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(54)

Tissue paper box with automatic lid

(57)

A tissue paper box with automatic lid includes a case (1), a lid (2) pivotally disposed on a top of a rear wall (13) of the case, and at least one induction device (4) disposed on fringe of the lid, preferably IR sensors. The rear wall of the case is hollow for receiving a driving mechanism (51), a deceleration mechanism (52), a circuit board (53), and a power supply (54). When the in-

duction device detects objects approaching, the circuit board triggers a pivot axle to rotate via the deceleration mechanism to lift the lid up. Specifically, the pivot axle, the driving mechanism, the deceleration mechanism, the circuit board, and the power supply are arranged on a same plane parallel to the rear wall to reduce volume.

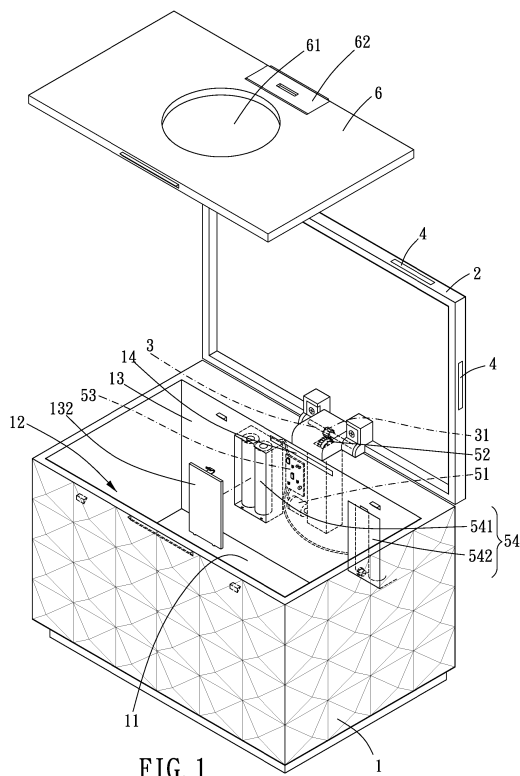


FIG. 1

Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a tissue paper box, more especially to a tissue paper box with automatic lid.

Description of the Prior Art

[0002] A conventional tissue paper box or tissue paper holder is usually formed with a through hole on its top for the tissue paper inside to penetrate. However, the most upper sheet of tissue paper is exposed out of the tissue box and may be contaminated.

[0003] Patent TW M416437 disclosed a tissue paper box having a lid to conceal the tissue paper. However, it is inconvenient that the lid has to be lifted manually. Furthermore, the lid may be contaminated by users' hands. On the other hand, it is also inconvenient that a user has to lift the lid by one hand and to take the tissue paper by the other hand.

SUMMARY OF THE INVENTION

[0004] The main object of the present invention is to provide a tissue paper box with automatic lid which looks like an ordinary tissue box.

[0005] To achieve the above and other objects, the tissue paper box with automatic lid of the present invention includes a case, a lid, and at least one induction devices.

[0006] The case has a bottom and an opening remote from the bottom. The case further has a rear wall. The lid is pivotally disposed on an upper fringe of the rear wall with a pivot axle. The lid is able to pivot to close the opening of the case. The induction device is disposed on an outer surface of one of the case and the lid. When the induction device detects objects approaching, the induction device triggers the lid to lift and to pivot away from the opening of the case.

[0007] Specifically, the rear wall of the case has a predetermined thickness and is at least partially hollow to form a receiving room inside. A driving mechanism, a deceleration mechanism, a circuit board, and a power supply are disposed in the receiving room. The driving mechanism is electrically connected with the circuit board and the power supply and is mechanically connected with the deceleration mechanism. The deceleration mechanism is mechanically connected with a driving portion of the pivot axle. The induction device is electrically connected with the power supply and the circuit board. When detecting objects approaching, the induction device sends a signal to the circuit board, and the circuit board further triggers the driving mechanism to drive the driving portion to rotate via the deceleration mechanism. Thereafter, the pivot axle is rotated to lift the lid up. Specifically,

the pivot axle, the driving mechanism, the deceleration mechanism, and the power supply are arranged substantially on a predetermined plane which is perpendicular to the bottom of the case and is parallel to the rear wall.

[0008] Thereby, the mechanisms to control the lid lifting automatically are arranged on a same plane to be received in the rear wall so that the mechanisms are entirely concealed. Thus, volume of the case may not be increased by the mechanisms. In addition, due to the automatic lid, users don't have to lift the lid up by hands so as to improve sanitation.

[0009] The present invention will become more obvious from the following description when taken in connection with the accompanying drawings, which show, for purpose of illustrations only, the preferred embodiment(s) in accordance with the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010]

Fig. 1 is a breakdown drawing of the present invention;

Fig. 1A is a stereogram showing a lid of the present invention;

Fig. 2 is a stereogram of the present invention;

Fig. 3 is a profile of the present invention when the lid is closed;

Fig. 4 is a profile of the present invention when the lid is lifted.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0011] Please refer to Fig. 1 to Fig. 4, the tissue paper box with automatic lid of the present invention includes a case 1, a lid 2, at least one induction device 4, a driving mechanism 51, a deceleration mechanism 52, a circuit board 53, and a power supply 54.

[0012] The case 1 has a bottom 11 and an opening 12 remote from the bottom. In other words, the opening 12 is formed at a top of the case 1. The case 1 further has a rear wall 13. In the present embodiment, the case 1 is a cuboid box and has two opposite side walls, a front wall, and the rear wall 13. The case encloses a space whose size corresponding to a common pack of tissue paper. The lid 2 is pivotally disposed on an upper fringe of the rear wall 13 of the case 1 by a pivot axle 3 so as to pivot with respect to the upper fringe of the rear wall 13 to alternatively cover the opening 12 of the case 1. The induction device 4 is disposed on an outer surface of one of the case 1 and the lid 2. When the detecting objects approaching, the induction device 4 triggers the lid 2 to lift and to move away from the opening 12. In the present embodiment, a plurality of induction devices 4 are provided. The induction devices 4 are spacedly arranged on fringe of the lid 2. The induction devices 4 are oriented toward at least two different directions respec-

tively so as to detect objects which approach by at least two different directions. More specifically, the induction devices 4 are oriented at least forward and toward two sides of the lid 2. Thereby, users approaching by any direction can be detected by the induction devices 4. In practice, the induction devices are preferably IR sensors.

[0013] Specifically, the rear wall 13 of the case 1 has a predetermined thickness and is at least partially hollow to form a receiving room 131 inside. The driving mechanism 51, the deceleration mechanism 52, the circuit board 53, and the power supply 54 are disposed in the receiving room 131. In addition, the pivot axle 3, the driving mechanism 51, the deceleration mechanism 52, the circuit board 53, and the power supply 54 are arranged on a predetermined plane which is perpendicular to the bottom 11 of the case 1 and is parallel to the rear wall 13 so that the thickness of the rear wall 13 can be reduced as more as possible. Thus, volume of the tissue paper box can be reduced, and mechanisms for controlling the lid can be concealed. In the major embodiment, the driving mechanism 51 is a motor. The driving portion 31 of the pivot axle 3 includes a plurality of teeth arranged around a longitudinal direction of the pivot axle 3. The deceleration mechanism 52 includes at least one gear wheel to engage with the teeth. The gear wheel rotates by a direction parallel to the rotation direction of the driving portion 31. The power supply 54 includes two battery boxes 541, 542 located at two sides of the circuit board 53 respectively. Detachable covers 132 corresponding to the two battery boxes 541, 542 are disposed on inner surface of the rear wall 13 for battery replacing.

[0014] The driving mechanism 51 is electrically connected with the circuit board 53 and the power supply 52, and is mechanically connected with the deceleration mechanism 52. The deceleration mechanism 52 is mechanically connected (e.g. engaged) with a driving portion 31 of the pivot axle 3. The induction device 4 is electrically connected with the power supply 54 and the circuit board 53. When detecting objects approaching, the induction device 4 sends a signal to the circuit board 53, and the circuit board 53 further triggers the driving mechanism 51 to drive the driving portion 31 to rotate via the deceleration mechanism 52. Thereafter, the pivot axle 3 is rotated to lift the lid 2 up.

[0015] Furthermore, the tissue paper box of the present invention includes a shielding plate 6. The shielding plate 6 is detachably disposed in the case 1 near the opening 12. The shielding plate 6 is formed with a through hole 61 at a central portion thereof for tissue paper to penetrate. The shielding plate 6 further has at least one positioning portion 62 at a fringe thereof. The case 1 has restriction portion 14 corresponding to the positioning portion 62 on the inner surface of the case 1. The positioning portion 62 is able to engage with the restriction portion 14 so that the shielding plate 6 can be positioned at a position which is distant from the bottom 11 of the case a predetermined length. Thereby, the shielding plate 6 can not be removed from the case 1 freely. Spe-

cifically, the shielding plate 6 is substantially parallel to the bottom 11 of the case 1. In the present embodiment, the positioning portion 62 includes an elastic element 621 and a protruding member 622, as shown in Fig. 1A. The restriction portion 14 is a recess. The elastic element 621 provides elastic force to the protruding member 622 so that the protruding member 622 tends to abut against the recess. Thereby, the shielding plate 6 is positioned, and the tissue paper pack inside the case is prevented from being lifted when a user pulls the tissue paper out.

[0016] On the other hand, in the preferred embodiment, to automatically close the lid, the circuit board is able to trigger the driving mechanism to driving the driving portion to rotate reversely via the deceleration mechanism when the lid has been lifted for a predetermined period of time. Thus, users don't have to close the lid manually. Besides, if the induction device detects objects continuously, the induction device continuously sends signals to the circuit board to prevent the circuit board from driving the lid to close.

[0017] In conclusion, the tissue paper box with automatic lid of the present invention looks like an ordinary tissue paper box and has reduced volume. Furthermore, the present invention has a lid automatically lifting or closing. As a result, the tissue paper is prevented from being contaminated.

Claims

1. A tissue paper box with automatic lid, including:

a case (1), having a bottom (11) and an opening (12) remote from the bottom (11), the case (1) further having a rear wall (13);
a lid (2), pivotally disposed on an upper fringe of the rear wall (13) of the case (1) with a pivot axle (3), the lid (2) being pivotable with respect to the upper fringe of the rear wall (13), the lid (2) being able to pivot to close the opening (12) of the case (1);
at least one induction device (4), disposed on an outer surface of one of the case (1) and the lid (2), the induction device (4) triggering the lid (2) to open when detecting objects approaching; wherein the rear wall (13) of the case (1) has a predetermined thickness and is at least partially hollow to form a receiving room (131) therein, a driving mechanism (51), a deceleration mechanism (52), a circuit board (53), and a power supply (54) are disposed in the receiving room (131), the driving mechanism (51) is electrically connected with the circuit board (53) and the power supply (54) and is mechanically connected with the deceleration mechanism (52), the deceleration mechanism (52) being mechanically connected with a driving portion (31) of the pivot axle (3), the induction

- device (4) is electrically connected with the power supply (54) and the circuit board (53), the induction device (4) sends a signal to the circuit board (53) when detecting objects approaching, the circuit board (53) further triggers the driving mechanism (51) to drive the driving portion (31) to rotate via the deceleration mechanism (52), the pivot axle (3) is further rotated by the driving portion (31) to lift the lid (2) up, the pivot axle (3), the driving mechanism (51), the deceleration mechanism (52), the circuit board (53), and the power supply (54) are arranged substantially on a same predetermined plane, the predetermined plane is perpendicular to the bottom (11) of the case (1) and is parallel to the rear wall (13) of the case (1).
2. The tissue paper box with automatic lid of claim 1, wherein the driving portion (31) of the pivot axle (3) includes a plurality of teeth arranged around a longitudinal direction of the pivot axle (3), the deceleration mechanism (52) includes at least one gear wheel which rotates by a direction parallel to a rotation direction of the driving portion (31).
 3. The tissue paper box with automatic lid of claim 1, wherein the power supply (54) includes two battery boxes (541, 542) located at two sides of the circuit board (53) respectively.
 4. The tissue paper box with automatic lid of claim 1, wherein the driving mechanism (51) is a motor.
 5. The tissue paper box with automatic lid of claim 1, including a plurality of induction devices (4), the induction devices (4) being spacedly arranged on a fringe of the lid (2), the induction devices (4) being oriented toward at least two different directions to detect objects approaching from at least two different directions.
 6. The tissue paper box with automatic lid of claim 1, further including a shielding plate (6), the shielding plate (6) being detachably disposed in the case (1) near the opening (12), the shielding plate (6) being formed with a through hole (61) at a central portion thereof for tissue paper to penetrate through, at least one positioning portion (62) being disposed at a fringe of the shielding plate (6), at least one restriction portion (14) being formed on an inner wall of the case (1) wherein the restriction portion (14) corresponds to the positioning portion (62), the positioning portion (62) being able to engage with the restriction portion (14) so that the shielding plate (6) is positioned at a position distant from the bottom (11) of the case (1) in a predetermined distance to prevent the shielding plate (6) from being removed from the case (1), the shielding plate (6) being substantially parallel to the bottom (11) of the case (1).
 7. The tissue paper box with automatic lid of claim 6, wherein the positioning portion (62) includes an elastic element (621) and a protruding member (622), the restriction portion (14) is a recess, the elastic element (621) provides elastic force to the protruding member (622) so that the protruding member (622) tends to abut against a bottom of the recess.
 8. The tissue paper box with automatic lid of claim 1, wherein the circuit board (53) is able to automatically trigger the driving portion (31) to rotate reversely via the deceleration mechanism (52) to close the lid (2) when the lid (2) has been lifted for a predetermined period of time.

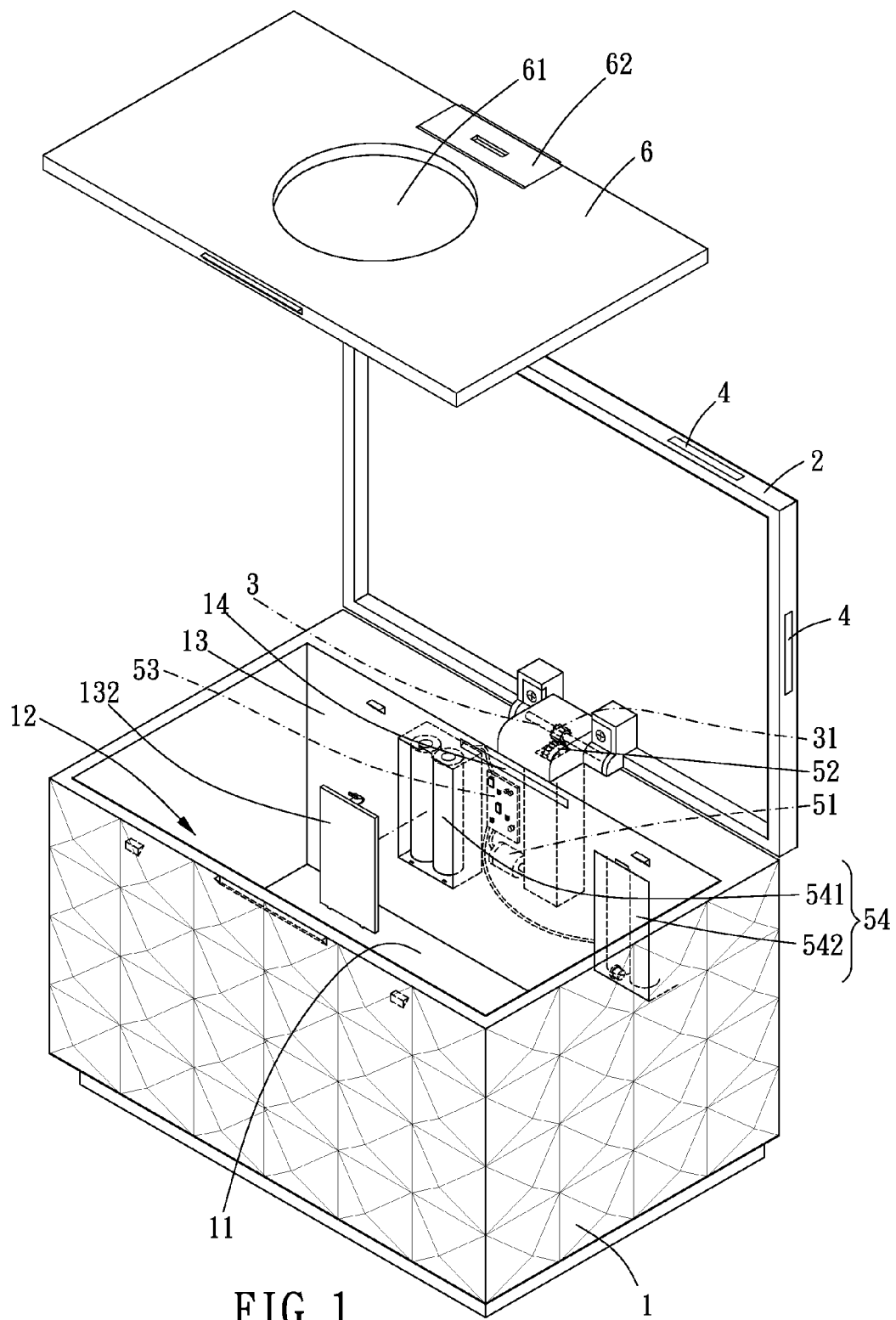


FIG. 1

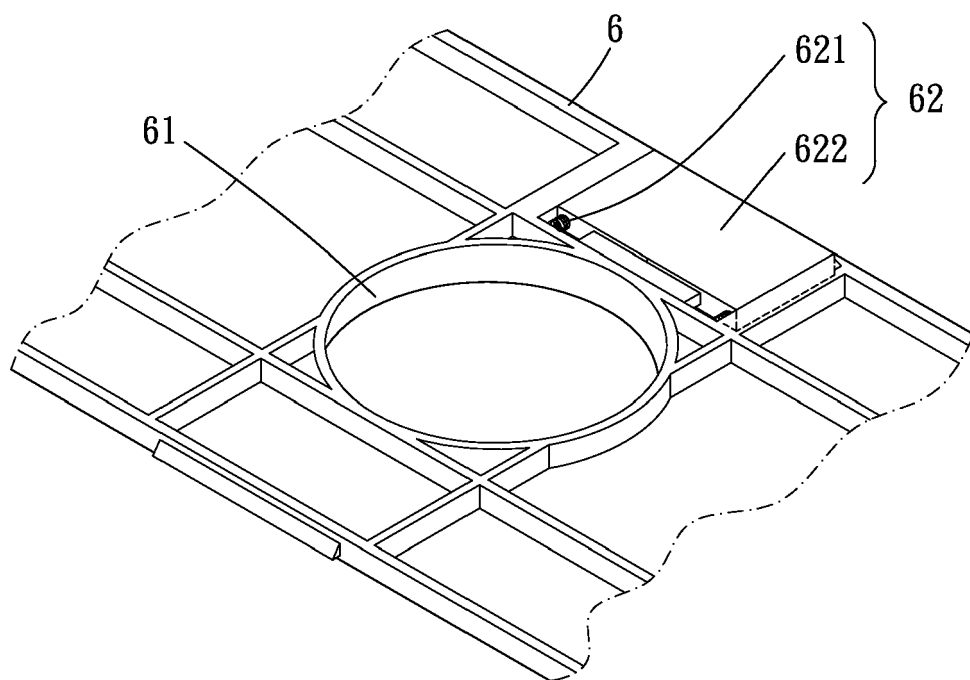


FIG. 1A

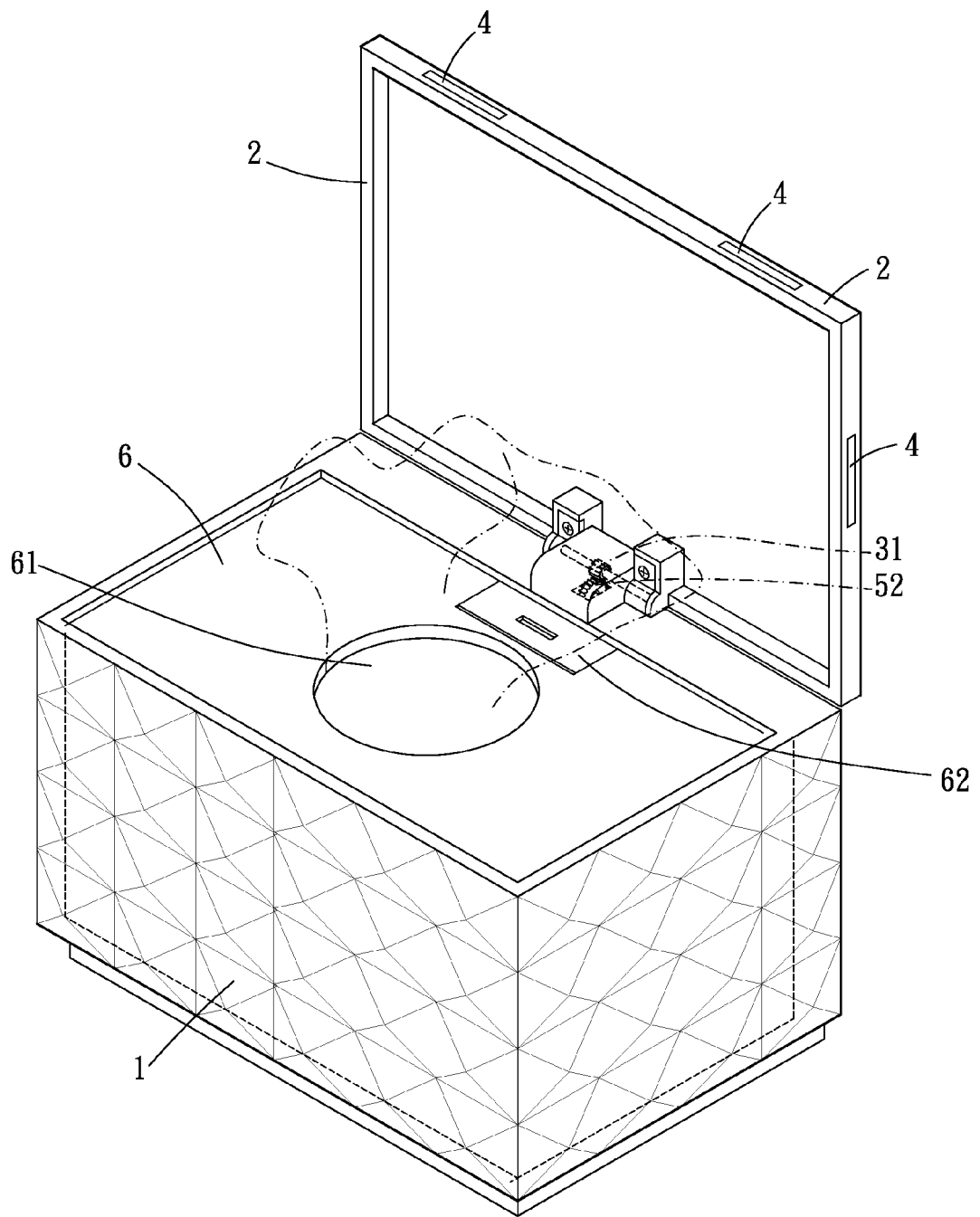


FIG. 2

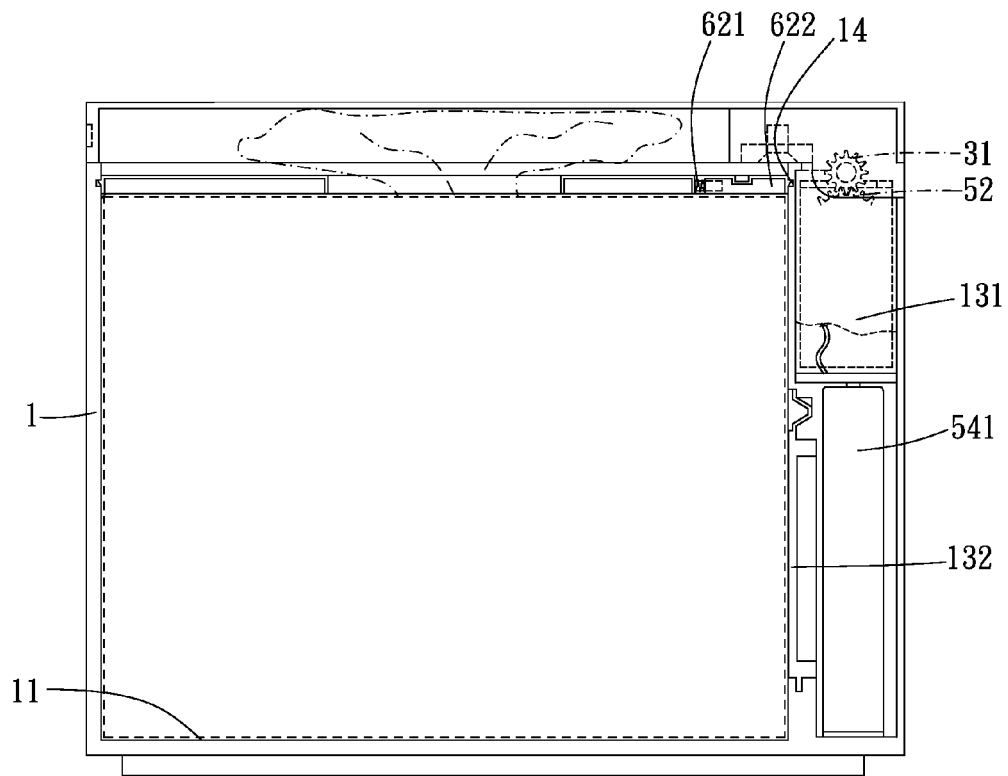


FIG. 3

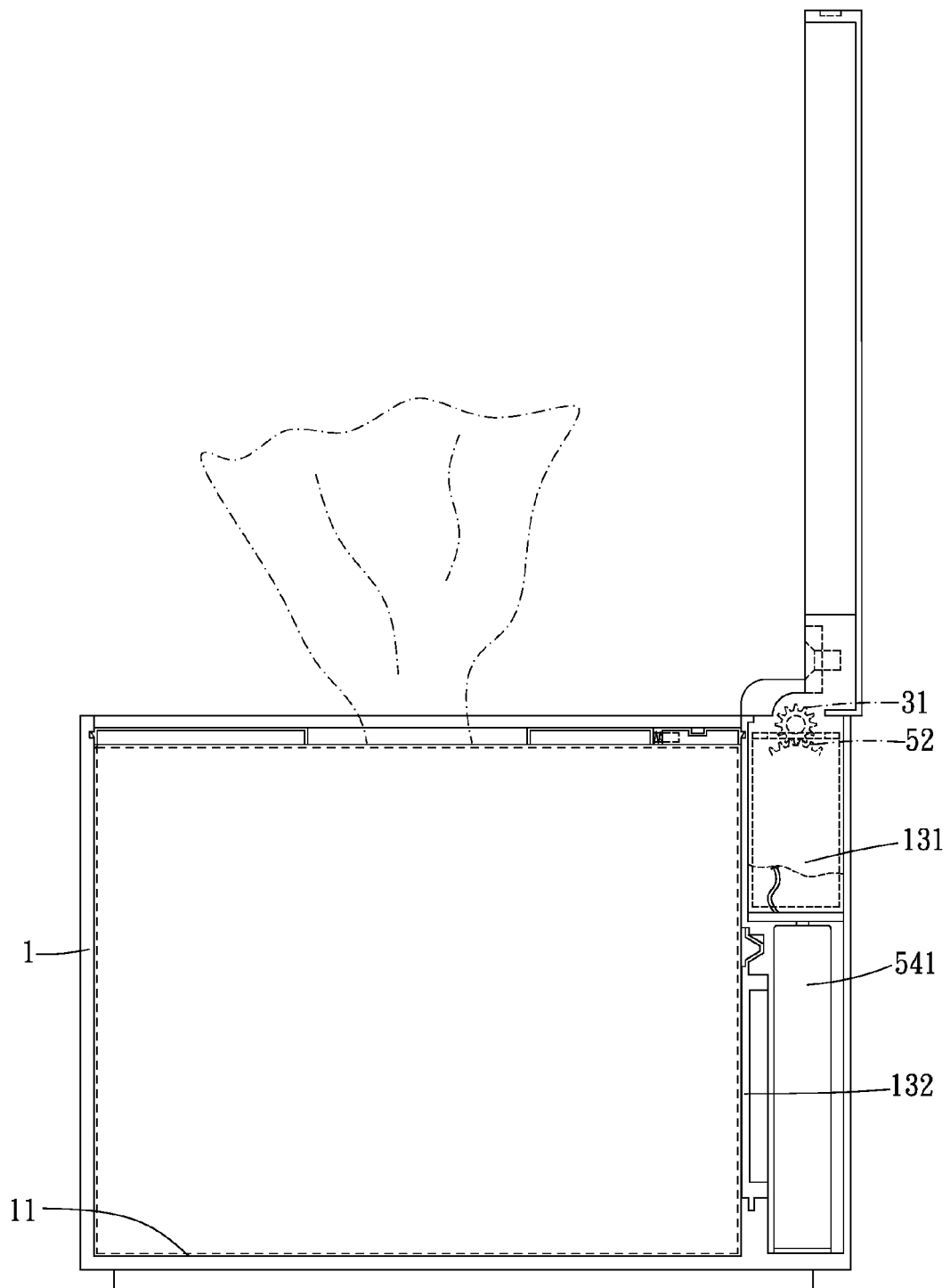


FIG. 4



EUROPEAN SEARCH REPORT

Application Number
EP 13 17 7332

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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X	CN 2 635 560 Y (MA JIANGUO [CN]) 25 August 2004 (2004-08-25) * the whole document *	1,2,4,8	
X	US 6 334 542 B1 (HSU CHI-MING [TW]) 1 January 2002 (2002-01-01) * column 1, line 46 - column 2, line 44; figures 1-5 *	1,2,4	
A	DATABASE WPI Week 200117 Thomson Scientific, London, GB; AN 2001-163190 XP002717405, -& JP 2001 002102 A (TOPPAN PRINTING CO LTD) 9 January 2001 (2001-01-09) * abstract; figures *	1,6,7	TECHNICAL FIELDS SEARCHED (IPC) A47K B65D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 6 December 2013	Examiner Zuurveld, Gerben
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 13 17 7332

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06-12-2013

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

REFERENCES CITED IN THE DESCRIPTION

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