

(19)



(11)

EP 2 241 235 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
09.11.2016 Bulletin 2016/45

(51) Int Cl.:
A47K 13/30 (2006.01)

(21) Application number: **09012279.7**

(22) Date of filing: **28.09.2009**

(54) **Automatic toilet cleaning device**

Automatische Toilettenreinigungsvorrichtung

Dispositif de nettoyage automatique de toilettes

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL
PT RO SE SI SK SM TR**

(30) Priority: **14.04.2009 TW 98112281**

(43) Date of publication of application:
20.10.2010 Bulletin 2010/42

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Description

BACKGROUND OF THE INVENTION

a) Field of the Invention

[0001] The present invention relates to an automatic toilet cleaning device, and more particularly to a device which is able to wash clean a toilet seat plate 20 and the toilet automatically.

b) Description of the Prior Art

[0002] An ordinary toilet structure is composed of a toilet body and a toilet seat, wherein the toilet body is provided with a bowl and a water tank which spouts water to the bowl. Under an ideal condition of use, dirt in the bowl can be flushed out through the water spouting function of the water tank to keep clean an interior of the bowl. The toilet seat, on the other hand, is provided above the bowl and includes a toilet lid and a seat plate, wherein a user can sit on the bowl by the seat plate when he or she uses the toilet and the toilet lid can be covered on the bowl when the toilet is not used, to keep a toilet room clean and pretty.

[0003] However, the toilet seat plate or peripheries of the bowl can be usually stained by splashing or an inappropriate use when the toilet is used. This condition occurs particularly easily in a public place and toilets in the public place can not only get dirty easily but easily become a propagation platform of germs. As a result, many people will carry a great psychological pressure when using the toilets in the public place or will be even forced to use the toilets by squatting or with a gesture like playing an acrobatics, with a purpose of reducing a chance of directly contacting the toilets and ambient environment thereof.

[0004] On the other hand, it will become a rather annoying issue when one is forced to lift the toilet lid or the seat plate first before using the toilet in the public place. Accordingly, a toilet seat which can automatically wash clean the seat plate and the toilet is developed by the present inventor, allowing the toilet to be used cleaner, more hygienically, conveniently and comfortably.

SUMMARY OF THE INVENTION

[0005] The primary object of the present invention is to provide an automatic toilet cleaning device to solve the issue that the user needs to lift the toilet lid and the seat plate manually and to keep the toilet seat plate clean at any time.

[0006] To achieve the aforementioned object, the automatic toilet cleaning device of the present invention includes a seat plate which is pivoted at an upper rim of a bowl, a toilet lid which is pivoted and covered at the upper rim of the bowl to cover the seat plate, a toilet lid open-close unit which is connected to the toilet lid to control

an open-close state of the toilet lid, a seat plate cleaning unit which is provided on the toilet lid, and a control unit which is provided close to the bowl. When implementing, the toilet seat is further provided with a flushing unit which is disposed at the upper rim of the bowl to clean skin between buttocks of the user, an operating interface of the flushing unit being integrated on the aforementioned control unit. The said toilet lid open-close unit is provided with a water feed end to fetch a water source, an air port end to connect a pneumatic device, and a cleaning head which is connected to the aforementioned water feed end and the air port end and unlike the closest known prior art, document EP1946691 A1 disclosing an automatic toilet cleaning device according to the preamble of claim 1 is adapted to move to encircle along an outline of the seat plate. The control unit is provided with at least one infrared inductive switch. When the infrared inductive switch detects that the user is approaching, the control unit will activate the toilet lid open-close unit to open the toilet lid automatically. Whereas, when the infrared inductive switch detects that the user has left, the control unit will drive the toilet lid to be closed and activate the seat plate cleaning unit after the toilet lid has been closed, allowing the cleaning head to move over the toilet seat plate sweeping a path encircling the toilet bowl to spray the seat plate, followed by enabling the cleaning head to move over the toilet seat plate sweeping the path encircling the seat plate, thereby achieving the object of automatically cleaning and air drying the seat plate.

[0007] The said toilet lid open-close unit includes a first motor gear assembly to drive the toilet lid pivoting. The seat plate cleaning unit includes a guiding rail which surrounds a lower rim of the toilet lid, a concealed conduit which is buried in the toilet lid to connect the water feed end and the air port end, a rotation connector which is connected with the concealed conduit, an open conduit which is connected with the rotation connector and is exposed at the lower rim of the toilet lid, an extension tube which is inserted at an end of the open conduit to mount the cleaning head at a tail end, a spring which is sheathed at an exterior of the extension tube, a pulley unit which is provided at a tail end of the cleaning head to fit with the guiding rail, and a second motor gear assembly which is buried in the toilet lid to drive the open conduit rotating and is electrically connected to the aforementioned control unit. When the second motor gear assembly drives the open conduit rotating, through guiding of the guiding rail and extension of the spring, an extension length of the extension tube can be changed following a change of span of the guiding rail.

[0008] Another object of the present invention is to provide the automatic toilet cleaning device, wherein a second cleaning head is provided and is pivoted at a side end of the cleaning head, such that the second cleaning head can swing and pivot relative to the cleaning head and wash simultaneously inner peripheries of the bowl along with a displacement of the cleaning head, thereby flushing clean the inner peripheries of the bowl where

dirt is easily accumulated.

[0009] At a same time when the cleaning head is carrying out the cleaning operation, the second cleaning head is suspended along with natural down-swing of the cleaning head. The second cleaning head is provided with a second linear water injection nozzle which injects cleaning water to flush the inner peripheries of the bowl simultaneously. Furthermore, the cleaning head is provided with a bypass assembly which is connected between a water injection chamber and the second cleaning head, allowing the water injection chamber to supply water to the second cleaning head. Besides, the cleaning head is disposed with a movement stop button to restrict a down-swing angle of the second cleaning head. The movement stop button is pushed by a hydraulic pressure to be protruded, thereby restricting the down-swing angle of the second cleaning head.

[0010] In comparison to the prior art, the present invention is at least provided with following features and advantages:

1. The infrared induction technology is used to detect the approaching user, allowing the toilet lid to be opened automatically. This can solve the annoying problem of the • conventional toilet that the toilet lid has to be lifted manually by the user.
2. The infrared induction technology is used to detect that the user has left, allowing the toilet lid to be closed automatically and automatically activating the seat plate cleaning unit, such that the seat plate can be cleaned in time after each use, thereby solving the problem that the seat plate and the bowl can get dirty easily.
3. The toilet lid can cover the upper rim of the bowl and completely cover the seat plate, preventing the cleaning water from sliding off an outer rim of the toilet and splashing and allowing the seat plate to be blown dry or sucked dry quickly when the pneumatic device blows or sucks air, thereby quickly accomplishing cleaning the seat plate and the upper rim of the bowl.

[0011] Besides, a rear side of an inner rim of the bowl can be provided with an odor discharge orifice which can be connected externally to a ventilation system of a building or an open outdoor space, thereby improving comfortableness in using the toilet.

[0012] To enable a further understanding of the said objectives and the technological methods of the invention herein, the brief description of the drawings below is followed by the detailed description of the preferred embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013]

FIG. 1 shows a three-dimensional perspective view

of a first embodiment of the present invention.

FIG. 2 shows a top view of a first embodiment of the present invention.

FIG. 3 shows a schematic view of a position where a seat plate cleaning unit is provided, according to a first embodiment of the present invention.

FIG. 4 shows a three-dimensional perspective view of a seat plate cleaning unit, according to a first embodiment of the present invention.

FIG. 5 shows a top view of a seat plate cleaning unit, according to a first embodiment of the present invention.

FIG. 6 shows a local cutaway view of a first embodiment of the present invention.

FIG. 7 shows a schematic view of an encircling operation of a seat plate cleaning unit, according to a first embodiment of the present invention.

FIG. 8 shows a schematic view of a bowl which is provided with an odor discharge orifice, according to a first embodiment of the present invention.

FIG. 9 shows a schematic view of a seat plate cleaning unit of a second embodiment of the present invention.

FIG. 10 shows a cutaway view of a cleaning head of a second embodiment of the present invention.

FIG. 11 shows a schematic view of a cleaning head of a third embodiment of the present invention.

FIG. 12 shows a schematic view of a cleaning head, which is not operating, of a third embodiment of the present invention.

FIG. 13 shows a schematic view of an operation of a cleaning head of a third embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0014] Referring to FIG. 1 and FIG. 2, it shows a three-dimensional perspective view and a top view of a first embodiment of the present invention. As shown in the drawings, a toilet seat is provided above a toilet body 10 and comprises a seat plate 20, a toilet lid 30, a toilet lid open-close unit 40, a seat plate cleaning unit 50, a control unit 60 and a flushing unit 70. The toilet body 10 is provided with a bowl 11 and a water tank 12 which supplies water to the bowl 11.

[0015] The seat plate 20 is pivoted at an upper rim of the bowl 11, and the toilet lid 30 is pivoted at the upper rim of the bowl 11 to completely cover the seat plate 20 when covering.

[0016] The toilet lid open-close unit 40 is connected to the toilet lid 30 to control an open-close state of the toilet lid 30. The toilet open-close unit 40 includes a hollow pivot 41 which is connected to the toilet lid 30, at least one set of first motor gear assembly 42 which is connected to the hollow pivot 41 to drive the toilet lid 30 pivoting.

[0017] The seat plate cleaning unit 50 is provided on the toilet lid 30 and is provided with a water feed end 51

(co-constructed with the aforementioned hollow pivot 41) to fetch a water source, an air port end 52 (co-constructed with the aforementioned hollow pivot 41) to connect a pneumatic device, and a cleaning head 53 which is connected to the aforementioned water feed end 51 and the air port end 52 to encircle along an outline of the seat plate 20. The cleaning head 53 is provided with at least one linear opening 531 corresponding to the seat plate 20 and two linear openings 531 are provided in the drawings for description.

[0018] The control unit 60 is provided close to the bowl 11 and is provided with at least one infrared inductive switch. A solenoid valve which controls water supply of the water feed end 51 and the pneumatic device which feeds and discharges air at the air port end 52 are connected at the control unit 60.

[0019] When the infrared inductive switch detects that a user is approaching, the control unit 60 will activate the toilet lid open-close unit 40 to open the toilet lid 30 automatically; whereas, when the infrared inductive switch detects that the user has left, the control unit 60 will activate the toilet lid open-close unit 40 to close the toilet lid 30 and activate the seat plate cleaning unit 50 after the toilet lid 30 has been closed, allowing the cleaning head 53 to encircle and spray the seat plate 20, followed by enabling the cleaning head 53 to move over the toilet seat plate 20 sweeping a path encircling the toilet bowl 11 and air dry the seat plate 20 (blowing or sucking air), thereby achieving the object of automatically cleaning the seat plate 20. In addition, a spout operation of the water tank 12 is controlled by a solenoid valve which is electrically connected with the control unit 60, allowing the water tank 12 to spout water automatically when the infrared inductive switch detects that the user has left.

[0020] The flushing unit 70 is provided at the upper rim of the bowl 11 to clean skin between buttocks of the user. An operating interface of the flushing unit 70 is integrated on the aforementioned control unit 60, facilitating the user to operate and control.

[0021] Referring to FIGS. 3 to 5, it shows a schematic view of a position where a seat plate cleaning unit is provided, a three-dimensional perspective view of a seat plate cleaning unit and a top view of a seat plate cleaning unit, according to a first embodiment of the present invention. The detail structure of the seat plate cleaning unit 50 disclosed in the drawings further includes a guiding rail 54 which surrounds at a lower rim of the toilet lid 30, a concealed conduit 55 which is buried in the toilet lid 30 to connect the water feed end 51 and the air port end 52, a rotation connector 56 which is connected with the concealed conduit 55, an open conduit 57 which is connected at the rotation connector 56 and is exposed at the lower rim of the toilet lid 30, an extension tube 571 which is inserted at an end of the open conduit 57 to mount the cleaning head 53 at a tail end, a spring 572 which is sheathed at an exterior of the extension tube 571, a pulley unit 58 which is provided at a tail end of the cleaning head 53 to fit with the guiding rail 54, and a

second motor gear assembly 59 which is buried in the toilet lid 30 to drive the open conduit 57 rotating. The second motor gear assembly 59 is electrically connected at the aforementioned control unit 60 and is provided with at least a motor 591, a worm shaft 592 and a transmission gear 593; whereas the pulley unit 58 disclosed in the present embodiment is constituted by plural pulleys.

[0022] Referring to FIG. 6, it shows a local cutaway view of a first embodiment of the present invention. When the toilet lid 30 is covered at the upper rim of the bowl 11, the entire upper rim of the bowl 11 will be shielded and the entire seat plate 20 will be covered completely. Therefore, when water is sprayed, air is blown or sucked at the linear opening 531 at a bottom end of the cleaning head 53, cleaning water can be prevented from leaking out of the toilet.

[0023] Referring to FIG. 7, it shows a schematic view of an encircling operation of a seat plate cleaning unit, according to a first embodiment of the present invention. When the second motor gear assembly 59 drives the open conduit 57 rotating, an extension length of the extension tube 571 can be changed through guiding of the guiding rail 54 and an extension function of the spring 572, following a change of span of the guiding rail 54, allowing the cleaning head 53 to encircle along the seat plate 20 to carry out the cleaning operation.

[0024] Referring to FIG. 8, it shows a schematic view of a bowl which is provided with an odor discharge orifice, according to a first embodiment of the present invention. As it is inevitable to result in unbearable odor when using the toilet, upon implementing the present invention, a rear side of an inner rim of the bowl 11 can be provided with an odor discharge orifice 13, a rear end of which can be connected externally to a ventilation system of a building or an open outdoor space wherein a natural chimney effect or a means of installing a powerless windmill can be employed to improve the discharge effect.

[0025] Referring to FIG. 9 and FIG. 10, it shows a schematic view of a seat plate cleaning unit and a cutaway view of a cleaning head, according to a second embodiment of the present invention. The second embodiment provides a technological means by which water supply and sucking dry can be conducted simultaneously. The difference of the seat plate cleaning unit 50 disclosed by the present embodiment from that disclosed by the first embodiment lies in that an interior of the concealed conduit 55 is transfixes with an inner concealed conduit 55a, wherein the inner concealed conduit 55a is connected with the water feed end 51 and a holding space formed between peripheries of the inner concealed conduit 55a and an inner wall of the concealed conduit 55 is connected with the air port end 52.

[0026] The open conduit 57 and the extension tube 571 are connected with the aforementioned inner concealed conduit 55a, allowing cleaning water to flow through. Exterior sides of the open conduit 57, the extension tube 571 and the spring 572 are sheathed with an extensible outer open conduit 57a and a holding space

formed between the outer open conduit 57a and the open conduit 57, the extension tube 571 and the spring 572 is connected with the concealed conduit 55, allowing high pressure gas to flow through.

[0027] As shown in FIG. 10, the cleaning head 53 of the second embodiment of the present invention includes a water injection chamber 53a which is connected with the extension tube 571 and two air suction chambers 53b which are provided respectively at two sides of the water injection chamber 53a to connect the outer open conduit 57a.

[0028] A bottom end of the water injection chamber 53a is provided with at least one linear water injection nozzle 531 a toward the seat plate 20 (two nozzles in the drawing), and there are at least one linear air suction port 531 b respectively at bottom ends of air suction chambers 53b at two sides, toward the seat plate 20. An aperture of the linear water injection nozzle 531 a is smaller than that of the linear air suction port 531 b and a proper spray distance is kept between the linear water injection nozzle 531 a and the seat plate 20; whereas, the linear air suction port 531 b keeps at a closer distance to the seat plate 20.

[0029] When performing the cleaning operation, the linear water injection nozzle 531 a will inject water to the seat plate 20 for cleaning. At this time, the linear air suction ports 531b at two sides can suck air simultaneously, thereby sucking dry the cleaning water at a same time. Thus, the seat plate 20 and the peripheries of the seat plate 20 can manifest a dry configuration after cleaning, and the cleaning water will not be easily sprayed onto the seat plate 20.

[0030] Referring to FIGS. 11 to 13, it shows a schematic view of a cleaning head, a schematic view of a cleaning head which is not operating and a schematic view of an operation of a cleaning head, according to a third embodiment of the present invention. The cleaning head of the present embodiment is an altered implementation derived from the second embodiment. A rear end of the cleaning head 53 is extended with a shelter 532 to shield the spring 572 and a side end of the cleaning head 53 is pivoted with a second cleaning head 533 which can swing and pivot relative to the cleaning head 53. In addition, the cleaning head 53 is provided with a bypass assembly 534 which is connected between the water injection chamber 53a and the second cleaning head 533, allowing the water injection chamber 53a to supply water to the second cleaning head 533. The second cleaning head 533 is provided with a second linear water injection nozzle 533a, and the pulley unit 58 described in the present embodiment is formed by a single pulley.

[0031] At a same time when the cleaning head 53 swings downward to a horizontal state to perform the cleaning operation, the second cleaning head 533 will swing downward naturally to manifest a suspension state. At this time, the cleaning water that is injected from the second linear water injection nozzle 533a can result in a wider cleaning angle and wash simultaneously the peripheries of the inner side of the bowl 11, along with the

displacement of the cleaning head 53. Therefore, the locations of the inner peripheries of the bowl 11, close to an upper side where dirt is easily accumulated, can be flushed clean.

[0032] On the other hand, the cleaning head 53 is provided with a movement stop button 535 which is used to restrict a down-swing angle of the second cleaning head 533. The movement stop button 535 penetrates the cleaning head 53 and enters into the water injection chamber 53a. When a water flow is filled into the water injection chamber 53a, the movement stop button 533 can be pushed by a hydraulic pressure to be protruded, thereby restricting the down-swing angle of the second cleaning head 533.

[0033] Accordingly, when the user approaches the toilet, the toilet lid 30 will be opened automatically and the odor generated when the toilet is being used will be removed immediately from the odor discharge orifice 13. On the other hand, when the user leaves, the toilet lid 30 will be closed automatically and the seat plate 20 will be washed clean and air dried immediately by the seat plate cleaning unit 50. As a result, the comfortableness in using the toilet is improved significantly, allowing the toilet to be used cleaner and more hygienically.

[0034] It is of course to be understood that the embodiments described herein is merely illustrative of the principles of the invention and that a wide variety of modifications thereto may be effected by persons skilled in the art without departing from the scope of the invention as set forth in the following claims.

Claims

1. An automatic toilet cleaning device being provided above a toilet body (10) which includes a bowl (11) and a water tank (12) to supply water to the bowl (11), the said toilet comprising: a seat plate (20) which is pivoted at an upper rim of the bowl (11); a toilet lid (30) which is pivoted at and covered on the upper rim of the bowl (11) to cover the seat plate (20); a toilet lid open-close unit (40) which is connected to the toilet lid (30) to control an open-close state of the toilet lid (30); a seat plate cleaning unit (50) which is provided on the toilet lid (30) and is provided with a water feed end (51) to fetch a water source, an air port end (52) to connect a pneumatic device and a cleaning head (53) being connected to the water feed end (51) and the air port end (52) to encircle along an outline of the seat plate (20); and a control unit (60) which is provided close to the bowl (11), activating the seat plate cleaning unit (50) after the toilet lid (30) has been closed, characterized in that when activated by the control unit (60) the cleaning head (53) is configured to move over the toilet seat plate (20) sweeping a path encircling the toilet bowl (11) to spray the seat plate (20) followed by the cleaning head (53) moving over the toilet seat plate

- (20) sweeping the path encircling the seat plate (20) thereby achieving an object of automatically cleaning and air drying the seat plate (20).
2. The automatic toilet cleaning device according to claim 1, wherein the cleaning head (53) is provided with at least one linear opening (531).
 3. The automatic toilet cleaning device according to claim 1, wherein the control unit (60) further includes an infrared inductive switch; when the infrared inductive switch detects that a user is approaching, the control unit (60) activating the toilet lid open-close unit (40) to open the toilet lid (30) automatically, whereas, when the infrared inductive switch detects that the user has left, the control unit (60) activating the toilet lid open-close unit (40) to close the toilet lid (30) automatically.
 4. The automatic toilet cleaning device according to claim 1, further including a flushing unit (70) which is provided at an upper rim of the bowl (11) to clean skin between buttocks of a user, an operating interface of the flushing unit (70) being integrated on the control unit (60).
 5. The automatic toilet cleaning device according to claim 1, wherein a rear side of an inner rim of the bowl (11) is provided with an odor discharge orifice (13).
 6. The automatic toilet cleaning device according to claim 1, wherein the toilet lid open-close unit (40) includes a first motor gear assembly (42) which is used to drive the toilet lid (30) pivoting.
 7. The automatic toilet cleaning device according to claim 1, wherein the cleaning unit (50) includes a guiding rail (54) which surrounds at a lower rim of the toilet lid (30), a concealed conduit (55) which is buried in the toilet lid (30) to connect the water feed end (51) and the air port end (52), a rotation connector (56) which is connected with the concealed conduit (55), an open conduit (57) which is connected at the rotation connector (56) and is exposed at the lower rim of the toilet lid (30), an extension tube (571) which is inserted at an end of the open conduit (57) to mount the cleaning head (53) at a tail end, a spring (572) which is sheathed at an exterior of the extension tube (571), a pulley unit (58) which is provided at a tail end of the cleaning head (53) to fit with the guiding rail (54), and a second motor gear assembly (59) which is buried in the toilet lid (30) to drive the open conduit (57) rotating, the second motor gear assembly (59) being electrically connected to the control unit (60).
 8. The automatic toilet cleaning device according to claim 1, wherein the pneumatic device sucks air at the air port end (52).
 9. The automatic toilet cleaning device according to claim 1, wherein the pneumatic device blows air at the air port end (52).
 10. The automatic toilet cleaning device according to claim 1, wherein a water sprout operation of the water tank (12) is controlled by a solenoid valve which is electrically connected with the control unit (60) and enables the water tank (12) to automatically spout water when the infrared inductive switch detects that a user has left.
 11. The automatic toilet cleaning device according to claim 1, to wherein the cleaning unit (50) includes a guiding rail (54) which surrounds at a lower rim of the toilet lid (30); a concealed conduit (55) which is buried in the toilet lid (30) to connect the air port end (52); an inner concealed conduit (55a) which is provided in the concealed conduit (55) to connect with the water feed end (51); a rotation connector (56) which is connected with the 'concealed conduit (55); an open conduit (57) which is connected with the rotation connector (56) to connect the inner concealed conduit (55a); an extension tube (571) which is inserted at an end of the open conduit (57) to mount the cleaning head (53) at a tail end; a spring (572) which is sheathed at an exterior of the extension tube (571); an extensible outer open conduit (57a) which is sheathed at exterior sides of the open conduit (57), the extension tube (571) and the spring (572); a pulley unit (58) which is provided at a tail end of the cleaning head (53) to fit with the guiding rail (54); and a second motor gear assembly (59) which is buried in the toilet lid (30) to drive the open conduit (57) rotating, the second motor gear assembly (59) being electrically connected with the control unit (60); the cleaning head (53) including a water injection chamber (53a) which is connected with the extension tube (571), and two air suction chambers (53b) which are provided respectively at two sides of the water injection chamber (53a) to connect the outer open conduit (57a); a bottom end of the water injection chamber (53a) being provided with at least one linear water injection nozzle (531) a toward the seat plate (20), and bottom ends of the air suction chambers (53b) at two sides being provided respectively with at least one linear air suction port (531)b toward the seat plate (20).
 12. The automatic toilet cleaning device according to claim 11, wherein a rear end of the cleaning head (53) is extended with a shelter (532) to shield the spring (572) and a side end of the cleaning head (53) is pivoted with a second cleaning head (533), allowing the second cleaning head (533) to swing and

pivot relative to the cleaning head (53); the cleaning head (53) being provided with a bypass assembly (534) which is connected between the water injection chamber (53a) and the second cleaning head (533), enabling the water injection chamber (53a) to supply water to the second cleaning head (533); the second cleaning head (533) being provided with at least one second linear water injection nozzle (533a); when the cleaning head (53) swings downward to a horizontal state to perform the cleaning operation, the second cleaning head (533) swinging downward naturally to manifest a suspension state.

13. The automatic toilet cleaning device according to claim 12, wherein the cleaning head (53) is provided with a movement stop button (535) which is used to restrict a down-swing angle of the second cleaning head (533); the movement stop button (535) penetrating the cleaning head (53) and entering into the water injection chamber (53a); when a water flow is filled into the water injection chamber (53a), the movement stop button (535) being pushed by a hydraulic pressure to be protruded, thereby restricting the down-swing angle of the second cleaning head (533).

Patentansprüche

1. Eine automatische Toilettenreinigungsvorrichtung oberhalb einer Toilettenkörper vorgesehen ist, (10), die eine Schale (11) und einen Wassertank (12) zur Versorgung von Wasser zu der Schüssel (11) umfasst, wobei die Toilette umfasst: eine Sitzplatte (20), die an einem oberen Rand der Schale (11) angelenkt ist; einen Toilettendeckel (30), die auf dem oberen Rand der Schale (11) angelenkt ist und bedeckt wird, um die Sitzplatte (20) zu bedecken; ein Toilettendeckel Öffnen-Schließen-Einheit (40), die mit dem Toilettendeckel verbunden ist (30) um einen offenen geschlossenen Zustand des Toilettendeckels (30) zu steuern; eine Sitzplattenreinigungseinheit (50), die auf dem Toilettendeckel (30) vorgesehen ist und mit einem Wasserzuführende (51) vorgesehen ist, um eine Wasserquelle zu holen, eine Luftöffnung Ende (52) um einer pneumatischen Vorrichtung zu verbinden und eine Reinigungskopf (53) mit dem Wasserzuführende (51) und der Luftöffnung Ende (52) verbunden um entlang einer Kontur der Sitzplatte (20) umzugeben; und eine Steuereinheit (60), die nahe an der Schale (11) vorgesehen ist, aktivierend der Sitzplattenreinigungseinheit (50) nach der Toilettendeckel (30) wurde geschlossen **dadurch gekennzeichnet, dass**, wenn von der Steuereinheit (60) aktiviert wird, die Reinigungskopf (53) so konfiguriert ist, über die Toilette Sitzplatte (20) fegt einen Weg rings um die Toilettenschüssel (11), um die Sitzplatte (20) zu sprühen, gefolgt von dem Reini-

gungskopf (53) bewegt über die Toilette Sitzplatte (20) fegt den Weg rings um die Sitzplatte (20), wodurch ein Zweck der automatischen Reinigung und Lufttrocknen der Sitzplatte (20) zu erreichen.

2. Die automatische Toilettenreinigungsvorrichtung nach Anspruch 1, wobei der Reinigungskopf (53) mit mindestens einer linearen Öffnung (531) vorgesehen ist.
3. Die automatische Toilettenreinigungsvorrichtung nach Anspruch 1, wobei die Steuereinheit (60) ferner einen Infrarot induktiver Schalter enthält; wenn der Infrarot-induktiver Schalter erfasst, dass ein Benutzer nähert, die Steuereinheit (60) der Toilettendeckel Öffnen-Schließen-Einheit (40) aktiviert der Toilettendeckel (30) automatisch zu öffnen, während, wenn der Infrarot-induktiver Schalter erfasst, dass der Benutzer verlassen hat, die Steuereinheit (60) der Toilettendeckel Öffnen-Schließen-Einheit (40) die Aktivierung der Toilettendeckel (30) automatisch zu schließen.
4. Die automatische Toilettenreinigungsvorrichtung nach Anspruch 1, ferner mit einer Spüleinheit (70), die an einem oberen Rand der Schale (11) vorgesehen ist zum Reinigen der Haut zwischen Gesäß eines Benutzers, eine Bedienschnittstelle der Spüleinheit (70) ist an der Steuereinheit (60) integriert.
5. Die automatische Toilettenreinigungsvorrichtung nach Anspruch 1, wobei eine Rückseite eines inneren Rand der Schale (11) mit einem Geruchsabgaböffnung versehen ist (13).
6. Die automatische Toilettenreinigungsvorrichtung nach Anspruch 1, wobei der Toilettendeckel Öffnen-Schließen-Einheit (40) einen ersten Motor-Getriebeanordnung (42), die verwendet wird, um die Toilettendeckel (30) schwenkkanzutreiben.
7. Die automatische Toilettenreinigungsvorrichtung nach Anspruch 1, wobei die Reinigungseinheit (50) eine Führungsschiene (54), die an einem unteren Rand des Toilettendeckel (30) umgibt, eine verdeckte Leitung (55), die in der Toilettendeckel (30) vergrabt ist, um die Wasserzuführende (51) und der Luftöffnung Ende (52) zu verbinden, einen Drehverbinder (56), die mit der verdeckte Leitung (55) verbunden ist, eine offene Leitung (57), die, am Drehverbinder (56) verbunden ist und am unteren Rand des Toilettendeckel (30) freigelegt ist, ein Verlängerungsrohr (571), die an einem Ende des offenen Leitung eingeführt wird (57), um den Reinigungskopf (53) an einem Endstück zu befestigen, eine Feder (572), die an einer Außenseite des Verlängerungsrohrs (571) ummantelt ist, eine Riemenscheibeneinheit (58), die an einem Endstück des Reinigungs-

- kopfes (53) vorgesehen ist um mit der Führungsschiene (54) zu passen, und einen zweiten Motor-Getriebeanordnung (59), die in dem Toilettendeckel (30) vergraben wird, um die offene Rohrleitung (57) zum Antrieb dreht, der zweite Motor-Getriebeanordnung (59) ist elektrisch mit der Steuereinheit (60) verbunden.
8. Die automatische Toilettenreinigungsvorrichtung nach Anspruch 1, wobei die pneumatische Vorrichtung Luft am Luftöffnung Ende (52) saugt.
9. Die automatische Toilettenreinigungsvorrichtung nach Anspruch 1, wobei die pneumatische Vorrichtung Luft am Luftanschluss Ende (52) bläst.
10. Die automatische Toilettenreinigungsvorrichtung nach Anspruch 1, wobei eine Wassersprießen Betrieb des Wassertanks (12) durch ein Magnetventil gesteuert wird, das elektrisch mit der Steuereinheit (60) verbunden ist und ermöglicht den Wassertank (12), automatisch Wasserauslauf, wenn der Infrarot-induktive Schalter feststellt, dass ein Benutzer verlassen hat.
11. Die automatische Toilettenreinigungsvorrichtung nach Anspruch 1, wobei die Reinigungseinheit (50) eine Führungsschiene (54), die an einem unteren Rand des Toilettendeckel (30) umgibt; eine verdeckte Leitung (55), die in der Toilettendeckel (30) vergraben wird, um die Luftöffnung Ende (52) zu verbinden; eine innere verdeckte Leitung (55a), die in dem verdeckten Leitung (55) vorgesehen ist, mit dem Wasserzuführungsende (51) zu verbinden; ein Drehverbindungsstück (56), die mit der verdeckte Leitung (55) verbunden ist; eine offene Leitung (57), die mit dem Drehverbinder (56) verbunden ist, um die innere verdeckte Leitung (55a) zu verbinden; ein Verlängerungsrohr (571), die an einem Ende des offenen Leitung eingeführt wird (57), um den Reinigungskopf (53) an einem Endstück zu befestigen; eine Feder (572), die an einer Außenseite des Verlängerungsrohrs (571) ummantelt ist; eine erweiterbare äußere offene Leitung (57 a), die an Außenseiten der offenen Leitung (57), das Verlängerungsrohr (571) und die Feder (572) ummantelt ist; eine Riemenscheibeneinheit (58), die an einem Endstück des Reinigungskopfs (53) vorgesehen ist, mit der Führungsschiene (54) zu passen; und einen zweiten Motor-Getriebeanordnung (59), die in dem Toilettendeckel vergraben wird (30), um die offene Leitung (57) zum Antrieb dreht, der zweite Motor-Getriebeanordnung (59) mit der Steuereinheit (60) elektrisch verbunden ist; der Reinigungskopf (53) einem Wassereinspritzkammer (53a) umfassend, die mit dem Verlängerungsrohr (571) und zwei Luft Saugkammern (53b) verbunden ist die vorgesehen sind, jeweils an beiden Seiten der Wassereinspritzkammer (53a), um die äußere offene Leitung (57a) zu verbinden; ein unteres Ende des Wassereinspritzkammer (53a) mit mindestens einem linearen, Wassereinspritzdüse (531) eine in Richtung auf die Sitzplatte (20) und unteren Enden der Luftsaugkammern (53b) jeweils an zwei Seiten mit mindestens einem linearen Luftansaugöffnung (531) b in Richtung auf die Sitzplatte (20) vorgesehen ist.
12. Die automatische Toilettenreinigungsvorrichtung nach Anspruch 11, wobei ein hinteres Ende des Reinigungskopfes (53) mit einem Schutz (532) verlängert wird, um die Feder (572) zu schützen und einem Seitenende des Reinigungskopfes (53) ist mit einem zweiten Reinigungskopf (533) geschwenkt, die zweite Reinigungskopf (533) ermöglicht zu schwingen und schwenken relativ zu dem Reinigungskopf (53); der Reinigungskopf (53) ist mit einer Bypassanordnung (534) vorgesehen, die zwischen dem Wassereinspritzkammer (53a) und der zweiten Reinigungskopf (533) verbunden ist, so dass der Wassereinspritzkammer (53a) zur Versorgung von Wasser zu der zweiten Reinigungskopf (533) ermöglicht; die zweite Reinigungskopf (533) ist mit mindestens einem zweiten linearen Wassereinspritzdüse (533a) vorgesehen; wenn der Reinigungskopf (53) nach unten zu einem horizontalen Zustand schwingt um die Reinigungsoperation auszuführen, wobei der zweite Reinigungskopf (533) schwingt natürlich nach unten um einen Suspensionszustand zu manifestieren.
13. Die automatische Toilettenreinigungsvorrichtung nach Anspruch 12, wobei der Reinigungskopf (53) mit einer Bewegungsstopptaste (535) vorgesehen ist, die verwendet wird, eine Abwärtsschwenkwinkel des zweiten Reinigungskopf (533) zu begrenzen; die Bewegungsstopptaste (535) dringt den Reinigungskopf (53) durch und tritt in die Wassereinspritzkammer (53a) ein; wenn ein Wasserfluss in die Wassereinspritzkammer (53a) gefüllt ist, die Bewegungsstopptaste (535) ist durch einen hydraulischen Druck um zu vorstehen geschoben, wodurch das Abwärtsschwenkwinkel des zweiten Reinigungskopf (533) begrenzt wird.

Revendications

1. Un dispositif automatique de nettoyage de toilettes est prévu au-dessus d'un corps de toilettes (10), qui comprend une cuvette (11) et un réservoir d'eau (12) pour alimenter la cuve (11) en eau, lesdits toilettes comprenant : une plaque (20) formant assise qui est montée pivotante sur un bord supérieur de la cuvette (11) ; un couvercle de toilettes (30) qui est monté pivotant sur le bord supérieur de la cuvette (11) en recouvrement de cette dernière pour recouvrir la plaque (20) formant assise ; une unité (40) d'ouverture-

- fermeture du couvercle de toilettes, qui est reliée au couvercle de toilettes (30) pour commander un état d'ouverture-fermeture du couvercle de toilettes (30) ; une unité (50) de nettoyage de plaque formant assise, qui est prévue sur le couvercle de toilettes (30) et est munie d'une extrémité (51) d'alimentation en eau pour amener une source d'eau, une extrémité (52) formant orifice d'air pour connecter un dispositif pneumatique et une tête de nettoyage (53) connectée à l'extrémité (51) d'alimentation en eau et à l'extrémité (52) formant orifice d'air pour entourer la plaque (20) formant assise le long d'un contour de celle-ci ; et une unité de commande (60) qui est disposée à proximité de la cuvette (11), qui active l'unité (50) de siège de nettoyage de plaque après que le couvercle de toilettes (30) ait été refermé, **caractérisée en ce que**, lorsqu'elle est activée par l'unité de commande (60), la tête de nettoyage (53) est configurée pour se déplacer au-dessus de la plaque (20) formant siège de toilettes, balayant un trajet entourant la cuvette de toilettes (11) pour pulvériser sur la plaque (20) formant assise, suivie par un déplacement de la tête de nettoyage (53) au-dessus de la plaque (20) formant siège de toilettes balayant un trajet entourant la plaque (20) formant assise, atteignant ainsi l'objectif d'un nettoyage automatique et d'un séchage à l'air de la plaque (20) formant assise.
2. Le dispositif automatique de nettoyage de toilettes selon la revendication 1, dans lequel la tête de nettoyage (53) est pourvue d'au moins une ouverture linéaire (531).
 3. Le dispositif automatique de nettoyage de toilettes selon la revendication 1, dans lequel l'unité de commande (60) comprend en outre un commutateur inductif infrarouge ; lorsque le commutateur inductif infrarouge détecte que l'utilisateur s'approche, l'unité de commande (60) active l'unité (40) d'ouverture-fermeture du couvercle de toilettes pour ouvrir le couvercle de toilettes (30) automatiquement, tandis que, lorsque le commutateur inductif infrarouge détecte que l'utilisateur est parti, l'unité de commande (60) active l'unité (40) d'ouverture-fermeture du couvercle de toilettes pour fermer le couvercle de toilettes (30) automatiquement.
 4. Le dispositif automatique de nettoyage de toilettes selon la revendication 1, comprenant en outre une unité de rinçage (70) qui est prévue au niveau d'un rebord supérieur de la cuvette (11) pour nettoyer la peau entre les fesses d'un utilisateur, une interface de fonctionnement de l'unité de rinçage (70) étant intégrée à l'unité de commande (60).
 5. Le dispositif automatique de nettoyage de toilettes selon la revendication 1, dans lequel une face arrière d'un rebord intérieur de la cuvette (11) est pourvue d'un orifice d'évacuation des odeurs (13).
 6. Le dispositif automatique de nettoyage de toilettes selon la revendication 1, dans lequel l'unité d'ouverture-fermeture du couvercle de toilettes (40) comprend un premier ensemble d'engrenages moteur (42) qui est utilisé pour entraîner le couvercle de toilettes (30) en pivotement.
 7. Le dispositif automatique de nettoyage de toilettes selon la revendication 1, dans lequel l'unité de nettoyage (50) comprend un rail de guidage (54) qui entoure un bord inférieur du couvercle de toilettes (30), un conduit dissimulé (55) qui est intégré dans le couvercle de toilettes (30) pour relier l'extrémité (51) d'alimentation en eau et l'extrémité (52) formant orifice pour l'air, un connecteur rotatif (56) qui est relié au conduit dissimulé (55), un conduit ouvert (57) qui est relié au niveau du connecteur rotatif (56) et qui est exposé au niveau de la bordure inférieure du couvercle de toilettes (30), un tube d'extension (571) qui est inséré à une extrémité du conduit ouvert (57) pour pouvoir monter la tête de nettoyage (53) à une extrémité postérieure, un ressort (572) qui est logé au niveau de l'extérieur du tube d'extension (571), une unité formant poulie (58) qui est prévue à une extrémité postérieure de la tête de nettoyage (53) pour s'adapter dans le rail de guidage (54), et un deuxième ensemble d'engrenage moteur (59) qui est intégré au couvercle de toilettes (30) pour entraîner le conduit ouvert (57) en rotation, le deuxième ensemble d'engrenage moteur (59) étant connecté électriquement à l'unité de commande (60).
 8. Le dispositif automatique de nettoyage de toilettes selon la revendication 1, dans lequel le dispositif pneumatique aspire de l'air à l'extrémité (52) formant orifice d'air.
 9. Le dispositif automatique de nettoyage de toilettes selon la revendication 1, dans lequel le dispositif pneumatique souffle de l'air au niveau de l'extrémité (52) formant orifice d'air.
 10. Le dispositif automatique de nettoyage de toilettes selon la revendication 1, dans lequel une opération d'écoulement de l'eau du réservoir (12) est commandée par une électrovanne qui est connectée électriquement à l'unité de commande (60) et permet au réservoir d'eau (12) de faire écouler l'eau automatiquement lorsque le commutateur inductif infrarouge détecte qu'un utilisateur est parti.
 11. Le dispositif automatique de nettoyage de toilettes selon la revendication 1, dans lequel l'unité de nettoyage (50) comprend un rail de guidage (54) qui entoure un bord inférieur du couvercle de toilettes (30) ; un conduit dissimulé (55) qui est intégré au

couvercle de toilettes (30) pour relier l'extrémité de l'orifice (52) pour l'air ; une conduite intérieure (55a) cachée, qui est située dans le conduit caché (55), reliée à l'extrémité (51) d'alimentation en eau ; un connecteur rotatif (56) qui est relié au conduit caché (55) ; un conduit ouvert (57) qui est relié au connecteur rotatif (56) et est relié à la conduite intérieure cachée (55a) ; un tube d'extension (571) qui est inséré à une extrémité du conduit ouvert (57) pour recevoir la tête de nettoyage (53) à une extrémité postérieure ; un ressort (572), qui est logé au niveau de l'extérieur du tube d'extension (571) ; un conduit ouvert externe (57a) extensible qui est logé sur les côtés extérieurs du conduit ouvert (57), du tube d'extension (571) et du ressort (572) ; une unité formant poulie (58) qui est prévue à une extrémité postérieure de la tête de nettoyage (53) pour s'adapter dans le rail de guidage (54) ; et un deuxième ensemble d'engrenages moteur (59) qui est intégré au couvercle de toilettes (30) pour entraîner le conduit ouvert (57) en rotation, le deuxième ensemble d'engrenages moteur (59) étant connecté électriquement à l'unité de commande (60) ; la tête de nettoyage (53) comprenant une chambre (53a) d'injection d'eau, qui est reliée au tube d'extension (571), et deux chambres d'aspiration d'air (53b) qui sont prévues au niveau de deux côtés respectifs de la chambre d'injection d'eau (53a) pour être connectés à la conduite extérieure ouverte (57a) ; une extrémité inférieure de la chambre d'injection d'eau (53a) étant munie d'au moins une buse linéaire (531a) d'injection d'eau vers la plaque (20) formant assise, et des extrémités inférieures des chambres (53b) d'aspiration d'air au niveau de deux côtés étant chacune prévue avec au moins un orifice linéaire (531b) d'aspiration d'air vers la plaque (20) formant assise.

12. Le dispositif automatique de nettoyage de toilettes selon la revendication 11, dans lequel une extrémité arrière de la tête de nettoyage (53) est prolongée par un logement (532) pour protéger le ressort (572) et une extrémité latérale de la tête de nettoyage (53) est en relation de pivotement avec une deuxième tête de nettoyage (533), permettant à la deuxième tête de nettoyage (533) de se balancer et de pivoter par rapport à la tête de nettoyage (53) ; la tête de nettoyage (53) étant munie d'un ensemble de dérivation (534) qui est connecté entre la chambre d'injection d'eau (53a) et la deuxième tête de nettoyage (533), permettant à la chambre d'injection d'eau (53a) d'alimenter en eau la deuxième tête de nettoyage (533) ; la deuxième tête de nettoyage (533) étant munie d'au moins une deuxième buse linéaire (533a) d'injection d'eau ; lorsque la tête de nettoyage (53) pivote vers le bas vers un état horizontal pour effectuer l'opération de nettoyage, la deuxième tête de nettoyage (533) se balance vers le bas naturellement pour manifester un état de suspension.

13. Le dispositif automatique de nettoyage de toilettes selon la revendication 12, dans lequel la tête de nettoyage (53) est munie d'un bouton d'arrêt de mouvement (535) qui est utilisé pour limiter un angle de basculement vers le bas de la deuxième tête de nettoyage (533) ; le bouton d'arrêt de mouvement (535) pénétrant dans la tête de nettoyage (53) et entrant dans la chambre d'injection d'eau (53a) ; lorsqu'un écoulement d'eau est introduit dans la chambre d'injection d'eau (53a), le bouton d'arrêt de mouvement (535) est poussé par une pression hydraulique pour faire saillie, limitant ainsi l'angle de basculement vers le bas de la deuxième tête de nettoyage (533).

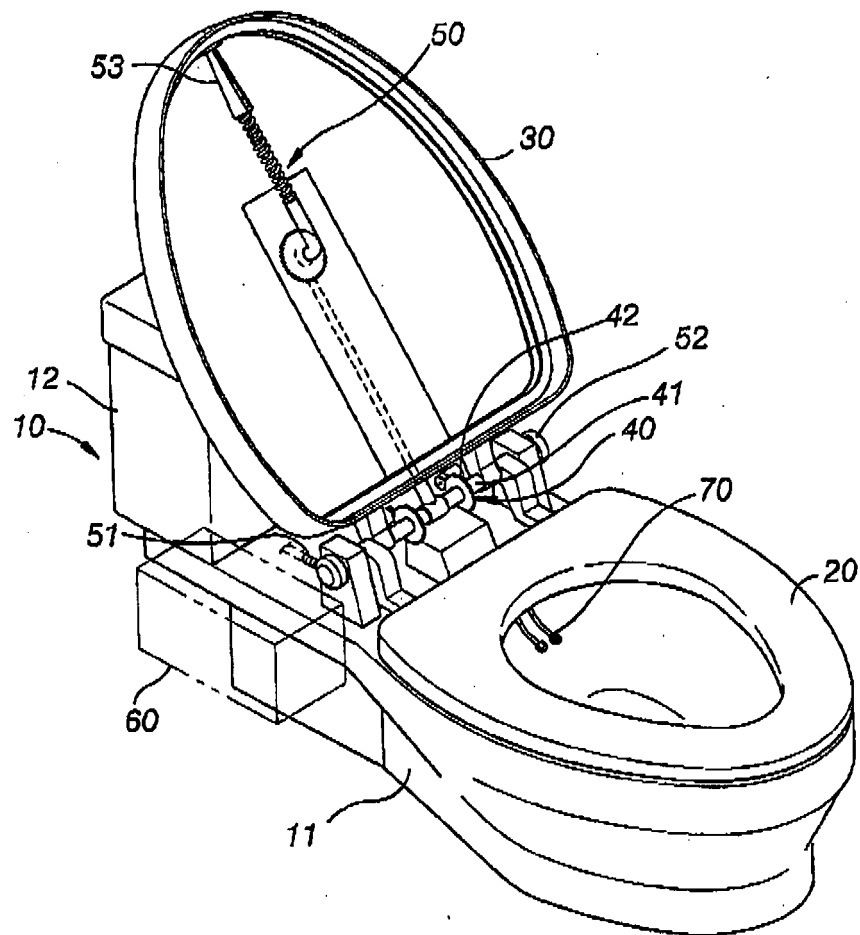


FIG. 1

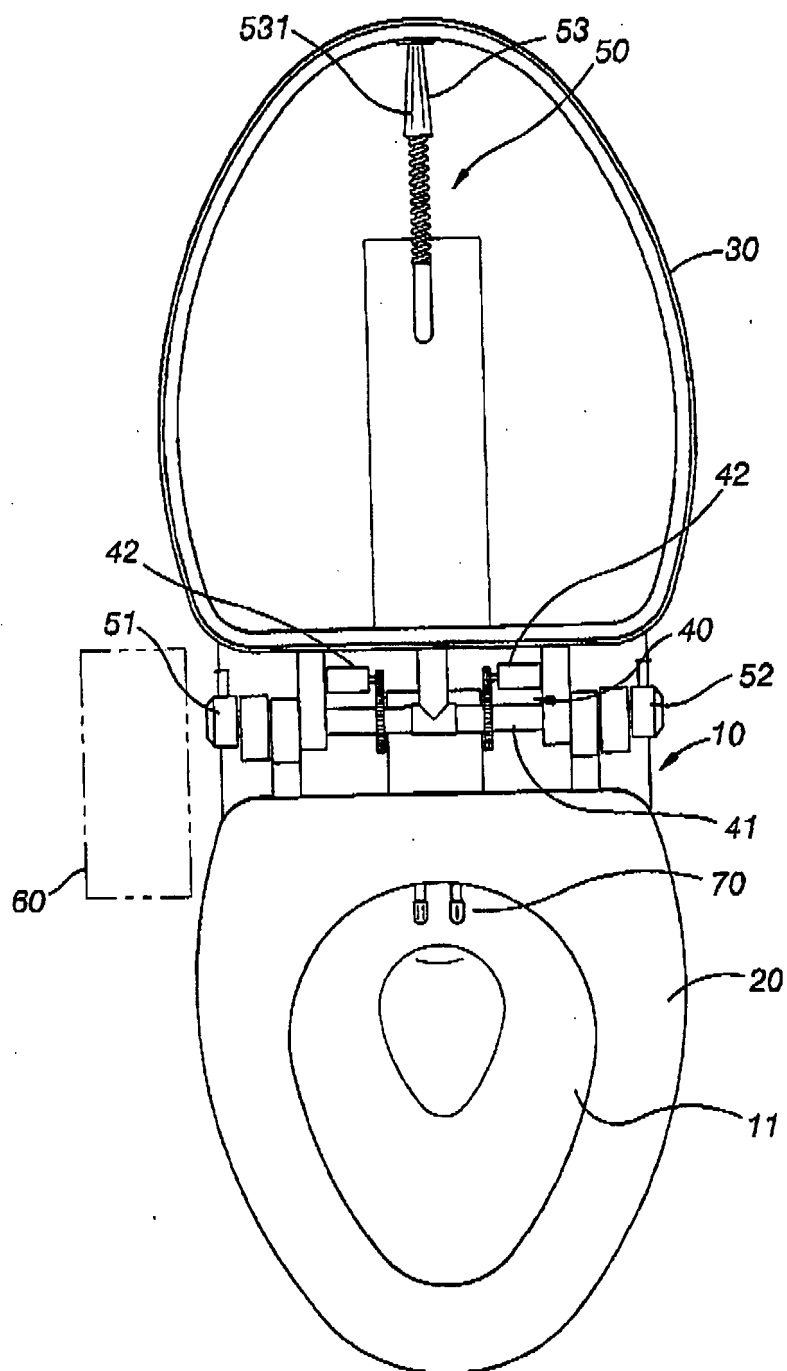


FIG. 2

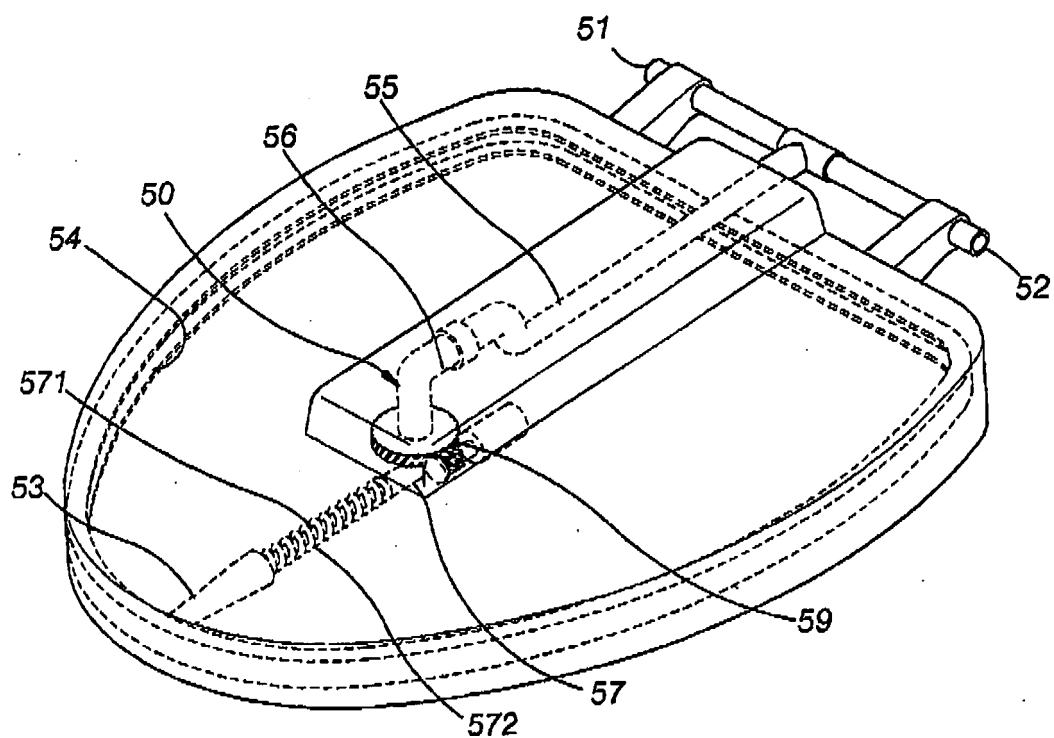


FIG. 3

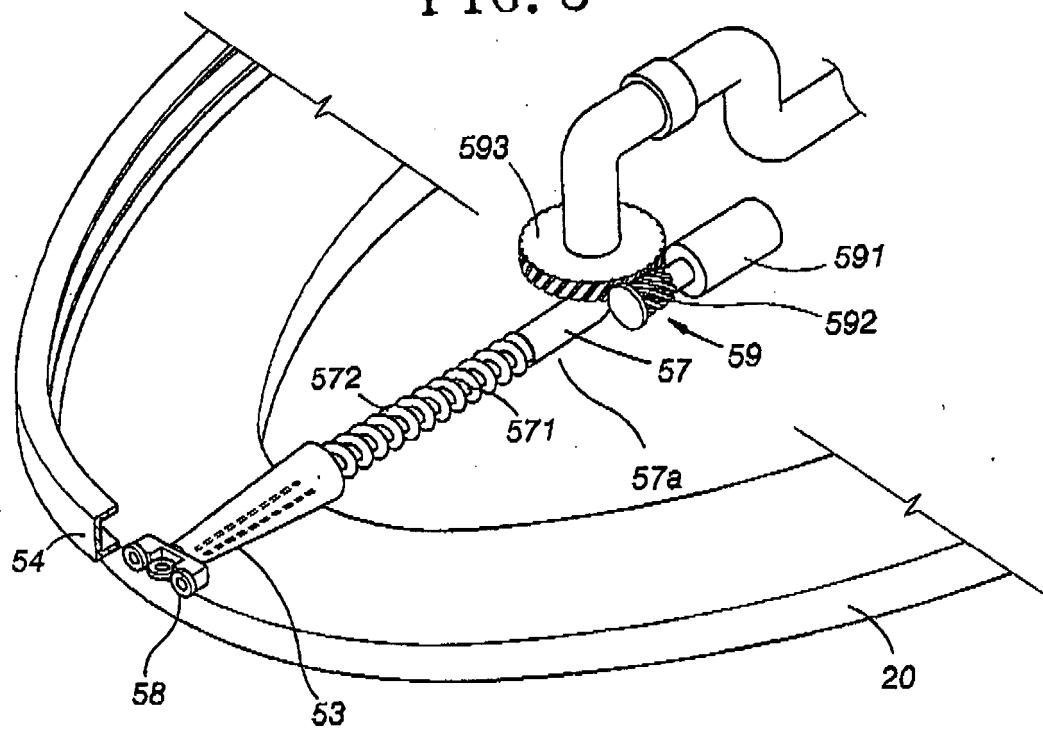


FIG. 4

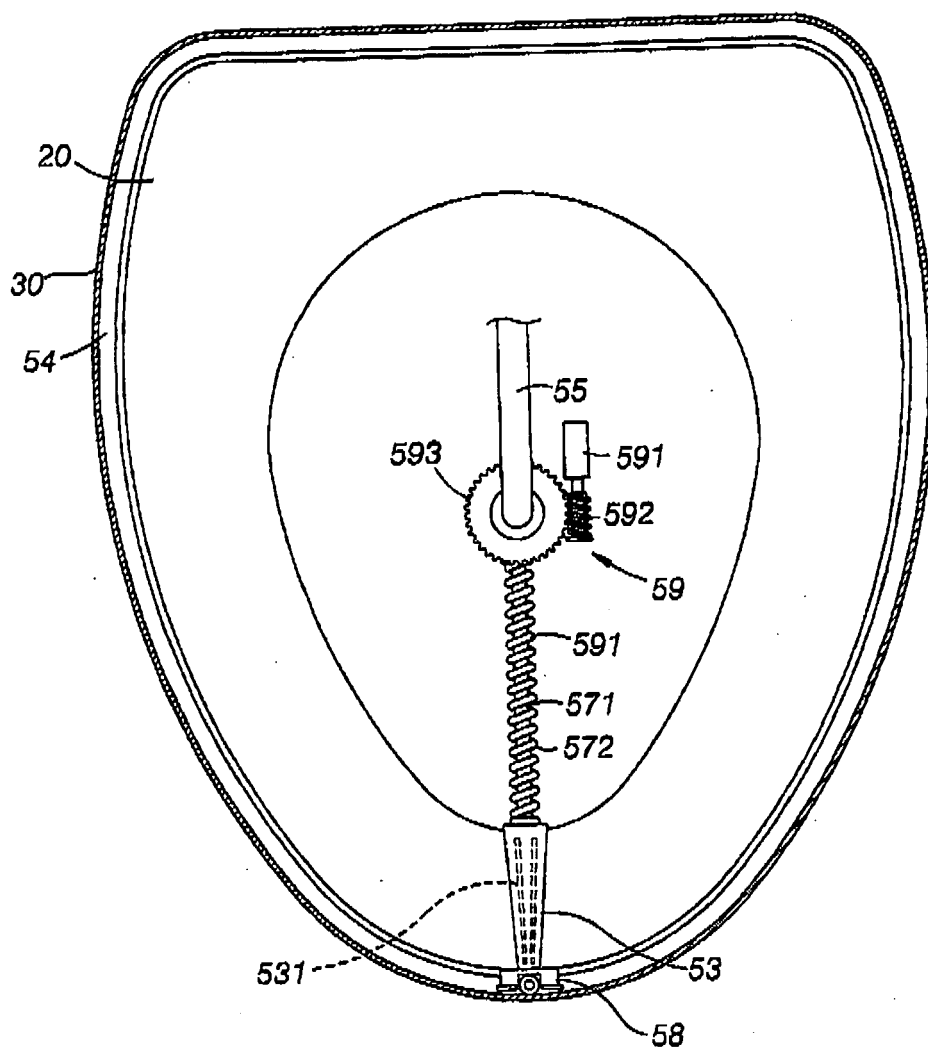


FIG. 5

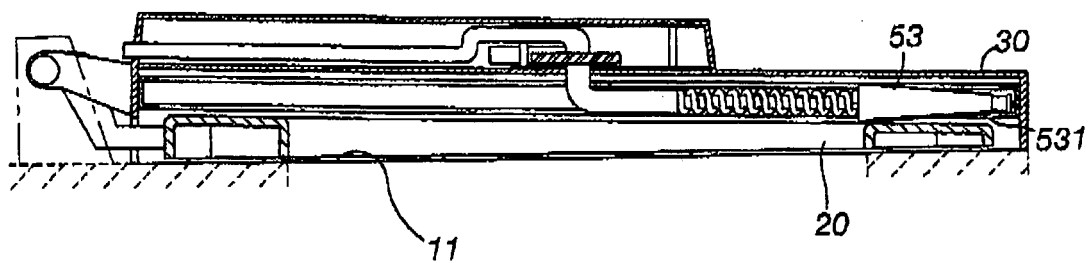


FIG. 6

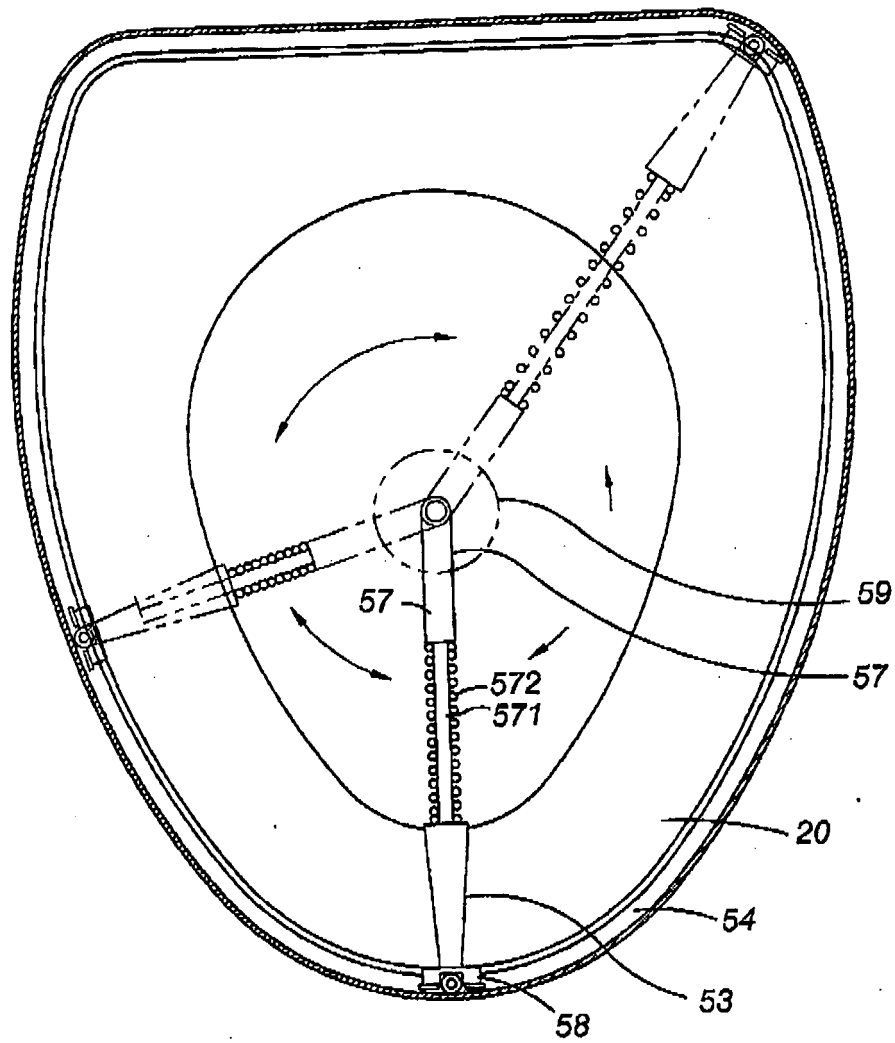


FIG. 7

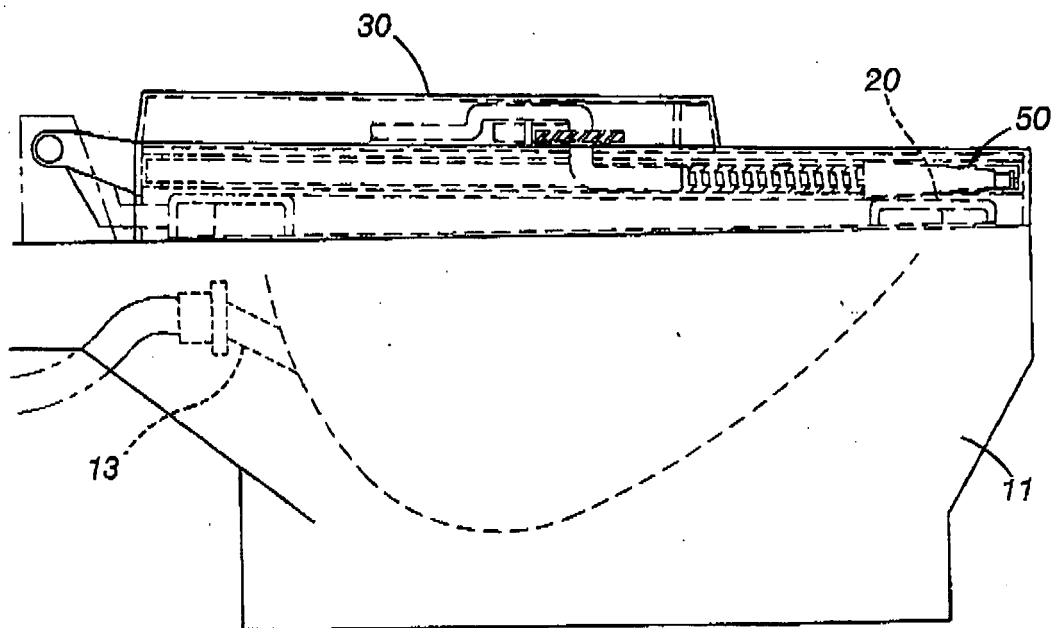


FIG. 8

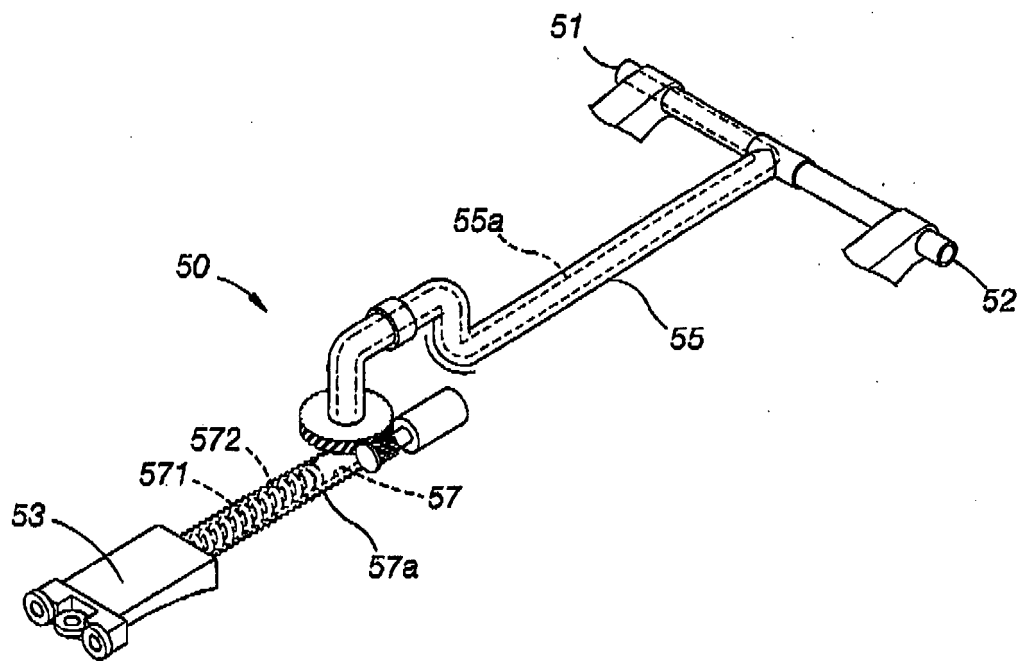


FIG. 9

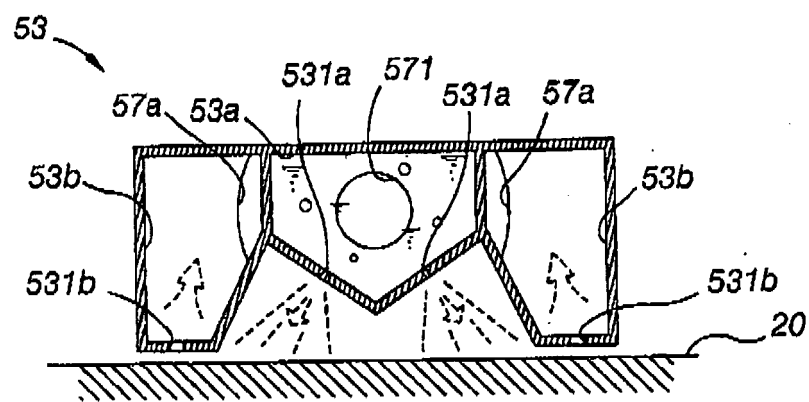


FIG. 10

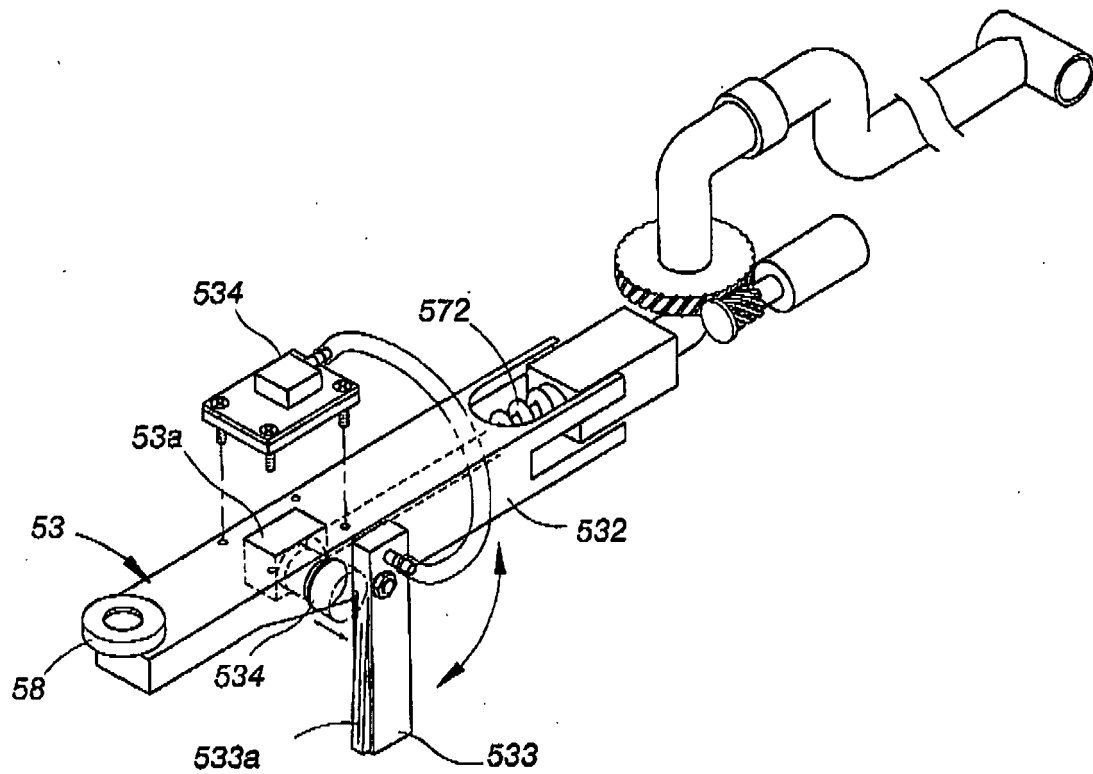


FIG. 11

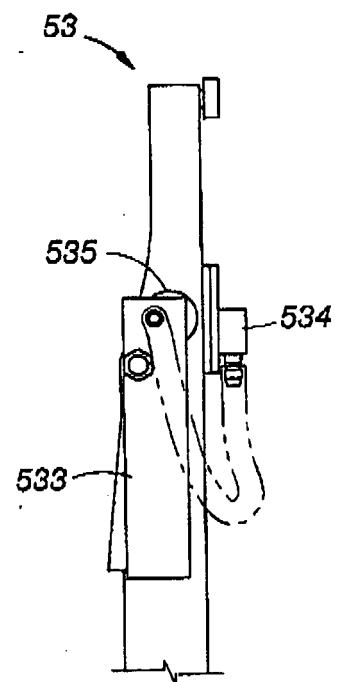


FIG. 12

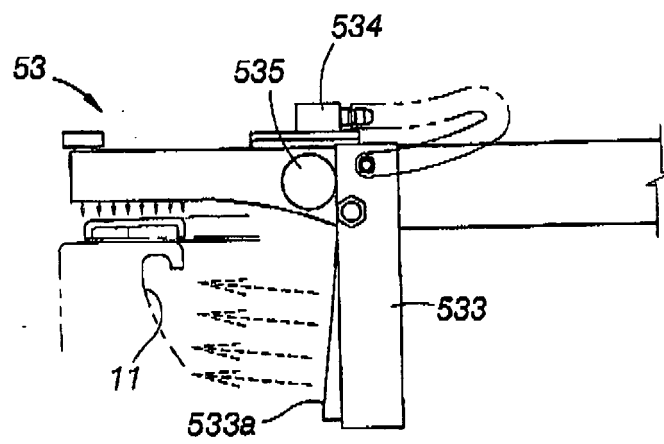


FIG. 13

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 1946691 A1 [0006]