

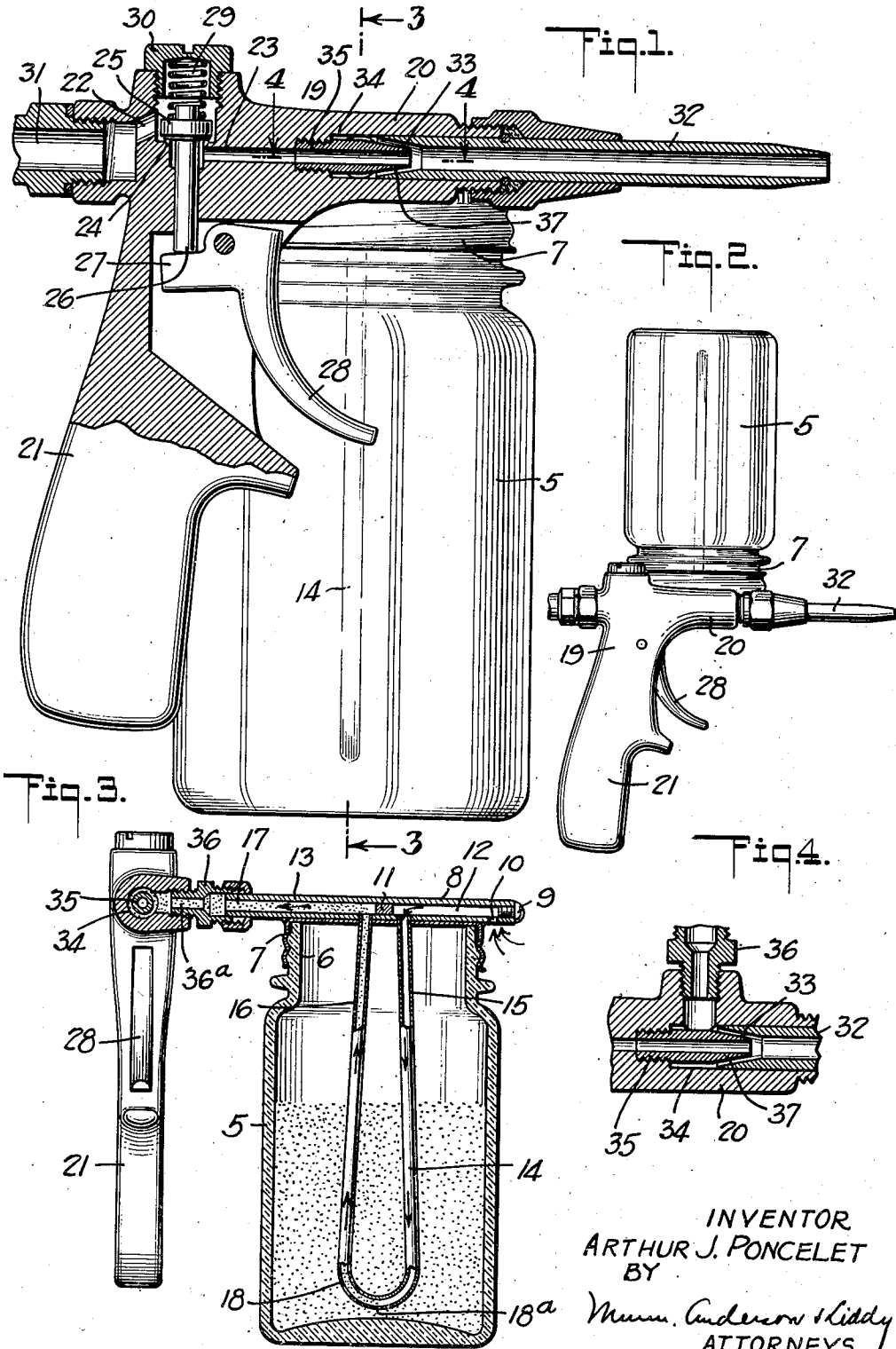
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SAND BLASTING MECHANISM

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SAND BLASTING MECHANISM

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5 Claims. (Cl. 51—8)

This invention relates to sand blasing mechanism.

An object of the invention is to provide a light weight mechanism of this character which can be conveniently carried in the hand of the user and wherein use is made of a pneumatic air gun through which a high velocity air stream can flow and the same be utilized to effect delivery into the stream of dry granular abrasive material from a container which is preferably, but not necessarily, carried by the gun.

A further object is to provide a sand blasting mechanism wherein means are employed to enable either an admixture of air and abrasive material or a mere high velocity air stream to be directed against a surface being treated as and when desired.

Among the many uses to which the invention can be put are the following, namely: (1) the removal or stripping of paint from metallic surfaces preparatory to soldering one surface to another; (2) the cleansing by sand blasting of any and all surfaces such as the spark plugs of internal combustion engines; (3) the etching of glass or metal by sand blasting; (4) the ornamentation of surfaces of wood with the use of stencils, etc.; and an important object of the invention is to provide mechanism characterized by an air gun, the nozzle of which is formed and disposed to enable the abrasive material to be effectively directed in to more or less inaccessible crevices or spaces, the wall surfaces of which are to be cleaned or acted upon.

A further novel feature of the invention resides in the provision of means by which the abrasive material employed will move at a velocity which is low as compared with the intended high velocity of an air stream, whereby to prevent undue wear upon the metallic surfaces of the conduit through which said material passes while in transit to the air stream in the discharge of the material from the mechanism by force of said air stream.

Another object is to provide a sand blasting mechanism in which is embodied a novel form of container for the abrasive material, the same supported by and otherwise connected with the air gun of the mechanism whereby it can be removed and supplied with a charge of said material and then quickly and conveniently reapplied to the gun for further use.

Other objects and advantages of the invention will be apparent from the following description, considered in conjunction with the accompanying drawing, in which

Figure 1 is a view partly in elevation and partly in longitudinal section of the device;

Figure 2 is a view in side elevation of the device;

Figure 3 is a section on line 3—3 of Figure 1;

Figure 4 is a section on line 4—4 of Figure 1.

In carrying the invention into practice, use is made of a vertically disposed container 5, the neck 6 of which is provided with a threaded cap 7 which can be removed from the container as and when desired, so that the container can be supplied with a charge of suitable dry abrasive material, such as sand of required mesh.

Extending transversely across the crown or closure wall of the cap 7 is a tubular conduit 8, the same closed at one end by a removable screw plug 9 adjacent to which and formed in the walls of the conduit is a small air intake orifice 10. Said conduit is provided with an intermediate partition 11 which subdivides the conduit into ducts 12 and 13, and, as illustrated, a substantially U-shaped tube 14 is carried by the conduit and has its limb 15 in direct communication with the duct 12 of said conduit and its limb 16 in communication with the duct 13, whereby air entering the perforation 10 can continuously flow through the tube by suction induced at the discharge end 17 of said conduit. The return band 18 of the tube 14 has a small perforation 18a formed therein by means of which sand in the container can be drawn into the tube by induced suction as the air flows through the tube as aforesaid and as clearly shown in Figure 3 of the drawing.

Removably attached to the discharge end 17 of the conduit 8 is an air gun 19, the same consisting of a barrel 20 having a hand grip 21 which is spaced apart laterally from the container to enable the grip to be grasped freely in the hand of the operator.

The barrel 20 is formed with an intake portway 22 and an outlet portway 23 and disposed between said portways is a valve seat 24 against which a disk valve 25 can close. Said valve is provided with a stem 26 which is yieldingly urged against a lifting lug 27 of a trigger 28 by means of a coil spring 29. The spring 29 is interposed between the valve disk 25 and a spring tensioning cap 30, the latter being removable from the barrel and adapted to be manually adjusted to insure a firm closure of the valve against its contacting seat 24. From the relationship to each other of the portways 22 and 23, it follows that when the disk 25 is lifted from its seat, air from a suitable well-known pressure source can enter

the portway 22 from an intake connection 31 and discharge into the portway 23 from beneath said disk.

Removably fitted to the forward end of the barrel 20 is a discharge nozzle 32 of hard metal, the inner end of the bore of which is formed with a flared portion 33. Threadedly fitted to the barrel 20 and co-axially positioned in an enlarged bore 34 in the barrel is a short tubular hard metal member 35, the external diameter of which is less than the diameter of the bore 34. As shown in Figures 1 and 3, the discharge end 17 of conduit 8 communicates directly with the bore 34 through the coupling device 36, whereby sand as it discharges from the duct 13 will be delivered to the bore 34. The forward end of the member 35 is provided with a tapered nose 37 which extends into the flared portion of the bore of the nozzle 32, said nose being of a size to provide an annular space between same and the walls of said flared portion of the bore of said nozzle and being of a length to extend forwardly beyond the orifice 36a in the coupling 36.

In operation, dry sand is placed in the container 5 and the cap 7 securely sealed to the container. When the container is in the position shown in Figure 1, the tube 14 penetrates the sand and the perforation 18a in the return bend 18 of the tube is disposed with respect to the bottom of the container to enable sand to be drawn into the tube by suction induced at the bore 34. Assuming the trigger 28 to be depressed and the valve disk 25 elevated above its seat 24, and assuming also that the connection 31 is in communication with a source of air pressure, it follows that an air stream at high velocity will discharge into the bore of the nozzle 32 from the member 35, thus inducing formation of suction at the discharge connection 36 of sufficient force to draw atmospheric air into the tube 14 by way of the perforation 10 and discharge same into the bore 34. In consequence thereof, sand will be drawn into the tube 14 by suction induced at the perforation 18a in said return bend 18, and same will be conducted to the bore of the nozzle 32 from which it can be directed against the surface to be acted upon.

By reason of the fact that the sand is drawn into the tube 14 by suction induced as aforesaid, abrasion of the tube 14 and the conduit 8 will be negligible, and these parts can, therefore, be made of light inexpensive metal. Due, however, to the high velocity of the air stream passing through the barrel 20 and nozzle 32 and through the bore of member 35, it is intended that these parts be constructed from hardened steel.

After a surface has been sand blasted in the manner above described, the container 5 which is swiveled at the connection 36 may be inverted as shown in Figure 2, to thus dispose the sand at a level beneath the perforation 18a in the return bend 18 of tube 14. The trigger 28 may now be actuated to open the valve 25 and permit a blast of air to be directed against the treated surface being acted upon, whereby to clean same of all loose particles of sand and foreign matter.

The device may be of any suitable size to enable it to be conveniently held in the hand and the device freely manipulated. The container 5 may consist of a Mason fruit jar of a capacity to hold about a pint of sand, so that the device when held in the hand will be nicely balanced and of light weight. The nozzle 32 may be of any well-known form, but is preferably of small external diameter and is pointed at its outer end to

enable it to be projected into more or less inaccessible spaces or crevices, such, for instance, as the space between the electrodes of a spark plug when the device is used to cleanse the electrodes.

What is claimed is:

1. In mechanism of the class described, a fluid container having a removable cap; a substantially U-shaped tube carried by the cap and having an imperforate return bend disposed within the container and provided with an intake orifice through which fluid can pass to the tube from the container; a discharge nozzle; and means on the cap connecting the tube with the nozzle and having a duct open to the atmosphere and to one stretch of the aforesaid tube by means of which air can be sucked into the intake orifice and fluid drawn into the tube to provide a low velocity fluid stream, said means having a duct through which the low velocity fluid stream can pass to the nozzle; and means by which a high velocity air stream from a source of air under pressure can be discharged from the nozzle and along a line relative to the second named duct, whereby to cause ejection at high velocity of the fluid stream from said nozzle, the first said means having swivel connection with the nozzle such as will enable the container to be turned from a depending position relative to said means to a position thereabove, the aforesaid tube being of such length with respect to the depth of the container so that when the container is in the aforesaid depending position, fluid can be drawn into the tube as aforesaid for discharge at low velocity therefrom and whereby, when the container is turned to a position above said first means, the discharge orifice will be situated with respect to the level of fluid in the container to prevent entrance of fluid to the tube to permit a high velocity air stream, devoid of fluid, to pass from the nozzle from the aforesaid pressure source.

2. A device of the class described comprising a nozzle from which air under pressure can discharge; a fluid container connected to swivel on the nozzle so as to be turned from a depending position to an inverted position; and a tube correlated with the nozzle and with the container and extending into the latter and provided with an arifice into which fluid can enter the tube from the container by suction induced in the tube when air under pressure is discharging from the nozzle and the container is in a depending position, the length of the tube being such that when the container is inverted, the orifice in the tube will be disposed above the level of fluid in the container to thus prevent entrance of fluid to the container when air under pressure is discharging from the nozzle.

3. A device of the class described comprising a fluid container; a nozzle having a handle; means by which fluid in the container can be ejected from the nozzle at high velocity; and means for mounting the container on the nozzle for swiveling movement relative thereto to compensate for angular movement of the nozzle in a vertical plane, so that the container can be disposed in an upright position for the ejection of fluid therefrom irrespective of the angle at which the nozzle is held.

4. A device of the class described comprising a fluid container; a nozzle having a handle; means by which fluid in the container can be ejected from the nozzle at high velocity; means for mounting the container on the nozzle for swiveling movement relative thereto to compen-

sate for angular movement of the nozzle in a vertical plane; the center of gravity of the container being below the mounting means, and the swiveling connection provided thereby being sufficiently free for the container to maintain an upright position, irrespective of angular movement of the nozzle in a vertical plane.

5 A device of the class described comprising a fluid container; a nozzle having a handle; means
10 by which fluid in the container can be ejected from the nozzle at high velocity; means for mounting the container on the nozzle for swivel-

ing movement relative thereto to compensate for angular movement of the nozzle in a vertical plane, so that the container can be disposed in an upright position for the ejection of fluid therefrom, irrespective of the angle at which the nozzle is held; and means by which fluid is delivered to the nozzle from the container through said swivel mounting means, irrespective of the angular position of the nozzle relative to the container.

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