Claims

1. A system for managing replacement of consumables, the system (10) including:

- an installed base (12) of equipment assemblies (14), each equipment assembly (14) including at least one of a gas chromatograph, a liquid chromatograph, a spectrometer and a mass-spectrometer;
- an installed base (16) of consumables (18, 18', 18", 70), each consumable having a limited lifetime and being used in combination with a said equipment assembly (14), the installed base of consumables (18, 18', 18", 70) including gas purifiers (18', 70) that are recyclable;
- a server (20) for registering the consumables (18, 18', 18"), the server (20) including:
  - a database (22) for storing various data about the consumables (18, 18', 18", 70) that are used in combination with the installed base (12) of equipment assemblies (14); and
  - a module (24) for calculating a replacement advice (26) with respect to the consumable (18, 18', 18", 70) that has been registered in the server (20);
- a web portal (28) configured to give an end user (30) or a provider (32), such as a manufacturer (32a), a channel partner (32b), a distributor or a service agent (32c) of the consumable (18, 18', 18", 70), access to the server (20), the web portal (28) being accessible via the internet (34);
- the web portal (28) being configured for inputting at least the following data:
  - data (36) identifying the end user (30);
  - a serial number (38) of the consumable (18, 18', 18", 70) that is registered in the server (20);

- a date of installation (40) of the consumable (18, 18', 18", 70) in the equipment assembly (14);
- a type (42) of the equipment assembly (14) in which the consumable (18, 18', 18", 70) is installed; and

– the web portal (28) being configured to output at least the replacement advice (26) that is associated with the registered consumable (18, 18', 18") of a said end user (30).

2. The system according to claim 1, including:

– at least one electronic programmable signalling device (76; 86) that is associated with a specific consumable (18, 18', 18", 70) of the system (10), the electronic programmable signalling device (76; 86) including at least one of a display (78, 88), coloured led's (80, 82; 90, 92) and a sound generator to indicate that replacement is required, wherein the electronic programmable signalling device (76; 86) is programmable on the basis of the replacement advice (26).

3. The system according to claim 2, including:

– a programming device (94) that may be connected wirelessly or over the wire with the electronic programmable signalling device (76, 86) and that is configured to be inputted with a code that is generated by the module (24) of the server (20) and that includes information that is indicative for the replacement advice (26), wherein the programming device (94) sends a programming signal to the electronic programmable signalling device (76; 86) on the basis of which signal the electronic programmable signalling device (76; 86) stores a remaining life time of the associated consumable (18, 18', 18", 70).

4. The system according to any one of claims 1-3, wherein the module (24) for calculating the replacement advice (26) is configured to calculate an

advisable renewal date (44) for the consumable (18, 18', 18", 70) and to include that advisable renewal date (44) in the replacement advice (26).

5. The system according to any one of claims 1-4, including:

- a servicing advice module (24') configured to provide a service advice (26').

6. The system according to any one of the preceding claims, a said equipment assembly (14) thereof including:

- an electronic controller (46) that is connected to the internet (34), the electronic controller (46) being configured to collect a use indication value (48) that is indicative of one of the following parameters:
  - the amount of gas that has passed the consumable (18, 18', 18", 70); and
  - the duration gas has flown through the consumable (18, 18', 18", 70);

  the electronic controller (46) being configured to input the use indication value (48) into the server (20) via the internet (34); and

the module (24) of the server (20) being configured include the use indication value (48) in its calculation of the replacement advice (26).

7. The system according to the combination of claims 4 and 6, wherein the module (24) is configured to calculate an advisable renewal date (44) that is dependent on the use indication value (48).

8. The system according to any one of the preceding claims, wherein the web portal (28) includes pages that are exclusively accessible for the provider (32) and provides data including at least one of:

- the replacement advices (26) relating to the various registered consumables (18, 18', 18", 70) of a said end user (30);

- the type equipment assembly or equipment assemblies (14) used by a said end user (30);
- a replacement cycle of consumables of a said end user (30); and
- a purchase and/or usage history of consumables (18, 18', 18", 70) of a said end user (30).

9. The system according to any of the preceding claims, wherein the web portal (28) includes pages that are exclusively accessible for the end user (30) and provides data including at least one of:

- the replacement advices (26) relating to the various registered consumables (18, 18', 18", 70) of the end user (30);
- a quality certificate (52) of the consumables (18, 18', 18", 70) used by the end user (30);

10. The system according to any of the preceding claims, wherein the web portal (28) includes pages that are accessible to both end users (30) and providers (32) and that provide data including at least one of:

- a training video (52);
- a manual (54);
- a knowledge base (56);
- on-line technical support (58) ; and
- an on-line user forum (60).

11. The system according to any of the preceding claims, wherein the web portal (28) includes pages that are accessible to at least the end user (30) of the system and that provide data including validation information of the system (10).

12. The system according to at least claim 5, wherein the web portal (28) includes pages that are accessible to at least the end user (30) of the system and that provide data including the service advice (26') that is determined by the service module (24'), wherein the service advice includes data that is directed to the equipment assembly (14) or parts of the equipment assembly (14).

13. The system according to any of the preceding claims, wherein the web portal (28) includes pages that are accessible to the end user (30) and that is configured to inputting data relating to the types of analyses that are performed by the equipment assembly (14).

14. A method for managing replacement of consumables (18, 18', 18", 70) having a limited lifetime, the method including:

- providing a system (10) according to any of the preceding claims;
- inputting via the web portal (28) at least the following data:
  - data (36) identifying the end user (30);
  - a serial number (38) of the consumable (18, 18', 18", 70) that is registered in the server (20);
  - a date of installation (40) of the consumable (18, 18', 18", 70) in the equipment assembly (14);
  - a type (42) of the equipment assembly (14) in which the consumable (18, 18', 18", 70) is installed;
- outputting via the web portal (28) at least the replacement advice (26) that is associated with the registered consumable (18, 18', 18", 70) of a said end user (30).

15. The method of claim 13, including that:

- the provider (32) sends, triggered by the replacement advice (26) or by an order from the end user (30), a replacement consumable (18, 18', 18", 70) to the end user (30); and that
- the end user (30) sends the consumable (18, 18', 18", 70) to be recycled to the provider (32).

Claims

1. A system for managing replacement of consumables, the system (10) including:

- an installed base (12) of equipment assemblies (14), each equipment assembly (14) including at least one of a gas chromatograph, a liquid chromatograph, a spectrometer and a mass-spectrometer;
- an installed base (16) of consumables (18, 18', 18", 70), each consumable having a limited lifetime and being used in combination with a said equipment assembly (14), the installed base of consumables (18, 18', 18", 70) including gas purifiers (18', 70) that are recyclable;
- a server (20) for registering the consumables (18, 18', 18"), the server (20) including:
    - a database (22) for storing various data about the consumables (18, 18', 18", 70) that are used in combination with the installed base (12) of equipment assemblies (14); and
    - a module (24) for calculating a replacement advice (26) with respect to the consumable (18, 18', 18", 70) that has been registered in the server (20);
- a web portal (28) configured to give an end user (30) or a provider (32), such as a manufacturer (32a), a channel partner (32b), a distributor or a service agent (32c) of the consumable (18, 18', 18", 70), access to the server (20), the web portal (28) being accessible via the internet (34);
- the web portal (28) being configured for inputting at least the following data:
    - data (36) identifying the end user (30);
    - a serial number (38) of the consumable (18, 18', 18", 70) that is registered in the server (20);

- a date of installation (40) of the consumable (18, 18', 18", 70) in the equipment assembly (14);
- a type (42) of the equipment assembly (14) in which the consumable (18, 18', 18", 70) is installed;

– the web portal (28) being configured to output at least the replacement advice (26) that is associated with the registered consumable (18, 18', 18") of a said end user (30); and

– at least one electronic programmable signalling device (76; 86) that is associated with a specific consumable (18, 18', 18", 70) of the system (10), the electronic programmable signalling device (76; 86) including at least one of a display (78; 88), coloured led's (80, 82; 90, 92) and a sound generator to indicate that replacement is required, wherein the electronic programmable signalling device (76; 86) is programmed on the basis of the replacement advice (26) so that the electronic programmable signalling device 76, 86 will signal the user of the system when replacement is advisable or needed.

2. The system according to claim 1, including:

– a programming device (94) that may be connected wirelessly or over the wire with the electronic programmable signalling device (76, 86) and that is configured to be inputted with a code that is generated by the module (24) of the server (20) and that includes information that is indicative for the replacement advice (26), wherein the programming device (94) sends a programming signal to the electronic programmable signalling device (76; 86) on the basis of which signal the electronic programmable signalling device (76; 86) stores a remaining life time of the associated consumable (18, 18', 18", 70).

3. The system according to any one of claims 1-2, wherein the module (24) for calculating the replacement advice (26) is configured to calculate an

advisable renewal date (44) for the consumable (18, 18', 18", 70) and to include that advisable renewal date (44) in the replacement advice (26).

4. The system according to any one of claims 1-3, including:

- a servicing advice module (24') configured to provide a service advice (26').

5. The system according to any one of the preceding claims, a said equipment assembly (14) thereof including:

- an electronic controller (46) that is connected to the internet (34), the electronic controller (46) being configured to collect a use indication value (48) that is indicative of one of the following parameters:
    - the amount of gas that has passed the consumable (18, 18', 18", 70); and
    - the duration gas has flown through the consumable (18, 18', 18", 70);

  the electronic controller (46) being configured to input the use indication value (48) into the server (20) via the internet (34); and

the module (24) of the server (20) being configured include the use indication value (48) in its calculation of the replacement advice (26).

6. The system according to the combination of claims 3 and 5, wherein the module (24) is configured to calculate an advisable renewal date (44) that is dependent on the use indication value (48).

7. The system according to any one of the preceding claims, wherein the web portal (28) includes pages that are exclusively accessible for the provider (32) and provides data including at least one of:

- the replacement advices (26) relating to the various registered consumables (18, 18', 18", 70) of a said end user (30);

- the type equipment assembly or equipment assemblies (14) used by a said end user (30);
- a replacement cycle of consumables of a said end user (30); and
- a purchase and/or usage history of consumables (18, 18', 18", 70) of a said end user (30).

8. The system according to any of the preceding claims, wherein the web portal (28) includes pages that are exclusively accessible for the end user (30) and provides data including at least one of:

- the replacement advices (26) relating to the various registered consumables (18, 18', 18", 70) of the end user (30);
- a quality certificate (52) of the consumables (18, 18', 18", 70) used by the end user (30);

9. The system according to any of the preceding claims, wherein the web portal (28) includes pages that are accessible to both end users (30) and providers (32) and that provide data including at least one of:

- a training video (52);
- a manual (54);
- a knowledge base (56);
- on-line technical support (58) ; and
- an on-line user forum (60).

10. The system according to any of the preceding claims, wherein the web portal (28) includes pages that are accessible to at least the end user (30) of the system and that provide data including validation information of the system (10).

11. The system according to at least claim 4, wherein the web portal (28) includes pages that are accessible to at least the end user (30) of the system and that provide data including the service advice (26') that is determined by the service module (24'), wherein the service advice includes data that is directed to the equipment assembly (14) or parts of the equipment assembly (14).

12. The system according to any of the preceding claims, wherein the web portal (28) includes pages that are accessible to the end user (30) and that is configured to inputting data relating to the types of analyses that are performed by the equipment assembly (14).

13. A method for managing replacement of consumables (18, 18', 18", 70) having a limited lifetime, the method including:

- providing a system (10) according to any of the preceding claims;
- inputting via the web portal (28) at least the following data:
    - data (36) identifying the end user (30);
    - a serial number (38) of the consumable (18, 18', 18", 70) that is registered in the server (20);
    - a date of installation (40) of the consumable (18, 18', 18", 70) in the equipment assembly (14);
    - a type (42) of the equipment assembly (14) in which the consumable (18, 18', 18", 70) is installed;
- outputting via the web portal (28) at least the replacement advice (26) that is associated with the registered consumable (18, 18', 18", 70) of a said end user (30); and
- programming the electronic programmable signalling device (76; 86) on the basis of the replacement advice (26) so that the electronic programmable signalling device 76, 86 will signal the user of the system when replacement is advisable or needed.

14. The method of claim 13, including that:

- the provider (32) sends, triggered by the replacement advice (26) or by an order from the end user (30), a replacement consumable (18, 18', 18", 70) to the end user (30); and that
- the end user (30) sends the consumable (18, 18', 18", 70) to be recycled to the provider (32).