A mobile surface maintenance machine includes a mobile body configured to travel over a surface, a motorized tool, a communicator, a memory, and a controller. The motorized tool is supported by the mobile body and configured to engage the surface. The communicator is configured to communicate over a network. The memory contains settings for the machine. The controller is configured to modify the settings of the machine in response to setting information received by the communicator over the network and to control operations of the machine based on the settings.
Fig. 3

Fig. 4
TRANSMIT SETTING INFORMATION OVER A NETWORK

RECEIVE THE SETTING INFORMATION USING A COMMUNICATOR OF THE MOBILE SURFACE MAINTENANCE MACHINE

MODIFY SETTINGS FOR THE MACHINE BASED ON THE SETTING INFORMATION

OPERATE THE MACHINE BASED ON THE SETTINGS

FIG. 5
REMOTE CONFIGURATION OF MOBILE SURFACE MAINTENANCE MACHINE SETTINGS

CROSS-REFERENCE TO RELATED APPLICATION

[0001] The present application is based on and claims the benefit of U.S. provisional patent application Ser. No. 60/741,659, filed Dec. 2, 2005, the content of which is hereby incorporated by reference in its entirety. Reference is also made to U.S. patent application Ser. No. 11/272,510, filed Nov. 10, 2005, the content of which is hereby incorporated by reference in its entirety.

FIELD OF THE INVENTION

[0002] The present invention generally relates to mobile surface maintenance machines and, more particularly, to modifying settings of the machine over a network.

BACKGROUND OF THE INVENTION

[0003] Mobile surface maintenance machines include motorized tools that are used to perform a surface maintenance operation on a floor surface. These machines include floor surface cleaners that are used to perform cleaning operations on floors including scrubbing and/or sweeping operations on hard floor and carpeted surfaces. Other mobile floor surface maintenance machines include those that include tools for performing polishing and burnishing floor surface treatments.

[0004] Mobile surface maintenance machines include various adjustable settings for the floor maintenance operation to be performed. These settings are typically configurable by the operator of the floor machine at a main operator interface of the machine, such as a control panel. For floor cleaning operations, the adjustable settings include, for example, a downward pressure to be applied to the floor by the motorized cleaning tool (brush speed, sweeper brush, or combination scrub and sweeper brush), a flow rate of cleaning liquid to be applied to the floor or the cleaning tool, a flow rate of cleaning agent or detergent that is mixed with water to form the cleaning liquid, and other settings. Similar settings are used by polishing and burnishing machines including a pressure setting that determines the downward pressure to be applied by the cleaning tool during floor polishing or burnishing operations.

[0005] The adjustable settings that relate to consumables of the mobile surface maintenance machine generally affect the life span of the consumable. For example, the lighter the downward pressure setting is for the motorized cleaning tool (i.e., scrub brushes, scrub pad, burnishing pad, polishing pad, etc.) the longer the cleaning tool will last before it must be replaced. Similarly, the slower the flow rate setting is for the cleaning agent or detergent, the more cleaning operations that can be performed using the available supply of cleaning agent. Thus, the setting can have a direct impact on the life span of the consumable and the cost of operating the mobile surface maintenance machine.

[0006] Unfortunately, conventional mobile surface maintenance machine allow an operator of the machine to adjust the settings described above through a control panel of the machine. While experienced operators may configure the machine to operate in an efficient manner, less experienced operators may not. For instance, when an administrator of one or more mobile surface maintenance machines would like to adjust a setting, not only must each machine be manually adjusted, but each operator of the machines must be consulted to ensure the adjusted setting is not changed.

[0007] The discussion above is merely provided for general background information and is not intended to be used as an aid in determining the scope of the claimed subject matter.

SUMMARY OF THE INVENTION

[0008] Embodiments of the invention are directed to a mobile surface maintenance machine that is configurable over a network and a method of configuring a surface maintenance machine over a network. One embodiment of the mobile surface maintenance machine includes a mobile body configured to travel over a surface, a motorized tool, a communicator, a memory, and a controller. The motorized tool is supported by the mobile body and configured to engage the surface. The communicator is configured to communicate over a network. The memory contains settings for the machine. The controller is configured to modify the settings of the machine in response to setting information received by the communicator over the network and to control operations of the machine based on the settings.

[0009] In one embodiment of the method of the present invention, setting information is received over a network using the communicator of the mobile surface maintenance machine. Next, the settings for the machine are modified using the controller based on the setting information. Finally, the surface maintenance machine is operated based on the settings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1 is a simplified block diagram of a mobile surface maintenance machine in accordance with embodiments of the invention.

[0011] FIG. 2 is a block diagram of a cleaning liquid dispensing system in accordance with embodiments of the invention.

[0012] FIG. 3 is a block diagram of a memory containing settings for the mobile surface maintenance machine in accordance with embodiments of the invention.

[0013] FIG. 4 is a block diagram of setting information in accordance with embodiments of the invention.

[0014] FIG. 5 is a flowchart illustrating a method of configuring a mobile surface maintenance machine in accordance with embodiments of the invention.

DETAILED DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

[0015] Embodiments of the present invention facilitate configuring settings of a mobile surface maintenance machine (hereinafter "machine") over a network. Thus, the present invention can be used by an administrator of one or more machines in a fleet of machines to change one or more adjustable settings of the machines over a network. Different machines can be configured differently from the other machines that are within the same fleet, if desired. As a result, problems that arise from modifications to the settings by an
operator can be reduced or eliminated. For example, the administrator can control the settings of the machines that affect the life span of consumables of the machine and, thus, the cost of operating the machine. Additionally, the administrator of the machines can use embodiments of the present invention to enable or disable certain features of the machines. This allows the administrator to tailor the machines for particular uses or for particular customers who may be leasing the machines, for example.

[0016] FIG. 1 is a simplified block diagram of a mobile surface maintenance machine 100 in accordance with embodiments of the invention. The machine 100 can be configured to perform a cleaning or condition operation on a floor surface. The machine 100 can be designed for use by an operator that walks behind, rides on, or tows the machine 100. The machine 100 can be powered by batteries, a combustible engine, line power or other suitable power source.

[0017] Cleaning operations on floors include scrubbing and/or sweeping operations on hard floor and carpeted surfaces. Examples of machines designed to perform such cleaning operations are described in U.S. Pat. Nos. 4,571,771, 5,016,310, 5,901,407, 5,945,724 and 6,735,811, all of which are assigned to Tennant Company of Minneapolis, Minn. Exemplary floor conditioning operations include polishing and burnishing operations. An example of a machine for performing such floor conditioning operations is described in U.S. Pat. No. 4,805,258, which is assigned to Tennant Company of Minneapolis, Minn. The above-referenced patents are hereby incorporated by reference in their entirety.

[0018] Embodiments of the machine 100 include a mobile body 102 comprising a frame that is supported on wheels 104 for travel over a surface 106, on which a cleaning operations is to be performed. In one embodiment, a motor 108 is configured to drive at least one of the wheels 104.

[0019] Embodiments of the machine 100 also include components that are supported on the mobile body 102 including, for example, a motorized tool 110, a communicator 112, memory 114 and a controller 116. The motorized tool 110 is supported by the mobile body 102 and is used to perform a cleaning or conditioning operation on the surface 106, as indicated by arrow 117. Exemplary motorized tools 110 include a scrub brush 118 (e.g., disk scrub brush or pad, or a cylindrical scrub brush), a sweeper brush 120 (e.g., disk or cylindrical), a combination sweep and scrub brush 122, a burnishing pad 124, a polishing pad 126, or other motorized tool 110 used to perform hard floor and/or carpeted surface maintenance operations.

[0020] In one embodiment, the machine 100 includes a tool lift 128. The tool lift 128 is configured to raise and lower the tool 110 relative to the frame of the mobile body 102, as indicated by arrow 130. The tool lift 128 can be used to raise the motorized tool 110 off the surface 106 during transport as well as control of a pressure that is applied to the surface 106 during surface maintenance operations. Exemplary tool lifts 128 are described in U.S. Pat. Nos. 6,618,888 and 7,038,416, which are assigned to Tennant Company and are hereby incorporated herein by reference in their entirety. In one embodiment, operation of the tool lift 128 is based on a control signal 132 from the controller 116. As explained below, in one embodiment the control signal 132 is based on a pressure setting. The tool lift 128 causes the motorized tool 110 to apply a pressure to surface 106 based on the pressure setting.

[0021] One embodiment of the machine 100 includes a cleaning liquid dispenser 134 that is configured to apply a cleaning liquid 136 to one of the surface 102 and the tool 128 (i.e., the scrub brush 118, the sweeper brush, or the sweep/scrub brush), as respectively indicated by arrows 136A and 136B of FIG. 1. Embodiments of the dispenser 134 are illustrated in the block diagram of FIG. 2.

[0022] One embodiment of the cleaning liquid dispenser 134 includes a supply of the cleaning liquid and a pump 138 for driving a flow of the cleaning liquid 136 through tubing to be discharged at the desired location. The cleaning liquid 136 can comprise water or a combination of water and a cleaning agent.

[0023] The flow rate of the cleaning liquid is substantially determined by the pump 138. The pump 138 generally operates in accordance with conventional methods. In one embodiment, the pump 138 is controlled by a control signal 140 from the controller 116. One embodiment of the control signal 140 is a pulsed signal that provides power relative to ground (not shown) and controls the duration over which the pump 138 drives the cleaning liquid 136 through the tubing. For example, the control signal 140 can turn the pump 138 on for 0.1 seconds and off for 2.75 seconds to produce the desired flow rate for the cleaning liquid 136. As will be discussed below, one embodiment of the control signal 140 is based on a cleaning liquid flow rate setting.

[0024] Another embodiment of the cleaning liquid dispensing system 134 includes separate supplies of water 142 and cleaning agent 144. The water 142 can be stored in a tank supported on the mobile body 102, while the cleaning agent 144 is provided in a separate container, such as a fixed tank or removable container or cartridge. A mixing member 146 combines a flow of water 148 with a flow of the cleaning agent 150 at a desired dosage to form the flow of cleaning liquid 136. The dosage of the flow of cleaning agent 150 into the flow of water 148 can be provided by a cleaning agent dispenser 151 that utilizes a venturi injector (not shown) or a dosing pump 152. In one embodiment the pump 152 is controlled by a control signal 154 from the controller 116, as described above with regard to pump 138. In one embodiment, the control signal 154 is based on a cleaning agent flow rate setting.

[0025] Another embodiment of the machine 100 includes a fluid recovery device 156, shown in FIG. 1, that operates to remove soiled liquid waste 158 from the surface 106 during scrubbing operations. One embodiment of the fluid recovery device 156 includes a vacuum squeegee 160 that collects the liquid waste 158 on the surface 106. The vacuum squeegee 160 is raised and lowered relative to the surface 106, as indicated by arrows 162 and 164, using a conventional lift mechanism 166. A vacuum 168 is placed in vacuum communication with the vacuum squeegee 160 and the liquid waste 158 is removed from the surface 106 and deposited in a waste recovery tank 170.

[0026] The controller 116 (e.g., microcontroller, microcomputer, etc.) controls the communications (i.e., data receptions and transmissions) of the machine 100 using the communicator 112 and the operations of some of the com-
ponents of the machine 100. It should be understood that multiple independent controllers can be used to perform the functions of the controller 116. For example, the machine 100 can include a controller that is generally responsible for the control of the communications (i.e., the communicator 112) while one or more other controllers control various machine operations. Exemplary machine operations include the control of the electronics of the machine, control of the motorized tool 110, and control of the motor 108 used to propel the mobile body 102 across the surface 106. The machine operations and communications can be controlled by the controller 116 in response to an operator input 172 provided at a control panel of the machine 100, for example.

[0027] Embodiments of the communicator 112 include a data transmitter and/or a data receiver. The transmissions and receptions of data are generally controlled by the controller 116 and can be performed in accordance with conventional communication techniques.

[0028] The communicator 112 is generally configured to communicate with one or more computing devices 174 of an administrator of the machine 100 through a network 176 or other communication link. In one embodiment, the computing device 174 is remotely located from the machine 100. Exemplary computing devices 174 include a mobile phone, a personal digital assistant (PDA), a personal computer, and other computing devices capable of transmitting messages over the network 176. The communicator 112 and the computing device 174 can be coupled either wirelessly or through a physical connection to the network 176.

[0029] One embodiment of the communicator 112 includes a wireless communications device. Exemplary wireless communications devices include radio frequency (RF) communications devices that are configured to perform wireless data transmissions and, in one embodiment, data receptions. The RF communications device can include an RF transmitter and an RF receiver. In one embodiment, the communicator 112 includes a low power (1 milliwatt) serial RF communications device configured for communicating 19.2 kilobits per second (kbps) at a frequency of 915.5 mega-hertz (MHz). This technology is mostly suitable for data communications over short distances, such as to the local computing device 114. However, the data communication can be extended over a greater distance through a suitable relay device.

[0030] In accordance with another embodiment of the invention, the communicator 112 includes a cellular communications device, such as a mobile phone, a cell modem, or another cellular device that is configured to receive data from and, in one embodiment, transmit data to, the computing device 174 through the network 176. One suitable cellular communications device is the Socket Modem (MTSMC) produced by Multitech.

[0031] The cellular communications device can operate with conventional cellular communication networks, such as, for example, Code Division Multiple Access (CDMA), General Packet Radio Service device (GPRS), Time Division Multiple Access (TDMA), Global System for Mobile (GSM), and other mobile communication networks.

[0032] Numerous conventional data communication techniques can be used to communicate data over the network 176 between the computing device 174 and the communicator 112 and controller 116. In one embodiment, the data communicated between the communicator 112 and the computing device 174 is packaged in a text message. For example, the communicator 112 can be configured to send and/or receive a short message service (SMS) text message, an email message containing the data, an email message with an attached document that contains the data, or other type of text message. The text message is communicated in accordance with any suitable communication method such as, for example, TCP/IP, or other method. In one embodiment, the text message includes a plurality of fields and associated data. The fields operate as labels for the associated data identifying what the data relates to.

[0033] In one embodiment, the data communications between the communicator 112 and the computing device 174 are secure communications. That is, a protocol is implemented that reduces the likelihood of unauthorized communications between the communicator 112 and the computing device 174. Any suitable security enabling communication method can be used.

[0034] One or more adjustable settings 180 for the machine 100 are stored in the memory 114, as illustrated in the block diagram of FIG. 3. The memory 114 can comprise conventional forms of memory. In one embodiment, the memory 114 is on board the machine 100 as illustrated in FIG. 1. Alternatively, the memory 114 can be remotely located and accessed by the machine 100 using the communicator 112.

[0035] Exemplary adjustable settings 180 of the machine 100 include a cleaning liquid flow rate setting 182 corresponding to an adjustable flow rate of cleaning liquid that is applied to the cleaning tool 110 or the surface 106 during a cleaning operation, as shown in FIGS. 2 and 3. As mentioned above, one embodiment of the control signal 140 from the controller 116 to the pump 138 is based on cleaning liquid flow rate setting. Thus, flow rate of the cleaning liquid 136 is based on the cleaning liquid flow rate setting 182.

[0036] In one embodiment, the cleaning liquid flow rate setting 182 is adjustable between maximum and minimum values corresponding to the maximum and minimum (e.g., zero) cleaning liquid flow rates that are desired. In another embodiment, the cleaning liquid flow rate setting 182 includes a plurality of preset values that extend across the range defined by the maximum and minimum flow rates.

[0037] Another embodiment of the adjustable settings of the machine 100 includes a cleaning agent flow rate setting 184 corresponding to an adjustable flow rate of cleaning agent 150 (FIG. 2) that is mixed with water to form the cleaning liquid 136 that is applied to the cleaning tool 110 or the surface 106 during a cleaning operation. As mentioned above, the control signal 154 from the controller 116 to the pump 152 is based on cleaning agent flow rate setting 184. Thus, flow rate of the cleaning agent 150 is based on the cleaning agent flow rate setting 184 stored in the memory 114.

[0038] In one embodiment, the cleaning agent flow rate setting 184 is adjustable between maximum and minimum values corresponding to the maximum and minimum (e.g., zero) cleaning agent flow rates that are desired. In another embodiment, the cleaning agent flow rate setting 184 includes a plurality of preset values that extend across the
range defined by the maximum and minimum flow rates. In one embodiment, the cleaning agent flow rates for the machine 100 span a range of less than 10.0 cubic centimeters per minute to greater than 0 cubic centimeters per minute.

[0039] Another embodiment of the adjustable settings of the machine 100 includes a pressure setting 186 corresponding to a pressure (e.g., soft, normal, hard) that the tool 110 applies to the surface 106 during a surface maintenance operation (e.g., sweeping, scrubbing, sweeping and scrubbing, burnishing, polishing, etc.). In one embodiment, the control signal 132 from the controller is based on the pressure setting 186.

[0040] In one embodiment, the pressure setting 186 is adjustable between maximum and minimum values corresponding to the maximum and minimum (e.g., zero) pressures that are desired to be applied to the surface 106 by the motorized tool 110 using the tool lift 128. In another embodiment, the pressure setting 186 includes a plurality of preset values that extend across the range defined by the maximum and minimum pressures.

[0041] One embodiment of the invention relates to the communication of setting information 190 from the computing device 174 to the controller 116 of the machine 100. Embodiments of the setting information 190 are illustrated in the block diagram of FIG. 4, which will be described in greater detail below.

[0042] The data that is communicated between the communicator 110 and the computing device, including the setting information 190, can include many different types of information. In one embodiment, the data communicated between the computing device 174 and the communicator 112 is uniquely identified by identification information 191. In one embodiment, the identification information 191 operates to uniquely identify the machine 100 to which the communication pertains. Embodiments of the identification information 191 include a machine identification (e.g., serial number, model number, etc.), an operator identification (e.g., employee number, name, etc.), an identification of the owner of the machine 100, a location of the machine 100, an identification of components of the machine 100, the date and time of the communication, or other information that uniquely identifies the communication and preferably the machine 100. The identification information 191 can be stored in a memory 114 of the machine 100 that is accessible by the controller 116, as shown in FIG. 3.

[0043] In one embodiment, the setting information 190 communicated from the computing device 174 to the communicator 112 relates to a desired configuration of the settings 180 of the machine 100. The setting information 190 can be processed by the controller 116 to update the configuration of the machine 100 by modifying the corresponding settings 180 stored in the memory 114. Thus, for example, one or more of the adjustable settings 180 of the machine 100 can be modified, based on the setting information 190 after the setting information 190 is received by the communicator 112 and processed by the controller 116.

[0044] The setting information 190 generally corresponds to the adjustable settings 180 of the machine 100 that an administrator of the machines 100 desires control over. In one embodiment, the setting information 190 corresponds to the settings 180 of the machine that are not generally adjustable through an operator interface of the machine, such as a control panel (i.e., input 172). In another embodiment, the setting information 190 corresponds to the settings 180 of the machine 100 that are adjustable through the operator input 172. However, as will be discussed below, the setting information 190 can be used to selectively restrict the ability of the operator to adjust the settings 180 through the input 172.

[0045] Embodiments of the setting information include a cleaning liquid flow rate setting 192, a cleaning agent flow rate setting 194 and a pressure setting 196 that respectively correspond to the cleaning liquid flow rate setting 182, the cleaning agent flow rate setting 184 and the pressure setting 186 stored in the memory 114. In one embodiment, the setting information includes an enable/disable setting 198 that corresponds to an enable/disable setting 200 stored in the memory 114. After the controller 116 receives the setting information 190 from the computing device 174 using the communicator 112, the controller 116 modifies the corresponding settings 180 stored in the memory 114. Once the settings 180 are modified based on the setting information 190, the controller 116 will operate the machine 100 in accordance with the modified settings 180.

[0046] As mentioned above, one embodiment of the adjustable settings 180 includes enable/disable settings 200 stored in the memory 114. The enable/disable settings 200 correspond to features of the machine 100 that can be enabled or disabled. One embodiment of the features includes select machine settings, such as settings 182, 184 and 186 described above. Thus, one embodiment of the enable/disable settings 200 includes a list of one or more adjustable settings of the machine 100, which can be selectively enabled to allow the operator of the machine 100 to directly adjust them, or disabled to prevent their adjustment by the operator through, for example, the operator input 172.

[0047] For example, it may be desirable to make the pressure setting 186 adjustable by the operator so that the operator can apply a greater pressure to the surface 106 using the tool 110 when desired. In that case, the pressure setting 186 would be enabled in the enable/disable settings 200 using the settings 198 to provide the adjustment control to the operator. However, if it is desirable to remove the power to adjust the pressure setting 186 from the operator of the machine 100, the pressure setting would be disabled in the enable/disable setting to prevent the adjustment of the pressure setting 186 by the operator. The other settings of the machine 100 could be enabled or disabled in the same manner by configuring the enable/disable settings 200 accordingly.

[0048] In one embodiment, the features that can be enabled or disabled based on the enable/disable settings 200 as configured by the settings 198 include the ability of the machine 100 to perform certain conditioning or cleaning operations on the surface 106. For example, the enable/disable settings 200 may be configured to allow the machine 100 to perform a surface cleaning operation using the motorized tool 110 or disabled from being allowed to perform the surface cleaning operation. This embodiment of the invention provides control over how the machine 100 is to be used. For example, this embodiment can be used to prevent the machine 100 from performing an operation that could damage the floor surface 106. Additionally, when the
machine 100 is being leased, the owner of the machine 100 can limit the uses of the machine 100 to only those subscribed to by the lessee.

[0049] In one embodiment, the operator input 172 provides limited control to the operator over the adjustable settings 180 as compared to machines of the prior art. In one embodiment, the operator input 172 does not include an input that corresponds to an adjustment to the pressure setting 186 for the motorized tool 110. In another embodiment, the operator input 172 does not include an input that corresponds to an adjustment to the cleaning agent flow rate setting 184. In yet another embodiment, the operator input 172 does not include an input that corresponds to an adjustment to the cleaning liquid flow rate setting 182.

[0050] FIG. 5 is a flowchart illustrating a method of configuring or operating embodiments of the mobile surface maintenance machine 100 described above. At step 210 setting information 190 is transmitted over a network 176. The transmission of the setting information 190 can be from the computing device 174 to the communicator 112 of the machine 100 in accordance with the embodiments described above. Next, at step 212, the setting information 190 is received using a communicator 112 of the mobile surface maintenance machine 100. The adjustable settings 180 for the machine 100 are modified based on the setting information 190 at step 214. In one embodiment, the settings 180 are stored in the memory 114 of the machine and the settings 180 are modified based on the setting information 190, as described above. Finally, at step 216, the machine 100 is operated based on the settings 190, as modified.

[0051] In one embodiment, the machine 100 includes a motorized tool 110 that is configured to apply a pressure to the surface 106 in accordance with a pressure setting 186 stored in the memory 114. In accordance with this embodiment, the modifying step 214 comprises modifying the pressure setting 186 based on the setting information 190 (i.e., pressure setting 196) and operating the machine 100 (step 216) by applying a pressure to the surface 106 using the motorized tool 110 in accordance with the modified pressure setting stored in the memory 114. In one embodiment, the pressure setting 186 determines the control signal 134 that is fed to the tool lift 128, which controls the pressure applied to the surface 106 by the motorized tool 110. Embodiments of the motorized tool 110 include the scrub brush 118, the sweeper brush 120, the sweep/scrub brush 122, the burnishing pad 124 and the polishing pad 126 described above.

[0052] In accordance with another embodiment of the method, the machine 100 includes the cleaning liquid dispenser 134 that is configured to discharge a cleaning liquid 136 to either the surface 106 (136A) or the motorized tool 110 (136B) at a flow rate that is based on the cleaning liquid flow setting 182 stored in the memory 114. In accordance with this embodiment, the modifying step 214 comprises modifying the cleaning liquid flow setting 182 based on the setting information 190 (i.e., cleaning liquid flow rate setting 192), and the operating step 216 comprises operating the cleaning liquid dispenser 134 based on the modified cleaning liquid flow rate setting 182. In one embodiment, the cleaning liquid flow rate setting 182 determines a control signal 140 from the controller 116, which controls the flow of cleaning liquid 136.

[0053] In accordance with another embodiment of the method, the machine 100 includes the cleaning agent dispenser 151 that is configured to discharge a cleaning agent 150 into a flow of water 148 at a flow rate that is based on a cleaning agent flow rate setting 184 stored in the memory 114. In accordance with this embodiment, the modifying step 214 includes modifying the cleaning agent flow rate setting 184 based on the setting information 190 (i.e., cleaning agent flow rate setting 194), and the operating step 216 comprises operating the cleaning agent dispenser 151 based on the modified cleaning agent flow rate setting 184 stored in the memory 114. In one embodiment, the cleaning agent flow rate setting 184 determines a control signal 154 that is fed to the cleaning agent dispenser 151, which controls the flow of cleaning agent 150.

[0054] In yet another embodiment of the invention, the method comprises disabling operation of the machine 100 based on the setting information 190. For example, the setting information 190 can include enable/disable settings 198 that control the enablement and disablement of various features of the machine 100, as described above. The disabling of features using the enable/disable settings 198 in the setting information 190 allows for the disablement of the operation of the machine 100.

[0055] Although the present invention has been described with reference to preferred embodiments, workers skilled in the art will recognize that changes may be made in form and detail without departing from the spirit and scope of the invention.

What is claimed is:

1. A mobile surface maintenance machine comprising:
   a mobile body configured to travel over a surface;
   a motorized tool supported by the mobile body and configured to engage the surface;
   a communicator configured to communicate over a network;
   a memory containing settings for the machine; and
   a controller configured to modify the settings of the machine in response to setting information received by the communicator over the network and control operations of the machine based on the settings.

2. The machine of claim 1, wherein:
   the motorized tool is configured to apply a pressure to the surface based on a pressure setting stored in the memory; and
   the controller is configured to adjust the pressure setting in response to the setting information.

3. The machine of claim 2, wherein:
   the motorized tool comprises a scrub brush; and
   the machine further comprises a vacuum squeegee.

4. The machine of claim 2, wherein the motorized tool comprises a sweeper brush.

5. The machine of claim 2, wherein the motorized tool is selected from the group consisting of a combination sweep and scrub brush, a burnishing pad and a polishing pad.

6. The machine of claim 1, further comprising a cleaning liquid dispenser configured to discharge a cleaning liquid to one of the surface and the motorized tool at a flow rate that
is based on a cleaning liquid flow rate setting stored in the memory, wherein the controller is configured to adjust the cleaning liquid flow rate setting based on the setting information.

7. The machine of claim 1, further comprising a cleaning agent dispenser configured to discharge a cleaning agent at a flow rate that is based on cleaning agent flow rate setting stored in the memory, wherein the controller is configured to adjust the cleaning agent flow rate setting based on the setting information.

8. The machine of claim 1, wherein the controller is configured to disable operation of a feature of the machine based on the setting information.

9. The machine of claim 1, wherein the communicator comprises a wireless communications device.

10. The machine of claim 9, wherein the communicator comprises a cellular communications device.

11. The machine of claim 9, wherein the communicator comprises a radio frequency communications device.

12. A method of configuring a mobile surface maintenance machine having a mobile body configured to travel over a surface, a motorized tool supported by the mobile body and configured to engage the surface, a communicator and a controller, the method comprising steps of:

- receiving setting information over a network using the communicator;
- modifying settings for the machine using the controller based on the setting information; and
- operating the machine based on the settings.

13. The method of claim 12, wherein:
- the method further comprises storing the settings for the machine in a memory; and
- the modifying step comprises modifying the settings in the memory based on the setting information.

14. The method of claim 13, wherein:
- the motorized tool is configured to apply a pressure to the surface in accordance with a pressure setting stored in the memory;
- the modifying step comprises modifying the pressure setting based on the setting information; and
- the operating step comprises applying a pressure to the surface using the motorized tool in accordance with the pressure setting stored in the memory.

15. The method of claim 14, wherein:
- the motorized tool comprises a scrub brush; and
- the operating step comprises scrubbing the surface with the scrub brush.

16. The method of claim 15, where:
- the machine includes a vacuum squeegee; and
- the operating step comprises removing liquid waste from the surface using the vacuum squeegee.

17. The method of claim 14, where:
- the motorized tool comprises a sweeper brush; and
- the operating step comprises sweeping the surface with the sweeper brush.

18. The method of claim 13, wherein:
- the machine further comprises a cleaning liquid dispenser configured to discharge a cleaning liquid to one of the surface and the motorized tool at a flow rate that is based on a cleaning liquid flow rate setting stored in the memory;
- the modifying step comprises modifying the cleaning liquid flow rate setting based on the setting information; and
- the operating step comprises operating the cleaning liquid dispenser based on the cleaning liquid flow rate setting.

19. The method of claim 13, wherein:
- the machine further comprises a cleaning agent dispenser configured to discharge a cleaning agent into a flow of water at a flow rate that is based on a cleaning agent flow rate setting stored in the memory;
- the modifying step comprises modifying the cleaning agent flow rate setting based on the setting information; and
- the operating step comprises operating the cleaning agent dispenser based on the cleaning agent flow rate setting stored in the memory.

20. The method of claim 13, further comprising disabling operation of the machine based on the setting information.