

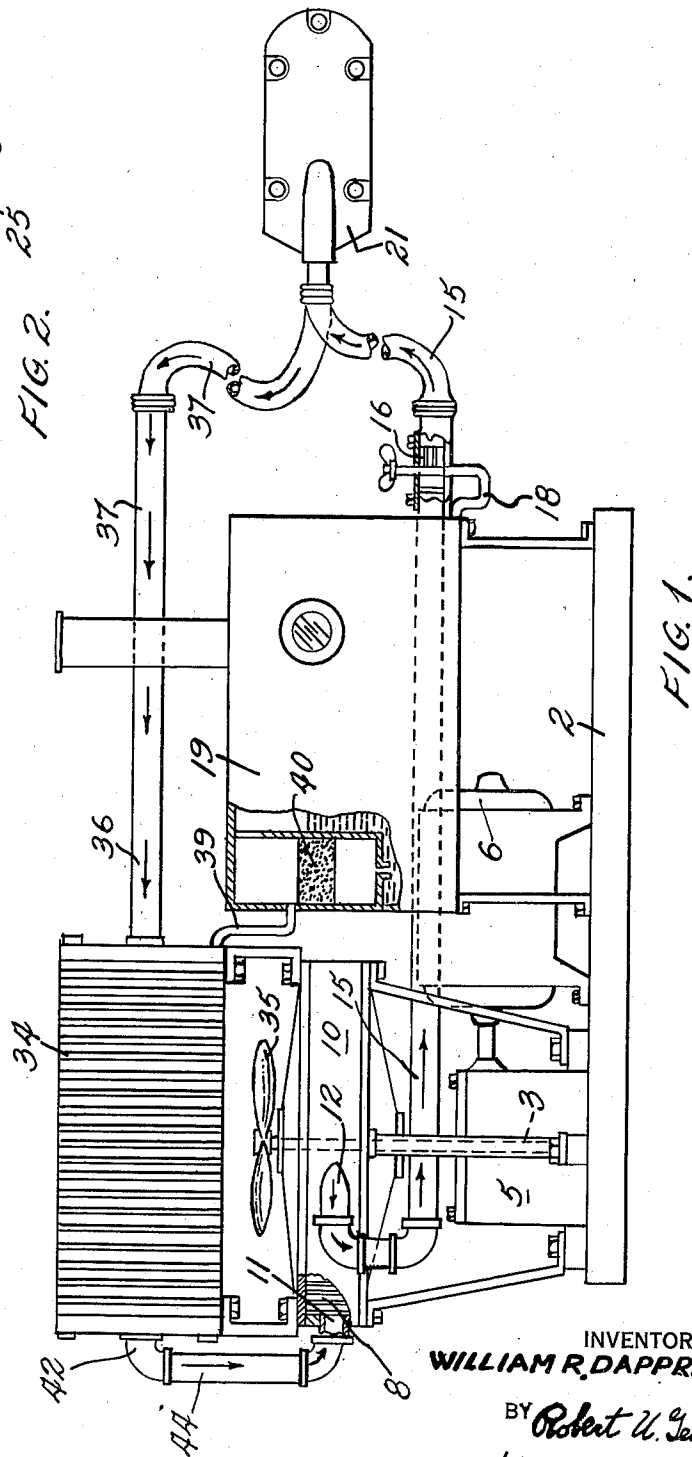
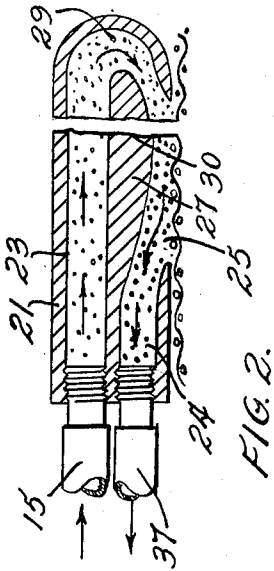
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APPARATUS FOR DRY CLEANING

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APPARATUS FOR DRY CLEANING

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This invention relates to apparatus for dry-cleaning, and more particularly to those which utilize a liquid cleaning agent, such as carbon tetrachloride or the like, in atomized form.

In the art of dry-cleaning, the article to be cleaned is commonly immersed in, or subjected to, a suitable dry-cleaning agent in liquid form. Such practice is characterized not only by requiring the expenditure of a considerable quantity of the cleaning agent, but also in that the article to be cleaned becomes completely or partially saturated, with the result that considerable time is consumed before it is sufficiently dry to be used. In addition, certain articles do not readily lend themselves to immersion in, or subjection to, the dry-cleaning agent; for example, upholstery, which is frequently difficult to remove. Moreover, the common practices referred to are frequently attended by disagreeable odors due to the necessary use of large quantities of dry-cleaner in liquid form.

It is among the primary objects of the present invention to provide an apparatus for dry-cleaning in which there is utilized a liquid cleaning agent in atomized form; and in such manner that the article, or work-object, may be thoroughly cleaned while conserving the cleaning agent.

Another object is the attainment of thorough dry-cleaning without the saturation or thorough wetting of the article, with the result that it does not require a protracted drying period during which it cannot be used.

Still another object is the material reduction in the intensity of the odors which frequently attend conventional methods of dry-cleaning.

A further object is the provision of an apparatus possessing the foregoing advantages and one which is at the same time simple and inexpensive to manufacture and operate.

A still further object is compactness and easy portability.

The invention, then, comprises the features hereinafter fully described and as particularly pointed out in the claims, the following description and the annexed drawings setting forth in detail certain illustrative embodiments of the invention, these being indicative of several of the number of ways in which the principles of the invention may be employed.

In said drawings:

Figure 1 is a side elevation of an illustrative embodiment of the apparatus of the present invention, parts thereof being fragmentarily illustrated in section; and

Figure 2 is a sectional elevation of a preferred

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form of cleaning head which is used to direct the cleaning agent to and away from the article to be cleaned.

Referring more particularly to the drawings, the numeral 2 designates a suitable base upon which there is rotatably disposed a vertical shaft 3 driven through a speed-increasing transmission 5 by means of an adjacently disposed electric motor 6.

Secured to the approximate upper end of the rotatable shaft 3 is a rotary blower 8 which is encased in a housing 10 and provided with the usual intake and exhaust ports as at 11 and 12, respectively.

To the exhaust port 12 of the housing 10 of the rotary blower 8 there is connected a conduit 15 within which there is an atomizer 16, preferably adjustable. This atomizer 16 is connected by means of a supply pipe 18 with a tank 19 which contains a suitable liquid dry-cleaning agent, for example, carbon tetrachloride.

After the air forced by the rotary blower 8 passes through the atomizer 16 and is heavily laden with finely atomized particles of liquid dry-cleaning agent, it is directed by the conduit 15 to a cleaning head generally designated at 21. This cleaning head 21 comprises an intake chamber 23, to which the conduit 15 is connected, and an exhaust chamber 24, by means of which air heavily laden with finely atomized particles of liquid dry-cleaning agent is caused to flow there-through.

As shown more clearly in Figure 2, the underside of the cleaning head 21 is provided with an opening 25 which is adapted to be pressed against the work-object, whereby the stream of air heavily laden with the finely atomized particles of liquid dry-cleaning agent causes the loosening and dissolution of dirt, etc.

More specifically, the cleaning head 21 comprises an elongated substantially rectangular hollow casing within which there is a longitudinally extending centrally disposed partition 27 which terminates short of one end thereof, as shown at 29, to provide an uninterrupted flow of blown air and atomized liquid dry-cleaning agent through the intake chamber 23 and exhaust chamber 24. The top of the longitudinally extending centrally disposed partition 27 is substantially planar, while the bottom 30 thereof is thickened and longitudinally curved from its approximate transverse mid-section toward both of its ends, all as shown in Figure 2. The thickened and longitudinally curved bottom 30 of the longitudinally extending centrally disposed partition 27 is so

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constructed and arranged with respect to the aperture 25 in the bottom of the cleaning head 21 as to provide a Venturi reaction to the flow of blown air and atomized liquid dry-cleaning agent as this mixture is moved into and out of contact with the work with which the bottom of the cleaning head is in contact. Thus the flow of blown air and atomized liquid dry-cleaning agent across the aperture 25 and through the exhaust chamber 24 is greatly facilitated, and turbulence is imparted to it as it leaves the cleaning head 21.

Superposed upon the housing 10 for the rotary blower 8 is a condenser, as shown at 34, the same providing a tortuous path for the blown air and atomized liquid dry-cleaning agent. This condenser 34 is cooled by means of a fan 35 which is secured to the upper extremity of the rotatable vertical shaft 3, the latter extending through and projecting from the upper side of the housing 10.

The exhaust chamber 24 of the cleaning head 21 is connected to the intake port 36 of the condenser 34 by means of a conduit 37.

In order to permit the easy application of the cleaning head 21 to the article to be dry-cleaned, the adjacent portions of the conduits 15 and 37 are constructed of a suitable flexible material, such as rubber.

The condensate flows from the condenser 34 through a conduit 39 and filter 40 into the tank 19.

In order to draw the air and atomized liquid dry-cleaning agent from the exhaust chamber 24 of the cleaning head 21, through the conduit 37 and into the intake 36 of the condenser 34, the exhaust port 42 of the latter is connected to the intake port 11 of the rotary blower 8 by means of a conduit 44.

Due to the construction and arrangement of the elements of the cleaning head 21, the air and atomized liquid dry-cleaning agent from the cleaned article are drawn through the conduit 37 at a greater velocity than that at which air and atomized liquid dry-cleaning agent are forced through the conduit 15.

The high-speed moderate-pressure blast of air carries to the article to be cleaned a maximum load of finely atomized particles of liquid dry-cleaning agent. This blast of air and finely atomized particles of liquid dry-cleaning agent very effectively loosen and dissolve the dirt contained in the article to be cleaned, and a very efficient scavenging action is provided by the Venturi feature of the cleaning head 21.

While I have shown and described one specific embodiment of the present invention, it will be readily understood that I do not wish to be limited exactly thereto, since various modifications may be made without departing from the scope of the invention as defined in the appended claims.

I claim:

1. Apparatus for dry-cleaning comprising means for atomizing a dry-cleaning liquid, a cleaning head having a work-engaging opening, means for conducting a mixture of air and atomized dry-cleaning liquid to and from said head, and a blower for continuously circulating said mixture through said last-named means and said cleaning head, said cleaning head including a Venturi element constructed and arranged to provide a low-pressure area adjacent the opening in said cleaning head.

2. A unitary and portable apparatus for dry-cleaning comprising means for atomizing a dry-cleaning liquid, a cleaning head having a work-engaging opening, means for conducting a mix-

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ture of air and atomized dry-cleaning liquid to and from said head, and a blower for continuously circulating said mixture through said last-named means and said cleaning head, said cleaning head including a Venturi element constructed and arranged to provide a low-pressure area adjacent the opening in said cleaning head.

3. Apparatus for dry-cleaning comprising means for supplying a dry-cleaning liquid, means for atomizing said dry-cleaning liquid, means connecting said supply means with said atomizing means, a cleaning head having a work-engaging opening and a fluid intake and a fluid exhaust, means connecting said atomizing means with the fluid intake of said cleaning head, a blower having an intake and an exhaust, a condenser, means connecting the gaseous side of said condenser to the intake of said blower, means connecting the condensate side of said condenser with said supply means, means connecting the exhaust side of said blower with said atomizing means, and means connecting the fluid exhaust of said cleaning head with said condenser, said cleaning head including a Venturi element constructed and arranged to provide a low-pressure area adjacent the work-engaging opening therein.

4. A unitary and portable apparatus for dry-cleaning comprising means for supplying a dry-cleaning liquid, means for atomizing said dry-cleaning liquid, means connecting said supply means with said atomizing means, a cleaning head having a work-engaging opening and a fluid intake and a fluid exhaust, means connecting said atomizing means with the fluid intake of said cleaning head, a blower having an intake and an exhaust, a condenser, means connecting the gaseous side of said condenser to the intake of said blower, means connecting the condensate side of said condenser with said supply means, means connecting the exhaust side of said blower with said atomizing means, and a conduit connecting the fluid exhaust of said cleaning head with said condenser, said cleaning head including a Venturi element constructed and arranged to provide a low-pressure area adjacent the work-engaging opening therein.

5. Apparatus for dry-cleaning comprising means for supplying a dry-cleaning liquid, means for atomizing said dry-cleaning liquid, means connecting said supply means with said atomizing means, a cleaning head having a work-engaging opening and a fluid intake and fluid exhaust, means connecting said atomizing means with the fluid intake of said cleaning head, a blower having an intake and an exhaust, a condenser, means connecting the gaseous side of said condenser to the intake of said blower, a filter, means connecting the condensate side of said condenser with said filter, means connecting said filter with said supply means, means connecting the exhaust side of said blower with said atomizing means, and a conduit connecting the fluid exhaust of said cleaning head with said condenser, said cleaning head including a Venturi element constructed and arranged to provide a low-pressure area adjacent the work-engaging opening therein.

6. A unitary and portable apparatus for dry-cleaning comprising means for supplying a dry-cleaning liquid, means for atomizing said dry-cleaning liquid, means connecting said supply means with said atomizing means, a cleaning head having a work-engaging opening and a fluid intake and a fluid exhaust, means connecting said atomizing means with the fluid intake of said cleaning head, a blower having an intake and an

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exhaust, a condenser, means connecting the gaseous side of said condenser to the intake of said blower, a filter, means connecting the condensate side of said condenser with said filter, means connecting said filter with said supply means, means connecting the exhaust side of said blower with said atomizing means, and a conduit connecting the fluid exhaust of said cleaning head with said condenser, said cleaning head including a Venturi element constructed and arranged to provide a low-pressure area adjacent the work-engaging opening therein.

7. Apparatus for dry-cleaning comprising means for supplying a dry-cleaning liquid, means for atomizing said dry-cleaning liquid, means connecting said supply means with said atomizing means, a cleaning head having a work-engaging opening and a fluid intake and a fluid exhaust, means connecting said atomizing means with the fluid intake of said cleaning head, a rotatable shaft, a blower secured to said shaft and having an intake and an exhaust, a condenser, a fan secured to said shaft, said fan being adapted to cool said condenser, means connecting the gaseous side of said condenser to the intake of said blower, means connecting the condensate side of said condenser with said supply means, means connecting the exhaust side of said blower with said atomizing means, and a conduit connecting the fluid exhaust of said cleaning head with said condenser, said cleaning head including a Venturi element constructed and arranged to provide a low-pressure area adjacent the work-engaging opening therein.

8. A unitary and portable apparatus for dry-

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cleaning comprising means for supplying a dry-cleaning liquid, means for atomizing said dry-cleaning liquid, means connecting said supply means with said atomizing means, a cleaning head having a work-engaging opening and a fluid intake and a fluid exhaust, means connecting said atomizing means with the fluid intake of said cleaning head, a rotatable shaft, a blower secured to said shaft and having an intake and an exhaust, a condenser, a fan secured to said shaft, said fan being adapted to cool said condenser, means connecting the gaseous side of said condenser to the intake of said blower, means connecting the condensate side of said condenser with said supply means, means connecting the exhaust side of said blower with said atomizing means, and a conduit connecting the fluid exhaust of said cleaning head with said condenser, said cleaning head including a Venturi element constructed and arranged to provide a low-pressure area adjacent the work-engaging opening therein.

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