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(54) Automatic cleaning device for paint sprayer gun

(57) An automatic cleaning device for paint sprayer gun comprises a cleaning tank (1) and a solvent container (2), a solvent injection pipe (11) provided with at least one nozzle (12) is installed in the cleaning tank (1). A solvent drain pipe (3) is disposed between the cleaning tank (1) and the solvent container (2) for communicating this two component parts. A solvent supply pipe (4) is inserted into the cleaning tank (1) and its one end is communicating with the injection pipe (11), while the other end is extended to the bottom of the solvent container (2). When the pressurized air supplied from an air compressor enters the solvent container via an entry inlet provided on the top of the solvent container (2), the solvent is forced into the injection pipe (11) via the solvent supply pipe (4) and injected out of the nozzle (12) for performing cleaning work. The used solvent flows back to the solvent container (2) by way of the solvent drain pipe (3) for repeated use. No fear of occurrence of hazardous electrostatic induction accident shall be considered because there is no mechanical friction in any part of the device so that the perfect safety can be expected.

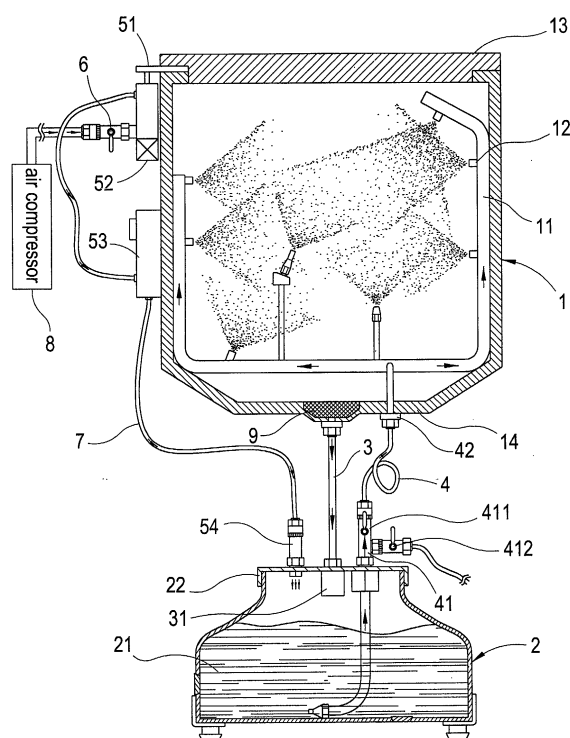


FIG. 1

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Description

BACKGROUND OF THE INVENTION

1. Field of the invention

[0001] The present invention relates to an automatic cleaning device for paint sprayer gun, in particular, to an automatic cleaning device for paint sprayer gun, for which compressed air is used as a power source to repeatedly cycling the solvent in a container for automatically cleaning a paint sprayer gun.

2. Description of the Prior Art

[0002] In a conventional paint sprayer gun, it is normally composed of a gun body, a nozzle, and a paint container, where the nozzle further includes various components such as a nozzle pipe, an air supplying and cycling pipe etc. In general, the paint sprayer gun must be cleaned after use so as to prevent degrading the performance of the sprayer gun by mingling the old paint color with the new one due to dregs of the old paint remained inside, and moreover, causing damage to the component parts of the sprayer gun.

[0003] Incidentally, a conventional cleaning device employs an air compressor associated with a pump as its power source. This causes the conventional cleaning device is deemed to operate at high cost and high noise. More severely, the way of motion, such as mechanical rotation or reciprocation (pump motion) that the conventional cleaning device relies on is apt to incur explosion of cleaning solvent (such as benzene) contained in the device owing to electrostatic induction by mechanical friction thereof.

[0004] Aiming at the above depicted defects, the present inventor is to propose a newly developed automatic cleaning device for paint sprayer gun capable of operating at low noise, high security and prolonged lifetime.

SUMMARY OF THE INVENTION

[0005] It is an first object of the present invention to provide an automatic cleaning device for paint sprayer gun capable of evading the electrostatic induction accident by mechanical friction during operation.

[0006] It is a second object of the present invention to provide an automatic cleaning device for paint sprayer gun whose solvent can be used repeatedly so as to reduce the operation cost.

[0007] It is a third object of the present invention to provide an automatic cleaning device for paint sprayer gun which can maintain a constant air pressure in the solvent container so as to ensure reliable operation of the device.

[0008] It is a fourth object of the present invention to provide an automatic cleaning device for paint sprayer

gun in which a timer is provided to preset the operation time.

[0009] It is a fifth object of the present invention to provide an automatic cleaning device for paint sprayer gun which is equipped with a microswitch on the upper lid of the cleaning tank capable of actuating to interrupt entry of pressurized air into the solvent container when the upper lid is opened so as to shut out injection of the solvent out of the nozzles.

[0010] It is a six object of the present invention to provide an automatic cleaning device for paint sprayer gun capable of releasing the pressurized air out of the solvent container rapidly through an exhaust valve in case the pressure inside the solvent container rises too high so as to protect security of the whole device and the operator as well.

[0011] To achieve these and other objects mentioned above, the paint sprayer gun of the present invention comprises a cleaning tank and a solvent container, a solvent injection pipe provided with at least one nozzle is installed in the cleaning tank. A solvent drain pipe is disposed between the cleaning tank and the solvent container for communicating the two component parts. A solvent supply pipe is inserted into the cleaning tank and its one end is communicating with the injection pipe, while the other end thereof is extended to the bottom of the solvent container. When the pressurized air supplied from an air compressor enters the solvent container via an entry inlet provided on the top of the solvent container, the solvent is forced into the injection pipe so as to perform cleaning work. The used solvent flows back to the solvent container by way of the solvent drain pipe such that the solvent can be used repeatedly. The abnormal pressure in the solvent container is released by the exhaust valve, the operation time for the cleaning device is preset by the timer, and the injection of the solvent from the nozzle is stopped by the microswitch when the upper lid of the cleaning tank is opened as that described above.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] For fuller understanding of the nature and objects of the invention, reference should be made to the following detailed description taken in conjunction with the accompanying drawings in which:

Fig.1 is a cross sectional view of the automatic cleaning device for paint sprayer gun according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0013] Referring to Fig.1, the automatic cleaning device for paint sprayer gun of the present invention comprises a cleaning tank 1, a solvent container 2, a solvent drain pipe 3, a solvent supply pipe 4, a microswitch 51,

a pressure regulation valve 52, a timer 53, an exhaust valve 54, a compressed air supply pipe 7, and an air compressor 8.

[0014] The cleaning tank 1 is provided with a removable upper lid 13 on its top, an injection pipe 11 equipped with at least one nozzle 12 is disposed in the tank 1. The bottom portion 14 of the tank 1 is formed into a funnel shape so as to facilitate discarding a solvent 21.

[0015] The solvent container 2 filled with the solvent 21 has a cap locked on its top.

[0016] The solvent drain pipe 3 is communicated with the bottom portion 14 of the cleaning tank 1 at its one end, while its other end is communicated with the cap 22 of the solvent container 2. A filter screen 9 is provided at the boundary between the solvent drain pipe 3 and the cleaning tank 1 for filtering adulterant in the solvent 21, while a check valve 31 is installed at the entry position of the solvent drain pipe 3 into the solvent container 2 biasing towards the container side.

[0017] The solvent supply pipe 4 communicates with the injection pipe 11 with its one end perforating the cleaning tank 1 and having a leak proof gasket 42 at the bottom of perforation so as to prevent the solvent 21 from oozing therefrom, while the other end thereof is extended to the bottom of the solvent container 2. A three-way tube 41 having valves 411, 412 installed in each of two sub-tubes of the three way tube 41, is provided for the solvent supply pipe 4 at the portion above the solvent container 2, wherein the valve 411 is for controlling the flow of the solvent 21 to the injection pipe, and the other valve 412 is for handling replenishment or replacement of the solvent 21 in the solvent container 2.

[0018] The microswitch 51 attached to the place where the upper lid 13 is closely fitted with the tank 1 can be triggered to operate when the lid 13 is opened.

[0019] The pressure regulation valve 52 is installed beneath the bottom of the microswitch 51 for presetting a constant air pressure so as to keep drawing up the solvent 21 without failing from a low pressure.

[0020] The timer 53 is attached to a side surface of the cleaning tank 1 for setting the time to automatically interrupt the input of pressurized air into the solvent container 2.

[0021] The exhaust valve 54 is provided on the solvent container 2 for rapid release of the pressurized air in the solvent container 2 so as to check drawing up the solvent 21 from the container 2.

[0022] The compressed air supply pipe 7 is communicated with the air compressor 8 at its one end, while its other end thereof is successively connected to the microswitch 51, the pressure regulation valve 52, the timer 53, the exhaust valve 54, and finally the cap 22 of the solvent container 2 such that the pressurized air can be introduced into the solvent container 2. Besides, a valve 6 is installed at the outlet of the pressurized air of the air compressor 8 for controlling the compressed air output.

[0023] At the beginning of the cleaning operation, the

pressurized air is produced by the air compressor 8. At first, the air pressure is regulated to a prescribed value by the valve 52, and then sent into the solvent container 2 by way of the timer 53 and the exhaust valve 54. At this instance, the check valve 31 located at the boundary between the solvent drain pipe 3 and the solvent container 2 closes as soon as it has detected compressed air entry to the cleaning tank 1 so as to maintain sufficient air pressure in the solvent container 2 to draw up the solvent 21 into the cleaning tank 1 via the solvent supply pipe 4. At this moment, the valve 411 at the mid-way of the solvent supply pipe 4 is in open state, while the other valve 412 thereof is in closed state so that the solvent 21 is able to be transported into the injection pipe 11 in the tank 1 and injected out of the nozzle 12 to clean the sprayer gun. The injected solvent 21 is deposited on the bottom of the tank 1 after completion of the cleaning work. The check valve 31 automatically opens as soon as the compressed air stops to enter the solvent container 2 so as to allow the solvent 21 to return to the container 2 via the solvent drain pipe 3. In this way the solvent 21 in the container 2 can be used repeatedly until the pressurized air ceases to enter the container 2.

[0024] In case during the operation of the cleaning device, the upper lid 13 of the cleaning tank 1 is inadvertently removed, the compressed air is instantaneously interrupted from entering the solvent container 2 by actuation of the microswitch 51, and simultaneously, the pressurized air in the solvent container 2 is automatically discharged by the exhaust valve 54 so that the solvent supply pipe 4 can not continue to draw the solvent 21, and the nozzle 12 is unable to inject the solvent 21 any more thereby assuring the operation security of the cleaning device. If it is desired, the timer 53 may be used to preset the operation time of the cleaning device. As soon as the time is over, the entry of the pressurized air into the solvent container 2 is interrupted to cease the cleaning work.

[0025] Meanwhile, for replacing the solvent 21 in the container 2, by closing the valve 411 and opening the other one 412, the solvent 21 in the container 2 is conducted out of the container 2 for replacement.

[0026] It emerges from the above description that the invention has several noteworthy advantages, in particular:

1.The hazardous electrostatic induction accident arising from the mechanical friction can be evaded because the power source for the present invention is compressed air.

2.The cleaning solvent is repeatedly usable so as to cut down the operational cost.

3.A relevant and constant air pressure can be maintained in the solvent container so as to ensure reliable operation of the device.

4.A timer can be utilized to preset the operation time.

5.A microswitch can be utilized to interrupt entry of

the pressurized air into the solvent container should the upper lid of the cleaning tank is opened inadvertently so that injection of solvent from the nozzle can be stopped too,

6. An exhaust valve is provided to release the pressurized air out of the solvent container instantly in case the pressure inside the solvent container rises to a hazardous value so as to protect the security of the whole device and the operator as well.

[0027] Although the invention has been described in terms of a preferred embodiment, it is apparent that numerous variations and modifications may be made without departing from the true spirit and scope thereof, as set forth in the following claims.

Claims

1. An automatic cleaning device for paint sprayer gun comprising:

a cleaning tank provided with a removable upper lid on its top, and an injection pipe equipped with at least one nozzle;

a solvent container filled with cleaning solvent and having a cap locked on its top thereof;

a solvent drain pipe communicated with the bottom portion of said cleaning tank at its one end, while its other end is communicated with said cap of said solvent container, and a check valve is installed at the entry position of said solvent drain pipe into said solvent container biasing towards said container side;

a solvent supply pipe communicating with said injection pipe with its one end perforating said cleaning tank, while the other end thereof is extended to the bottom of said solvent container; and

a compressed air supply pipe communicating with an air compressor at its one end, while its other end thereof is connected to said cap of said solvent container;

when the pressurized air is produced by the air compressor, the pressurized air is introduced into said solvent container via said compressed air supply pipe so as to automatically close a check valve located at the boundary between said solvent drain pipe and said solvent container thereby preventing entry of the pressurized air into the cleaning tank and maintaining sufficient air pressure in said solvent container to draw up the solvent into said cleaning tank via said solvent supply pipe and enters said injection pipe, and then the solvent is injected out of said nozzle thereof to carry out the cleaning work, the used solvent is deposited on the bottom surface of said cleaning tank after comple-

tion of cleaning work, thereafter said check valve automatically opens as soon as the compressed air stops to enter said solvent container so as to allow the solvent to return to said solvent container via said solvent drain pipe such that the solvent can be repeatedly used.

2. The cleaning device of claim 1, wherein the bottom portion of said cleaning tank is formed into funnel shape so as to facilitate the solvent return to said solvent container.
3. The cleaning device of claim 1, wherein a filter screen is provided at the boundary between said solvent drain pipe and said cleaning tank for filtering adulterant in the solvent.
4. The cleaning device of claim 1, wherein a three-way tube having two valves installed in each of the two sub-tubes, is provided for said solvent supply pipe at the portion above said solvent container, wherein one of the two valves is for controlling the flow of the solvent to said injection pipe, and the other one is for handling replenishment or replacement of the solvent in said solvent container.
5. The cleaning device of claim 1, wherein a pressure regulation valve is installed for said compressed air supply pipe for presetting a constant air pressure so as to keep drawing up the solvent without failing due to a low pressure, or cause to ruin the cleaning device by an over pressure.
6. The cleaning device of claim 1, wherein a micro-switch is attached to the place where said upper lid is closely fitted to said cleaning tank to be triggered to interrupt entry of the pressurized air into said solvent container thereby preventing the solvent from being drawn up by said solvent supply pipe.
7. The cleaning device of claim 1, wherein a timer is provided for said compressed air supply tube for presetting the time to automatically interrupt the input of pressurized air into said solvent container.
8. The cleaning device of claim 1, wherein an exhaust valve is provided on said solvent container for rapid release of pressurized air in said solvent container by way of said compressed air supply pipe so as to check drawing up the solvent from said solvent container.
9. The cleaning device of claim 1, wherein a valve is equipped at the outlet of the pressurized air of said air compressor for controlling the compressed air output.

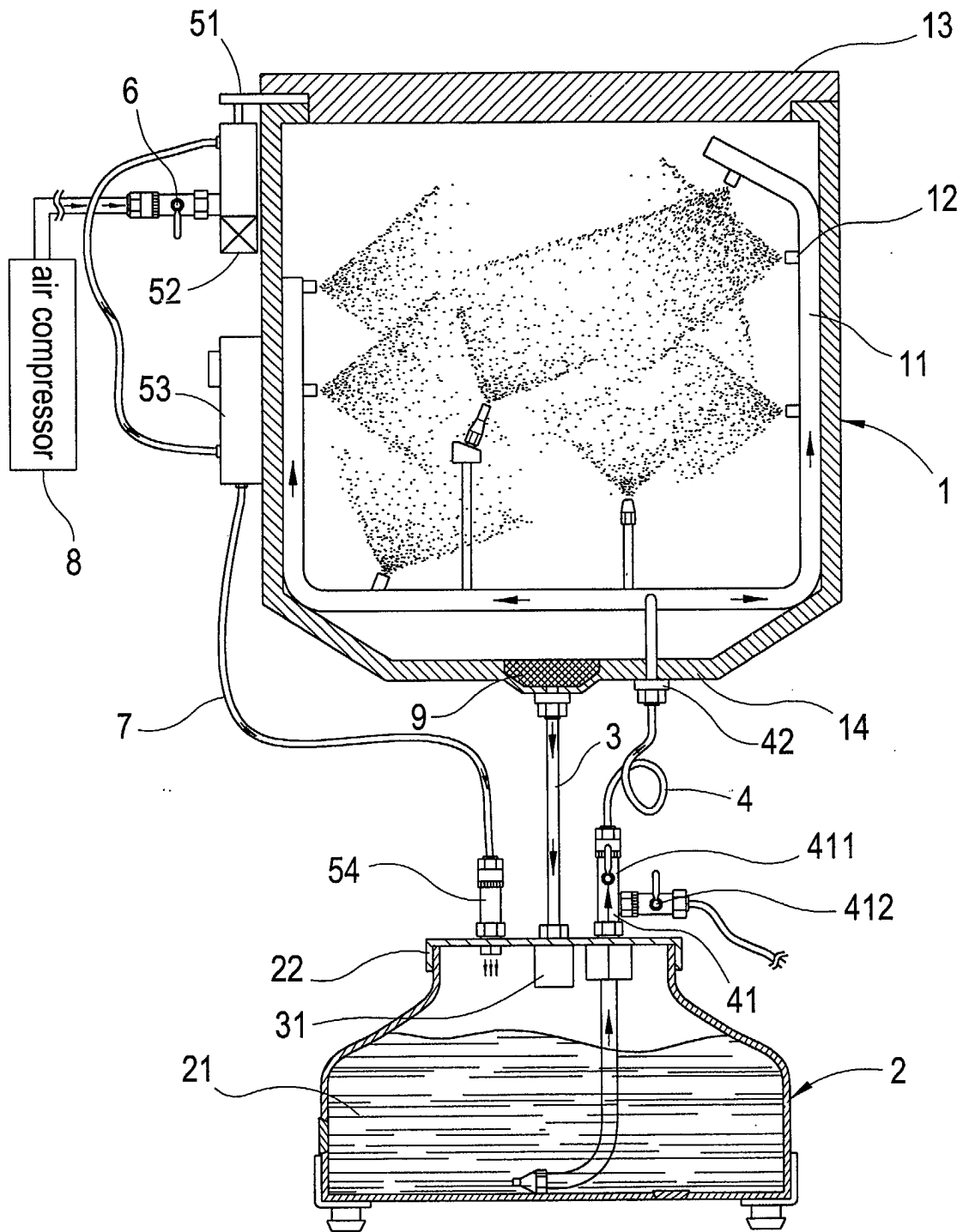


FIG. 1