

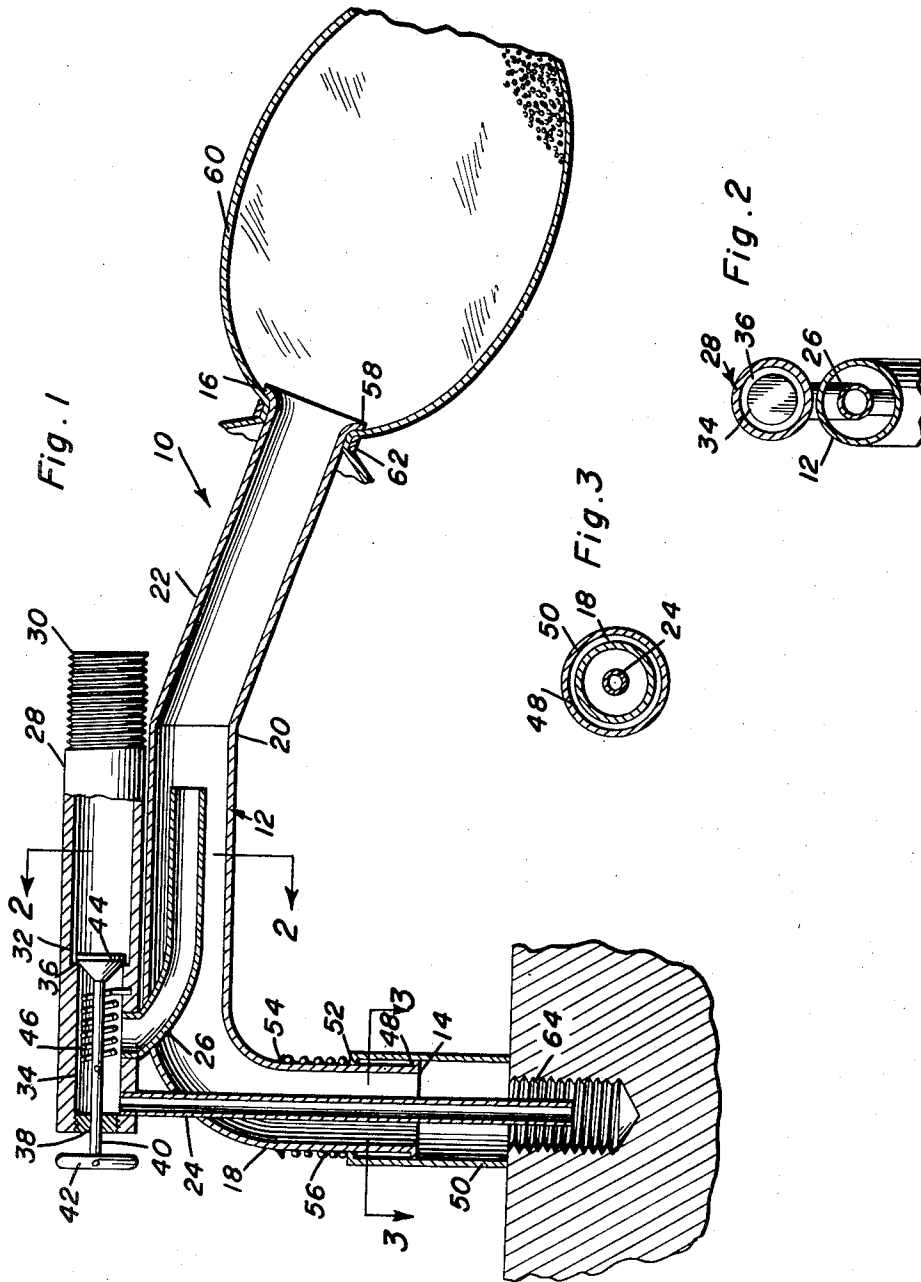
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G. F. HAKA

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TOOL FOR CLEANING BLIND BORES

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George F. Haka
INVENTOR.

BY *Alvince A. O'Brien*
and *Harvey B. Jacobson*
Attorneys

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TOOL FOR CLEANING BLIND BORES

George F. Haka, Lansing, Mich.

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1 Claim. (Cl. 15—345)

The present invention relates to a tool for cleaning blind bores.

The primary object of the invention is to provide a blind bore cleaning tool wherein a current of air is employed for blowing out foreign particles from a blind bore while at the same time creating a vacuum for conducting the dislodged foreign particles to a place remote from the bore.

A highly important object of the invention, ancillary to the primary object, is the provision of a tool of the class described wherein the same air current is utilized both as a pressure jet to dislodge foreign particles from a blind bore and as means for creating a partial vacuum within the vacuum conduit or barrel through which the dislodged foreign particles are conducted.

Another important object of the invention is to provide a vacuum conduit for the dislodged particles having an extensible sleeve on one end thereof whereby the tool is capable of use with bores of different depths while maintaining the opening of the bore in alignment with the vacuum discharge conduit without destroying the partial vacuum within this conduit.

These, together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a side elevational view in cross section of the blind bore vacuum cleaning tool constituting the present invention;

Figure 2 is a cross sectional view of a portion of the tool taken substantially along the plane of section line 2—2 of Figure 1; and

Figure 3 is a cross sectional view of another portion of the tool taken substantially along the plane of section line 3—3 of Figure 1.

In the drawings, the vacuum cleaning tool constituting the invention is designated in its entirety by the numeral 10. The tool 10 comprises essentially an elongated tube or barrel 12 having first and second sections 18 and 22, respectively connected by an intermediate section 20. For convenience to an operator utilizing the tool, the tube 12 is bent to dispose the first and intermediate sections 18 and 20 substantially at right angles to one another. The section 22 is angled downwardly from the intermediate section 20, as shown in Figure 1, so that a discharge open end 16 thereof and of the tube 12 is disposed below the level of the connection of the intermediate section 20 to the first section 18 of the conduit.

A pair of first and second tubes 24 and 26 project into the conduit 12 intermediate the ends thereof with first tube 24 being of a relatively small diameter and projecting axially through the first section out of the entrance or mouth end 14 of the section 18 and tube 12. The second tube 26 extends parallel to the intermediate section 20 of the tube 12 and opens within this section.

Valve means for admitting fluid under pressure to the

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tubes 24 and 26 is designated generally by the reference numeral 28. As shown, this valve means consists of an elongated, hollow cylinder having a threaded, open end 30 for attachment to a suitable source of fluid under pressure, such as an air compressor, or the like (not shown).

Within the cylinder 28 are a pair of axially extending chambers communicating with one another and with the open end 30. Chamber 32 opens at one end into the open end 30 of the cylinder 28 and at its opposite end into the second, relatively smaller, in diameter, chamber 34, the juncture between the chambers 32 and 34 forming an annular shoulder 36.

The other end of the cylinder 28 is closed by means of a plug 38 having an axial bore therethrough through which a plunger or piston rod 40 slidably projects. The outer end of the piston rod 40 disposed exteriorly of the cylinder 28 is provided with a suitable handle 42 whereas the inner end of the piston rod 42 is disposed within the chamber 32 and provided with a piston head 44 normally seating against the annular shoulder 36. To maintain the valve 44 on the seat 36, coil spring 46 attached at one end to an intermediate portion of the piston rod 40 and its other end to the wall of the chamber 34, continually urges the valve 44 into seating position. Tubes 24 and 26 open into the second chamber 34 and are thus normally closed off from the compressed air supply in chamber 32 by the valve 44.

The mouth end 14 of the tube 12 is provided with a lip 48. A shield or sleeve 50 slidably surrounds the first section 18 of the tube 12 and is provided with an intumed lip 52 at its upper end which seats against the lip 48 to define the outer or farthest extension of the shield 50. Flange 54 is secured to the outer surface of the first section 18 adjacent its juncture with the section 20 of the conduit 12 and coil spring 56 surrounding the section 18 reacts at its opposite ends against the flange 54 and the lip 52 of the shield 50 to continually bias the shield 50 outwardly of the first section 18 to its outermost position.

The discharge end 16 of the tube 12 is also formed with an outwardly turned lip as at 58 and a particle receiving receptacle 60 is secured to this end of the conduit 12 in any suitable manner, elastic band 62 being shown as attaching the bag at its mouth to the end 16.

The operation of the device is extremely simple. The mouth end 14 and consequently the shield 50 are placed in surrounding relation to a blind bore such as 64, downward pressure guiding the sleeve upwardly on the section 18 of the tube 12 and thus projecting the tube 24 into the blind bore. Then, by urging the plunger rod or piston rod 40 inwardly by means of the handle 42, the valve 44 is unseated from its seat 36 and compressed air is permitted to flow into the chamber 34 thence through the tubes 24 and 26. Compressed air flowing through the tube 24 dislodges foreign particles from the blind bore 64 while the compressed air jet flowing through the tube 26 creates a vacuum within the tube 12 toward the discharge end 16 of the tube whereby the foreign particles dislodged by the jet of air from the tube 24 are drawn through the tube or barrel 12 into the receptacle 60 out of harms way. With this expedient, the same air current is utilized both to dislodge the foreign particles from the blind bore and to conduct these foreign particles to a suitable receptacle away from the major area, from which receptacle these particles may be emptied in any suitable location.

The tool has found extensive use in the removal of loose carbon from head bolt bores and is obviously adaptable to any conditions wherein it is desired to remove foreign particles from blind bores. An air jet of a few seconds duration is usually sufficient to thoroughly clean the blind bore, consequently the tool is extremely eco-

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nomical to use as well as being easily handled and safe in its application.

From the foregoing, the construction and operation of the device will be readily understood and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claim.

What is claimed as new is as follows:

A tool for cleaning blind bores in an object comprising an open-ended barrel of uniform diameter having front and rear first and second sections connected by an intermediate section at a right angle to the first section, a coaxial, terminal, spring-loaded sleeve on said first section extending and spring biased to project outwardly therefrom for positioning against an object and around a bore in the object, a tubular valve housing on said intermediate section parallel therewith for connection at one end to a source of air under pressure, a first tube extending radially from the other end of the valve housing through said first section and sleeve along the axis thereof and along the major portion of the length of the sleeve for blowing air from said valve housing into a bore and being spaced from said front section and sleeve to provide a vacuum space communicating with said intermediate section,

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tion, a second tube leading from said other end of the valve housing into said intermediate section in the axis thereof and opening rearwardly in said intermediate section and being spaced therefrom to blow air from said valve housing out of the barrel and create a suction through said barrel, and a spring-loaded plunger valve in said housing manually operative longitudinally of said housing for controllably admitting air from said housing into both tubes.

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