United States Patent

Nolan

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[54] WET SANDBLAST GUN

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[52] **U.S. Cl.** **51/8,** 51/11
[51] **Int. Cl.** **B24c 3/06**
[58] **Field of Search** 51/8, 11, 321

[56] **References Cited**

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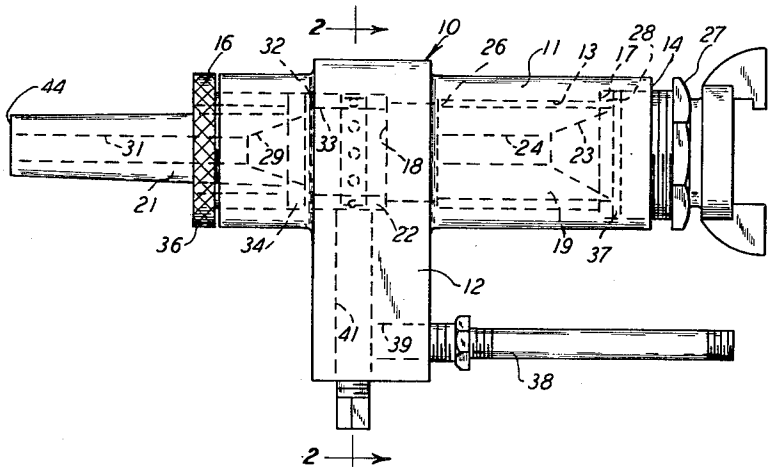
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Attorney—Arthur J. Hansmann

[57] **ABSTRACT**

A gun housing including a barrel having a cylindrical opening extending through the barrel. Replaceable parts are located within the barrel for receiving sand in one end of one of the parts and for directing it to the other parts for flow through the gun. A water jacket part is provided in the barrel and a water inlet opening and a water connection are incorporated in the housing for introducing water into the chamber where the sand and water are mixed for flow of the wet sand from the outlet end of the gun.

3 Claims, 5 Drawing Figures



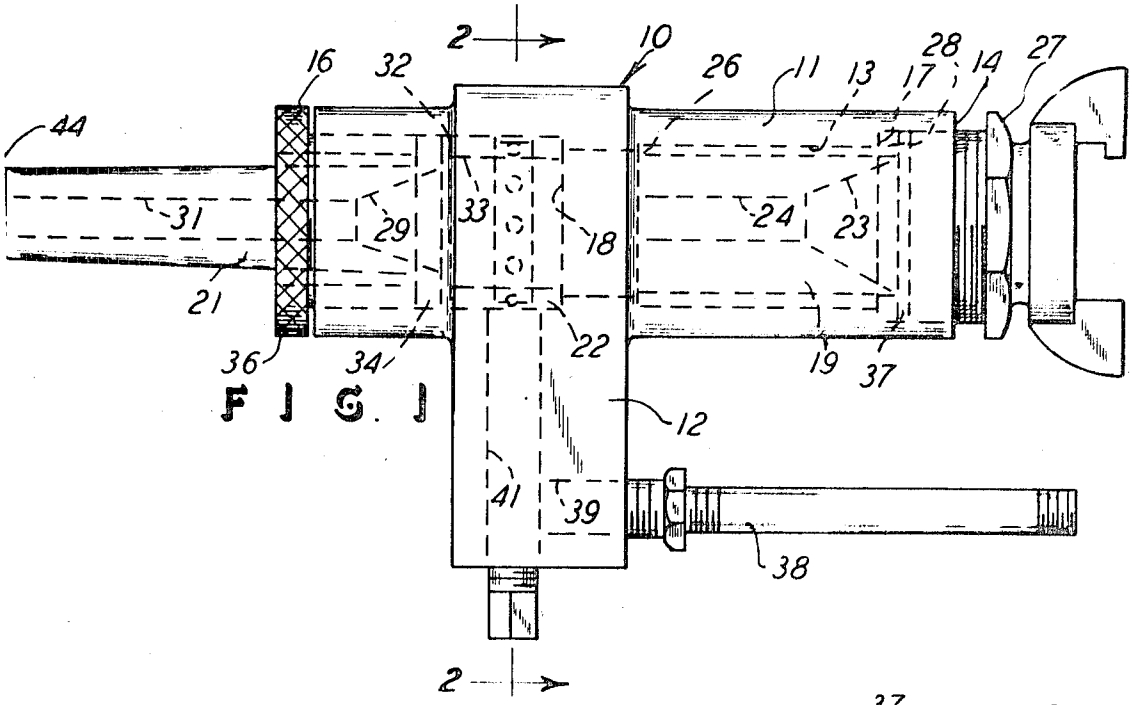


FIG. 1

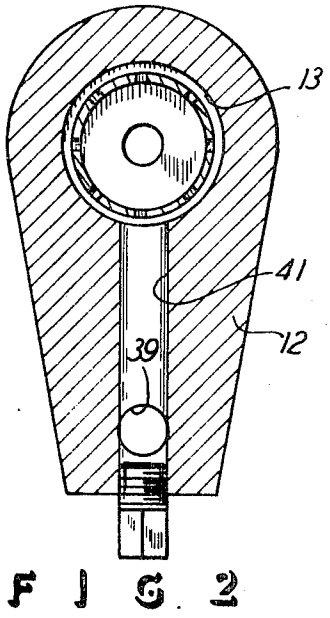


FIG. 2

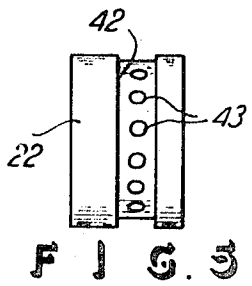


FIG. 3

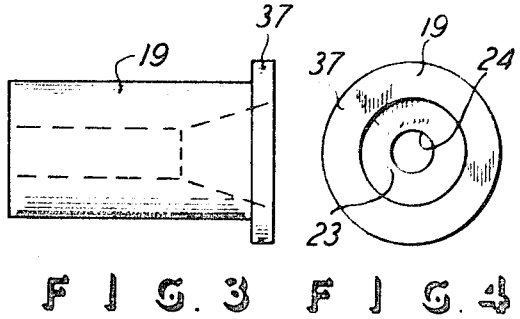


FIG. 4

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WET SANDBLAST GUN

This invention relates to a wet sandblast gun of the type used in the cleaning of exteriors of buildings or the like.

BACKGROUND OF THE INVENTION

The prior art is already aware of sandblast guns which receive both sand and water under pressure for mixing the sand and water in the gun and for blowing the wet mixed sand against a building or other object for cleaning. The prior art guns are provided with a gun housing having a barrel or passageway and with a multiplicity of complexly shaped parts disposed within the barrel for achieving the passage and mixing of the sand and water, as mentioned. Such prior art guns are subjected to abrasive action created by the flow of the sand through the gun, and there is a further problem and concern with regard to adequately and effectively mixing the sand and water for the desired condition of wet sand. These prior art complex parts are themselves subject to abrasive wear, in addition to the wear caused by the sand against the gun housing proper, and the parts are also subject to clogging and failure due to misalignment and the wear.

Accordingly, it is a general object of this invention to provide a sandblast gun which mixes sand and water and provides for the easy flow of sand and water through the gun with a minimum of abrasive wear and clogging and inefficiency of the gun itself. In accomplishing this object, the gun of this invention is made with replaceable parts which extend along the barrel of the gun and which are subjected to the sand and water passing through the gun. The parts therefore shield the gun itself from the abrasive action of the sand, and the parts are arranged for easy removal for replacement and cleaning, but, they are nevertheless easily positioned in fluidtight relationship in the gun so that pressures such as 100 pounds per square inch of sand pressure can be applied to the gun without damaging the gun and without escaping from the gun in any place except the outlet end of the gun.

Another important object of this invention is to provide a sandblast gun which is simplified in its construction, compared to the prior art guns, and which is easier to manufacture, maintain, and use, all compared to the prior art guns.

Another important object of this invention is the provision of a sandblast gun which is arranged with parts providing a continuous and straight flow path for the sand, so that there is a minimum of abrasive action of the sand on the parts and the gun itself, and there is a maximum of efficiency in the gun and a maximum utilization of the fluid pressure applied to the sand in introducing the sand to and directing it through the gun.

Other objects, advantages, and improvements over the prior art will become apparent upon a study of the prior art and a consideration of the following description.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevation view of a preferred embodiment of this invention.

FIG. 2 is a sectional view taken along the line 2—2 of FIG. 1.

FIG. 3 is a side elevational view of a part shown in dotted lines in FIG. 1.

FIG. 4 is an end elevational view of the parts shown in FIG. 3.

FIG. 5 is a side elevational view of a part shown in dotted lines in FIG. 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The drawings show the sandblast gun to include a housing, generally designated **10** and having a substantially tubular portion **11** and a handle portion **12**. The housing **10** has a cylindrical opening **13** extending therethrough from the sand inlet end **14** to the sand outlet end **16**. The barrel portion **11** also presents a first annular shoulder **17** on the interior thereof, and it presents a second annular shoulder **18** on the interior thereof.

The gun is provided with three removable pieces **19**, **21**, and **22**. These pieces in turn have passageways extending therethrough, and the passageways are coaxially aligned in the coaxially positioned pieces, as shown in FIG. 1. Thus the piece **19** has a conical opening **23** which extends centrally in the piece **19** and to a cylindrical opening **24**, such that the openings **23** and **24** extend through the piece **19** and from end to end thereof for the passage of sand through the openings **23** and **24**. It will also be noted that the piece **19** has its enlarged end **37** in abutment with a washer **28** which in turn abuts the first shoulder **17**. The piece **19** is removable from the gun, but the piece **19** is held in place by a threaded connector **27** which threads into the barrel **11** and abuts the end **37** to compress the fluidtight washer **28**. The connector **27** is a connector for attachment to the sand hose which is not shown but which would connect to the piece **27** for introducing sand, at 100 pounds per square inch, into the gun and initially into the first removable piece **19** for sand flow to piece end **26**.

The removable piece **21** is somewhat similar in shape to the removable piece **19**, and the piece **21** includes a conical passageway **29** and a cylindrical passageway **31** which is in flow communication with the passageway **29** and is shown smaller in cross section, just as the passageway **24** is smaller in cross section than is the inlet end of the passageway **23**. With the shape of the passageways of the pieces **19** and **21**, the material flowing therethrough is introduced into the pieces **19** and **21** at the large ends thereof and is then confined to the smaller and outlet ends of the respective pieces for the desired high-speed and high-pressure flow of the material through the pieces. Also, the pieces **19** and **21** protect the barrel **11** from contact by the sand flowing through the gun.

The piece **22** is in abutment with the shoulder **18**, and a fluidtight washer **32** exists between the piece **21** and the piece **22** to permit the flow of sand between the pieces but to preclude the escape of fluid pressure and to protect the gun from the sand. Thus the piece **22** has a cylindrical opening **33** which receives the sand passing through the gun and which directs the sand toward the piece **21**.

The piece **21** has a flange **34** which is engaged by a threaded connector **36** extending into the barrel **11** and against the flange **34** for holding the piece **21** to the barrel **11** and against the washer **32**. This arrangement is the same as the flange **37** on the piece **19** for abutting the washer **28** and the first shoulder **17** in fluid tightly securing the piece **19** in the gun.

A water connector **38** attaches to the gun portion **12** and is in communication with a passageway **39** which in turn is in flow communication with a passageway **41** extending in the gun portion **12**. The passageway **41** extends to the piece **22** which is shown to have a groove **42** around the exterior thereof for receiving the water passing through the passageway **41**. Also, the piece **22** is perforated by being provided with holes **43** through which the water can pass and move into the interior of the cylindrical piece **22** and into its interior chamber **33**. In the chamber **33**, the water and sand are mixed, and the mixture of the wet sand then continues to flow through the gun by passing into the piece **21** and through the piece and its outlet end **44**.

Therefore, the sand under high pressure, and the water under common water pressure of approximately 20 pounds per square inch, are mixed in the chamber of the gun and are then passed from the gun in the condition of wet sand. In this process, the various parts described provide one straight line of flow of the sand through the gun, and the water is introduced into the gun at the chamber which is enlarged, compared to the cross section of the passageways **24** and **31**, so that the water and sand can be adequately mixed for passing them from the gun.

It will now be appreciated that the described parts protect the gun from the abrasive action of the fast moving sand under high pressure, and the parts are also removable from the gun for cleaning and replacement, as necessary. Therefore, it will be seen and understood that the pieces **19**, **21**, and **22** are replaceable pieces, and the piece **22** is shown to extend diametrically inwardly with respect to the size of the bore **13**

in the gun and at the extent of the passageway or opening 33 in the piece 22, also that the piece 22 can be tapped out of the gun outlet end as the bore 13 is sufficiently large through the outlet end for the insertion and removal of the piece 22 as described.

I claim:

1. A wet sandblast gun comprising a gun housing including a barrel having a cylindrical opening extending therethrough and presenting a sand inlet end, at one end of said barrel, and presenting a sand outlet end, at the other end of said barrel, a first shoulder in said barrel and facing said sand inlet end, a second shoulder in said barrel and facing said sand outlet end, a first nozzle piece removably positioned in said barrel in fluidtight relationship with said first shoulder and having a bore therethrough extending coaxially with said cylindrical opening and being reduced in cross section at the end toward said sand outlet end and compared to the cross section at the end toward said inlet end, a perforated cylinder in said cylindrical opening intermediate said sand inlet and outlet ends thereof and being in axially abutting relation with said second shoulder and having perforations for receiving water at the exterior of said cylinder and passing it to the interior chamber of said cylinder, and a second nozzle piece removably positioned in said barrel in fluidtight relationship therewith and at said outlet end and having a bore therethrough extending and reduced as with said first nozzle piece, said first nozzle piece and said cylinder and said second nozzle piece all being coaxially aligned in said barrel and in fluid flow communication, a threaded connector on each said end of said barrel for abutment with the respective one of said nozzles and for releasably securing said nozzles in their fluidtight relationship with said barrel, said connector at said sand inlet end being a sand supply hose type of connector and being in fluid flow communication with said first nozzle piece for introducing sand into said first nozzle piece, and said barrel having a water passageway extending to said cylinder for introducing water to said cylinder interior chamber for mixing with the sand.

2. The wet sandblast gun as claimed in claim 1, wherein said cylinder interior chamber is substantially larger in cross section than the cross section of the end of said first nozzle piece adjacent said cylinder, for mixing the sand and water in said chamber.

3. The wet sandblast gun as claimed in claim 2, wherein said cylinder has an outer diameter of a size slidable into said barrel through said sand outlet end and to said second shoulder, and said cylinder has an inner diameter of a size smaller than the diametric extent of said first shoulder, for leaving said cylinder available to be tapped out of said barrel through said sand outlet end for replacement of said cylinder.

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