

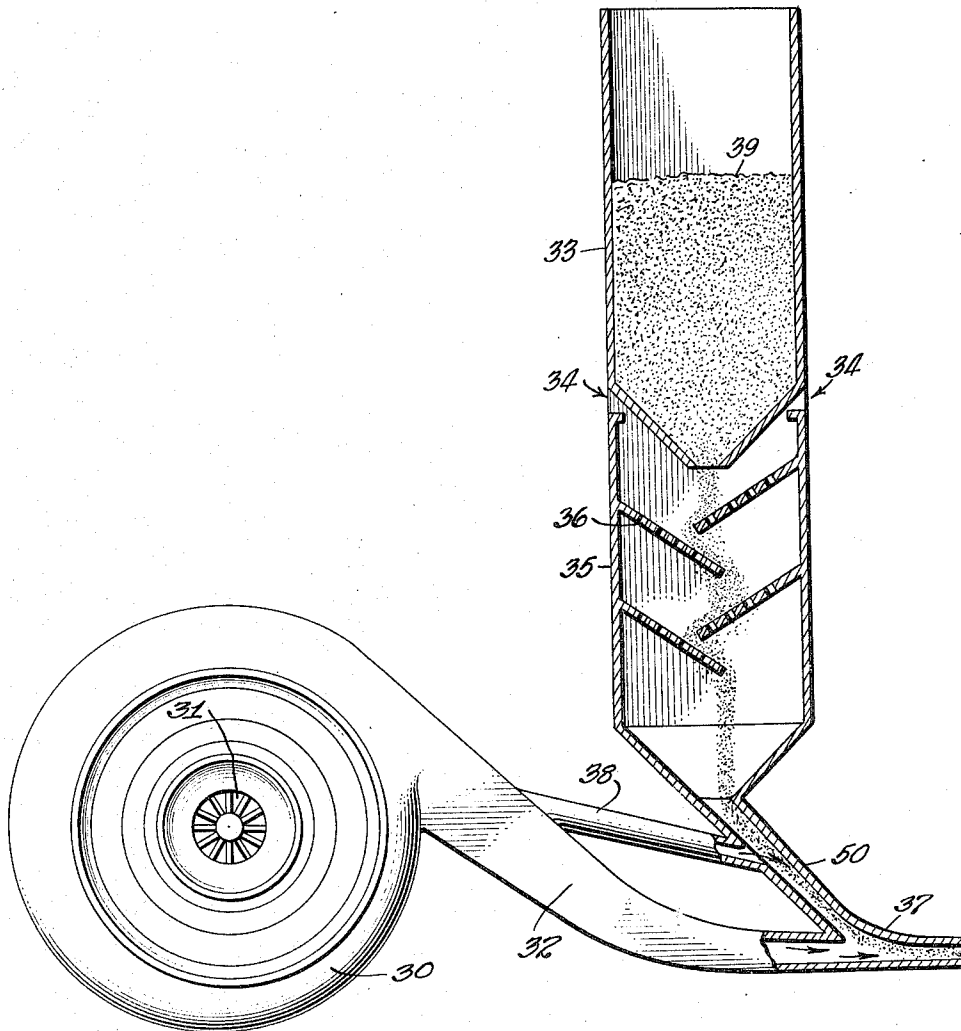
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LOW PRESSURE ABRASIVE BLAST SYSTEM

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LOW PRESSURE ABRASIVE BLAST SYSTEM

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3 Claims. (Cl. 51—8)

The invention relates to systems for cleaning, and more particularly to systems for cleaning castings and the like by a blast of abrasive particles carried in a stream of air.

According to the invention, the abrasive particles are mixed with an air stream obtained from a centrifugal blower or low pressure centrifugal air pump. The abrasive particles may be sand, steel shot or steel grit, or any suitable abrasive material. Care is taken in introducing the abrasive into the air stream to reduce frictional losses to a minimum. For example, a mechanical feeder or slinger may be used to impart an initial velocity to the abrasive particles at the point of introduction into the air stream.

If desired, an auxiliary air stream or "booster", preferably obtained from the main blower, may be utilized to give the abrasive particles their initial velocity before being introduced into the main air stream. Gravity may also be utilized to give the abrasive particles their initial velocity.

The abrasive particles may be introduced into the main air stream either at a point back from the discharge end of the stationary conduit or directly at the end of the conduit. The delivery conduit may be shaped to give maximum overall efficiency. The stationary conduit may be of any desired cross section, namely, circular, square or oblong, and may be either flaring or converging.

The invention also consists in certain new and original features of construction and combinations 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 the single figure represents diagrammatically a low pressure system according to the invention.

In the following description and in the claims, various details will be identified by specific names for convenience but they are intended to be as generic in their application as the art will permit.

In the drawing accompanying and forming part of this specification, certain specific disclosure of the invention is made for purposes of explanation, but it will be understood that the details may be modified in various respects without departure from the broad aspect of the invention.

Referring to the drawing, the blower or pump 30 has a suction inlet 31 and a discharge conduit

32. The abrasive is carried by a hopper or container 33 which is fed with abrasive either manually or automatically by means not shown. The hopper 33 has a troughed lower end through which the abrasive drops in a restricted stream onto inclined perforated baffles 36 located on the lower baffle section 35. The baffle section 35 is provided with air inlets 34 and has a lower inclined connection intersecting the main discharge conduit 32 at a point near the discharge end thereof.

For assisting in giving the abrasive particles an initial velocity before mixing with the main air stream, a bypass 38 is provided receiving air from the discharge side of the pump 30, discharging the same into the lower inclined portion 50 of the baffle section 35 so that the abrasive particles already have a considerable velocity when they impinge upon the main air stream. The mixing of abrasive with the main air stream may take place either as shown or at a point directly at the discharge end of the discharge conduit.

In operation, the abrasive particles will drop down through the baffle section 36 becoming mixed with the air sucked in through the openings 34. As the stream of abrasive falls to the bottom of the baffle section 35, it is picked up by the auxiliary air stream 38 which imparts to the abrasive an initial velocity prior to mixing with the main air stream at 37.

It will be understood that the cross section of different parts of the bypass 38, as well as the angle of intersection of the bypass 38, with inclined portion 50 and the angle of intersection of inclined portion 50 with main discharge conduit 32, will depend on the pressures and functions desired. Also, if desired, the baffle section 35 may be omitted and the container 33 may be applied directly to the inclined portion 50.

In the above described system, the abrasive will be thoroughly mixed with the air so that a uniform and homogeneous air blast is obtained without any tendency for the abrasive to separate out of the sides of the blast. The abrasive particles are given an initial velocity to cut down disturbances in the main air stream at the mixing point. Different types of abrasive may be used, for example, sand, steel shot or steel grit. The pressures developed by the air blower or pump may run less than a pound or may run up to five pounds if certain types of high pressure centrifugal air pumps are used. Ordinarily, a 10 or 20 horsepower motor should be sufficient to drive the centrifugal blower or pump for an ordinary installation.

The cross section of the discharge conduit

may vary, it may be either circular, square or rectangular. In the case of a rectangular shape, for example, the dimensions may be anywhere from three inches to six inches by one-quarter inch to one-half inch. The blast velocities may run in the neighborhood of 3000 feet per minute and if sufficient power is used and the other dimensions are correct, the velocities may run up to 30,000 feet per minute.

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. In an abrasive blast system, a centrifugal air blower having a discharge conduit, a hopper for holding abrasive, an auxiliary mixing chamber under said hopper having air inlets and a series of inclined perforated baffle plates, said auxiliary mixing chamber connecting with said discharge conduit at a point near the discharge end thereof and an auxiliary bypass connecting said pump to the outlet of said auxiliary mixing chamber, whereby to give the abrasive an initial velocity before being mixed with the main air stream.

2. In an abrasive blast system, a centrifugal air compressor having a discharge conduit, a container for holding abrasive, an auxiliary mixing chamber connected to said container, said auxiliary mixing chamber connecting with said discharge conduit and discharging abrasive thereinto at a relatively small angle to the main air stream, and an auxiliary bypass connecting said compressor to said auxiliary mixing chamber, whereby to give the abrasive an appreciable initial velocity before being mixed with the main air stream.

3. In an abrasive blast system, a centrifugal air blower having a discharge conduit, a container for holding abrasive, an auxiliary mixing chamber below said container, said auxiliary mixing chamber connecting with said discharge conduit at a point near the discharge end thereof and discharging abrasive into the main air stream at a relatively small angle thereto, and an auxiliary bypass connecting said blower to said auxiliary mixing chamber, whereby to give the abrasive an appreciable initial velocity before being mixed with the main air stream.

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