The present invention provides a novel model train cleaning device and uses thereof.
MODEL TRAIN CLEANING DEVICE

FIELD OF THE INVENTION

The present invention relates to a model train cleaning device, and uses thereof.

BACKGROUND

Model trains and layout related accessories often go uncleaned because of the delicate nature of their scale components. The average model train enthusiast can clean their model train equipment with a soft bristled brush, or the occasional vacuum type brush, but they run the risk of damaging the equipment. For example detail parts can become loosened and damaged. Additionally, the delicate finishes and paints can be scratched because of direct contact with bristles or cloths. The cleaning process is not quick, because the many details of model trains suffer from dust and debris ingress. Model train enthusiasts have dozens of railroad cars and engines; consequently most go uncleaned because of the time commitment needed for cleaning and tendency for damage. U.S. Pat. No. 6,758,145 describes a track cleaner for model railroads, but offers no solution for cleaning rail cars or locomotives.

Therefore, there exists a need to provide a device which effectively and rapidly cleans the delicate model train scale components without the contact of brush bristles to reduce the risk of damaging their equipment and decrease the time needed to clean the scale components. It is desirable to provide a cleaning device that can be used in conjunction with the model train enthusiast’s common scale railroad setting, enabling the user to perform cleanings on site, without the need to remove cars and engines from the tracks. Additionally it is desirable to create an enclosure for the cleaning device which contains the dust and debris removed from the objects being cleaned and which camouflages the cleaning device so that it appears to be part of the model train enthusiast’s railroad setting.

SUMMARY OF THE INVENTION

In one general aspect, the invention provides a model train cleaning device comprising an encapsulation structure; a non contact sensing device; and at least one fluid transportation tube. In another general aspect, the model train cleaning device further comprises an automatic cleaning media valve.

In some embodiments the model train cleaning device further comprises a timing circuit. In other embodiments the model train cleaning device further comprises a solenoid.

In some embodiments the model train cleaning device further comprises a perforated plate which can be mounted into an opening that is cut into the model train layout or similar table beneath the model train cleaning device. The plate has an attachment on it that will permit the connection of a household vacuum appliance to remove the dust and debris that will build up inside the structure.

Other aspects, features and advantages of the invention will be apparent from the following disclosure, including the detailed description of the invention and its preferred embodiments and the appended claims.

DESCRIPTION OF THE FIGURES

FIG. 1 illustrates a perspective view of the model train cleaning device 1); the “LOCO-MAI” and the model railroad track 7) are shown.

FIG. 2 illustrates a perspective view showing one side entrance of the model train cleaning device; the “LOCO-MAI”1) and the model railroad 7) track are shown.

FIG. 3 illustrates another perspective view showing the underside of the model train cleaning device; the “LOCO-MAI” showing 1) Encapsulating Structure, 2) Fluid Transportation Tubing, 3a) Cleaning Media Inlet, 3b) Automatic Cleaning Media Valve, 4) Timing Circuit, 5) Non Contact Sensing Device, and 6) Jet Orifice

FIG. 4 illustrates a further perspective view showing 1) Encapsulating Structure, 2) Fluid Transportation Tubing, 3) Automatic Cleaning Media Inlet, 4) Timing Circuit, and 5) Non Contact Sensing Device

FIG. 5 illustrates a side view of an engine traveling through a structure which camouflages or otherwise disguises the “LOCO-MAI” so that it appears to be part of the model train enthusiast’s railroad setting.

DETAILED DESCRIPTION

All publications cited herein are hereby incorporated by reference. Unless defined otherwise, all technical and scientific terms used herein have the same meaning as commonly understood to one of ordinary skill in the art to which this invention pertains.

References

1. U.S. Pat. No. 6,758,145

As used herein, the terms “comprising”, “containing”, “having” and “including” are used in their open, non-limiting sense.

The model train cleaning device as defined herein, also called the “LOCO-MAI” is an automated device packaged within a structure that efficiently cleans model railroad engines and cars. Triggered by a non-contact, sensing device, a network of compressed air jets is activated. As the train advances, it is cleansed by the curtain of air that is produced.

Now referring to FIGS. 1 through 5 in detail, the model train cleaning device “LOCO-MAI” can comprise the following items:

1) The “Encapsulating Structure” as used herein is designed to prevent dust that is blown from the model railroad equipment from contaminating the surrounding layout the device is encased in a structure that serves to contain debris. The structure can be designed to simulate a building that can be found in many common railroad settings. The encapsulating structure
1 also serves to package the other components mentioned below by serving as a location to mount the items.

[0019] 2) The “Fluid Transportation Tube” as used herein is designed to transport cleaning media (such as air, or other fluids) from the automatic cleaning media valve 3b (such as a solenoid as discussed infra) to the jet orifices 6 through this tubing 2. In some embodiments there can be one or more than one section of tubing 2. In some embodiments cleaning media such as air can be provided by any commonly available air compressor such as one provided by http://www.airs -ingersoll-rand.com. In other embodiments there are multiple sections of tubing. The tubing 2 can be bent in such a manner that it closely follows the general cross sectional elevation of most model railroad equipment. The tubing 2 can be designed to rest as close to the model train without coming in contact with the train cars. By maintaining tight tolerance between the tubing and model railroad equipment, energy loss from the cleaning media traveling over a distance, and due to turbulence is minimized. By placing the tubing as close as possible to the model train maximum cleaning action can occur.

[0020] 3a) The “Cleaning Media Inlet” as used herein is configured to allow the introduction of cleaning media into the system. The model train is remotely sensed by a sensing device 5. The sensing device 5 starts an event that results in the opening of a normally closed automatic cleaning media valve 3a, (an electronically controlled valve, a solenoid). The automatic cleaning media valve 3a allows the cleaning media to travel through the cleaning media inlet 3a, while the signal is received from the non contact sensing device 5 and intermediate electrical timing circuit 4 (discussed in further detail infra). Electrical power can be supplied by any desirable source such as a power supply (transformer) that plugs into a home alternating current power source such as an electrical outlet. The power supply which can be purchased separately, or can be provided with the present invention, transforms 120 volts, alternating current (AC) into 12 volt, direct current (DC), but other voltages and currents are envisioned within the scope of the invention.

[0021] 3b) The “Automatic Cleaning Media Valve” as used herein is designed to control and or regulate the introduction of cleaning media into the model train cleaning device through the Cleaning Media Inlet 3a. The automatic cleaning media valve 3b can be located within the model train cleaning structure 1, and in some embodiments the automatic cleaning media valve 3b can be located outside the model train cleaning structure 1. The automatic cleaning media valve 3b can be directly interconnected with the Cleaning Media Inlet 3a or other items such as tubing 2 can be used to join 3a to 3b.

[0022] 4) The “Timing Circuit” as used herein is required to prevent rapid cycling of item 3b, described supra. The sensing device 5 senses at a rate that would cause rapid on/off cycling of item 3b, described supra. To overcome various railroad equipment configurations the sensing device is located in a common location 5. However, this location will cause rapid cycling which will not result in maximum cleaning action. To eliminate rapid cycling an electrical timer circuit is incorporated to effectively lock on item 3b for a predetermined amount of time. Each time the model railroad equipment is sensed the timer is reset.

[0023] 5) The “Non Contact Sensing Device” as used herein is a sensor 5 used to detect the presence of model railroad equipment to begin the cleaning cycle. The sensor is of the non contact type which requires no physical contact with the object being cleaned to prevent any interference or damage.

[0024] 6) The “jet orifice” or as used herein is an opening that permits the cleaning media escape from the Fluid Transportation Tube 2. In some embodiments there can be one or more than one jet orifice 6. In some embodiments the jet orifices are simply drilled holes. In other embodiments the jet orifices 6 are fitted with nozzles to focus or concentrate the airflow. In other embodiments the jet orifices 6 are fitted with other suitable attachments to direct the flow of the cleaning media over the model train.

[0025] 7) The term “model railroad track” as used herein includes any scale of model railroad track employed in the hobby, including but not limited to tracks employed by Large Scale, HO, O, S, Z, and N scale model trains as well as and track codes 100 (0.1000"), code 83 (0.0830"), code 80 (0.0800"), code 70 (0.0700") and code 55 (0.0500"). The model railroad track can be made of any metal or combination thereof including but not limited to brass, nickel-silver, or steel.

[0026] No longer do model railroad operators need to clean their equipment with brush, vacuum, or any other type of labor intensive, possibly destructive apparatus. The LOCO-MAT is non contact cleaning, time saving device that is used to enhance the model railroad experience.

EXAMPLE 1

[0027] The model train cleaning device or “LOCO-MAT” was installed or set on the model train layout such that model railroad track passed through the device on a model train user’s table see for example FIGS. 1, 2 and 5. The AC power supply and compressed air supply were connected to the “LOCO-MAT”. To begin the cleaning process the model train was advanced through the device. Motive force to advance the model train was provided by the powered model train equipment (in this example a diesel engine was used), but this can be provided by any other means such as an electric engine or the model railroad actively pushing the trains through the cleaning device. When the model railroad equipment passed through the device and broke the plane of the non-contact sensing device 5, the compressed fluid cleaning media (air) was released. The compressed fluid cleaning media (air) passed through the network of tubing 2 and eventually was forced to the atmosphere through the orifices (jets) on the tubing 2. The compressed fluid cleaning media removed dust and debris that were attached to the model railroad equipment. The dislodged dust and debris were contained within the structure 1. The train advanced through the cleaning device and the curtain of air swept along its length continuing the debris removal process. During this time the process of the compressed fluid clean-
ing media cleaning the model train was constant. The train eventually exited the structure. When the non-contact sensor 5 no longer detected the presence of the model train the compressed fluid was automatically turned off.

[0028] A perforated plate was mounted into an opening cut into the model train layout beneath the model train cleaning device. The plate had an attachment on to permit connection of a household vacuum appliance to remove the dust and debris that built up inside the structure.

1 claim:
1. A model train cleaning device comprising:
   (a) an encapsulation structure;
   (b) a non contact sensing device interconnected with said encapsulation structure; and
   (c) at least one fluid transportation tube interconnected with said encapsulation structure.

2. The model train cleaning device of claim 1 further comprising:
   a cleaning media inlet interconnected with said at least one fluid transportation tube.

3. The model train cleaning device of claim 2 wherein said at least one fluid transportation tube further comprises a jet orifice.

4. The model train cleaning device of claim 3 further comprising:
   a timing circuit interconnected with said encapsulation structure.

5. The model train cleaning device of claim 4 further comprising:
   an automatic cleaning media valve interconnected with at least one fluid transportation tube.

6. The model train cleaning device of claim 5 further comprising:
   a perforated plate interconnected with said encapsulation structure.

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