April 19, 1938. H. L. MYERS 2,114,967

SURFACING MACHINE

Filed Sept. 19, 1936

Fig. 2.

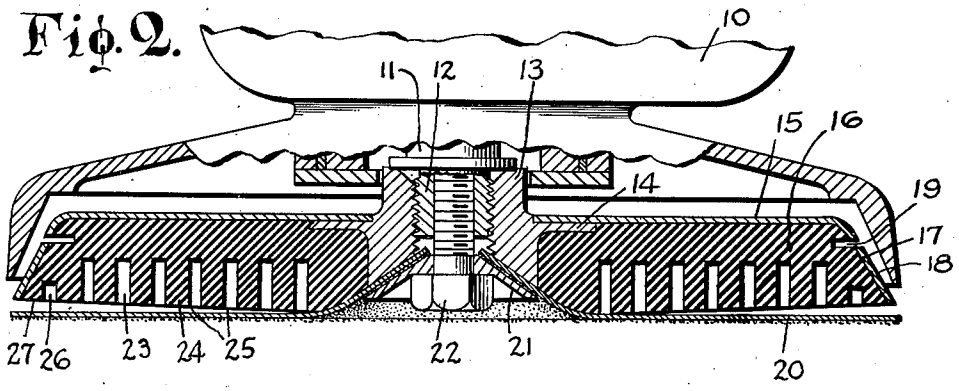
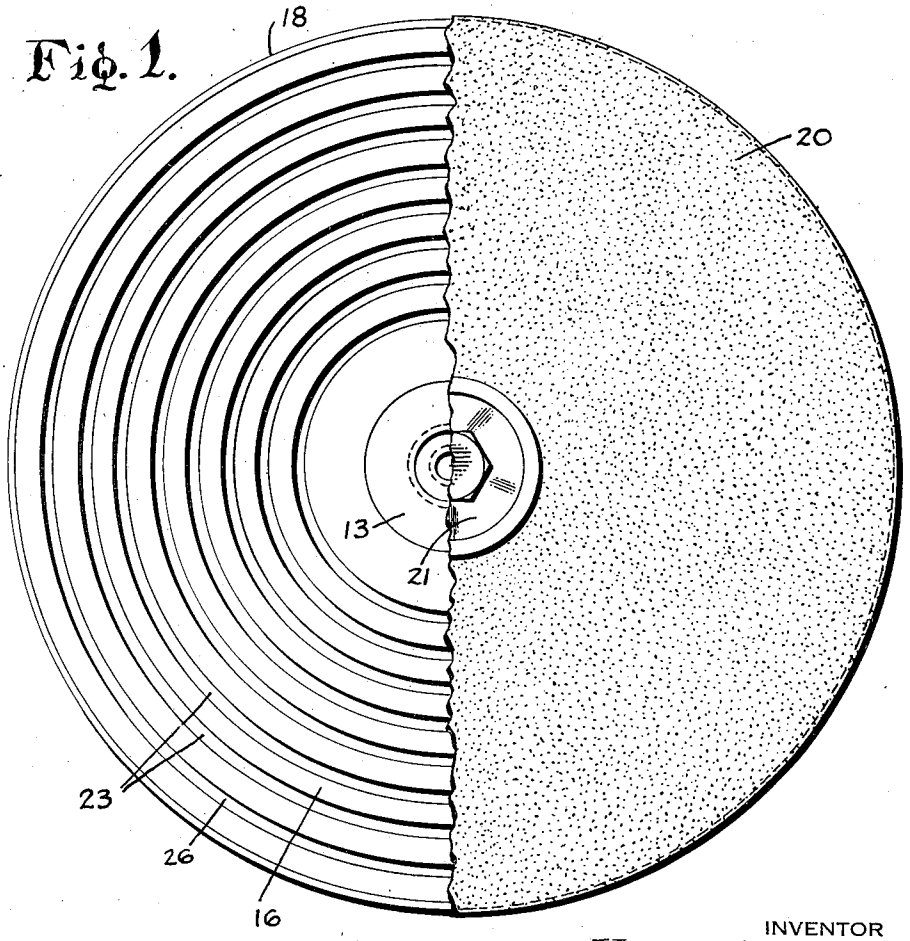


Fig. 1.



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SURFACING MACHINE

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5 Claims. (Cl. 51—197)

This invention relates to surface conditioning and finishing devices and more particularly to an improved surface finishing implement or element for such devices.

In floor finishing machines of the type shown in the Myers Patent No. 1,951,105, the motion of a shaft driven by an electric motor is transmitted to a driving head adapted to support and give motion to a removable and renewable abrading, rubbing or finishing member. In order to permit ready removal and attachment and not present any protuberances or obstructions to mar the work, the abrading or finishing member is locked or attached to the head preferably at its center and the machine is so formed as to present the abrading or finishing member to contact with the surface being treated within a restricted area at one side of said center and spaced therefrom.

As the reactive forces engendered by contact of the abrading or finishing member with the surface being treated are operating upon said abrading or finishing member at a point spaced from the point of attachment of the finishing member to the center of the head, and as for reasons of economy the replaceable abrading or finishing member is of relatively frangible material, and as there is a considerable amount of heat generated in the operation, a serious problem has been presented to provide a driving head that will effectively couple the power shaft to the finishing member, that will properly support the finishing member to the work and that will utilize the ordinarily destructive reactive forces to further the desired purposes.

I have achieved the desired objects by providing a resilient head constructed so as to be compressible to enable the abrading or finishing member to conform to the contour of the surface being operated upon and to distribute and maintain a predetermined desired pressure upon all portions of the surface of the work, said head being provided with means for dissipating heat generated in the abrading or rubbing action and provided with means for effectively and automatically locking the abrading or finishing member to the head at the point of contact with the work while the head is in work contacting motion and spaced from the normal central locking means, such means automatically releasing when operation has ceased to permit ready removal of the abrading or finishing member for replacement.

In the drawing:

Fig. 1 is a view of the improved device looking directly at the working surface thereof;

Fig. 2 is a cross sectional view taken substantially at right angles to Fig. 1.

In the particular embodiment disclosed, the principles of the invention have been incorporated in a power operated finishing or abrading device which has a motor driven rotatable shaft carrying at its end a substantially discoidal finishing or abrading member mounted for rotation with the shaft and having finishing or abrading material disposed upon its outer radial face. In the drawing, the numeral 10 indicates generally a casing or housing which may contain a driving motor for the device and 11 designates a rotatable shaft for carrying the improved finishing or abrading member and for transmitting rotary movement thereto from the motor or other driving device.

The shaft 11 has a reduced threaded portion 12 and a central hub member 13 of the finishing or abrading element is mounted thereon. The hub member 13 is provided with an outwardly and annularly extending flange 14 which carries and has affixed thereto a plate member 15 preferably of metal. The plate member 15 acts as a backing or support for a substantially circular body of rubber or other resilient material 16. In my preferred form of the invention, illustrated, the body of resilient material 16 flares outwardly and downwardly at its periphery, as at 17, and the plate member 15 partly follows this contour of the resilient body 16 at its periphery. A ring member 18 is positioned about the periphery of the resilient body 16 and cooperates with the plate member 15 to provide a backing or support for enclosing and maintaining the cushioning body 16 with just the proper degree of firmness and yet with sufficient flexibility to permit the device to adjust itself to irregularities and unevenness of surfaces being finished. The deformed peripheral edge of the plate member 15 is spaced from the member 18 and an annular groove 19 is provided in the resilient body 16 in registry with the space between these members. This construction permits slight relative movement between the parts 15 and 18 and increases the flexibility of the device.

In the disclosed embodiment I have shown the ring member 18 as extending down to the working face of body 16 to protect the body 16 from adventitious contact with obstructions upon the surface being treated, regardless of the height of the obstruction. Such obstructions frequently project only slightly from the surface being treated, as, for instance, heat registers on a floor, and in such cases guards of usual and known types are

ineffective to protect the resilient material against harmful contact with such obstructions.

The unenclosed or working surface of the resilient body 16 is shown in the present instance as carrying a sheet of abrading material 20, such as sand paper, emery cloth or the like, against its face and retained at its central portion by a conical clamping washer 21 which is held in place by a screw 22 which is threaded into the reduced end portion 12 of the shaft 11.

It will be noted that the sheet of abrading material 20 is fixed to the body 16 at its central portion and that in the normal operation of the device the outer regions of the sheet of abrading material must depend upon the friction between the back face of the sheet and the resilient body 16 for transmission of movement thereto and to prevent buckling or other action destructive to the sheet 20. Such buckling might have very serious consequences and might result in marring or mutilating the surface to be finished.

To insure proper gripping of the abradant sheet by the resilient body the latter is preferably provided with a series of spaced wall members, the spaces between the wall members defining grooves of suitable configuration and being utilized as heat conducting passages to dissipate heat from the working zone.

In the present form a series of concentric annular grooves 23 have been provided in the working face of the resilient body 16. These grooves 23 are preferably so formed that their depth is substantially greater than their width and provide sheet contacting portions 24 having edges 25. Lying outside the series of grooves 23 is a groove 26 providing a sheet contacting portion 27. Groove 26 is shallower than the grooves 23 and so proportioned that it compensates for the varying thickness of the member 16 adjacent its flaring periphery and provides a substantially uniform degree of resiliency across the entire working surface of the resilient body 16.

In its disclosed form the resilient body 16 is shown as being slightly conical. In this form the device is intended to be used with its axis of rotation slightly inclined with relation to a perpendicular from the surface to be treated. This inclination is sufficient to bring the surface to be treated in tangency with the conical face of the resilient body 16 on a line extending from the center of the member to its outer edge in one direction.

The proposed construction has been found to greatly increase the friction or traction between the resilient body 16 and the back face of the sheet of abrading material 20 and to substantially eliminate the possibility of relative surface movement therebetween when the working face of the sheet 20 is brought into moving contact with a surface it is desired to work upon even when only a slight pressure is present to urge the sheet 20 against the body 16. The groove and ridge construction in fact operates to momentarily lock the sheet of abrading material to the body in the area of contact with the work.

The grooves in the face of the resilient body 16 assist to a marked degree in ventilating or cooling the body 16 and the sheet 20 and maintain a more efficient temperature in the immediate region of operation by dissipating or carrying away the heat of friction which is necessarily generated in such operations, the annular grooves providing for immediate dissipation of heat to points relatively remote from the point of generation while the relatively great depth of the grooves greatly amplifies the heat absorbing and dissipating area of the resilient disk itself. The novel proportioning and configuration of the grooves have been found to result in a highly uniform degree of resilience of the body 16 throughout its extent.

While a single form of the device has been described and illustrated and while that form has been shown as associated with a machine or implement of a given type, it is to be understood I intend to in no way limit myself thereto or in any other way, except as defined in the appended claims.

I claim:

1. An abradant driving head for coupling and supporting a rotatable discoidal abrading or finishing member with a moving shaft, said head being vertically compressible and provided with alternate annular grooves and ridges of different radii upon its surface for contacting and frictionally gripping said abrading or finishing member.

2. An abradant driving head for coupling and supporting a rotatable discoidal abrading or finishing member with a moving shaft, said head being of resilient material, a relatively rigid backing for the resilient material, alternate annular grooves and ridges in the face of said resilient material for frictional engagement with said abrading or finishing member, and a comparatively rigid annulus supporting the sides of said resilient material, said annulus being spaced from said backing whereby portions of said resilient material may be compressed vertically.

3. An abradant driving head for coupling and supporting a rotatable discoidal abrading or finishing member with a moving shaft, said head being of resilient material, a relatively rigid backing for the resilient material, alternate annular grooves and ridges in the face of said resilient material for frictional engagement with said abrading or finishing member and a comparatively rigid annulus supporting the sides of said resilient material, said annulus being spaced from said backing whereby said resilient material may be compressed vertically and said annulus being coterminous with said resilient material at its face whereby the periphery of the resilient material is protected against harmful contact with obstruction upon or about the surface being treated.

4. An abradant driving head for coupling and supporting a rotatable discoidal abrading or finishing member with a moving shaft, said head being vertically compressible and provided with alternate annular grooves and ridges of different radii upon its surface for contacting and frictionally gripping said abrading or finishing member, the depth of said grooves being substantially greater than their width.

5. An abradant driving head for coupling and supporting a rotatable discoidal abrading or finishing member with a moving shaft, said head being of resilient material and having means for frictionally engaging said abrading or finishing member which includes spaced, elongated wall portions extending generally in the direction of rotation of said driving head, said wall portions being of a height substantially greater than their thickness.

HARRY L. MYERS.