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AUTOMATICALLY CONFIGURABLE CHEMICAL DOSING APPARATUS FOR CLEANING EQUIPMENT

An apparatus and system for dispensing chemicals in an industrial or commercial setting is disclosed. The system includes a dispensing machine that can be configured to dispense various chemicals at different concentrations or dosages. The machine is designed to be flexible and can adapt to different operating conditions or requirements.

The system operates by storing chemicals in a container and then reconfiguring the system to deliver the desired chemical dosage. This allows for efficient and precise dispensing of chemicals, which is particularly useful in industries such as manufacturing, agriculture, and water treatment.

The machine is equipped with sensors and control mechanisms that monitor the chemical concentrations and ensure that the correct dosage is delivered. This helps in maintaining the quality and effectiveness of the chemical treatments. The system also includes safety features to prevent accidents and ensure the safety of operators.

The flexibility of the system allows it to be used in various applications, from small-scale industrial processes to large-scale operations. The system's ability to adapt to different conditions makes it suitable for a wide range of industries that require controlled chemical dispensing.

In summary, the disclosed apparatus and system provide a reliable and flexible solution for chemical dispensing in industrial and commercial settings, ensuring efficient and precise delivery of chemicals. This reduces waste and ensures the effectiveness of chemical treatments.

[Continued on next page]
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.
What is claimed is:

1. An apparatus (20) for dispensing a chemical into a cleaning machine (10) wherein the chemical is stored in a container (22,23,24) that has data recorded thereon, said apparatus (20) comprising:
   a dispenser port (27,27,28) for receiving the chemical from the container;
   a flow control device (58,64,66) connected to the dispenser port (27,27,28) and controlling flow of the chemical from the dispenser port (27,27,28) to the cleaning machine (10);
   a data reader (33) that reads the data from the container (22,23,24) that is located at the dispenser port (27,27,28) ; and
   a data reader (37) connected to the data reader (33) and operating flow control device (58,64,66) in response to the data to control an amount of chemical that is dispensed.

2. The apparatus (20) as recited in claim 1 wherein the flow control device (58,64,66) is selected from a group consisting of an electric motor for moving a metering and dispensing closure on the container, a pump, and a valve.

3. The apparatus (20) as recited in claim 1 wherein the data reader (37) operates the flow control device (58,64,66) to control an amount of chemical that is dispensed by controlling one of an amount of time that the chemical is dispensed, a rate at which the chemical is dispensed, and movement of a metering and dispensing closure on the container (22,23,24).
4. The apparatus (20) as recited in claim 1 wherein the data reader (37) operates a given flow control device (58,64,66) for an amount of time determined from a signal produced by the data reader (33).

5. The apparatus (20) as recited in claim 1 wherein the data are recorded as indicia (32) (32) on the container (22,23,24) and the data reader (33) optically senses the indicia (32) on the container.

6. The apparatus (20) as recited in claim 5 wherein the indicia (32) are formed in a plurality of areas (81-84) on the container (22,23,24); and the data reader (33) senses an optical characteristic each of the plurality of areas.

7. The apparatus (20) as recited in claim 6 wherein the data reader (33) comprises a plurality of light detectors (92) each sensing the optical characteristic of a different one of the plurality of areas (81-84).

8. The apparatus (20) as recited in claim 5 wherein the dispenser port (27,27,28) includes an element (31) that cooperates with the container (22,23,24) in a manner that orients the container with the indicia (32) facing the data reader (33).

9. The apparatus (20) as recited in claim 1 wherein the data reader (33) comprises a barcode reader (95).

10. The apparatus (20) as recited in claim 1 wherein the data are recorded in a radio frequency tag (96) on the container (22,23,24); and each of the data reader (33) comprises a device that interrogates the radio frequency tag to obtain the data.
11. The apparatus (20) as recited in claim 10 further comprising detecting when the container (22,23,24) is empty; and erasing the data recorded in the radio frequency tag (96).

12. The apparatus (20) as recited in claim 1 further comprising detecting when the container (22,23,24) is empty; and erasing the data from the container.

13. An apparatus (20) for dispensing a plurality of types of chemicals into a cleaning machine (10), wherein each chemical is stored in a container (22,23,24) that has data recorded thereon, said apparatus comprising:

   a plurality of dispenser ports (27,27,28) each for receiving a container (22,23,24) to accept chemicals therefrom;

   a plurality of flow control devices (58,64,66) each associated with a different one of the plurality of dispenser ports (27,27,28) and controlling flow of chemicals from the associated dispenser port to the cleaning apparatus (20):

   a data reader arrangement (33,34,35) that reads data from containers (22,23,24) located in the plurality of dispenser ports (27,27,28); and

   a data reader (37) connected to the plurality of flow control devices (58,64,66) and the data reader arrangement (33,34,35), and operating the plurality of flow control devices in response to the data read from each container (22,23,24) to control amounts of each chemical that are dispensed.

14. The apparatus (20) as recited in claim 13 wherein each of the plurality of flow control devices (58,64,66) is selected from a group consisting of an electric motor for moving a metering and dispensing closure on the container, a pump, and a valve.
15. The apparatus (20) as recited in claim 13 wherein the data reader arrangement comprises a plurality of data readers (33,34,35) each associated with a different one of the plurality of dispenser ports (27,27,28) to read data from a container (22,23,24) received in the associated dispenser port.

16. The apparatus (20) as recited in claim 15 wherein each of the plurality of data readers (33,34,35) optically reads indicia (32) on the container (22,23,24).

17. The apparatus (20) as recited in claim 16 wherein the indicia (32) are formed by a plurality of areas (81-84) on each container (22,23,24); and each of the plurality of data readers (33,34,35) senses an optical characteristic of each of the plurality of areas.

18. The apparatus (20) as recited in claim 17 wherein each of the plurality of data readers (33,34,35) comprises a plurality of light detectors (92) each sensing the optical characteristic of a different one of the plurality of areas (81-84).

19. The apparatus (20) as recited in claim 15 wherein each of the plurality of data readers (33,34,35) comprises a barcode reader (95).

20. The apparatus (20) as recited in claim 15 wherein the data are encoded in a radio frequency tag (96) on each container (22,23,24); and each of the plurality of data readers (33,34,35) comprises a device that interrogates the radio frequency tag to obtain the data.
21. The apparatus (20) as recited in claim 20 further comprising detecting when a given container (22,23,24) is empty; and erasing the data encoded in the radio frequency tag (96) on that given container.

22. The apparatus (20) as recited in claim 15 wherein the data reader (37) operates given flow control device (58,64,66) for an amount of time determined from a signal produced by one of the plurality of data readers (33,34,35) that is associated with the same one of the plurality of dispenser ports (27,27,28) with which the given flow control device is associated.

23. The apparatus (20) as recited in claim 13 further comprising detecting when a given container (22,23,24) is empty; and erasing the data from the given container.

24. The apparatus (20) as recited in claim 13 wherein the data reader (37) operates the flow control device (58,64,66) to control an amount of chemical that is dispensed by controlling one of an amount of time that the chemical is dispensed, a rate at which the chemical is dispensed, and movement of a metering and dispensing closure on the container (22,23,24).

25. A method for dispensing a chemical into a cleaning machine (10) wherein the chemical is stored in a container (22,23,24) that has data recorded thereon, said apparatus (20) comprising:

receiving the chemical from the container (22,23,24) located at a dispenser port (27,27,28);
reading the data from the container (22,23,24) that is located at a dispenser port (27,27,28);

operating a flow control device (58,64,66) to control an amount of chemical that is dispensed from the dispenser port (27,27,28) in response to the data read from the container (22,23,24).

26. The method as recited in claim 25 wherein operating a flow control device (58,64,66) controls one of an amount of time that the chemical is dispensed, a rate at which the chemical is dispensed, and movement of a metering and dispensing closure on the container (22,23,24).

27. The method as recited in claim 25 wherein the data are recorded as indicia (32) on the container (22,23,24) and reading the data optically senses the indicia (32).

28. The method as recited in claim 25 wherein reading the data comprises interrogating a radio frequency tag (96) on the container (22,23,24) to obtain the data.

29. The apparatus (20) as recited in claim 28 detecting when the container (22,23,24) is empty; and erasing the data in the radio frequency tag (96).

30. The apparatus (20) as recited in claim 25 further comprising detecting when a given container (22,23,24) is empty; and erasing the data from the container.
BECOME THE EUROPEAN PATENT OFFICE
AS THE INTERNATIONAL SEARCHING AUTHORITY
Applicant: JohnsonDiversey, Inc.
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For: Automatically Configurable Chemical Dosing Apparatus For Cleaning Equipment

STATEMENT UNDER ARTICLE 19(1)

International Bureau
World Intellectual Property Organization
34 chemin des Colombettes
1211 Geneva 20
Switzerland

Sir:

Applicant submits herewith substitute pages 1-3 and 16-21 containing amendments to the above-identified International Patent Application. Pages 1-3 provide a reference to document D1 in the Background of the Invention section as requested in the Written Opinion. Pages 16-21 contain amendments to the claims.

Description of the Amendments

Reference to document D1, requested in the Written Opinion, now appears in paragraph [0006] on the enclosed substitute pages.

Claim 1 is being amended to state that the data reader reads data from the container that is located at a dispenser port. This arrangement is shown in Figures 1 and 2 and described in paragraph [0023] of the application. This concept also appears in claim 13.

Reference numerals have been added to the claims as requested in the Written Opinion.

Response to the Written Opinion

The Written Opinion stated that claim 1 was not patentable because document D1 describes a system that had all of the elements of claimed apparatus. However, document D1 does not describe a system that has a controller which operates a flow control device in response to the data read from a container wherein that operation of the flow control device controls an amount of chemical that is dispensed. The apparatus
in document D1 merely uses the container information to determine in which of several dispensing compartments each different chemical is located. The determination enables the machine to know from which compartment to dispense a particular chemical, see paragraphs [0020] through [0023]. The information from the container is not used to control the amount of the chemical that is dispensed. Therefore, the apparatus in document D1 does not have the controller recited in the present claims.

Document D2 describes a system that reads information from a container to determine whether the correct chemical is located at each of several dispensing locations. This document also does not disclose a system that controls the flow of a chemical based on the information read from a container to vary the dose amount of the chemical.

The system in document D3 has a single sensor that is remote from the locations from which chemicals are dispensed from a plurality of containers. A machine operator manually scans each container with the sensor to read information before the container is placed into one of the dispensing locations. That information is used to determine a dose amount of chemical being dispenses from that container. However, the machine does not read the information while the container is in the dispensing location as in the present claims and thus the document D3 system does not know if the operator put the container in the proper location for the particular chemical. Also document D3 states that the dose remains set until the operator manually scans another container (page 4, lines 3-19). Therefore, if the operator replaces a container with one holding a different chemical concentration and does not scan the new container, the machine will not use the correct dose. In contrast the system in the present application scans the contain at the dispensing location and does not require manual scanning by the machine operator, thereby eliminating operator errors.

These claim amendments do not go beyond the disclosure in the international application as filed. Furthermore, these amendments do not have an impact on the description and drawings of this application.

Respectfully submitted,

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