June 18, 1946. B. F. FOWLER 2,402,131

BACKING WHEEL FOR BELT TYPE POLISHING MACHINES

Filed Sept. 14, 1944

Fig. 2

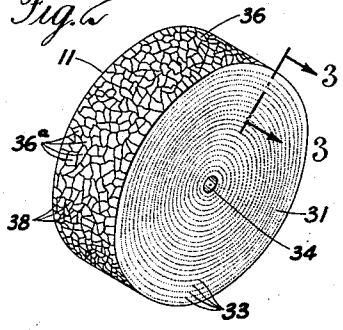


Fig. 3

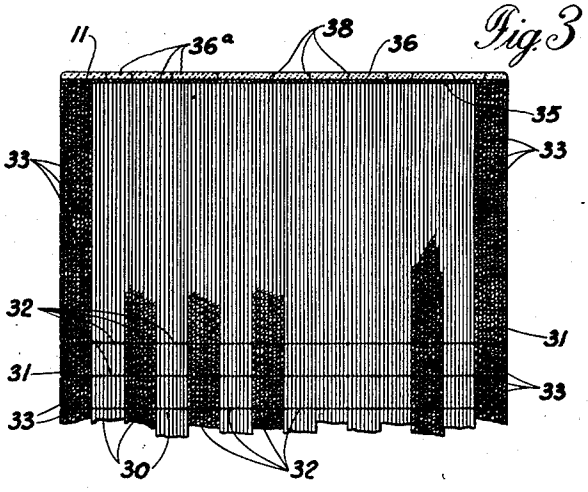
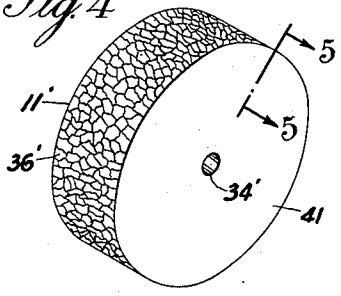


Fig. 4



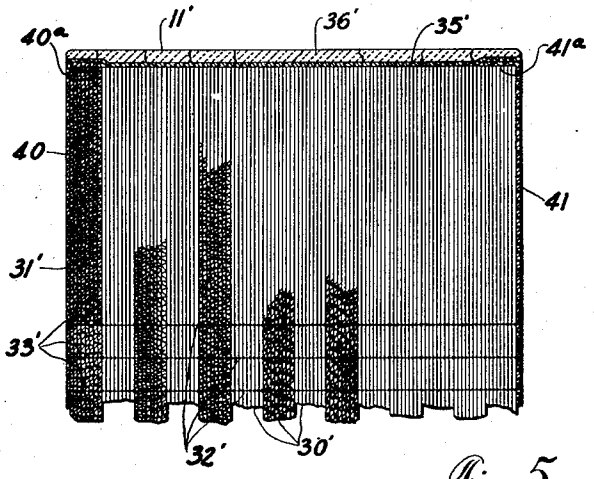


Fig. 5

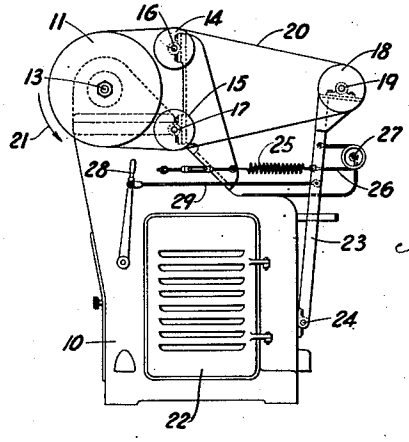


Fig. 1

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BACKING WHEEL FOR BELT TYPE POLISHING MACHINES

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6 Claims. (Cl. 51—141)

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This invention relates, in general, to polishing or finishing machines, and has particular relation to an improved backing wheel for belt type machines of this character.

In machines of the class described, an emery belt or other polishing or finishing belt travels over a backing wheel, and the object to be polished or finished is applied against the emery or other polishing or finishing surface of the belt along the portion of the belt that is backed by the backing wheel.

The object to be polished or finished may be, for example, a fender or other body part of an automotive vehicle, or it may be a part which it is desired to make smooth, for example, after a soldering, brazing, welding or the like operation, or any other part to be polished or finished.

If the circumference of such a backing wheel is too hard or rigid it will not accommodate itself to irregular surfaces or operate uniformly upon various uneven surfaces which require polishing or finishing, for example, convex, concave, and angular surfaces, and various combinations thereof. On the other hand, if the circumference of the wheel is too soft, the desired polish or finish is not obtained.

Backing wheels formed of rubber or rubber-like material have been provided, but they produce a chattering action and otherwise are not satisfactory. Chatter-marks or other irregular markings are produced on the surface of an object polished or finished on a belt backed by such a wheel, and, as a result, the desired polish or finish is not produced.

One of the main objects of the present invention is to provide an improved backing wheel of the class described which will provide better cooperation between the polishing or finishing surface of the belt and the object to be polished or finished, and, as a result, better polishing or finishing of the object.

Another object of the invention is to provide a backing wheel which is sufficiently soft or yielding to provide the desired accommodation of the polishing or finishing surface of the belt to various irregular surfaces and which will produce uniform operation of the belt upon various uneven surfaces, for example, convex, concave, and angular surfaces, and various combinations thereof; also a backing wheel having the desired soft or yielding properties combined with a circumference which will provide and maintain improved contact of the polishing or finishing surface of the belt with the surface of the object to be polished or finished.

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Another object of the invention is to provide an improved backing wheel comprising a relatively yielding body having its circumference covered with a coating secured to the circumference of the body and broken into pieces which, in operation of the wheel, will tend to be forced outwardly by centrifugal force to provide and maintain improved contact of the polishing or finishing surface of the belt with the object to be polished or finished; the yielding body of the wheel and the broken character of the coating at the same time enabling effective and uniform cooperation with all portions of irregular, as well as smooth, surfaces of the object to be polished or finished.

Another object of the invention is to provide a backing wheel having an improved form of yielding body; more particularly, a yielding body comprising a plurality of sections each of which comprises a plurality of suitable fabric discs stitched together out from the center to a distance short of or spaced inwardly from the circumference of the wheel an amount that will provide the desired degree of softness or yielding character along the circumference of the wheel.

Another object of the invention is to provide a backing wheel having a yielding body comprising sections composed of fabric discs stitched together to a distance short of or spaced inwardly from the circumference of the wheel, combined with sections composed of fabric discs stitched together out to, or substantially to, the circumference of the wheel.

Further objects and advantages of the invention will appear from the following detailed description, taken in connection with the accompanying drawing which illustrates the manner of constructing and operating a backing wheel in accordance with the present invention.

In the drawing:

Figure 1 is a more or less simplified side elevational view of a polishing or finishing machine showing a backing wheel embodying the present invention employed thereon;

Figure 2 is a perspective view of one form of backing wheel embodying the present invention;

Figure 3 is a fragmentary radial section taken substantially on the line 3—3 of Figure 2;

Figure 4 is a perspective view of another form of backing wheel embodying the present invention; and

Figure 5 is a fragmentary radial section taken substantially on the line 5—5 of Figure 4.

Referring now to the drawing, the polishing or finishing machine shown in more or less sim-

plified form in Figure 1, and which is for illustrative purposes, comprises a main body 10 on which the backing wheel 11 of the present invention is journaled for rotation at 13. Guide pulleys 14 and 15 are journaled for rotation at 16 and 17, and an idler pulley 18 is journaled for rotation at 19. The pulleys 14, 15 and 18 are preferably of crowned form to keep the belt from slipping off.

The backing wheel 11 preferably acts as the driving wheel for the polishing or finishing belt 20 which is trained about and travels over the wheel 11 and pulleys 14, 15, and 16, preferably in the direction indicated by the arrow 21. The wheel 11 is driven from a motor or other driving means by a belt or other driving connection (not shown). The driving means may be housed within the body 10 for access, for example, through a door 22. The pivoted arm 23 on which the idler pulley 18 is journaled is urged clockwise about its pivot 24 by a spring 25 to maintain proper tension in the belt 20.

The spring 25 is connected, for example, at one end to the body 10 and, at its other end, to the arm 23 through a flexible element 26 trained over a sheave 27. A hand lever 28, pivoted to the body 10 and connected by a link 29 to the arm 23, is adapted for swinging the arm 23 counterclockwise against the tension of the spring 25 in order to release the tension in the belt 20 for application and removal of the same. The foregoing details are for illustrative purposes and may vary widely.

The backing wheel 11, shown in Figures 1, 2, and 3, comprises a relatively yielding body composed, for example, of a plurality of intermediate fabric sections 30 each comprising a plurality of fabric discs (such as canvas or the like) and a pair of end sections 31, one at each of the opposite ends of the wheel. Each of the end sections 31 also comprises a plurality of fabric discs which may also be made of canvas or the like. In the illustrated embodiment of the invention the body of the wheel is composed of twelve intermediate sections 30 and the two end sections 31, but this may, of course, vary.

The fabric discs of each intermediate section 30 are shown as stitched together at 32 out from the center of the wheel to a distance short of or spaced inwardly from the circumference of the wheel an amount that will provide the desired degree of softness or yielding character along the circumference of the wheel. The spacing of the stitching 32 from the circumference of the wheel will vary according to the size and character of the wheel and the properties desired therein.

The fabric discs of the end sections 31 are shown stitched together at 33 out to, or substantially to, the circumference of the body of the wheel 11 to provide stability at the ends of the wheel. The fabric sections 30 and 31 are provided with coaxial openings 34 for receiving the mandrel or shaft on which the wheel 11 is fixed for rotation, and end plates or collars (not shown) may be provided for clamping the fabric sections 30 and 31 together centrally of the wheel, as well known in the art. The stitching at 32 and 33 may be spiral stitching as well known, or any other suitable stitching.

A fabric wrapping 35 is applied circumferentially about the circumference of the fabric sections 30 and 31 and its free ends may be secured to the circumference of the body part of the wheel 11 by suitable glue or adhesive.

A coating 36, preferably comprising glue or a gelatin-like or glue-like material which will adhere to the circumference of the body of the wheel 11, is applied to the circumference of the wheel, for example, by painting it thereon. While the coating material may vary widely within the scope of the present invention, one suitable glue for this purpose is marketed by Industrial Lubricant Company of Detroit, Michigan, under the trade name "Grain Lock Cement."

The coating is preferably applied uniformly to provide a relatively thin and uniform coating covering the entire circumference of the wheel 11. The coating 36 will set to a relatively hard and frangible or brittle condition, and when so set I break the same into numerous relatively small pieces 36*a*, for example, by striking the coating about the circumference of the wheel with a rod or other suitable implement. The small pieces 36*a* adhere or are secured to and cover the outer circumference of the wheel 11 except for the interlacing network of cracks 38 between the pieces 36. The outer surfaces of the pieces 36 conform generally with the circumference of the wheel 11.

In the operation of the machine, the object to be polished, such as a fender or other body part of an automotive vehicle or a part which it is desired to smoothen, polish or finish after soldering, brazing, welding or the like, or any other part to be polished or finished, is applied or pressed against the outer emery or other finishing or polishing surface of the belt 20 along the portion of the belt that is backed by the wheel 11. The object is preferably applied to the under part of the wheel backed part of the belt 20 to the left of a vertical plane through the axis of the wheel 11 as it is viewed in Figure 1, and, so applied, the object is preferably worked upwardly in the polishing or finishing operation.

In the polishing or finishing operation the circumference of the backing wheel 11 is sufficiently soft or yielding to provide the desired conformity to irregular as well as regular surfaces of the object and uniform operation upon various uneven surfaces. At the same time the numerous pieces 36*a* into which the coating 36 is broken are forced or tend, in the operation of the machine, to be forced outwardly by centrifugal force to provide and maintain improved contact of the polishing or finishing surface of the belt 20 with the object to be polished or finished. As a result, the chattering of rubber or rubber-like wheels is avoided, and improved smoothening, polishing or finishing of the object is obtained.

The embodiment of the invention shown in Figures 4 and 5 of the drawing is similar to the embodiment shown in Figures 1, 2, and 3 except that the stitching together at 33', of the fabric discs comprising the end sections 31', instead of extending out to the circumference of the wheel 11', terminates where the stitching together at 32', of the discs comprises the intermediate sections 30', terminates, i. e., spaced inwardly of the circumference of the wheel.

The wheel shown in Figures 4 and 5 also has fabric end pieces 40 and 41, one covering each of its opposite ends. These fabric end coverings 40 and 41 are turned in marginally at 40*a* and 41*a* beneath the opposite ends of the fabric wrapping 35' which otherwise corresponds with the fabric wrapping 35 of the preceding embodiment of the invention. The coating 36' is similar to the coating 36 of the preceding embodiment of the

invention, and is applied, broken into pieces, and operates in the manner previously set forth.

The embodiments of the invention shown in the drawing are for illustrative purposes only, and it is to be expressly understood that said drawing and the accompanying specification are not to be construed as a definition of the limits or scope of the invention, reference being had to the appended claims for that purpose.

I claim:

1. A backing wheel for a polishing or finishing belt having a relatively yielding fabric body comprising a plurality of sections each of which is composed of a plurality of fabric discs stitched together outwardly from the center to a distance short of or spaced inwardly from the circumference of the wheel an amount that will provide the desired degree of softness or yielding character along the circumference of the wheel, and said fabric body having its circumference covered with an outer non-abrasive coating secured to the circumference of said body and broken into an irregular patch work of individual pieces.

2. A backing wheel for a polishing or finishing belt having a relatively yielding fabric body comprising sections composed of fabric discs stitched together to a distance short of or spaced inwardly from the circumference of the wheel combined with sections composed of fabric discs stitched together substantially to the circumference of the wheel, and said fabric body having its circumference covered with an outer non-abrasive coating secured to the circumference of said body and broken into an irregular patch work of individual pieces.

3. A backing wheel for a polishing or finishing belt comprising a body composed of a plurality of sections each comprising fabric discs stitched together out to a distance short of or spaced inwardly from the circumference of the wheel, and an outer non-abrasive coating covering the circumference of said body and comprising a gelatin-like or glue-like material applied to the circumference of the body of the wheel and allowed to set, said coating being broken into an irregular patch work of individual pieces with the marginal edges of the several individual pieces extending indiscriminately along lines in intersecting and non-intersecting relation with respect to each other.

4. A backing wheel for a polishing or finishing belt comprising a body composed of a plurality of sections comprising fabric discs stitched together to a distance short of or spaced inwardly from the circumference of the wheel combined with sections composed of fabric discs stitched together out to substantially the circumference of the wheel, and a coating covering the circumference of said wheel and broken into pieces.

5. A backing wheel for a polishing or finishing belt comprising a body composed of intermediate sections comprising fabric discs stitched together to a distance spaced inwardly from the circumference of the wheel, combined with end sections composed of fabric discs stitched together out to substantially the circumference of the wheel, and a coating covering the circumference of said wheel and comprising a gelatin-like or glue-like material applied to the circumference of the wheel and allowed to set, said coating being broken into pieces.

6. A backing wheel for a polishing or finishing belt comprising a fabric body having its circumference covered with a coating secured to the circumference of said body and broken into pieces, a fabric wrapping applied between the circumference of the body of the wheel and said coating, and fabric pieces covering the ends of the wheel and turned in marginally beneath said coating.

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