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(54) **APPARATUS TO MANAGE CONTAINERS**

(57) Apparatus to manage containers (12) for the collection of clothing comprising a plurality of containers (12) in which the clothing is introduced and each provided with a removal aperture (17) to remove the clothing. A

door (18) and an electronic lock (20) being associated with the removal aperture (17), the electronic lock (20) being configured to allow or prevent the opening of said door (18).

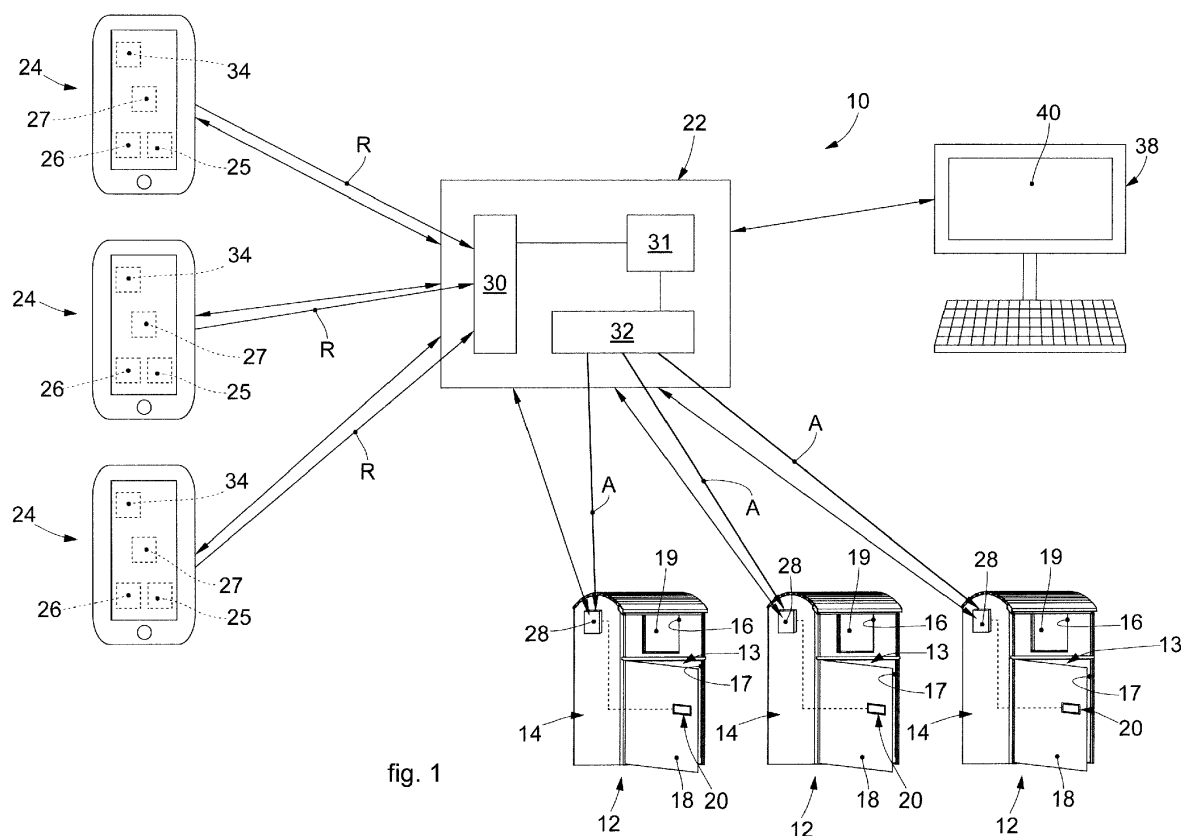


fig. 1

Description

FIELD OF THE INVENTION

[0001] The present invention concerns an apparatus to manage containers used to collect used clothing such as clothes, shoes, or suchlike.

[0002] In particular, the apparatus allows to carry out controls on the condition of the container, such as the state of fullness, and allows to manage how clothes are removed from the containers by authorized operators.

[0003] The present invention also concerns a method to manage containers.

BACKGROUND OF THE INVENTION

[0004] Containers for collecting used clothing are known, which is inserted through a suitable insertion aperture of the container.

[0005] The containers are also provided with a removal aperture, which can be selectively closed by a door, and through which authorized operators empty the container.

[0006] The door is generally associated with a closing member, such as an electric lock, selectively activated to allow the door to open or prevent access to the contents of the container.

[0007] It is known that the state of fullness of the containers needs to be monitored in order to define removal programs, and hence to define for the operators an optimized temporal sequence and spatial path to reach the containers and remove the clothing.

[0008] It is also known that the operations to remove the clothing need to be managed safely, so that they are only carried out by authorized operators.

[0009] For example, a solution to manage the removal of clothing from containers is known from document EP-A-15165089, filed in the name of the present Applicant.

[0010] However, known solutions to manage containers have difficulty in monitoring in real time the state of fullness of the containers, in optimizing removal operations by authorized operators, and in reducing collection frequency.

[0011] Other disadvantages related to solutions to manage containers concern the impossibility of guaranteeing that the operator authorized to remove the articles is recognized, to perform a check by a central control and management unit.

[0012] One purpose of the present invention is to obtain an apparatus to manage containers that is safe and secure, and that prevents free access to the articles present in the container by unauthorized persons.

[0013] Another purpose of the present invention is to obtain an apparatus to manage containers that allows to continuously monitor the geographical location of each container.

[0014] Another purpose of the present invention is to obtain an apparatus to manage containers that allows to control the state of the container and the operators au-

thorized to remove the clothing contained therein.

[0015] The Applicant has devised, tested and embodied the present invention to overcome the shortcomings of the state of the art and to obtain these and other purposes and advantages.

SUMMARY OF THE INVENTION

[0016] The present invention is set forth and characterized in the independent claims, while the dependent claims describe other characteristics of the invention or variants to the main inventive idea.

[0017] In accordance with the above purposes, an apparatus to manage containers for the collection of clothing comprises a plurality of containers in which the clothing is introduced and each provided with a removal aperture to remove the clothing. A door and an electronic lock are associated with the removal aperture, to allow or prevent the opening of the door.

[0018] According to one aspect of the invention, the apparatus comprises:

- a central unit configured to memorize information concerning at least the state of fullness of the containers, and temporal removal programs of the clothing from the containers, the temporal removal programs each being associated with an operator assigned to the removal;
- a plurality of electronic units of the portable type, each associable with an operator and, on the request of the operator, configured to send, in wireless mode, to the central unit a signal to request the opening of one of the containers;
- a plurality of communication units each provided in one of the containers, connected electrically to the respective electronic lock and configured to communicate to the central unit information concerning at least the state of fullness of the respective container.

[0019] According to one aspect of the present invention the central unit is provided with a reception device configured to receive from the electronic units respective opening request signals and with a transmission device configured to transmit an opening signal of one of the containers to the respective communication unit on the basis of at least the temporal removal program.

[0020] In this way, all the communications pass through the central unit, which monitors the removal operations of the containers, allowing to open the respective doors, only by authorized operators and in predefined temporal intervals pre-established and identified in the temporal removal programs.

[0021] Embodiments of the invention also concern a method to manage containers that provides at least to remove, through a removal aperture, clothing introduced into the containers. The removal comprises at least the activation/deactivation of an electronic lock associated with a closing door of the removal aperture.

[0022] According to one aspect of the invention, the method provides:

- to memorize in a central unit information concerning at least the state of fullness of the containers;
- to process temporal removal programs of the clothing from the containers on the basis of the information memorized;
- to assign each temporal removal program to an operator responsible for the removal;
- to supply each operator with an electronic unit of the portable type;
- on the request of the operator, to send an opening request signal of one of the containers using the electronic unit;
- to communicate to the central unit information concerning at least the state of fullness of the containers by means of a communication unit provided in one of the containers and electrically connected to the respective electronic lock;
- to receive the opening request signal from one of the electronic units in a reception device of the central unit;
- to compare the opening request signal with the temporal removal program and to transmit an opening signal with a transmission device of the central unit to the respective communication unit.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] These and other characteristics of the present invention will become apparent from the following description of some embodiments, given as a non-restrictive example with reference to the attached drawings wherein:

- fig. 1 is a schematic view of an apparatus to manage containers in accordance with the present invention;
- fig. 2 is a block circuit diagram of a communication unit of a container in accordance with the present invention;
- fig. 3 is a flow chart of the method to manage containers according to the present invention.

[0024] To facilitate comprehension, the same reference numbers have been used, where possible, to identify identical common elements in the drawings. It is understood that elements and characteristics of one embodiment can conveniently be incorporated into other embodiments without further clarifications.

DETAILED DESCRIPTION OF SOME EMBODIMENTS

[0025] Embodiments described here concern an apparatus 10 to manage containers 12 for collecting clothing such as clothes, shoes, or suchlike.

[0026] In particular, the management apparatus 10 comprises a plurality of containers 12 disposed in differ-

ent zones inside a geographical area, for example in a region, a province, a city or a neighborhood.

[0027] Each container 12 (fig. 1) comprises a containing body 14, defining a containing compartment 13 in which users put the clothing.

[0028] The containing body 14 can be provided with an introduction aperture 16 to allow the clothing to enter. The introduction aperture 16 can be provided in the upper part of the container 12, so that the clothing falls to the bottom of the containing compartment 13.

[0029] The introduction aperture 16 can be selectively opened/closed, with introduction means 19 such as a rotating drum, to allow both the introduction of the clothing into the containing compartment 13 and also the selective closure of the introduction aperture 16.

[0030] The containing body 14 is also provided with a removal aperture 17 to allow the clothing to be removed.

[0031] The removal aperture 17 can advantageously be located below the introduction aperture 16.

[0032] A door 18 is associated with the removal aperture 17 and is configured to selectively close the removal aperture 17 and hence the containing compartment 13.

[0033] According to one embodiment, an electronic lock 20 is associated with the door 18 and the removal aperture 17, and is configured to assume at least one active condition in which it constrains the positioning of the door 18 to close the removal aperture 17, and an inactive condition, in which access to the containing compartment 13 is possible through the removal aperture 17.

[0034] According to some embodiments, each container 12 comprises a communication unit 28 connected to the electronic lock 20 and configured to activate/deactivate the electronic lock 20 and determine respectively the closing or opening of the door 18.

[0035] The management apparatus 10 also comprises a central unit 22 in which information regarding the containers 12 is memorized, such as the geographical spatial localization of each container 12 and/or its state of fullness.

[0036] According to some embodiments, the central unit 22 is also configured to memorize information regarding temporal programs for removing the clothing from the containers 12.

[0037] In particular, it can be provided that such information comprises at least one of the specific containers 12 in which to make the removal, the temporal sequence for removing clothing from the containers 12, the order for making the removal from the containers 12, the operator to which the removal is assigned, the temporal interval in which to make the removal.

[0038] According to some embodiments of the invention, each temporal program is associated with an operator who, on the basis of the temporal program, moves inside a delimited geographical area to remove the clothing from the containers 12.

[0039] The apparatus 10 also comprises a plurality of portable electronic devices 24, each associated with an operator and, upon request of the latter, configured to

send in wireless mode to the central unit 22 an opening request signal R of one of the containers 12.

[0040] According to possible solutions, the electronic units 24 are selected from a group comprising at least one of either a smartphone, an I-phone, a tablet, a cell phone, or other types of known telecommunication devices.

[0041] According to possible solutions, communication between the electronic units 24 and the central unit 22 can be made via a mobile phone server.

[0042] It is not excluded, however, in possible variant embodiments, that the electronic unit 24 can comprise a telecommunication device suitably made and suitable for the purpose.

[0043] The electronic units 24 are selectively enabled to communicate with the central unit 22. For example, it can be provided that each electronic unit 24 is selectively programmed to communicate with the central unit 22 by means of a specific communication protocol, different or identical for each electronic unit 24.

[0044] According to some embodiments, each electronic unit 24 comprises a communication device 26 configured to communicate in wireless mode with the central unit 22.

[0045] The communication device 26 is configured to send to the central unit 22 at least the opening request signal R of a given container 12.

[0046] For example, it can be provided that the communication device 26 uses specific data communication protocols to communicate with the central unit, such as a dedicated software application like a web app.

[0047] According to some embodiments, the software application can be for example programmed to allow a protected remote communication between the central unit 22 and the electronic unit 24. To allow access to the software application, it can be provided that the operator inserts a user recognition code into the electronic unit 24 to enable communication between the two units.

[0048] According to possible solutions, the electronic unit 24 comprises a processor 25 configured to initiate computer programs, that is, specific or configured software, for example, to manage the functioning of the communication device 26.

[0049] For example, it can be provided that the computer program is configured to manage the exchange of information between the central unit 22 and the electronic unit 24.

[0050] According to one aspect of the present invention, the communication device 26 is configured to receive the temporal removal program from the central unit 22.

[0051] To this purpose, each electronic unit 24 can be provided with a user interface 27 with which the operator can interact to consult, for example, the temporal removal program.

[0052] The user interface 27 can comprise at least one of a screen, keys, buttons, a touch screen, or a combination thereof.

[0053] In a possible solution, through the user interface 27, an operator can access the computer program, which displays on the user interface 27, for example, the temporal removal program.

5 **[0054]** The computer program can also provide information regarding the containers 12 already emptied and/or the containers that are still to be emptied.

10 **[0055]** The user interface 27 can allow the operator to display, possibly in interactive mode, the spatial path to be followed in order to reach the containers 12 and remove the clothing.

[0056] Through the user interface 27, the operator can determine the sending of the opening request signal R of a specific container 12.

15 **[0057]** The processor 25, when it has received from the user interface 27 the order to send the opening request signal R, activates the communication device 26 so that it proceeds to do so.

20 **[0058]** The opening request signal R can contain at least the data relating to the operator by whom the request is made, that is, relating to the electronic unit 24 by which the opening request signal R is emitted, and the data relating to the container 12 that the operator indicated that he wanted to empty.

25 **[0059]** The data relating to the container 12 can include, for example, a serial number assigned to it, or a spatial reference in which it is located, such as geographic coordinates and/or street address.

30 **[0060]** According to one aspect of the invention, the central unit 22 is provided with a reception device 30 configured to receive the opening request signal R from the electronic unit 24 and a transmission device 32 configured to transmit an opening signal A to the communication unit 28. The latter, depending on the opening signal A, allows to open the door 18 or not, by deactivating the electronic lock 20.

35 **[0061]** According to some embodiments, the opening signal A is emitted by the transmission device 32 on the basis at least of the temporal removal program of the operator associated with the specific electronic unit 24 which has transmitted the opening request signal R.

40 **[0062]** According to some embodiments, the central unit 22 comprises a processor 31 configured to process the opening request signal R received by the reception device 30 and to generate the possible opening signal A to be supplied to the transmission device 32 which will provide to transmit it.

45 **[0063]** According to some embodiments, the processor 31 compares the data contained in the opening request signal R with those of the temporal removal program associated with the electronic unit 24 that sent the opening request signal R.

50 **[0064]** For example, it can be provided that the processor 31 receives from the opening request signal R an identification of the electronic unit 24 from which the opening request signal R has been emitted, and an identification of the container 12 which the operator has reported that he wants to open, such as the serial number

and/or spatial reference of the container 12.

[0065] Based on the identification of the electronic unit 24, the processor 31 identifies the temporal removal program associated with the operator holding the electronic unit 24.

[0066] The processor 31 compares whether the identification of the container 12 for which opening is requested is contained in the temporal removal program identified.

[0067] Furthermore, according to some embodiments, the processor 31 can check whether the date and time of sending of the opening request signal R correspond to a predetermined date and/or temporal interval for removing the clothing for that particular container 12, said temporal interval being identified in the temporal removal program.

[0068] According to possible variant embodiments, the electronic unit 24 can comprise a spatial localization device 34 connected to the communication devices 26 and configured to detect the spatial position of the electronic unit 24.

[0069] The spatial position is acquired by the communication devices 26 which provide to send it in wireless mode to the central unit 22.

[0070] The spatial position data of the electronic unit 24 can be contained in the opening request signal R.

[0071] The central unit 22, for example, by means of the processor 31, compares the position data of the electronic unit 24 with the position data of the container 12 for which opening is requested.

[0072] If the data identifies that the electronic unit 24 and the container 12 for which opening is requested are in direct proximity to each other, for example inside an area of less than 50m, preferably less than 30m, even more preferably less than 10m, the processor 31 confirms the transmission of the opening signal A.

[0073] According to some embodiments, the central unit 22 can be provided with, or connected to, a user interface 38 provided with a display device 40 on which the spatial localization of the containers 12 and possibly their state of fullness can be displayed.

[0074] The user interface 38 is also configured to allow an administrator user to generate the temporal removal programs for each operator, or associated with each electronic unit 24.

[0075] The temporal removal programs generated by the user interface 38 are memorized in the central unit 22.

[0076] According to some embodiments, based on localization information supplied by a specific electronic unit 24, the display device 40 also allows to display the spatial localization of the operator associated with the specific electronic unit 24 as well as the path taken by the operator associated with it for removal.

[0077] According to some embodiments, described for example, with reference to fig. 2, the communication unit 28 of each container 12 comprises a control and command device 42 configured to supervise, control and command the functioning of the components of the com-

munication unit 28.

[0078] According to possible solutions, the communication unit 28 comprises an electric power unit 44 to supply the necessary electric energy to the various components of the communication unit.

[0079] According to some embodiments, the electric power unit 44 comprises energy storage devices 47, such as batteries, configured to electrically power the electrical/electronic components of the communication unit 28.

10 The power storage devices 47 can be of the rechargeable and/or replaceable type.

[0080] According to variant embodiments, which can be combined with the embodiments described here, the electric power unit 44 can comprise a connection to an electrical supply network, not shown in the drawings.

15 **[0081]** According to other embodiments, which can be combined with the embodiments described here, the electric power unit 44 comprises a renewable energy absorption device 46, for example a solar panel or photovoltaic panel.

[0082] The renewable energy absorption device 46 can, in turn, be connected to the energy storage devices 47 to store the electrical energy absorbed.

20 **[0083]** The renewable energy absorption device 46, and/or energy storage devices 47, are electrically connected to power conversion devices 45, such as inverters, configured to supply the various components of the communication unit 28 with electrical energy suitable to power them.

25 **[0084]** According to possible solutions, the electric power unit 44 can comprise recharging devices 48 connected to the renewable energy absorption device 46 and to the storage devices 47 and configured to charge the storage devices 47 with the energy produced by the renewable energy absorption device 46.

30 **[0085]** The electric power unit 44 can also comprise an optimizer device 49 connected to the charging devices 48 and/or to the power conversion devices 45 and configured to manage the electric power absorption of the individual storage devices 47.

35 **[0086]** According to some embodiments, the communication unit 28 can comprise a detection device 50 configured to detect the quantity of clothing present in the container 12. This data is then transmitted to the central unit 22 for monitoring the state of fullness.

40 **[0087]** According to some embodiments, the communication unit 28 can comprise a localization device 51, for example a GPS (Global Positioning System), configured to determine the spatial localization of the container 12.

45 **[0088]** The communication unit 28 can also comprise a data communication device 52 configured to communicate, for example via a data network or a mobile phone network, and/or the Internet, with the central unit 22, to send information about the state of fullness and/or spatial localization of the container 12.

[0089] In some embodiments, the central unit 22 is constantly informed of both the position where the con-

tainer 12 is located, since it can easily detect whether it has been moved with respect to a previously memorized position, and also the state of fullness. This allows to optimize the temporal removal programs by reducing unnecessary removal interventions, it allows to know if a specific container 12 has been opened and how much clothing has been removed, and to monitor over time the quantity of clothing collected from a specific container 12.

[0090] Furthermore, according to the data on the state of fullness of the containers 12, it is possible to optimize the removal paths also depending on the capacity of the vehicles used for removal.

[0091] According to other variant embodiments, the communication unit 28 can comprise optical acquisition devices 53, such as a TV camera and/or camera, possibly connected through the Net to the central unit 22. This allows to survey the area surrounding the containers, to prevent thefts or damage, or allow quick intervention in the event that these occur.

[0092] According to other embodiments, the communication unit 28 can also comprise a network connection device 54 to supply an operator and/or a user with a network to access a data communication system, for example a Wi-Fi internet access point.

[0093] According to possible solutions, a management module 56 can be provided, connected to the control and command device 42 and to at least one of either the localization device 51, the data communication device 52, the optical acquisition devices 53, or the network connection device 54, and configured to control and coordinate the functioning thereof.

[0094] According to some embodiments, the communication unit 28 comprises a port 58 to command the opening of the door, connected by means of electrical connections to the control and command device 42 and to the electronic lock 20, to send activation/deactivation signals of the latter and to prevent or allow the door 18 to be opened.

[0095] According to other embodiments, the communication unit 28 also comprises a status sensor 59 configured to detect whether the door 18 is open or closed. The status sensor 59 can check whether, after deactivation of the electronic lock 20, the door 18 has been opened within a preset temporal interval. Otherwise, the control and command device 42 commands the activation of the electronic lock 20 to lock the door 18 in the closed condition.

[0096] According to some embodiments, the data received from the state sensor 59 and the detection device 50 can be sent to the central unit 22 which, if combined, can provide an indication of a possible break-in of the container 12.

[0097] According to some embodiments, the communication unit 28 can also comprise an emergency opening device 60, configured to allow the door 18 of a specific container 12 to open when data communication between the electronic unit 24 and the central unit 22 and/or between the central unit 22 and the communication unit 28

is not possible.

[0098] According to some embodiments, the emergency opening device 60 can comprise a connector attached to the containing body 14 and accessible from the outside, through which to connect an external electrical power supply to provide a commanded opening signal of the electronic lock 20.

[0099] According to other embodiments, the communication unit 28 can also comprise a lighting device 62 attached to the containing body 14 and configured to illuminate the area surrounding the container 12. The lighting device 62 can comprise, for example, one or more of either a spotlight, or a light-emitting diode (LED) 61 and/or a LED panel 63.

[0100] According to other embodiments, the communication unit 28 can also comprise a charging device 64 configured to charge, for example, an operator's electronic unit 24 or other electronic device such as a smartphone, tablet or suchlike.

[0101] According to other embodiments, a temperature detector 66 can be provided, connected to the control and command device 42 and configured to monitor the charge status of the storage devices 47 in order to optimize their functioning and/or detect possible fires.

[0102] Embodiments described here with reference to fig. 3 also concern a method to manage containers 12.

[0103] Based on the information received from the communication unit 28 of the containers 12, the central unit 22, or an operator using the central unit 22, processes a plurality of temporal removal programs for each authorized operator and associates it with the electronic unit 24 assigned to the operator.

[0104] The operator, using the electronic unit 24, accesses the temporal removal program assigned to him and reaches, with a removal vehicle, the containers 12 to execute the removal.

[0105] When he is near the container 12 to be removed, the operator sends to the central unit 22, via the electronic unit 24, an opening request signal R of the predefined container 12.

[0106] According to some embodiments, the central unit 22 receives the opening request signal R and checks whether the given container 12 is comprised in the temporal removal program of the operator associated with the electronic unit 24 that sent the signal.

[0107] The central unit 22 can also compare if the date and time of sending the opening request signal R falls within an estimated temporal interval for removing the clothing.

[0108] If so, the central unit 22 transmits an opening signal A of the container 12. Otherwise, the central unit 22 does not emit any signal, or sends an error signal to the electronic unit 24.

[0109] According to possible variant embodiments, the electronic unit 24 also communicates its spatial localization to the central unit 22. The central unit 22 verifies whether the spatial localization of the electronic unit 24 is located near the container 12 for which the opening

request signal R has been sent. If so, the central unit 22 can emit the opening signal A of the particular container 12, otherwise it does not emit any signal, or sends an error signal to the electronic unit 24.

[0110] It is clear that modifications and/or additions of parts can be made to the apparatus and method to manage containers as described heretofore, without departing from the field and scope of the present invention.

[0111] For example, according to possible embodiments, it can be provided that if two or more containers 12 are positioned close to one another, for example inside a radius of a few meters or a few dozen meters, they are grouped into a group and a single communication unit 28 is provided, associated with one of the containers 12 belonging to the group, to manage the opening of the containers 12 of the group separately.

[0112] In these embodiments, the communication unit 28 can be enabled to communicate to the central unit 22 information regarding the position of each of the containers 12 of the group associated with it, and to receive from the central unit 22 the commands to open each of the containers 12. According to these embodiments, depending on the opening signal A received, the communication unit 28 can be configured to recognize which is the container 12 for which the opening signal A has been sent and consequently deactivate the respective electronic lock 20.

[0113] According to other embodiments, it can be provided that the emergency opening device 60 of the communication unit 28 associated with the group of containers 12 is configured to receive commanded opening signals for each electronic lock 20 of each container 12 of the group.

[0114] In these embodiments, the communication unit 28, depending on the commanded opening signal received by the emergency aperture device 60, can be configured to deactivate the respective electronic lock 20 of the container 12 for which the signal has been received.

[0115] It is also clear that, although the present invention has been described with reference to some specific examples, a person of skill in the art shall certainly be able to achieve many other equivalent forms of apparatus and method to manage containers, having the characteristics as set forth in the claims and hence all coming within the field of protection defined thereby.

Claims

1. Apparatus to manage containers (12) for the collection of clothing comprising a plurality of containers (12) in which said clothing is introduced and each provided with a removal aperture (17) to remove said clothing, a door (18) and an electronic lock (20) being associated with said removal aperture (17), said electronic lock (20) being configured to allow or prevent the opening of said door (18), **characterized in that** it comprises:

- a central unit (22) configured to memorize information concerning at least the state of fullness of said containers (12), and temporal removal programs of said clothing from said containers (12), said temporal removal programs each being associated with an operator assigned to the removal;

- a plurality of electronic units (24) of the portable type, each associable with an operator and, on the request of said operator, configured to send, in wireless mode, to said central unit (22) a signal to request the opening (R) of one of said containers (12);

- a plurality of communication units (28) each provided in one of said containers (12), connected electrically to the respective electronic lock (20) and configured to communicate to said central unit (22) information concerning at least the state of fullness of the respective container (12),

and in that said central unit (22) is provided with a reception device (30) configured to receive from said electronic units (24) respective opening request signals (R) and with a transmission device (32) configured to transmit an opening signal (A) of one of said containers (12) to the respective communication unit (28) on the basis of at least the temporal removal program.

2. Apparatus as in claim 1, **characterized in that** said central unit (22) comprises a processor (31) configured to process the opening request signal (R) received by said reception device (30), to compare it with said temporal removal program and to generate the possible opening signal (A) to be supplied to said transmission device (32) that will provide to transmit it.

3. Apparatus as in claim 1 or 2, **characterized in that** said electronic unit (24) comprises a spatial localization device (34) connected to communication devices (26) and configured to detect the spatial position of said electronic unit (24), said communication devices (26) being configured to send said spatial position to said central unit (22).

4. Apparatus as in any claim hereinbefore, **characterized in that** each electronic unit (24) is provided with a user interface (27) configured to allow to display said temporal removal program and at least the sending of said opening request signal (R).

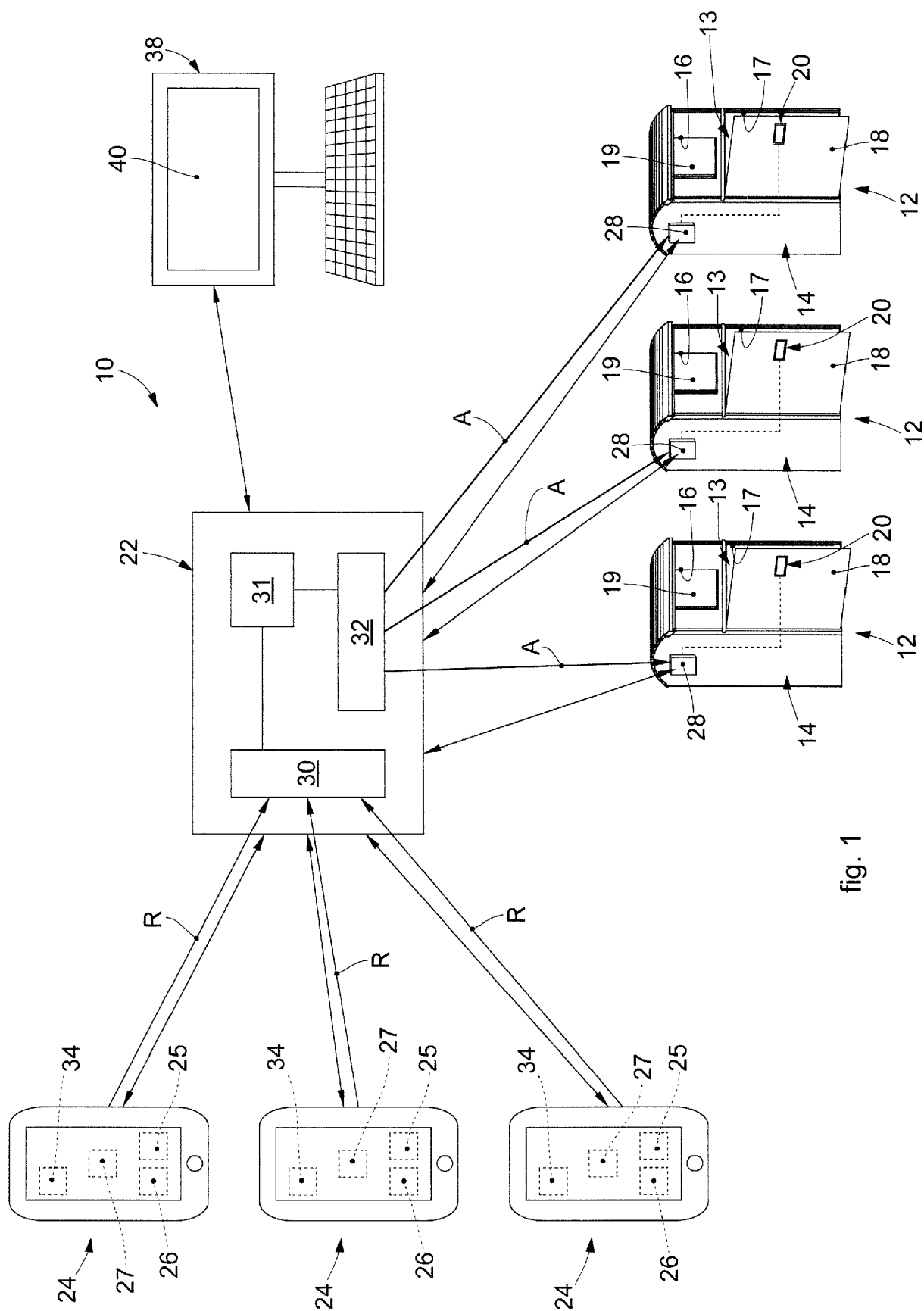
5. Apparatus as in any claim hereinbefore, **characterized in that** said communication unit (28) comprises an electric power unit (44) to supply the electric power needed for the different components of said communication unit (28), said electric power unit (44) comprising at least one of either energy storage de-

vices (47), a renewable energy absorption device (46) or a connection with an electric power network.

6. Apparatus as in any claim hereinbefore, **characterized in that** said communication unit (28) comprises at least one of either optical acquisition devices (53), a network connection device (54), a condition sensor (59) to detect the open or closed condition of the door (18), or a lighting device (62). 5
7. Method to manage containers (12) that provides at least the removal, through a removal aperture (17), of clothing introduced into said containers (12), said removal comprising at least the activation/deactivation of an electronic lock (20) associated with a closing door (18) of said removal aperture (17), **characterized in that** it provides: 10
 - to memorize in a central unit (22) information concerning at least the state of fullness of said containers (12); 20
 - to process temporal removal programs of said clothing from said containers (12) on the basis of said information memorized;
 - to assign each temporal removal program to an operator responsible for the removal; 25
 - to supply each operator with an electronic unit (24) of the portable type;
 - on the request of said operator, to send an opening request signal (R) of one of said containers (12) using said electronic unit (24); 30
 - to communicate to said central unit (22) information concerning at least the state of fullness of said containers (12) by means of communication units (28), each provided in one of said containers (12) and electrically connected to the respective electronic lock (20); 35
 - to receive said opening request signal (R) from one of said electronic units (24) in a reception device (30) of said central unit (22); 40
 - to compare said opening request signal (R) with said temporal removal program and to transmit an opening signal (A) with a transmission device (32) of said central unit (22) to the respective communication unit (28). 45
8. Method as in claim 7, **characterized in that** with said opening request signal (R) it also provides to send the spatial localization of said electronic unit (24), **and in that** said central unit (22) verifies if the spatial localization of said electronic unit (24) is in proximity to the container (12) for which said opening request signal (R) has been sent. 50
9. Method as in claim 7 or 8, **characterized in that** said opening request signal (R) contains at least data concerning the electronic unit (24) from which said opening request signal (R) has been sent and data 55

concerning the container (12) that the operator has indicated he/she wants to empty.

10. Method as in any of the claims from 7 to 9, **characterized in that** said comparison of the opening request signal (R) provides to verify if the container (12) that the operator has indicated he/she wants to empty is included in the temporal removal program associated with the operator.



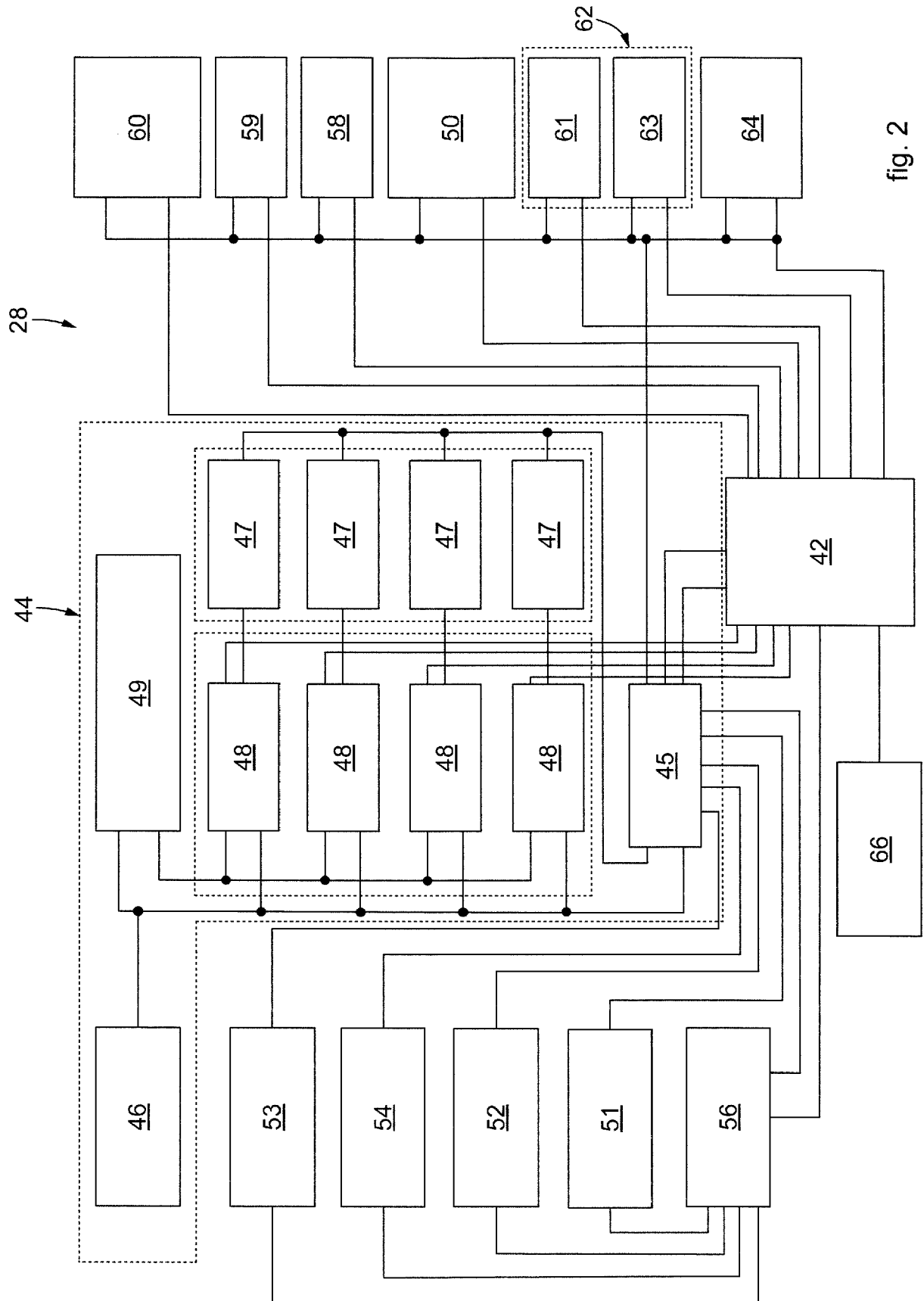


fig. 2

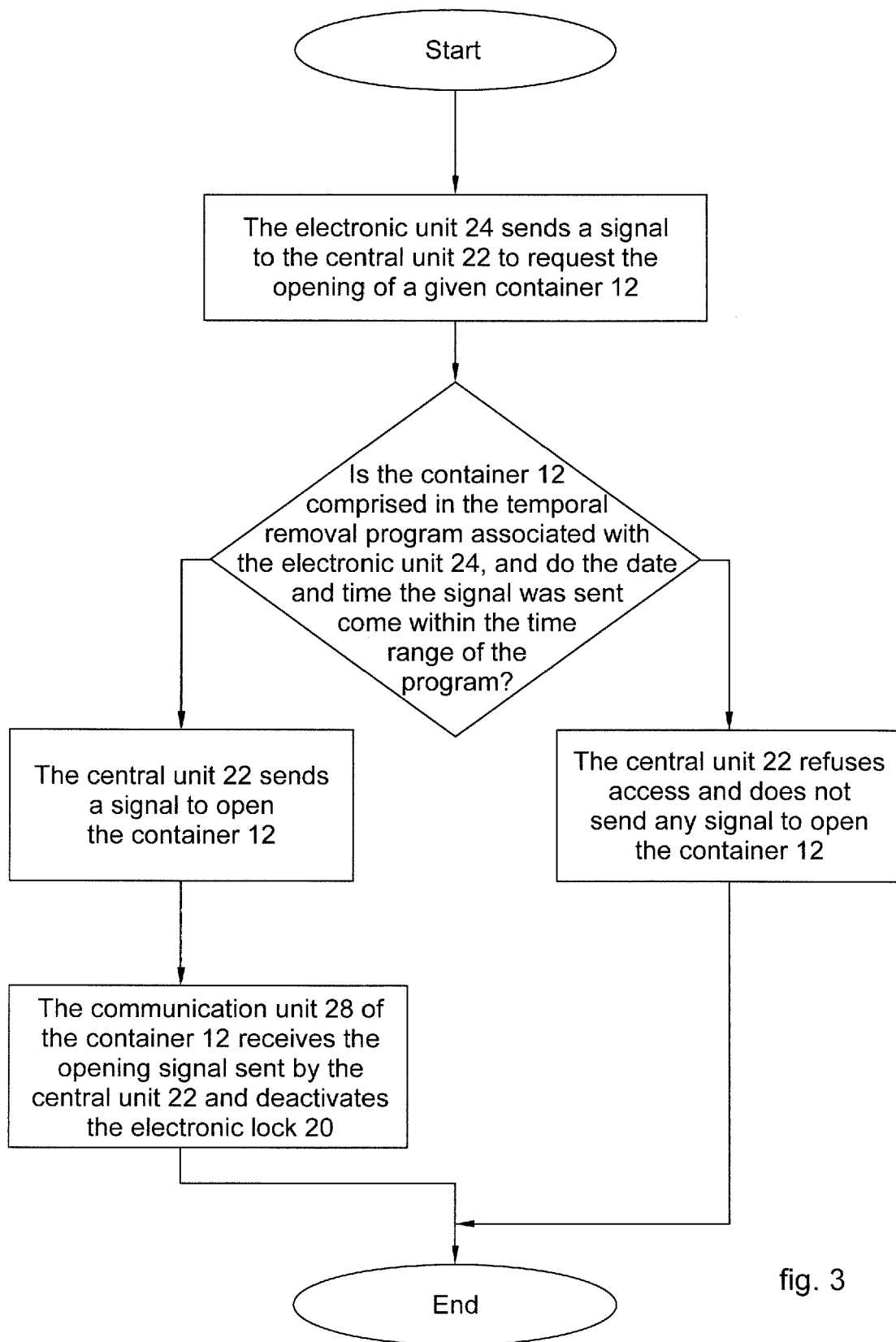


fig. 3



EUROPEAN SEARCH REPORT

 Application Number
 EP 17 18 0559

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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 2015/307273 A1 (LYMAN JEFFERSON [US]) 29 October 2015 (2015-10-29) * paragraphs [0024], [0025], [0046], [0047]; figures 1-3 *	1-10	INV. B65F1/14
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Place of search		Date of completion of the search	Examiner
The Hague		31 October 2017	Luepke, Erik
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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