

G. B. PICKOP.
CLEANING DEVICE.
APPLICATION FILED JULY 1, 1918.

1,415,467.

Patented May 9, 1922.

Fig. 1.

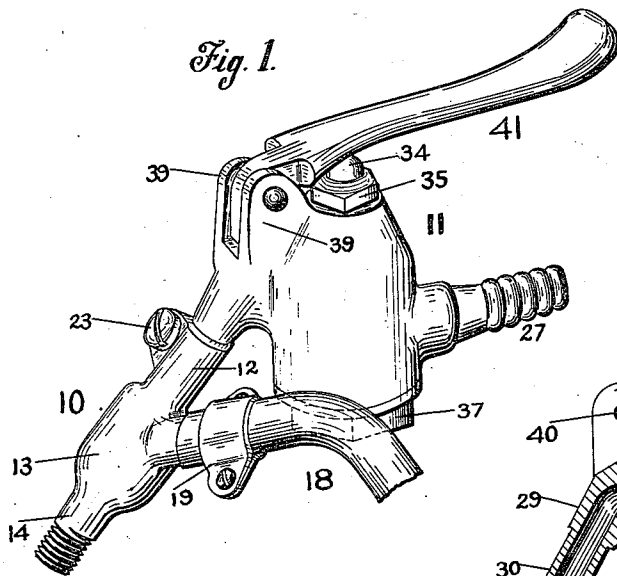


Fig. 2.

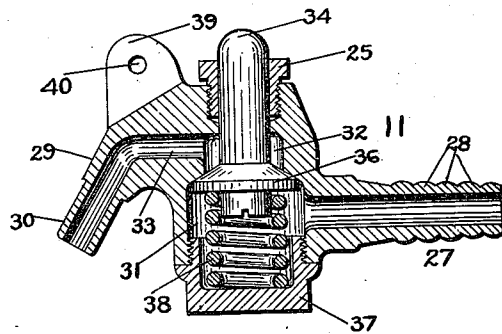


Fig. 3.

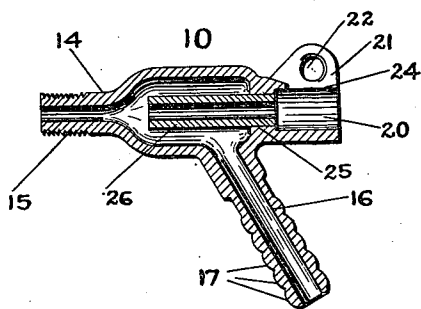
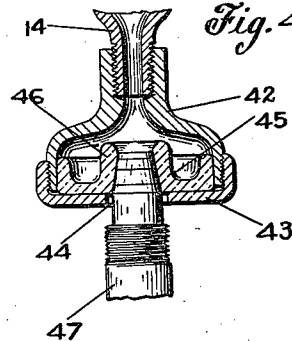


Fig. 4.



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CLEANING DEVICE.

1,415,467.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, GEORGE B. PICKOP, a citizen of the United States, residing in the city and county of New Haven, State of Connecticut, have invented certain new and useful Improvements in Cleaning Devices, of which the following is a full, clear, and exact description.

This invention relates to a pneumatic cleaning device, and more particularly to a device adapted to clean the surface of various objects by directing a blast of air carrying a cleaning liquid in the form of a spray, or solid particles scattered through the air blast against the surface to be cleaned.

My device is designed to be used in shops and the like, where a supply of compressed air is available, and it is particularly well adapted for use in garages for cleaning dirt, grease and rust from automobiles.

The principal object of my invention is to provide a small and inexpensive but very useful cleaning device adapted to utilize a supply of compressed air in removing dirt and other foreign matter from the surface of an automobile or other object to be cleaned.

A more specific object of my invention is to provide a convenient and handy device for producing an air driven spray of kerosene or other cleaning liquids for cleaning or treating the surface of various objects; to provide a device for producing a sand blast for removing rust and the like; to provide a small, handy device adapted to utilize an air blast to produce a dust removing vacuum; and to provide a device adapted to be used for various purposes.

To these and other ends, the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawing,

Fig. 1 is a perspective view of my cleaning device;

Fig. 2 is a longitudinal sectional view of the plunger air valve portion of my device;

Fig. 3 is a longitudinal sectional view of the ejector portion of my cleaning device; and

Fig. 4 is a longitudinal sectional view showing the discharge end of my ejector de-

vice having a tire inflating nozzle secured thereto, the latter being shown in its operative position upon a tire valve.

My cleaning device preferably consists of an ejector-like device 10 and a plunger air valve 11 to which the ejector 10 is adapted to be secured.

The ejector 10 is preferably made of a casting having the configuration shown in Fig. 1 and in sectional view in Fig. 3, and consists preferably of a neck portion 12 which is connected to the enlarged body portion 13, which body portion is provided with a reduced tubular extension 14 provided with threads 15. The body portion 13 is further provided with a tubular extension 16 extending at an angle thereto, which extension communicates with the interior of the body portion 13. This extension is preferably corrugated upon its outer surface as at 17. The extension is provided in order that a flexible tube or hose 18 may be secured to the same so that this tube will communicate with the interior of the body portion 13. The interior of this tube should snugly receive the corrugations 17 in a well-known manner, in order to prevent leakage between the tube and the outer end of this extension, and if desired the tube 18 may further be provided with a clamp such as 19, by means of which the end of the tube may be tightly clamped to the extension 16. The neck 12 of my ejector is preferably bored out as at 20 to substantially the same dimension as the external diameter of the exhaust end of the valve 11. This neck 12 is preferably provided with a pair of spaced ears 21 having a drill hole there- through such as 22, by means of which these ears may be drawn together by a threaded bolt 23, a saw cut preferably being formed through a portion of the neck as at 24, in order that the ears 21 may be sprung towards each other to reduce the diameter of the bore 20 and thereby rigidly clamp my ejector 10 upon the exhaust end of the valve 11, as shown in Fig. 1. The chamber formed inside of the hollow body portion 13 is preferably somewhat larger than the bore 20 of the neck just referred to, the arrangement being such that a partition or wall 25 is formed between the interior of the

body portion 13 and the neck 12. This partition has a drill hole formed therethrough and a tube 26 is mounted therein by starting the inner end of the tube in this drill hole and forcing the tube through the same until the rear end of the tube lies substantially flush with the outer face of the partition 25, as shown in Fig. 3. The tube 26 is forced through the partition 25 in the manner just described, because the bore of the reduced tubular end 14 is too small to permit the tube to be placed within the chamber 13 from that end of my device. The discharge end of this tube should not lie further from the entrance to the extension 14 than is necessary to provide a free passage from the chamber surrounding the tube to the air blast, since the tube 26 prevents the blast of air from spreading out into this chamber.

The plunger operated air valve 11 preferably consists of a casting having the configuration shown in Figs. 1 and 2 the body of which is substantially cylindrical and has formed upon one side thereof the tubular extension 27, the outer surface of which is corrugated as at 28 and is adapted to receive a flexible hose (not shown) for supplying compressed air to the same. Upon the opposite side of the cylinder-like body portion of the valve 11 and nearer the top of the same, is formed the hollow outlet spout 29, the outer end of which 30 is reduced to a diameter which will snugly fit in the bore 20 of the ejector 10 as above mentioned. The cylindrical portion of the valve 11 has a chamber extending axially therethrough. The lower portion of this chamber 31 is relatively large and communicates with the hollow extension 27. Immediately above the portion 31 of the chamber extending axially through the valve is a reduced cylindrical portion 32, which communicates with the outlet spout or nozzle 29 by means of a passage 33. The upper portion of the chamber extending through the valve is again reduced to form a bearing in which the plunger valve 34 is slidably mounted. This end of the chamber is provided with a stuffing box of the usual type, having the gland nut 35 which prevents the air from escaping through the bearing in which the valve 34 slides. The valve 34 is formed adjacent its lower end with a circular flange 36, the upper face of which is tapered, as shown, and is adapted to seat against a shoulder formed between the portions 31 and 32 of the chamber extending through the air valve 11. The lower end of the chamber 31 is closed by a nut 37, having a socket formed therein by which a coiled spring 38 is seated. The upper end of this spring contacts with the lower surface of the flange 36 formed upon the valve 34 and normally holds this valve in its seated or closed position. Upon the upper face of the valve casing are formed a pair

of spaced lugs 39 having a drill hole 40 formed therethrough, between which lugs is pivotally mounted a valve-operating lever 41. The under face of this lever 41 adjacent its pivotal mounting, bears upon the upper end of the plunger valve 34, the construction being such that the valve may be forced downwardly in order to permit air to pass through the valve chamber and out through the nozzle 29 whenever a slight pressure is exerted in a downward direction upon the lever 41.

The object in forming threads upon the reduced tubular end 14 of the ejector 10 is to enable a well-known type of device now in general use for blowing up pneumatic tires, to be attached thereto in the manner shown in Fig. 4 of the drawing. This tire inflating device usually consists of a body portion 42, the upper end of which is provided with an internally threaded extension, by means of which it may be attached to an air supply pipe. The lower end of the body portion 42 is enlarged, as shown, and is threaded to receive a cap such as 43, the cap having a drill hole 44 therethrough of sufficient diameter to permit the outer end of the valve of the ordinary automobile tire to be freely inserted therein. Inside of this tire inflating nozzle is mounted a rubber washer 45 having the configuration shown, and provided with an inwardly directed annular boss 46 having an opening formed therethrough adapted to receive the ordinary tire valve 47, the configuration of the washer 45 being such that the compressed air within the chamber 42 exerts an inwardly directed force upon the boss 46 surrounding the end of the tire valve and holds the inner walls of this boss in snug engagement with the end of the valve to prevent the air from escaping between the walls of the same and the washer.

By providing the novel cleaning device above described, compressed air may be used in connection with a cleaning liquid or a powder to clean surfaces which could not be cleaned with compressed air alone. As above stated, my cleaning device is designed particularly to be used in garages in cleaning grease, dirt and rust from automobiles, but it may obviously be used for various other purposes.

Should it be desired to use my cleaning device in connection with an air blast to remove dirt and grease from an automobile, the flexible tube 18 shown in Fig. 1 of the drawing would have its free end connected with a vessel containing kerosene or some other grease removing liquid. The valve 11 having my improved device attached thereto would have its outer end directed toward the part of the automobile or the like to be cleaned, and upon depressing the lever 41 to open the air valve, the compressed air would rush through my cleaning device with such

velocity that a partial vacuum would be produced within the body portion 13 about the inner end of the tube 26, so that the cleaning liquid with which the tube 18 is connected will be sucked through this tube and into the chamber about the tube 26, whereupon this liquid will be drawn into the path of the air rushing through my device and will be carried in the form of a spray with this blast of air upon the surface to be cleaned, the air and the cleaning liquid together forming a very efficient means for removing the objectionable grease or dirt.

Should it be desired to use my improved device to remove rust from the spokes of automobile wheels or from other surfaces, all that is necessary is to connect the free end of the tube 18 with a vessel containing sand and then to open the valve by depressing the plunger 34 in order to permit a blast of air to pass through my device, whereupon the sand will be sucked into the path of this blast of air within the device 10 and will be impelled thereby upon the surface to be cleaned the same as in the case of the cleaning liquid just described.

Should it be desired to use my improved device to remove dust and the like from the surfaces to be cleaned somewhat in the nature of the ordinary vacuum cleaner, all that is necessary is to attach the desired type of cleaning nozzle to the outer end of the flexible tube 18 and then depress the lever 41 to operate the valve 11 to permit an air blast to rush through my device, whereupon the velocity of the air passing through the same will produce a partial vacuum within the body portion 13 and within the tube 18, thereby creating a suction at the free end of this tube which will suck up the objectionable dust and other light particles.

The device herein described may also be conveniently used to blow up the ordinary automobile tire, it being simply necessary to screw upon the outer end of my device 10 the ordinary tire inflating nozzle such as shown in Fig. 4, whereupon the tire may be easily and quickly blown up in the usual manner, it being simply necessary to grasp the tube 18 with the fingers of the free hand or close this tube in any suitable way to prevent the compressed air from escaping therethrough as the pressure within the tire increases.

The particular construction of my ejector 10 herein described and illustrated is important as the amount of suction the same is capable of producing within the extension 17 and flexible tube 18 depends very largely upon the configuration of the interior of the body portion 13 and the location of the inner end of the tube 26 within this body portion. It will be apparent that should the tube 26 be entirely omitted, a small amount of suction may be produced within the extension

17 by directing a blast of air or the like, through the chamber 13, but in order to obtain an ejector that will satisfactorily suck up sand, heavy oils, thick paint and the like, the ejector should have substantially the configuration shown in Fig. 3. In this figure it should be noted that the interior of the chamber 13 is sufficiently large to permit the material or liquid which is sucked into the same to entirely surround the tube 26. This construction permits the material or liquid used in my device to be introduced into the path of the air blast from all sides of the same. It should also be noted that the bore of the tube 26 is substantially the same as the bore of the extension or outlet 14, in order that the velocity of the air blast will not be appreciably reduced as it passes through the ejector. Furthermore, it should be observed that the tube 26 extends substantially throughout the length of the chamber in which it is mounted; this prevents the air blast from spreading out sufficiently to strike against the end wall of the chamber 13 while at the same time, a sufficient space is provided between the end of the tube 26 and the inner wall of the chamber, to permit the liquid and the like, surrounding the tube 26 to be sucked into the path of the air blast and thoroughly distributed through the air blast without appreciably decreasing its velocity. In this manner a very satisfactory ejector having a strong lifting force or suction is produced.

Although the above described uses of my device are some of the important uses to which the same may be put, I have not attempted to describe all the purposes for which this little device is adapted. Furthermore, I have not attempted to describe different practical constructions which my device may be given, it being obvious that numerous changes may be made from the construction herein disclosed without departing from the scope of my invention as defined in the annexed claims.

What I claim is:

1. A portable manually directed engine or like cleaner having a nozzle and a mixing chamber provided with connections for a motive fluid and for a cleaning substance, and having a socket, a valve housing containing a spring pressed valve and having its outlet nozzle detachably and rigidly mounted in said socket and means to operate the valve against the tension of the spring, said means being located in position to be operated by the hand directing the cleaner nozzle.

2. A portable manually directed engine or like cleaner having a nozzle and a mixing chamber provided with an inlet duct for a motive fluid, directed substantially longitudinally of the chamber and a rearwardly directed connection for a cleaning substance,

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a valve housing containing a spring-pressed valve, said housing having an outlet nozzle, means for detachably connecting the valve housing and cleaner so that the outlet nozzle of the former discharges into the motive fluid connection of the latter, and manually operable means for actuating the valve, said means being located in position to be operated by the hand directing the cleaner nozzle. 10

In witness whereof, I have hereunto set my hand on the 27th day of June, 1918.

GEORGE B. PICKOP.