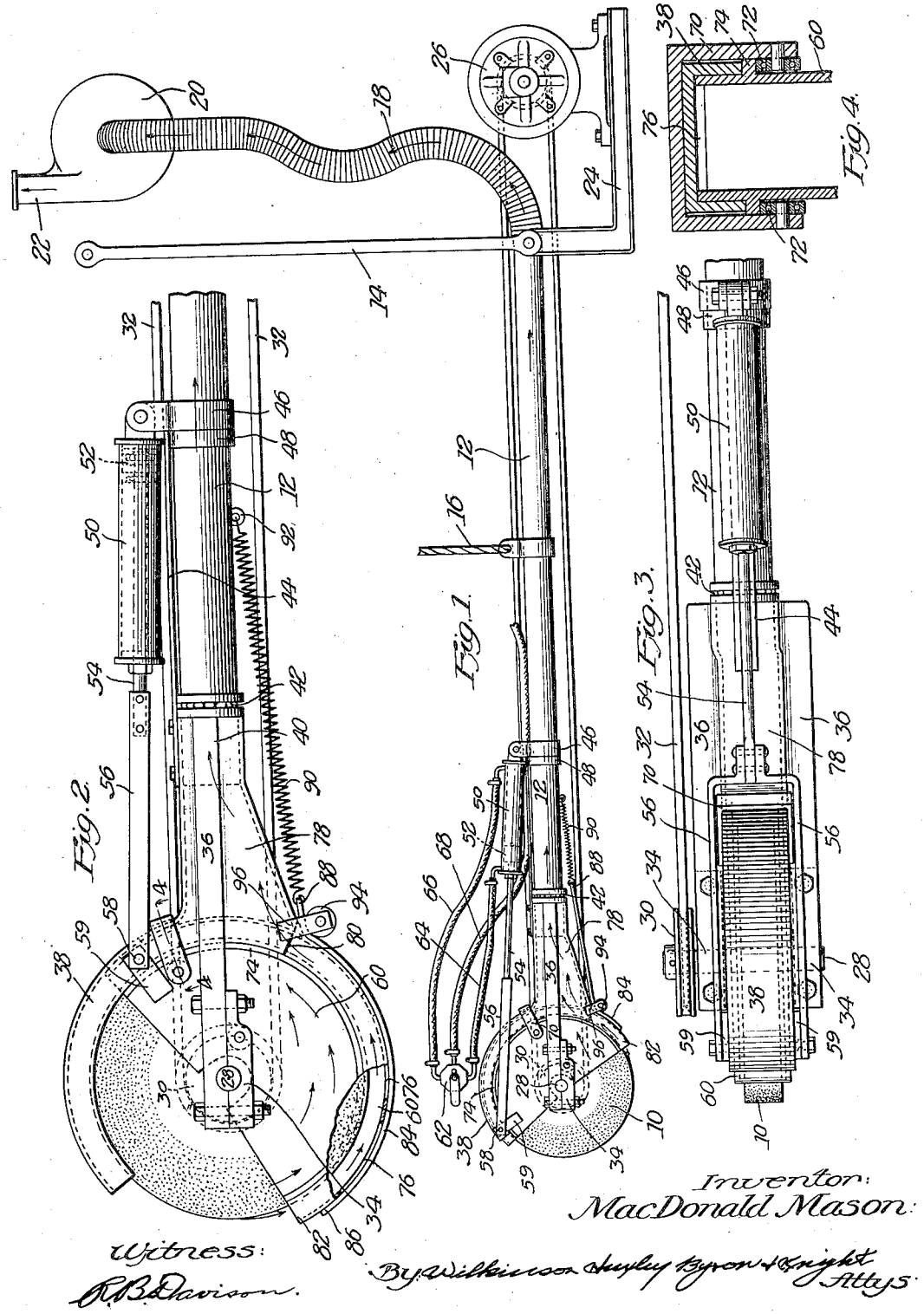
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MOVABLE GUARD FOR SWING FRAME GRINDERS

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MOVABLE GUARD FOR SWING FRAME GRINDERS

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This invention relates to improvements in a movable guard for a grinding wheel and more particularly a movable guard constituting the suction hood of a swing frame grinding wheel.

It is highly important for the safety of the workman that some means be provided for removal of the dust produced by the operation of a grinding wheel. This is a comparatively simple problem when the grinding wheel is mounted in a fixed position, the part being worked upon being held in position by a machine or by the workman. However the present disclosure is concerned with the problem of efficient dust removal for grinding wheels which are movably supported for manipulation by the workman into contact with the work.

It is an object of the present invention to provide a movable guard for a suspended or freely movable grinding wheel whereby the guard may be adjusted to the most efficient position for collection of the dust, dependent upon the point at which the grinding wheel is contacting the work; thus the grinding wheel may be used for surface grinding or side face grinding and the movable guard may be correspondingly adjusted.

It is further an object of the present invention to provide a guard for a grinding wheel comprising a stationary outer guard member and an inner rotatable guard member, the inner member having openings therein for the passage of the air drawn out by a dust collecting system, means being provided for covering such openings which might otherwise be exposed and destroy the efficiency of the device as the inner guard is rotatably adjusted in its position to take care of the different conditions under which the grinding wheel may be used.

Further objects and advantages of my invention will be more readily apparent from the following description taken in connection with the attached drawing in which—

Figure 1 is a side elevation of the structure;

Figure 2 is an enlarged detail side elevation showing the movable guard in a different position from that of Figure 1;

Figure 3 is a partial plan view of the structure, and

Figure 4 is a detail section on the plane indicated 4—4 in Figure 2.

The grinding wheel 10 is mounted upon a pipe support 12, which is suspended at one end by a swinging link 14 and is normally held in position by the provision of a counter-balance (not shown) connected to the pipe support 12 by rope 16. The pipe support 12 has connected thereto a flexible metal hose 18 which at its other end is connected to the suction fan 20, having an outlet 22 leading to the usual dust collector. The pipe support 12 has fastened thereto a bracket 24 for supporting the driving motor 26. The grinding wheel is mounted on a stub shaft 28, the inner end of which has secured thereto a pulley 30 driven from the motor by the belt 32. The stub shaft 28 for the grinding wheel is journaled in bearings 34 of a grinding head comprising a yoke portion 36 and an outer guard portion 38 which together are rotatably supported on the pipe support 12 as at 40. Ball bearing 42 provides for easy turning movement of the grinding head with respect to the pipe support 12.

The grinding head is held against axial displacement by the provision of a bar 44, connected at one end to the outer guard 38 and at the other end to a bracket 46 rotatably mounted on the pipe support 12 adjacent a stop band 48 fixed to the pipe support 12. The bracket 46 constitutes the mounting for one end of an air cylinder 50 having a piston 52 therein, the piston rod 54 being connected to a yoke 56. The yoke 56 is connected at 58 to brackets 59 on the inner guard 60 which is rotatably mounted with respect to the inner guard 38.

The valve 62 is a four-way air valve for control of the air cylinder 50 and for shifting in position the inner guard 60 with respect to the outer guard 38. The hose connections 64 and 66 lead to opposite ends of the air cylinder 50 and the hose 68 is connected to a suitable source of air pressure. It will be understood that the valve 62 should be suitably mounted on the grinding head in a convenient position for operation by the workman who is manipulating the grinding wheel.

The inner guard is held in proper concentric position with respect to the outer guard 38 by provision of a bracket 70 carrying rollers 72 which bear against the flanges 74 on the inner guard 60. The bracket 70 may be attached to the outer guard 38 by any suitable means.

The inner guard is provided with a plurality of openings 76 so that whatever the position of the inner guard, certain of said openings will be in position to allow passage of air through the housing portion 78 of the outer guard into the pipe support 12 and towards the suction fan. Since the lower edge of the outer guard terminates at 80 and the forward edge 82 of the inner guard is movable to position materially spaced from the edge 80, it is necessary to provide some means for covering up the openings 76 which would otherwise be exposed. I have provided a flexible steel strip 84 connected at 86 to one end

of the inner guard 60 and at the other end 88 to a spring 90 fastened at 92 to the pipe support 12. The flexible strip 84 is guided and held against the inner guard 60 by a roller 94 rotatably carried by a bracket 96 which is fastened to the outer guard.

The direction of rotation of the grinding wheel and the direction of movement of the air are indicated by arrows in Figures 1 and 2. In Figure 1 the guard 60 is in position for surface grinding in which case the stream of sparks and dust from the grinding wheel are directed approximately horizontally towards the edge 82 of the inner guard and the dust and stream of sparks will pass within the guard and the dust will be drawn off by the dust-collecting system. On the other hand, when the grinding wheel is used for side face grinding, the stream of sparks from the grinding wheel will pass downwardly and the guard 60 will be positioned as shown in Figure 2. As the operator moves the grinding wheel from time to time so that the work contacts the grinding wheel at relatively different positions, the operator by control of the valve 62 will cause movement of the inner guard 60 so as to bring it into proper position for efficient collection of the sparks and dust.

I claim:

1. In a grinding device, a rotatable grinding wheel, a support for said wheel, a dust-collecting system for removal of dust during operation of said grinding wheel, a guard member mounted on said support for rotation about the axis of said wheel and controlling the entrance to said dust-collecting system, means for moving said guard member with respect to said support to different positions dependent upon the point at which the grinding wheel is contacting the work and manually operable valve means for controlling the operation of said means.

2. In a grinding device, a rotatable grinding wheel, a support for said wheel, a dust-collecting system for removal of dust during operation of said grinding wheel, a guard member mounted on said support for rotation about the axis of said wheel and controlling the entrance to said dust-collecting system and pneumatic means for moving said guard member with respect to said support to different positions dependent upon the point at which the grinding wheel is contacting the work.

3. In a grinding device, a rotatable grinding wheel, a support for said wheel, a dust-collecting system for removal of dust during operation of said grinding wheel, a guard member mounted on said support for rotation about the axis of said wheel and controlling the entrance to said dust-collecting system and pneumatic means for moving said guard in either direction with respect to said support and a valve for controlling the operation of said pneumatic means.

4. In a grinding device, a rotatable grinding wheel, a support for said wheel forming a stationary guard about a portion of said wheel, a dust-collecting system for the removal of dust during operation of said wheel through said support, a movable guard member for said wheel carried by said support for rotation about the axis of said wheel, said guard member having a plurality of openings in the periphery thereof adapted to permit the passage of air through said support to said dust-collecting system at any position of adjustment of said movable guard and means for closing the openings which are beyond said support as the movable guard is rotated with respect to said support.

5. In a grinding device, a rotatable grinding wheel, a support for said wheel forming a stationary guard about a portion of said wheel, a dust-collecting system for the removal of dust during operation of said wheel through said support, a movable guard member for said wheel carried by said support for rotation about the axis of said wheel, said guard member having a plurality of openings in the periphery thereof adapted to permit the passage of air through said support to said dust-collecting system at any position of adjustment of said movable guard and means for closing the openings which are beyond said support as the movable guard is rotated with respect to said support, said last-named means comprising a flexible strap connected at one end to the edge of said movable guard which is adjacent the work and resilient means extending between the other end of said strap and said support.

6. In a grinding device, a rotatable grinding wheel, a support for said wheel forming a stationary guard about a portion of said wheel, a dust-collecting system for the removal of dust during operation of said wheel through said support, a movable guard member for said wheel carried by said support for rotation about the axis of said wheel, said guard member having a plurality of openings in the periphery thereof adapted to permit the passage of air through said support to said dust-collecting system at any position of adjustment of said movable guard and means for closing the openings which are beyond said support as the movable guard is rotated with respect to said support, said last-named means comprising a flexible strap connected at one end to the edge of said movable guard which is adjacent the work, resilient means extending between the other end of said strap and said support and a guide roller guided by said support engaging said strap to cause said strap to lie closely against the periphery of said movable guard as said movable guard is rotated.

7. In a grinding device, a rotatable grinding wheel, a grinding head supporting said grinding wheel for rotation, a tubular support carrying said grinding head, a dust-collecting system connected to said tubular support, said grinding head having a passage extending therethrough from said grinding wheel to said tubular support for the passage of air to said dust-collecting system, a guard member for said grinding wheel movably carried by said grinding head for rotation about the axis of said wheel, means for moving said guard to bring one edge of said guard closely adjacent the work with which the grinding wheel is brought into contact, said guard having an annular portion concentric with the axis of said wheel provided with a plurality of openings therein, whereby at least one of said openings is in communication with the passage through said grinding head in any position of adjustment of said guard, a flexible strap connected at one end to the annular portion of said guard adjacent the edge of said guard which is moved adjacent the work, resilient means for holding said strap under tension and a guide roller carried by said movable head engaging said strap to cause said strap to lie closely adjacent the annular portion of said guard and cover the openings in said guard which are outside of said support.

8. In a grinding device, a rotatable grinding wheel, a support for said wheel, a sector-shaped

stationary guard member extending about a portion of the periphery of the wheel, a hood member supported within said guard member for rotation about the axis of said wheel, a dust-collecting system for the removal of dust during operation of said wheel, said guard member having a passage leading to said dust-collecting system and said passage having an entrance opening adjacent said hood member, said hood member having a perforate area materially larger than said entrance opening, whereby a portion of said perforate area is in cooperating relation with said entrance opening at any position of rotative adjustment of said hood for the removal of dust from said hood through said guard member to said dust-collecting system, said perforate area extending beyond said guard member at certain positions of adjustment of said hood and means for preventing the entrance of air into said hood through any portion of said perforate area which may be positioned beyond said guard member.

9. In a grinding device, a rotatable grinding wheel, a support for said wheel, a sector-shaped stationary guard extending about a portion of the periphery of said wheel, said wheel being free to contact the work at any point throughout its exposed periphery, a hood member enclosing a portion of the wheel mounted in and supported by said guard member for rotative adjustment about the axis of said wheel, dependent upon the point at which the wheel is contacting the work, whereby one edge of said hood may be brought close to the work, a dust-collecting system for the removal of dust during operation of said wheel, said guard member having a passageway leading to said dust collecting system and said passageway having an entrance opening adjacent said hood member, said hood member having a perforate area through which the air and dust from said hood may pass into said passageway at any position of adjustment of said hood with respect to said guard, said perforate area which extends beyond said entrance opening being closed and covered on one side thereof by said guard member and means on the other side of said entrance opening for closing the perforate area of said hood which extends beyond said guard member, whereby substantially all of the air and dust is caused to pass into said hood adjacent the edge of said hood which is close to the point of contact between the wheel and the work.

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