COMPRESSED AIR DRYER-HANDLE ATTACHMENT FILTER

Inventors: William D. Maggiacomo, Beverly; Fred A. Winslow, Marblehead, both of Mass.


Filed: Oct. 9, 1973

References Cited

UNITED STATES PATENTS

ABSTRACT

A replaceable moisture filter handle attachment is provided for removing moisture from compressed air driven tools such as paint-spray guns. The filter, which readily opens for replacement of cotton batting filter material, attaches in the compressed air line input to the handle of the tool employed.
COMPRSSD AIR DRYER-HANDLE ATTACHMENT FILTER

FIELD OF THE INVENTION

This invention relates to a means for demoisturizing compressed air, particularly an apparatus for demoisturizing compressed air for use in power tools.

THE PRIOR ART

Compressed air is widely used as a means for powering tools, such as hand tools including spray paint guns, drills, buffing tools and the like. The problem in the use of such tools is the condensation of moisture within the air which accumulates when humid air is compressed, e.g. in a compressor. The moisture in the compressed air can interfere with the proper functioning of the power tools where the moisture becomes a nuisance. A particularly adverse effect of moisture in the compressed air appears, for example, in the use of spray tools, paint tools, drills, etc. If not removed, the moisture in the compressed air passes into the spray gun to mix with the paint as it emerges from the nozzle, forming paint blisters on the vehicle body surface, of course, is a highly undesirable result.

Efforts have been made to remove such moisture from the compressed air. Typically, a filter box is installed in the compressed air line and mounted on the wall and the filter removes most of the moisture from the air passing through, as of course. However, in a short time the wall filter becomes saturated and no longer effectively removes moisture from the compressed air passing therethrough. These relatively large filters are expensive and difficult to replace, and as a result are not replaced as often as they should be, so that effective moisture filtration does not, in practice, take place except infrequently.

It has been proposed to put cotton batting in the handle of the spray gun, the batting being pushed well up into the handle with a string hanging down to assist removal thereof when the batting becomes saturated and no longer effective. The batting is, of course, in the path of the compressed air and initially this batting serves to remove moisture from the compressed air passing through the spray gun. However, the batting has proved difficult to remove in that the compressed air blasts the pull string up against the batting which becomes moist, and string and batting adhere to each other, or the string can break off, in either case making removal of the batting difficult. And in the manner of the wall filter above, the batting is not replaced as often as necessary due to the difficulties thereof. However, the batting cannot be employed with other tools in that it is inserted in the handle of the spray gun and thus is not interchangeable with other compressed air power tools. See U.S. Pat. Nos. 1,822,622 to Herrmann and 2,959,558 to Vork.

There is therefore, a need and market for an easily accessible filter means for removing moisture from compressed air, which filter means provides for easy and inexpensive replacement of filter material and which unit is interchangeable for use with various power tools.

SUMMARY

There has now been discovered a compressed air demoisturizer which permits ready replacement of filter material, which is interchangeable with various power tools, is low-cost and which in one or more embodiments readily attaches to the handle of the power tool being used.

Broadly, the present invention provides a replaceable moisture remover for compressed air driven tools comprising a tubular retainer which attaches to said tool proximate the compressed air inlet thereof such that the compressed air passes therethrough, a moisture collecting chamber within the retainer, the retainer having a screen positioned at the exit end of the chamber, means to open the chamber to remove the used moisture filter therewith and to insert a new moisture filter therein and means to close the chamber before reactivating the power tool.

DESCRIPTION

The present invention will become more apparent from the following detailed description and drawings in which:

FIG. 1 is an elevation view of an apparatus employing an embodiment of the present invention;

FIG. 2 is an enlarged sectional elevation of the moisture remover embodying the present invention; and

FIG. 3 is a plan view of the moisture remover of FIG. 2.

Referring now to the drawings, cotton batting 11 is employed in moisture filter 10 which filters moisture from compressed air passing therethrough in line 13 from compressed air reservoir 14 and compressed air source 16 as shown in FIGS. 1 and 2. The demoisturized air then passes through the handle 18 of spray gun 20 and mixes with paint 22 which is fed from container 24 by feeder tube 26 and the compressed air-paint mixture is discharged from spray gun 20 at spray nozzle 28 as shown in FIG. 1. The spray gun 20 is activated by depressing trigger valve 30.

The moisture filter has an upper tubular half 32 and a lower tubular half 34 which form a filter chamber 36 as shown in FIG. 2. The upper filter section 32 has threads 33 therein and the lower tubular section 34 has threads 35 thereon which enables the respective tubular sections 32 and 34 to be readily screwed together or apart for prompt access to the filter chamber 36 as shown in FIG. 2. Rubber washer 39 resiliently separates the tubular sections 32 and 34 as shown in FIG. 2. Within the filter chamber 36 are positioned first filter screen 38 at one end of said chamber and, at the other end of said chamber, second filtering screen 40. Positioned between said screen is replaceable filter material, e.g. cotton batting for moisture collection as shown in FIG. 2.

Compressed air line 13 attaches to the moisture filter 10 through exit port 42 while spray gun 20 attaches to the moisture filter 10 at threaded exit port 44, also as shown in FIG. 2. The rate of compressed air flow through the inlet port 42, moisture collection chamber 36 and exit port 44 of moisture filter 10 can be controlled by rotatable pressure control valve 46, having orifice 47, which communicates with moisture chamber conduit 49 as shown in FIG. 2.

The moisture filter 20 described above can, if desired, be reversed with threaded port 42 being hooked to the spray gun 20 and threaded port 44 being connected with the compressed air line 13.

In operation, compressed air is fed from the compressor via line 13 to compressed air reservoir 14 and thence by a line 13 to moisture filter 10, where the air
passes through inlet port 42 through pressure control valve orifice 47, through moisture removal chamber conduit 49, through the first filtering screen which removes dust particles and the like, then through the cotton batting moisture filter within the moisture removal chamber, thence through the orifice of the rubber washer 39, through the second filtering screen 40 the removal of cotton fibers and other impurities, then through exit port 44 where the dehumidified compressed air enters the spray gun 20 through the handle 18. The dehumidified compressed air then mixes with the paint and spray nozzle 28 of the spray gun 20 as stated above.

The moisture filter of the present invention provides a unit which readily screws apart for quick replacement of the filter material therein, after which the unit is readily put together. The moisture filter employed to the present invention thus readily provides for the replacement on the filter material at the end of the day, for shorter period of use or in dry weather at the end of several days, i.e. whenever the filter material loses effectiveness. Because of the ease of replacement of such filter material, the workmen will be more inclined to promptly make such replacement and the air power tools, including the spray gun, are rendered more effective. Moreover, the moisture remover embodying the present invention can be employed with various compressed air power tools for greater use and effectiveness thereof.

It is important that the moisture remover embodying the present invention be readily openable to the moisture removing chamber whether by a portal in the side of the one piece moisture filter or a two or more piece moisture filter which has components which come apart readily and as readily can be reassembled. The multi-piece filters can be attached by screw threads, clamps, snap means, screws, latches and the like. Preferably, however, the multi-piece moisture filter is attached by means of mating screw threads, an example of which is shown in FIG. 2.

The moisture filter can be made of various materials, e.g. wood, plastic, metal and the like, preference being given to metal such as aluminum and brass and/or durable plastic such as polystyrene.

The moisture filter can be tubular or angular in cross-section, provided it defines a compressed air conduit therethrough. Preferably, the moisture filter defines a rounded or tubular conduit for compressed air therethrough. Moreover, a moisture filter embodying the present invention, can have a pressure control valve built-in as shown in FIGS. 2 and 3 of the drawing. However, such control valve can be dispensed within the scope of the present invention as desired.

The moisture collection chamber of the moisture filter of the present invention has at least one filter screen mounted therein approximate the exit end thereof, which restrains the moisture material within such chamber, while permitting the passage therethrough of the dehumidified compressed air. If desired, two or more such filter screens can be added to said chamber, where desired, including the entrance and exit ends thereof.

The filter material can be various moisture absorbing materials, e.g. cotton, wool, cellulose material including porous paper, urethane and porous metal filters, e.g. steel, aluminum and the like. Preferably, because of its low cost, availability and high moisture absorption characteristics, cotton batting is preferred.

The moisture filter of the present invention can, as indicated above, be installed on the handle of the compressed air tool. However, the moisture filter can also be installed in the air line at any point desired. Preferably for convenience, the moisture filter of the invention is installed at the inlet of the compressed air inlet of the power tool being employed.

What is claimed is:

1. A replaceable moisture filter for a compressed air driven tool comprising, a tubular retainer which attaches to said tool proximate the compressed air inlet thereof such that the compressed air passes therethrough, said retainer having at least two members which fit together including a first member secured within a second member to define a filter chamber therein, a moisture collecting filter sized to fit within said chamber (within said retainer), an inlet channel passing through said retainer to an inlet end of said chamber, an outlet channel passing through said retainer to an exit end of said chamber, (a) an exit screen releasably secured between shoulders defined by said first and second members at the exit end of said chamber, an inlet screen positioned at the inlet end of said chamber on a shoulder on said first member, means to separate said first and second members to open said chamber to insert and replace a moisture filter therein and means to rejoin said members to close said chamber said moisture collecting filter being positioned between said screens.

2. The moisture filter of claim 1 having a pressure control valve inserted therein to govern the flow of compressed air therethrough.

3. The moisture filter of claim 1 attached to the handle of a paint spray gun.

4. The moisture filter of claim 1 wherein the tubular retainer is a two part tube which comes apart to reveal said chamber for replacement of said moisture filter therein.

5. The moisture filter of claim 4 wherein said retainer comprises two threaded components which screw together.

6. The moisture filter of claim 5 wherein the retainer components are each hexagonal shaped in cross-section.

7. The moisture filter of claim 1 wherein said tubular retainer is a two-part tube, the lower tube fitting inside the upper tube to define an annular shoulder at the upper portion of said chamber, said screen extending across said lower tube and being supported in place on said shoulder.

8. The moisture filter of claim 7 wherein said filter is positioned on a resilient annular washer positioned on said shoulder.

* * * * *