



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
24.02.2021 Bulletin 2021/08

(51) Int Cl.:
B65F 1/16 (2006.01)

(21) Application number: **20189474.8**

(22) Date of filing: **04.08.2020**

(84) Designated Contracting States:
**AL 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 RS SE SI SK SM TR**
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(71) Applicant: **Shek, Michael**
San Mateo, CA 94404 (US)

(72) Inventor: **Shek, Michael**
San Mateo, CA 94404 (US)

(74) Representative: **Lang, Christian**
LangPatent Anwaltskanzlei IP Law Firm
Ingolstädter Straße 5
80807 München (DE)

(30) Priority: **14.08.2019 TW 108210695 U**

(54) **AUTOMATICALLY ACTUATED GARBAGE BIN LID**

(57) An inductive garbage bin lid for being disposed on a barrel (3) includes a main body (1) and an opening system (2). The opening system is arranged on the main body and includes a lid (21), a processing unit (22), a lighting unit (25), and a driving unit (26). The lid covers the opening at a normal state. The sensing unit (23) and the lighting unit are electrically connected to the processing unit respectively. The driving unit electrically connects the processing unit and the lid therebetween. When an object is detected by the sensing unit, the sensing unit sends an actuating signal to the processing unit to further actuate the driving unit to drive the lid to open to leave the opening. The processing unit selectively actuates the lighting unit to light at different lighting modes.

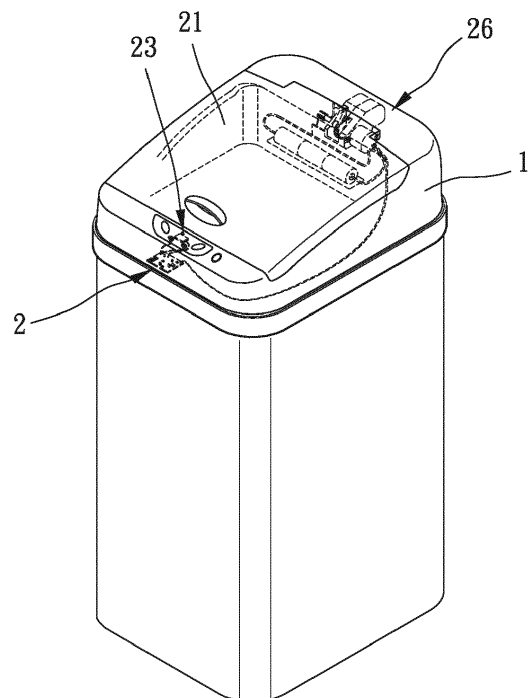


FIG. 1

Description**BACKGROUND OF THE INVENTION**

Field of the Invention

[0001] The present invention relates to a garbage bin, more especially to an actuating garbage bin lid.

Description of the Prior Art

[0002] A garbage bin is usually used to collect garbage, and a lid is often used to block the odor or to prevent flies or other insects from entering the garbage bin. However, when the user is holding object to be difficult to open the lid or the user doesn't want to touch the lid, an automatic lid can solve the problem.

[0003] However, it is inconvenient that the inductive lid sometimes closes wrongly during using.

SUMMARY OF THE INVENTION

[0004] The main object of the present invention is to provide an inductive garbage bin lid whose lighting unit can light at different lighting modes to make the user notice whether he is inside the sensing area in order to prevent the lid from closing wrongly.

[0005] To achieve the above and other objects, the inductive garbage bin lid of the present invention is for being disposed on a barrel. A receiving space is defined between the inductive garbage bin lid and the barrel. The inductive garbage bin lid includes a main body and an opening system.

[0006] The main body is formed with an opening for communicating the receiving space. The opening system is arranged on the main body and includes a lid, a processing unit, a lighting unit, and a driving unit. The lid is disposed on the main body to cover the opening at a normal state. The sensing unit and the lighting unit are electrically connected to the processing unit respectively. The driving unit electrically connects the processing unit and the lid therebetween. When an object is detected by the sensing unit in a sensing area, the sensing unit sends an actuating signal to the processing unit, the processing unit actuates the driving unit to drive the lid to open to leave the opening after received the actuating signal. The processing unit also actuates the lighting unit to light at a first lighting mode. When the opening is not covered by the lid and no object is detected by the sensing unit in the sensing area, the processing unit actuates the lighting unit to light at a second lighting mode different from the first lighting mode.

[0007] 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**[0008]**

- 5 Fig. 1 is a stereogram of the present invention;
Fig. 2 is an illustration showing an electrical connection of the present invention;
Fig. 3 is an illustration showing a sensing area of the present invention;
10 Fig. 4 is an illustration showing a lid opening of the present invention;
Fig. 5 is a partial enlargement of Fig. 4;
Fig. 6 is an illustration showing an object leaving a sensing area of the present invention;
15 Fig. 7 is a partial enlargement of Fig. 6.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

- 20 **[0009]** Please refer to Fig. 1 to Fig. 7, the inductive garbage bin lid of the present invention is adapted for being disposed on a barrel 3 wherein a receiving space 31 is defined between the inductive garbage bin lid and the barrel 3. The inductive garbage bin lid includes a main
25 body 1 and an opening system 2.

- [0010]** The main body 1 is formed with an opening 11 communicating the receiving space 31. The opening system 2 is disposed on the main body 1 and includes a lid 21, a processing unit 22, a sensing unit 23, a lighting unit 25, and a driving unit 26. The lid 21 is disposed on the
30 main body 1 and covers the opening 11 at a normal state. The sensing unit 23 and the lighting unit 25 are electrically connected to the processing unit 22 respectively. The driving unit 26 electrically connects the processing unit 22 and the lid 21 therebetween.

- [0011]** When the sensing unit 23 detected an object in a sensing area 24, the sensing unit 23 sends an actuating signal to the processing unit 22. When the processing unit 22 received the actuating signal, it actuates the driving unit 26 to drive the lid 21 to open to leave the opening 11. At the same time, the processing unit 22 actuates the lighting unit 25 lights at a first lighting mode. When the lid 21 doesn't cover the opening 11, and the sensing unit 23 didn't detect an object in the sensing area 24, the processing unit 22 will actuate the lighting unit 25 lights at a second lighting mode different from the first lighting mode.
35

- [0012]** When the user wants to drop garbage in a longer period of time, such as cutting something continuously, sorting large amount of garbage, or cutting nails, the lid 21 has to open for a longer period of time, and the user perhaps moves. Because the lighting unit 25 lights at different lighting modes, the user can acknowledge if he leaves the sensing area 24 to prevent the lid 21 from closing. In addition, the sensing area 24 is fan-shaped and has a maximum sensing distance of 40 cm. If it is necessary to make the lid 21 keep opening, the user should keep inside the sensing area 24 as possible.
40
45
50
55

[0013] Preferably, the lighting unit 25 lights continuously at the first lighting mode, and the lighting unit 25 flickers at the second lighting mode. The difference between the two lighting modes is obvious, so the users in any ages can distinguish. Thus, the lighting modes are suitable for the default settings. In other words, the user can acknowledge that he has left the sensing area 24 to result the lid 21 to close the opening 11 when he saw the lighting unit flickering. However, the lighting modes can be changed for different situations.

[0014] Preferably, the lighting unit 25 lights in a first color at the first lighting mode, and the lighting unit 25 lights in a second color at the second lighting mode. The second color is different from the first color. Human eyes are sensitive to colors, so the changing of colors can easily make the user notice the difference.

[0015] More preferably, the first color and the second color are contrast colors to make the change of colors more obvious in order to call the user's attention.

[0016] In the present embodiment, the first color is green, and the second color is red. When the user is inside the sensing area 24 to open the lid 21, the lighting unit 25 lights in green continuously. When the user left the sensing area 24, the lighting unit 25 flickers in red. Specifically, the lighting unit 25 includes a first lighting element 251 and a second lighting element 252. The processing unit 22 actuates the first lighting element 251 to light at the first lighting mode and actuates the second lighting element 252 to light at the second lighting mode. More specifically, each of the first lighting element 251 and the second lighting element 252 is an LED light to have a longer life-time and stronger brightness.

[0017] Specifically, the opening system 2 further includes a timer unit 27 which is electrically connected to the processing unit 22. When the opening 11 is not covered by the lid 21, and the sensing unit 23 didn't detect any object in the sensing area 24, the lighting unit 25 will lights at the second lighting mode, and the processing unit 22 actuates the timer unit 27. When the timer unit 27 counts time to a specific time, the timer unit 27 feedbacks a closing signal to the processing unit 22. Thereby, the processing unit 22 actuates the driving unit 26 to drive the lid 21 to close to cover the opening 11.

[0018] Preferably, the specific time is smaller than or equal to 10 seconds. Thereby, When the user left the sensing area, the lid 21 can close in a short period of time to prevent flies from entering the receiving space 31 and to prevent pets from touching the garbage in the receiving space 31. In the present embodiment, the specific time is 5 seconds. That is, the lid 21 will close after the lighting unit 25 flickers in red in 5 seconds.

[0019] During the timer unit 27 counting time, if the sensing unit 23 detected an object in the sensing area 24, the processing unit 22 stops the timer unit 27 to make it back to the original state. At the same time, the lighting unit 25 is back to the first lighting mode (lighting in green continuously), and the lid 21 is kept opening.

[0020] In conclusion, the two lighting modes of the

lighting unit of the present invention can make the user easily acknowledge whether he is inside the sensing area or not to prevent the lid from closing when using.

Claims

1. An inductive garbage bin lid, for being disposed on a barrel (3), a receiving space (31) being defined between the inductive garbage bin lid and the barrel (3), the inductive garbage bin lid including:

a main body (1), formed with an opening (11) for communicating the receiving space (31);
 an opening system (2), arranged on the main body (1), including a lid (21), a processing unit (22), a sensing unit (23), a lighting unit (25), and a driving unit (26), the lid (21) being disposed on the main body (1) to cover the opening (11) at a normal state, the sensing unit (23) and the lighting unit (25) being electrically connected to the processing unit (22) respectively, the driving unit (26) electrically connecting the processing unit (22) and the lid (21) therebetween; when an object is detected by the sensing unit (23) in a sensing area (24), the sensing unit (23) sending an actuating signal to the processing unit (22), the processing unit (22) actuating the driving unit (26) to drive the lid (21) to open to leave the opening (11) after received the actuating signal, the processing unit (22) also actuating the lighting unit (25) to light at a first lighting mode; when the opening (11) is not covered by the lid (21) and no object is detected by the sensing unit (23) in the sensing area (24), the processing unit (22) actuating the lighting unit (25) to light at a second lighting mode different from the first lighting mode.

2. The inductive garbage bin lid of claim 1, wherein the lighting unit (25) includes a first lighting element (251) and a second lighting element (252), the processing unit (22) actuates the first lighting element (251) to light at the first lighting mode and actuates the second lighting element (252) to light at the second lighting mode.

3. The inductive garbage bin lid of claim 1, wherein the opening system (2) further includes a timer unit (27), the timer unit (27) is electrically connected to the processing unit (22); when the opening (11) is not covered by the lid (21) and no object is detected by the sensing unit (23) in the sensing area (24), the lighting unit (25) lights at the second lighting mode, the processing unit (22) actuates the timer unit (27) to count time; when the timer unit (27) counted time to a specific time, the timer unit (27) feedbacks a closing signal to the processing unit (22) to make the

processing unit (22) to actuate the driving unit (26) to drive the lid (21) to close to cover the opening (11).

4. The inductive garbage bin lid of claim 3, wherein during the timer unit (27) counting time, if the sensing unit (23) detected an object in the sensing area (24), the processing unit (22) stops the timer unit (27) to make the timer unit (27) back to an original state, the lighting unit (25) lights at the first lighting mode, and the lid (21) is kept opened. 5
10

5. The inductive garbage bin lid of claim 3, wherein the specific time is smaller than or equal to 10 seconds.

6. The inductive garbage bin lid of claim 1, wherein the lighting unit (25) lights continuously at the first lighting mode. 15

7. The inductive garbage bin lid of claim 6, wherein the lighting unit (25) flickers at the second lighting mode. 20

8. The inductive garbage bin lid of claim 1, wherein the lighting unit (25) lights in a first color at the first lighting mode, the lighting unit (25) lights in a second color at the second lighting mode, the first color is different from the second color. 25

9. The inductive garbage bin lid of claim 8, wherein the first color and the second color are contrast colors. 30

10. The inductive garbage bin lid of claim 4, wherein the lighting unit (25) includes a first lighting element (251) and a second lighting element (252), the processing unit (22) actuates the first lighting element (251) to light at the first lighting mode and actuates the second lighting element (252) to light at the second lighting mode; the lighting unit (25) lights continuously at the first lighting mode; the lighting unit (25) flickers at the second lighting mode; the lighting unit (25) lights in a first color at the first lighting mode, the lighting unit lights in a second color at the second lighting mode, the first color is green, the second color is red; each of the first lighting element (251) and the second lighting element (252) is an LED light; the specific time is 5 seconds; the sensing area (24) is fan-shaped; the sensing area (24) has a maximum sensing distance of 40 cm. 35
40
45

50

55

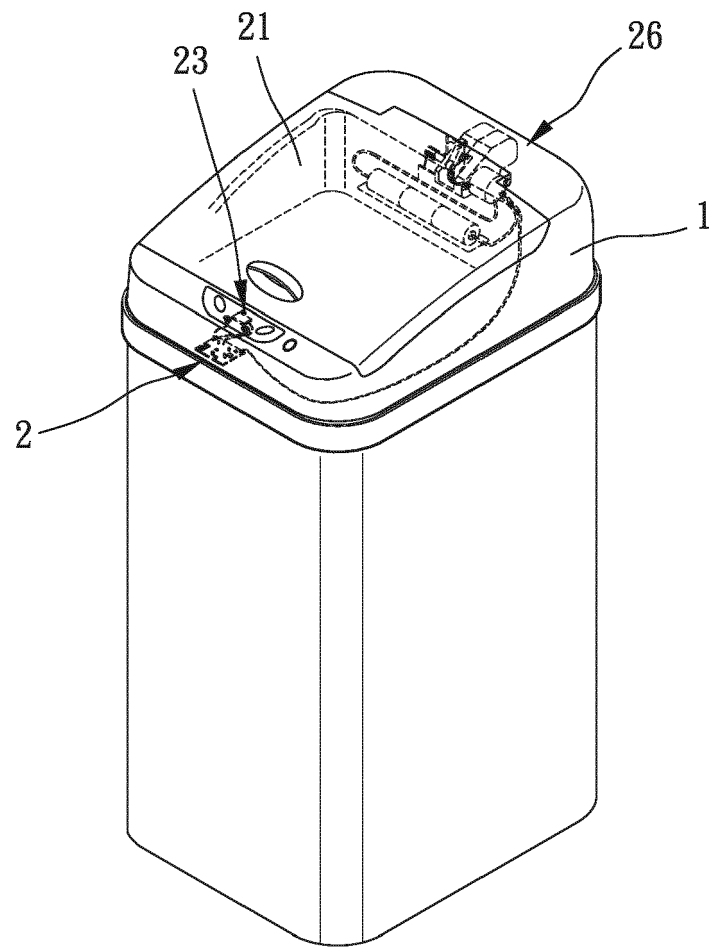


FIG. 1

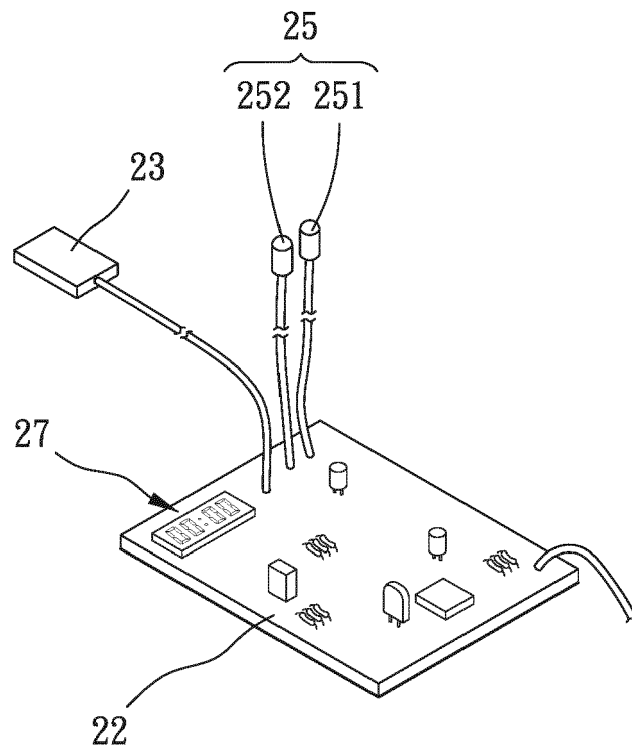


FIG. 2

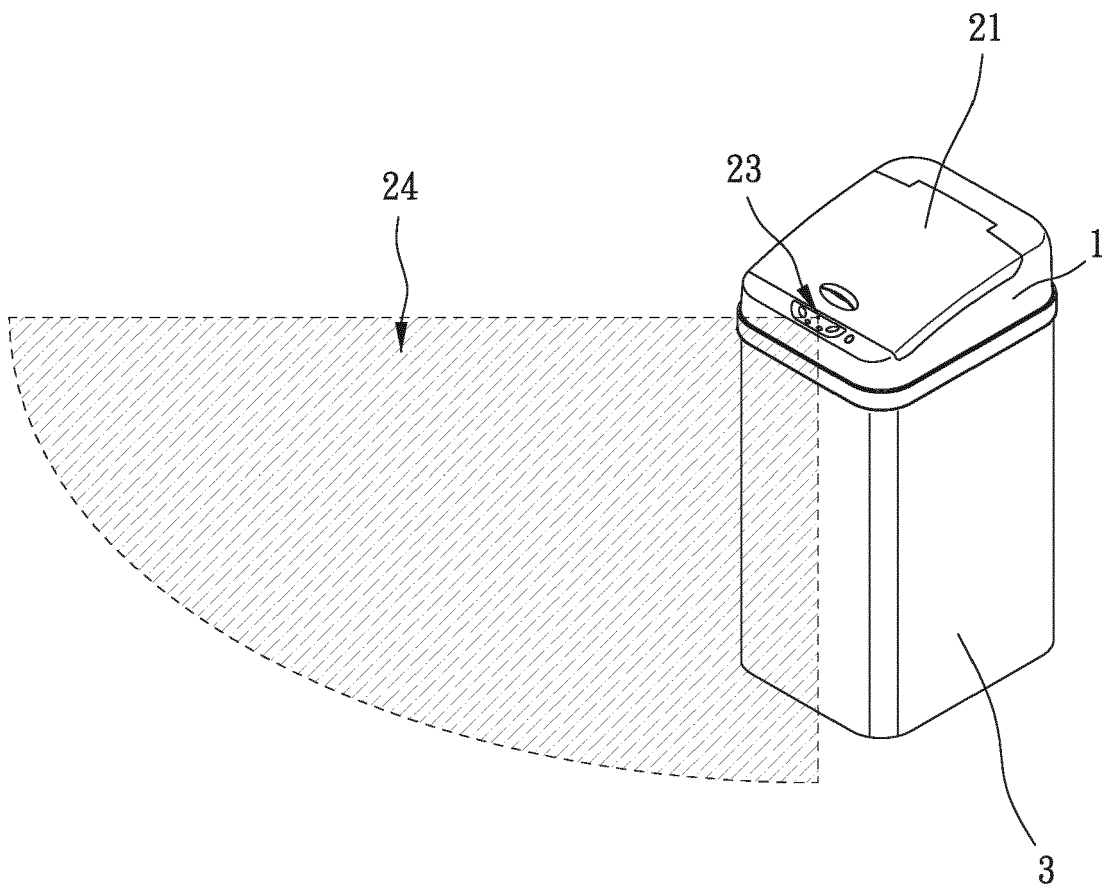


FIG. 3

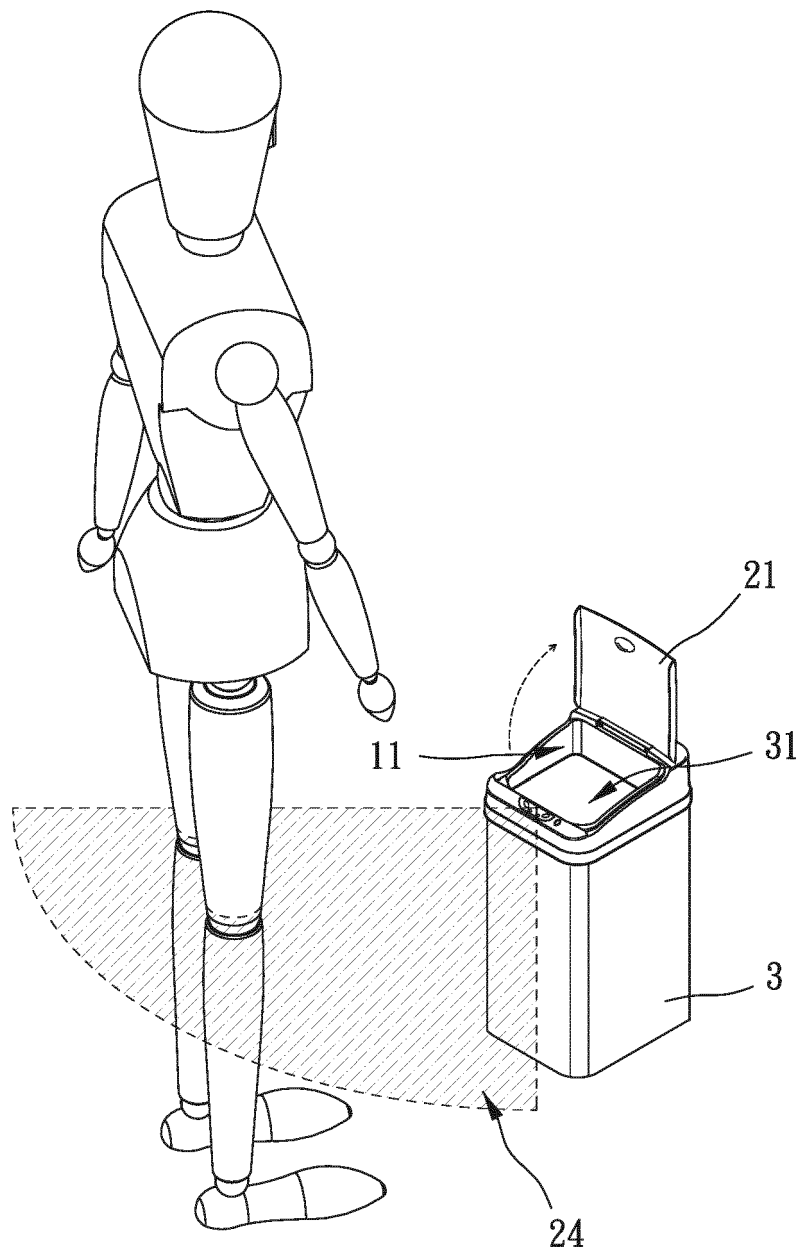


FIG. 4

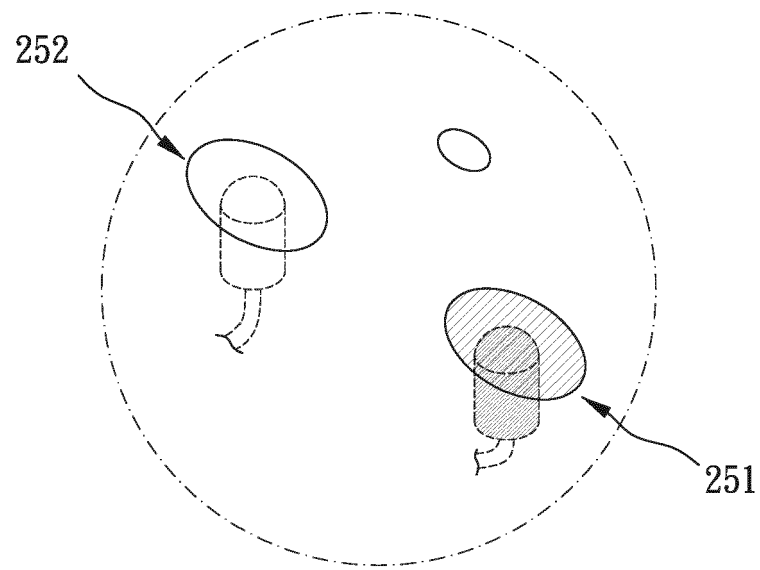


FIG. 5

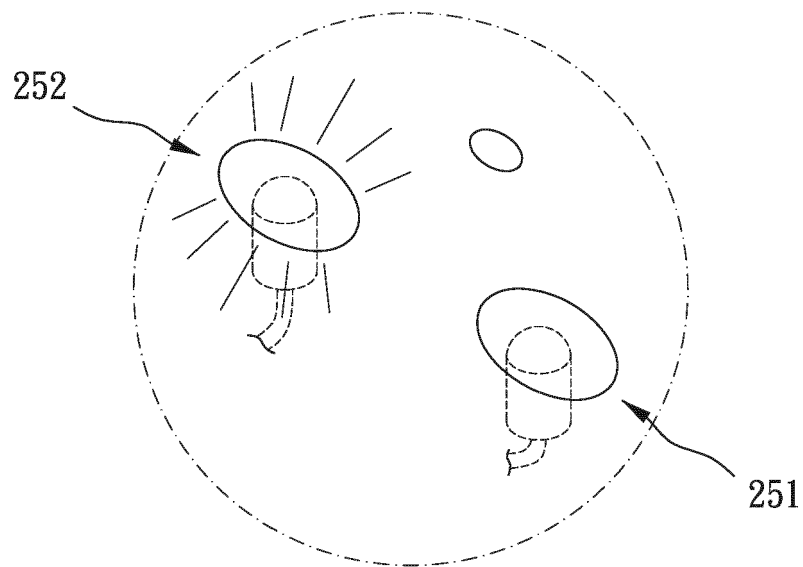


FIG. 7

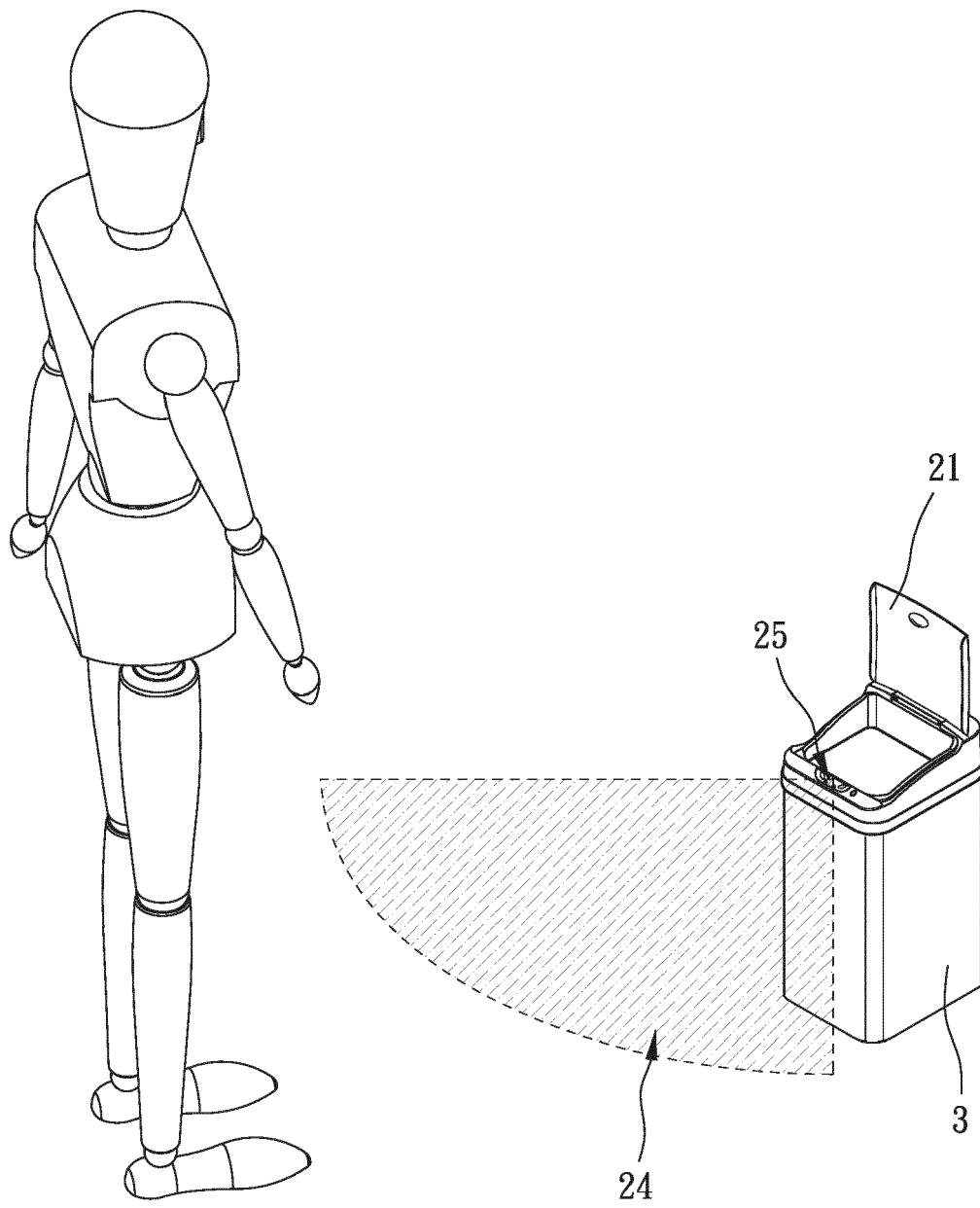


FIG. 6



EUROPEAN SEARCH REPORT

 Application Number
EP 20 18 9474

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2017/096299 A1 (YANG FRANK [US] ET AL) 6 April 2017 (2017-04-06) * paragraphs [0061], [0079], [0127], [0156], [0157]; figures 1, 9B, 10B *	1-10	INV. B65F1/16
X	CN 109 878 935 A (ZHIJING INT INC) 14 June 2019 (2019-06-14) * paragraphs [0077], [0083], [0118], [0124], [0128]; figures 5, 9 *	1-10	
A	US 2018/229930 A1 (SHEK MICHAEL [US]) 16 August 2018 (2018-08-16) * paragraphs [0016], [0021]; figures 1-7 *	1-10	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65F
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 13 January 2021	Examiner Luepke, Erik
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

 1
EPO FORM 1503 03.82 (P04C01)

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

EP 20 18 9474

5

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

13-01-2021

10

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2017096299 A1	06-04-2017	US 2017096299 A1	06-04-2017
		US 2018178978 A1	28-06-2018
		US 2020148467 A1	14-05-2020
-----	-----	-----	-----
CN 109878935 A	14-06-2019	NONE	
-----	-----	-----	-----
US 2018229930 A1	16-08-2018	NONE	
-----	-----	-----	-----

15

20

25

30

35

40

45

50

55

EPO FORM P0459

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