

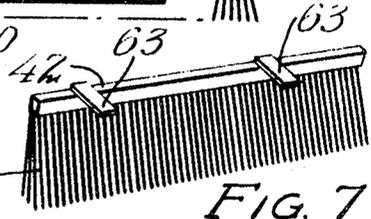
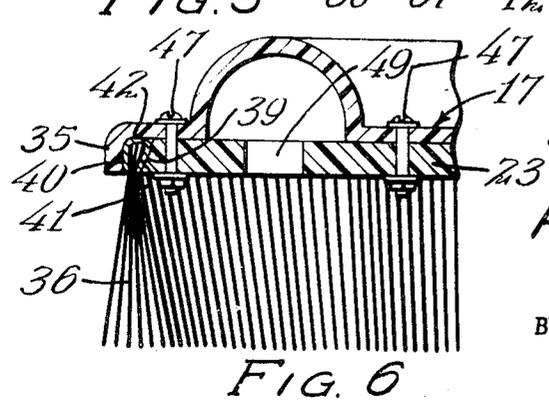
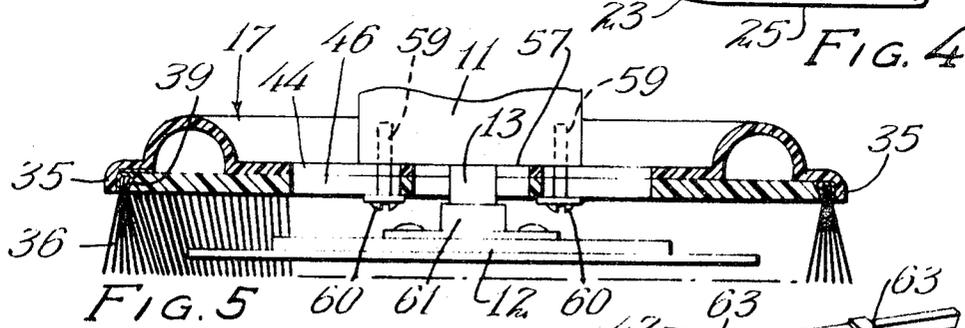
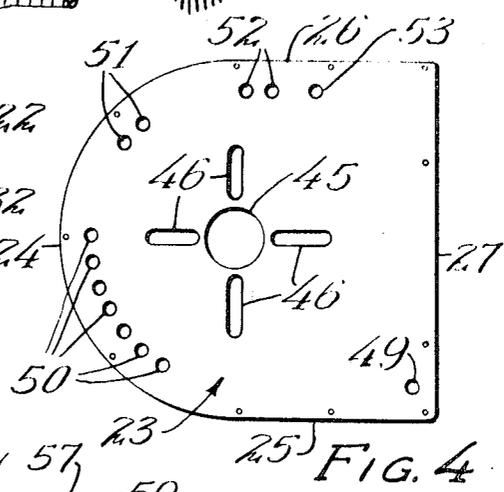
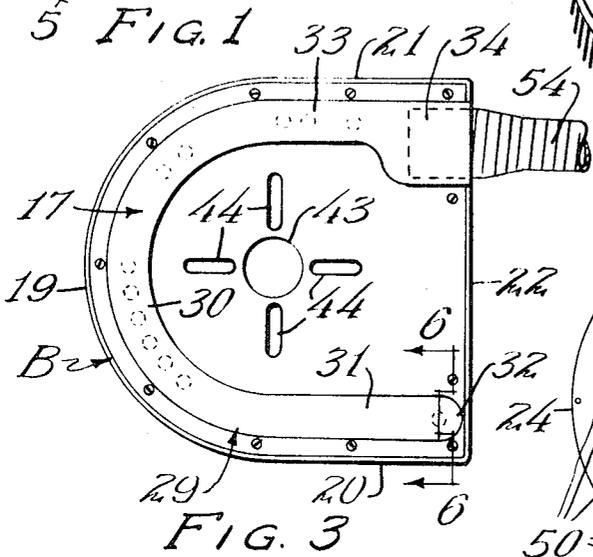
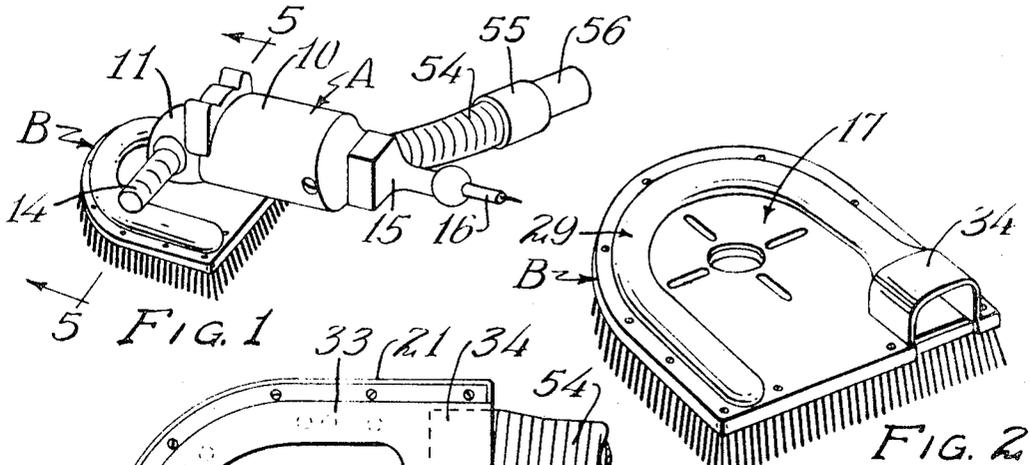
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DUST COLLECTOR FOR GRINDERS

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8 Claims

ABSTRACT OF THE DISCLOSURE

The dust collector includes a transparent body adapted to overlie a grinding disc the shaft of the grinder extending through the body. A wall of bristles encloses the grinding disc which allows air to pass but which inhibits the passage of dust. A generally U-shaped manifold is built into the body, and has a closed end and an open end to which a vacuum hose may be attached. Apertures which are spaced longitudinally of the manifold connect the interior of the manifold with the portion of the body within the bristle wall.

This invention relates to an improvement in dust collector for grinders and deals particularly with a means of collecting the dust and other particles which are caused by a grinding operation.

Considerable dust and dirt is created by the operation of grinding surfaces by portable grinders. For example, in the repair of automobile fenders and other portions of the body, the indentations in the surface are usually filled with a metal and the surface is then carefully ground down to the level of the surrounding surface. This operation is slow and creates an extremely dusty atmosphere. As a result, in garages which specialize in body repair, the areas in which the cars are painted must be completely segregated from the areas in which the grinding operations take place to prevent the impurities in the air from adhering to the newly painted surface. Furthermore, the operators of the grinding apparatus are usually required to wear masks to prevent the inhalation of the foreign particles. This is often objectionable to the workers.

I have found that by providing a suitable enclosure encircling the grinding disk, and by attaching the enclosure to a source of partial vacuum, virtually all of the dust and dirt can be collected. This is accomplished by means of a housing including a plate overlying the grinding disk and bearing a manifold. This manifold is connected by a flexible tubular conduit to a vacuum cleaner or similar source of vacuum. As the surface is ground away, the dust and dirt circulating in the air are collected and drawn away into a suitable receptacle.

One of the major problems involved in a device of this type lies in the fact that the surfaces which are being ground are not flat surfaces. For example, in grinding the surface of a fender or quarter section of a vehicle, the grinding disk is constantly traveling over a convex surface. In order to compensate for this difficulty and to provide a seal between the housing and the surface being ground, I provide a peripheral wall of flexible material such as a thick wall of bristles. While a wall of this type is not completely impervious, it provides a sufficiently tight seal so that the source of vacuum supply is able to withdraw the dust particles.

A further feature of the present invention resides in the provision of a device of the type described which is adaptable to fit most grinders in common use. In some instances, the housing is bolted directly to the fixed portion of the grinder housing encircling the driven shaft. In other cases, the housing is provided with suitable brackets which may be attached to the sides of the housing in order to provide a suitable connection between the two.

One of the objections to the use of dust collecting housings has been in the fact that the operator normally has difficulty in viewing the surface being ground during the operation. With this in mind, the body of the housing has been formed of transparent material such as transparent plastic. As a result, the surface may be seen virtually as well as if the housing were not present.

A further feature of the present invention resides in the specific construction of the device. Preferably the housing is made of a flat sheet of plastic and a shaped upper member overlying the flat sheet and secured in face contact therewith. The upper portion of the housing is shaped to provide a generally U-shaped manifold which terminates in a socket designed to accommodate the end of a flexible resilient tube designed for connection with the vacuum cleaner hose. Holes are drilled in the flat bottom sheet of the housing to provide communication between the U-shaped manifold and the interior of the housing. These apertures are mainly located near the rounded end of the U-shaped manifold as this arrangement of openings has proven most effective in the collection of the dust particles.

These and other objects and novel features of the present invention will be more clearly and fully set forth in the following specification and claims.

In the drawings forming a part of the specification:

FIGURE 1 is a perspective view of the dust collector attached to a grinder.

FIGURE 2 is a perspective view of the dust collector removed from the grinder.

FIGURE 3 is a top plan view of the dust collector.

FIGURE 4 is a top plan view of the bottom plate of the housing.

FIGURE 5 is a sectional view through the housing, the position of the section being indicated by the line 5—5 of FIGURE 1.

FIGURE 6 is a vertical sectional view substantially on the line 6—6 of FIGURE 3.

FIGURE 7 is a perspective view of a part of the flexible wall.

FIGURE 1 illustrates the general assembly including a disk grinder or sander which is indicated in general by the letter A, and the dust collecting attachment which is indicated in general by the letter B. In general, the sander A includes a cylindrical motor housing 10 having a gear housing 11 at one end designed to drive the grinding disk 12 on a shaft 13 which is at right angles to the motor shaft, the motor shaft not being illustrated. A handle 14 projects laterally from one side of the gear housing 11, and a second handle 15 extends rearwardly from the motor housing 10. The electrical cord 16 extends through the handle 15 and to a suitable source of current supply.

The assembly dust collector attachment appears as indicated in FIGURES 2 and 3 of the drawings. The housing B includes an upper body portion 17 which is of generally U-shaped outline, having a rounded end 19 which is generally concentric with the shaft of the shaft 13 of the grinder when the two are attached, parallel sides 20 and 21 and a square end 22 which is generally at right angles to the sides 20 and 21. The housing also includes a bottom plate 23 which is best illustrated in FIGURE 4 of the drawings. The bottom plate 23, like the upper body portion 17 includes a rounded end 24, parallel sides 25 and 26, and a square end 27. The rounded ends 19 and 24 are substantially semi-circular, and the parallel sides 25 and 26 extend as tangents from the rounded end 24.

The upper body portion 17 is provided with an air duct which is of substantially semi-circular cross-section, the duct being indicated in general by the numeral 29. The air duct generally follows the contour of the rounded end 19 and the sides 20 and 21, and includes a curved end

portion 30 which merges into a straight end portion 31 spaced inwardly from the edge 20. The end 31 of the duct 29 terminates in a closed end wall 32. The rounded end portion 30 of the duct also merges into a short straight section 33 which is spaced inwardly from the edge 21 of the upper body portion 17. The short end portion 33 blends into an enlarged open end portion 34 which is designed for connection with a suitable flexible adapter which will be described.

In order to maintain the upper body portion and bottom plate 23 in proper registry, the upper body portion 17 is provided with a marginal downturn lip 35 which serves as a retainer for a pair of bristle strips 36 and 37. As is best indicated in FIGURE 6 of the drawings, the marginal edge 39 of the bottom plate 23 is beveled upwardly and inwardly so as to provide a groove between the lip 35 and the wall 39 of generally trapezoidal cross-section. In other words, the base of the groove which is along the undersurface of the upper body portion 17 is wider than the entrance to the groove. The bristle strips 36 and 37 are held clamped between the sides 40 and 41 of a metal channel 42 which holds the bristles in place. The sides 40 and 41 of the channel 42 incline toward one another to hold the bristles tightly clamped at their upper ends.

The bristle strip 36 is of generally U-shaped form and follows the contour of the rounded end 19 and adjoining straight sides 20 and 21 of the upper body portion 17. The bristle strip 37 extends across the end 22 of the upper body portion, and is similarly engaged between the downturned marginal lip 35 and the marginal edge 39 of the bottom plate.

The upper portion 17 is provided with a shaft-receiving aperture 43 extending therethrough in coaxial relation to the rounded edge 19 of this member. The upper body portion 17 also preferably includes four radially extending slots 44 which are ninety degrees (90°) apart.

The bottom plate 23 is similarly provided with a shaft-receiving aperture 45 and radially extending right angularly arranged slots 46. When the body portion 17 is mounted upon the bottom plate 23, the apertures 43 and 45 are in registry, as are also the slots 44 and 46.

As is indicated in FIGURES 1, 2, 3, and 6 of the drawings, the undersurface of the body portion 17 is secured with its undersurface in face contact with the upper surface of the bottom plate 23 by means of bolts 47 or other fastening means. The fastening means 47 are preferably detachable to permit disassembly of the structure for replacing the bristle strips 36 and 37.

As indicated in FIGURE 4 of the drawings, the bottom plate 23 is provided with a series of apertures therethrough communicating with the air duct 29 and through which air and dust may be drawn from the area confined by the bristle strips 36 and 37. As indicated in FIGURE 4, as a preferred arrangement of apertures, one aperture 49 extends through the bottom plate adjoining the closed end 32 of the air duct. A series of seven (7) angularly spaced apertures are provided in angularly spaced relation about the center of the curved end of the body extending from approximately the center of the curved end through an angle of about sixty degrees (60°). A pair of apertures 51 are centered approximately forty-five degrees (45°) from the last of a series of holes 50 toward the side 26 of the bottom plate. A pair of spaced apertures 52 are provided parallel to the straight side 26 and a final aperture 53 is spaced from the apertures 52 a distance slightly greater than the distance between the apertures 52. All of the apertures described are substantially centered between the sides of the substantially semi-circular duct 29.

Obviously there may be variations in the arrangement of the various apertures and the number thereof. However, the particular arrangement illustrated was arrived at after considerable experimental work and seems to be more effective than any other arrangement. The numeral

54 comprises a cylindrical flexible tube of plastic or similar material having its end flexed into substantially oval form and frictionally engaged in the outlet end 34 of the conduit 29. The free end of the tube 54 is provided with a frictional coupling including a large diameter end 55 encircling the tube end of the tube 54 and a smaller diameter end 56 designed for connection with a flexible hose connected to a vacuum cleaner or similar blower. In view of the fact that such devices are well known in the art, they are not illustrated in the drawing.

As indicated in FIGURE 5, the gear housing 11 of the particular grinder or sander A is provided with a flat end 57 provided with parallel threaded sockets 59 designed to accommodate attaching bolts 60 extending through the slots 44, 46 of the body portion of the bottom plate. Other forms of grinders or sanders are provided with stationary sleeves which may accommodate collars or brackets for attaching the sander to the dust collector attachment. Means are provided for attaching each style of grinder to the attachment, this being simplified by the fact that there are a relatively few types of grinders which are in common use.

As also indicated in FIGURE 5, the grinding wheel is provided with a suitable hub 61 for attachment to the driven shaft 13. As will also be noted, the face of the grinding wheel or disk 12 is spaced above the level of the free end of the bristle strips 36 and 37 so that the bristles may flex when the grinding disk is in engagement with the surface to be ground. Due to the fact that the dust collector body and bottom plate are made out of transparent material, the operator is afforded a clear view of the surface being operated upon at all times during the operation.

FIGURE 7, as well as the left side of FIGURE 5, shows an alternate manner of securing the brush in place. As indicated, short flat arms or clips 63 may be secured to the base of the channel 42 at intervals, and may be clamped between the bottom plate 23 and the upper body portion 17 when the two parts are secured together. These arms or clips 63 may be eliminated if the channel 42 is snugly accommodated between the bottom plate 23 and the lip 35.

In accordance with the patent office statutes, I have described the principles of construction and operation of my improvement in dust collector for grinders and while I have endeavored to set forth the best embodiment thereof, I desire to have it understood that changes may be made within the scope of the following claims without departing from the spirit of my invention.

I claim:

1. A dust collector in combination with a portable grinder having a rotatable abrasive disc, and the like including:

a body portion overlying the abrasive disc substantially parallel thereto,

an air duct in said body portion of generally U-shaped form and having a closed end and an open end, and said body portion having a series of apertures spaced longitudinally of said air duct and providing communication between the side of the body nearest the abrasive disc and said air duct,

a peripheral wall of flexible bristles attached to said body portion encircling said abrasive disc and extending beyond the plane of said disc, said open end of said duct being adapted to accommodate a flexible suction hose.

2. The structure of claim 1 and in which said body portion is generally U-shaped in outline having a rounded end and a square end.

3. The structure of claim 1 and in which said body portion includes an upper portion shaped to provide said air duct, and a bottom plate secured in face contact therewith and including the said apertures.

4. The structure of claim 3 and in which said peripheral wall is clamped between the marginal edge of said

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base plate and a peripheral flange on said upper portion.

5. The structure of claim 1 and in which said body portion is transparent.

6. A dust shield adapted for use with a portable grinder having a driven shaft supporting a grinder disc and including:

a body portion of transparent material adapted to be secured to said grinder encircling said shaft and generally parallel to said disc,

an air duct incorporated in said body portion and extending about the major portion of the periphery thereof,

said air duct having a closed end and an open end adapted for attachment with a suction hose,

said body portion having a series of apertures there-through spaced longitudinally of said air duct and providing communication between said air duct and the side of said body most closely adjacent said disc when said body portion is attached to said grinder and

a flexible resilient sealing wall peripherally attached to said body and adapted to encircle said grinding disc when attached thereto.

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7. The structure of claim 6 and in which said body portion is generally U-shaped in outline, and in which said air duct is U-shaped to fit the contour of said body portion.

8. The structure of claim 6 and in which said duct is substantially semi-circular in cross-section.

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