Dec. 12, 1950 E. H. SHAFF 2,534,183

BLOW GUN FOR CLEANING MACHINES OR THE LIKE

Filed Feb. 6, 1948

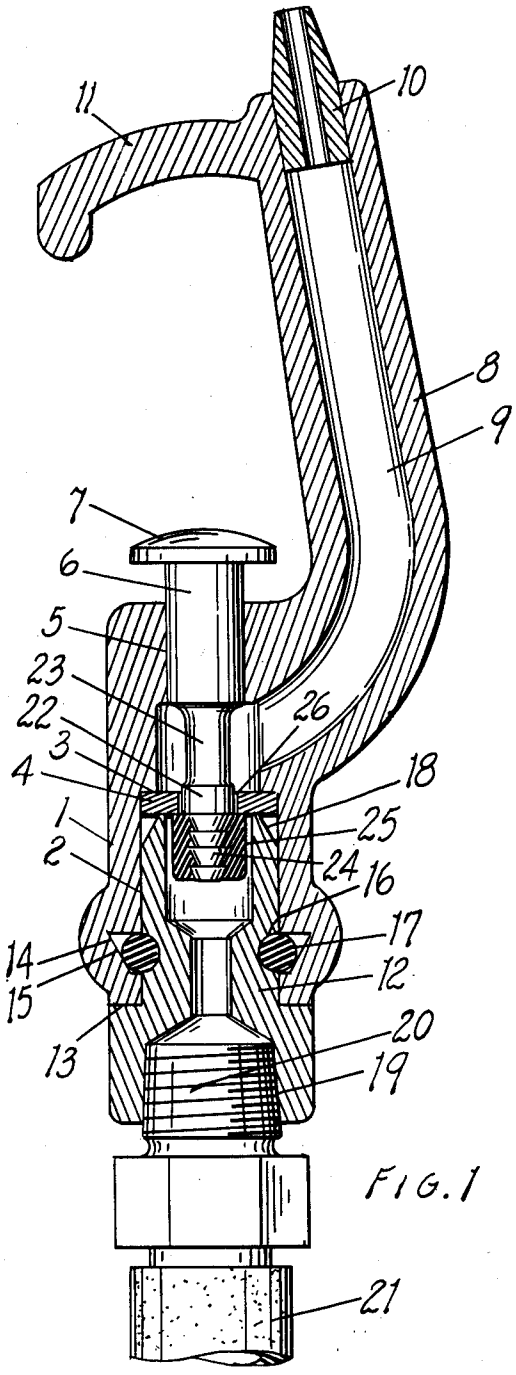


FIG. 1

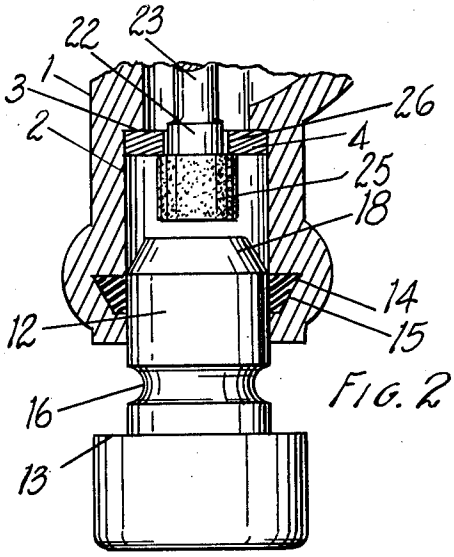


FIG. 2

INVENTOR.
Ernest H. Shaff
BY
Attorney.

Patented Dec. 12, 1950

2,534,183

UNITED STATES PATENT OFFICE

2,534,183

BLOWGUN FOR CLEANING MACHINES OR THE LIKE

Ernest H. Shaff, Spring Lake, Mich.

Application February 6, 1948, Serial No. 6,578

6 Claims. (Cl. 299—150)

1

This invention relates to improvements in blow guns for cleaning machines and the like.

The main objects of this invention are:

First, to provide a blow gun for cleaning machines and the like which is efficient and at the same time easily manipulated to deliver a moderate blast of air or a full blast of air, as occasion may require.

Second, to provide a blow gun in which the parts are economical to produce and very easily assembled.

Third, to provide a blow gun including a swiveled coupling member in which the coupling member constitutes means for supporting the valve seat member in operative position and also adapted for a hose connection, the means for securing the coupling member to the body member also constituting a packing for the joint between the body and coupling members.

Fourth, to provide a blow gun in which the parts are assembled without the use of screws.

Objects relating to details and economies of the invention will definitely appear from the description to follow. The invention is defined in the claims.

A structure which embodies the features of the invention is clearly illustrated in the accompanying drawing, in which:

Fig. 1 is a view of my improved blow gun mainly in longitudinal section with a hose attached thereto, parts of the valve being shown in full lines.

Fig. 2 is a fragmentary view partially in longitudinal section illustrating certain of the steps of assembling.

The embodiment of my invention illustrated comprises a body member 1 desirably formed as a casting and having a bore-like cylindrical chamber 2 disposed longitudinally thereof. This chamber is stepped at 3 to provide an annular shoulder constituting a supporting seat for the valve seat member 4. This seat member 4 is disk-like in shape and preferably of non-metallic material such as fabric or relatively hard rubber. The body member is provided with a bearing 5 at its outer end for the valve stem 6 which is provided with a fingerpiece 7.

The nozzle extension 8 is laterally offset from the body and preferably inclined relative to the axis thereof, the passage 9 of this nozzle opening to the side of the chamber at the front side of the valve seat member. The nozzle tip 10 is a separate piece inserted in the passage of the nozzle extension to project therefrom. The hook 11 extends from the outer end of the nozzle extension 8 to provide means for hanging up the gun.

2

The inner coupling member 12 is a rotatable fit within the larger portion of the chamber 2 of the body member and is provided with a shoulder 13 abutting the inner or rear end of the body member. The inner end of this coupling member is in supporting engagement with the valve seat member when the parts are assembled.

The body member is provided with an internal groove 14 desirably having a rearwardly inclined bottom 15. The coupling member is provided with an annular external groove 16 desirably of curved section. The ring 17 is of such diameter that when seated in the groove 16 it projects into the groove 14 to rotatably or swivelly retain the coupling member in assembled relation to the body member. The ring 17 is formed of resilient or expansible material so that it may be expanded into the groove 14 when the coupling member is assembled with the body member as illustrated in Fig. 2.

The inner end of the coupling member is externally beveled at 18 to facilitate this assembly, the bevel being such that as the coupling member is pushed into the body member its beveled end engages the ring previously assembled in the body member and forces it into the groove 14. When the groove 16 comes into register with the groove 14 the ring contracts into the groove 16 to the position shown in Fig. 1, in which position it serves as a retaining means for the coupling member and also as a packing or seal for the joint between the coupling member and the body member. The outer end of the coupling member has an internally threaded socket 19 adapted to receive the hose coupling 20, the hose being conventionally illustrated at 21.

The valve stem is provided with a cylindrical head portion 22, a reduced portion 23 between the head and the bearing portion of the stem, and a serrated stud 24 at the inner or rear end of the stem. The valve 25 is formed of resilient material and may be a section of suitable rubber tubing. It is sleeved upon the stud and retainingly engaged by the serrations. The valve is adapted to seat against the inner or rear side of the valve seat member as illustrated in Fig. 1. No seating springs are employed, the air pressure acting to seat the valve and hold it to its seat except as the valve is manually opened. The cylindrical portion 22 is of a length exceeding the thickness of the valve seat member 4 and is of a diameter approximating but slightly less than the diameter of the port 26.

The body member is designed to serve as a

handle or grip for the gun and may be grasped so that the index finger may be engaged with the fingerpiece of the valve.

My improved blow gun is well adapted for use by machinists, machine operators, tool makers and the like for blowing chips and other debris from the machines and from the work. There are many cases where it is desirable not to have a heavy blast of air as that results in blowing the chips or debris on to other parts of the machine and scattering to other work and even to adjacent machines. My improved valve is designed so that so long as the cylindrical head portion 22 remains within the port a restricted quantity of air is delivered as the valve is disengaged from its seat. If a full delivery is desired the valve may be opened to such an extent that the cylindrical portion clears the port, bringing the reduced portion of the stem into the port and thereby giving a full discharge or heavy blast of air.

I have illustrated and described my invention in a highly practical embodiment thereof, both from the standpoint of use and the economy of parts an assembly thereof. I have not attempted to illustrate other embodiments which I contemplate as it is believed this disclosure will enable those skilled in the art to embody or adapt my invention as may be desired.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A blow gun comprising a body member having an internally cylindrical chamber stepped to provide an annular rearwardly facing shoulder and having an internal annular groove of angular radial cross section adjacent its rear end, said body having a valve stem bearing at its outer end alined with said chamber and a laterally offset nozzle extension opening to the chamber at the outer side of said shoulder, a disk-like valve seat member seated on said shoulder and having a central port, a coupling member rotatable within said body member in supporting engagement with said valve seat member, said coupling member having an annular groove registering with said internal groove in said body member, a ring of resilient material and circular radial cross section seated in said groove in said body member to project into said groove in said coupling member for retainingly and swivelly supporting the coupling member within the body member and constituting a packing for the joint between said body member and coupling member, the groove in said coupling member being of semi-circular radial cross section and of such size as to permit the completely filling cross sectional expansion of said ring therein when the coupling member is forced into the body member, a valve comprising a stem slidably supported in said bearing, a head portion and a serrated stud at the inner end of said head portion, and a resilient valve sleeved upon said stud to retainingly engage the serrations thereof and to coact with said valve seat member, said head being slightly smaller than said port and the portion of said stem adjacent to said head being substantially smaller than said port whereby said valve is cooperative with said valve seat to selectively close said port and open said port to two sizes of valve opening.

2. A blow gun comprising a body member having an internally cylindrical chamber stepped to provide an annular rearwardly facing shoulder and having an internal annular groove adjacent its rear end, said body having a valve stem bearing at its outer end alined with said chamber and a laterally offset nozzle extension opening to the chamber at the outer side of said shoulder, a disk-like valve seat member seated on said shoulder and having a central port, a coupling member rotatable within said body member in supporting engagement with said valve seat member, said coupling member having an annular groove registering with said internal groove in said body member, a ring of resilient material seated in said groove in said body member to project into said groove in said coupling member for retainingly and swivelly supporting the coupling member within the body member and constituting a packing for the joint between said body member and coupling member, the groove in said coupling member being such as to permit the cross sectional expansion of said ring therein when the coupling member is forced into the body member, a valve comprising a stem slidably supported in said bearing, a head portion and a stud at the inner end of said head portion, and a resilient valve sleeved upon said stud to coact with said valve seat member, said head being slightly smaller than said port and the portion of said stem adjacent to said head being substantially smaller than said port whereby said valve is cooperative with said valve seat to selectively close said port and open said port to two sizes of valve opening.

3. A blow gun comprising a body member having an internally cylindrical chamber stepped to provide an annular rearwardly facing shoulder and having an internal annular groove adjacent its rear end, said body having a valve stem bearing at its outer end alined with said chamber and a laterally offset nozzle extension opening to the chamber at the outer side of said shoulder, a disk-like valve seat seated on said shoulder and having a central port, a coupling member rotatable within said body member in supporting engagement with said valve seat, said coupling member having an annular groove registering with said internal groove in said body member, a ring of resilient material seated in said groove in one of said members to project into said groove in the other of said members for retainingly and swivelly supporting the coupling member within the body member and constituting a packing for the joint between said body member and coupling member, the groove in said other of said members being such as to permit the cross sectional expansion of said ring therein when the coupling member is forced into the body member, a valve comprising a stem slidably supported in said bearing, a head portion and a stud at the inner end of said head portion, and a resilient valve sleeved upon said stud to coact with said valve seat, said head portion being of a length exceeding the thickness of said valve seat and of a diameter approximating but less than that of the port to permit restricted flow through the port when the valve is partially opened, the valve stem having a portion at the outer side of the head portion of less diameter than said head whereby when the valve is fully opened the reduced portion is within the port permitting increased flow of fluid.

4. A blow gun comprising a body member having an internally cylindrical chamber stepped to provide an annular rearwardly facing shoulder and having an internal annular groove adjacent its rear end, the groove having a rearwardly inclined bottom, said body having a valve stem bearing at its outer end alined with said chamber and a laterally offset nozzle extension open-

ing to the chamber at the outer side of said shoulder, a disk-like valve seat member seated on said shoulder and having a central port, a coupling member rotatable within said body member in supporting engagement with said valve seat member and shouldered to engage the rear end of said body member, said coupling member having an annular groove of curved section registering with said internal groove in said body member, a ring of resilient material seated in said groove in said body member to project into said groove in said coupling member for retainingly and swivelly supporting the coupling member within the body member and constituting a packing for the joint between said body member and coupling member, the groove in said coupling member being such as to permit the cross sectional expansion of said ring therein when the coupling member is forced into the body member, the inner end of said coupling member being externally beveled to radially extend and cross sectionally compress said ring and facilitate such expansion and the assembly of the coupling member within the body member, the coupling member being adapted to receive a hose connection, a valve comprising a stem slidably supported in said bearing, and a valve mounted on said stem to coact with said valve seat member.

5. A blow gun comprising a body member having an internally cylindrical chamber stepped to provide an annular rearwardly facing shoulder and having an internal annular groove adjacent its rear end, said body having a valve stem bearing at its outer end alined with said chamber and a laterally offset nozzle extension opening to the chamber at the outer side of said shoulder, a disk-like valve seat seated on said shoulder and having a central port, a coupling member rotatable within said body member in supporting engagement with said valve seat and shouldered to engage the rear end of said body member, said coupling member having an external groove registering with said internal groove in said body member, a ring of resilient material seated in said groove in one of said members to project into said groove in the other of said members for retainingly and swivelly supporting the coupling member within the body member and constituting a packing for the joint between said body member and coupling member, the groove in said other of said members being such as to permit the cross sectional expansion of said ring therein when the coupling member is forced into the body member, a valve comprising a stem slidably supported in said bearing, and a valve mounted on said stem to coact with said valve seat.

6. A blow gun comprising, a body member having an internally cylindrical chamber stepped to provide an annular rearwardly facing shoulder and having an internal annular groove adjacent its rear end, said body having a valve stem bearing at its outer end aligned with said chamber and a laterally offset nozzle extension opening to the chamber at the outer side of said shoulder, a disk-like valve seat seated on said shoulder and having a central port, a coupling member rotatable within said body member in supporting engagement with said valve seat, said coupling member having an external groove registering with said internal groove in said body member, a ring of resilient material seated in said groove in one of said members to project into said groove in the other of said members for retainingly and swivelly supporting the coupling member within the body member and constituting a packing for the joint between said members, the cross sectional shape of the groove in said one of said members being different than the normal cross sectional shape of said ring permitting the cross sectional deformation of said ring therein as said coupling member is forced into said body member, the groove in said other of said members being such as to permit the cross sectional expansion of said ring therein when said coupling member is forced into the body member, a valve comprising a stem slidably supported in said bearing, and a valve mounted on said stem to coact with said valve seat.

ERNEST H. SHAFF.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
807,243	Chapin	Dec. 12, 1905
1,873,304	Moody	Aug. 23, 1932
2,327,574	Zinkil et al.	Aug. 24, 1943
2,342,276	Hehemann	Feb. 22, 1944
2,370,245	Jacobsson et al.	Feb. 27, 1945
2,406,914	Sievers	Sept. 3, 1946

FOREIGN PATENTS

Number	Country	Date
284,863	Great Britain	Feb. 9, 1928
513,013	Great Britain	Oct. 2, 1939