Aug. 22, 1961 H. L. GIANATASIO 2,996,851

ABRADING TOOLS

Filed Aug. 4, 1958

FIG. 1

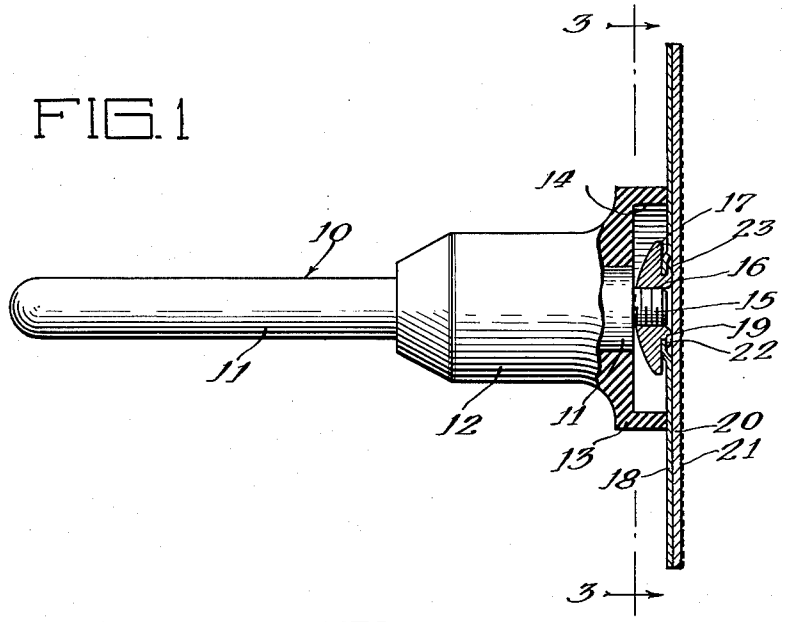


FIG. 2

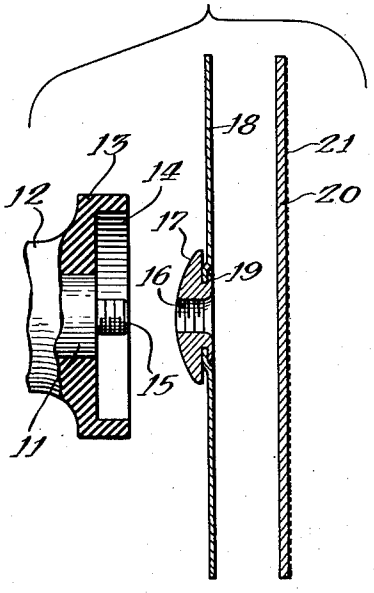
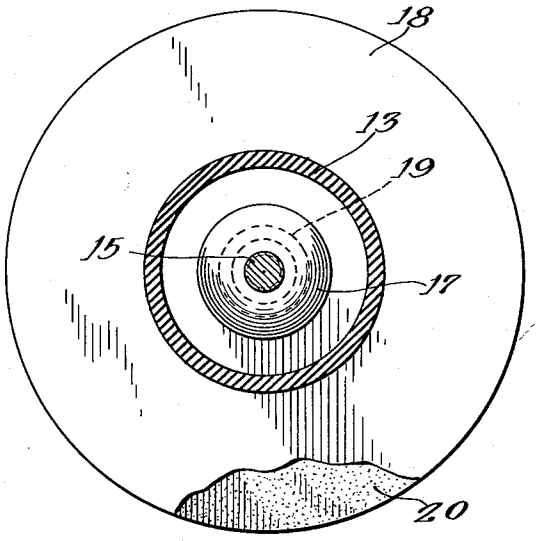


FIG. 3



Inventor:
Henry L. Gianatasio
By: Wallace and Cannon
Attorneys

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ABRADING TOOLS

Henry L. Gianatasio, Oak Park, Ill., assignor to Pres-On Abrasives, Inc., Addison, Ill., a corporation of Illinois

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This invention relates to abrading tools.

More specifically this invention relates to abrading tools of the type which employ an abrasive coated disc mounted on a rotatable arbor or shaft which is adapted to be attached to the chuck of a portable electric hand drill, or other source of power, for rotating the unit.

One of the problems experienced in the use of prior abrading tools of the character referred to above has been the fact that the rapid rotation of the abrasive coated disc in contact with the work, and the pressure exerted thereon, as an incident to the operation, and the heat of friction developed therein has tended to cause the abrasive coated disc to disintegrate under the heat and pressure incidental to the use thereof, particularly when it is necessary to press the abrasive-coated disc into contact with a curved surface of the work, as is frequently necessary in using such abrading tools on metal castings, and the like.

Accordingly, an object of the present invention is to provide a new and improved abrading tool which in use overcomes the above mentioned and other difficulties experienced in the use of prior abrading tools of a comparable character.

Another object of the invention is to provide a new and improved abrading tool which embodies an abrasive coated disc having a flexible metallic backing disc arranged in back thereof and which provides a yieldable backing support for the abrasive coated disc and enables the abrasive coated disc to be bent or curved into contact with a curved work surface while, at the same time, affording a backing support for the abrasive coated disc which prevents the same from being disintegrated under the pressure applied in the use of such an abrading tool and the heat developed incidental to such pressure.

Other objects will appear hereinafter.

In the drawings, FIG. 1 is an elevation view, partly in section, showing a preferred embodiment of the present invention; FIG. 2 is an exploded fragmentary sectional view showing the parts of the new abrading tool; and FIG. 3 is a view on line 3—3 in FIG. 1, partly in section and partly in elevation.

A preferred embodiment of the present invention is illustrated in the drawing, wherein it is generally indicated at 10, and comprises a relatively small cylindrical metal shaft or arbor 11 having an enlarged rubber head or mandrel 12 mounted thereon at one end thereof, the mandrel 12 being substantially larger in diameter than the shaft 11, and the shaft being designed to be inserted in the chuck of a portable electric hand drill, or like source of power.

The rubber mandrel 12 has an enlarged annular flange 13 at its forward end and this flange 13 forms or provides a cylindrical cup 14 which is open at its forward end.

The shaft 11 has a reduced screw threaded front end extension 15 which is aranged centrally within the cup 14 provided by the annular flange 13.

The new abrading tool includes a flexible, relatively, thin metal backing disc 18, which may be made of suitable metal stock, and this metal backing disc 18 is attached to the threaded front end portion of the shaft 11 by a formed rivet having the body 17 which has a centrally located threaded bore 16 therein and which includes a short neck portion terminating in a clamping

flange 19. The metal backing disc 18 is attached to the rivet body 17 over a centrally arranged annular offset portion 22 of the backing disc 18 which defines a central opening 23 in the metal backing disc 18.

The new abrading tool is completed by an abrasive coated disc 20 which is adhesively attached at its rear surface to the front surface of the metal backing 18.

In assembling the new abrading tool the central opening 23 is formed in the metal backing disc 18, and the clamping flange portion 19 of the neck of the rivet body 17 is swedged around and into the recess formed by the offset portion of the metal of the metal backing 18 which defines the central opening 23 therein so as to complete the attachment of the metal backing disc 18 to the rivet body 17. The abrasive coated disc 20 may then be adhesively attached to the front surface of the metal backing disc back 18, by means of any suitable adhesive, and the metal backing disc 18 and attached abrasive coated disc 20 may then be mounted on the shaft 11 by threading the threaded end portion 15 of the shaft 11 into the internally threaded bore 16 in the rivet body 17.

When the parts are thus arranged, the rivet body 17 lies within the cup 14 formed by the annular flange 13 on the mandrel 12 and the metal backing disc 18 is supported and backed up in its central area by engagement of the rear surface of the metal backing disc 18 with front edge portion of the flange 13, thereby providing a yieldable backing support for the metal backing disc 18 and attached abrasive coated disc 20. Also it will be seen that by the provision of the offset portion 22 of the plate 18, which portion is substantially parallel with the plate, there is formed a recess which receives the clamping flange 19 and the outer surface of the clamping flange lies in the plane of the surface of the flexible backing disc 18 to which the abrasive coated disc 20 is secured. Accordingly, the abrasive coated disc lies in one plane throughout its entire working surface and is supported throughout by the opposing surface of the resilient backing disc.

In the use of the new abrading tool the shaft 11 may be attached to the chuck of an electric hand drill, or the like, and when the abrasive coated outer surface 21 of the abrasive coated disc 20 is rotated in contact with the work, the metal backing disc 18, and the abrasive coated disc 20, may be bent or deformed by manual pressure applied to the tool to enable the abrasive coated disc 21 to conform to the rough or curved surface of the work, such as a metal casting while, at the same time, the metal backing disc 18 yieldably urges the abrasive coated disc 20 against and into contact with the work, thus providing a flexible backing support for the abrasive coated disc 20 and preventing the same from being disintegrated under the pressure applied thereto in use and the heat of friction incidental to such pressure.

It will thus be seen from the foregoing description, considered in conjunction with the accompanying drawing, that the present invention provides a new and improved abrading tool, having the desirable advantages and characteristics, and accomplishing its intended objects, including those herein appointed out, and others which are inherent in the invention.

I claim:

An abrading tool comprising a shaft having one end for connection with a source of rotary power and having a reduced axial and threaded extension at its other end, a body of resilient material secured to and surrounding the said other end of the shaft, said body including an axially directed flange forming a cup of relatively large inside diameter as compared to the outside diameter of the shaft, a rivet having a body portion formed

with a threaded central bore and removably threaded on said extension and a reduced neck portion terminating in a lateral clamping flange, the rivet body portion and neck being entirely within the cup, a resilient backing disc having a central opening defined by a marginal portion offset from and lying in a plane parallel with one side face of the disc, said neck portion of the rivet extending through said disc opening and said flange lying in the depressed side of said marginal offset portion, the side of the clamping flange remote from the body portion of the rivet being coplanar with the surface of the backing disc remote from said cup, the cup having a flat rim surface bearing upon the adjacent back surface of the backing disc, and an abrasive coated disc secured to and covering the front surface of the backing disc and rivet.

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