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(54) **Turning seat with automatic turning cover**

(57) A toilet seat with an automatic turning cover includes a start device, a toilet seat cover, a toilet seat, an elevating arm, a turning arm and a belt. The toilet seat cover and elevating arm are coupled to the start device. A lower end of the turning arm is pivotally coupled to the middle of the elevating arm and fixed to the toilet seat cover, and an upper end is pivotally coupled to a pivotal

base and passed through two fulcrums of the turning arm to couple the upper end with the pivotal base. The toilet seat controls the start device to drive the elevating and turning arms to lift the toilet seat independently. The belt is pulled to change the surface of the toilet seat to face towards the front of the toilet seat cover. The start device is controlled to lift both toilet seat cover and toilet seat.

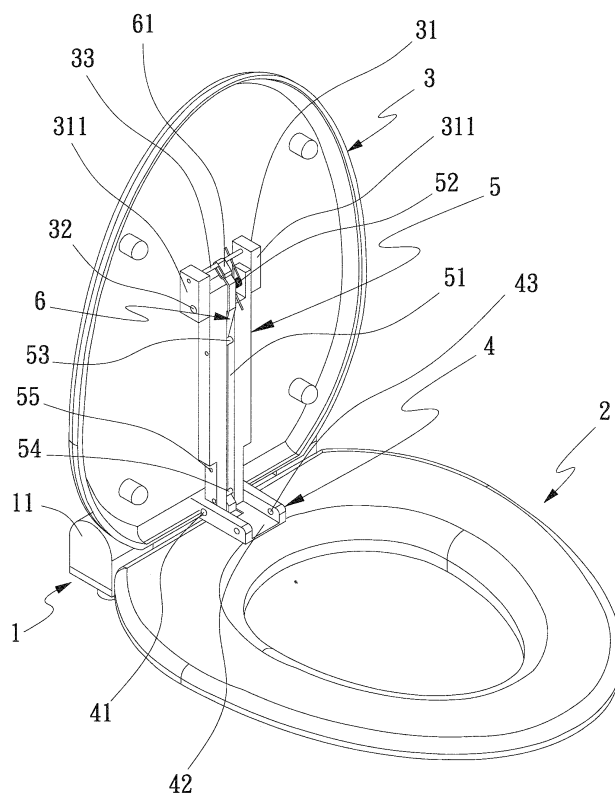


Fig. 1

Description

FIELD OF THE INVENTION

[0001] The present invention relates to a toilet seat with an automatic turning cover, in particular to an electric toilet seat that can be lifted and controlled electrically, and whose surface can be turned towards the front while the toilet seat is being lifted.

BACKGROUND OF THE INVENTION

[0002] A conventional manual lifting toilet seat coupled to a toilet stool includes a toilet seat cover and a toilet seat. The toilet seat cover and the toilet seat are regularly covered onto the toilet stool, and the toilet seat is lifted up manually by hands when the toilet stool is used. Particularly for male urinations, the toilet seat cover is also lifted up to avoid spilling urine on the surface of the toilet seat cover. However, for convenience, male users generally do not lift up the toilet seat cover, and urine may be accumulated at the toilet seat cover and an internal side of the lifted toilet seat. Even if the toilet seat cover is lifted, urine may be spilled from a hollow portion of the toilet seat cover into the internal side of the toilet seat. If the next user needs to sit on the toilet seat cover, the rear side of the cloth of this user may touch the internal side of the toilet seat easily, which is really disgusting. Although toilet seats with an electrically lifted cover are available in the market, yet the toilet seats of this sort can lift the toilet seat only, and the internal side of the toilet seat is still facing towards the front. Therefore, it is unable to overcome the drawback of the cloth being in contact with the internal side of the toilet seat having accumulated urine when a user is sitting on a toilet seat cover. The sanitary problem still exists.

[0003] It is an important subject of the present invention to find a way of developing a toilet seat with an automatic turning cover, such that users no longer have to lift a toilet seat and a toilet seat cover by hands, and when the toilet seat is lifted, the surface of the toilet seat will change its direction towards the front to avoid the users' cloth from touching the internal side of the toilet seat.

SUMMARY OF THE INVENTION

[0004] In view of the aforementioned shortcomings of the conventional manual and electric toilet seat, the inventor of the present invention based on years of experience in the related industry to conduct extensive researches and experiments, and finally developed a toilet seat with an automatic turning cover in hope of achieving the sanitary effect.

[0005] Therefore, it is a primary objective of the present invention to provide a toilet seat with an automatic turning cover, such that the surface of the toilet seat is changed to face towards the front by means of a design of an electric toilet seat and a turning structure when the toilet

seat is lifted by an electric control, so as to achieve the effects of providing a sanitary appearance, preventing the users' cloth from touching the internal side of the toilet seat, providing an easy way of using a toilet stool and keeping the toilet stool clean and sanitary.

[0006] To achieve the foregoing objective, the present invention provides a toilet seat with an automatic turning cover, comprising: a start device, having a first rotating portion and a second rotating portion disposed on a base respectively, and a motor for driving and rotating the first rotating portion and the second rotating portion; a toilet seat cover, with a rear end coupled with the second rotating portion of the start device; a toilet seat, having a pivotal base disposed at an internal side of the toilet seat, and the pivotal base having an upper pivoting portion and a belt fixing portion; an elevating arm, with a rear end coupled with the first rotating portion of the start device, and a lower pivoting portion disposed at the middle of the elevating arm; a turning arm, having a long rod with a groove disposed at the middle of the long rod, and a lower end of the long rod being rotably coupled to the lower pivoting portion of the elevating arm, and an upper end of the long rod being rotably coupled to an upper pivoting portion of the pivotal base on an internal side of the toilet seat, an elastic element coupled with the upper end for pushing the toilet seat, an upper axle installed transversally in the groove and proximate to the upper end, and a lower axle is installed transversally and proximate to the lower end; and a belt, with a lower end fixed at the bottom of the toilet seat cover, an upper end passed from the bottom of the lower axle of the turning arm into the groove, through the lower axle and the upper axle, and then from the top of the upper axle and out of the groove, such that the upper end is coupled to the belt fixing portion of the pivotal base on an internal side of the toilet seat to constitute the toilet seat with an automatic turning cover.

[0007] The aforementioned design of a toilet seat with an automatic turning cover has at least three modes of lifting a toilet seat. Firstly, a user can use the start device to drive the elevating arm and the turning arm to lift the toilet seat independently through an operation of a control box while the belt is pulled to change the direction of the surface of the toilet seat to face towards the front, so as to achieve the effect of keeping the toilet stool sanitary easily. Secondly, the start device can be controlled and driven to lift the toilet seat cover and the toilet seat synchronously when male users urinate, so as to prevent urine from being spilled onto the toilet seat cover and maintain a clean and sanitary toilet stool. Thirdly, the toilet seat or the toilet seat cover can be lifted manually during a power failure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Fig. 1 is a perspective view of a preferred embodiment of the present invention;

[0009] Fig. 2 is a side view of a preferred embodiment

of the present invention;

[0010] Fig. 3 is a front view of a preferred embodiment of the present invention;

[0011] Fig. 4 is a bottom view of a preferred embodiment of the present invention;

[0012] Fig. 5 is a schematic view of a fully covered toilet seat in accordance with a preferred embodiment of the present invention;

[0013] Fig. 6 is a schematic view of lifting up a toilet cover in accordance with a preferred embodiment of the present invention;

[0014] Fig. 7 is a first schematic view of turning a toilet seat in accordance with a preferred embodiment of the present invention;

[0015] Fig. 8 is a second schematic view of turning a toilet seat in accordance with a preferred embodiment of the present invention;

[0016] Fig. 9 is a first schematic view of lifting a toilet seat and a toilet seat cover in accordance with a preferred embodiment of the present invention; and

[0017] Fig. 10 is a second schematic view of lifting a toilet seat and a toilet seat cover in accordance with a preferred embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0018] Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiments with reference to the accompanying drawings.

[0019] With reference to Figs. 1 and 2 for a toilet seat with an automatic turning cover in accordance with a preferred embodiment of the present invention, the toilet seat comprises start device 1, a toilet seat cover 2, a toilet seat 3, an elevating arm 4, a turning arm 5 and a belt 6.

[0020] The start device 1 as shown in Figs. 2 and 4 includes a first rotating portion 12 and a second rotating portion 13 disposed on a base 11, and a motor (not shown in the figure) for driving the first rotating portion 12 or driving the first rotating portion 12 and the second rotating portion 13 individually. The preferred embodiment further comprises a recession 14 disposed at the middle of the base 11 of the start device 1, two circular second rotating portions 13 coupled to the recession 14, and a circular first rotating portion 12 coupled at the middle between the two second rotating portions 13, and the motor is connected into the base 11 for driving and rotating the first rotating portion 12, or driving and rotating the first rotating portion 12 and second rotating portion 13 individually.

[0021] The toilet seat cover 2 as shown in Figs. 1 and 2 is a circular seat cover, whose rear end is coupled to the second rotating portion 13 of the start device 1, and an opening 21 (as shown in Fig. 4) is disposed at the middle of a rear end of the toilet seat cover 2 for passing the belt 6.

[0022] The toilet seat 3 as shown in Figs. 1 to 3 is a cover in a shape corresponding to the circular seat cover, and a pivotal base 31 is disposed at the middle of an internal side of the toilet seat 3, and an upper pivoting portion 32 and a belt fixing portion 33 are disposed on the pivotal base 31.

[0023] The elevating arm 4 as shown in Figs. 1 to 3 is a rectangular arm, whose rear end is coupled to the first rotating portion 12 of the start device 1, and a lower pivoting portion 41 is disposed at the middle of the elevating arm 4. The preferred embodiment further comprises an embedding slot 42 disposed at the middle of the elevating arm 4 and corresponding to the turning arm 5, wherein the lower pivoting portion 41 is disposed at the middle of the embedding slot 42, and the lower pivoting portion 41 is formed by a pivot disposed transversally in the embedding slot 42, such that the pivot can be passed through a lower end of the turning arm 5, and the lower pivoting portion 41 is pivotally coupled to the lower end of the turning arm 5, and a movable positioning steel ball 43 is installed at an internal wall proximate to a front end of the embedding slot 42.

[0024] The turning arm 5 as shown in Figs. 1 to 3 includes a long rod having a groove 51 at the middle of the long rod, whose lower end can be rotably coupled to a lower pivoting portion 41 of the elevating arm 4, and whose upper end can be rotably coupled to an upper pivoting portion 32 of the pivotal base 31 at an internal side of the toilet seat 3, and an elastic element 52 is coupled to the upper end for pushing open the toilet seat 3, and the elastic element 52 can be a torque spring sheathed to the upper pivoting portion 32, and an upper axle 53 is transversally installed proximate to the upper end in the groove 51, and a lower axle 54 is transversally installed proximate to the lower end, and the upper axle 53 and the lower axle 54 can be sheathed to a metal slide ring. The preferred embodiment further comprises a lower end of the turning arm 5 rotably coupled to the lower pivoting portion 41 in the embedding slot 42 of the elevating arm 4, and both surfaces of the turning arm 5 include a positioning hole 55 individually corresponding to the positioning steel ball 43, such that the positioning hole 55 can be provided for embedding or separating the positioning steel ball 43.

[0025] The belt 6 as shown in Figs. 1 to 3 is a flexible strip, whose lower end is passed through the elevating arm 4 and the toilet seat cover 2 and fixed to the bottom of the toilet seat cover 2 (as shown in Figs. 2 and 4), and whose upper end is passed from the bottom of the lower axle 54 of the turning arm 5 into the groove 51, and through the lower axle 54 and the upper axle 53, and then through the top of the upper axle 53 and out from the groove 51, such that the upper end of the belt 6 is coupled to the belt fixing portion 33 of the pivotal base 31 at the internal side of the toilet seat 3.

[0026] In Figs. 1 to 3, the pivotal base 31 of the toilet seat 3 in accordance with the preferred embodiment includes coupled to the two protruding bases 311 on the

internal side of the toilet seat 3, and the upper pivoting portion 32 and the belt fixing portion 33 are disposed transversally at transversal rods between the two protruding bases 311 respectively, and one of the transversal rods is passed through an upper end of the turning arm 5, and another transversal rod is coupled to an upper end of the belt 6, and the upper end of the belt 6 is coupled to a latch ring 61, and the latch ring 61 can be an elliptical ring for latching to the belt fixing portion 33 in the shape of the transversal rod.

[0027] With the design of a toilet seat with an automatic turning cover of the present invention as shown in Fig. 5, the toilet seat cover 2 and the toilet seat 3 are maintained covered regularly, such that if a user needs to use the toilet stool, the user can lift the toilet seat electrically by operating a control box or a sensor or by hands.

[0028] In the first type of the electric operating mode, a user performs the lifting operation through the control box or sensor as shown in Figs. 2 and 6, so that the first rotating portion 12 of the start device 1 is rotated, while the elevating arm 4 is being driven to turn backward, and the elevating arm 4 is supporting the turning arm 5 synchronously, and the toilet seat 3 pivotally coupled to the upper end of the turning arm 5 can be lifted independently. In the meantime, the lower axle 54 of the turning arm 5 is turned backward, and thus the lower axle 54 pulls the belt 6 gradually tighter, and the upper end elliptical latch ring 61 is latched to the belt fixing portion 33 gradually tighter. Until the toilet seat 3 is lifted to a specific height and a sufficient turning space is reserved at the front end, the belt 6 and the latch ring 61 can drag the belt fixing portion 33 downward until the toilet seat 3 is turned downward. In Figs. 7 and 8, if the elevating arm 4 and the turning arm 5 rise to fixed positions, the belt 6 will pull the toilet seat 3 tightly, so that the surface of the toilet seat 3 will turn and change its direction towards the front of the toilet seat cover 2 to show the clean appearance of the toilet seat, and prevent a user's cloth from touching the internal side of toilet seat 3 to achieve a sanitary effect easily when the user uses the toilet stool. On the other hand, if the user controls the toilet seat 3 to move downward to cover toilet seat cover 2 as shown in Figs. 1 and 5, the first rotating portion 12 of the start device 1 will drive the elevating arm 4 and the turning arm 5 to turn forward, while the lower axle 54 of the turning arm 5 is turned forward to release the belt 6, such that the upper end of the belt 6 is released from tightly pulling the toilet seat 3, and then the elastic element 52 at the upper end of the turning arm 5 props the toilet seat 3, so that the toilet seat 3 changes the direction to be covered onto toilet seat cover 2.

[0029] In a second electric operating mode of the present invention, the user performs the lifting operation through the control box or sensor as shown in Figs. 9 and 10, so that the first rotating portion 12 and the second rotating portion 13 of the start device 1 synchronously drive the elevating arm 4 and the toilet seat cover 2, wherein the elevating arm 4 can also lift turning arm 5,

such that the toilet seat 3 coupled to the upper end of the turning arm 5 can be lifted. However, the toilet seat cover 2 is also lifted upward synchronously, so that a fixing point of the lower end of the belt 6 being fixed to the bottom of the toilet seat cover 2 rises synchronously, and the lower axle 54 of the turning arm 5 cannot pull the belt 6 tightly, and the toilet seat 3 will not change its direction. The toilet seat 3 and the toilet seat cover 2 stacked with one another are lifted together, so that a male user needs not to lift the toilet seat 3 and the toilet seat cover 2 before taking a urination, and the toilet seat cover 2 can be kept clean easily. On the other hand, both toilet seat 3 and toilet seat cover 2 can be turned downward simultaneously and covered onto the toilet stool again.

[0030] In a third mode which is the manual operation of the present invention as shown in Fig. 1, the user can lift the toilet seat 3 manually by hands during a power failure. Now, the positioning steel ball 43 of the elevating arm 4 can be separated from the positioning hole 55 of the turning arm 5, and only the turning arm 5 and the toilet seat 3 are allowed to turn upward individually. The present invention provides a measure for operating the toilet seat in a power failure situation.

[0031] In summation of the description above, the present invention achieves the effect of using the toilet stool easily and sanitarily by changing the direction of the surface of the toilet seat towards the front to avoid the user's cloth from touching the internal surface of the toilet seat 3 when the user uses the design of the toilet seat and the turning structure to electrically control and lift the toilet seat 3. Obviously, the present invention complies with the patent application requirements and the products manufactured in accordance with the present invention can meet the current market requirements.

[0032] While the invention has been described by means of specific embodiments, numerous modifications and variations could be made thereto by those skilled in the art without departing from the scope and spirit of the invention set forth in the claims.

Claims

1. A toilet seat with an automatic turning cover, comprising:

a start device, having a first rotating portion and a second rotating portion disposed on a base respectively, and a motor for driving and rotating the first rotating portion and the second rotating portion;

a toilet seat cover, with a rear end coupled with the second rotating portion of the start device;

a toilet seat, having a pivotal base disposed at an internal side of the toilet seat, and the pivotal base having an upper pivoting portion and a belt fixing portion;

an elevating arm, with a rear end coupled with

- the first rotating portion of the start device, and a lower pivoting portion disposed at the middle of the elevating arm;
- a turning arm, having a long rod with a groove disposed at the middle of the long rod, and a lower end of the long rod being rotably coupled to the lower pivoting portion of the elevating arm, and an upper end of the long rod being rotably coupled to an upper pivoting portion of the pivotal base on an internal side of the toilet seat, an elastic element coupled with the upper end for pushing the toilet seat, an upper axle installed transversally in the groove and proximate to the upper end, and a lower axle is installed transversally and proximate to the lower end; and a belt, with a lower end fixed at the bottom of the toilet seat cover, an upper end passed from the bottom of the lower axle of the turning arm into the groove, through the lower axle and the upper axle, and then from the top of the upper axle and out of the groove, such that the upper end is coupled to the belt fixing portion of the pivotal base on an internal side of the toilet seat to constitute the toilet seat with an automatic turning cover.
2. The toilet seat with an automatic turning cover as recited in claim 1, wherein the motor of the start device drives and rotates the first rotating portion and second rotating portion.
 3. The toilet seat with an automatic turning cover as recited in claim 2, wherein the base of the start device includes a recession disposed at the middle of the base, two circular second rotating portions coupled with the recession, and a circular first rotating portion coupled with the middle of the two second rotating portions, and the motor is coupled into the base.
 4. The toilet seat with an automatic turning cover as recited in claim 1, wherein the toilet seat cover has an opening disposed at the middle of a rear end of the toilet seat cover, and a lower end of the belt is passed through the opening and fixed to the bottom of the toilet seat cover.
 5. The toilet seat with an automatic turning cover as recited in claim 1, wherein the elevating arm is a rectangular arm, and whose rear end is coupled with the first rotating portion of the start device, and an embedding slot corresponding to the turning arm is disposed at the middle of the elevating arm, and the lower pivoting portion is disposed at the middle of the embedding slot, and a movable positioning steel ball is installed in an internal wall proximate to a front end of the embedding slot, and a lower end of the turning arm is rotably coupled to a lower pivoting portion in the embedding slot, and a positioning hole is disposed on a side of the turning arm and corresponding to the positioning steel ball.
 6. The toilet seat with an automatic turning cover as recited in claim 5, wherein the lower pivoting portion is transversally disposed at a pivot in the embedding slot, and the pivot is passed through a lower end of the turning arm.
 7. The toilet seat with an automatic turning cover as recited in claim 1, wherein the pivotal base of the toilet seat includes two protruding bases coupled to an internal side of the toilet seat, and the upper pivoting portion and the belt fixing portion are disposed transversally at transversal rods between the two protruding bases, and one of the transversal rods is passed through an upper end of the turning arm, and the other transversal rod is coupled to an upper end of the belt.
 8. The toilet seat with an automatic turning cover as recited in claim 7, wherein the upper end of the belt is coupled with a latch ring, and the latch ring is latched to the transversal rod.
 9. The toilet seat with an automatic turning cover as recited in claim 8, wherein the latch ring is an elliptical ring.
 10. The toilet seat with an automatic turning cover as recited in claim 1, wherein the elastic element is a torque spring.

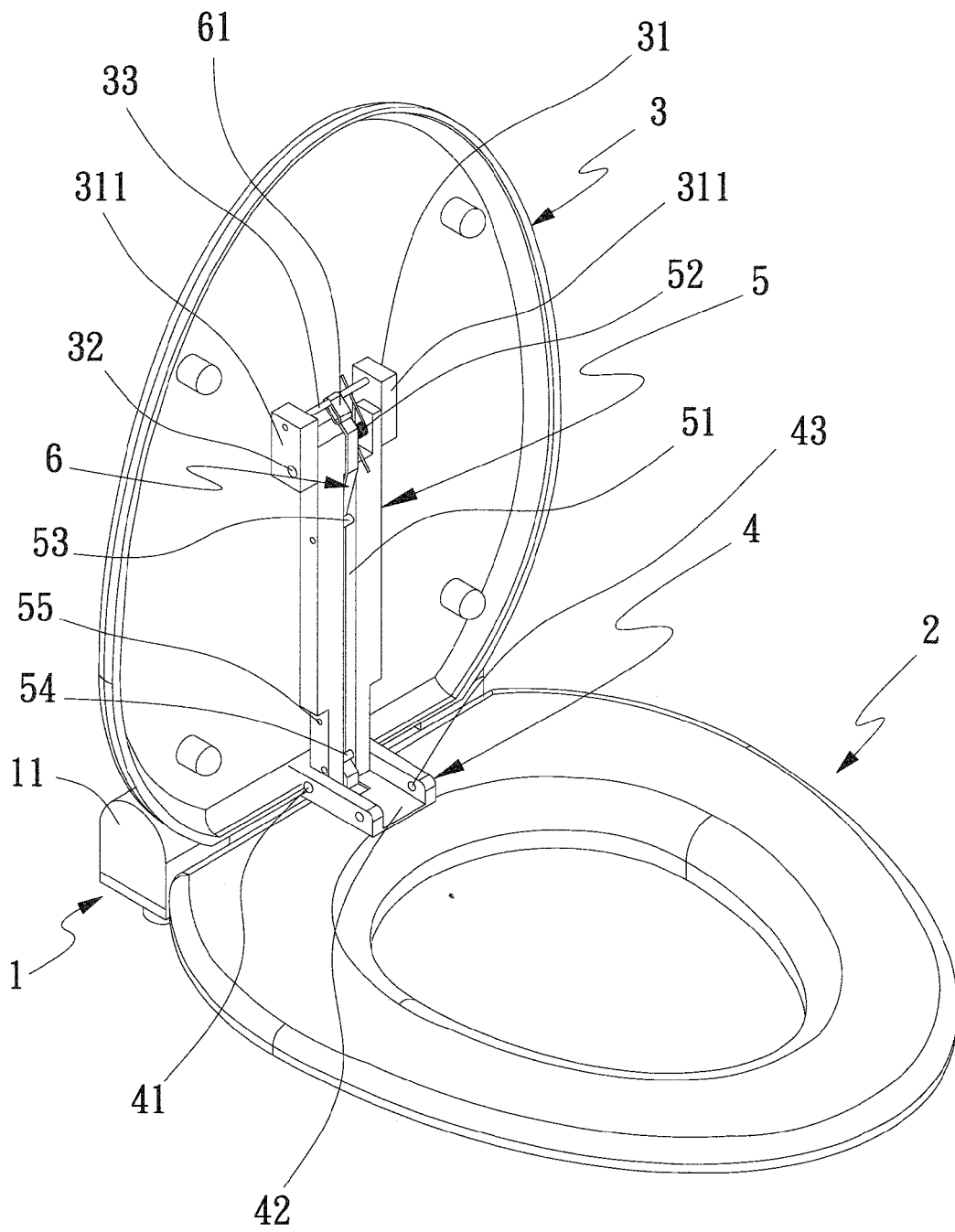


Fig. 1

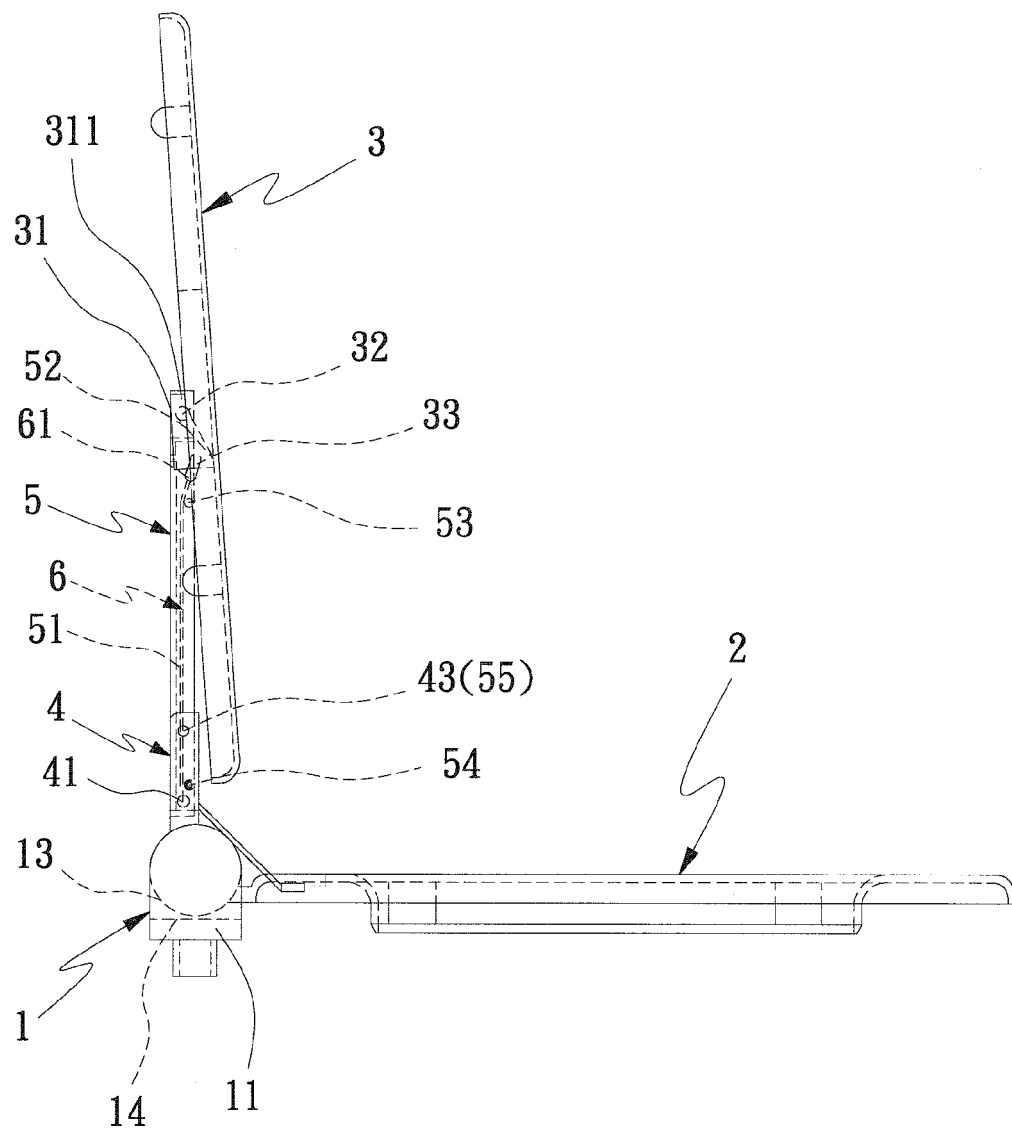


Fig. 2

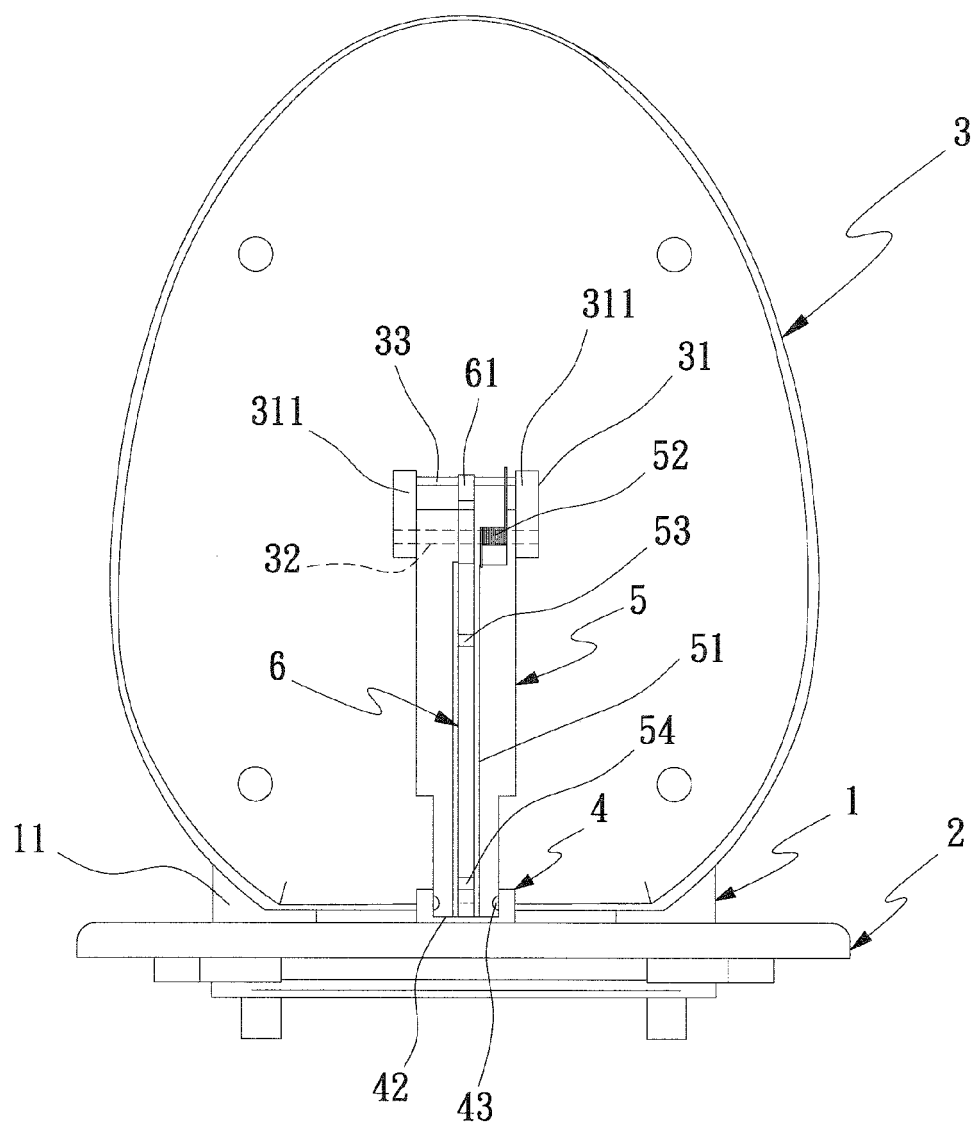


Fig. 3

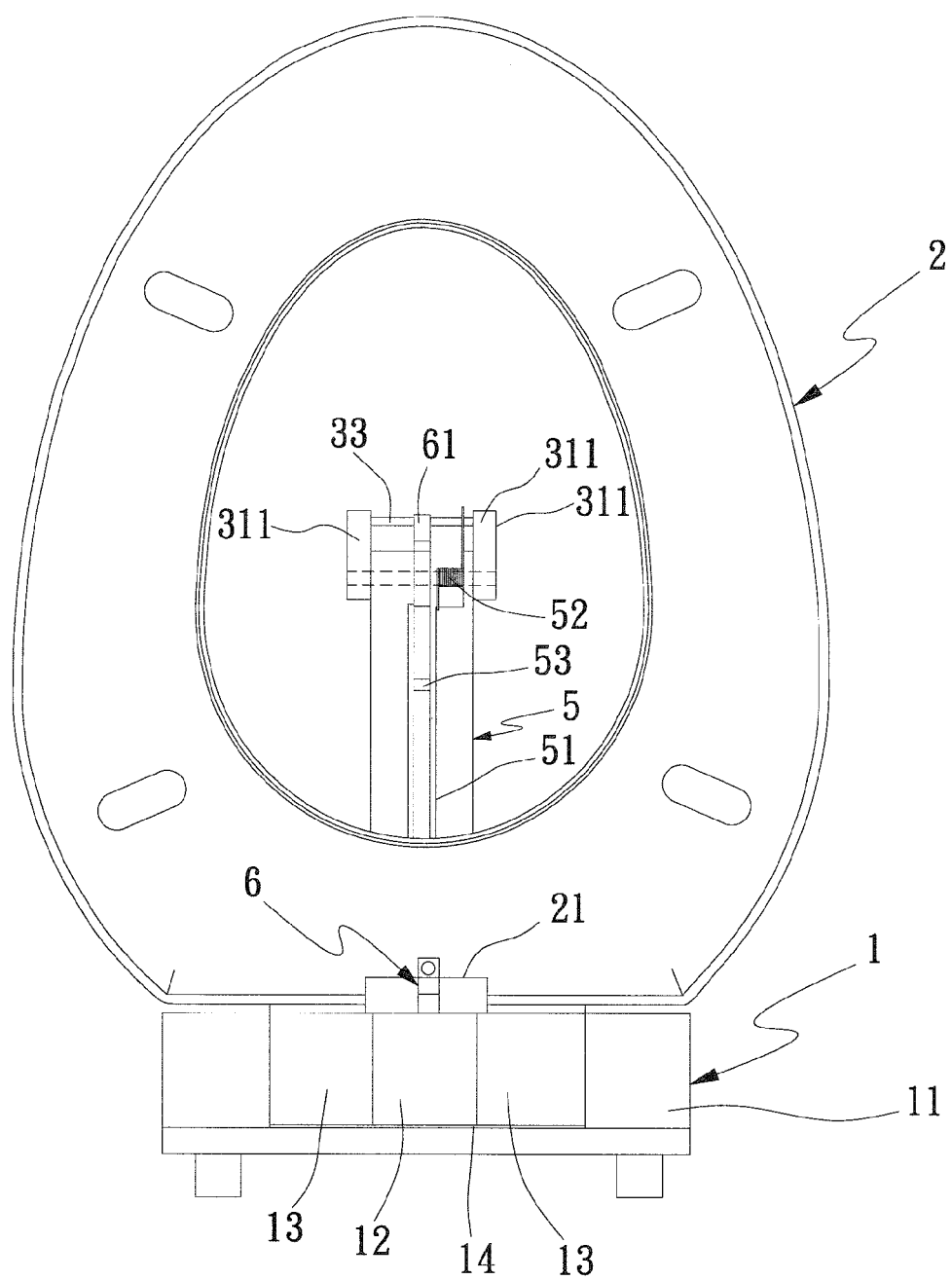


Fig. 4

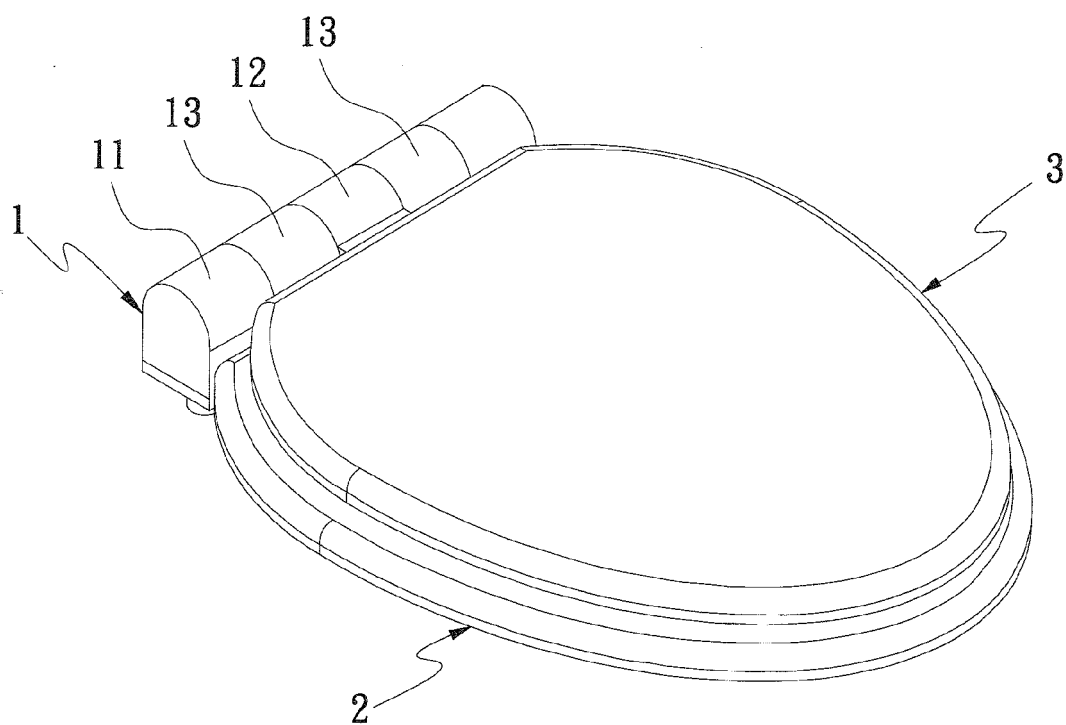


Fig. 5

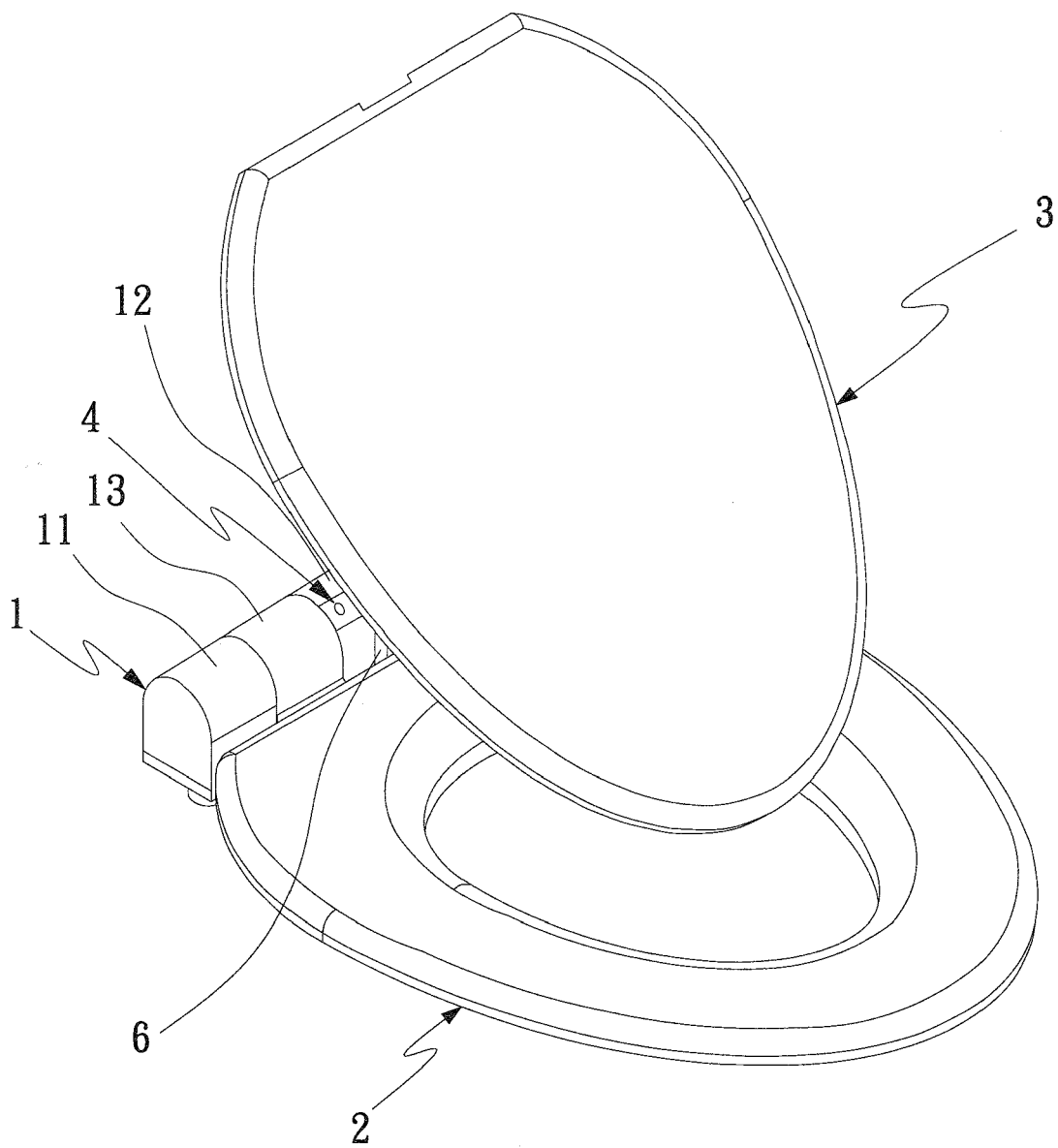


Fig. 6

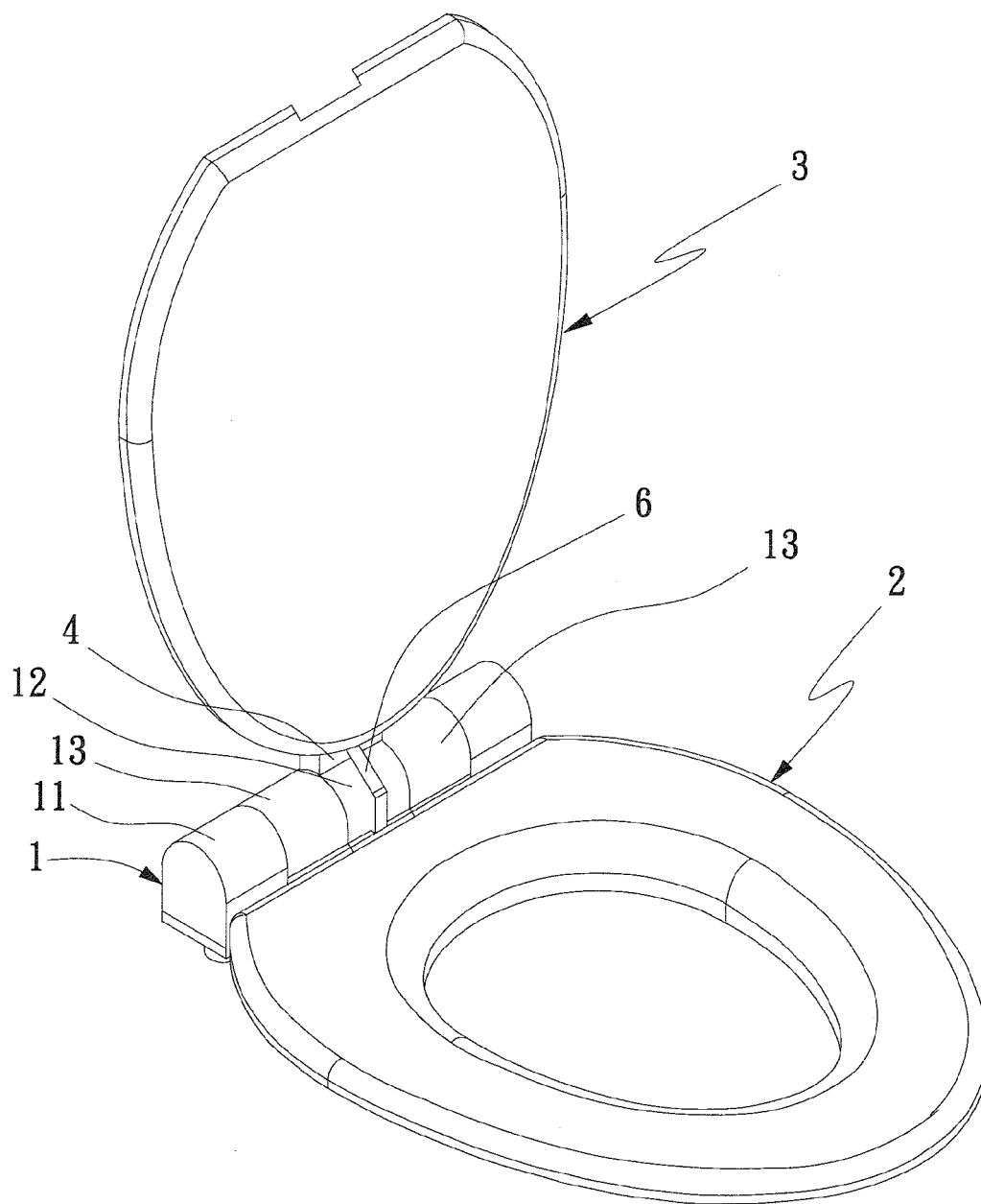


Fig. 7

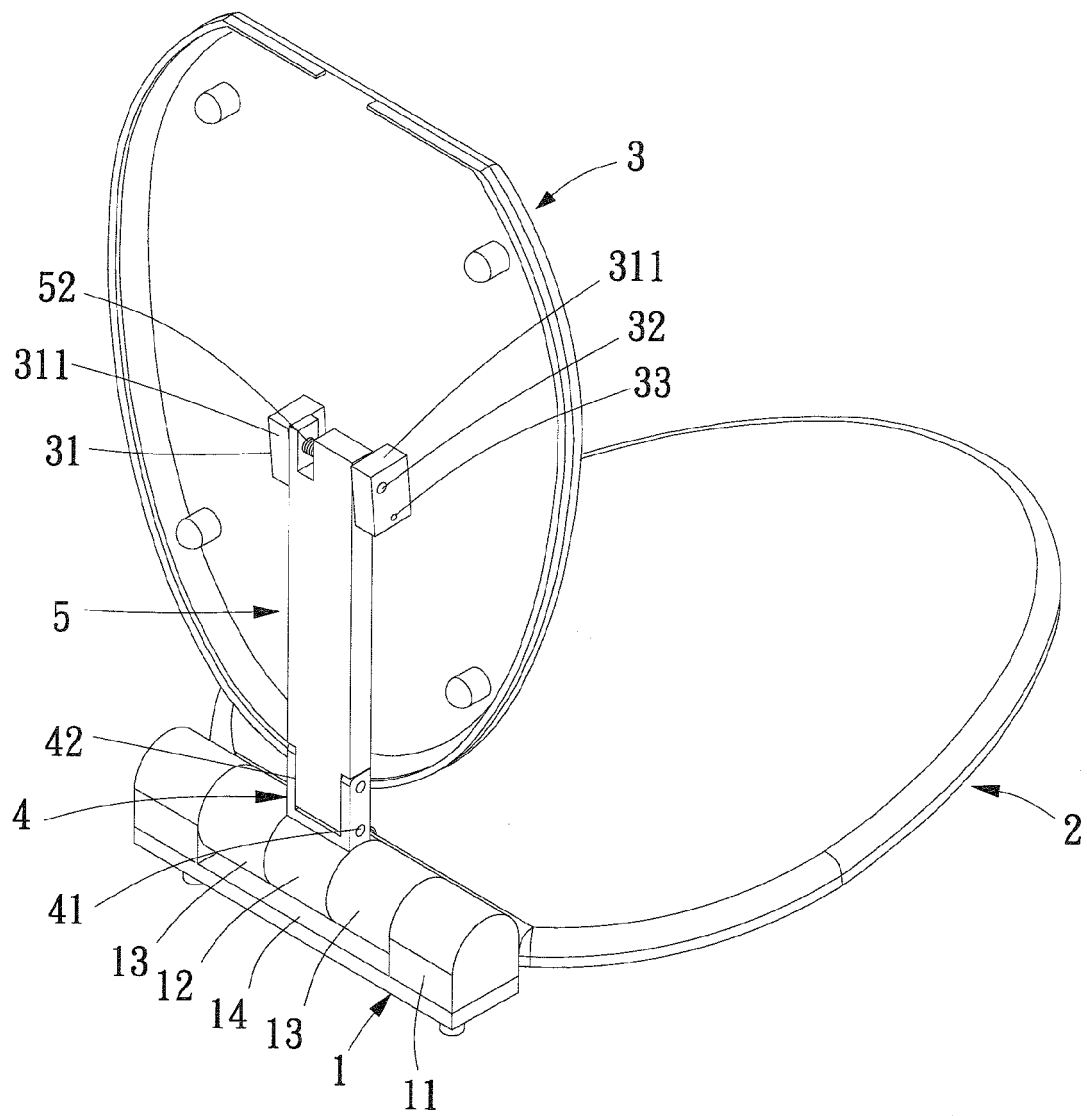


Fig. 8

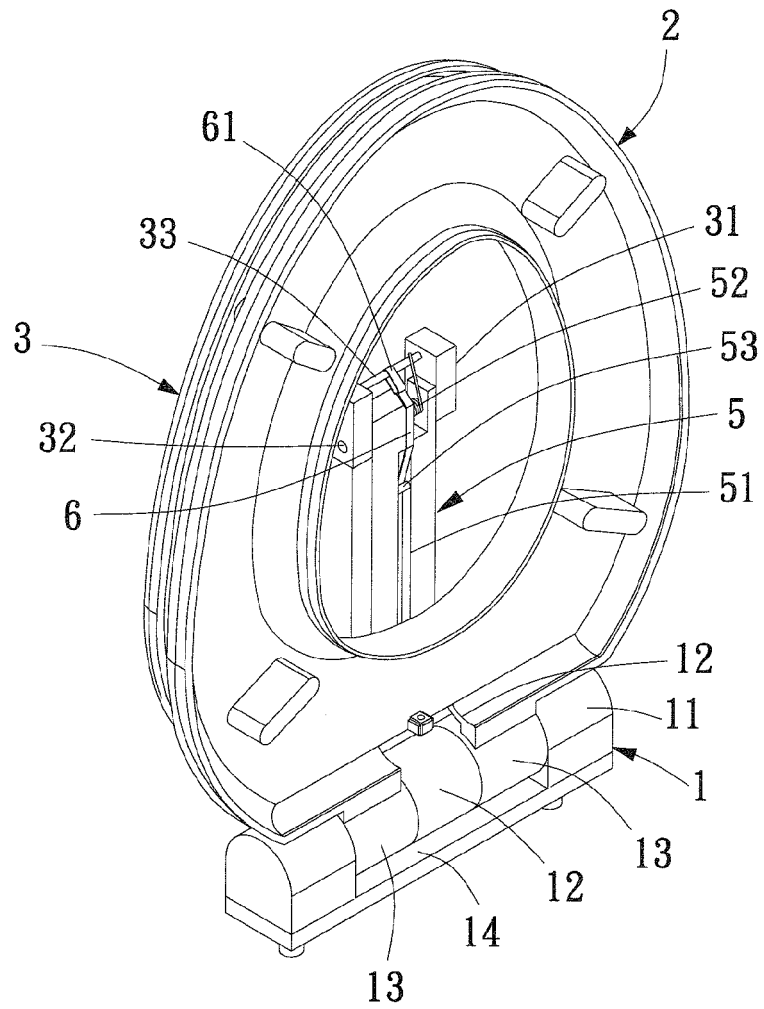


Fig. 9

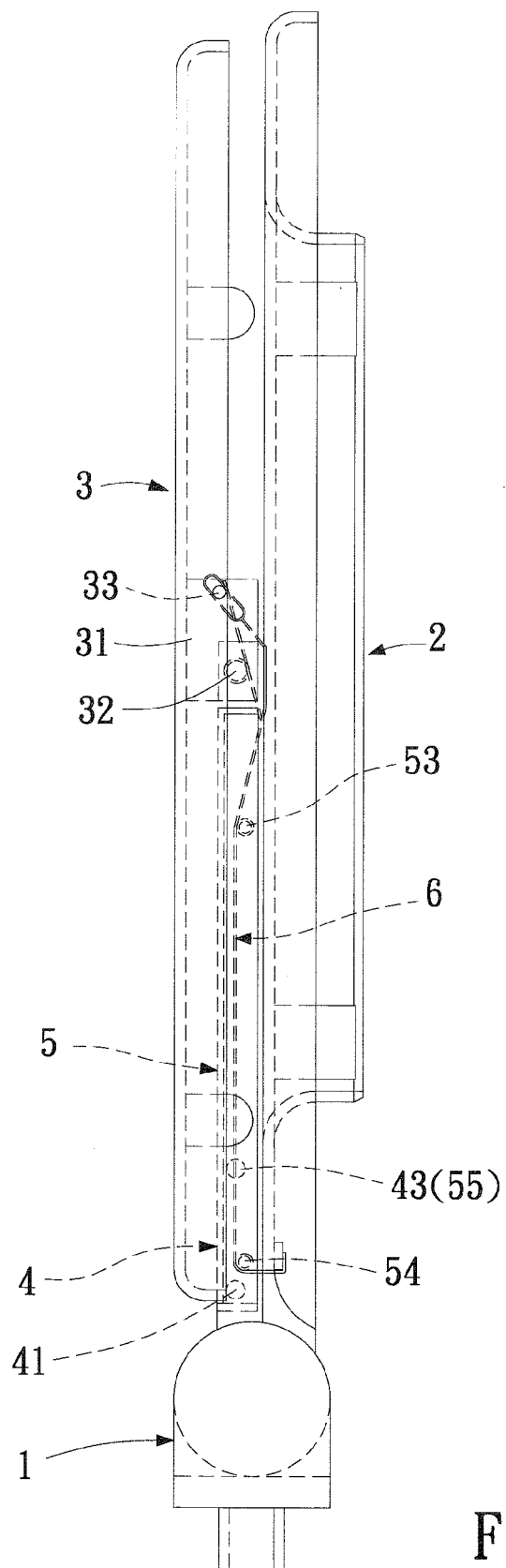


Fig. 10



EUROPEAN SEARCH REPORT

Application Number
EP 09 16 1925

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	JP 07 111959 A (MATSUSHITA ELECTRIC WORKS LTD) 2 May 1995 (1995-05-02) * paragraph [0010] - paragraph [0022]; figures 1,3-9 *	1	INV. A47K13/10
X	US 2 219 044 A (HARR ARTHUR F) 22 October 1940 (1940-10-22) * page 1, column 1, line 10 - page 2, column 2, line 12; figures 1-4 *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			A47K
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 13 November 2009	Examiner Lopes, Claudia
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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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 09 16 1925

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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13-11-2009

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
JP 7111959	A	02-05-1995	NONE	

US 2219044	A	22-10-1940	NONE	
