a roll, in closed position, has been inserted in a mold and a soft rubber covering of a considerable thickness has been molded around the vulcanized rubber covering upon the metallic segments. The heat required to melt the rubber to be poured into the mold is sufficient to secure adherence between the soft rubber covering and the vulcanized rubber covering. With this method, however, there was produced a buffing roll in which the tendency for the soft rubber covering to become detached immediately over the hinge of the roll was serious because the resultant so-called "ballooning" of the rubber covering over the hinge interfered with the proper operation of the roll as a support for an abrasive covering and also tended to cause the early destruction of the roll covering.

In accordance with the novel method of my invention, a buffing roll of suitable form comprising semicylindrical metallic segments 10 and 12 connected along one meeting edge by a hinge 14, is provided with end members 16 and 18 having inturned flanges by means of which they are attached to the cylindrical segments 10 and 12. Links 20 are commonly provided to allow the opening of the segments to a limited degree, and the roll is intended to be mounted upon a supporting shaft passed through the openings 22, the parts being held in closed position by the application of cam members at the ends of the roll to coact with pins 24. Adjacent to the meeting edges of the semicylindrical segments are secured strips 26 having coacting prongs 28 and corresponding recesses by means of which the edges of an abrasive covering may be secured to the roll by being passed over the prongs and the roll closed. The illustrated roll is provided with a thin rubber covering 30 vulcanized to the metallic segments with a relatively high degree of hardness. This covering stops a short distance away from the hinge 14 and a covering strip 32 of similar thickness but of a lesser degree of vulcanization is applied at this point. When it is desired to apply a soft rubber covering to a roll of this type, a suitable spacer member 34 is inserted between the meeting edges of the opened roll, and the roll and its spacer are inserted between parts 36 and 38 of a mold in which it is customary to separate the parts of the mold slightly by projections 40 which, as is well understood, allow a complete filling of the mold. The space between the roll and the parts of the mold is then filled by pouring in material to form a soft rubber covering 42 which surrounds the supporting body members of the roll and the spacer 34 and is in untensioned condition throughout its whole extent.

Upon the removal of the roll with the attached soft rubber cover from the mold the portion 44 (Fig. 2) overlying the spacer 34 is cut out, thus allowing the body portions of the roll as well as the remainder of the cover to be brought into closed position, as indicated in Fig. 3.

When the parts of the roll are closed and mounted upon a suitable shaft 46, it will be apparent that a portion 50 which overlies the strip 32 will be somewhat tensioned and flattened out so that the resulting surface of the roll covering is not truly cylindrical. The re-forming of the surface to make it truly cylindrical may be done in any suitable manner as, for example, by a grinding roll 52.

This will result in a buffing roll having a soft resilient covering which is elastic or extensible and of which the portion overlying the hinge between the two body segments is tensioned when the roll is in closed position. This tensioning of the covering assists the opening of the roll by virtue of the contractile force of the cover and allows the frequent opening and closing of the roll for the removal and replacement of the abrasive covering without danger of loosening the covering at the portion 50 because the natural tension of the rubber will cause it to cling tightly to the roll even when the parts are separated and the contraction of the portion 50 will avoid the otherwise common tendency to crowd this part of the cover away from the roll.

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

1. The method of molding a resilient cover upon a hinged supporting body which consists in placing the supporting body in a mold in opened position and molding a cover on the opened supporting body, whereby the resilient cover adjacent to the hinge on the supporting body will be tensioned as the parts of the body are moved into closed position.

2. The method of attaching a resilient cover to a hinged supporting body which consists in providing a thin layer of relatively hard vulcanized rubber on the supporting body and then attaching an untensioned resilient relatively soft cover to said

supporting body while it is in opened position, whereby the closing of the parts of the supporting body will tension the soft resilient cover adjacent to the hinge and thereby avoid any tendency for the cover to become disengaged from the supporting body adjacent to the hinge.

3. The method of applying a soft resilient cover to the hinged segments of a buffing roll which consists in opening the roll, applying and securing a cover of soft rubber in untensioned condition entirely around the opened roll, and removing part of the applied cover adjacent to the opening of the roll to allow it to be closed with a resultant tensioning of the rubber cover adjacent to its hinge.

4. The method of applying a soft rubber cover to a hinged buffing roll which consists in opening the roll, inserting a spacer between the opened edges of the roll, applying a soft rubber cover in untensioned condition and securing it to the roll entirely to surround the roll and its spacer, and cutting out the portion of the cover which lies over the spacer to allow the removal of the spacer and the closing of the roll with a resultant tensioning of the rubber cover adjacent to the hinge of the roll.

5. The method of applying a soft rubber cover to the metallic segments of a hinged buffing roll which consists in vulcanizing to the outer surface of said segments a thin relatively hard rubber coating while leaving part of said segments adjacent to the hinge uncovered, vulcanizing a strip of similar thickness but of less hardness to fill in the space over the hinge, and then placing the roll in a mold in opened condition and molding a relatively thick untensioned soft rubber covering over the thin covering already applied to the roll so that the portion of the soft rubber covering overlying the hinge will become tensioned when the roll is closed.

6. The method of applying a rubber cover to the hinged segments of a buffing roll which comprises, in addition to the steps defined in claim 5, the step of inserting a spacer member between the opened edges of the roll prior to the application of the soft rubber covering.

7. The method of applying a soft rubber covering to the hinged segments of a buffing roll which consists in molding a covering of substantially uniform thickness and of the desired degree of hardness on the segments of the roll, while the latter are in opened condition, removing the rubber above the opening between the edges of the segments, closing the roll with a resultant tensioning of the cover adjacent to the hinge and distortion of the cover as regards its thickness, and grinding the surface of the roll while in closed condition to provide a truly cylindrical surface.

8. The method of providing a rubber covering upon the hinged segments of a cylindrical buffing roll which consists in securing an untensioned soft rubber covering to the segments of said roll while in its opened position, said covering being of substantially uniform thickness, removing the portion of the covering which lies over the space between the opened edges of the roll, closing the roll with a resultant distortion of the surface of the covering, and truing up the distorted cover to make the surface cylindrical.

9. A buffing roll comprising semicylindrical body members connected by a hinge, a strip of relatively thin lightly vulcanized rubber applied to said body members overlying the hinge between the members, a thin covering of similar thickness of more highly vulcanized rubber attached to the remaining surface of the segments, and a thicker covering of soft rubber secured on the outside of said thin rubber covering and arranged so that a portion of the thicker covering overlying the hinge between the body segments will be tensioned when the roll is in closed position.

10. A buffing roll comprising semicylindrical body members connected by a hinge, a thin covering of rubber vulcanized to said body members, and a thicker covering of softer rubber secured on the outisde of said thin covering and constructed and arranged to be untensioned when the roll is in opened position and to have a portion tensioned when the roll is in closed position.

11. A buffing roll comprising segments connected by a hinge, means for locking said segments in closed position, a thin covering of rubber vulcanized to said segments, and a cover of relatively soft rubber secured to the outer side of said thin covering of rubber, said relatively soft cover being constructed and arranged to open the segments of the roll, by the contractile force of said cover, when the locking means is released.

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

RENÉ E. DUPLESSIS.