

Feb. 13, 1945.

N. KOEHN

2,369,356

BLOW GUN

Filed Jan. 29, 1941

FIG. 1

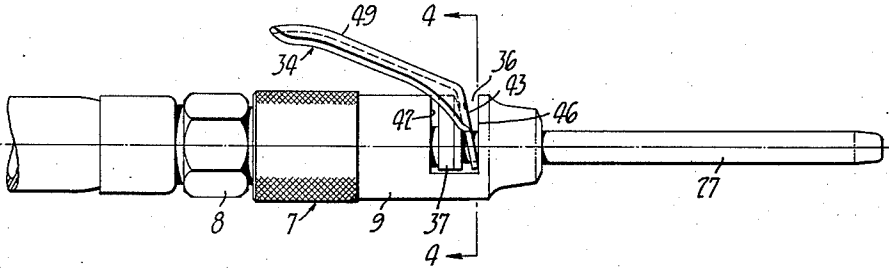


FIG. 2

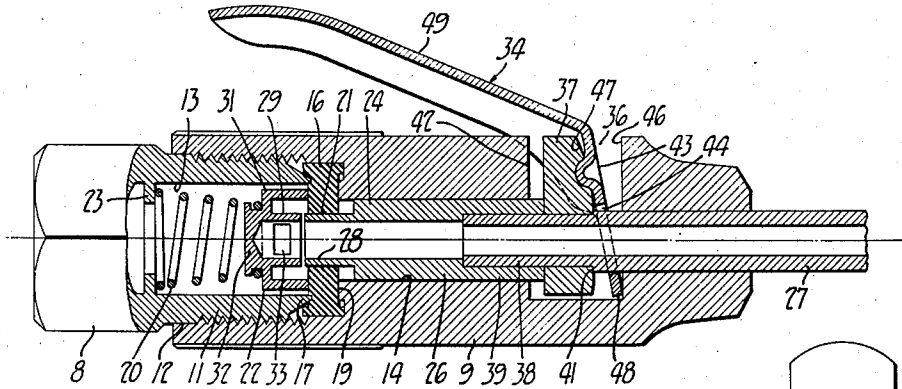
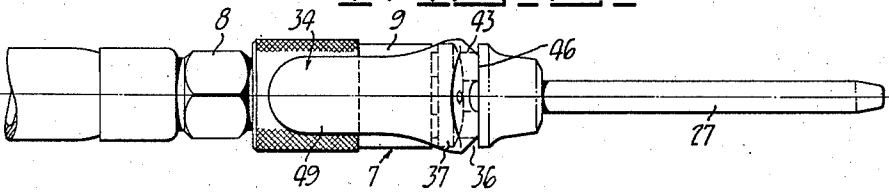
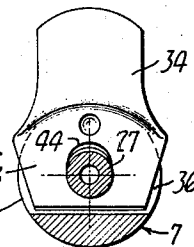
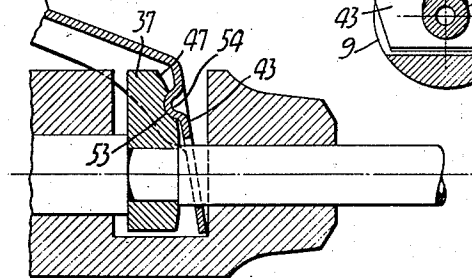


FIG. 3

FIG. 4



INVENTOR
Nathaniel Koehn
FIG. 5 - BY *Joseph B. Gartner*
his ATTORNEY

UNITED STATES PATENT OFFICE

2,369,356

BLOWGUN

Nathaniel Koehn, Berkeley, Calif.

Application January 29, 1941; Serial No. 376,446

1 Claim. (Cl. 251-115)

The invention relates to air tools of the type including, in combination, an air nozzle and a manually operated valve associated therewith for controlling the flow of air through the nozzle and used generally in shops and laboratories and the like for blowing off dust or metal particles from machinery and parts and the like, for air blasting, cleaning, etc.

An object of the invention is to provide a blow gun of the character described wherein the valve mechanism thereof will have a desirable short and very sensitive range of movement in combination with a manually operated lever which is so connected to the valve mechanism so as to greatly extend the operating range thereof and so reduce the required motivating force as to provide a device having a very easy and accurate manual operation.

Another object of the invention is to provide a blow gun of the character described wherein the exterior exposed moving parts of the device are relatively large and well spaced so as to permit easy and ready cleaning of the device and to avoid the lodging of sufficient dirt, oil or other foreign material in the ordinary use of the device to interfere with the operation of the blow gun.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of the invention which is illustrated in the drawing accompanying and forming part of the specification. It is to be understood, however, that variations in the showing made by the said drawing and description may be adopted within the scope of the invention as set forth in the claims. Referring to said drawing:

Figure 1 is a side elevation of a blow gun constructed in accordance with the present invention.

Figure 2 is a plan view of the blow gun illustrated in Figure 1.

Figure 3 is an enlarged longitudinal sectional view of a part of the blow gun illustrated in Figures 1 and 2.

Figure 4 is a cross-sectional view of the blow gun taken substantially on the plane of line 4-4 of Figure 1, the scale of Figure 4 being somewhat larger than that of Figure 1.

Figure 5 is a fragmentary longitudinal sectional view of enlarged size showing a portion of the blow gun.

The blow gun illustrated in the accompanying drawing consists of a main body 7 which is com-

posed of a pair of elongated tubular threadably attached sections 8 and 9, the attachment being here effected by threading one end portion 11 of the section 8 into an interiorly threaded end recess or socket 12 in the section 9. The sections are provided with longitudinal passages 13 and 14 therethrough which are positioned in longitudinal alignment and registration upon attachment of the sections as described. A sealing gasket 16 is clamped between the inserted end face 17 of the section 8 and the base 19 of the recess 12. Preferably, and as here shown, gasket 16 is formed with a central opening 21 which is axially aligned with the passages 13 and 14 and is of a smaller diameter than the passage 14, whereby the gasket will extend transversely into and partially across the passages 13 and 14.

A valve member 22 is mounted for longitudinal reciprocation in the passage 13 and is normally urged to a seated position against the gasket 16 by means of a helical spring 20 mounted in the passage 13 and compressed between the valve 22 and an internal shoulder 23 in the passage. Mounted for longitudinal reciprocation in the passage 14 is a tubular member 24, which is here composed of a pair of longitudinally aligned telescopically attached tubular sections 26 and 27 and serves as the air ejector nozzle of the device. One end 28 of the tubular member 24, here the inner end of the section 26, is reduced in diameter so as to tightly fit through the opening 21 in the gasket 16 to seal off this end of the tubular member and to engage and displace the valve 22 away from its seat on the gasket, to thereby place the tubular member 24 in registration with the passage 13. As will be seen from Figure 3, the valve member 22 is composed of concentric inner and outer annular walls 29 and 31 which are connected at their ends away from the gasket by an end wall 32 which serves as a seat or rest for one end of the spring 20. In the seated position of the valve member 22, the opposite end of the outer annular wall 31 engages the gasket 16 while the adjacent end of the inner annular wall 29 is positioned in aligned position with respect to the inner end 28 of the tubular member 24. Upon longitudinal displacement of the tubular member, to the left as viewed in Figure 3, the end 28 engages the adjacent end of the inner annular wall 29 and displaces the valve member to the left, thereby unseating the wall 31 from the gasket. In this unseated position of the valve, air or other fluid from passage 13 can flow into the end 28 of the tubular member by way of a

plurality of openings 33 provided in the annular wall 29.

Means for longitudinally displacing the tubular member 24 here consists of a manually operated lever 34 which is mounted in an opening 36 provided in the body section 9 and is therein operatively engaged with the tubular member 24 and a side of the opening to cause a longitudinal movement of the tubular member upon rocking of the lever. As will be seen from Figure 3, the sections 26 and 27 of the tubular member 24 are of such construction and length that the telescopic attachment of these sections is arranged at the opening 36, and in accordance with the present construction, an abutment member 37 is mounted on a reduced end portion 38 of the section 27 which is telescopically received into the adjacent end portion 39 of the section 26, whereby the abutment member 37 is clamped between the end of the portion 39 and a shoulder 41 at the end of the reduced portion 38. Preferably the interfitting portions 38 and 39 are of pressed fit whereby the abutment member 37 is permanently anchored in place in the opening 36 adjacent to one end wall 42 of the opening. The lever 34 is provided with an end portion 43 which is positioned in the opening 36 and provided with an opening 44 loosely surrounding the tubular member between an opposite end wall 46 of the opening 36 and the adjacent opposed end surface 47 of the abutment. The free end 48 of the lever is positioned below the tubular member and may be moved to engage the end wall 46 of the opening as illustrated in Figure 3, so as to serve as a point of support for the lever when rocked against the face 47 of the abutment to longitudinally displace the tubular member 24. Preferably the end face 47 of the abutment is curved to facilitate movement of the lever thereagainst. As here shown the end face 47 of the abutment 37 is formed with a bearing recess 53 which is adapted to receive a rounded projection 54 formed on the end portion 43 of the operating lever 34. This form of bearing engagement between the lever and abutment, as will be evident, will cause the lever to pivot rather than slide on the abutment, and thus provide a very smooth and practically effortless abutment displacing action. The outer end portion 49 of the lever is preferably bent at an angle from the end portion 43 extended into the opening so as to overlie the body portion of the device for convenient engagement by the fingers of the operator in the normal grasping of the device.

As will be seen from the foregoing, the relatively strong action of spring 20 aided by the air pressure in passage 13 provides a firm positive seating of the valve 31 on the gasket, and by reason of the direct end abutment of the valve with the gasket, only a relatively small move-

ment of the valve away from the gasket is necessary in order to provide substantially full output of air. In this manner a desirable positiveness and short range and sensitivity of operation is obtained. While this strong positive operation of the valve mechanism is desirable from a mechanical standpoint, a longer range of movement and a substantially reduced force of motivation is desirable from an operational standpoint. The lever construction here used provides a substantial mechanical advantage wherein relatively large easy movement of the outer end of the lever is translated into a short powerful movement of the valve. In this manner the range of the valve movement is considerably extended and easy and accurate of operation of the device results over the full operating range of the air gun.

As another important feature of the present construction, the opening 36 is of sufficient size relative to the size of the abutment 37 and the lever end portion 43 to provide a substantial spacing between the abutment and the lever from the adjacent walls of the opening, thereby rendering the device easy to clean and avoiding the lodging of sufficient oil or dirt or other foreign matter to interfere with the normal operation of the device. As will be seen from Figure 3, a substantial spacing is provided between the abutment 37 and the end wall 42 of the opening and between the opposite side of the abutment and the opposite end wall 46 of the opening. Also the lever may be moved by reason of its loose connection to the tubular member, into a position where the same is completely spaced from the abutment member 47 to thereby enable ready cleaning between these members.

I claim:

In a blow gun of the character described, a body having axially spaced bearing portions with aligned bores, an air tube slidable axially in and extending through said bores and being exposed exteriorly in the space between said bearings, an abutment fixed on said tube and positioned in said space for movement between the adjacent ends of said bearings, an operating lever member inserted within said space and having a perforated end portion loosely surrounding said member and positioned between said abutment and an inner end of one of said bearings, said abutment having a bearing recess provided in an end face thereof opposed to said lever, and a bearing projection on said lever engageable in said recess, said lever being adapted when swung about said tubular member to engage one end of said lever against the adjacent bearing and to engage said projection in said recess to longitudinally displace said tubular member.

NATHANIEL KOEHN.