Dec. 27, 1949 N. DEGEN 2,492,849

SANDER DRUM AND FLOOR SANDING ABRASIVE SHEET

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Fig. 1.

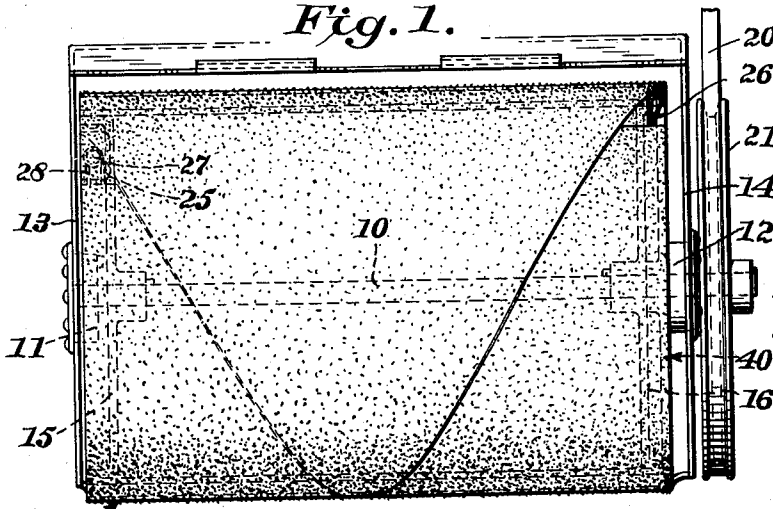


Fig. 4.

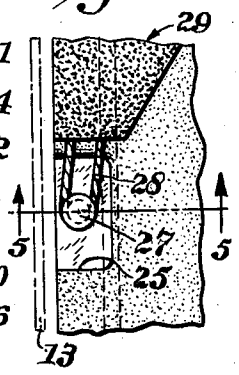


Fig. 2.

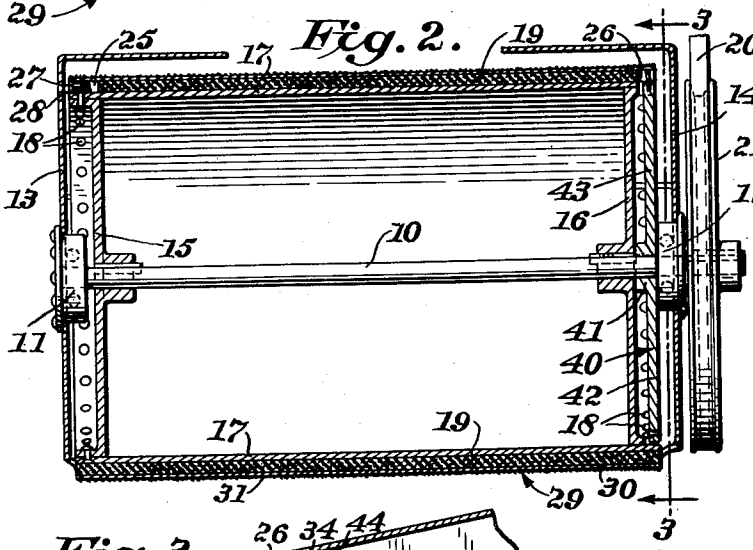


Fig. 5.

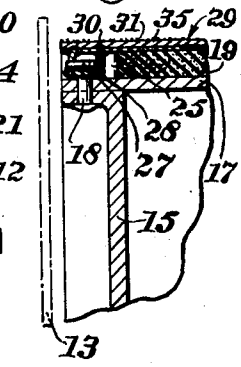
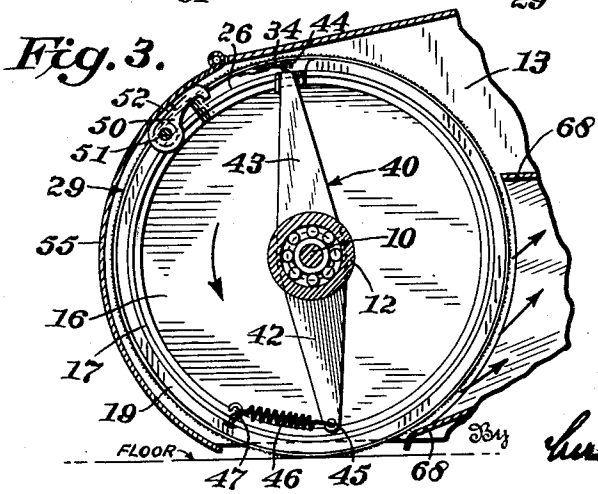


Fig. 3.



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SANDER DRUM AND FLOOR SANDING ABRASIVE SHEET

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Fig. 8.

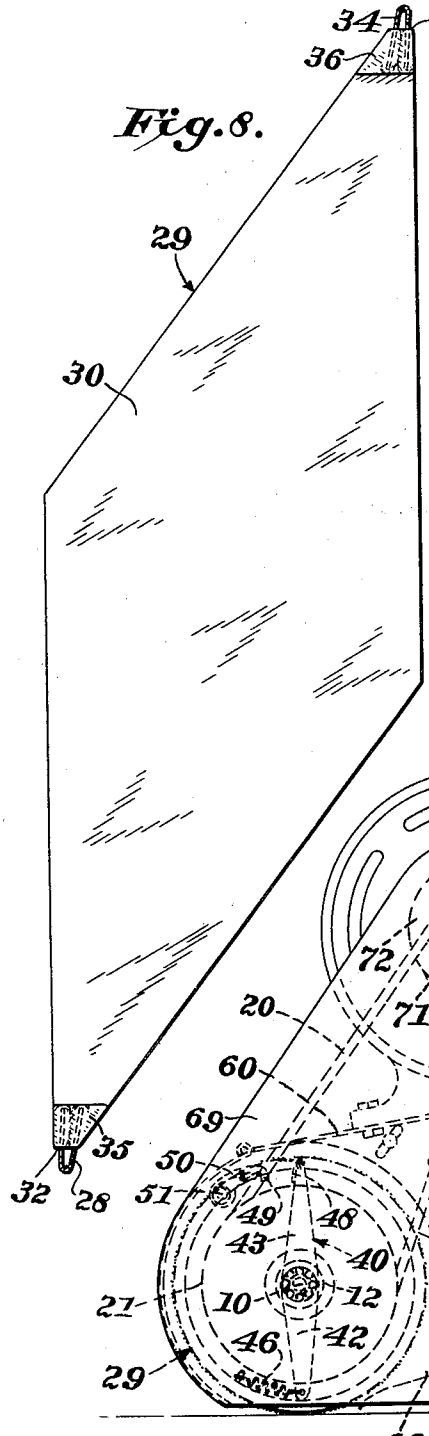


Fig. 6.

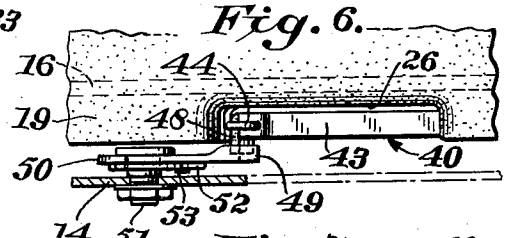


Fig. 7.

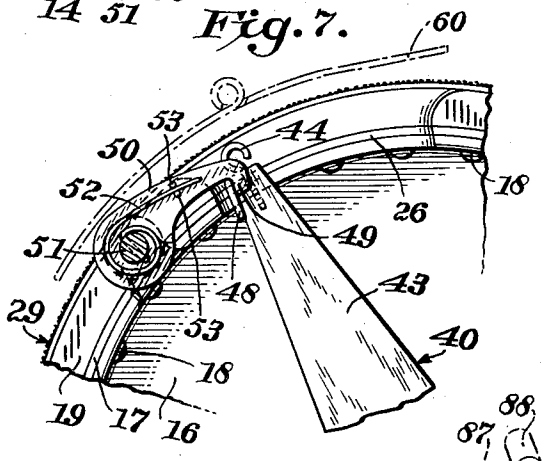


Fig. 9.

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UNITED STATES PATENT OFFICE

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SANDER DRUM AND FLOOR SANDING ABRASIVE SHEET

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7 Claims. (Cl. 51—194)

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The present invention relates to abrasive apparatus or sanding machines and, more particularly, to floor sanders, of the type employed in conditioning new floors for the reception of finishing materials and for refinishing old, worn floors.

A primary object of the invention is to improve the constructions of the sander drums employed in floor sanding machines and the like.

Another object of the invention is to provide a sander drum structure having novel means for securing to the surface thereof a sheet, strip or band of flexible coated abrasive material, such as abrasive cloth or paper.

Another important object of the invention is to provide a new and improved coated abrasive sheet, strip or band, adapted to cooperate in an improved manner with the drum of the invention and with drums of other types.

Another object is to provide improvements in sander drums and coated abrasive sheets, cooperating in a novel manner so as to maintain the sheet upon the surface of the drum in the best working condition and to prevent the creation of slack in the sheet which would tend to cause bending, cracking or buckling of the sheet, with consequent shortening of the working life of the abrasive material. To this end, the invention provides means for constantly maintaining the sheet, strip, or band under tension on the surface of the drum.

Another object of the invention is to provide structural features in the drum which facilitate removal of a worn sheet of abrasive material and the replacement thereof by a new sheet.

Another object is to provide a floor sanding machine having novel means for adjusting and controlling the pressure under which the sander drum is applied to the surface being sanded.

Other and further objects of the invention will be apparent from a consideration of the following description of a specific embodiment, shown for purposes of illustration in the accompanying drawings, in which:

Figure 1 is an elevational view of the sander drum with a coated abrasive sheet mounted upon its surface;

Figure 2 is a longitudinal sectional view through the drum of Figure 1, with certain parts shown in elevation;

Figure 3 is an end elevation and partial section, taken substantially on line 3—3 of Figure 2;

Figure 4 is a fragmentary plan view on an enlarged scale, showing the manner of attaching one end of the abrasive sheet to the drum;

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Figure 5 is a sectional detail on line 5—5 of Figure 4;

Figure 6 is a fragmentary plan view on an enlarged scale, showing certain details in connection with the means for securing the other end of the abrasive sheet;

Figure 7 is an elevation of the structure shown in Figure 6;

Figure 8 is a plan view of the back side of a coated abrasive sheet, strip, or band in accordance with the present invention, and

Figure 9 is a side elevation of the complete floor sanding machine.

Referring to Figures 1–7, the sander drum preferably comprises a shaft 10, journalled for rotation in ball bearing assemblies 11, 12, carried by the machine casing side walls 13, 14; spaced drum heads 15, 16 coaxially arranged on the shaft and keyed thereto for rotation therewith; a cylindrical, metallic rim 17 which may be carried by the drum heads and secured thereto by rivets 18 or, in many cases, cast integrally therewith of aluminum or the like; and a resilient outer sleeve 19 of rubber or similar material which may be vulcanized or otherwise secured to the rim 17.

Rotation may be imparted to the drum by a V-belt 20, trained about a pulley 21, fixed on the end of the shaft 10 and connected to a source of power, as hereinafter described.

The opposite ends of the cylindrical drum are provided with a recess 25 in the rubber sleeve and a notch or opening 26 extending through the rim 17 axially beyond the drum head 16.

The surface of the drum rim 17, within the recess 25 carries a headed projection 27, about ¼ of an inch from the edge of the rim, over which a strand loop 28 at one end of a rhomboid-shaped abrasive sheet 29 is adapted to be hooked.

The abrasive sheet comprises a backing 30 of paper, cloth, or other flexible sheet material, and a facing layer 31 of abrasive grains, adhesively united to the backing, as is well understood in the art. The acute angle ends or tips of the rhomboid sheet or strip are cut off, as indicated at 32, 33, and cord or other strand loops 28 and 34 are adhesively united thereto, with the eye portions thereof extending into the general area of the removed tips. The legs of the loops are laid upon the back surface of the abrasive sheet and united thereto by reinforcing tabs 35, 36 under substantial pressure with an interposed body of adhesive.

The abrasive sheet so shaped and produced, and provided with strand loops at its ends, is a new article of manufacture and is an important part of the present invention.

At the opposite end of the drum adjacent the head 16, there is positioned a lever 40 having a central hub 41 fulcrumed on the shaft 10 and including diametrically extending arms 42, 43, the latter terminating adjacent the opening 26 and having associated with its end portion a hook or other projection 44 about which the other end loop 34 of the abrasive sheet may be engaged. The other arm 42 is apertured at 45 for the reception of the hooked end of a tension spring 46, having its other end connected to a hook or other projection 47 carried by the inner surface of the drum rim.

The upper end of the arm 43 is also provided with a laterally projecting lug or keeper 48 adapted to be engaged by the hooked end 49 of a latch 50 pivoted upon a pin 51 or the like carried by the machine casing 14. The latch is normally urged to the upwardly disposed inoperative position by a spring 52 having one end connected to the pin 51 and the other held between suitable projections 53.

As indicated in Figures 2–5, with one end of the abrasive sheet 29 held by the fixed projection 27, and the sheet wrapped spirally around the drum rim, the other end loop is engaged with the hook 44 (Fig. 3). The tension of spring 46 constantly urges the lever 40 and arm 43 in a clockwise direction (Fig. 3), thereby tending further to wind the sheet on the drum and to maintain the latter in a taut condition. When it is desired to relieve the tension for removal of a band or sheet, the hinged front casing section 55 may be swung upwardly, to give access to the latch 50 so that the latter may be manually depressed, to project the end 49 thereof downwardly into the opening 26 into engagement with the lug or keeper 48 or the arm 43. With the parts so engaged, the drum may be rotated in the clockwise direction, reverse to its normal direction of rotation, against the force of spring 46, to provide slack in the band. This reverse rotation may be readily effected by simply grasping the drum with one hand while the latch 50 is depressed to the operative position in engagement with the keeper 46 with the other, in which position the parts will remain because of the hooking engagement between the latch end 49 and the keeper, and the rotational force imparted by the spring 46. With the slack so provided, the band may be readily removed and a new one placed in position, with its end looped over the hook 44, whereupon the latch may be released and the slack immediately taken up by the relative forward rotation of the arm 43.

As indicated in Figure 9, the sanding machine may include a main frame 60, upon which an electric driving motor 61 is mounted. The lower casing 60a carries a pair of floor engaging rollers 62 on opposite sides and houses a centrifugal blower 63, provided with a discharge conduit 64, leading to a dust bag 65 or the like, supported by a handle bar 66 which also supports an electric cable 67 leading from a suitable outlet to the motor 61. The blower is connected by an inlet scroll 68 to the area of the sanding drum, as indicated in Figures 9 and 3. A belt guard 69, carried by the frame in any suitable manner encloses the belt 20, trained about the pulley 21 associated with the drum and about a pulley 70 fast on the motor shaft 71. The latter carries a second pulley 72 of larger diameter, connected by a belt 73 to a pulley 74 on the blower shaft.

A bracket 75, pivoted at 76 to the rear of the lower machine casing 60a is connected to a caster carriage 77, having a caster 78 swiveled therein and including an apertured flange 77', in which a vertically extending rod 79 is loosely received. The lower end of the rod 79 is loosely received in an aperture in the flange and connected thereto by a nut 80 and a spring 81.

The upper end of the rod 79 projects through an opening in a guiding flange 82 carried by the motor housing and is connected through an adjustable turnbuckle assembly 84 to a crank arm 85, fast on the lower end of a rock shaft 86 journalled in bearings 87 carried by the handle bar 66 and connected at its upper end to a rockable handle 88, horizontally aligned, when in its lowermost position, with the fixed handle 89 at the upper end of the handle bar 66.

When the movable handle 88 is depressed, the crank arm 85 is swung downwardly, thereby depressing the vertical rod 79 and lowering the caster assembly, by downward swinging movement of the pivoted bracket 75. This action brings the caster wheel 78 into engagement with the floor and lifts the rollers 62 from the floor.

Since the center of gravity of the entire machine is positioned only slightly forwardly of the rollers 62, this action will cause a major portion of the weight of the machine to be transferred to the sander drum, to apply maximum sanding pressure to the floor. By varying the vertical position of the caster 78, the distribution of weight between the caster, the rollers 62 and the sander drum may be nicely adjusted, to control the effective sanding pressure. When the caster is in its uppermost position, the crank arm 85 may be swung past dead center, and the machine tipped rearwardly so that its entire weight is supported by the rollers 62 and the caster 78, for transporting the machine, in inoperative position, from place to place.

It is thought that the structural features and mode of operation of the invention will be entirely clear from the foregoing description. It must be understood, however, that the invention is not limited to the details of construction shown and described, but includes all modifications coming within the scope of the appended claims and their equivalents.

I claim:

1. A sander drum for floor sanders and the like comprising a shaft journalled for rotation about its axis, a pair of spaced drum heads coaxial with and fast on the shaft, a circumferentially continuous, non-slotted cylindrical rim carried by the heads having fixed fastening means positioned adjacent one end thereof, for one end of a coated abrasive strip adapted to be wound on the rim, a lever fulcrumed intermediate its ends on said shaft axially beyond the head at the opposite end of the rim for rotation with the drum and for oscillation with respect thereto and having one end adjacent the last mentioned end of the rim and its other end spaced therefrom, fastening means for connecting the other end of the strip to the first mentioned end of the lever, and a tension spring interposed between the other end of the lever and the inner surface of the rim, axially beyond the adjacent head, tending to urge the lever in a direction to tighten the strip on the rim.

2. In a floor sander or the like, the combination of a casing having bearings associated therewith and a sander drum within the casing comprising a shaft journalled in said bearings, a pair of drum heads fixed to the shaft, a cylindrical rim carried by the drum heads, means for securing to the rim, one end of a flexible abra-

sive band wound around the rim, an arm pivoted on the shaft having a free end, means for attaching the other end of the band to said arm, resilient means urging the arm relative to the drum in a direction to tighten the band on the rim, and normally inoperative means carried by the casing, movable to engage the arm for movement of the drum relative thereto in a direction against the force of said resilient means to slacken the band on the rim to facilitate its release from the arm.

3. In a floor sander or the like, the combination of a casing having bearings associated therewith and a sander drum within the casing comprising a shaft journalled in said bearings, a pair of drum heads fixed to the shaft, a cylindrical rim carried by the drum heads having a recess at one end and an opening or notch adjacent its opposite end, means disposed in the recess for securing one end of a flexible abrasive band wound around the rim, an arm pivoted on the shaft having its free end adjacent the opening or notch, means for attaching the other end of the band to said arm, resilient means urging the arm relative to the drum in a direction to tighten the band on the rim, a latch pivoted to the casing at the end adjacent the opening, and means normally maintaining the latch in retracted position, said latch being manually movable into the opening to engage said arm, whereby the drum may be rotated relative to the arm against the force of said resilient means to slacken the band for removal and replacement of a band.

4. A sander drum for floor sanders and the like comprising a shaft, a pair of spaced drum heads mounted coaxially on the shaft, a cylindrical rim carried by the heads having a fixed projection at one end and an opening at the other, an arm pivoted to the shaft having a free end adjacent the opening and having a projection associated therewith, a diamond-shaped flexible coated abrasive sheet having the tips of its acute angle ends removed and flexible strand loops attached to said ends with eye portions thereof substantially disposed in the removed tip areas, one of said loops being hooked over the projection at the first end and the other being hooked over the projection on said arm with the sheet spirally wound around the drum, and a spring interposed between the arm and the drum tending to pivot the arm relative to the drum in a direction to tension the sheet on the drum.

5. As an article of manufacture, an abrasive sheet of rhomboid shape in plan, having the tips of its acute angle ends removed, a flexible loop at each end having the eye portion thereof substantially disposed in the removed tip area and the free ends lying upon the adjacent back surface of the abrasive sheet and adhesively united thereto.

6. As an article of manufacture, an abrasive sheet, of rhomboid shape in plan, having the tips of its acute angle ends removed, a flexible loop at each end having the eye portion thereof substantially disposed in the removed tip area and the free ends lying upon the adjacent back surface of the abrasive sheet, and a reinforcing layer of sheet material covering said ends and adhesively united thereto and to the adjacent surface of the sheet.

7. A sander drum for floor sanders and the like comprising a shaft journalled for rotation about its axis, a pair of spaced drum heads coaxial with and fast on the shaft, a cylindrical rim carried by the heads and projecting axially therebeyond, said rim having a recess in its outer surface adjacent one end thereof and an opening extending therethrough adjacent the other end beyond the drum head at the last mentioned end, fixed fastening means in the recess below the surface of the rim for one end of a coated abrasive strip adapted to be wound spirally on the rim, a lever fulcrumed on the shaft at the second mentioned end of the rim, inwardly thereof, in axially spaced relation to the adjacent drum head, said lever having diametric arms of substantially equal mass, with the end of one arm positioned in the opening in the rim, means carried by said end of the arm for connecting the same to the other end of such a coated abrasive strip, and a tension spring interposed between the end of the other arm and the inner surface of the rim axially beyond the adjacent drum head, tending to pivot the lever in a direction to tighten the strip on the rim.

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