Claims

1. A ~~consumables monitoring system comprising a~~ dispenser mounting assembly ~~in communication with computing means,~~

~~wherein the~~ (10) for a dispenser of consumables, the dispenser mounting assembly ~~comprises~~ (10) comprising

a mounting unit~~,~~ (100) for attaching the assembly to a surface,

dispenser retaining means (200) configured to receive a dispenser~~,~~ (300), and ~~a sensor;~~

a sensor (140),

wherein the ~~sensor,~~ mounting unit (100) comprising guidance and retention means for operably engaging the dispenser retaining means (200),

wherein the sensor (140), mounting unit (100) and dispenser retaining means (200) are arranged such that the sensor (140) can monitor the quantity of consumables stored in any dispenser (300) attached to the dispenser retaining means~~,~~ (200),

wherein the dispenser mounting assembly ~~is configured to communicate sensor data to the computing means,~~

~~wherein the computing means are configured to monitor the usage of the dispenser assembly using the sensor data, and~~

(10) further ~~comprising~~comprises one or more additional sensors~~,~~ (140), wherein a plurality of said sensors (140) have different sensitivities ~~over a~~across and overlapping range of inputs, wherein the dispenser mounting assembly (10) is configured to switch between the sensors depending on the value of the inputs detected.

2. The ~~system~~dispenser mounting assembly (10) of claim 1 ~~further comprising a dispenser attached to the dispenser retaining means.~~

~~3. The system of any preceding claim~~ wherein at least one of the plurality of sensors is one of a force sensing resistor, strain gauge, load cell, spring switch, and/or wherein at least one of the plurality of sensors is mounted on the mounting unit (100), and/or wherein at least one of the plurality of sensors is mounted on the dispenser retaining means (200), and/or wherein the inputs measured by the sensors are one or

more of overall weight of the dispenser (300) and consumables, weight of the consumables held in said dispenser (300), amount of consumables, fill level of dispenser (300), type of consumable detected.

3.

4. The system of any preceding claim wherein at least one of the plurality of sensors is mounted on the mounting unit.

5. The system of dispenser mounting assembly (10) of any of claims 1 to 3 wherein at least one of the plurality of sensors is mounted on the dispenser retaining means.

6. The system of any preceding claim wherein the dispenser retaining means is sized such that the dispenser is completely contained within the extents of the dispenser retaining means.

7. The system of any preceding claimand 2 further comprising communication means.

8. The system of claim 7 (130), and wherein the communication means (130) comprise an RF transceiver.

9. The system of any preceding claim further comprising a display for visually indicating the level of

4. A consumables in the dispenser.

10. The system of any preceding claim further comprising a user input for indicating a type of recent event, or a stage in a calibration process.

11. The system of any preceding claim, wherein the inputs measured by the sensors are one or more of overall weight of the dispenser and consumables, weight of the consumables held in said dispenser, amount of consumables, fill level of dispenser, type of consumable detected.

~~12. The system of any preceding claim wherein the computing means is a remote server.~~

~~13. The system of any of claims~~ monitoring system (1 ~~to 11 wherein the computing means are provided by~~) comprising the dispenser mounting assembly~~.~~ (10) of any of claims 1-3 in communication with computing means (135),

~~14~~ wherein the dispenser mounting assembly (10) is configured to communicate sensor data to the computing means (135),

wherein the computing means (135) are configured to monitor the usage of the dispenser mounting assembly (10) using the sensor data.

5. The system of claim 4 further comprising a dispenser (300) attached to the dispenser retaining means.

6. A method for monitoring consumables within a dispenser mounting assembly~~,~~ (10), said dispenser mounting assembly (10) comprising a mounting unit~~,~~ (100), dispenser retaining means (200) configured to receive a dispenser~~,~~ (300), and a plurality of sensors~~,~~ (140), wherein the plurality of said sensors have different sensitivities ~~over a~~across an overlapping range of inputs, configured to switch between the sensors depending on the value of the inputs detected,

the method comprising the steps of:

at the dispenser mounting assembly~~,~~ (10), measuring via the plurality of sensors in the dispenser mounting assembly, the quantity of consumable in a dispenser retained in the dispenser retaining means~~;~~ (200);

switching between the sensors depending on the value of the inputs detected; and

communicating the sensor data to computing means~~,~~ (135), wherein the computing means are configured to monitor the usage of the dispenser mounting assembly (10) using the sensor data.

~~15~~7. The method of claim ~~14~~6 wherein the communicating step is accomplished via communication means (130) in the dispenser mounting assembly~~.~~ (10).

~~16. The method of claim 15 wherein the computing means is a remote server.~~

~~17. The method of claim 15 wherein the computing means are provided by the dispenser mounting assembly.~~

~~18~~8. The method of any of claims ~~15 to 17~~6 and 7 wherein the inputs~~-~~ measured by the sensors are one or more of overall weight of the dispenser and consumables, weight of the consumables held in said dispenser, amount of consumables, fill level of dispenser, type of consumable detected.

~~19~~9. The method of any of claims ~~14 to 18~~6-8 further comprising the step of calibrating the plurality of sensors, wherein the output of the plurality of sensors is calibrated to the amount of consumables stored in the dispenser~~.~~

~~20. The method of claim 19,~~ wherein the calibration step comprises reading existing calibration data from memory within the dispenser mounting assembly~~.~~

~~21. The method of claim 19~~, and/or wherein the calibration step comprises receiving calibration data from remote computing means~~.~~

~~22. The method of claims 19 to 21~~ , and/or wherein the calibration step further ~~comprising~~comprises the step of identifying the type of dispenser held by the dispenser mounting assembly (10) and looking up associated calibration data~~.~~

~~23. The method of claim 22,~~ wherein the identifying the type of dispenser is accomplished by detecting the weight of the dispenser when empty of consumables~~.~~

~~24. The method of claim 22 wherein the identifying the type of dispenser is accomplished~~, and/or by reading identification means on the dispenser~~.~~

~~25. The method of claim 24,~~ wherein the identification means comprise at least one of an RF transmitter, serial number or barcode.

~~26~~10. The method of claim ~~19~~9 wherein the calibration step comprises taking a reading from the plurality of sensors (140) when the dispenser is empty of consumables, taking a reading when the dispenser is full of consumables and applying an interpolation so as to enable the mounting plate to determine the amount of consumables stored in the dispenser from the output of the plurality of sensors.

~~27~~11. The method of any of claims ~~14 to 26~~6-10 wherein the dispenser mounting assembly (10) polls the plurality of sensors at regular intervals for an updated reading of the amount of consumables stored in the dispenser~~.~~

~~28. The method of any of claims 14 to 26~~ (30), and/or wherein the computing means (135) prompt the dispenser mounting assembly (10) to poll the plurality of sensors (140) for an updated reading of the amount of consumables stored in the dispenser~~.~~

~~29. The method of any of claims 14 to 26~~ (300), and/or wherein use of the dispenser prompts the dispenser mounting assembly (10) to poll the plurality of sensors (140) for an updated reading of the amount of consumables stored in the dispenser~~.~~

~~30. The method of any of claims 14 to 29~~, and/or further comprising the step of indicating, via the communication means~~,~~ (130), when the weight of consumables stored in the dispenser drops below a first threshold, or is above a second threshold.

~~31~~12. The method of any of claims ~~14 to 30~~6-11 further comprising the step of associating a change in the output of the plurality of sensors (140) with a dispenser usage event~~.~~

~~32. The method of any of claims 14 to 31 further comprising the step of associating a change in the output of the plurality of sensors with,~~ a dispenser refill event~~.~~

~~33. The method of any of claims 14 to 32 further comprising the step of associating a change in the output of the plurality of sensors with,~~ a partial dispenser refill event~~.~~

~~34. The method of any of claims 14 to 33 further comprising the step of associating a change in the output of the plurality of sensors with~~, or the removal of the dispenser from the dispenser mounting assembly~~.~~ (10).

~~35~~13. The method of any of claims ~~14 to 34 further comprising the step of storing a log of such events in the memory of the dispenser mounting assembly.~~

~~36. The method of claims 35 further comprising the step of transmitting, via the communication means, the log of such events to the computing means.~~

~~37. The method of any of claims 14 to 36~~6-12 further comprising the step of resolving the change in weight of consumables stored in the dispenser (300) associated with a single usage event~~.~~

~~38. The method of any of claims 14 to 37 further comprising the step of~~, and estimating the number of remaining usage events before the weight of consumables stored in the dispenser drops below a first threshold~~.~~

~~39. The method~~, wherein estimating the number of ~~any of claims 14 to 38 further comprising the step of~~remaining usage events comprises estimating the frequency of usage events based on historical usage data or data stored in memory~~.~~

~~40. The method of any of claims 14 to 39 further comprising the step of~~, and estimating the amount of time before the weight of consumables stored in the dispenser drops below a first threshold.

~~41. A dispenser mounting assembly for a dispenser of consumables, the dispenser mounting assembly comprising~~

~~a mounting unit for attaching the assembly to a surface,~~

~~dispenser retaining means configured to receive a dispenser, and~~

~~a sensor,~~

~~wherein the mounting unit comprising guidance and retention means for operably engaging the dispenser retaining means,~~

~~wherein the sensor, mounting unit and dispenser retaining means are configured such that the combined mass of the dispenser retaining means and any dispenser attached thereto is measured by the sensor, and~~

~~wherein the mounting assembly further comprises one or more additional sensors, wherein a plurality of said sensors have different sensitivities over a range of inputs, wherein the dispenser mounting assembly is configured to switch between the sensors depending on the value of the inputs detected.~~

~~42. The dispenser mounting assembly of claim 41 wherein at least one of the plurality of sensors is one of a force sensing resistor, strain gauge, load cell, spring switch.~~

~~43. The dispenser mounting assembly of any of claims 41 to 42 wherein at least one of the plurality of sensors is mounted on the mounting unit.~~

~~44. The dispenser mounting assembly of any of claims 41 to 42 wherein at least one of the plurality of sensors is mounted on the dispenser retaining means.~~

~~45. The dispenser mounting assembly of any of claims 41 to 44 wherein the dispenser retaining means is sized such that the dispenser is completely contained within the extents of the dispenser retaining means.~~

~~46. The dispenser mounting assembly of any of claims 41 to 45 further comprising communication means.~~

~~47. The dispenser mounting assembly of claim 46 wherein the communication means comprise an RF transceiver.~~

~~48. The dispenser mounting assembly of any of claims 41 to 47 further comprising a display for visually indicating the level of consumables in the dispenser.~~

~~49. The dispenser mounting assembly of any of claims 41 to 48 further comprising a user input for indicating a type of recent event, or a stage in a calibration process.~~

~~50. The dispenser mounting assembly of any of claims 41 to 49 , wherein the inputs measured by the sensors are one or more of overall weight of the dispenser and consumables, weight of the consumables held in said dispenser, amount of consumables, fill level of dispenser, type of consumable detected.~~

~~51. The dispenser mounting assembly of any of claims 41 to 50 wherein the computing means is a remote server.~~

~~52. The dispenser mounting assembly any of claims 41 to50 wherein the computing means are provided by the dispenser mounting assembly.~~

~~53. A dispenser mounting assembly substantially as described herein with reference to figures 1 to 3.~~