

May 19, 1931.

J. A. PAASCHE

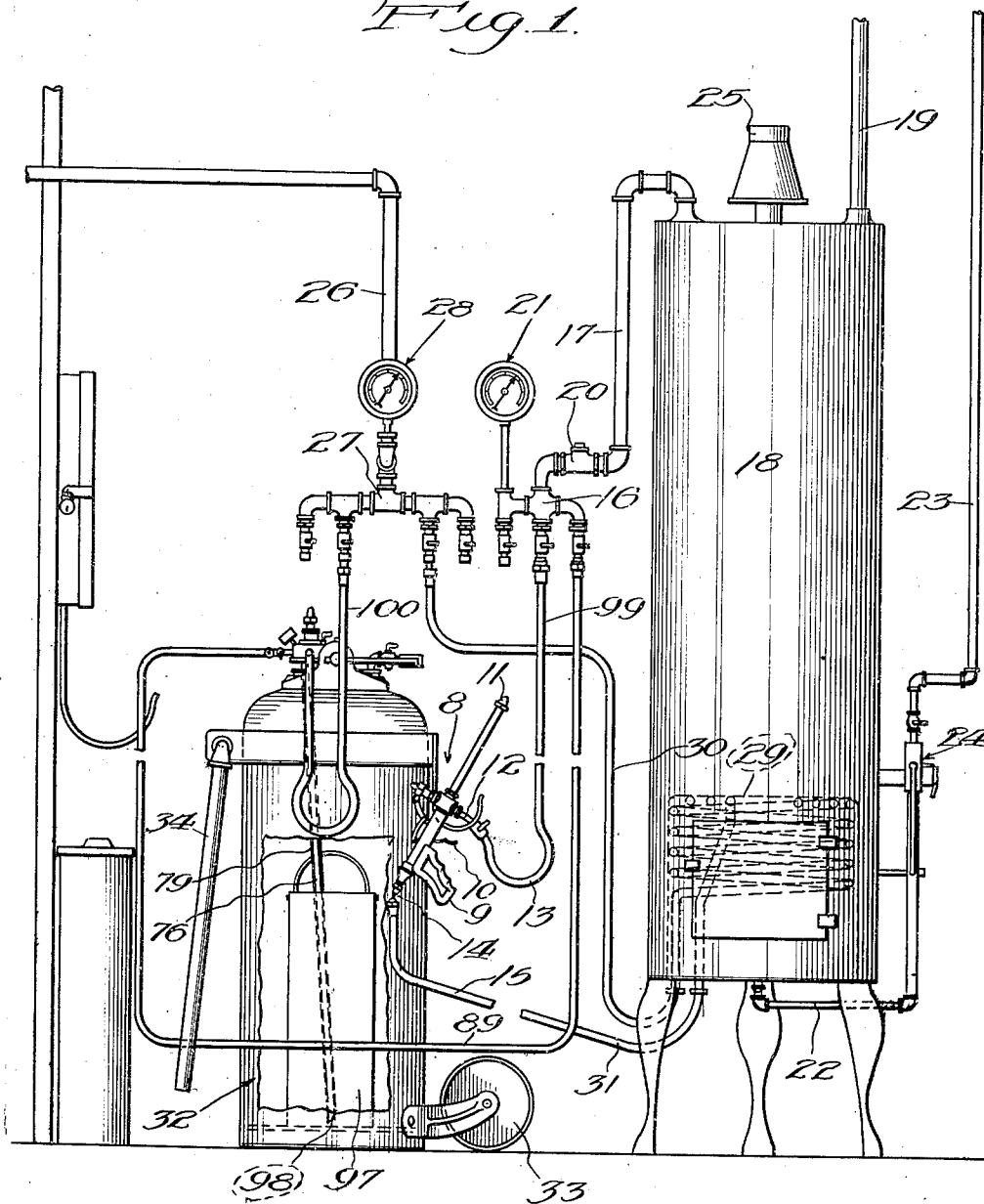
1,806,365

SYSTEM AND APPARATUS FOR SPRAYING

Original Filed May 18, 1925

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Fig. 1.



Inventor:
Jens A. Paasche,
by Samp & Samp
Attys

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J. A. PAASCHE

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Fig. 2.

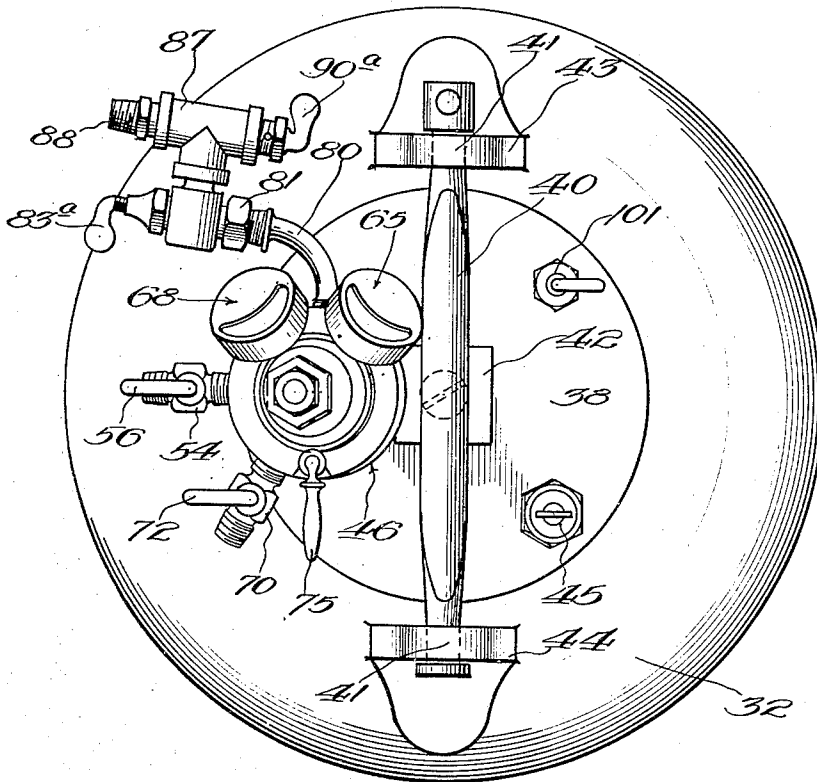
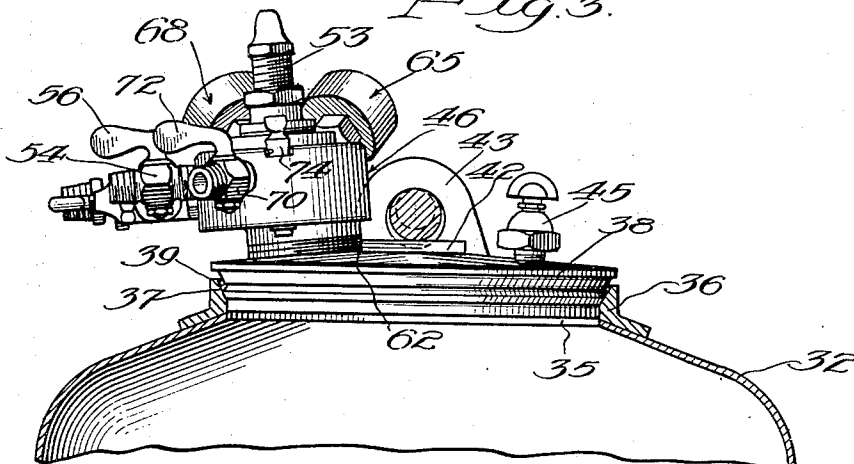


Fig. 3.



Inventor:
Jens A. Paasche,
by *L. L. L. L.*
Attys

May 19, 1931.

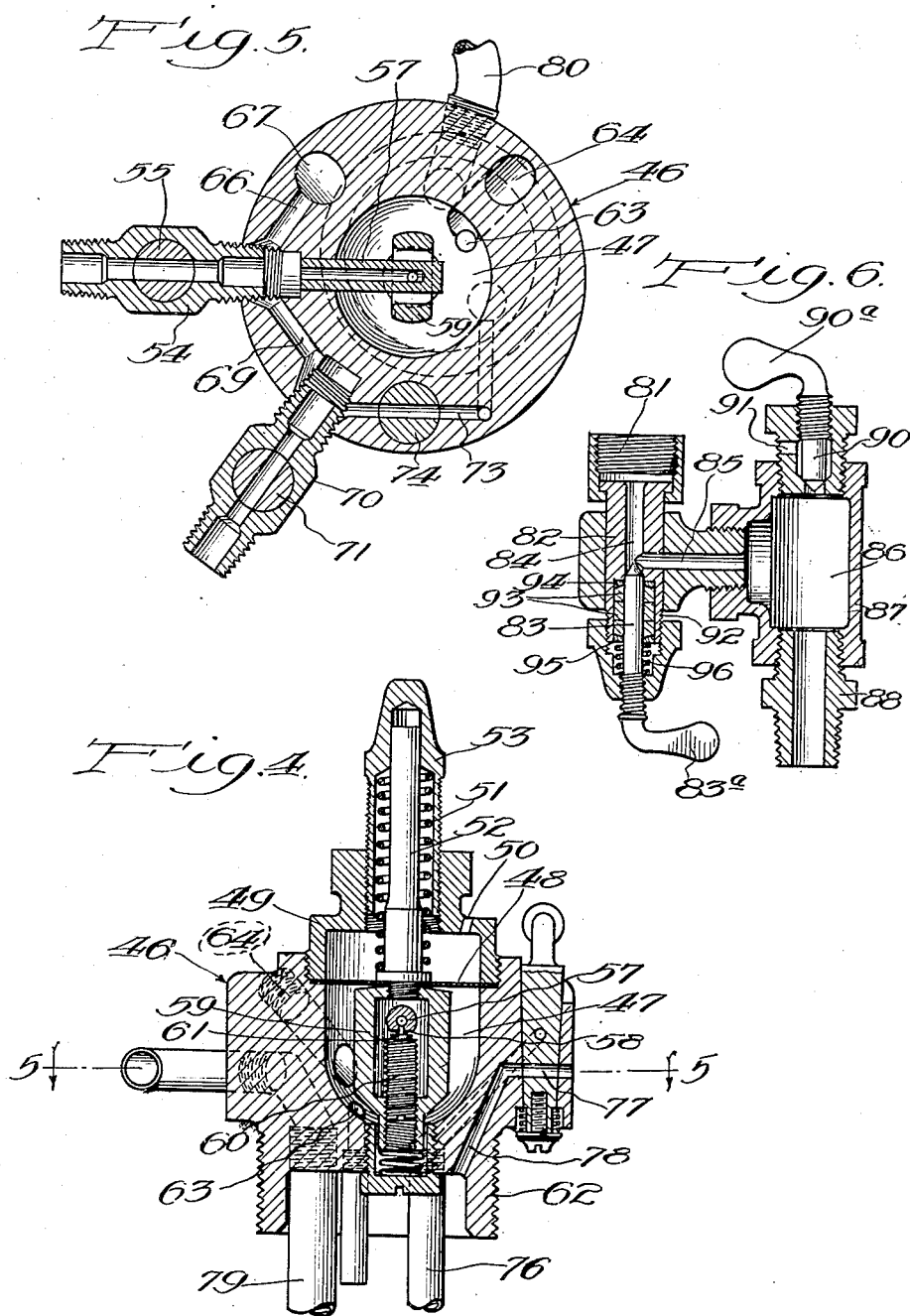
J. A. PAASCHE

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SYSTEM AND APPARATUS FOR SPRAYING

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Inventor:
Jens A. Paasche,
by *Louis & Louis*
Attys

UNITED STATES PATENT OFFICE

JENS A. PAASCHE, OF WILMETTE, ILLINOIS

SYSTEM AND APPARATUS FOR SPRAYING

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This invention has to do with improvements in systems and apparatus for spraying liquid materials, such as water, soap water, cleansing fluid, chemicals, etc. Many other kinds of liquid can be sprayed as will presently appear.

The main object of the present invention is to provide a system and apparatus for spraying water and other cleansing fluids for rapid cleaning of automobiles, machinery, and vehicles generally. In this connection, it is desired to produce an outfit which may be conveniently installed for use in garages, engine works, and other similar locations.

One feature of the invention relates to the provision of means for delivering the cleansing fluid under an air spray under control of the operator, so that the cleansing fluid may be readily thrown onto the different parts which are to be cleaned. In this connection, it is an object to provide means for delivering the cleansing fluid at whatever temperature may be selected so as to avoid damage to the finish, and at the same time effectively perform the cleansing operation.

In connection with the above, it will be noted that air in expanding has its temperature greatly lowered, depending upon the conditions of expansion, and that as a result the direct tendency is for the spray to be accordingly cooled as it is delivered from an air brush or similar tool. In order to overcome this objectionable result, one of the features of the invention relates to the provision of means for preheating the air directly before it is delivered to the air brush by an amount which will ensure actual delivery of the expanded air at an elevated temperature as compared to the surrounding atmosphere.

A further feature in connection with the foregoing is to also preheat the cleansing fluid itself, so that both the cleansing fluid and air will be delivered at the desired temperature. Another feature in connection with the above is the provision of means for heating both the fluid and the air by the use

of a common burner with resulting economy and simplicity of operation.

Still another feature of the invention relates to the provision of means for supplying soap or other desired cleaning agent to the water, so that a proper mixture will be directly supplied to the spray nozzle. In this connection, it is an object of the invention to make provision for regulating the rate of delivery of the soap, chemicals, kerosene, or similar agent, so that a proper solution will be insured at all times.

Still another feature of the invention relates to the provision of an outfit in which the soap or other material may be supplied from a container which is placed under air pressure within a tank, which container may be easily set into or removed from the tank either for refilling or for the substitution of a different material.

Another feature of the invention relates to the provision of a very conveniently arranged and satisfactory form of container, together with a quick removable air control head with valves which are so arranged that the various air and fluid connections may be conveniently made.

Other objects and uses of the invention will appear from a detailed description of the same, which consists in the features of construction and combinations of parts hereinafter described and claimed.

In the drawings:

Figure 1 shows a side elevation of an outfit embodying the features of the present invention, a portion of the pressure tank being broken away so as to reveal the removable can which is located therein;

Fig. 2 shows a plan view of the pressure tank itself with the removable head in place, and on greatly enlarged scale, as compared to Fig. 1;

Fig. 3 shows a side elevation of the head of Fig. 2, the upper portion of the tank itself being shown in fragmentary section;

Fig. 4 shows a vertical section through the distributor head on enlarged scale, as compared to Fig. 3;

Fig. 5 shows a horizontal section on the

line 5—5 of Fig. 4, looking in the direction of the arrows; and

Fig. 6 shows a horizontal section through the needle valve and associated parts for controlling the delivery of the soap solution, the same being on enlarged scale as compared to Fig. 2.

Referring first to Fig. 1, the arrangement therein illustrated includes a suitable spray brush 8 by which the liquid material is delivered to the part to be cleaned. This spray brush may be of any convenient construction, such, for example, as an air brush of the general type disclosed in my co-pending application for Letters Patent of the United States, Serial No. 732,564, which was filed August 16, 1924. The particular brush illustrated in the drawings includes a handle 9, trigger 10 by which the valve mechanism is operated and delivery nozzle 11. It also includes a connection 12 to which the liquid hose 13 is attached and a connection 14 to which the air hose 15 is attached.

The liquid from the hose 13 may be either plain water, kerosene, or a soap solution or any other cleaning fluid. I prefer to deliver the same from a header 16 placed at a convenient point on the wall, said header in turn receiving water through the pipe 17 from the heater 18. This heater is supplied with water in the first instance through a connection 19 under pressure from any source, and a check valve 20 is preferably placed in the line 17 to prevent any back-flow at this point. A gauge 21 shows pressure at the header 16.

The heater 18 may be of any convenient construction, but the type illustrated is well adapted for the present work. It includes a burner placed at the lower end of the water tank and supplied by a gas line 22 from a gas supply line 23 and under the control of a thermostat, generally indicated at the point 24. The burned gases are discharged through a chimney connection 25 at the upper end of the heater.

The compressed air is delivered in the first instance through a pipe 26 from any suitable source of supply, such as a compressor, and reaches a header 27. A pressure gauge 28 shows the pressure available at this header.

The air line 15 to the air brush may be connected directly to the header 27, in which case cold air will be used, but I prefer to preheat the air before delivering it to the air brush. For this purpose, I have shown a heating coil 29 in the lower portion of the heater 18, or preferably between the burner and the heater itself, so that said air coil 29 will be effectively heated. When the same is used the compressed air from the header 27 is delivered through a pipe 30 to the coil 29 and from the coil through a pipe

31 to the air brush pipe 15. Assurance is thus had that hot air will be available at all times, so that the cooling action due to expansion will be compensated for and the spray will be delivered at whatever temperature is desired.

In some cases it will be found advisable to mix soap or other cleansing fluid with water before delivering the same to the air brush. For this purpose, I have herein illustrated a type of construction similar to that disclosed in my co-pending application for Letters Patent of the United States on pneumatic liquid placing machinery, Serial No. 732,653, which was also filed August 16, 1924. The same includes a pressure tank 32 preferably provided with a wheel 33 at one side by means of which it can be easily rolled into position, suitable handle bars 34 being provided at the other side to facilitate this work. Said tank is provided with a relatively large opening 35 at its upper end which is reinforced by a flange 36, as shown in Fig. 3. Said flange is in turn provided with a beveled upwardly facing seat 37 against which may be set a cover 38. Such cover has a tapered lower face, and if desired, a gasket 39 may be set in place at this point.

The cover is held in place by a cross rod 40 having a central eccentric lug 41 which will bear against a seat 42 on the cover when the rod is turned. For this purpose, the rod is journaled within a pair of lugs 43 and 44 at the sides of the tank.

The cover 38 can be provided with a safety valve 45. It is also provided with a distributor head, generally indicated by the numeral 46. Said distributor head has a central chamber 47 which is closed by a diaphragm 48 held in place by a cap 49. Said cap is suitably vented by a vent opening 50. A spring 51 surrounds a stem 52 reaching up from the diaphragm and working easily within a threaded nipple 53, so that by tightening down said nipple the tension of the spring will be increased and thus also the pressure on the diaphragm.

Compressed air may be delivered to the head through a fitting 54 including a plug valve 55 having a cock handle 56, as shown in Figs. 2 and 3. This compressed air is delivered through a horizontal nipple 57 which reaches over into the chamber 47 and has a downwardly facing orifice at its inner end, as indicated at 58 in Fig. 4. A yoke 59 surrounds the nipple 57 and has its upper end connected to the diaphragm 48 or to a lug of the stem 52 reaching through said diaphragm, as shown in Fig. 4.

Reaching up from the lower portion of the yoke is a nipple 60 having on its upper end a chrome leather valve seat 61 which will close the orifice 57 when the diaphragm is raised against the spring pressure by rea-

son of the accumulated air pressure beneath it.

The distributor head 46 has a downwardly reaching threaded neck 62 which can be threaded into the head 38. A delivery opening 63 communicates from the chamber 47 down into the body of the tank 32, so that the interior of said tank will be placed under the full pressure of the air within the chamber 47. A side passage 64 also communicates with the chamber 47 and may receive an air gauge 65 to show the pressure within the body of the tank.

Referring particularly to Fig. 5 the air delivered from the fitting 54 may also communicate sidewise through a passage 66 to another passage 67 into which may be connected an air gauge 68, which gauge indicates the air pressure available on the supply line. Another passage 69 reaches to the other side to supply air to a fitting 70 having a valve 71 with a cock 72, through which the full air pressure may be delivered to any other device if desired. In the present case, this fitting and valve are not needed.

The passage 69 also communicates with another passage 73 under control of a valve 74 having a cock 75, and said passage 73 leads downwardly to communicate with the tube 76 which I will designate the agitator pipe. The valve 74 also has a cross connection 77 which when the valve is turned into the open position of Fig. 5, serves to also open a passage 78 (see Fig. 4) so as to allow escape of air from the upper end of the tank at the same time that the agitator pipe is being used.

A delivery pipe 79 reaches upwardly from the lower portion of the pressure tank to the distributor head 46 and terminates in an opening into which may be connected a fitting 80, preferably in the form of a section of curved tubing. The outer end thereof is connected into a union coupling 81 on a tubular fitting 82 having a needle valve 83 by means of which the passage 84 of said fitting 82 may be controlled. Another passage 85 receives the discharged liquid controlled by the needle valve 83 and delivers it into a small chamber 86 within a fitting 87. A nipple 88 leads from the chamber 86 and serves as a convenient fitting to which may be attached a hose 89 presently to be explained (see Fig. 1). Another needle valve 90 controls the chamber 86 and controls the exhaust of compressed air or fluid therefrom through an orifice 91.

In order to pack the needle valve 83, which is subjected to heavy pressure of the soap solution or similar material, I have provided a cylindrical recess 92 surrounding the needle valve and into which may be placed a series of chrome leather washers 93, as shown in Fig. 6. Preferably, the tapered disks 94 and 95 are placed at the lower and

upper ends of the pile of disks, being forced together under pressure by a spring 96.

Within the pressure tank 32 there may be set an open top can 97, as shown in Fig. 1, the same carrying the liquid soap or other material which is to be used. The tubes 76 and 79 from the distributor head 46 reach down into the can 97, their lower ends preferably being beveled, as shown at 98 in Fig. 1, so that they will also operate without being sealed by contact with the floor of the can.

The hose 89 reaches over to the header 16, already referred to, so that the soap solution or other material delivered from the can 97 will be directly mixed with the water which is delivered to the liquid connection 12 of the air brush through the hose 99. The compressed air is preferably delivered to the fitting 54 of the head 46 by a hose 100, as shown in Fig. 1.

The operation of this device is as follows: Upon opening the valve 55 the interior of the tank 32 will be subjected to the full air pressure available as controlled, however, by the reducing valve including the diaphragm 48. This will subject the liquid within the can 97 to a similar pressure and thus tend to discharge the same through the hose 89 to the header 16. Reference to the gauge 21 will show the pressure existing in said header so the operator may then adjust the reducing valve to a point where the gauge 65 will indicate a pressure somewhat higher than that of the gauge 21, sufficient in fact to insure a proper delivery of the material into the header and against the water pressure existing therein. Furthermore, the rate of delivery of the liquid material may be controlled by the needle valve 83 by the use of its cock 83^a, as shown in Fig. 6.

In the above manner assurance will be had that the solution delivered from the air brush is of the desired composition and carries a satisfactory amount of soap or similar material.

If desired, a small vent valve 101 may be provided within the cover 38 so as to quickly release the pressure within the tank after the supply of air is shut off by closing the valve 55.

Manifestly, it is a simple matter to remove the can 97 either to fill the same or for the substitution of a different can after the air pressure within the container 32 has been released.

This outfit is usable with a wide variety and composition of materials, and it is found that by being able to control the temperature of both the air and solution, as well as the composition of the solution itself, extremely satisfactory results may be obtained under a very wide range of conditions.

While I have herein shown and described

only certain embodiments of the features of my present invention, still I do not intend to limit myself in the same, except as I may do so in the claims.

I claim:

5 1. Apparatus for the purpose specified comprising in combination a compressed air header, a pressure gauge in conjunction therewith, a water header, a pressure gauge
10 in conjunction therewith, means for supplying compressed air to said compressed air header, means for supplying hot water to the water header, an air tight container, a receptacle for cleaning liquid therein, means
15 for delivering compressed air to the container under control of the operator, a pressure gauge for indicating the pressure within said container, an air gun, couplings for liquid and air thereon, means for preheating
20 air, a connection from the air header thereto, a connection from said preheating means to the air coupling of the air gun, a connection from the receptacle within the compressed air container to the water header
25 for supply of cleansing liquid thereto, means under control of the operator for regulating the pressure of cleansing liquid so supplied to the water header, and a connection from the water header to the liquid
30 coupling of the air gun, substantially as described.

2. Apparatus for the purpose specified comprising in combination a compressed air header, a water header, means for supplying
35 compressed air to said compressed air header, means for supplying hot water to the water header, an air tight container, a receptacle for cleaning liquid therein, means for delivering compressed air to the
40 container under control of the operator, a pressure gauge for indicating the pressure within said container, an air gun, couplings for liquid and air thereon, means for preheating air, a connection from the air header
45 thereto, a connection from said preheating means to the air coupling of the air gun, a connection from the receptacle within the compressed air container to the water header for supply of cleansing liquid thereto,
50 means under control of the operator for regulating the pressure of cleansing liquid so supplied to the water header, and a connection from the water header to the liquid coupling of the air gun, substantially as described.
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3. Apparatus for the purpose specified comprising in combination a compressed air header, a water header, means for supplying
60 ing compressed air to said compressed air header, means for supplying hot water to the water header, an air tight container, a receptacle for cleaning liquid therein, means for delivering compressed air to the container under control of the operator, an air
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gun, couplings for liquid and air thereon, means for preheating air, a connection from the air header thereto, a connection from said preheating means to the air coupling of the air gun, a connection from the receptacle within the compressed air container to the water header for supply of cleansing liquid thereto, means under control of the operator for regulating the pressure of cleansing liquid so supplied to the water header, and a connection from the water header to the liquid coupling of the air gun, substantially as described.

JENS A. PAASCHE.

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