

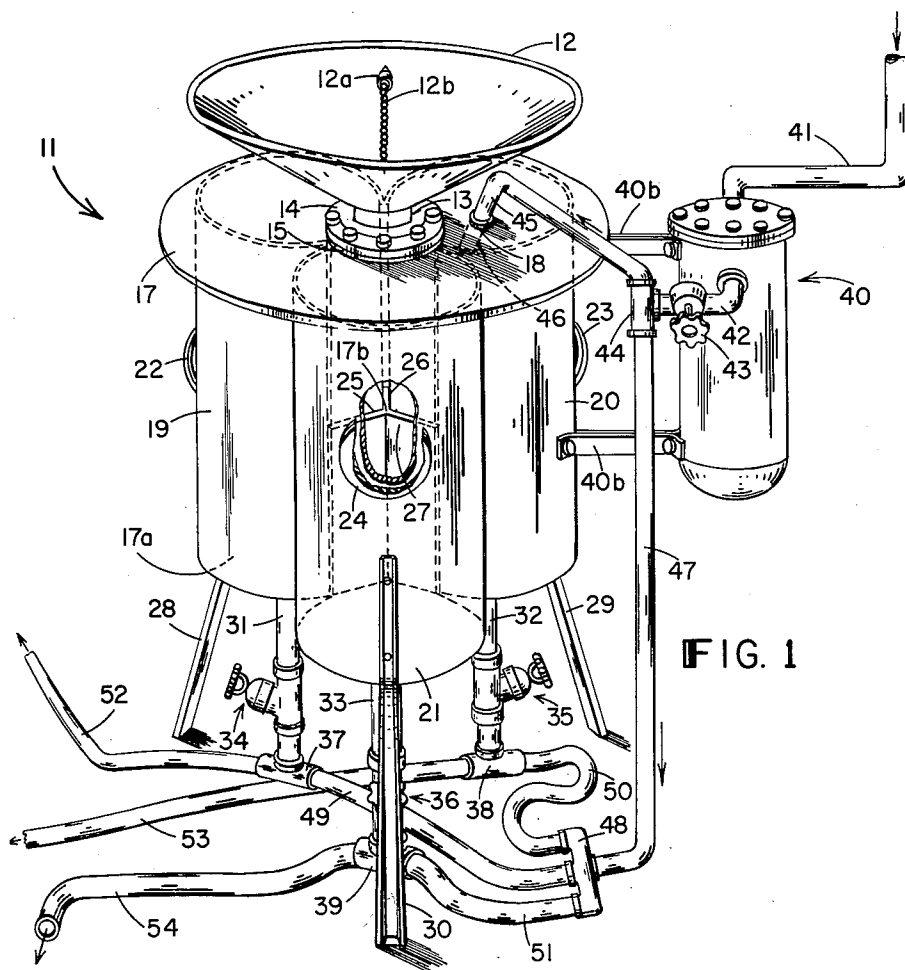
Feb. 20, 1962

S. B. WILLIAMS
SAND BLAST APPARATUS

3,021,646

Filed April 16, 1959

2 Sheets-Sheet 1



INVENTOR.
SUMNER B. WILLIAMS
BY *Joseph J. Allen*
ATTORNEY.

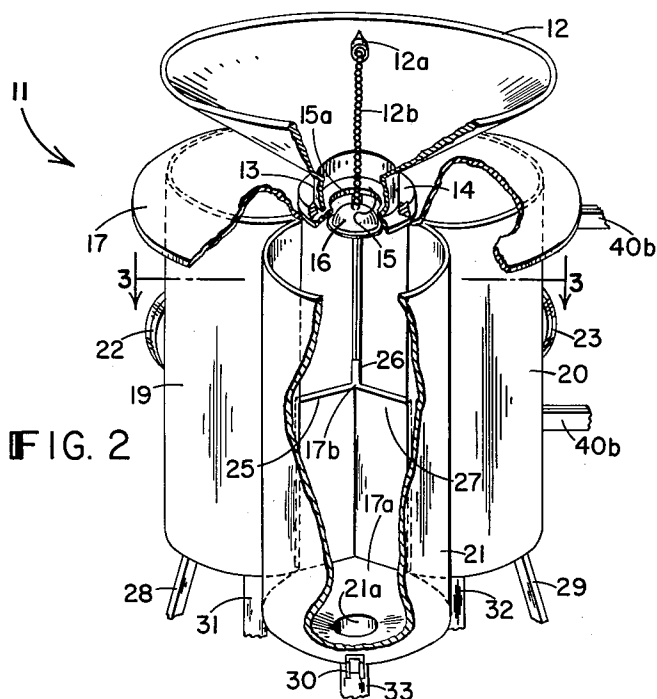
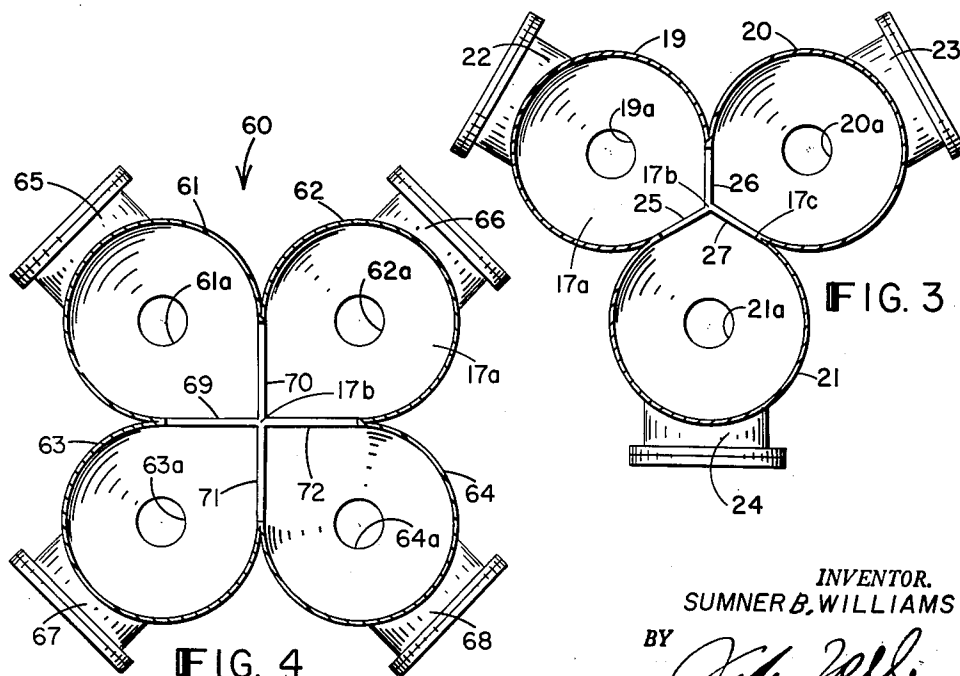
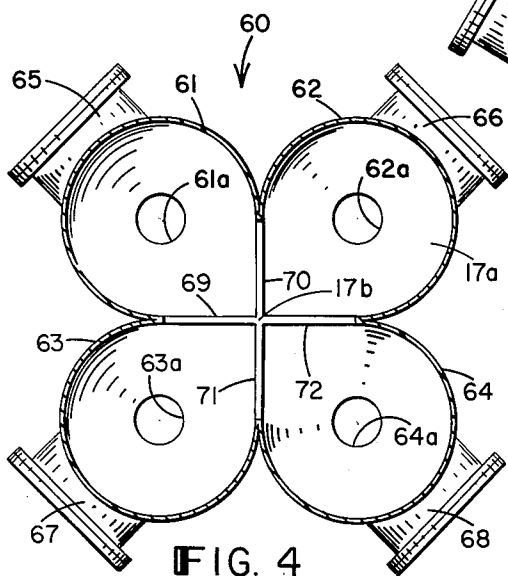
Feb. 20, 1962

S. B. WILLIAMS
SAND BLAST APPARATUS

3,021,646

Filed April 16, 1959

2 Sheets-Sheet 2



INVENTOR.
SUMNER B. WILLIAMS
BY *John J. Jellie*
ATTORNEY.

1

3,021,646

SAND BLAST APPARATUS

Sumner B. Williams, 50 Deborah Road, Newton, Mass.

Filed Apr. 16, 1959, Ser. No. 806,853

7 Claims. (Cl. 51-12)

This invention relates to an abrasive blasting apparatus such as sand blasting devices. In particular it relates to a novel, economical and compact abrasive blasting apparatus.

Conventional sand-blasting apparatus occupies a great deal of space and requires costly fittings and connections to the air supply. Where, as for example in factories preparing the surfaces of printing plates, many separate sand blasting operations must be carried on rapidly, simultaneously and intermittently, the conventional apparatus is uneconomical. What has been desired is a compact apparatus whereby a plurality of simultaneous sand blasting operations could be carried out. No method of accomplishing this has been previously described, it being well known that the obvious method of having a plurality of outlet taps is totally unsatisfactory in that either the sand clogs or it does not flow at all.

In accordance with the present invention, a new compact economical sand blast apparatus is proposed which permits a plurality of simultaneous, separate blasting operations from one tank.

The device comprises generally a tank shaped in the form of a plurality of uniform incomplete cylinders fused together longitudinally with separating partitions extending a portion of the way upward from the bottom. The result of this construction is a plurality of symmetrical, substantially cylindrical compartments closed at the bottom and opening laterally into one another in a single compartment a portion of the way up. The bottom of each compartment leads to a feed line connecting with the air line. Air pressure is maintained by a pipe through the cover. When sand is loaded into this container and the compressed air turned on, a separate flow is obtained from each outlet.

Further objects and a fuller understanding of the invention will hereinafter appear from the following description of a preferred embodiment illustrative of the invention and shown in the accompanying drawings in which:

FIGURE 1 is a perspective of the apparatus partly broken away;

FIGURE 2 is a perspective of a container partly broken away to show lower partition and upper sand plug;

FIGURE 3 is a transverse cross section on line 3-3 of FIGURE 2 showing a three cylinder cloverleaf arrangement;

FIGURE 4 is a transverse cross section showing a four cylinder cloverleaf arrangement.

The device consists of an abrasive containing pressure feeding apparatus comprising an abrasive container consisting of a plurality of longitudinally intersecting cylinders with tops and bottoms forming a cloverleaf configuration. The upper portion of the container is open while the lower portion is equally divided into sections by a multiwalled partition, each wall of which extends laterally from a common longitudinal axis to a vertical edge of an adjacent longitudinal intersection of two of the cylinders. Each section has an outlet pipe and control valve preferably a disc-diaphragm valve extending from the bottom. The pressure feeding apparatus is so arranged that compressed air is fed from the reservoir to the air space at the top of the container above the abrasive and simultaneously to the lower opening of outlet pipes. The abrasive is thus forced downwardly by gravity and by air pressure into the cylinders and out through the depending outlet pipes where it is met in each

2

pipe by a cross current of compressed air flowing directly from the reservoir and then forced out through the various hoses and associated nozzles. We thus have a single container, a single compressed air supply but a plurality of operating abrasive blasting hoses and nozzles.

Referring to the drawings the apparatus therein shown as illustrative of my invention comprises an abrasive containing and feeding apparatus 11 consisting of a container having an abrasive feeding hopper 12 provided with a chain conduit 12a extending therethrough for guiding a pull chain 12b to the lower end of which is attached a sand plug 16. The hopper 12 has a throat 13 feeding through the top wall 17 of the container. A collar 14 is seated on a gasket 15 positioned on the top wall 17 and having an orifice 15a, smaller in diameter than that of the plug 16. The plug 16 is adapted to be manually raised or lowered and to be pressed upwards against the orifice 15a by the compressed air. The container has a top wall 17 and a bottom wall 17a, the top wall 17 having an air inlet 18. Extending between the top wall 17 and the bottom wall 17a are longitudinally intersecting cylindrical containers 19, 20, and 21 arranged in symmetrical cloverleaf formation and forming the side walls of the assembly. Containers 19, 20, and 21 are provided with clean-out ports 22, 23, and 24. Within the lower portion of the cloverleaf formation there is positioned a symmetrical multiple walled interior partition, the wall of which 25, 26, and 27 rest on the bottom 17a, extend laterally from a common longitudinal central axis 17b to an adjacent longitudinal intersection of two of said cylinders 17c and extend upwardly into said container, the angles between said partition walls being equal. These partition walls are joined together along the common longitudinal central axis, are joined to the base 17a and to the lines 17c of intersection of the cylindrical containers. A cross section taken across this lower portion is in the form of a cloverleaf symmetrically partitioned off between the central axis 17b and the cylinder intersections 17c.

The container is supported by legs 28, 29 and 30. The container may have various numbers of longitudinally intersecting cylinders and partitions as for example that shown in FIGURE 4 wherein the container 60 has four cylinders 61, 62, 63 and 64 with four bottom outlets as 61a, 62a, 63a and 64a and a partition with four walls as 69, 70, 71, and 72 extending from a common longitudinal axis 17b. Each cylinder may also have a clean out port as 65, 66, 67, and 68.

Extending from the bottom walls of containers 19, 20 and 21 are sand outlet discharge pipes 31, 32, and 33 provided with abrasive flow control disc-diaphragm valves 34, 35, 36 (such as Rockwell "D-D" valves) and T fittings 37, 38, and 39.

Positioned adjacent the abrasive container is a compressed air storage receptacle 40 supported by brackets 40b and having a compressed air intake supply pipe 41 and a compressed air outlet pipe 42 having an air control valve 43 and a T fitting 44. From one side of T fitting 44 is a top air supply pipe 45 extending and connected to and through the top wall 17 by pipe 46 which is oriented in the direction of the center 17b of the top of the partition. Extending from the other side of fitting T 44 is air pipe 47 terminating in an air manifold connector 48. Air pipe 49 connects manifold 48 to one side of T fitting 37. Air pipe 50 connects manifold 48 to one side of T fitting 38. Air pipe 51 connects manifold 48 to one side of T fitting 39. To the other end of T fitting 37 there is connected the hose 52 and an abrasive blast nozzle. To the other end of T fitting 38 there is connected the hose 53 and an abrasive blast nozzle. To the other end of T fitting 39 there is connected the hose 54 and an abrasive blast nozzle.

In operation, the abrasive is introduced into the hopper 12 and falls through the throat 13 more or less evenly distributed into the leaves of the cloverleaf which are separated from each other by the partitions 25, 26 and 27. The tank can be filled to almost the top, allowing clearance for the plug 16. The plug 16 is drawn manually up against the gasket 15.

The air control valve 43 is opened, allowing compressed air to flow from the reservoir 40 into the two branches 45 and 47. The branch 45 feeds the compressed air into the top portion of the container above the abrasive already in place. The other branch 47 feeds the compressed air to the manifold 48 and thence through pipes 49, 50, and 51 across the bottoms of the pipes 31, 32, and 33 carrying abrasive and air flowing from the cylinders 19, 20, and 21. This cross flow of air forces the combined compressed air and abrasive as it descends from the cylinders into hoses 52, 53, and 54, and associated nozzles.

The flow of sand from the hopper into the containers is controlled by the operation of the plug 16 in and out of contact with the gasket 15 by movement of the chain 12b to which the plug is attached. During operation the plug 16 may be manually seated against the gasket and held in place against the gasket 15 by the pressure of the air in the upper portion of the container.

The flow of air and abrasive from the semi-partitioned container to the operating nozzles is controlled by operation and regulation of valves 43, 34, 35, and 36. Where a standardized factory operation is involved, such control is simple. Thus, where an array of overlapping simultaneously operating sand blasts is desired, as in preparing the surfaces of high quality printing plates, valves 34, 35 and 36 can be pre-set so that the control will be from valve 43.

While the preferred embodiments of my invention have been described in detail, it will be understood that I do not wish to be limited to the particular construction set forth, since various changes in the form, proportions and arrangement of parts, and in the detail of construction may be resorted to without departing from the spirit and scope of the invention, or destroying any of the advantages contained in the same, heretofore described and defined in the following claims.

I claim:

1. An abrasive containing and feeding apparatus comprising an abrasive container and a plurality of independent abrasive conductors; said container consisting of a plurality of longitudinally intersecting cylinders enclosed at their tops and bottoms; the upper portion of said container being open and the lower portion of said container being divided into equal sections by partitions each extending laterally from a common longitudinal axis to the vertical edge of an adjacent longitudinal intersection of two of said cylinders; the upper portion of said container being provided with an abrasive inlet; the bottom of each of said sections having a separate outlet pipe connecting to one of said conductors; means being provided for supplying compressed air to each of said conductors and to said upper portion of said container.

2. The apparatus of claim 1 wherein the abrasive inlet is provided with an air-controlled plug.

3. An abrasive containing and feeding apparatus comprising an abrasive container, a compressed air reservoir, and a plurality of independent abrasive conducting hoses each having an associated nozzle; said container consisting of a plurality of longitudinally intersecting cylinders enclosed at their tops and bottoms, the upper portion of said container being open, the lower portion of said container being divided into equal sections by partitions, each extending laterally from a common longitudinal axis to the vertical edge of an adjacent longitudinal intersection of two of said cylinders; the bottom of each of said sections having an outlet pipe connecting with one of said hoses and a control valve; means being provided to controllably feed air from said reservoir to the upper portion of said container and across the bottom of the opening of each of said outlet pipes to said hoses.

4. In combination, a compartmented sand blast tank, a compressed air storage receptacle, and a plurality of associated hoses and nozzles; said sand blast tank being composed of a plurality of similar longitudinally intersecting cylinders, a top wall and a bottom wall; a multiple walled interior partition being positioned in the lower portion of said tank; each wall of said partition resting on said bottom wall and extending laterally from a common longitudinal axis to an adjacent longitudinal intersection of two of said cylinders and extending upwardly into said tank the upper portion of which is open; the angles between said walls being equal; each of said compartments having an outlet orifice and pipe extending from its bottom wall, each of said outlet pipes being provided with flow control means and a T fitting; said compressed air receptacle having an air intake supply pipe and an air outlet pipe having a control valve and dual air feed, one side of said dual air feed being connected to and through said top wall, the other side being split and piped to one branch of each of said T fittings, the opposite branch of each of the said fittings being provided with a sand blast hose and nozzle.

5. Claim 4 wherein said top wall is provided with a sand filling orifice into which is positioned the throat of a hopper, said throat having in its base an air-controlled sand plug.

6. Claim 4 wherein compressed air is piped simultaneously from said compressed air storage receptacle to said upper open portion of said container and to one branch of each of said T fittings.

7. Claim 4 wherein compressed air is piped simultaneously from said compressed air storage receptacle through the top wall of said container and directed towards the top of the walls of said partition at the junction of said walls and to one branch of each of said T fittings.

References Cited in the file of this patent

UNITED STATES PATENTS

783,218	Murray	Feb. 21, 1905
2,388,818	Bick	Nov. 13, 1945
2,409,722	Stark	Oct. 22, 1946
2,569,952	Ridley	Oct. 2, 1951
2,791,494	Thompson	May 7, 1957
2,938,305	Bipes	May 31, 1960