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(54) **Apparatus for painting heating radiators.**

(57) A device for painting a radiator whilst it is mounted on a wall comprises a container for paint, a paint dispenser for dispensing a flood of paint over the top and upper side walls of the radiator, and a peristaltic pump for pumping paint from the container to the dispenser. A collecting trough is also provided to collect run-off paint. The peristaltic pump acts on a continuous length of flexible tube which extends from the container and comprises the dispenser and thus no paint contacts the working components of the pump, reducing associated problems of cleaning since only the tube needs to be cleaned after use.

Description

APPARATUS FOR PAINTING HEATING RADIATORS

This invention relates to a method and apparatus for painting room heating radiators, particularly, but not exclusively, radiator panel assemblies secured in position against a wall.

It is difficult and tedious to paint a wall-mounted central heating radiator panel assembly by brush painting or by spraying without first removing the radiator assembly from the wall, but this requires disconnection of the water connections, and draining of the radiator. There is the usual problem with painting vertical surfaces that unsightly drips are often produced. If attempts are made to brush paint a radiator in situ then it is difficult to keep the paint off the wall, and of course the back of the radiator cannot be reached. Furthermore, many radiators panels now have associated fins to increase their effective surface area, and the painting of the fins, even at the top, is extremely difficult.

It has previously been proposed in DE-A-1 752 662 to paint a radiator whilst it is still mounted on a wall by pumping paint from a reservoir along a flexible supply tube connected to the reservoir and then through a manually controlled flow control at its free end which comprises a discharge outlet. The discharge outlet is positioned above the radiator and paint is discharged onto the top of the radiator from where it flows down the sides of the radiator, coating them uniformly. A drip-tray is provided under the radiator and collects run-off paint. The pump continuously sucks paint from the drip-tray via a fixed return pipe and returns it to the reservoir. The pump is a vane-pump and has two working chambers. The entire painting unit is provided as a wheeled vehicle.

A similar device is disclosed in DE-A-1 913 961. This device also has a manually operable flow control provided at the free end of a flexible supply tube fixed to a reservoir for paint, a drip-tray which collects run-off paint and feeds it back to the reservoir, and a pump for pumping paint from the reservoir to the flow control. The kind of pump used is said to be a low-pressure pump.

The known devices for flood-coating a radiator work well, but have associated problems. For example they have to be cleaned thoroughly after use so as to ensure that no paint is left inside the flow control supply tube and return pipe, and indeed to ensure that no paint remains in the pump. If the device is used to paint a radiator in one colour and then subsequently used to paint another radiator another colour, for example white, the residual paint inside the device after the first painting operation can contaminate a subsequent painting operation. A second reason for cleaning the device thoroughly is that residual paint in the supply tube, return pipe, and pump can dry if the device is left idle for some days. This can cause clogging of the tubes and pipes, and can also cause the pump to seize due to paint drying on its working components. Thus it is important to clean the machines thoroughly after use.

Apparatus for painting a room heating radiator panel assembly comprising a paint dispenser for dispensing a stream of paint at a predetermined flow rate onto an upper region of the panel assembly, and a peristaltic pump for pumping paint to the dispenser.

The use of a peristaltic pump to pump the paint to the dispenser means that the paint never contacts the working components of the pump and so it cannot dry on them.

A peristaltic pump allows the use of a continuous length of flexible pipe extending from a container for paint to the dispenser, which pipe can be stroked or worked at an intermediate portion in its length by the peristaltic pump positively displacing fluid from a downstream portion of the flexible pipe to an upstream portion. It is thus possible to have a pipe which is readily removable from the apparatus. The pipe may be thrown away after completing a days painting, or when it is desired to change the colour of the paint. Alternatively, the pipe may be cleaned for re-use. Cleaning of a readily removable pipe is far simpler and quicker than cleaning the working components of a pump and associated permanently fixed tubes.

Preferably the apparatus further comprises means capable of collecting surplus paint which runs from the bottom of the panel assembly.

The flow and drying characteristics of the paint are preferably chosen such that the paint distributes itself as a substantially uniform layer over the height of the radiator, the drying time being sufficiently long to allow this vertical flow of paint to take place.

In order to provide a sufficiently long "flow time" before drying, it is preferred to use an oil-based paint rather than a cellulose paint which would generally be unacceptable.

Oil-based paint thinned with substantially 15% by volume of appropriate thinners is found suitable in general, when working under normal indoor temperatures.

Preferably the paint collected at the bottom of the panel assembly is re-used.

Most preferably the paint collected at the bottom of the panel assembly is returned to a container from which paint is supplied to the top of the panel assembly.

The paint dispenser is traversed slowly, conveniently by hand, along the the panel assembly, the dispenser preferably being positioned adjacent to the front surface of a panel, adjacent to the top, for painting the front surface during one pass, and being positioned adjacent to the back surface of a panel, adjacent to the top, for painting the back surface during another pass (the order of painting front and back does not matter).

The paint dispenser is preferably a tubular nozzle, conveniently simply being the free end of a flexible tube length through which the paint is caused to flow.

A further advantage of using a peristaltic pump is

that such a pump "polishes" the paint, rather than over-working the paint and introducing air bubbles, as would an impeller pump.

The motor of the peristaltic pump may conveniently be housed in a casing to keep it clean, the tube holding and squeezing members of the pump being mounted externally of the casing. The motor is conveniently an electric motor, but other forms of power could be used. The tube holding members may comprise manually releasable clips, and the tube squeezing members may comprise rollers.

A single supply and delivery tube can extend for the most of the length between the container and the dispenser when a peristaltic pump is employed, the lower end of the tube being suitably located in the paint container to prevent it slipping out, and to prevent air from being sucked into the tube inlet end.

It is not desirable to provide a trigger valve to control the supply of paint to the paint dispenser, since blocking of the paint flow after the pump would cause bursts. It is therefore preferred to provide a foot or hand-operated control for the pump motor. This may be a foot-operated air switch for example. The rate of flow of paint is controlled by the rate of operation of the pump and the diameter of the tube. For simplicity it may be desirable to provide a single-speed pump together with a range of tubes of different diameter (narrow tubes being used for greater control).

A trough is preferably provided to catch the excess paint which runs from the bottom of the panel assembly.

The trough is preferably arranged as a gutter the base of which slopes along the length of the radiator, and is positioned below the base of the panel assembly, to convey the excess paint to one or more collection points.

Preferably the gutter base slopes in two directions to a substantially central collection point.

Most preferably the collection point directs a paint stream into the paint container from which paint is pumped to the dispenser.

In order to avoid cleaning of a pre-formed trough, the trough is conveniently constructed from a piece of disposable, paint-proof sheet material, such as polythene sheet of suitable gauge. A back part of the sheet is secured against the wall in the lower region of a wall-mounted radiator, and the front part of the sheet is upturned to define the trough, except that a mid-region of the front part of the sheet is permitted to project forwardly and downwardly from the radiator so as to direct the collected paint into the paint container.

The rear part of the sheet could be attached to the wall during painting by tape, such as masking tape, but in order to avoid any possible damage to exposed areas of the wall it is preferred to employ a plurality of resiliently biased pad assemblies, each pad assembly comprising a rearwardly facing pad which bears against the rear part of the sheet, and a forwardly directed pin which presses against the rear surface of the radiator panel assembly. The use of a pin minimises the contact area with the radiator, so as to minimise the effect on painting. The pin can be suitably biased, by a coiled compression spring

for example, with respect to the pad.

The front part of the sheet can be held up to define the trough shape by suitable floor stands, conveniently in the form of a base plate with upright post to which the sheet can be secured by suitable means, such as a clip or with adhesive tape. For a short radiator two stands, one positioned at each end of the radiator, will suffice, but for longer radiators four or more stands may be employed.

A suitable form of container for collecting the paint from the trough is a conventional tray for use with a paint roller, since this is shallow and can fit under many obstructions.

An advantage of flood-coating the radiator is that a relatively thick continuous layer of paint can be provided on the radiator surfaces in a single operation. As an example, the usage of paint can be typically 125 ml for 1000 in² of radiator surface.

The peristaltic pump used typically has a pumping capacity of 125 ml per minute, and can flood-paint a radiator of surface area 1000 in² in 6 minutes.

In order to minimise wastage of paint during cleaning of the tube, the tube is preferably of minimum length commensurate with enabling the operator to reach the ends of the radiator. The pump unit is preferably, therefore, placed on the floor, close to the paint container.

In another version the pump would be provided in a hand held unit.

Typically the dispenser is a tube of inside diameter 3.5 mm. The dispenser tube can be of the spirally wound, flexible type to enable the shape of the tube to be altered at will, for reaching the inaccessible parts behind the upper part of the front panel of a complex radiator panel assembly.

A filter is preferably arranged to filter particles from the paint entering the inlet end of the supply tube.

A preferred type of paint is that supplied by G.K.N./A.F. and sold under the designation C71-4. This paint is particularly suitable as it has a low odour and dries in approximately two hours at normal indoor temperatures.

Drying of the paint can be hastened if desired by suitable heating means. For example, by the use of an infra red heater, or by charging the radiator with hot fluid.

Although the invention will usually be used to paint wall-mounted central heating radiator panel assemblies it can be used for painting free-standing heating radiators of the electrically powered oil-filled type, or similar radiators.

Claims

1. Apparatus for painting a room heating radiator panel assembly comprising a paint dispenser for dispensing a stream of paint at a predetermined flow rate onto an upper region of the panel assembly, and a peristaltic pump for pumping paint to the dispenser.

2. Apparatus as claimed in claim 1, further comprising means capable of collecting surplus paint which runs from the bottom of the panel

assembly.

3. Apparatus as claimed in claim 1 or claim 2, characterised in that the paint dispenser is a tubular nozzle at the free end of a flexible tube length through which the paint is caused to flow.

4. Apparatus as claimed in any preceding claim, characterised in that a single supply and delivery tube extends substantially for the most of the length between a container for paint and the dispenser.

5. Apparatus as claimed in claim 4, characterised in that the lower end of the tube is suitably located by locating means in the paint container to prevent it slipping out.

6. Apparatus as claimed in claim 4 or claim 5, characterised in that the supply and delivery tube is replaceable by a new tube for a change of colours of paint, or for a new painting operation.

7. Apparatus as claimed in any of claims 1 to 6, comprising a trough for catching the excess paint which runs from the bottom of the panel assembly.

8. Apparatus as claimed in claim 7 in which

the through is arranged as a gutter which extends for the full length of the radiator, and is adapted to be positioned below the base of the panel assembly, to convey the excess paint to one or more collection points.

9. A method of painting a substantially vertically positioned room heating radiator panel assembly by causing paint to flow down the radiator surfaces by supplying a stream of paint at a predetermined flow rate to the top of the panel assembly, excess paint being collected at the bottom of the panel assembly, characterised in that the paint is supplied by apparatus according to any one of claims 1 to 8.

10. The method according to claim 9, characterised in that the paint dispenser is traversed slowly along the panel assembly, the dispenser being positioned adjacent to the front surface of a panel, adjacent to the top, for painting the front surface during one pass, and being positioned adjacent to the back surface of a panel, adjacent to the top, for painting the back surface during another pass.

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