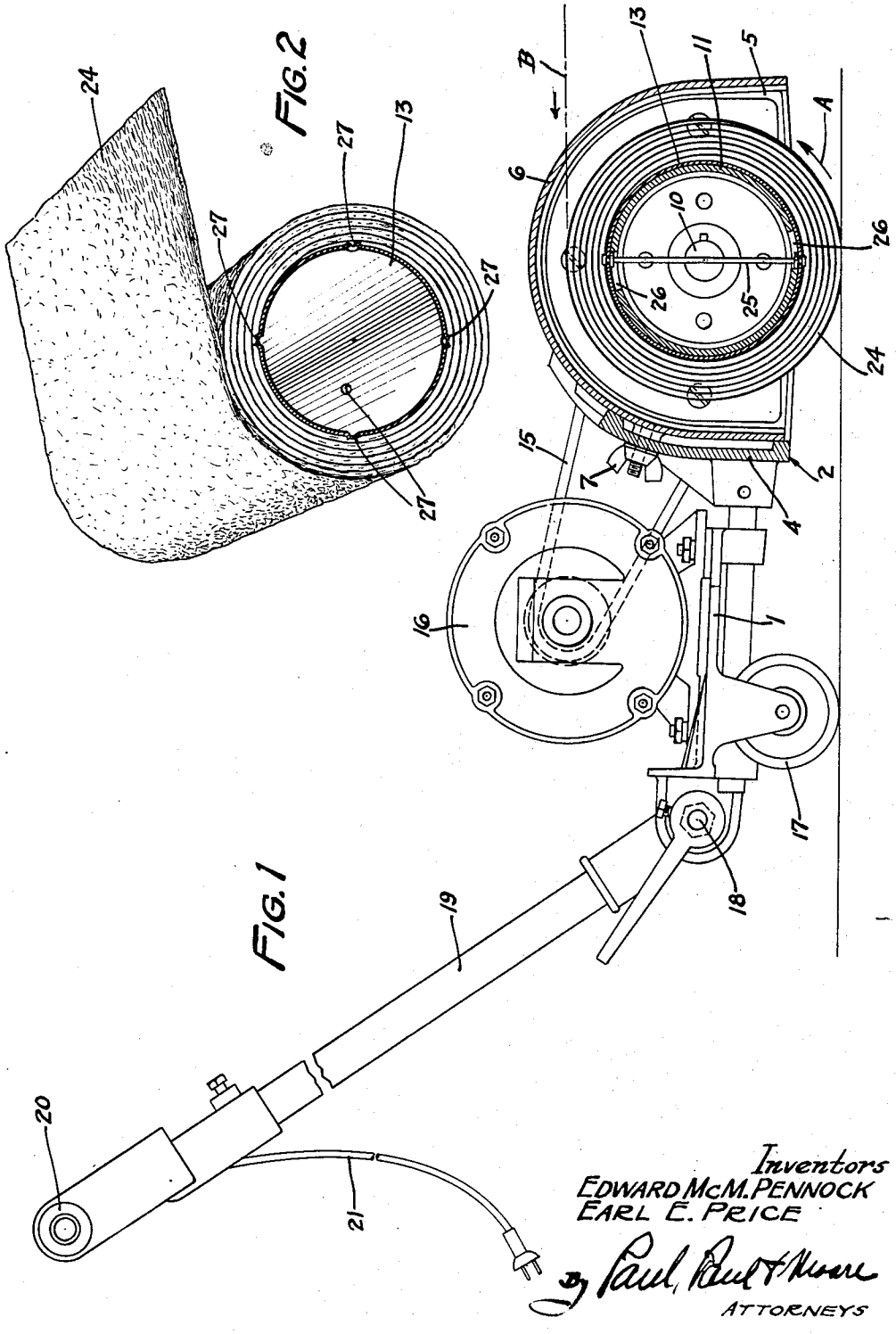
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ABRADING DEVICE

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ABRADING DEVICE

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This invention relates to improvements in abrading devices, and is particularly concerned with an abrading device composed of a single sheet of spirally wound steel wool, and the manner of using the same, to prevent unwinding of the sheet during use.

Heretofore it has been the practice to produce a steel abrading roll by using a ribbon, the width of which is less than the long axis of the core upon which it is wound, or than the long axis of the roll produced, and to move this ribbon back and forth as the roll is rotated to obtain helical winding in which the ribbon overlaps itself as it forms the helices.

We are also aware that attempts have been made to use steel wool by making a relatively thick blanket of the same, the length of the blanket being equal to the circumference of the roll, and the blanket being applied to the roll by securing the ends in abutted relation on the roll. In this case special securing means must be provided to hold the abutted ends together and this securing means must be something other than steel wool, and a seam is formed at the point of abutment. In our device no seam is formed and no securing means is needed, the material being tensioned during winding and the end portion being pressed into the underlying portion.

The present device has for its purpose to utilize a layer, or layers, of steel wool, and to wrap it or them under tension spirally like a towel on a towel roll about a core in a direction at right angles to the core axis, and to gradually build up an abrading device of the proper diameter in the form of a steel wool roll having a peripheral operating face and being self-sustaining in character. The device is primarily intended for use in power driven abrading machines such as floor surfacing machines, and the character of the roll is such that the same may operate successfully in such machines at relatively high rotating speeds and maintain its form and character without the necessity of binding or other securing means to maintain its spiral layers in proper relation.

The invention is preferably carried out by using a continuous sheet for winding each roll, although, a plurality of sheets consecutively applied may be used. In this way it is only necessary to provide some means on the core roll by which the wool is held preliminarily until a few winds have been made wherafter winding proceeds until a roll of the proper diameter has been formed. In the present scheme there is no necessity for connection of the ends of a blanket to complete the roll, because the material of one wind clings to the material of another, and the end portion clings to the underlying material after the roll is completed. The manner of using the roll prevents unwrapping of this spiral sheet. The material in sheet form can have varying thicknesses but for most purposes is relatively thin. This thickness is generally controlled by suitable regulators, sometimes by the fingers of the operator. When a relatively thick steel wool blanket or sheet is employed and/or where the material is wound under insufficient tension, the completed roll will be soft and lacking in self-sustaining characteristics. The latter is also true where the roll is wound to a large diameter in relation to its axial dimension.

Features of the invention include the use of a blanket of steel wool wrapped like toweling to form a roll, the roll so formed, and the manner of using the roll to prevent unwrapping of the sheet, thus spirally wound.

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

Figure 1 is a side elevation, partly in section, showing a roll attached to a machine, and illustrating not only the method of winding the roll but the manner of using it so that the wool will not be unwound; and

Figure 2 is a perspective view illustrating how the steel wool sheet is wound.

Referring to the drawing, the invention can be used on any machine which is capable of operating it but is shown in this instance on a floor machine wherein at present it has had its most valuable application. This machine has a two section base. Numeral 2 generally indicates the front section, which has upright walls 4, 5, to which a cowl, or cover 6, is removably attached as by bolts and wing-nuts 7, only one of such devices being shown. The wall 5 supports a horizontal bearing, not shown, having a shaft 10 and on this shaft is arranged a spindle 11. On this spindle is arranged a core 13 upon which the steel wool sheet of this invention is wound. The shaft is driven by a suitable belt 15 from a motor 16 which is supported on the rear base member 1. This rear member 1 has rollers 17, and also has pivotally attached thereto at the rear, as at 18, an operating handle or shaft 19 having a cross handle 20 at the top. The connection 21 for the motor runs down through the handle. The machine per se forms no part of this invention, and may be of any preferred type, and is shown principally to illustrate the process of operating

the roll. The core 13 is secured to the spindle by a diametrically disposed rod 25, cooperating with slots 26 of the spindle.

In Figure 1 the arrow A indicates the direction of rotation of the roll when in use, as well as the direction of rotation when winding. On this figure a line B shows the direction of the movement of the material during winding which, as before stated, may occur either on a separate winding machine or on the core 13 after it has been attached to the spindle of the floor or other machine.

Referring now to Figure 2 which shows the abrading device of this invention and the process of making the same. In forming the steel wool roll by winding, the core is rotated in a certain direction and is afterwards put into the machine to rotate in the same direction. By this means as heretofore stated the wool is held from unwinding when the device is used. This is particularly necessary when the wool is wound in the manner of a towel.

The wool is first manipulated to form a sheet or blanket. This is accomplished sometimes by bars or rollers over which the wool drags or is pressed, or by the fingers of the operator. This sheet may have thicknesses varying from $\frac{1}{8}$ to $\frac{1}{4}$ of an inch. Preferably thinner layers are used, and it will be understood that the steel wool before it is wound is of a tenuous, rather open, structure. Varying tension may be placed on the sheet, as it is wound, in accordance with use to which the abrading device is to be put, and in accordance with the thickness, but it is preferred in all cases that the material be wound tightly so that the layers will securely interlock with each other and provide a roll which is relatively hard and unyielding so that the roll will not tend to disintegrate under working contact with a surface to be abraded. This is particularly important where the roll is to be employed in power driven machines because of the tendency of centrifugal force to disintegrate the roll. The sheet is indicated at 24. The supply roll has not been shown, nor has the core 13 been shown in Figure 2, on a spindle, but the spindle 11 may be used and in fact winding can be accomplished on the machine and so to speak, in situ, by the ultimate consumer.

The sheet metal core 13 has punched out portions 27, in proper number, and arranged lengthwise of the core, as means by which the inner end or portion of the sheet is held while winding is accomplished.

This scheme or process is employed because by this means the direction of rotation for winding is the same as the direction of rotation used, and this is desirable, indeed necessary, if the best results in use are to be obtained.

The number of layers spirally wound to form the roll may vary considerably, but to secure a self-sustaining structure which will have a relatively unyielding peripheral operating surface and stand up in use in power driven machines, the annular thickness of the completed body, which is determined by the number and thickness of the windings, should be smaller than the axial length of the body, and preferably also should be smaller than the diameter of the core 11. By winding the roll tightly so as to be relatively non-yielding, frictional engagement of the peripheral operating surface of the body with the surface being abraded will not only prevent unwinding of the spiral layers but will tend to tighten them. Thus, even though the peripheral surface wears away during use so as to progressively diminish the number of spiral layers, the abrading body will not tend to loosen up.

While we have herein referred to the peripheral operating surface of the roll as being relatively "non-yielding" it is to be understood that said surface may, of course, yield to some extent in operation, due to the inherent nature of steel wool. Whereas, soft steel wool abrading rolls, as disclosed for example in Robbins U. S. Reissue Patent No. 20,002 and British Patent No. 284,688, are relatively spongy and compressible, so that their peripheral surface would readily yield and cause the entire body to be distorted out of shape and disintegrate if such rolls were employed with the periphery as the working surface in a power-driven floor machine, an abrading roll made according to the present invention is a relatively hard body which is so compacted and firm as a whole that when used in a power driven machine it retains its cylindrical shape and resists yielding of the peripheral operating surface except to a limited degree during working contact of such surface with a floor being treated.

We claim as our invention:

1. A steel wool rotary abrading unit including a rotatable core, and abrasive material comprising steel wool strands in thin sheet form anchored to the core and tightly wound spirally thereon in a circumferential direction at right angles to the core axis as a succession of spiral layers which interlock with each other and constitute an annular body which is self-sustaining under rotary operation, the annular thickness of said body being smaller than the axial length of the body and said body presenting a relatively unyielding peripheral abrading surface, the body being wound in such a direction with respect to the intended rotary operating direction that abrading engagement of the peripheral abrading surface of the body with a floor surface tends to tighten the spiral layers and maintain the body in compacted condition without the necessity of a binder as fastening elements.

2. In a power driven floor surfacing machine, a rotary core adapted to rotate about an axis parallel to the floor, and a compacted self-sustaining annular abrasive body having a peripheral operating surface and comprising a sheet of steel wool of a width substantially the same as the axial length of the completed body anchored to the core and forming thereon a succession of tightly wound spiral interlocking windings forming a completed body having an annular thickness which is smaller than the diameter of the core, said windings being wound in a circumferential direction at right angles to the core axis so that each winding extends the full axial length of the completed body, the sheet being wound in such a direction with respect to the rotary operating direction of the core during use that rotation of the body with its peripheral surface in engagement with the floor maintains the windings tight in interlocking engagement with one another and prevents loosening of the inner convolutions as one after another of the outer convolutions is worn away during use.

3. A steel wool rotary floor surfacing unit for power driven abrading machines including a rotary core, and abrasive material comprising steel wool strands in sheet form anchored to the core and tightly wound spirally thereon in a circumferential direction at right angles to the core axis as a succession of spiral layers which interlock with each other and constitute a compacted rela-

tively unwielding annular body presenting a firm cylindrical peripheral abrading surface, the annular thickness of said body being smaller than both the inner diameter and axial length of the annular body, the body being wound in such a direction with respect to the intended rotary operating direction that abrading engagement of the periphery of the body with a floor surface will maintain the layers in tight interlocking relation and render the body permanently self-sustaining and compact in form without the necessity of binders or fastening elements.

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