

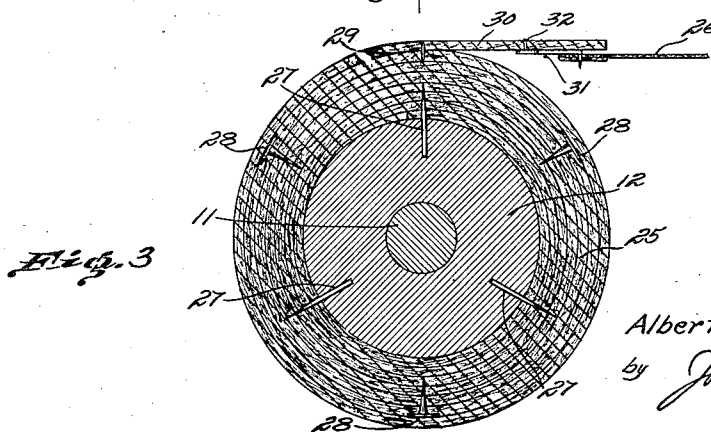
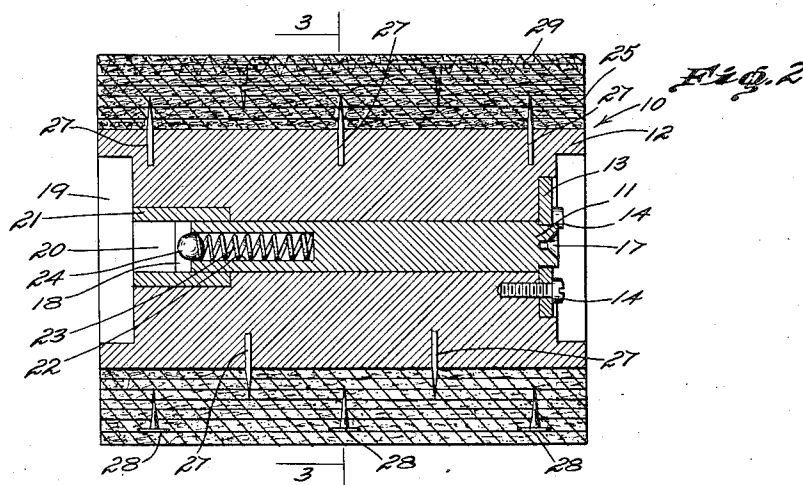
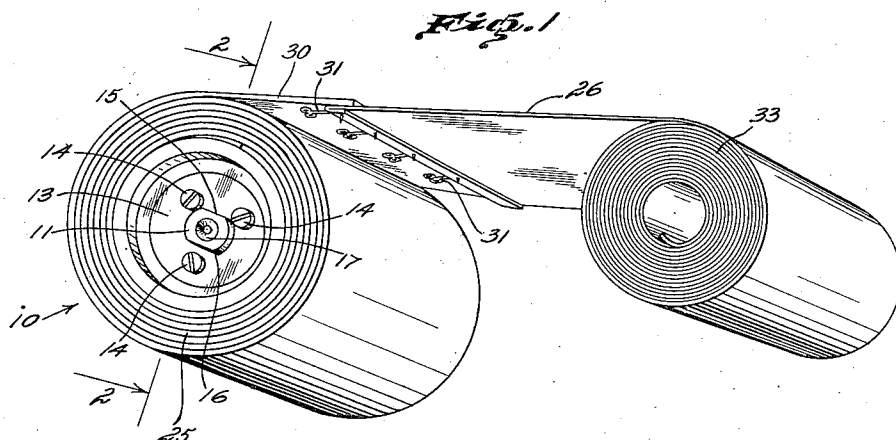
Sept. 17, 1935.

A. E. MOORHEAD

2,014,627

FLEXIBLE BUFFER

Original Filed July 3, 1931 2 Sheets-Sheet 1



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Fig. 4

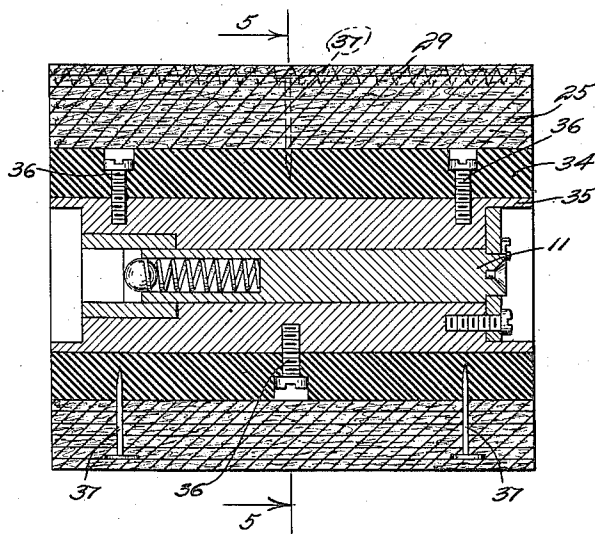
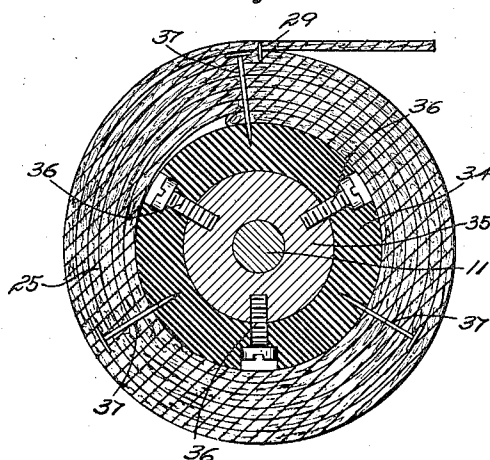


Fig. 5



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UNITED STATES PATENT OFFICE

2,014,627

FLEXIBLE BUFFER

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Application July 3, 1931, Serial No. 548,697
Renewed February 23, 1935

9 Claims. (Cl. 91—67.8)

This invention relates to a flexible buffer rotor, and more particularly to a centrifugal force expanding flexible buffer that urges a floor polishing material in a floating contactual relationship to a floor surface, in order to impart a hard surfacing finish of high lustre, thereto.

To properly finish a floor surface with a surfacing material such as wax, it is essential to first remove all dirt and stains. This was at first performed manually with a rag saturated with oil or gasoline or some solution prepared for that purpose. After the floor was cleaned and dried, shavings of pure beeswax were inserted between successive layers of folded fabric such as cheesecloth, which were then rubbed over the floor surface by means of a heavily weighted brush. Due to the weight of the brush and the constant rubbing of the material over the floor thereby, friction was created, and consequently heat which caused the wax to melt and saturate the fabric. The wax now coming in contact with the floor created in time a smooth hard wax finish thereon which served as a pleasing background for rugs or the like.

With the advent of the so-called liquid wax and lighter weighted brushes into the market, the floor waxing process was slightly modified. A cloth saturated with this liquid wax was bound over a brush and propelled back and forth over a floor to produce the desired effect. As the cloth soon became dirty or worn out, it had to be changed quite frequently; and consequently as this entailed considerable time and effort before the desired effect was produced, this method soon became obsolete.

In recent years the market has been literally flooded with floor polishing machines which utilized an electrically driven rotor over which the wax saturated material was bound. These rotors were made of a relatively rigid non-yielding material such as metal, wood, or solid felt which when driven over the floor at a high burnishing speed in the order of 1000 to 1500 R. P. M.'s bounced about due to the inherent unevenness or roughness of the rotors per se, or the floor surface. Consequently, the floor was polished only in spots, and accordingly, it did not possess the desired uniform finish. Moreover, no suitable means were provided on these rotors for quickly removing the dirty cloths and attaching clean ones, and accordingly these prior art devices have met with little or no success.

The objections inherent in the rotors of the prior art have been overcome by means of my novel high speed burnisher that urges a pretreated

fabric with a flexible, resilient and floating contact to a floor and thereby produces the desired uniform finish thereon.

The rotor for accomplishing this is formed by simply winding loosely around the driving core a long strip of felt. In order to prevent the felt from shifting sidewise on the core when in use, sharp pins are embedded in the core with the points projecting therefrom, and the felt is wound over these pins. Before the last circumference of the felt is wound on, common carpet tacks are forced through the outer layers until their points extend below the points of the pins. The heads of these tacks are then covered by the last circumference of the felt to prevent them from coming in contact with the floor.

It is quite apparent from the foregoing that these rotors when rotated at a high speed will expand a predetermined distance due to the action of the centrifugal force on the loosely wound felt pad. This pad cannot expand beyond the predetermined limits, or become displaced laterally due to the pins and tacks which permit only the desired expansion. It is quite evident that each and every layer of the felt pad will be acted upon by the centrifugal force to urge them apart or outwardly with the consequent formation of air cushions between each layer. As has been hereinabove set forth, this is very desirable due to the formation of a flexible resilient rotor which floatingly urges the saturated cloth in contact with all portions of the floor surface.

A simple expedient is provided on this rotor for quickly removing old or attaching new pretreated cloths.

When the last layer of felt has been wound over the core, it is sewed to the underlying layer adjacent its extremity. In this manner a flap is provided to the under side of which pointed hooks are secured. One end of a pretreated fabric of the desired length is placed under the flap and the pointed hooks are pressed through it and into the felt pad. The pretreated fabric can be then power wound over the flexible felt pad and then rotated over a floor to produce the desired result. Any desired length of a pretreated fabric can be utilized, although I prefer to use the material disclosed in my copending application to a floor polishing material, Serial No. 473,090, filed May 3, 1930, and which has matured into Patent #1,947,135, issued February 13, 1934.

It is therefore an object of my invention to provide a centrifugal force expanding flexible buffer of the type described which obviates the objections inherent in the prior art devices.

It is a further object of this invention to provide a flexible resilient buffer which is simple in design and construction, relatively inexpensive in manufacture, and which is capable of use for an indefinite period of time.

My invention possesses many other advantages, and has other objects which may be made more easily apparent from a consideration of one embodiment of my invention. For this purpose I have shown a form in the drawings accompanying and forming part of the present specification. I shall now proceed to describe this form in detail, which illustrates the general principles of my invention; but it is to be understood that this detailed description is not to be taken in a limiting sense, since the scope of my invention is best defined by the appended claims.

Referring to the drawings:

Figure 1 is a perspective view of my flexible buffer and a roll of pretreated fabric, showing the manner of attaching the pretreated material to the buffer;

Fig. 2 is a longitudinal section of my flexible buffer taken substantially along the plane 2—2 of Fig. 1;

Fig. 3 is a transverse section thereof taken substantially along the plane 3—3 of Fig. 2.

Fig. 4 is a longitudinal section of a modified form of the flexible buffer shown in Figs. 1—3; and

Fig. 5 is a transverse section thereof taken substantially along the plane 5—5 of Fig. 4.

The flexible buffer rotor embodying my invention is adapted to be used in and driven by a floor treating head such as a floor polisher, or combination floor polisher and vacuum sweeper. Power for rotating this rotor is supplied by means of a motor forming a part of the head to which electric current from any suitable source may be applied.

The rotor, designated by the numeral 10 comprises a drive shaft 11 which is rotated by a suitable rotating clutching mechanism in the head in a manner to be described.

A core 12 of aluminum or other suitable metal is keyed to the rotor driven shaft 11 and is adapted to be driven thereby. This is effected by means of a disk 13 having a central aperture coinciding with the periphery of the shaft 11 at one end thereof, and by the screw bolts 14 which thread into the core to maintain the disk on the shaft. As is clearly apparent from Fig. 1, the end of shaft 11 is provided with flattened portions 15 and 16 in order to accomplish this.

The rotor drive shaft 11 is adapted to be rotated by a clutching mechanism in the head about a cone shaped ball bearing stub shaft (not shown) carried by the side walls of the head. This stub shaft, when in engaging position, coacts with a cone shaped bearing 17 formed in the end of the driven shaft 11 adjacent the disk 13.

A cooperating clutching member is provided in the rotor as by a slot 18 formed in the other end of the rotor shaft 11. A disk shaped recess 19 having an extension 20 is formed in the core 12. The clutching element in the head is adapted to enter these recesses and engage the slot 18 in the shaft 11 in order to drive the latter. A member 21 telescopes over the end of the shaft 11 and in effect forms an extension thereof which surrounds the opening 29. This member serves as a bearing for the rotating clutching element in the head.

An elongated recess 22 is formed in the shaft

11 which leads into the slot 18. This recess serves to house a compression spring 23 which urges a ball 24 against the rotating clutching element in the head. This ball and spring in the rotor drive shaft 11 act to take up any variations in the length thereof, and urges the shaft 11 to the right to keep bearing 17 against its cooperating shaft.

A flexible resilient pad or support 25 for a pretreated floor treating material 26 is formed about the core 12. The support 25 is formed by simply winding in a loose fashion, a long strip of felt similar to billiard cloth until the support is in the order of from $\frac{3}{4}$ " to 1 inch in thickness. The layers of felt wound in the manner hereinabove described would shift sideways when in use, and accordingly destroy the flexible cushioning effect thereof. To prevent this, sharp pins 27 are embedded in the core 12 with the points thereof extending outwardly. The felt layers comprising the support 25 are wound on the core over the pins 27 in a manner readily apparent from the drawings.

Before the last circumference of the felt layers is wound on, common carpet tacks 28 are forced through the outer layers just past the points of the pins 27. The heads of the tacks 28 are prevented from coming in contact with the floor by the last turn of the felt layers.

It is quite evident from the foregoing that the centrifugal force set up by rotating the rotors 10 will act to cause the resilient support or pad 25 to expand a predetermined distance outwardly. The pins 27 and the tacks 28 effectively prevent the lateral displacement of the layers constituting the pad. It follows from the foregoing that each and every layer of the felt pad 25 would be acted upon evenly to force them apart or outwardly, thus forming air cushions between the successive layers which form a floating support for floatingly urging the floor treating material 26 in contact with all portions of the floor surface.

When the last layer of felt has been wound over the core, it is secured to the layer immediately below it, as by the line of stitching 29. The stitching 29 is along a line spaced from the end of the felt material to form a flap 30 in a manner readily apparent from Fig. 3. To the underside of the flap 30 pointed hooks 31 are secured in any desirable manner as by sewing 32.

The operation of the device is readily apparent from the foregoing and from an inspection of Fig. 1. One end of a desired length of pretreated fabric, from a supply roll 33 is placed under the flap 30 and the hooks 31 pressed through it and into the permanent felt flexible pad 25. The material is then power wound on the rotor 10 and is ready for use. It is a simple expedient to replace the pretreated material after it becomes soiled or worn out.

In actual practice, the core 12 is formed by casting aluminum with the pins 27 therein. These pins are quite similar in shape and design to the conventional phonograph needles. It is to be understood that this invention is not to be limited to the specific core and drive shaft shown and described, as it is equally applicable to any form of driven core. If desired, the core could be formed of wood or the like.

As these rotors are designed for use under high speeds, and as they are relatively heavy, being in the order of four inches in diameter by five inches in length, it is desirable to provide bearings at the end of the drive shaft, as for in-

stance the bearing 17. This serves to steady the drive shaft and eliminate any whipping action at the end thereof. This whipping action, if permitted, would cause excessive wear and thereby materially reduce the life of the rotor. Due to the flexible yielding action of the felt pad 25, the rotor 10 will not bounce over a floor when driven thereover and will in fact serve as an effective means for urging the pretreated material against all portions of the floor surface, even the low or sub-spots.

In Figs. 4 and 5 a slightly modified form of my invention is shown. This form is substantially similar to that shown in Figs 1-3, and differs therefrom, in general, by the insertion of a sponge rubber cushioning layer 34 between the core 35 and the flexible pad 25. As it is desirable to maintain substantially the same overall diameter in this rotor as in rotor 10, the diameter of the core 35 is made considerably smaller than that of core 12 in order to compensate for the thickness of cushioning layer 34. The sponge rubber cushioning layer is secured to core 35, and relative lateral movement between layer 34 and core 35 is prevented as by counter-sunk screws 36.

The flexible pad 25 is formed, as before, by winding in a loose fashion, a long strip of felt similar to billiard cloth until the pad is in the order of from $\frac{3}{4}$ " to 1 inch in thickness. Relative sidewise shifting of the felt layers constituting pad 25 is prevented by means of long nails 37. These nails are forced through the felt layers and into the sponge rubber cushioning layer prior to winding the last layer of material thereon. The heads of nails 37 are prevented from coming in contact with the floor by the last turn of the felt.

In all other respects this flexible rotor is similar in design and operation to that described in connection with Figs. 1-3. The use of an intermediate sponge rubber cushioning layer such as 34 serves to further enhance the flexible characteristics of the rotor.

I claim:

1. A permanent buffer rotor about which a desired length of a floor treating material is adapted to be wound comprising, a core, means forming a flexible resilient pad about the core, and means for so supporting said pad on the core as to permit the pad to expand, and an intermediate cushioning layer between the core and the pad.

2. A permanent buffer rotor about which a desired length of a floor treating material is adapted to be wound comprising, a core, means forming a flexible resilient pad about the core, and means for so supporting said pad on the core as to permit the pad to expand, and an intermediate sponge rubber cushioning layer between the core and the pad.

3. A permanent buffer rotor about which a desired length of a floor treating material is adapted to be wound, comprising a core, a resilient flexible pad around the core, said pad being formed of successive windings of fibrous material, means permitting a predetermined expansion of said layers when the rotor is rotated, whereby air cushions are formed between the successive layers, said means also acting to prevent sidewise movement of the layers on the core, and an intermediate sponge rubber cushioning layer between the pad and the core.

4. In a buffer rotor, a core, successive loose windings of yielding material around the core, said windings having no material tension and means for preventing the said material from being wound tightly around the core when the rotor is in use.

5. In a buffer rotor, a core, successive loose windings of yielding material around the core, said windings having no material tension and means for preventing the said material from being wound tightly around the core when the rotor is in use, comprising means holding spaced parts of the material against angular motion with respect to the core.

6. A floor treating roll, comprising a plurality of loosely wound layers of thick, yielding fabric, means for holding the layers against winding up tightly, and a superposed layer of material that operates as a floor treating medium.

7. A floor treating roll, comprising a support, yielding means thereon, forming a substantially cylindrical body for the roll, and means for loosely holding the yielding means on the support, so that said yielding means is responsive to the operation of centrifugal force to expand it, when the roll is rapidly rotated.

8. In a floor treating roll, a supporting core, yielding means loosely wrapped around the core, and means for preventing said yielding means from tightening around the core, as well as for securing said means to the core, comprising anchoring devices angularly spaced around the core and engaging the yielding means at angularly placed points.

9. In a floor treating roll, a supporting core, yielding means wrapped around the core, means for preventing said yielding means from tightening around the core, as well as for securing said means to the core, comprising anchoring devices angularly spaced around the core and engaging the yielding means at angularly placed points, said yielding means having a free flap at its outer end, and an outer layer of floor treating material attached at one end only to said flap.

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