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ABRASIVE THROWING MACHINE

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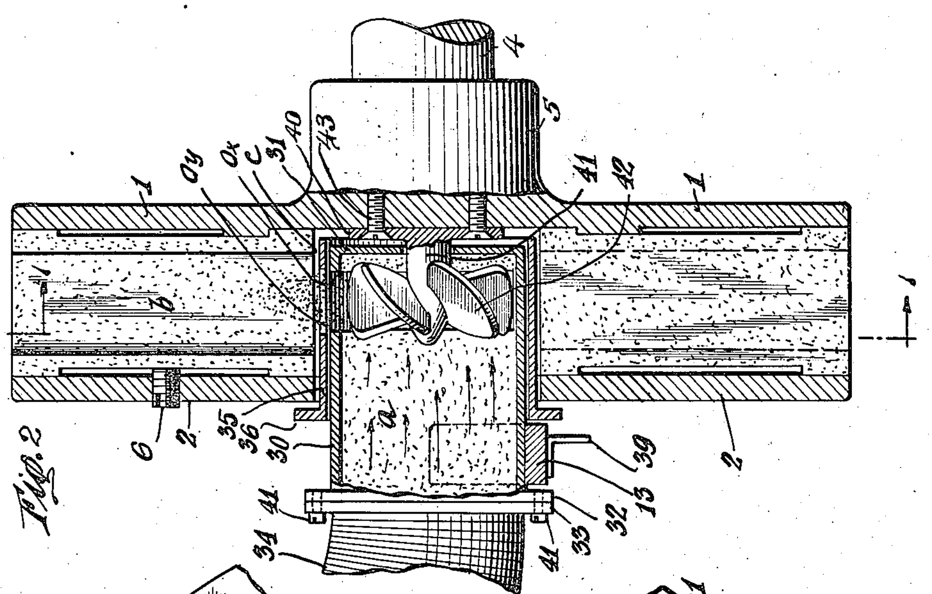

Fig. 2

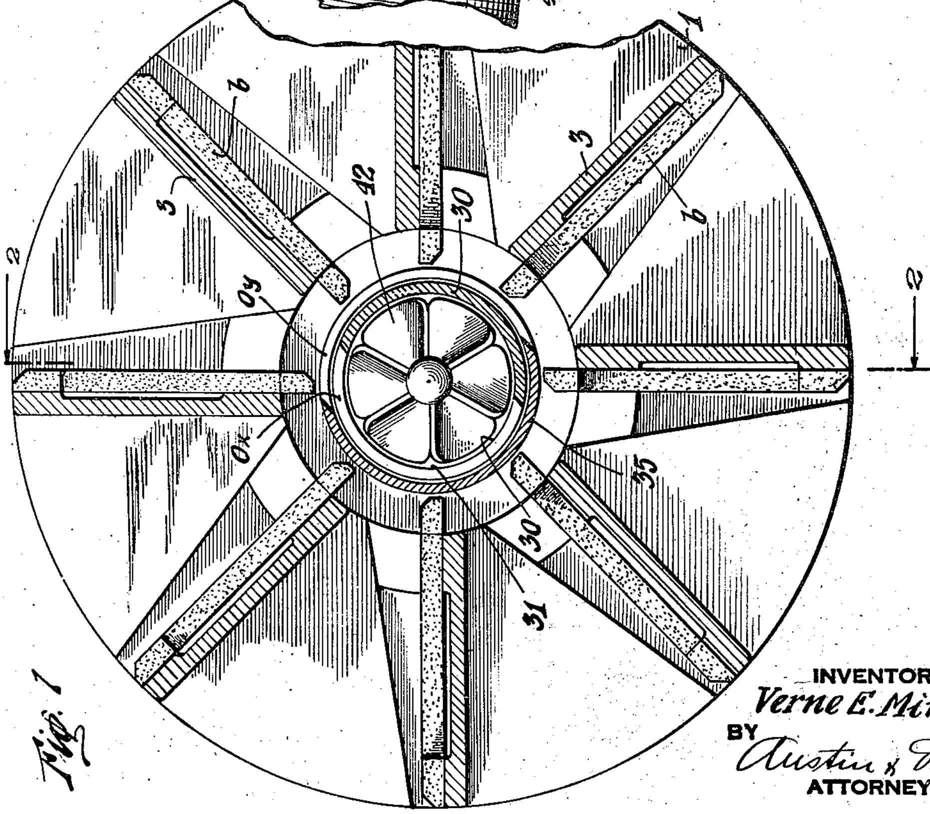

Fig. 1

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ABRASIVE THROWING MACHINE

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2 Claims. (Cl. 51—9)

This invention relates to abrasive throwing machines and more particularly to apparatus for directing abrasive thrown by the machine.

This invention comprehends the provision of devices adapted to be associated with an abrasive throwing machine whereby the abrasive thrown may be controlled particularly as respects the direction of flight, the area covered by the thrown abrasive, and intensity of impingement. The machine generally comprises spaced rotatably mounted side wall members having removable and replaceable throwing blades arranged therebetween. The blades are preferably shaped to contain the abrasive entirely within the area of the blades and out of contact with the permanent parts of the machine. The blades preferably extend short of the center of the machine so as to provide a central chamber into which abrasive feeding means is inserted. The feeding means includes a tubular member having one or more discharge openings in the side wall thereof operative to direct the abrasive substantially radially across the inner ends of the blades. An adjustable sleeve surrounds and encloses the tubular member and is also provided with a discharge opening in the side wall thereof. The tubular member and sleeve are so arranged that the openings therein may be brought into various degrees of alignment so as to vary the size of the discharge area and also direct the abrasive discharged to impinge the desired work area. The discharge openings may be so arranged that two or more separated surfaces may be cleaned simultaneously. The abrasive may be conveyed to the machine through a suitable feed pipe through which abrasive is moved either by gravity, air blast, screw conveyor or other means. A fan impeller may be used to assist in directing the abrasive into the path of the moving blades. The impeller is provided with vanes arranged on a bias and may be separately driven or connected to one of the side wall members so as to rotate therewith.

The direction toward which the abrasive is thrown from the machine is determined by the position at which abrasive is fed into the path of the rotating blades. By adjusting the position of the discharge opening of the feed sleeve, abrasive may be thrown in any desired direction. The length of the path swept by the thrown abrasive is determined by the peripheral length of the discharge opening, which is regulated by the adjustable sleeve above described.

The intensity of abrasive impingement against the work is determined by the peripheral length of the discharge opening and the volume of abrasive fed into the machine. Consequently, if the peripheral length of the discharge opening is increased, the volume of abrasive fed into the machine must be proportionately increased to obtain the same or greater intensity of impingement.

The invention consists in certain new and original features of construction and combination of parts hereinafter set forth and claimed.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claims appended hereto, the invention itself, as to its objects and advantages, and the manner in which it may be carried out, may be better understood by referring to the following description taken in connection with the accompanying drawing forming a part thereof, in which

Fig. 1 is a longitudinal cross-sectional view of an abrasive throwing machine having abrasive control means of further modified construction associated therewith, this view being taken on line 1—1 of Fig. 2;

Fig. 2 is a transverse cross-sectional view of the machine and modified abrasive control means shown in Fig. 1, this view being taken on line 2—2 of Fig. 1.

Similar reference characters refer to similar parts throughout several views of the drawing and specification.

Referring to the drawing, the abrasive throwing wheel comprises spaced plates or side wall members 1 and 2 joined together by radially extending vanes 3. The wheel is suitably mounted upon a shaft 4 which is fixed to the hub 5 extending from the side wall member 1. Removable and replaceable wear blades or shoes *b* of generally channel form rest upon the vanes 3 and may be held in position by means of a set screw 6 which extends through the side wall member 2 and engages the side of the removable blade *b*. The blades *b* are designed to retain the abrasive moving through the wheel within the confines thereof, and out of contact with the permanent parts of the machine. The radial supporting vanes 3 and the throwing blades *b* extend short of the center of the rotor providing a central chamber *c*, within which the abrasive control means is positioned.

As shown in Figs. 1 and 2, the abrasive throwing wheel is provided with a control member 30 of tubular form which substantially fills the central chamber *c*. The control member 30 is preferably provided with an end wall or inturned flange **31** on the inner end thereof. The control member **30** is provided with an elongated discharge opening O_x which extends a considerable distance around the periphery of the member, as indicated in Fig. 1. A tubular collar or sleeve **35** surrounds the control member **30**. The collar **35** is also provided with an elongated opening O_y which also extends a considerable distance around the periphery of the collar, as indicated in Fig. 1. It will be noted that the sleeve **35** may be manipulated with respect to the control member **30** so as to define the peripheral length of the free opening through which abrasive *a* may be discharged from the control member to the blade area.

By providing elongated discharge openings of considerable peripheral length, it is seen that a free discharge opening of considerable peripheral range results by a proper manipulation of the collar **35**. The length of the path swept by the thrown abrasive *a* can thus be varied within wide limits.

The control member **30** is preferably rotatably mounted upon a suitable guide support **13** fixed to a supporting frame **39**. A flexible hose or conduit **34** is connected to the mouth of the control member **30** by means of bolts **37** or other connecting means extending through the abutting flanges **32** and **33** provided respectively on the control member and the conduit **34**. Suitable means, such as a flange **36**, may also be provided on the collar **35** to facilitate manipulation thereof.

The abrasive may be conveyed through the conduit **34**, control member **30** and out through the free discharge opening therein by gravity, low pressure air, conveyor, or other suitable means. To further increase the velocity of discharge through the discharge opening and the control member, an impeller comprising impelling vanes **42** fixed to a supporting stud **41** may be provided. The stud **41** extends through an opening provided in the end wall **31** of the control member and may be mounted upon a plate **40** fixed to the side member **1** of the wheel by means of screws **43**, so as to rotate therewith. The impeller vanes **42** are preferably arranged on a bias so as to direct the abrasive flowing into the control member **30** substantially radially across the inner end of the blades *b*. The throwing blades *b* serve to augment and further increase the velocity of the hurled abrasive so that the abrasive when discharged will effectively clean metal sheets, castings, forgings and the like.

A throwing wheel having a diameter of approximately 20 inches and rotated at approximately 2220 revolutions per minute will discharge the abrasive at approximately 180° from the point of entry of the abrasive into the path of the throwing blades. For example, when the discharge openings O_x and O_y are in alignment at approximately the 12:00 o'clock position, the abrasive *a* will be discharged at approximately the 6:00 o'clock position. The length of the path swept by the thrown abrasive is determined by the peripheral length of the discharge opening in the feed control means. By adjusting the sleeve **35** it is seen that the peripheral length of the discharge opening may be varied as desired to sweep a path of the desired length.

While certain novel features of the invention have been disclosed and are pointed out in the annexed claims, it will be understood that various omissions, substitutions and changes may be made by those skilled in the art without departing from the spirit of the invention.

What is claimed is:

1. A machine for throwing abrasive at blasting velocities including, a side wall member, abrasive throwing blades mounted on said side wall member extending inwardly short of the axis of rotation of said blades defining a central space, a tubular control member having a discharge opening in the side wall thereof extending into said central space, means for feeding abrasive into said control member, and an impeller fixed to rotate with said blades for throwing the abrasive out through the discharge opening in said control member, said impeller comprising a plurality of radially arranged vanes, the outer ends of said vanes being biased with respect to the advancing face of said blades and the axis of rotation of said blades whereby said vanes effect substantially uniform volume of flow of the abrasive through the entire peripheral length of said discharge opening.

2. A machine for throwing abrasive at blasting velocities including, spaced substantially radially arranged throwing blades extending inwardly short of the axis of rotation of said blades to define a central space, a tubular control member having a discharge opening in the tubular side wall thereof extending into said central space, means for feeding abrasive into said tubular control member, and an impeller for projecting the abrasive through said discharge opening and into the path of rotation of said blades, said impeller including a hub portion fixed to rotate with said blades and vanes radiating from said hub portion, the outer ends of said vanes being biased with respect to the axis of rotation of said blades so as to effect substantially uniform volume of flow of the abrasive through substantially the entire peripheral extent of said discharge opening, and a sleeve adjustable on said tubular member for adjusting the peripheral extent of said discharge opening.

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