Sept. 22, 1936. I. FLEMING 2,054,932

DUST COLLECTING APPARATUS

Filed April 3, 1935

Fig. 1.

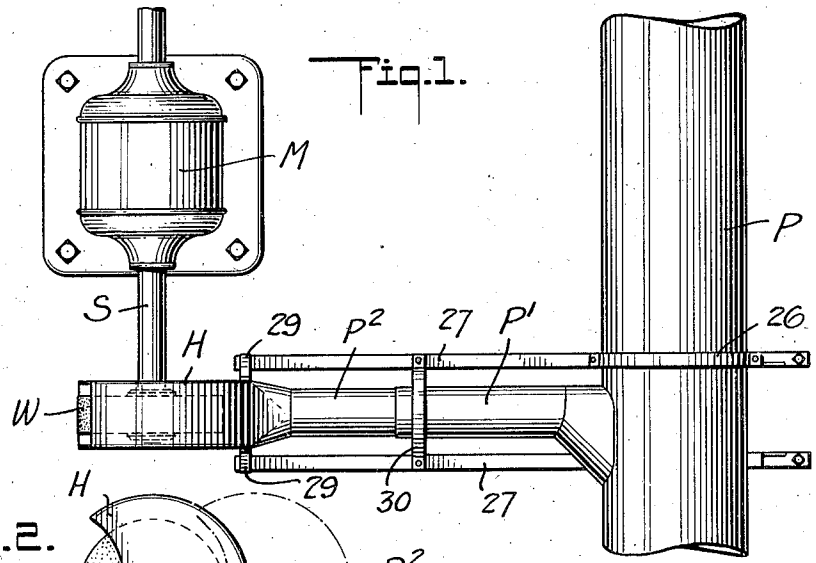
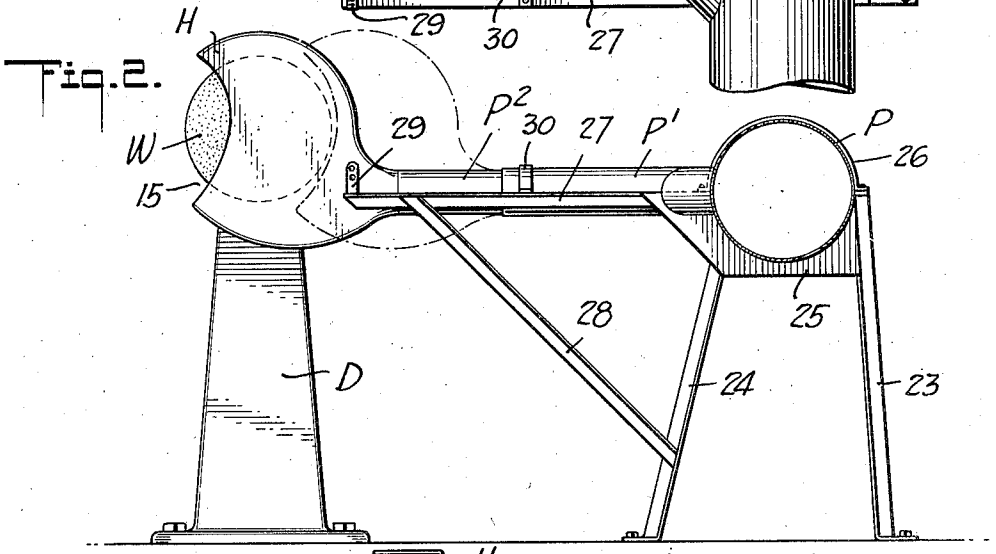


Fig. 2.



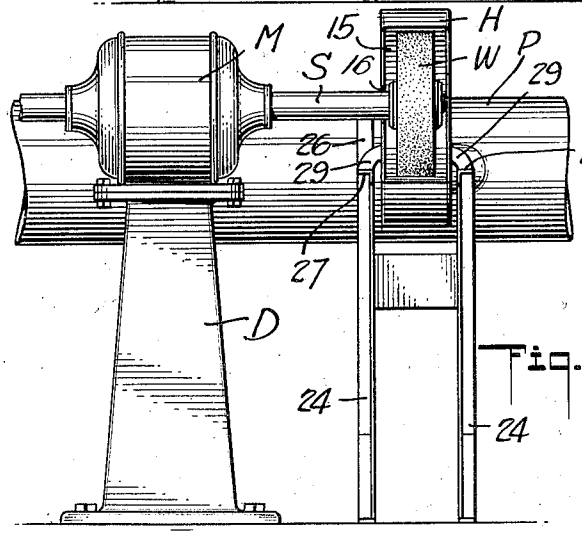
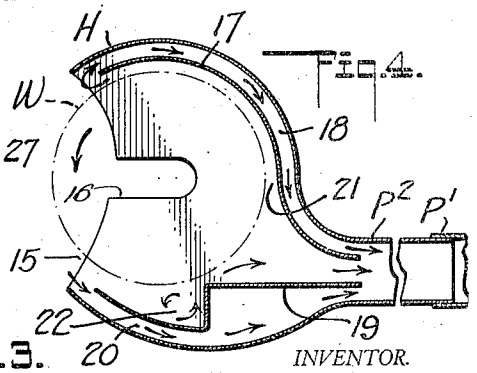


Fig. 3.

Fig. 4.



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DUST COLLECTING APPARATUS

Isaac Fleming, Los Angeles, Calif.

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3 Claims. (Cl. 51—273)

My invention relates to dust collecting apparatus and it has particular reference, although not necessarily, to apparatus for collecting metal dust as produced by the grinding or polishing of metal articles with the motor driven wheel.

It is a purpose of my invention to provide a dust collecting apparatus which is characterized by a suction head that functions to produce in association with a grinding or polishing wheel, a plurality of air currents so correlated to the wheel as to collect all metal particles removed from the metal work by the wheel and particularly the finer metal particles known as dust which float in the air to be inhaled by and which are so injurious to the operator.

It is also a purpose of my invention to provide in a dust collecting apparatus a suction head supporting means of simple construction by which a suction head is supportable in various positions of adjustment with relation to a grinding or polishing wheel to expose various portions of such wheel for the purpose of permitting work of various shapes and sizes to be applied to the wheel in grinding, cutting or polishing thereof. Further, the hood supporting means allows such adjustment thereof as to expose and thus render accessible the entire wheel and to thereby allow the ready removal thereof for substitution of another wheel when and as required.

I will describe only one form of dust collecting apparatus embodying my invention, and will then point out the novel features thereof in claims.

In the accompanying drawing:

Fig. 1 is a view showing in top plan one form of dust collecting apparatus embodying my invention.

Fig. 2 is a view showing the same apparatus in side elevation.

Fig. 3 is a view showing the same apparatus in front elevation.

Fig. 4 is an enlarged vertical sectional view of a hood embodied in the apparatus shown in the preceding views.

Referring specifically to the drawing, my invention in its present embodiment comprises, a hood H, adapted to partly house a wheel W, the latter being removably secured to one end of a shaft S rotatable by a motor M supported in elevated position by a standard D. The wheel W may be a grinding, polishing, or any other form of wheel by which the surface of metal work is adapted to be treated, as will be understood.

As shown in Figs. 1 and 3, the motor shaft S extends completely through and to opposite sides of the motor, such a showing being for the purpose of indicating that the motor M and the wheel W are one of a number of such elements which constitute in the aggregate a bank or gang of such elements, it being understood that in practice the metal working wheels, as well as the dust collecting hoods, are used in multiples with one hood for each wheel. Of course, my invention is not limited or restricted in any manner to the multiple use of the dust collecting hood.

The foregoing explanation renders understandable the illustration of a main suction pipe P which is adapted to be connected to a suction fan (not shown) so that the latter produces therein, the requisite suction of air for the hood H. Extending from and communicating with the main pipe P is a branch pipe P^1, one of such pipes for each hood H where the dust collecting apparatus is made up of a plurality of units, with one unit for each of the wheels W.

The pipe P^1 communicates with a relatively short length of pipe P^2 formed integral with the hood H, and the two pipes are connected one to the other in the manner best illustrated in Fig. 4 so that the pipe P^2 telescopes within the pipe P^1 to permit adjustment of the hood H toward and away from the wheel W and yet maintain a connection between the hood and the pipe P^1 so that the suction produced in the main pipe P will function to cause air to flow inwardly through the hood.

As illustrated in Fig. 4, the hood H, in its present embodiment, comprises a hollow body of substantially circular form. The body is provided with an opening 15 spaced substantially diametrically from the pipe P^2, and which opening has a portion extending peripherally of the body and other portions at the sides of the body. Extending inwardly from one side portion of the opening is a slot 16 designed for the purpose of receiving the shaft S and permitting horizontal adjustment of the hood. Fixed within the hood H is an upper partition 17 spaced in parallelism with the upper wall of the hood to define an intervening upper passage 18 through which air is adapted to flow.

The upper or forward end of the partition 17 terminates rearwardly or short of the upper end of the opening 15 to provide an inlet end at the upper end of the opening into which air is adapted to enter the passage 18. The lower or rear end of the partition extends through the pipe P^2 to provide an air outlet end for the passage 18 which merges into the bore of the pipe P^2. Thus, it will be seen that the passage 18 communicates with the pipe P^2 so that when air is caused to

flow inwardly through the pipe P^2, the air is also caused to flow inwardly through the passage 18.

Within the hood H is fixed a lower partition 19 which spans the side walls of the hood and is spaced from the bottom wall thereof to provide an intervening lower passage 20. Similarly, the forward or outer end of the partition terminates rearwardly of the lower end of the opening 15 and at the periphery of the body, to form an inlet end for the passage 20. The inner end of the partition 19 extends into the pipe P^2 and terminates at a point corresponding to the inner end of the partition 17 to provide an outlet end for the passage 20 which is in direct communication with the interior of the pipe P^2. Thus, it will be seen that when air is caused to flow inwardly through the pipe P^2, air is also caused to flow inwardly through the passage 20.

The partitions 17 and 19 coact to form an intermediate passage 21 of an area to receive the wheel W and to allow for the necessary adjustment of the hood with respect to the wheel without the periphery of the latter contacting with the partitions. The opening 15 constitutes the inlet end of the passage 21, while the space between the inner ends of the partition 17 and 19 constitute the outlet end of such passage, and as will be understood, air is caused to flow inwardly through this intermediate passage when a suction is produced within the pipe P^2.

For the purpose of preventing particles of metal removed from the metal work by the wheel from passing into the pipe P^2 and ultimately entering the bearings of the suction fan, the partition 19 is bent, as shown in Fig. 4, to provide a pocket or trap 22 in which the vertical portion thereof functions as an abutment or baffle to intercept the metal particles in their travel through the lower portion of the intermediate passage 21.

The main suction pipe P is supported in horizontal position by a frame consisting of rear uprights 23 and forward uprights 24. These uprights are connected at their upper ends by metal webs 25 shaped at their upper edges to receive the pipe P. One of these webs is shaped to accommodate the widened portion of the pipe P^2 where it is connected to the pipe P, as clearly shown in Fig. 2. For fixedly securing the pipe P on the webs, a yoke 26 is bolted or otherwise secured to the upper end of one rear upright 23 and to one of a pair of horizontal rails 27 which extend forwardly from the webs 25 to be rigidly supported in horizontal position by diagonally disposed rails 28.

The rails 27 are spaced apart to accommodate the pipes P^1 and P^2, as well as the hood H, and these elements are supported on the rails by means of a pair of arms 29 secured to and extending laterally from opposite sides of the hood H. These arms repose on the upper surfaces of the rails 27 so as to be slidable thereon and thus permit horizontal adjustment of the hood with respect to the wheel, the pipe P^2 telescoping within the pipe P^1 during such adjustment. To brace the pipe P^1 against any tendency to move upwardly, a yoke 30 is secured to the rails 27, as illustrated in Fig. 1.

In practise, the hood H in its association with the wheel W, houses the latter in such manner as to expose a portion of its periphery as well as parts of the sides thereof. The amount of such portions of the wheel W exposed in the opening is, of course, dependent upon the adjustment of the hood horizontally on the support, and it will be understood that the amount exposed is dependent upon what portions of the wheel it is desired to gain access to in order that the various parts of a particular piece of metal work can be applied to the periphery or sides of the wheel in effecting polish, grinding, or buffing of the work.

In the operation of the apparatus, let it be assumed that the wheel W is rotating in a counter-clockwise direction as when viewed in Fig. 4, so that that portion of the wheel exposed in the opening 15 is moving downward. With the suction fan operating to produce a flow of air inwardly through the hood H, there will be produced in the intermediate passage 21 a current of air which passes inwardly of the opening 15 and around the wheel W to suck into the pipe P^2, a part of the metal dust as removed from the metal applied to the wheel. The heavier metal particles will be deposited in the trap 22, as has been described.

Similarly, in the passages 18 and 20 other currents of air are produced, but because of the fact that these passages are relatively narrow, the air is caused to travel therethrough at relatively high velocities, and these high velocities are utilized in the following manner:

The passages having their inlet ends situated at the circumferential extremities of the opening 15, there is produced at these points suctions of relatively great intensity which function to collect and draw into the passages all metal dust rising and falling from the wheel not collected by the air traversing the intermediate passage 21. Thus, irrespective of the wheel's direction of rotation and the resultant resistance offered by such rotation to collection of the metal dust, the air currents induced in the passages 18 and 20 operate to effectively collect that metal dust which is so injurious to an operator.

Although I have herein shown and described a dust collecting apparatus in association with a machine used for the abrasion of metal articles, it is to be understood that my apparatus can be used in association with wood working machines or any other machine which generates injurious dust.

I claim:

1. In combination; a dust collecting hood for wheels, having an opening therein adapted to expose a portion of a wheel within the hood; a suction pipe connected to said hood at a point spaced from said opening; and means for so supporting said hood and said pipe for movement as to expose greater or less portions of said wheel, said means comprising horizontal rails spaced to receive said hood and pipe therebetween, and arms fixed to said hood and slidable on said rails.

2. A combination as embodied in claim 1 wherein a yoke is secured to said rails to overlie said pipe and thus prevent upward movement thereof between the rails.

3. A dust collecting hood for wheels, comprising; a hollow body having a rear wall formed with an opening adapted for connection to a suction pipe; and a partition in the body spaced from the bottom wall thereof to define an air passage below the partition communicating with said opening, and having a part disposed transversely of its length to form a dust trap within the body above the passage.

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