GRIT BLASTING APPARATUS

TECHNICAL FIELD

This invention relates to an apparatus for surface treatment and in particular, to an apparatus for surface treatment of work piece by grit blasting.

BACKGROUND

Grit blasting involves a process of using high-speed, air jet-powered abrasives onto the surface of an object or work piece, to remove certain substances e.g. several layers of paint or corroded metal of the object, prior to paint application or other subsequent surface treat processes. Without proper control, grit blasting may have a negative impact on the environment. Due to its destructive nature, grit blasting is a difficult process to contain without a proper environmental protection.

Normal grit blasting processes involve the use of several layers of covering sheets, e.g. canvases, over the object to be cleaned, to form a large cover over the object to contain the tremendous dust clouds that are created during the cleaning process. In the long run, these canvas covers could be perforated with holes, due to wear and tear caused by the abrasives. Damaged canvases reduce the effectiveness of the protection, leading to the formation of undesirable dust clouds caused by expended grit which is hazardous to health given the high toxicity levels.

SUMMARY OF THE INVENTION

Embodiments of the present invention provide solutions to address this issue. One of which was to reduce the size of coverage to the necessary area. To reduce the size of coverage, localizing blasting to a handheld chamber mechanism becomes a more viable solution to minimize the impact of expanded grit created by the process.

In one embodiment, a grit blasting apparatus includes a housing with a first conduit and a second conduit attached to the housing. The housing has a bore formed in a sidewall and a first opening at a first end of the bore. The first conduit has an outlet disposed in the bore and facing the first opening. The second conduit is connected to the housing and in fluid communication with the bore. The first conduit supplies a high speed grit jet from its outlet and through the first opening of the housing, to perform surface treatment to a work piece placed adjacent to the first opening. The second conduit connects to a vacuum pump. On activation of the vacuum pump, vacuum will take place within the bore of the housing. This creates an area of low air pressure within the bore, extracting the expended grit and dust particles generated by the blasting operation.

Other aspects and advantages of the present invention will become apparent from the following detailed description, illustrating by way of example the inventive concept of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other aspects of the present invention will be described in detail with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view showing a grit blasting apparatus according to one embodiment of the present invention.

Fig. 2 is a perspective view showing the grit blasting apparatus of Fig. 1 from another viewing angle.

Fig. 3 is a front view of Fig. 1.

Fig. 4 is a cross sectional view of Fig. 1.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

A grit blasting apparatus 200 according to one embodiment of the present invention is shown in Figs. 1 to 4. Grit blasting apparatus 200 has a housing 210 and a first conduit 220, e.g. a steel pipe, attached to housing 210. Housing 210 is cone-shaped having a closed narrow end 215 and a first opening 216 formed at the opposite broad end. First conduit 220 is attached to housing 210 at narrow end 215, with its inlet 222 positioned outside housing 210 and outlet 224 positioned inside bore 214 of housing 210. First conduit 220 is to be connected at inlet 222 to a grit supply source 10 of air-jet and grit material mixture. A second conduit 230, e.g. a steel pipe is connected to narrow end 215 of housing 210, and in fluid communication with bore 214. Second conduit 230 has an outlet 234 to be connected to a vacuum source 20. At the other end, second conduit 230 intersects with bore 214 to form a second opening 232 of housing 210.

Upon activation of grit supply source 10, the mixture of high speed air-jet and grit material 22 enters first conduit 220 at inlet 222, and jet out from outlet 224 to arrive at a surface of a work piece 40 to perform surface treatment on work piece 40, through bore 214 and opening 216 of housing 210. A cloud of grit particles 24 is generated at the surface of work piece 40 when the high speed grit jet 22 impacts on the work piece 40.

Vacuum source 20 generates a low-pressure air pressure zone adjacent to opening 216 by which, grit particles 24 will be sucked into bore 214 of housing 210 and further out of second conduit 230, as depicted in Fig. 3. Possible contamination by grit particles 24 surrounding the surface area of work piece 40 is therefore reduced. Grit particles may be filtered out at vacuum source 20, that will allow the grit particles of different levels to be collected and for recycling purpose.

In the present embodiment, second opening 232 is positioned farther away from first opening 216 of housing 210 than outlet 224. The positional relationship of first opening 216, second opening 232 and outlet 224 as well as the cone-shaped housing 210 are helpful to reduce the interference between the high speed girt 12 jetting out of outlet 224 and the vacuum operation to suck out grit particles 24 from the surface area of work piece 40.

CLAIMS

1. A grit blasting apparatus comprising:

a housing having a sidewall, a bore formed in the sidewall and a first opening at a first end of the bore;

a first conduit attached to the housing, the first conduit having an outlet disposed in the bore and facing the first opening;

a second conduit connected to the housing and in fluid communication with the bore;

wherein the first conduit is to supply abrasives from the outlet to the first opening through the bore, and

wherein the second conduit is to remove the abrasives from the opening through the bore.

2. The apparatus of claim 1, wherein the second opening is positioned farther away from the first opening than the outlet.

3. The apparatus of claim 1, wherein the second conduit intersects with the bore at a second opening formed at a second end opposite to the first end,

4. The apparatus of claim 3, wherein second opening faces the first opening.