



Feb. 23, 1937.

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2,071,472

WATER-SAND BLAST GUN

Filed Oct. 26, 1936

2 Sheets-Sheet 1

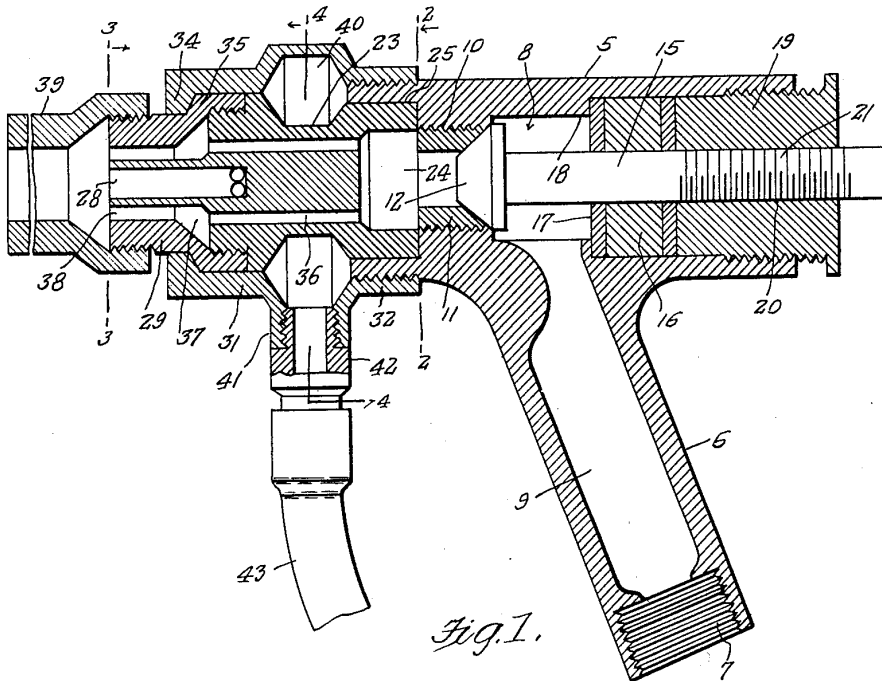


Fig. 1.

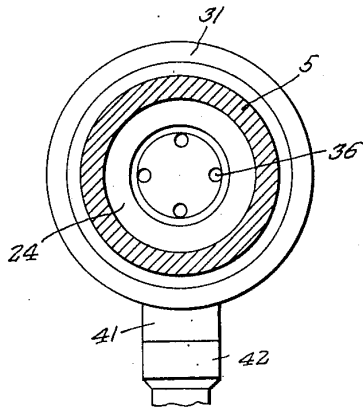


Fig. 2.

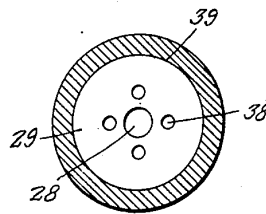


Fig. 3.

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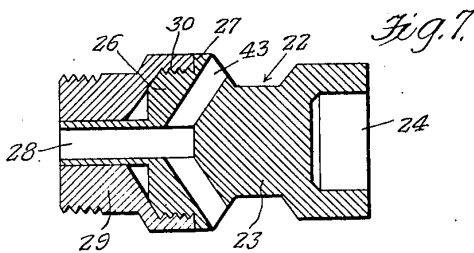
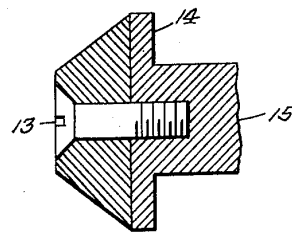
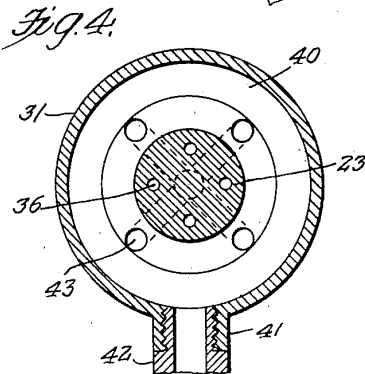
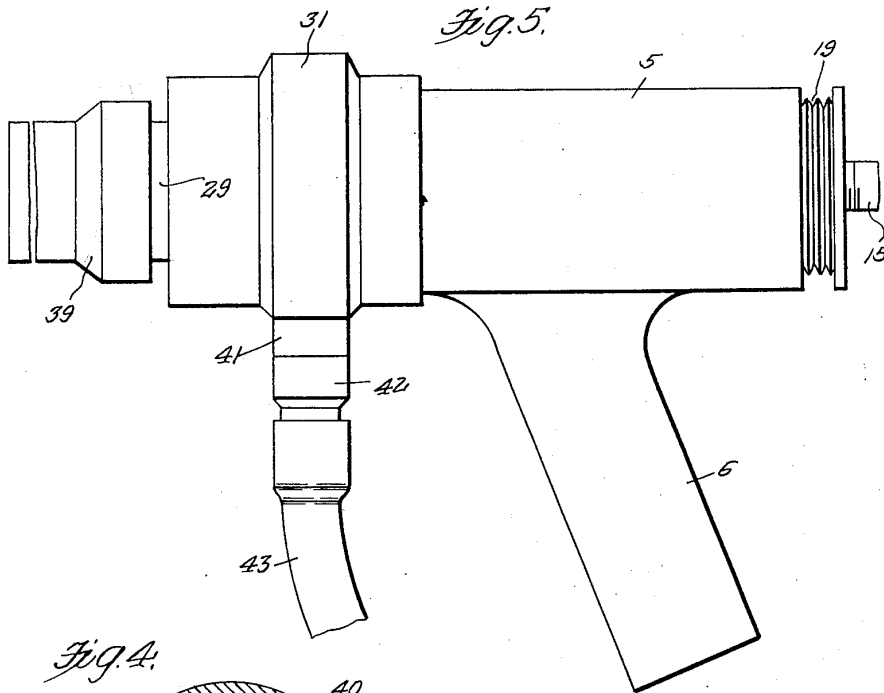
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Patented Feb. 23, 1937

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UNITED STATES PATENT OFFICE

2,071,472

WATER-SAND BLAST GUN

Clarence Fletcher, Buchanan, Mich.

Application October 26, 1936, Serial No. 107,704

5 Claims. (Cl. 51—11)

This invention relates to a blast gun, and more particularly to that type of gun designed for blasting with abrasive in which a liquid, such as water, is employed, and an object of the invention is to provide a gun characterized by such an arrangement of parts that the water issuing from the gun in a stream forms, as it were, an encasing wall or jacket for the sand as it issues from the gun, the object, intent and purpose being to increase the cleaning action and to keep the sand dry until it strikes the surface being cleaned, at which time it mixes with the water, thereby eliminating dust as would otherwise occur; the water further acting to carry the sand against the surface to be cleaned.

The invention, together with its objects and advantages will be best understood from a study of the following description taken in connection with the accompanying drawings wherein:—

Figure 1 is a sectional view through the gun. Figs. 2, 3 and 4 are sectional views taken substantially on the lines 2—2, 3—3, and 4—4 respectively of Fig. 1.

Fig. 5 is a side elevational view of the gun.

Fig. 6 is a detail sectional view of a shut-off valve and

Fig. 7 is a sectional view through what may be termed a transposition unit.

Referring more in detail to the drawings, it will be seen that the gun comprises a barrel 5 having integral therewith a hollow tubular handle portion 6, internally threaded as at 7 for the coupling of one end of a water hose or the like thereto.

Barrel 5 is chambered so as to provide a chamber 8 into which opens the bore or conduit 9 of the handle 6.

Also at one end of the chamber, the barrel 5 is internally threaded as at 10 to receive a removable externally threaded valve seat 11. Cooperable with the valve seat 11 is a conical valve member 12 of any suitable material and secured through the medium of a screw or similar fastening element 13 to the head 14 of a valve stem 15.

Valve stem 15 works through a suitable packing arranged in the barrel 5 and consisting of suitable packing material 16 confined between a pair of packing disks 17.

The packing 16 and disks 17 are held in position through the medium of an internal shoulder 18 and a gland nut 19, the latter being threaded into one end of the barrel 5 as clearly shown in Fig. 1.

The gland nut 19 is provided with a threaded bore 20 complementary to threads 21 provided on

a section of the stem 15 and cooperable therewith for securing the valve 12 at the desired adjustment relative to the seat 11.

At the discharge end of the barrel 5 there is provided what may be termed a transposition unit indicated generally by the reference numeral 22.

The unit 22 as will be clear from a study of Figs. 1 and 7 comprises a substantially cylindrical body member 23 having a diametrically enlarged socket end 24 fitting snugly within a socket 25 provided in that end of the barrel 5 remote from the gland nut 19.

At its opposite end, the body 23 presents a threaded part 26, a shoulder 27, and a jet passage 28.

Sleeved on the passage extension 28 is a nipple 29 that has an externally threaded diametrically enlarged end 30 that is screwed onto the threaded section 26 of body 23.

A coupling sleeve 31 has one end 32 screw threaded onto the socket equipped end of the barrel 5 while its relatively opposite end is provided with an intumed flange 33 which engages behind a shoulder 34 on the nipple 29, as shown in Fig. 1 for holding the transposition unit in place on the discharge end of the barrel 5.

The body 23 has a plurality, in the present instance, four passages 36 extending through the same from the socket 24 for communicating the socket 24 with a chamber 37 provided in the nipple 29. Nipple 29 also has a plurality, in the present instance, for passages 38 therethrough that extend from the chamber 37 as best shown in Fig. 1.

It will thus be seen that water entering the chamber 28 will under pressure, with valve 12, in an open or unseated position, pass from the chamber 8 into the socket or chamber 24 and through the passages 36 to the chamber 37 discharging from the chamber 37 through the passages 38 and through a nozzle 39 threaded on one end of the nipple 29, onto the surface to be cleaned.

Intermediate its respective opposite ends, the body member 23 of the transposition unit is grooved or otherwise circumferentially reduced, while the coupling sleeve 31 intermediate its ends is internally grooved to mate with the grooved or circumferentially reduced portion of the body 23, in a manner to provide therewith a suction or vacuum chamber 40 surrounding the body member 23. At the aforementioned groove portion thereof, the coupling sleeve 31 is pro-



2

2,071,472

vided with an internally threaded neck 41 which receives one end of a coupling nipple 42, the other end of which nipple is suitably engaged with or inserted into one end of a hose 43, leading from a source of sand supply.

The body member 22 also is provided with a plurality of diagonal passages 43 that connect or communicate the chamber 40 with the passage 28 of said unit.

Thus it will be seen that the water discharging through the nozzle 29 will create at the discharge end of the passage 28 a suction sufficient to draw the sand fed to the chamber 40 through the medium of the pipes 43, from a source of supply, through the passages 43, the passage 28, to discharge from the gun through the nozzle 39 in the center of the somewhat cylindrical water stream issuing from the gun. Thus it will be seen that through the medium of this construction, the water issues from the gun in a substantially tubular stream with the sand also issuing from the gun within the confines of the water stream, so that the water stream forms as it were an encasing jacket for the sand. As a result the sand remains practically dry until it strikes the surface being cleaned when it mixes with the water. In this way flying sand dust is reduced to a minimum if not entirely eliminated.

In actual practice it will be found that the dry sand hitting the surface to be cleaned cleans the surface more quickly and thoroughly than where the sand and water mixed together strikes the surface to be cleaned. Also by reason of the gun construction involving the subject matter of the invention, this manner of feeding the water and sand will result in the water cushioning the sand and otherwise provides for a better cleaning action than heretofore obtained by known and used sand blast gun constructions.

It is thought that a clear understanding of the construction, utility and advantages of an invention of this character will be had without a more detailed description.

Having thus described the invention, what is claimed as new is:—

1. In a sand blast gun, a barrel provided with a chamber and a handle for the barrel having a water passage therethrough for supplying water to said chamber, a body member mounted on one end of the gun and provided at one end with a socket and a relatively opposite end with a hollow tubular extension providing a discharge passage, and a circular series of relatively spaced passages extending through said body from the socket end thereof, a valve arranged in the barrel between said water chamber and the socket end of said body and controlling the passage of water from said chamber into said socket, the water passing from said socket through said series of passages to create a suction at the open end of said tubular extension, a nipple sleeved on the tubular extension of said body member and provided with a chamber and a circular series of relatively spaced passages leading from said chamber longitudinally through said nipple circumjacent the tubular extension, a member surrounding said body and providing therewith a sand chamber and also having an inlet for said sand chamber, and said member being provided with diagonal passages connecting the sand chamber with said tubular extension whereby the sand will be drawn from said sand chamber through said diagonal passages and into said tubular extension to discharge therefrom within the confines of the stream of water issuing from

the nipple through the aforementioned passages in said nipple.

2. In a sand blast gun, a barrel provided with a chamber and a handle for the barrel having a water passage therethrough for supplying water to said chamber, a body member mounted on one end of the gun and provided at one end with a socket and a relatively opposite end with a hollow tubular extension providing a discharge passage, and a circular series of relatively spaced passages extending through said body from the socket end thereof, a valve arranged in the barrel between said water chamber and the socket end of said body and controlling the passage of water from said chamber into said socket, the water passing from said socket through said series of passages to create a suction at the open end of said tubular extension, a nipple sleeved on the tubular extension of said body member and provided with a chamber and a circular series of relatively spaced passages leading from said chamber longitudinally through said nipple circumjacent the tubular extension, a member surrounding said body and providing therewith a sand chamber and also having an inlet for said sand chamber, and said member being provided with diagonal passages connecting the sand chamber with said tubular extension whereby the sand will be drawn from said sand chamber through said diagonal passages and into said tubular extension to discharge therefrom within the confines of the stream of water issuing from the nipple through the aforementioned passages in said nipple, and a nozzle member threaded on said nipple.

3. In a sand blast gun, a barrel provided with a chamber and a handle for the barrel having a water passage therethrough for supplying water to said chamber, a body member mounted on one end of the gun and provided at one end with a socket and a relatively opposite end with a hollow tubular extension providing a discharge passage, and a circular series of relatively spaced passages extending through said body from the socket end thereof, a valve arranged in the barrel between said water chamber and the socket end of said body and controlling the passage of water from said chamber into said socket, the water passing from said socket through said series of passages to create a suction at the open end of said tubular extension, a nipple sleeved on the tubular extension of said body member and provided with a chamber and a circular series of relatively spaced passages leading from said chamber longitudinally through said nipple circumjacent the tubular extension, a member surrounding said body and providing therewith a sand chamber and also having an inlet for said sand chamber, and said member being provided with diagonal passages connecting the sand chamber with said tubular extension whereby the sand will be drawn from said sand chamber through said diagonal passages and into said tubular extension to discharge therefrom within the confines of the stream of water issuing from the nipple through the aforementioned passages in said nipple, a nozzle member threaded on said nipple, and the member surrounding said body member having one end threaded on the gun barrel and the second end provided with a flange engaging said nipple whereby said member serves as a coupling for retaining said body member and said nipple together with said nozzle on one end of the gun barrel.

4. In a sand blast gun, a barrel provided with a chamber and a handle for the barrel having



2,071,472

3

a water passage therethrough for supplying water to said chamber, a body member mounted on one end of the gun and provided at one end with a socket and a relatively opposite end with a hollow tubular extension providing a discharge passage, and a circular series of relatively spaced passages extending through said body from the socket end thereof, a valve arranged in the barrel between said water chamber and the socket end of said body and controlling the passage of water from said chamber into said socket, the water passing from said socket through said series of passages to create a suction at the open end of said tubular extension, a nipple sleeved on the tubular extension of said body member and provided with a chamber and a circular series of relatively spaced passages leading from said chamber longitudinally through said nipple circumjacent the tubular extension, a member surrounding said body and providing therewith a sand chamber and also having an inlet for said sand chamber, said member being provided with diagonal passages connecting the sand chamber with said tubular extension whereby the sand will be drawn from said sand chamber through said diagonal passages and into said tubular extension to discharge therefrom within the confines of the stream of water issuing from the nipple through the aforementioned passages in said nipple, and said valve means including a removable valve seat positioned in the barrel between said chamber and the socket end of the first mentioned member, a packing secured within one end of the barrel and including a gland nut having an internally threaded bore, and a valve engaging said seat and having a stem extending through the packing and the bore of the gland nut, said stem being provided with a section threaded complementary to the threads of said packing for cooperation therewith whereby said valve may be secured at the desired position of adjustment relative to the valve seat.

5. In a sand blast gun, a barrel provided with a chamber and a handle for the barrel having a water passage therethrough for supplying water

to said chamber, a body member mounted at one end of the gun and provided at one end with a socket and a relatively opposite end with a hollow tubular extension providing a discharge passage, and a circular series of relatively spaced passages extending through said body from the socket end thereof, a valve arranged in the barrel between said water chamber and the socket end of said body and controlling the passage of water from said chamber into said socket, the water passing from said socket through said series of passages to create a suction at the open end of said tubular extension, a nipple sleeved on the tubular extension of said body member and provided with a chamber and a circular series of relatively spaced passages leading from said chamber longitudinally through said nipple circumjacent the tubular extension, a member surrounding said body and providing therewith a sand chamber and also having an inlet for said sand chamber, said member being provided with diagonal passages connecting the sand chamber with said tubular extension whereby the sand will be drawn from said sand chamber through said diagonal passages and into said tubular extension to discharge therefrom within the confines of the stream of water issuing from the nipple through the aforementioned passages in said nipple, and said barrel means including a removable valve seat positioned in the barrel between said chamber and the socket end of the first mentioned member, a packing secured within one end of the barrel and including a gland nut having an internally threaded bore, a valve engaging said seat and having a stem extending through the packing and the bore of the gland nut, said stem being provided with a section threaded complementary to the threads of said nut for cooperation therewith whereby said valve may be secured at the desired position of adjustment relative to the valve seat, and said handle being provided at the free end thereof for the coupling of a hose thereto.

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45