May 15, 1934. V. J. ZACK 1,958,601

PORTABLE SANDING MACHINE

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Fig. 1.

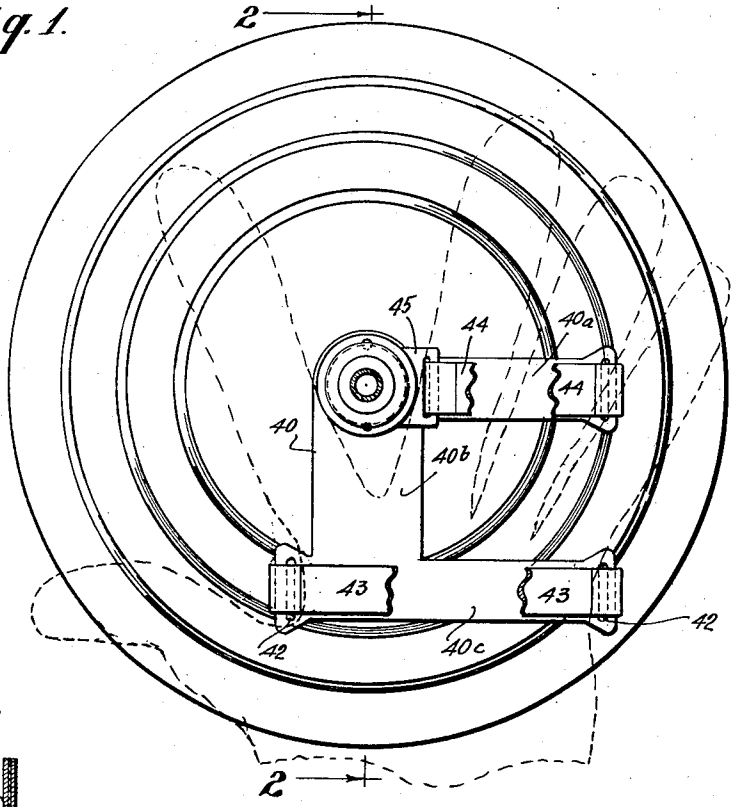
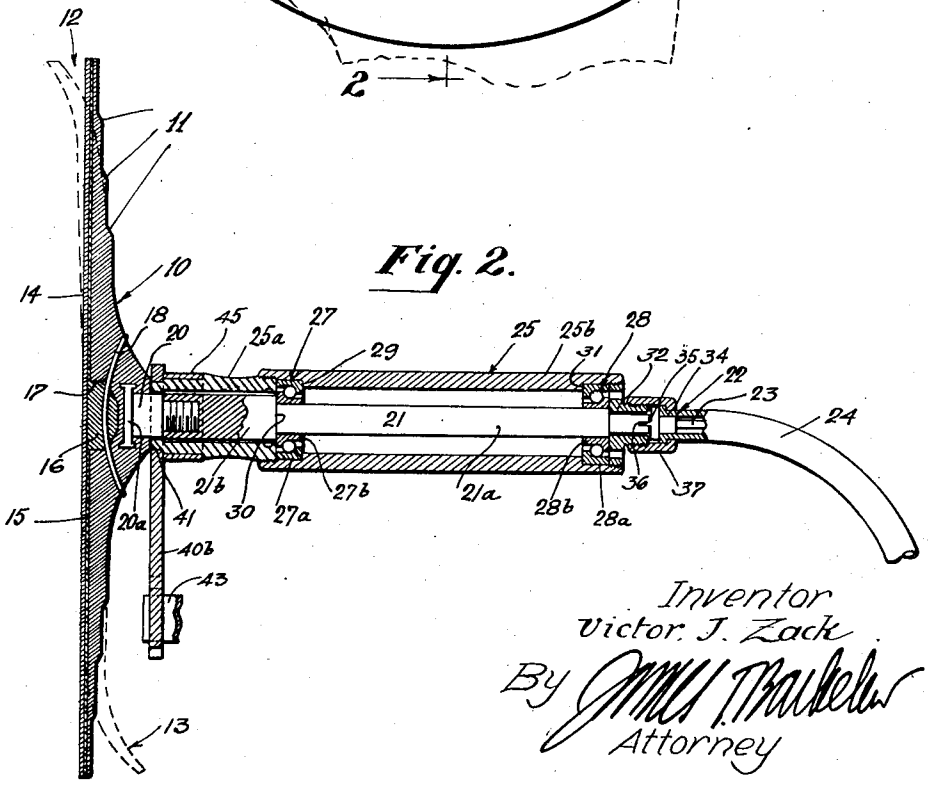


Fig. 2.



Inventor
Victor J. Zack
By James J. Maskell
Attorney

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PORTABLE SANDING MACHINE

Victor J. Zack, Los Angeles, Calif.

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7 Claims. (Cl. 51—170)

This invention has reference to rotary sanding devices for finishing or smoothing surfaces to which paints, fillers or the like have been applied. The invention may be further characterized as having to do more particularly with devices of this character that are especially suited for finishing surfaces of uneven or irregular contour, for example surfaces having depressions which ordinarily would not be reached using a flat surface sandpaper.

It is a general purpose of the invention to provide a rotary sanding device in which the sanding head or disk carrying the abrasive surface, is of such pliability as to enable it to be caused to conform with such irregular surfaces as ordinarily would not be entirely acted upon or reached by the usual rigid or non-pliant sanding head, having at best no substantial degree of pliability, heretofore used in rotary sanding devices of the present type. In accordance with the invention I provide a freely pliable head adapted to carry on its forward face an abrasive sanding surface, and having its back face exposed to permit pressure to be applied so as to selectively depress or deflect localized areas of the head. Due to the pliable characteristics of the head it may be caused to conform with surfaces having depressed areas or of otherwise uneven contour, as a result of pressure which the operator may apply in the manner stated. The operator ordinarily will wear a glove having heavy leather finger tips, and by pressing his fingers against selected points on the back of the head, he may readily cause the head to conform with a depression in the surface being sanded and existing at the point at which the localized pressure is applied.

Due to the fact that the head may be rotated at considerable speed, say from 100 to 300 R. P. M., the application of but a slight or gentle pressure to the head will suffice, by virtue of its free pliability and speed of rotation, to cause the abrasive surface to act effectively upon the surface being sanded. A particular advantage is gained by the invention in the sanding of surfaces to which such substances or certain paints or fillers have been applied, substances become easily overheated as a result of friction in the sanding operation. Using the present device, injury by overheating these substances is entirely obviated by virtue of the effective action of the device under the influence of such slight pressures as would at no time result in the development of friction to a degree such as to injure the substances being removed.

The above as well as additional objects and features of the invention will be further described in connection with the accompanying drawing illustrating a typical and preferred embodiment of the invention. In the drawing:

Fig. 1 is a plan view of the device looking at the back surface of the sanding head; and

Fig. 2 is a medial section on line 2—2 of Fig. 1 taken through the head and the drive shaft connection therewith.

In the drawing, numeral 10 indicates the circular or disk shaped sanding head which is adapted to be rotated by way of the drive connection hereinafter described. The head 10 may be formed of any suitable material of a flexible or pliable nature, typically leather or fabric and rubber composition. The head preferably will have such pliability as not only to permit comparatively large areas or portions thereof to become substantially deflected, but it also will have such pliability as to permit comparatively small areas to become selectively depressed as a result of pressure applied at localized points on the back surface of the head. Preferably the cross sectional thickness of the head will decrease radially outward as shown in Fig. 2, and while I have shown the back surface to be stepped at 11 in order to so decrease the thickness radially outward, it will be understood of course that if desired the back surface of the head may be given a smooth or gradual outward bevel. As shown in Fig. 2, the head will have such pliability as to enable it to be readily deflected in both directions, either forwardly as at 12, or in a reverse direction as at 13.

Sandpaper, emery or sand cloth, or the like, indicated at 14, may be applied to the forward surface of the head, and if desired the latter may be provided with a soft rubber coating at 15 in order that the sheet 14 of abrasive material will adhere more effectively to the head. The sand cloth may be cemented to the head, or if it is desired, it may be attached by inserting a rubber plug 16, integral with the sand cloth, within a central opening 17 in the head, and securing the plug therein by wire 18 passing through the central raised portion of the head and through the plug. In case this latter method of attachment is used, it may not be necessary to cement the sand cloth to the head because of the effective frictional engagement of the rear surface of the sand cloth by the rubber face 15.

The head is rotatably driven by a shaft connection with threaded stud 20 projecting axially from the back face of the head, and having its

inner flanged end 20*a* embedded in the central raised portion of the head, as shown. A rigid spindle or drive shaft 21 is screwed on the end of stud 20, the opposite end of this rigid section of the drive shaft being connected as at 22 to a flexible shaft 23 contained within the conduit 24. A sleeve assembly, generally indicated at 25, is placed about the shaft 21, the sleeve assembly preferably being made up in two sections comprising an end thrust sleeve 25*a*, adjacent the head, and a second sleeve 25*b* threadedly attached thereto. Shaft section 21*a* within sleeve 25*b* preferably is comparatively smaller in diameter than section 21*b* within sleeve 25*a*, the former being spaced sufficiently from its surrounding sleeve to enable the shaft to be journaled in ball bearings 27 and 28. The outer ball race ring 27*a* of bearing 27 is clamped between the end of thrust sleeve 25*a* and annular shoulder 29, and the inner race ring 27*b* is brought to bear against annular shoulder 30 between the shaft sections 21*a* and 21*b*. The outer ball race ring 28*a* of bearing 28 similarly is clamped between shoulder 31 and the end bushing 32, the inner ball race ring 28*b* bearing against the inner end of said bushing.

While any suitable form of connection may be provided between shaft 21 and the flexible shaft 23, I have shown as a typical form of connection, a head 34 carried on the end of the flexible shaft having a tongue 35 inserted within an end slot 36 in the shaft. Also as a typical means for connecting the flexible shaft conduit 24 with the sleeve assembly, I show a coupling 37 carried on the flanged end of the conduit and screwed on the end of bushing 32.

Mounted on the sleeve assembly is a hand rest 40, shown to be integrally attached to the inner sleeve section 25*a* by inserting the inner end of the sleeve within an opening 41 in the hand rest plate. Preferably the end of the sleeve will have a press fit within opening 41 so as to cause the plate 40 to be held integral with the sleeve. As shown in Fig. 1, plate 40 is shaped to provide radial arms 40*a*, 40*b*, and a right angle portion 40*c* at the end of arm 40*b*. The ends of portion 40*c* of the hand rest are provided with eyes 42 to permit attachment of a hand strap 43. A second hand strap 44 is similarly attached to the outer end of arm 40*a* and to a ring 45 placed about the inner end of the thrust sleeve 25*a*.

The device is carried in the operator's hand by inserting the fingers through the straps 43 and 44, and around the inner thrust sleeve, as shown by the dotted lines in Fig. 1. As will readily be seen, by virtue of the shape and comparatively small area of the hand rest, substantially the entire back surface of the head is exposed so as to enable the operator to apply pressure to any desired point thereon. Also since the hand rest is spaced from the back of the head, it will be seen that it is rendered freely flexible responsive to the pressures applied by the operator.

I claim:

1. In a sanding device of the character described, a pliable head adapted to carry on its forward face an abrasive sanding surface, the back face of said head being exposed to permit pressure to be applied thereto by hand, said head having such pliability as to be caused to conform with surfaces of uneven contour as a result of localized pressures applied to its said back face, means for rotating said head, and a hand rest at the back side of said head and adapted to be held stationary aginst rotation.

2. In a sanding device of the character described, a circular pliable head adapted to carry on its forward face an abrasive sanding surface, a rotatable shaft connected to said head and extending axially from the rear face thereof, said rear face of the head being substantially entirely exposed radially from said shaft, and said head having such pliability as to be caused to conform with surfaces of uneven contour as a result of localized pressures applied by hand to the back face thereof, and a hand rest mounted at the back side of said head and spaced therefrom.

3. In a sanding device of the character described, a pliable head adapted to carry on its forward face an abrasive sanding surface, the back face of said head being exposed to permit pressure to be applied thereto by hand, said head having such pliability as to be caused to conform with surfaces of uneven contour as a result of localized pressures applied to its said back face, a rotatable rigid shaft connected to said head and extending axially from the rear face thereof, and a sleeve placed about said shaft, adapted to be held stationary against rotation, and a hand rest mounted on said sleeve.

4. In a sanding device of the character described, a pliable head adapted to carry on its forward face an abrasive sanding surface, the back face of said head being exposed to permit pressure to be applied thereto by hand, said head having such pliability as to be caused to conform with surfaces of uneven contour as a result of localized pressures applied to its said back face, a stud having one end embedded in said head and projecting axially from the back face thereof, a rotatable shaft joined to said stud, a sleeve placed about said shaft and spaced therefrom, roller bearings between said sleeve and the shaft, and a hand seat mounted on said sleeve.

5. In a sanding machine of the character described, a pliable head having a forward abrading surface and having such pliability as to conform to surfaces of uneven contour as a result of localized pressure applied to the back of said head, and means to support an operator's hand adjacent the back of the head whereby localized pressure may be manually applied by the operator to the back of the head.

6. In a sanding machine of the character described, a pliable head having a forward abrading surface and having such pliability as to conform to surfaces of uneven contour as a result of localized pressure applied to the back of said head, and a hand grip adapted to be engaged by the operator's hand substantially in a plane parallel to said head.

7. In a sanding machine of the character described, a pliable head having a forward abrading surface and having such pliability as to conform to surfaces of uneven contour as a result of localized pressure applied to the back of said head, and a member encompassing the operator's hand in a plane substantially parallel to the head and leaving the operator's fingers free to apply localized pressure to the back face of the head.

VICTOR J. ZACK.