Feb. 14, 1956 C. H. ELLIOTT 2,734,776

BLOW-GUN

Filed Feb. 6, 1953

Fig. 1

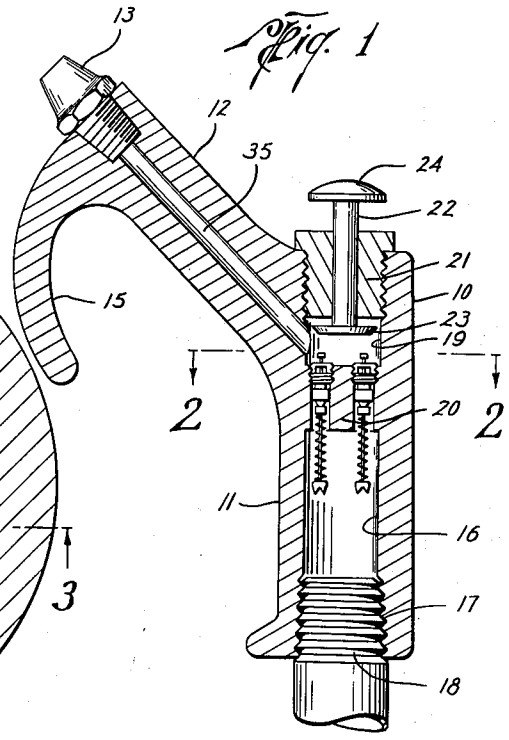


Fig. 2

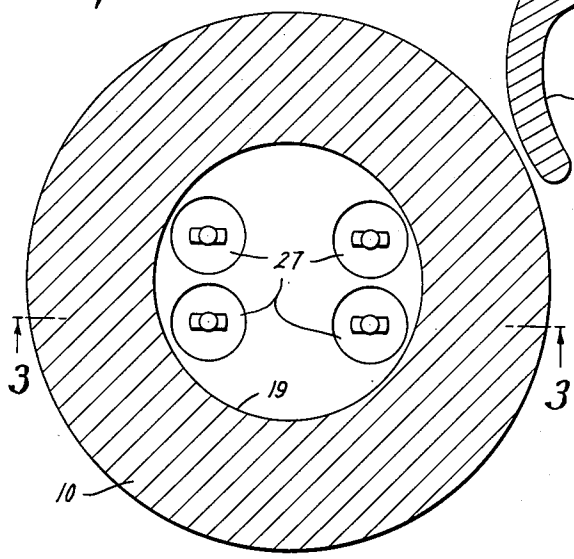


Fig. 3

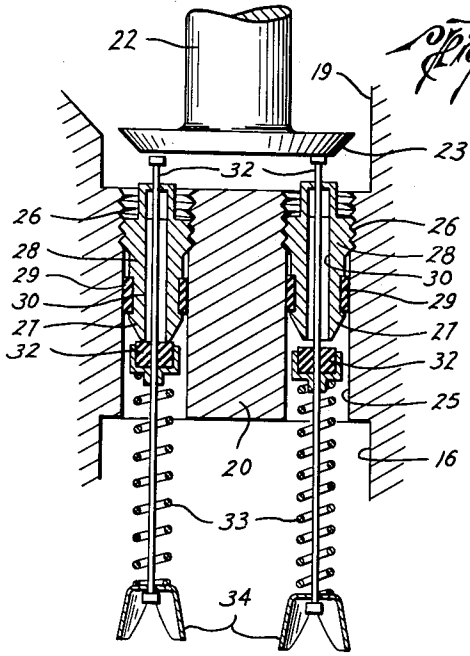
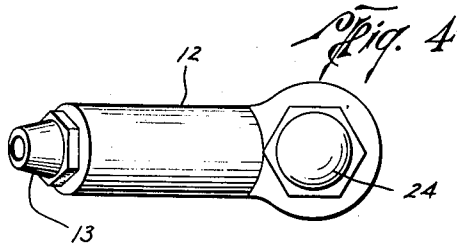


Fig. 4



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2,734,776

BLOW-GUN

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Application February 6, 1953, Serial No. 335,540

1 Claim. (Cl. 299—149)

This invention relates to blow-guns, consisting essentially of a hand held body having a passage extending therethrough, one end of which is provided with a nozzle while the other is shaped to receive an air hose, and containing manually operated valve means for controlling discharge of compressed air through the nozzle for cleaning purposes.

This application is a continuation-in-part of the copending application Serial No. 283,779, filed April 22, 1952.

One object of this invention is to provide such blow-guns with improved valve means, of relative large capacity, readily operable for controlling the discharge of compressed air through the nozzle.

Another object of this invention is to provide such blow-guns with valve means comprising a plurality of standard pneumatic tire core valves each constituting a single unit easily installed in and removed from the gun.

Another object of this invention is to provide valve means for blow-guns comprising a plurality of valve units arranged and disposed in a manner affording a smooth throttling action through which the amount of air discharged through the nozzle can readily be controlled.

For better understanding of the present invention, reference may be had to the accompanying drawing in which:

Figure 1 is a longitudinal sectional view of a blow-gun embodying the invention.

Figure 2 is an enlarged cross sectional view taken on line 2—2 in Figure 1.

Figure 3 is an enlarged sectional view taken on line 3—3 in Figure 2, and

Figure 4 is a top view of the blow-gun.

Referring to the drawing, the blow-gun consists of a body 10 made of any suitable metal such as aluminum, bronze, or cast iron, or of non-metallic material such as molded rubber, plastic and the like. It can be of any desired configuration, but preferably it comprises a hand grip portion 11 adapted to fit in the hand of the operator, and an outwardly tapered extension 12 projecting angularly therefrom and terminated by a removable nozzle 13. Toward its free end, the extension 12 is provided with an integral hook 15 through which the blow-gun may be hung at easy reach of the user.

The hand grip portion 11 has a central inlet bore 16 extending partway therein from the lower end thereof as seen in Figure 1, where it is screw threaded as at 17 to receive the threaded end 18 of a conduit through which compressed air is supplied to the bore 16. Similarly provided in the upper end of the hand grip portion 11, there is a second flat bottom bore 19 extending partway therein and defining, between its inner end and the inner end of the bore 16, a relatively thick partition or valve carrying wall 20. The second bore 19 is normally closed by a removable bushing 21 screwed therein, through which is slidable a plunger 22 formed with a relatively large flat face inner head 23 and an outer head or knob 24.

Drilled through the wall 20 on axes offset from but parallel to the center axis of the bores 16 and 19 are

several relatively small orifices 25 normally affording communication between the bores 16 and 19. Each orifice has its end adjacent the bore 19 screw threaded as at 26 to receive a standard pneumatic tire core valve unit 27. This valve unit, which is well known and universally obtainable, may briefly be described as comprising a housing 28, threaded at one end to fit in the threads 26, and carrying a ring packing 29 affording a fluid tight joint with the wall of the orifice 25. This housing has a central bore 30 extending therethrough in which is slidably mounted a valve stem 31 having a metal cup-shaped rubber filled valve head 32 rigidly secured thereon. This valve head has its under side engaged by one end of a compression spring 33 mounted on the stem while the other end engages a spring seat 34 slidable on the adjacent end of the stem 31. The other or free end of the valve or valve stem 31 extends into the bore 19.

The extension 12 has a passage 35 extending therethrough and connecting the bottom of the bore 19 to the nozzle 13. This passage together with bores 16 and 19 and orifices 25, constitute a passageway having the nozzle 13 as its outlet end and the threaded end 17 of the bore 16 as its inlet end. Interposed between the outlet and inlet ends of this passageway are the valve units 27 which are normally closed, and therefore prevent the flow of compressed air through the passageway.

The valve units 27 may be installed in or removed from the wall 20 by simply removing the screwed in bushing 21, thereby leaving the valve units readily accessible for installation or removal.

An important feature of this invention is to mount the four valve units in the wall 20 in such a manner as to position the free ends of the stems 31, when the valves are closed, at different distances from the flat face of the inner head 23 of the operating plunger 22, to cause successive opening of the valves upon downward movement of the plunger 22. Since the valves are normally held in closed position by the air pressure acting on the underside of the valve heads 32, it will be understood that with the valves opening successively, the user can gradually open the passageway leading to the nozzle 13 without having to overcome the combined pressure of the four valves. In other words, the pressure required by the operator on the plunger 22 to open all four valves is the same as that required to open one valve. Furthermore, the amount of compressed air discharged through the nozzle 13 may be controlled by the operator within a range of one valve partly opened to all valves fully opened.

The extent of variation in the distance between the free ends of the valve stems 31 and the inner head 23 of the plunger 22 need not be very pronounced. Only a few thousandths of an inch difference between each valve stem is sufficient to assure successive opening of the valves. This may be accomplished by purposely threading the holes 25 to different depths, thereby causing the entire valve units 27 to be differently spaced from the operating plunger head 23. In practice, excellent results have been obtained by simply relying on various manufacturing tolerances. Tolerances such as variations in the length of the valve stems, depth of the threads in holes 25, the degree of tightness with which the valve housings 28 are screwed in the orifices 25 and others, have been found sufficient to position the valve stems 31 in different distances from the plunger head 23 and cause successive opening of the valves upon downward movement of the operating plunger 22.

From the foregoing, it will be understood that the invention provides for a very simple and inexpensive blow-gun, wherein the often complicated valves heretofore used in such devices have been replaced by standard valves which are universally obtainable at relatively low

cost and can be installed in or removed from the blow-gun without any difficulty. It will further be understood that by providing a plurality of valves in the wall **20**, it has been possible to greatly increase the air capacity of the blow-gun while retaining all the advantages incident to the use of standard pneumatic tire core valves.

It is also apparent that with the valve stems **31** projecting into the lower end of the bore **19** in different spaced relationship with the inner end **23** of the plunger **22**, upon downward movement of the plunger the valves will automatically open successively, thereby enabling all the valves to be opened without undue resistance by the combined pressure of the compressed air urging the valves in closed position, and that this successive or gradual opening of the valves enables the user to readily control the amount of compressed air discharged through the nozzle **13**.

The details of structure and arrangements of parts shown and described may be variously changed and modified without departing from the spirit and scope of the invention.

I claim:

A blow-gun comprising a single member formed with an extension integral therewith, a compressed air conveying passageway within said member including an inlet bore having compressed air supplied thereto, a second bore coaxial with said inlet bore, a detachable bushing

closing the outer end of said second bore, a plunger slidable through said bushing, an air passage through said extension having one end opening into said second bore, a nozzle at the other end of said passage, a wall between said bores integral with said member, a plurality of orifices through said wall affording communication between said bores, interchangeable valve assemblies in said orifices each bodily removable as a unit upon removal of said bushing, each valve assembly including a valve member normally closing its respective orifice and a valve stem protruding into said second bore, said stems being substantially of equal lengths and adapted to be depressed by said plunger for causing said valve members to open said orifices, said valve assemblies being mounted in said orifices so that when said valve members close said orifices the free ends of said stems are differently spaced from said plunger to cause said valve members to open said orifices successively.

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