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## (54) USER GUIDANCE SYSTEM FOR A SANITARY FITTING

(57) A user guidance system (10) for a sanitary fitting (14) of sanitary installation for guiding a user through a handwashing process, has a control unit (32) and a user indicating device (30), which is controlled by the control unit (32) and is configured to interact with the user. The control unit (32) comprises a signal input, which is configured to receive a faucet activation signal from the sanitary fitting (14), and a signal output configure to control the user indicating device (30) such that it provides at least one guidance step for the user indicating how to wash hands when the control unit (32) determines the faucet activation signal.

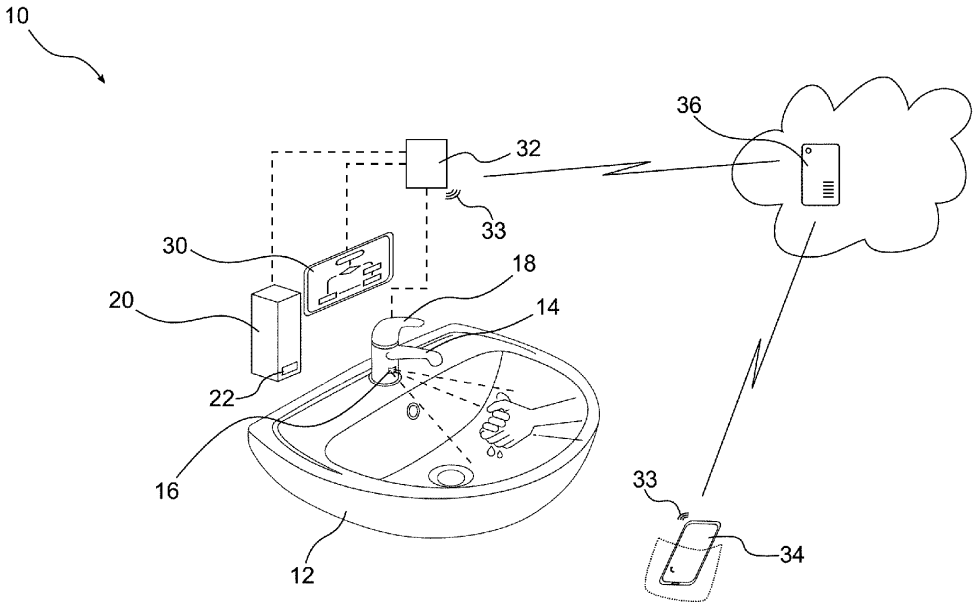


Fig. 1

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## Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

**[0001]** The invention concerns a user guidance system for a sanitary fitting of a sanitary installation as well as a method for guiding a user through a handwashing process.

2. Description of the Prior Art

**[0002]** Sanitary installation are of major importance in order to provide hygienic standards in critical environments which have higher hygienic requirements like hospitals, homes for the elderly or other day care institutions.
**[0003]** In particular the current COVID-19 pandemic situation has shown how important frequent handwashing is in order to prevent the spreading of germs.

SUMMARY OF THE INVENTION

**[0004]** The object of the invention is therefore to provide a user guidance system for a sanitary fitting of sanitary installation which guides a user through a handwashing process, to improve overall hygienic standards and in particular to improve hygienic standards in critical environments.
**[0005]** According to the invention this object is achieved by providing a user guidance system for a sanitary fitting of sanitary installation for guiding a user through a handwashing process, having

a) a control unit,

b) a user indicating device, which is controlled by the control unit and is configured to interact with the user,

c) wherein the control unit comprises a signal input, which is configured to receive a faucet activation signal from the sanitary fitting, and a signal output configure to control the user indicating device such that it provides at least one handwashing guidance step for the user indicating how to wash hands when the control unit determines the faucet activation signal.

**[0006]** Using such a user guidance system the user of a sanitary installation may - during his or her handwashing process - be provided with information how to optimally perform the handwashing. In particular the timing during the handwashing process is of importance and the user indicating device may give indications if e.g. the soaping of the hands was long enough. Nonetheless, the user guidance system is not restricted to such timing guidance but could also be used to explain a thorough handwashing process to the user.
**[0007]** Such a handwashing guidance system may animate the user to a better handwashing process. In particular, such a system may be used in environments with increased hygienic requirements and/or in child care or schooling institutions in order to better teach a handwashing process with better results.
**[0008]** The at least one handwashing guidance step may comprise instructions directed in particular to a prerinsing step, a soaping step, a rinsing step, a drying step and/or a disinfecting step.
**[0009]** All the components of the user guidance system should be considered mainly as functional components which might be present as separate structural units but which might as well be integrated in other units already known from sanitary installations.
**[0010]** In particular, the control unit of the user guidance system may be a separate unit or may be integrated in one of the components of the sanitary installation. The control unit may be connected the other components using wired and/or wireless connections. In particular, the control unit may be integrated into the sanitary fitting, preferably into an automatic faucet.
**[0011]** Preferably, the user indicating device is a display, a speaker and/or a lighting element.
**[0012]** In particular, a display or a speaker may be used to provide the user with detailed guidance steps for the handwashing process. The user indicating device may be provided as a separate component or may be integrated into other components of a sanitary installation, in particular into the sanitary fitting or any other external hygienic device, like e.g. an air dryer, itself.
**[0013]** Preferably, the sanitary installation comprises an external hygiene device, in particular a dispenser for a hygiene ingredient, wherein the external hygiene device is connected to the control unit to provide an external hygiene device activation signal to the control unit.
**[0014]** This allows to further monitor the handwashing performed by the user, in particular it allows to monitor the use of the external hygiene device. The external hygiene device may also be a hand drying device like an air dryer and/or a paper dispenser, the hygiene ingredient may be soap and/or a disinfectant like e.g. provided by a soap dispenser or a disinfectant dispenser. For the above purpose, the control unit may communicate via a wired or wireless connection with the external hygiene device. In particular, the control unit may only receive a signal from the external hygiene device but may even drive the device, e.g. for enabling the device itself and/or a lighting on the device.
**[0015]** Preferably, the user guidance system comprises a portable handwashing data device, which may be carried by the user and is configured to communicate with the control unit.
**[0016]** This allows to collect handwashing data associated with a user. Such a portable handwashing data device may be implemented by a smartphone running a given application. In this case, the user guidance system may for example use the speaker of the smartphone as a user indication device. For this purpose, the control unit

only has to communicate with the smartphone, when the faucet activation signal is determined. One may even think of including the control unit within the smartphone respectively in the software application. Then the faucet activation signal may be provide over a short range communication channel to the smartphone which includes the control unit.

**[0017]** However, the portable handwashing data device may just be any other simple electronic device.

**[0018]** Preferably, the portable handwashing data device comprises a user identification element.

**[0019]** A user identification element could be implemented by a RFID tag, a smartphone ID or any other suitable data structure to identify a user throughout the handwashing process.

**[0020]** Preferably, the user guidance system comprises a preferably cloud-based server to store, monitor, and/or analyze handwashing data associated with the handwashing process of the user.

**[0021]** This allows for example in an environment of increased hygienic requirements like a hospital to analyze how the user or a plurality of users carry out their handwashing in order to improve the overall hygienic profile of this environment. E.g. the at least guidance step could be improved in order to better guide the user through its handwashing process.

**[0022]** Preferably, the user guidance system comprises an electronically controllable valve connected to the control unit, wherein the control unit is configured to control the valve in accordance with the at least one guidance step.

**[0023]** Such a valve allows for example to stop the water flow from the sanitary fitting for a given amount of time thereby forcing the user to soap his hands for this amount of time. Only after this amount of time the user may rinse his hands when the control unit starts to release water again. The timer used in this context may be triggered by an activation signal from a dispenser. The valve may be included in the sanitary fitting of the sanitary installation or in any supply line.

**[0024]** With respect to a method the object of the invention may be achieved with a method for guiding a user through a handwashing process comprising the following steps:

a) Determine a faucet activation by the user by means of a control unit;
b) Indicating at least one handwashing guidance step to the user by means of a user indicating device;

**[0025]** Preferably, the at least one handwashing guidance step may be configurable.

**[0026]** This allows to introduce changes into the handwashing process which might be necessary because of new scientific insights regarding handwashing best practices or to implement different local hygiene guidelines. Preferably, the guidance steps provided to the user may be downloaded from a server using any suitable communication channel.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0027]** Various features and advantages of the present invention may be more readily understood with reference to the following detailed description taken in conjunction with the accompanying drawings in which:

Figure 1 shows a perspective systematic view of a user guidance system according to the invention;

## DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

**[0028]** Fig. 1 shows a user guidance system 10 for guiding a user through a handwashing process according to the invention implemented with an exemplified sanitary installation.

**[0029]** The sanitary installation comprises a sink 12 and an automatic faucet 14 as an example of a sanitary fitting which may be activated touchless by way of a faucet activation sensor 16. The faucet activation sensor 16 may be implemented e.g. as a presence sensor. Additionally, the faucet 14 comprises a temperature lever 18 for adjusting the water temperature.

**[0030]** The sanitary installation further comprises a soap dispenser 20. In this embodiment the soap dispenser 20 is a separate component mounted on a wall above the sink 12 near the faucet 14. However, any other arrangement position for the soap dispenser 20, e.g. even integrated into the automatic faucet 14, may be used.

**[0031]** The soap dispenser 20 also comprises a dispenser activation sensor 22 for releasing the soap.

**[0032]** Furthermore, the exemplarily shown user guidance system 10 includes a display 30 as a user indicating device. The display 30 is mounted in a position where the user of the sanitary installation has a good viewing angle on the display 30 during handwashing, e.g. on a wall behind the sink 12.

**[0033]** As shown by dashed lines, the user guidance system 10 comprises a control unit 32 which is connected with the other components, in particular the automatic faucet 14, the soap dispenser 20 and the display 30. Notably, the control unit 32 has not to be provided as a separate device but may also be included in one of the other components, in particular the display 30.

**[0034]** Finally, Fig. 1 shows a smartphone as a personal washing data device 34, which may be carried by the user. The personal washing data device 34 may communicate with the control unit 32 via any short range wireless communication channel 33, in particular via Bluetooth, WIFI and/or RFID.

**[0035]** As an alternative or additional communication model, the user guidance system 10 may also comprise a preferably cloud-based data server 36 which establishes a communication channel with the personal washing

data device 34, the control unit 32 and/or with the control unit 32 via the personal washing data device 34 using the short range communication channel 33.

**[0036]** The user guidance system 10 may work as follows:

When a user steps towards the sink 12, the faucet activation sensor 16 senses the approaching hands of the user and signals this information to the control unit 32.

**[0037]** Furthermore, the control unit 32 individually identifies the user using the personal washing data device 34.

**[0038]** The control unit 32 then signals the display 30 to show for example a guidance step like a pictogram showing the pre-rinsing of hands with clear water from the automatic faucet 14. The guidance step may also comprise individualized audio instructions or a short melody directed to the user via a speaker integrated with the display.

**[0039]** The user may then further approach his hands under the automatic faucets 14 in order to release the water flow. When the user retracts his hands the water flow may be stopped.

**[0040]** During this step the control unit 32 triggers a timer in order to record how long the pre-rinsing step took.

**[0041]** The display 30 then guides the user towards a soaping step, e.g. by showing a pictogram of hands reaching for the soap dispenser 20. Alternatively or additionally, the soap dispenser 20 may be highlighted, e. g. by turning on a lighting at the soap dispenser 20.

**[0042]** The user then reaches for the soap dispenser 20 and by use of the dispenser activation sensor 22 may release soap from the soap dispenser 20. Again this is signaled to the control unit 32 and recorded associated with the individual handwashing process, in particular with the individual user.

**[0043]** The display 30 may then provide a guidance step on how long the user should soap his hands, e.g. by displaying a pictogram together with a progress meter, like a progress bar known from common graphical user interfaces. During this time the control unit 32 may even prevent the release of water from the automatic faucet 14.

**[0044]** Again the time used for the soaping step is recorded for later analysis.

**[0045]** After the soaping step, the display 30 shows how to perform a rinsing step, in particular by guiding the user back to the automatic faucet 14. When the user approaches his hands underneath the automatic faucet 14 water is released and the user may rinse off the soap from his hands (and with it hopefully the germs).

**[0046]** Again the time used for the rinsing step is recorded for later analysis.

**[0047]** Along the same general idea, the handwashing process may also include a drying step using an air dryer or paper dryer as an external hygienic device.

**[0048]** Furthermore, a disinfecting step may be included in the handwashing process.

**[0049]** As a last step in the handwashing process the control unit 32 may transmit handwashing data, in particular the user identification data and the timing data for the individual steps, associated with the handwashing process to the data server 36.

**[0050]** These handwashing data may later be used e. g. for documentation purposes and/or analyzed and/or reported by user or by groups of user, like a whole organization. In particular, the handwashing data may be analyzed with respect to: how many times a user washed his hands; how good the handwashing process was; how strictly the user followed the guiding steps; individual user may be compared to an average or each other. The handwashing data may also be used to follow local laws regarding hygienic documentation regulations.

**[0051]** Furthermore, using the handwashing data a feedback may be given to the user. For this purpose, the data server 36 may use any suitable communication technology like email, SMS, a personal messenger or the like.

**[0052]** Generally, the control unit 32 may communicate via the short range communication channel 33 (e.g. using Bluetooth, in particular Bluetooth Low Energy) with the smartphone of the user in order to transmit the handwashing data to the data server 36 via any long range communication channel like WiFi or GSM/UMTS and/or to identify the user using a user identification number stored on the smartphone.

## Claims

1. A user guidance system (10) for a sanitary fitting (14) of sanitary installation for guiding a user through a handwashing process, having

   a) a control unit (32),
   b) a user indicating device (30), which is controlled by the control unit (32) and is configured to interact with the user,
   c) wherein the control unit (32) comprises a signal input, which is configured to receive a faucet activation signal from the sanitary fitting (14), and a signal output configure to control the user indicating device (30) such that it provides at least one handwashing guidance step for the user indicating how to wash hands when the control unit (32) determines the faucet activation signal.

2. The user guidance system according to any of the preceding claims, **characterized in that** the user indicating device (30) is a display, a speaker and/or a lighting element.

3. The user guidance system according to any of the preceding claims, **characterized in that** an external hygiene device (20), in particular a dispenser for a hygiene ingredient, is connected to the control unit (32) to provide an external hygiene device activation

signal to the control unit (32).

**4.** The user guidance system according to any of the preceding claims, **characterized in that** the user guidance system (10) comprises a portable handwashing data device (34), which may be carried by the user and is configured to communicate with the control unit (32).

**5.** The user guidance system according to claim 4, **characterized in that** the portable handwashing data device (34) comprises a user identification element.

**6.** The user guidance system according to any of the preceding claims, **characterized in that** the user guidance system (10) comprises a preferably cloud-based server (36) to record, monitor and/or analyze handwashing data associated with the handwashing process of the user.

**7.** The user guidance system according to any of the preceding claims, **characterized in that** the user guidance system (10) comprises an electronically controllable valve (14) connected to the control unit, wherein the control unit (34) is configured to control the valve (14) in accordance with the at least one guidance step.

**8.** Method for guiding a user through a handwashing process comprising the following steps:

a) Determine a faucet activation by the user by means of a control unit;
b) Indicating at least one handwashing guidance step to the user by means of a user indicating device;

**9.** Method according to claim 8, **characterized in that** the at least one handwashing guidance step is configurable.

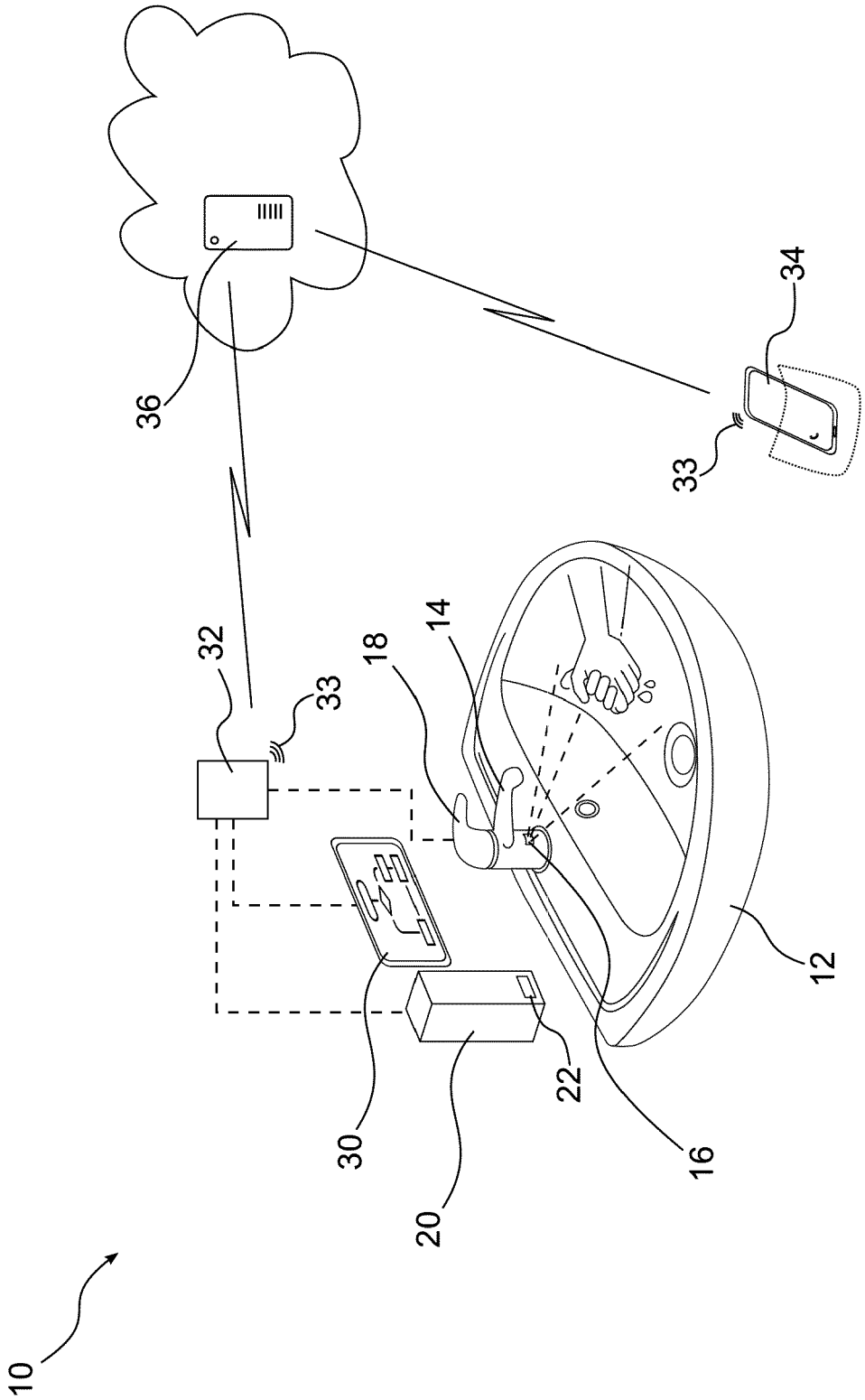


Fig. 1

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# EUROPEAN SEARCH REPORT

Application Number
EP 21 19 1015

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
|---|---|---|---|
| X | US 10 643 454 B1 (SANTAMORE MEGAN [US]) 5 May 2020 (2020-05-05) * See SUMMARY OF DISCLOSURE; page 1 * | 1,7 | INV. G08B21/24 |
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1 The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| Munich | 19 January 2022 | Flygare, Esa |

CATEGORY OF CITED DOCUMENTS

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## ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 21 19 1015

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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19-01-2022

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82