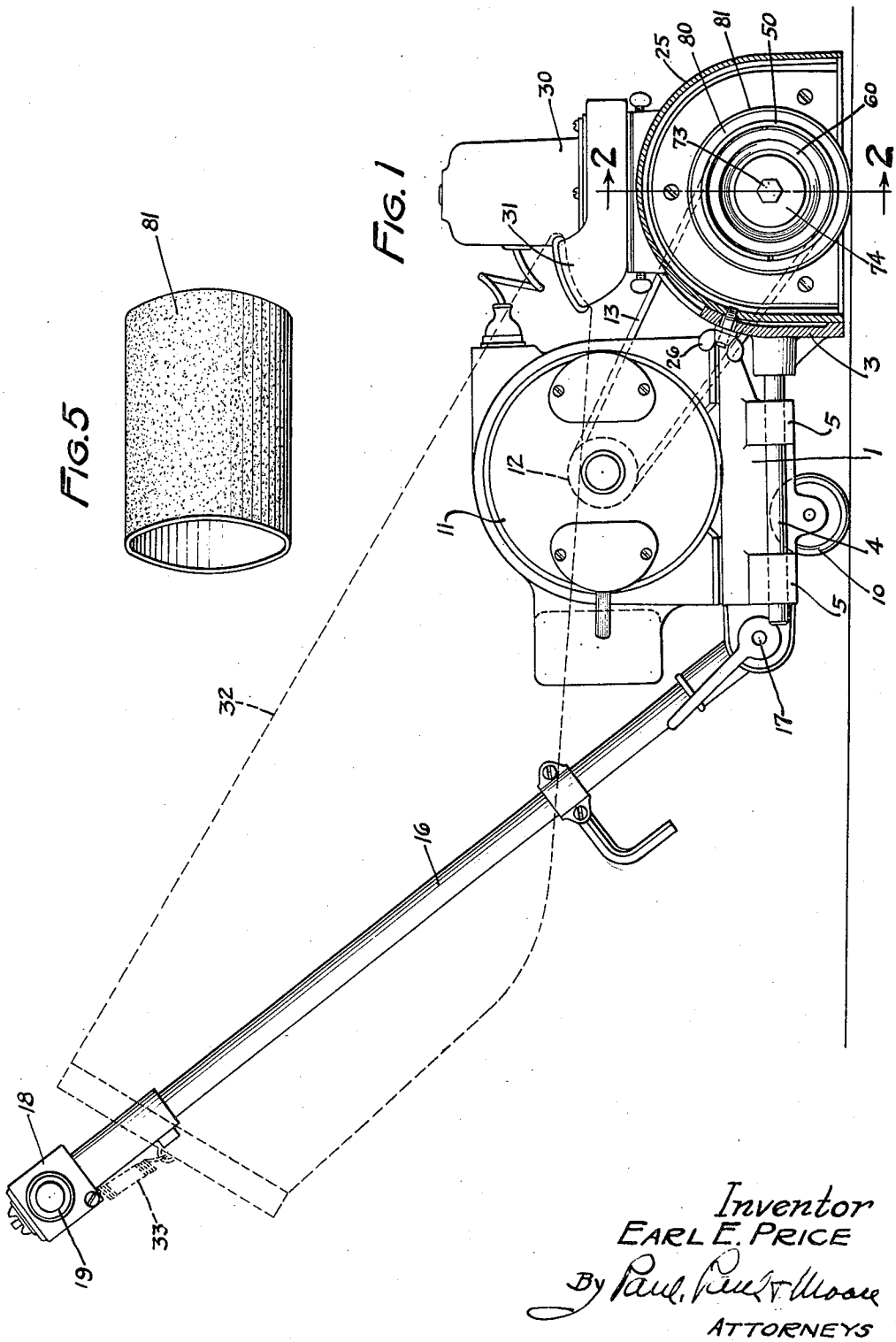
June 15, 1937 E. E. PRICE 2,083,793

ABRADING OR POLISHING IMPLEMENT

Filed Jan. 14, 1937 2 Sheets-Sheet 1



Inventor
EARL E. PRICE
By Paul, Paul & Moore
ATTORNEYS

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FIG. 2

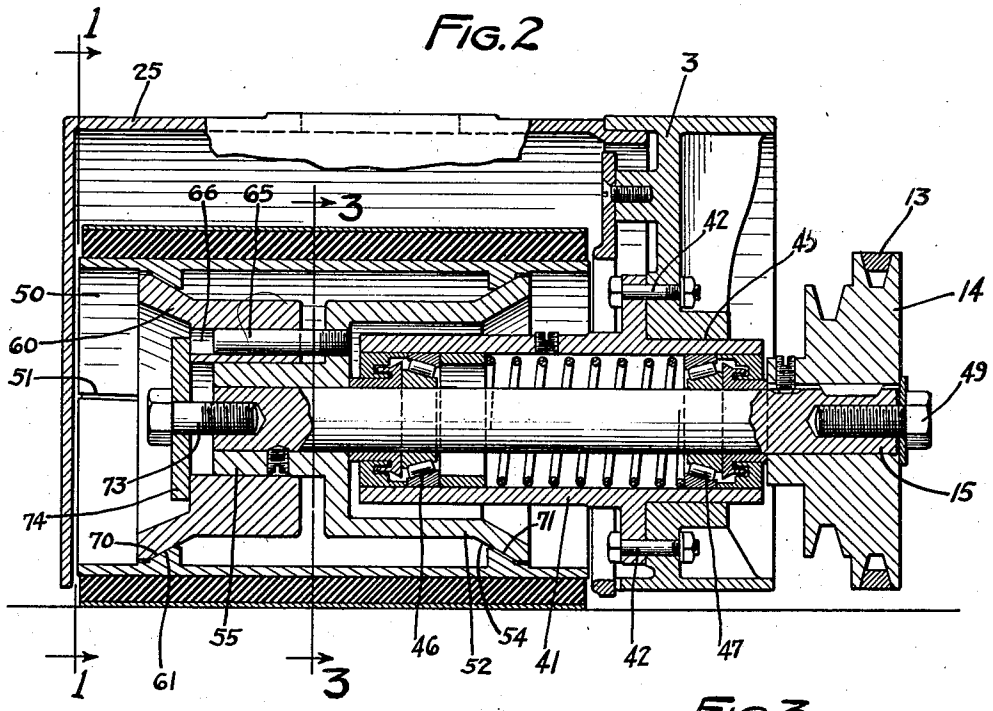


FIG. 4

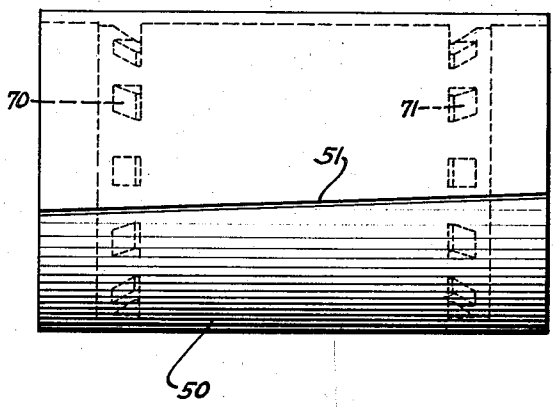
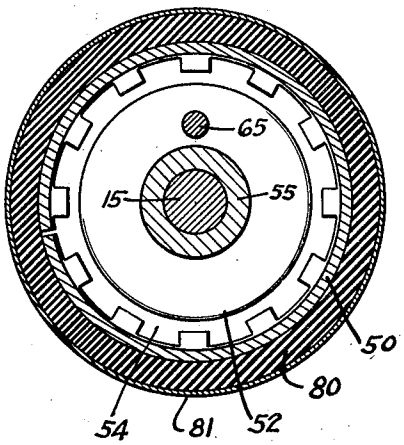


FIG. 3



Inventor
EARL E. PRICE
By Paul Paul & Moore
ATTORNEYS

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ABRADING OR POLISHING IMPLEMENT

Earl E. Price, Minneapolis, Minn., assignor to G. H. Tennant Company, Minneapolis, Minn., a corporation of Minnesota

Application January 14, 1937, Serial No. 120,541

5 Claims. (Cl. 51—190)

This invention relates generally to improvements in abrading machines and abrading methods and has herein been shown as applied to a floor polishing machine. An important object is to provide a method and means by which a tube of abrading material can be quickly and securely attached to a spindle to rotate therewith, and perform an abrading action without slippage and without streaking of the surface being abraded.

Other objects are: to produce a rotary abrading device which is backed by a resilient material, and to provide a cushion backing for a tubular abrading element, on the outside of which the abrading material is distributed, and to thus provide means by which the abrading surface can conform to the inequalities to the surface being abraded, particularly to the inequalities of a flat surface.

Another object is to provide an expansible and contractable base upon which an abrading tube may be mounted, which base when expanded will frictionally secure the abrading tube in abrading position to move therewith without slipping. Another object is to provide means facilitating the application and removal of a tubular abrading element to and from a spindle by which it is to be rotated for abrasive action.

Features of the invention include all details of construction shown in the drawings along with the broader ideas of means inherent in the disclosure.

Objects, features and advantages of the invention will be set forth in the description of the drawings forming a part of this application, and in said drawings

Figure 1 is a sectional elevation of a floor polishing machine taken on line 1—1 of Figure 2, and showing my invention applied thereto and viewing the spindle assembly from its outer end;

Figure 2 is a vertical longitudinal section through the spindle assembly taken on line 2—2 of Figure 1;

Figure 3 is a vertical cross section taken on line 3—3 of Figure 2;

Figure 4 is a view of the expansible base tube or split sleeve; and

Figure 5 is a perspective view of the abrading tube or tubular element which carries abrading material.

Referring first to Figure 1, numeral 1 indicates the rear frame section of a two-section machine base. A vertical portion of the front frame section is indicated at 3 and this vertical portion is slidably adjustably connected by rods 4 (only one of which is shown) to the base 1, said rods passing through openings of lugs 5 at the rear section 1. The section 1 has ground rollers 10 serving as fulcra, and on this section is mounted a motor generally indicated at 11. The motor has a pulley 12 connected by a belt 13 with a suitable pulley 14 (see Figure 2) on spindle 15.

The motor is arranged above the rollers 10, and its center of gravity is slightly forward of said rollers. The hollow control extension 16 is adjustably pivoted indicated at 17 to the base 1, and has at its upper end a switch box 18 to which is suitably attached a cross bar handle 19, a suitable service cable, not shown, connects with a switch within the box 18, and suitable wires, not shown, lead through the hollow control element 16 to the motor.

Arranged over the spindle 15 is a U-shaped cowl indicated at 25, which is secured to part 3 by means of a screw and thumb nut generally indicated at 26. On top of this cowl is mounted the suction mechanism of a vacuum cleaner which is generally indicated by numeral 30, and the suction tube 31 of this mechanism has connected thereto a suitable bag 32, the outline of which is indicated in dotted lines. The bag is connected at the outer or upper end to the box 18 by a spring 33.

Referring now to Figure 2, the spindle 15 traverses a tubular bearing support 41 which support is bolted as at 42 to the forward frame 3. The tubular 41 element projects through an opening 45 in frame 3 and projects a substantial distance inwardly as shown. Within the tube 41 are roller bearing assemblies 46, 47 for spindle 15. The bearing 47 lies in the same plane with a vertical lateral portion of the frame 3, and the bearing 46 lies a substantial distance from that plane. The pulley 14 is suitably keyed to the spindle 15 and is held against outward translation by cap screw 49. The combination of the spindle with its tube 41 and bearings constitute an outboard bearing.

Surrounding the spindle is an expansible tubular base member indicated at 50 (see Figure 4) the expansibility being accomplished in this case by longitudinally splitting the base member as at 51. Means is provided by which force can be applied to expand the base tube 50, and this means is not only broadly claimed but its specific construction is also claimed. It consists specifically of two wedging members, one movable toward the other in combination with complemental wedging members disposed within the tube 50. One wedging member 52 is suitably attached by set screw near the outer end of the spindle 15. The member 52 surrounds and caps the outer end of bearing tube 41, and has at its inner terminal an outwardly faced inclined wedging surface 54. Translatably mounted on an outer reduced tubular portion 55 of the member 52 is another tubular wedging member 60 having a circumferential wedging surface 61 opposed to or facing toward the surface 54. The element 60 is held against rotation by means of a

pin 65 threaded into the tubular member 52. This pin slidably enters an opening 66 of the member 60. Arranged circumferentially within the base tube 50 are two series of wedging planes respectively indicated at 70, 71 which respectively cooperate with inclined faces 61, 54 of the tubular members 60, 52.

In assembling the device, the cap screw 73 and cap plate 74, are removed then the tube 60 is removed. The base tube 50 is then placed so that the inclined surfaces 71 and 54 are in engagement. The tubular member 50 is then slid into place so that the inclined surfaces 61 and 70 engage. Whereupon the cap plate 74 and screw 73 are put into place and the screw is turned to translate the member 60 so that the wedging surfaces act to expand the base 50. The degree of expansion is limited by an abrading tube which as a result of such expansion is secured, as is the base tube, for rotation with the spindle.

An important feature of this invention, which is claimed broadly irrespective of the specific construction of the wedging device or expanding means relates to the utilization of the expanding principle for frictionally securing a tubular abrading element, as well as a base therefor to a spindle.

Another feature relates to the interposing of an elastic cushion material between the tubular abrasive material and its base.

Numeral 80 indicates an elastic cushion tube which exerts constrictive action on the split base tube 50. When the base tube is expanded it expands against the constrictive action of this elastic tube. A tube 81 of abrasive material, or a base tube for such material, circumscribes the elastic tubing 80 and it will be seen that when expansion of the base tube 50 takes place the elastic tubing or its equivalent is compressed between this base and the tube of abrasive material. Assuming that the outer diameter of the split tube is five inches when in normal or unexpanded condition, the inner diameter of the rubber tubing will be about four and seven-eighths inches. Thus the diameter of the split tube will be slightly decreased, as the rubber or cushion tube is drawn thereover. The inner diameter of the abrading tube is slightly greater than the outer diameter of the rubber tube, after the latter is drawn over the split tube and thus the abrading tube can be easily slipped over the rubber tube. As the split tube is expanded, the rubber tube is likewise expanded against the abrading tube and all tubes are thus held to rotate in unison with one another and with the spindle. When wedging action ceases, the rubber tube contracts to release the abrading tube to facilitate removal of the latter.

I also believe myself the first to provide a cushion material which allows a certain compensatory adjustment of the abrading material for inequalities in the level of the surface being abraded and the first to utilize a constrictive action of such elastic material, for assisting in the loosening of the abrasive tube after the latter has been worn and replacement is necessary. I also believe myself the first to use elastic material like rubber as a compressible intermediary between a base (whether constrictable or not) and a tube of abrasive material, like sand paper or emery paper in which the outer surface of the tube is sprinkled with such material, or in which the entire tube is made of such material. The use of compressible and resilient cushion material which allows inward motion of the abradent comformably to inequalities of the surface being abraded and which acts a shock absorber, and to maintain cylindrical continuity of the abrading surface is believed to be new in the abrading art.

I claim as my invention:

1. In combination with a spindle, a longitudinally split tube wedging means by which the tube is evenly expanded, an elastic tube which exerts an initial constrictive action to lessen the normal diameter of the split tube, and an abrading tube against which the elastic tubing is compressed when the split tube is expanded.

2. In combination with a spindle, an expansible tube, means by which the tube is evenly expanded, an elastic tube which initially exerts a constrictive action on the split tube, to initially make its diameter less than normal and an abrading tube against which the elastic tubing is compressed when the split tube is expanded, the structure and relation of the parts therefore being such that after the expanding operation of the expanding means and subsequent release thereof, the constricting action of the elastic tubing on the expansible tube loosens the abrading tube to facilitate its removal.

3. An abrading machine having, a bearing, a shaft in said bearing extending outwardly therebeyond, a wedging member fixed to the extended portion of the shaft, a second wedging member splined to the first and removable therefrom by outward translation and adapted for inward translation to obtain wedging action, a split resilient tube having wedging members operatively engaging with the before-mentioned wedging members and means to forcibly translate the second member to expand the tube.

4. An abrading machine having, a bearing, a shaft in said bearing extending outwardly therebeyond, a wedging member fixed to the extended portion of the shaft and having a portion extending lengthwise of the bearing and surrounding a substantial lengthwise portion of the same, and having near its inner end, a circumferential wedging surface, a second wedging member adapted for inward translation for obtaining wedging action, means by which the wedging members are detachably connected to move in unison, a split resilient tube having wedging members operatively engaging with the before-mentioned wedging members, and expansible to operatively secure a tubular abrading element and means for forcibly translating the second member to expand the tube.

5. A floor abrading machine having a vertical wall, a bearing extending horizontally outwardly from the wall, a shaft in said bearing extending outwardly therebeyond, a wedging member fixed to the extended portion of the shaft and having an inner portion surrounding and spaced from the bearing and extending to a point near to the wall, a second wedging member splined to the first and adapted for inward translation for obtaining wedging action, a split resilient tube having wedging members operatively engaging with the before-mentioned wedging members, and means for forcibly moving said second wedging member toward the first to expand the tube.

EARL E. PRICE.