



Europäisches Patentamt
European Patent Office
Office européen des brevets



Publication number: **0 396 039 B1**

EUROPEAN PATENT SPECIFICATION

- ④⑨ Date of publication of patent specification: **07.09.94** ⑤① Int. Cl.⁵: **A47K 1/00, A47K 1/02**
②① Application number: **90108047.3**
②② Date of filing: **27.04.90**

⑤④ **Automatic hand cleaning device and relevant process.**

③⑩ Priority: **03.05.89 IT 2036889**

④③ Date of publication of application:
07.11.90 Bulletin 90/45

④⑤ Publication of the grant of the patent:
07.09.94 Bulletin 94/36

⑧④ Designated Contracting States:
BE CH DE ES FR GB LI NL

⑤⑥ References cited:
EP-A- 0 180 236 DE-A- 3 011 303
FR-A- 2 595 108 US-A- 3 918 987
US-A- 4 145 769 US-A- 4 606 085

⑦③ Proprietor: **SIN-BIOS S.r.l. Ambiente e biotecnologie**
Via Benigno Crespi, 70
Milano (IT)

⑦② Inventor: **Malfa, Salvatore**
Viale Montello, 16
I-20100 Milan (IT)

⑦④ Representative: **Dr. Ing. A. Racheli & C. S.r.l.**
Viale San Michele del Carso, 4
I-20144 Milano (IT)

EP 0 396 039 B1

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid (Art. 99(1) European patent convention).

Description

The present invention refers to the field of devices for washing, disinfecting and drying the hands.

Many apparatuses of this type are known, each of which is capable of carrying out singly one of the functions mentioned: there exist detergent and/or disinfectant dispensers, taps for delivering rinsing water, possibly operated by means of photoelectric cells, manually operated or automatic driers, using air or dispensing paper. US-A-4.145.769 discloses an apparatus comprising in combination only some elements, i.e. a delivery spout, a container for the detergent, a boiler connected to pipes for feeding and outlet of water, each provided with a valve. The main disadvantage connected with the said apparatuses lies in the fact that, in order to obtain a complete washing/disinfecting/rinsing/drying cycle, it is necessary to install many different apparatuses, which therefore cannot be programmed harmoniously following a precise sequence.

The main aim of the present invention is therefore to realize a single device which carries out all the functions described above, according to an automatic programme or one which is set each time, allowing at the same time a check on the consumption of materials used (soap, disinfectant, paper) and the signalling of their depletion.

A second aim is to realize a device which, in one of its embodiments, can be adapted for already existing sanitary installations.

An additional aim is to realize a device capable of disinfecting itself automatically at predetermined intervals, so as to guarantee a continuing perfect hygiene.

The last aim is to realize a device which is easy to construct and to maintain, consisting of blocks assembled in a simple manner, all accessible and easy to substitute.

The above aims have been achieved by realizing a device according to the enclosed claims from 1 to 4, whose function is described in the enclosed claims from 5 to 9. The self-disinfecting process is described in the enclosed claims 10 and 11.

The present invention will now be explained more clearly with reference to the enclosed drawings, in which:

- figure 1a shows an axonometric view of the device according to the present invention as a whole, in a first embodiment;
- figure 1b shows a transparent view of the device in figure 1a;
- figure 2a shows an axonometric view of the device according to the present invention as a whole, in a second

embodiment;

figure 2b shows a transparent view of the device in figure 2a.

With reference to figure 1a, the device object of the present invention is seen, comprising a body 1, having a parallelepiped shape with a part projecting upwards, inside which a control block 2 is located, consisting of a plurality of control keys 2a, a delivery spout 3, which can be a two- or three-way type, a display 4, a pair of photoelectric cells 5, and a plurality of indicators 6. In the upper part of the body 1 a tank 7 is located, enclosed inside the body 1, which has a drain 8 on its lower surface. In the front part of the body 1 there is a door 9, in which an opening 10 is located, closed with a swing door 11, into which the paper used for drying the hands is thrown, and a slot 12 for dispensing the paper for drying.

With reference now to figure 1b, it can be seen how the opening 10 is part of a container 13 for collecting the used paper and other waste; a roll 14 of paper can also be seen connected to the slot 12. An electric motor, not shown in the drawings, is connected to the axis of the roll 14. On the bottom of the device two containers 15 and 16 are positioned, which contain liquid detergent and disinfectant, also liquid, respectively, or any other liquid substance which it may be desired to use. A duct 17 is connected to the container 15, and carries the detergent to the delivery spout 3; duct 17 is equipped with a small pump 18 for feeding spout 3. Similarly, a duct 19, equipped with a pump 20, is connected to the container 16.

Behind the containers 15 and 16 an electric boiler 21 is located, which rests on a support 22. At the inlet to the boiler 21 a pipe 23 is located, for feeding cold water; at the outlet from the boiler 21 a second pipe 24 is located, for the outlet of hot water. The boiler 21 is also provided with a thermostat 25, while the pipes 23 and 24 are each provided with a solenoid valve, 26 and 27 respectively.

The operation of the device is as follows; first of all it is switched on (this is shown by one of the indicators 6 or by a message such as "Machine working" appearing on the display 4), and then the programme is set by acting on the control block 2, in which the keys 2a are located which govern the following functions:

- switching on/off the device;
- operating the device manually or automatically;
- regulating the quantities of detergent and disinfectant;
- regulating the quantity of water;
- regulating the temperature of water (cold water can also be obtained by disconnecting the boiler);

- setting the times of the duration of the various phases and of the wait between one phase and the next;
- regulating the length of the dispensed strip of paper;
- regulating the self-disinfecting programme (which will be explained later).

The complete standard operating cycle of the described device is as follows:

- bringing the hands under the spout 3; this is detected by the photoelectric cells 5 and revealed by one of the indicators 6;
- appearance of a message such as "Start of washing cycle" on the display 4;
- dispensing of a predetermined quantity of detergent, obtained by operation of pump 18 for a set time;
- an interval of time available for soaping, during which a message such as "Wait" appears on the display 4;
- delivery of a predetermined quantity of water for rinsing, at a set temperature, obtained by means of operation of the solenoid valves 26 and 27 located on the pipes 23 and 24, during which a message such as "First rinse" appears on the display 4;
- dispensing of a predetermined quantity of disinfectant, obtained by means of the operation of the pump 20 for a set time;
- interval of time available for distributing the disinfectant on the hands, during which a message such as "Wait" appears on the display 4;
- delivery of a predetermined quantity of water for rinsing, at the set temperature, obtained by means of the operation of the solenoid valves 26 and 27, located on the pipes 23 and 24, during which a message such as "Second rinse" appears on the display 4;
- operation of the motor for sliding the roll 14 and dispensing a predetermined quantity of paper;
- interval of time necessary for re-initialization of the device for the beginning of a new washing/disinfecting cycle, shown by the switching on of one of the indicators 6 and the appearing of a message such as "Wait - machine loading" on the display 4.

It is obvious how devices of the type described can be realized which foresee the carrying out of the washing and first rinsing phases only, the disinfecting phase and the second rinse being excluded or not foreseen.

The display 4 is used also to show the number of complete cycles carried out by the device, as well as a partial number of cycles, capable of being set to zero by means of a pushbutton not shown in the drawings. In this way information can be ob-

tained concerning the consumption of the materials (detergent, disinfectant, water) and they can be replenished. The depletion of the stock of detergent, disinfectant or paper is signalled by the switching on of one of the indicators 6.

The device described up to this point also foresees the possibility of carrying out a self-disinfecting action; once the moment for carrying out such a programme (for example during the night) and its duration have been programmed by means of the control block 2, the boiler 21 is activated at the moment scheduled and heats the water up to a temperature of 80-90 °C. The water which is heated in this way is then made to circulate inside the pipes and made to come out of the spout 3, thus guaranteeing the internal cleaning of the pipes.

With reference now to figure 2a and 2b, another embodiment can be seen of the device which is the object of the present invention. The parts which make up this embodiment are completely analogous to those already described with reference to figures 1a and 1b and are indicated with the same identifying numbers. The only difference lies in the fact that, in this case, no washing tank is foreseen, since this type of embodiment is suitable for applying to an existing wash basin, provided with a delivery spout, the pipes 17, 19 and 24 being able to be connected to the said spout or to a second delivery spout, to be installed at the side of the existing one.

In this way, a device has been realized for cleaning the hands, which meets the aforesaid aims, since it allows the different phases of washing, rinsing, disinfecting and drying to be carried out; it can also signal the consumption of the materials used. In addition, the device can be applied, in one of its embodiments, to existing sanitary installations; it is also capable of self-disinfecting and consists of block units which are easy to replace and maintain.

Claims

1. An automatic device for cleaning the hands, comprising:
 - a delivery spout (3);
 - a container (15) for a detergent connected to the spout (3) by means of a duct (17), provided with a pump (18);
 - a boiler (21), provided with a thermostat (25) and connected to pipes (23, 24) for the feeding and outlet of water, each provided with a solenoid valve (26, 27), the water outlet pipe (24) being connected to the spout (3);
 - characterized in that it further comprises
 - a control block (2);

- a pair of photoelectric cells (5) for detecting the presence of user's hands under said spout (3) and consequently activating the control block (2);
 - luminous indicators (6) for revealing the functioning of the device and for signalling that one or more of materials (detergent, disinfectant) needs replenishment; 5
 - a slot (12) for dispensing drying paper; 10
 - a roll (14) of paper, whose sliding is operated by a motor; 15
 - the control block (2) being provided with keys (2a), for determining the washing program and the relating times, as well as the temperature and the quantity of dispensed water; said control block operating said boiler thermostat (25), the electrovalves (26, 27), said motor of the sliding paper, said pumps for the detergent (18) and a possible pump for the disinfectant, said luminous indicators (6). 20
2. A device according to claim 1, characterized in that it comprises also a second container (16) for the liquid disinfectant, connected to the spout (3) by means of a duct (19) provided with a pump (20). 25
 3. A device according to claim 1 or 2, characterized in that it also comprises a container (13) for collecting the paper used for drying, provided with an opening (10) closed by a swing door (11). 30
 4. A device according to any one of the previous claims, characterized in that it also comprises a washing tank (7) provided with a drain (8). 35
 5. An automatic process for cleaning the hands, characterized in that it comprises the following phases: 40
 - setting the characteristic parameters of the process on a control block (2) by means of keys (2a): the quantity of detergent dispensed, the waiting or "contact" time, the quantity of water delivered, the temperature of the rinsing water, the duration of the rinsing operations, the length of the paper dispensed; 45
 - automatic starting of the process, as a result of the hands being brought near to the delivery spout (3), signalled by a pair of photoelectric cells (5); 50
 - dispensing of a preset quantity of detergent through the spout (3), connected to the detergent container (15) by means of a duct (17), and obtained by means of the operation of a pump (18); 55
- delivery of first rinsing water at the preselected temperature through the spout (3), connected by a pipe (24) to the boiler (21), connected in its turn to a feed pipe (23), the said delivery being obtained by means of the opening of the solenoid valves (26, 27) for predetermined periods of time;
 - dispensing of the desired quantity of drying paper, obtained by means of the operation of a motor which causes the rotation of the axis of a roll (14) of paper;
 - re-initialization of the device, signalled by the switching on of an indicator (6).
6. A process according to claim 5, characterized in that it also comprises the phases of:
 - setting the quantity of disinfectant dispensed on the control block (2);
 - dispensing the set quantity of disinfectant after the delivery of the first rinsing water, through the spout (3), connected by means of a duct (19) to the disinfectant container (16), obtained by means of the operation of a pump (20);
 - subsequent delivery of second rinsing water at the preselected temperature through the delivery spout (3), connected by means of a pipe (24) to the boiler (21), connected in its turn to a feed pipe (23), the said delivery being obtained by means of the opening of the solenoid valves (26, 27) for predetermined periods of time.
 7. A process according to claim 5 or 6, characterized in that the carrying out of all the working phases or part of the working phases is signalled on the display (4).
 8. A process according to any one of the claims from 5 to 7, characterized in that it provides for the visualization of the total and partial number of washing cycles carried out, obtained by means of the display (4).
 9. A process according to any one of the claims from 5 to 8, characterized in that it foresees the indication of the depletion of the stocks of expendable materials, obtained by means of the indicators (6).
 10. A process of periodic self-disinfecting of a device for cleaning the hands according to any one of the claims from 5 to 9, characterized in that it comprises the following phases:
 - programming the periods of the self-disinfection process and the opening times

of the solenoid valves (26, 27) carried out by means of the control block (2);

- automatic starting of the boiler (21), at the preselected moment, followed by the opening of the solenoid valve (26) for a determined time, followed by the heating of the water up to a suitable temperature;
- the opening of the solenoid valve (27) for a determined time and the outlet of the heated water from the spout (3).

11. A process according to claim 10, characterized in that the water is heated up to a temperature of 80-90 °C.

Patentansprüche

1. Automatische Handreinigungsvorrichtung, umfassend:

- einen Ausgabe-Stutzen (3);
- einen Behälter (15) für ein Reinigungsmittel, verbunden mit dem Stutzen (3) über eine Leitung (17), ausgerüstet mit einer Pumpe (18);
- einen Heisswasserspeicher (21), versehen mit Temperaturregler (25), verbunden mit Rohrleitungen (23, 24) für die Versorgung und den Abfluss des Wassers, eine jede ausgerüstet mit einem Solenoid-Ventil (26, 27), wobei die Rohrleitung (24) für die Abfluss des Wassers mit dem Stutzen (3) verbunden ist; dadurch gekennzeichnet, dass diese weiterhin umfasst:
- einen Steuerblock (2);
- ein Paar fotoelektrische Zellen (5) zum Anzeigen der Hände des Benutzers unterhalb des Stutzens (3) und folglich Aktivierung des Steuerblocks (2);
- leuchtende Anzeigervorrichtungen (6) zur Prüfung des ordnungsgemässen Arbeitens der Vorrichtung und das Anzeigen dass eines oder mehrere der Materialien (Reinigungsmittel, Desinfektionsmittel) eine Nachfüllung erfordern;
- eine Öffnung (12) für die Ausgabe vom Papierhandtücher;
- eine Papierrolle (14), deren Verschiebung durch einen Motor erfolgt;
- wobei der Steuerblock (2) mit Tasten (2a) versehen ist, für das Einstellen des Waschprogramms und der diesbezüglichen Zeiten, so wie der Temperatur und der Menge des abgegebenen Wassers; welcher Steuerblock den Heisswasserspeicher (25) betätigt, die Elektroventile (26, 27), den Motor für das Verschieben des Papiers, die Pumpen für das Reini-

gungsmittel und eine mögliche Pumpe für das Desinfektionsmittel und das leuchtende Anzeigegerät (6).

2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, dass diese ausserdem einen Behälter (16) für das flüssige Desinfektionsmittel aufweist, der über eine Leitung (19), versehen mit einer Pumpe (20) mit dem Stutzen verbunden ist.

3. Vorrichtung nach einem der Ansprüche 1 oder 2, dadurch gekennzeichnet, dass diese ausserdem einen Behälter (13) aufweist, zur Aufnahme des zum Trocknen verwendeten Papiers, versehen mit einer durch eine Flügeltür (11) verschlossene Öffnung (10).

4. Vorrichtung nach einem der vorausgehenden Ansprüche, dadurch gekennzeichnet dass diese ausserdem ein Waschbecken (7) mit einem Abfluss (8) besitzt.

5. Automatisches Verfahren zur Handreinigung, dadurch gekennzeichnet, dass dieses folgende Stufen umfasst:

- Festlegung, auf einen Steuerblock (2) der Kenndaten des Verganges mit Hilfe vom Drucktasten (2a): Menge des abgegebenen Reinigungsmittels, Warte- oder "Kontakt"-Zeit, Menge des abgegebenen Wassers, Temperatur der Spülwassers, Dauer der Spülvorganges, Länge des abgegebenen Papiers;
- automatischer Anlauf des Verfahrens, infolge der nahe bis an dem Ausgabe-Stutzen (3) gebrachten Hände, angekündigt durch ein Fotozellenpaar (5);
- Ausgabe einer vorgegebenen Menge Reinigungsmittel durch den Stutzen (3), mit dem Reinigungsbehälter (15) über eine Leitung (17) verbunden, erzielt durch das Ansprechen einer Pumpe (18);
- Ausgabe von erstem Spülwasser vorgegebener Temperatur durch den Stutzen (3), verbunden über ein Rohr (24) mit dem Heisswasserspeicher (21), der seinerseits mit einem Beschickungsrohr verbunden ist, wobei diese Ausgabe infolge Öffnung des Solenoid-Ventils (26, 27), während vorgegebenen Zeitspannen, erfolgt;
- Ausgabe der gewünschten Menge Trocknungspapier, erhalten durch Inbetriebsetzung eines Motors der die Welle einer Papierrolle (14) in Drehung versetzt,
- Inbetriebsetzung der Vorrichtung, signalisiert durch das Einschalten einer Anzei-

gevorrichtung (6).

6. Verfahren nach Anspruch 5, dadurch gekennzeichnet, dass dieses ausserdem folgende Stufen umfasst:

- Festlegen, durch den Steuerblock (2), der ausgegebenen Menge Desinfektionsmittel;
- Ausgabe der festgelegten Menge Desinfektionsmittel nach Ausgabe von erstem Spülwasser durch den Stutzen (3), verbunden über eine Leitung (11) mit dem Behälter (16) für das Desinfektionsmittel, erzielt durch die Betätigung einer Pumpe (20);
- Anschliessende Ausgabe von zweitem Spülwasser vorgegebener Temperatur durch den Stutzen (3), verbunden über ein Rohr (24) mit dem Heisswasserspeicher (21), seinerseits verbunden mit einem Förderrohr (23), wobei die Ausgabe durch Öffnen der Solenoid-Ventile (26, 27) während vorgegebener Zeitspannen, erzielt wird.

7. Verfahren nach Anspruch 5 oder 6, dadurch gekennzeichnet, dass das Ausführen dieser Arbeitsstufen oder ein Teil der Arbeitsstufen vorteilhaft auf dem Bildschirm (4) aufgezeigt wird.

8. Verfahren nach einem der Ansprüche 5 bis 7, dadurch gekennzeichnet, dass dieses die Sichtbarmachung der totalen oder teilweisen Anzahl ausgeführten Waschzyklen vorsieht, erzielt durch das Bildgerät (4).

9. Verfahren nach einem der Ansprüche 5 bis 8, dadurch gekennzeichnet, dass die Angabe der erschöpften Vorräte der Verbrauchs-Materialien vorgesehen ist, erzielt durch Anzeigegeräte (6).

10. Verfahren für periodische Selbst-Desinfizierung einer Handreinigungsvorrichtung nach einem der Ansprüche 5 bis 9, dadurch gekennzeichnet, dass dieses folgende Stufen umfasst:

- Programmierung der Perioden des Selbst-Desinfizierungsprozesses und die Öffnungszeiten der Solenoid-Ventile (26, 27), ausgeführt durch den Steuerblock (2);
- automatisches Anspringen des Heisswasserspeichers (21) bei der vorgegebenen Zeit, gefolgt durch die Öffnung des Solenoid-Ventils (26) während einer bestimmten Zeit, gefolgt durch die Erwärmung des Wassers bis zu der erforderlichen Temperatur;

- Öffnen des Solenoid-Ventils (27) während einer vorgegebenen Zeit und Ausgabe des erwärmten Wassers durch den Stutzen (3).

11. Verfahren nach Anspruch 10, dadurch gekennzeichnet, dass das Wasser bis auf eine Temperatur von 80 bis 90 ° C erwärmt wird.

Revendications

1. Appareil automatique pour le nettoyage des mains, comprenant:

- un bec diffuseur (3);
- un récipient (15) pour un détergent placé sur le bec (3) au moyen d'une tuyauterie (17) et muni d'une pompe (18);
- une chaudière (21) avec thermostat (25) raccordée à des tubes (23, 24) pour l'alimentation et la sortie de l'eau, chacun pourvu d'une électro-valve (26, 27), le tube (24) de sortie de l'eau étant raccordé au bec (3); caractérisé par le fait de comprendre également:
- un bloc de commandes (2);
- une paire de cellules photo-électriques (5) pour détecter la présence des mains de l'utilisateur sous le bec (3) et activer conséquemment le bloc des commandes (2);
- des voyants lumineux (6) pour détecter le fonctionnement du dispositif et pour signaler la nécessité d'ajouter un ou plusieurs produits (détergent, désinfectant);
- une fissure (12) pour la distribution du papier pour l'essuyage;
- un rouleau de papier (14) dont l'avancement est actionné par un moteur;
- le bloc de commandes (2), étant pourvu de touches (2a) pour l'entrée d'un programme de lavage et de sa durée, de la température et de la quantité d'eau distribuée; ce bloc de commandes pilotant ce thermostat de la chaudière (25), les électro-valves (26, 27), ce moteur d'avancement du papier, ces pompes du détergent (18) et éventuellement une pompe pour le désinfectant, ces voyants lumineux (6).

2. Appareil suivant la revendication 1, caractérisé par le fait qu'il comprend également un deuxième récipient (16) pour le liquide désinfectant, raccordé par une tuyauterie (19) avec une pompe (20) sur le bec (3).

3. Appareil suivant la revendication 1 ou 2, caractérisé par le fait de comprendre également un

- conteneur (13) pour recueillir le papier utilisé pour le séchage, pourvu d'une ouverture (10) fermée par une contre-porte (11).
4. Appareil suivant l'une quelconque des revendications précédentes, caractérisé par le fait de comprendre également une cuve (7) de lavage, pourvue de drainage (8). 5
5. Procédé automatique pour le nettoyage des mains caractérisé par le fait de comprendre les phases suivantes: 10
- entrée sur un bloc de commandes (2) au moyen de touches (2a) des paramètres caractéristiques du procédé: quantité de détergent distribuée, temps d'attente ou "de contact", quantité d'eau distribuée, température de l'eau de rinçage, durée des opérations de rinçage, longueur du papier distribué; 15
 - démarrage automatique du procédé suite à l'approche des mains sous le bec (3) diffuseur, signalé par une paire de cellules photoélectriques (5); 20
 - distribution d'une quantité prévue de détergent au moyen du bec (3) raccordé par un tuyau (17) au récipient (15) du détergent, obtenue par l'actionnement d'une pompe (18); 25
 - distribution de l'eau de premier rinçage à la température choisie par le bec (3), raccordé par un tube (24) à la chaudière (21), à son tour raccordée par un tube (23) d'alimentation, cette distribution étant obtenue par l'ouverture des électrovalves (26, 27) pendant un laps de temps prédéterminé; 30
 - distribution de la quantité de papier de séchage désiré, obtenue par actionnement d'un moteur qui commande la rotation de l'axe d'un rouleau (14) de papier; 35
 - nouvelle initialisation du dispositif, signalée par l'allumage d'un voyant (6). 40
6. Procédé suivant la revendication 5, caractérisé par le fait de comprendre également les phases de: 45
- entrée sur le bloc de commandes (2) de la quantité de désinfectant distribuée; 50
 - distribution de la quantité prévue de désinfectant après la distribution d'eau de premier rinçage, au moyen du bec (3), raccordé par une tuyauterie (19) au récipient (16) du désinfectant, au moyen de l'actionnement d'une pompe (20); 55
 - distribution d'eau de deuxième rinçage, à la température choisie par le bec (3), raccordé par un tube (24) à la chaudière
- (21), à son tour raccordé par un tube (23) d'alimentation, cette distribution étant obtenue par l'ouverture des électrovalves (26, 27) pendant un laps de temps fixé au préalable.
7. Procédé suivant la revendication 5 ou 6, caractérisé par le fait que le déroulement de toutes, ou de certaines parties des phases opératives est opportunément signalé sur le display (4).
8. Procédé suivant l'une quelconque des revendications de 5 à 7, caractérisé par le fait de prévoir la visualisation du nombre total et partiel des cycles de lavage effectués, obtenue au moyen du display (4).
9. Procédé suivant l'une quelconque des revendications de 5 à 8, caractérisé par le fait de prévoir l'indication de l'épuisement des stocks des produits de consommation, obtenue par les voyants (6).
10. Procédé d'auto-désinfection périodique d'un appareil pour le nettoyage des mains suivant l'une quelconque des revendications de 5 à 9, caractérisé par le fait de comprendre les phases suivantes:
- programmation des périodes du procédé d'auto-désinfection et des temps d'ouverture des électrovalves (26, 27) effectuée au moyen du bloc de commandes (2);
 - allumage automatique de la chaudière (21) à l'instant choisi, suivi par l'ouverture de l'électrovalve (26) pendant un laps de temps déterminé, et le chauffage de l'eau jusqu'à la température opportune;
 - ouverture de l'électrovalve (27) pendant un laps de temps déterminé et distribution de l'eau chaude par le bec (3).
11. Procédé suivant la revendication 10, caractérisé par le fait que l'eau est chauffée jusqu'à une température atteignant 80-90 ° C.

FIG. 1b

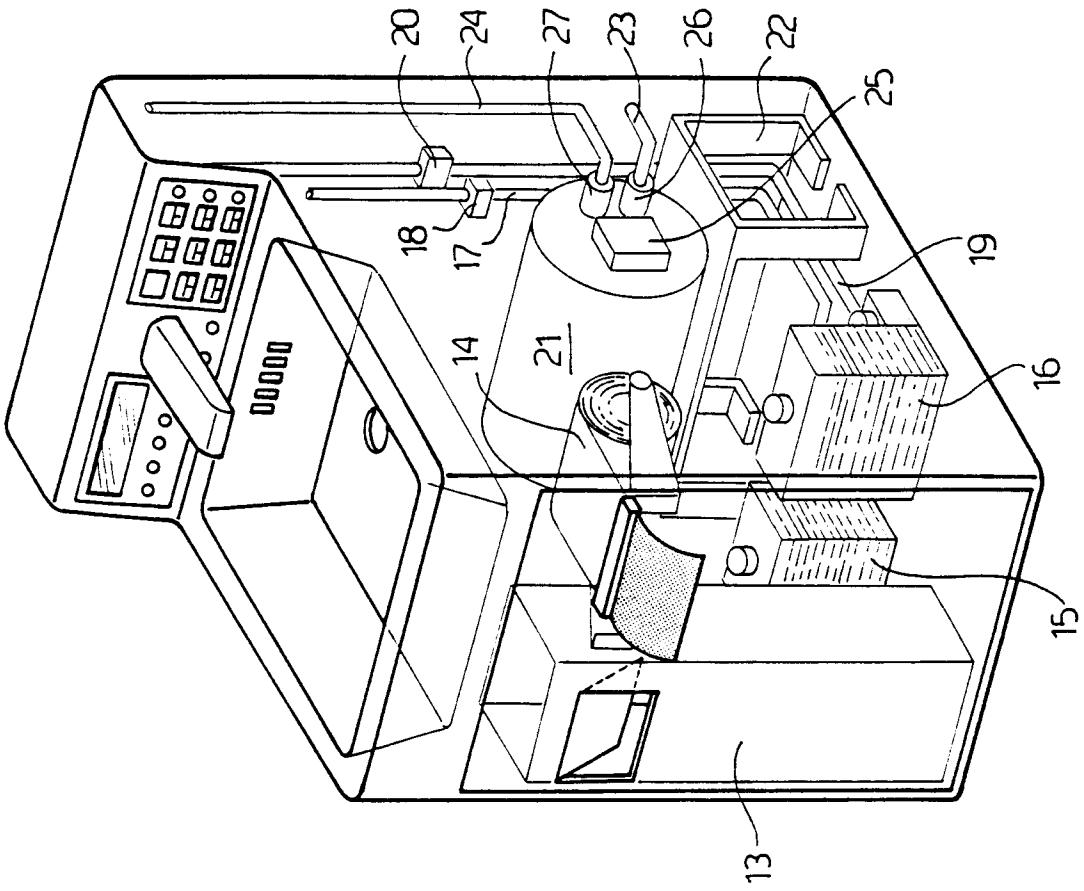


FIG. 1a

