(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 025 623 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
18.02.2009 Bulletin 2009/08

(51) Int Cl.:
B65F 1/16 *(2006.01)* *B65F 1/06* *(2006.01)*

(21) Application number: **08360014.8**

(22) Date of filing: **30.05.2008**

(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 MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA MK RS

(30) Priority: **15.08.2007 TW 96213459 U**

(71) Applicants:
- **Kao, I-Feng**
  An-Ping Industrial Park
  Tainan (TW)
- **Kao, Ming-Hung**
  An-Ping Industrial Park
  Tainan (TW)

(72) Inventors:
- **Kao, I-Feng**
  An-Ping Industrial Park
  Tainan (TW)
- **Kao, Ming-Hung**
  An-Ping Industrial Park
  Tainan (TW)

(74) Representative: **Metz, Paul**
Cabinet METZ PATNI
1A place Boecler
67100 Strasbourg (FR)

(54) Waste container with electrostatically controlled cover

(57) A waste container includes a metal body (11) having a peripheral wall (111) defining a compartment (112) for receiving a garbage bag (15). Mounted above the body (11) is a cover (13) having a lid (133) movable between an open position and a closed position. An electrostatic device (2) is mounted to the cover (13) and operably connected to the lid (133). The lid (133) is moved from the open position to the closed position when the human body is within a detection range of a sensor (21) of the electrostatic device (2). A hollow frame (12) is mounted between the body (11) and the cover (13) and includes a perimeter wall (121) made of non-electrically conductive material. The body (11) is spaced from the cover (13) by the perimeter wall (121) and located outside the detection range of the sensor (21), preventing electrostatic interaction between the body (11) and the sensor (21).

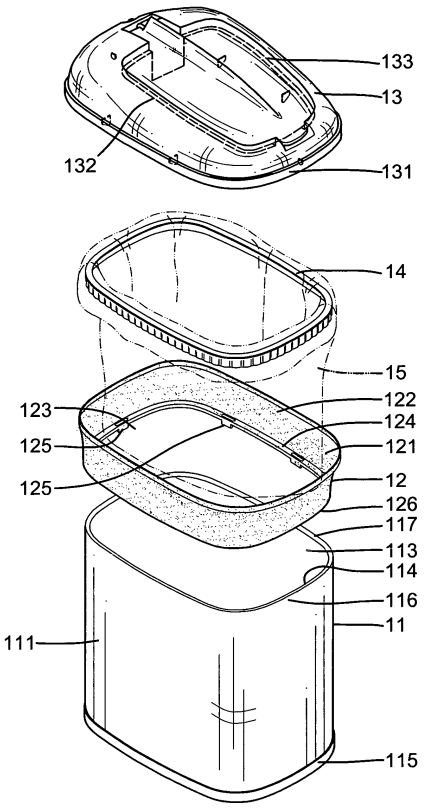


FIG.1

EP 2 025 623 A1

Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a waste container and, more particularly, to a waste container including a cover that can be opened by an electrostatic device.

[0002] A cover is generally mounted on top of a waste container body or the like to prevent from smell and flies. Waste containers with a step-on device or a sensor for opening and closing the cover have been developed, allowing a user to throw waste into the container without touching the container for hygiene purposes. Electrostatic device is one of the options for automatically opening the cover of the waste container and generally includes a battery, a circuit board with electronic components, and a sensor wire mounted along a periphery of the cover. When a hand of a user enters a detection range of the sensor wire, a motor is activated to open the cover through a reduction device. After a preset period of time, the motor is activated again to close the cover. However, electrostatic operation of the sensor wire is liable to be interfered by the environment, leading to limitation of the choice of the material for the container body. Specifically, the container body made of conductive metal material can not be utilized, for the cover can be mistakenly opened due to electrostatic interaction between the sensor wire and the metal container. Due to this limitation, the container bodies of waste containers are generally made of plastic and provide an appearance aesthetically inferior than metal waste container bodies. Furthermore, plastic waste container bodies have a shorter life.

[0003] A need exists for a waste container having a container body that can be made of a material other than plastic to allow more choices while allowing the cover to opened under electrostatic control without touching the container body.

BRIEF SUMMARY OF THE INVENTION

[0004] The present invention solves this need and other problems in the field of electrostatically controllable waste containers by providing, in a preferred form, a waste container including a body made of metal and having a peripheral wall defining a compartment adapted for receiving a garbage bag. The compartment includes a top opening in an upper end of the peripheral wall. Mounted above the body is a cover including a slot and a lid movable between an open position revealing the slot and a closed position covering the slot. An electrostatic device is mounted to the cover and operably connected to the lid. The electrostatic device includes a sensor adapted for electrostatically interacting with a human body. The lid is moved from the open position to the closed position when the human body is within a detection range of the sensor. A hollow frame includes a perimeter wall made of non-electrically conductive material. The perimeter wall is mounted between the body and the cover and defines a through-hole extending in a vertical direction and having upper and lower openings spaced in the vertical direction. The upper opening is covered by the cover. The lower opening is in communication with the top opening of the body. The body is spaced from the cover by the perimeter wall and located outside the detection range of the sensor, preventing electrostatic interaction between the body and the sensor.

[0005] In the most preferred form, the peripheral wall of the body includes an annular bend extending inward from the upper end thereof. The annular bend includes a top end face facing upward and a bottom face opposite to and spaced from the top end face in the vertical direction. The perimeter wall of the hollow frame includes a lower end having a bottom end face and defining the lower opening. The perimeter wall of the hollow frame further includes an inner flange extending inward from the lower end thereof and perpendicular to the vertical direction. The inner flange is spaced from the bottom end face of the perimeter wall in the vertical direction, forming a skirt abutting and surrounding the upper end of the peripheral wall of the body. The inner flange abuts the top end face of the annular bend. Furthermore, the inner flange includes a plurality of spaced hooks extending downward from an inner edge thereof and coupled with the bottom face of the annular bend. A ring is mounted in the through-hole of the perimeter wall of the hollow frame. The ring has L-shaped cross sections and includes a vertical section parallel to the vertical direction and a horizontal section perpendicular to the vertical section. The vertical section has a bottom end face resting on the inner flange. The vertical section abuts the perimeter wall. An open end edge of the garbage bag can be clamped between the vertical section and the perimeter wall.

[0006] The present invention will become clearer in light of the following detailed description of an illustrative embodiment of this invention described in connection with the drawings.

DESCRIPTION OF THE DRAWINGS

[0007] The illustrative embodiment may best be described by reference to the accompanying drawings where:

FIG 1 shows an exploded, perspective view of a waste container according to the preferred teachings of the present invention.

FIG 2 shows a side elevational view of the waste container of FIG 1.

FIG 3 shows a partial, cross-sectional view of the waste container of FIG 1.

FIG 4 shows a partly-cutaway perspective view of a frame of the waste container of FIG 1.

[0008] All figures are drawn for ease of explanation of the basic teachings of the present invention only; the ex-

tensions of the Figures with respect to number, position, relationship, and dimensions of the parts to form the preferred embodiment will be explained or will be within the skill of the art after the following teachings of the present invention have been read and understood. Further, the exact dimensions and dimensional proportions to conform to specific force, weight, strength, and similar requirements will likewise be within the skill of the art after the following teachings of the present invention have been read and understood.

[0009] Where used in the various figures of the drawings, the same numerals designate the same or similar parts. Furthermore, when the terms "lower", "upper", "end", "section", "horizontal", "vertical", "annular", "inward", "spacing", and similar terms are used herein, it should be understood that these terms have reference only to the structure shown in the drawings as it would appear to a person viewing the drawings and are utilized only to facilitate describing the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0010] A waste container according to the preferred teachings of the present invention is shown in the drawings and generally designated 1. According to the preferred form shown, the waste container 1 includes a body 11 made of metal and includes a peripheral wall 111 defining a compartment 112 for receiving a garbage bag 15. Compartment 112 includes a top opening 113 in an upper end 116 of peripheral wall 111. According to the most preferred form shown, body 11 is made of stainless steel and includes an annular bend 114 extending inward from upper end 116 and having a top end face 117 facing upward and a bottom face 119 opposite to and spaced from top end face 117 in a vertical direction. A bottom cap 15 is mounted to a lower end of body 11.

[0011] According to the preferred form shown, waste container 1 further includes a hollow frame 12 mounted to upper end 116 of body 11. Frame 12 is made of non-electrically conductive material such as plastic. Frame 12 includes a perimeter wall 121 defining a through-hole 120 extending in the vertical direction and having an upper opening 122 in an upper end of perimeter wall 121 and a lower opening 123 in a lower end 126 of perimeter wall 121. Perimeter wall 121 further includes an inner flange 124 extending inward from lower end 126 thereof and perpendicular to the vertical direction. Inner flange 124 is spaced from a bottom end face 127 of lower end 126 in the vertical direction, forming a skirt 128 abutting and surrounding upper end 116 of peripheral wall 111 of body 11. Inner flange 124 includes a plurality of spaced hooks 125 extending downward from an inner edge 129 thereof and coupled with bottom face 119 of annular bend 114 of body 11. Note that inner flange 124 abuts top end face 117 of annular bend 114 and that lower end 126 of frame 12 receives upper end 116 of body 11 with lower opening 123 of frame 12 in communication with top opening 113 of body 11.

[0012] According to the preferred form shown, waste container 1 further includes a ring 14 mounted in through-hole 120 of perimeter wall 121 of frame 12. Ring 14 has L-shaped cross sections and includes a vertical section 142 parallel to the vertical direction and a horizontal section 144 perpendicular to vertical section 142. Vertical section 142 has a bottom end face 146 resting on inner flange 124. Note that vertical section 142 abuts perimeter wall 121 and that an open end edge of garbage bag 15 can be clamped between vertical section 142 and perimeter wall 121. Thus, the whole garbage bag 15 is completely received in waste container 1, providing a clean appearance.

[0013] According to the preferred form shown, waste container 1 further includes a cover 13 having a lower end 131 mounted to and covering upper opening 122 of frame 12. Cover 13 has a slot 132 allowing a user to throw garbage into body 11. A lid 133 is pivotably coupled by a pivot 134 to cover 13 and movable between an open position revealing slot 132 and a closed position covering slot 132. An electrostatic device 2 is mounted to cover 13 and operably connected to lid 133. According to the most preferred form shown, a cell 135, a switch 139, a motor 136, a gear 137, and a circuit board 140 are mounted in cover 13. Gear 137 can be driven by motor 136 and meshes another gear 138 formed on pivot 134. Electrostatic device 2 includes a sensor 21 in the preferred form shown as a wire extending along a periphery of cover 13. Circuit board 140 includes a plurality of electronic components 142 operably connected to sensor 21 and motor 136. When switch 139 is turned on and if a human body enters a detection range of sensor 21 (e.g., a distance between a hand of a user and sensor 21 is less than 5 cm), motor 136 is activated due to electrostatic interaction between sensor 21 and the human body to drive gears 137 and 138 to rotate, moving lid 133 to the open position (see phantom lines in FIG 2) allowing the user to throw garbage into body 11. After a preset period of time, motor 136 is stopped, and lid 133 moves back to its original closed position under the action of gravitational force.

[0014] It can be appreciated that body 11 is spaced from cover 13 by perimeter wall 121 and located outside the detection range of sensor 21, preventing undesired electrostatic interaction between body 11 and sensor 21. According to the most preferred form shown, body 11 and cover 13 have a spacing therebetween larger than 6 cm. However, the spacing between body 11 and cover 13 can be adjusted according to the detection range of sensor 21. Bottom cap 115 can be integrally formed with body 11 as a single continuous monolithic piece. Lid 133 can be moved back to its closed position by other ways such as by motor 136.

[0015] Body 11 of waste container 1 according to the preferred teachings of the present invention can be made of metal such as stainless steel to allow more choices and to create increased value so that waste container 1 can be utilized in places including but not limited to living

rooms, conference rooms, etc. while allowing cover 13 to be opened under electrostatic control without touching waste container 1 to avoid the hands of the user from becoming dirty. Furthermore, metal body 11 creating increased value is spaced from cover 13 by frame 12 and, thus, will not interfere with electrostatic operation of cover 13.

[0016] Thus since the invention disclosed herein may be embodied in other specific forms without departing from the spirit or general characteristics thereof, some of which forms have been indicated, the embodiments described herein are to be considered in all respects illustrative and not restrictive. The scope of the invention is to be indicated by the appended claims, rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are intended to be embraced therein.

Claims

1. A waste container comprising:

a body (11) made of metal and including a peripheral wall (111) defining a compartment (112) adapted for receiving a garbage bag (15), with the compartment (112) including a top opening (113) in an upper end (116) of the peripheral wall (111);

a cover (13) mounted above the body (11), with the cover (13) including a slot (132) and a lid (133) movable between an open position revealing the slot (132) and a closed position covering the slot (132), with an electrostatic device (2) being mounted to the cover (13) and operably connected to the lid (133), with the electrostatic device (2) including a sensor (21) adapted for electrostatically interacting with a human body, with the lid (133) being moved from the open position to the closed position when the human body is within a detection range of the sensor (21); and

a hollow frame (12) including a perimeter wall (121) made of non-electrically conductive material, with the perimeter wall (121) being mounted between the body (11) and the cover (13) and defining a through-hole (120) extending in a vertical direction and having upper and lower openings (122, 123) spaced in the vertical direction, with the upper opening (122) being covered by the cover (13), with the lower opening (123) being in communication with the top opening (113) of the body (11), with the body (11) being spaced from the cover (13) by the perimeter wall (121) and located outside the detection range of the sensor (21), preventing electrostatic interaction between the body (11) and the sensor (21).

2. The waste container as claimed in claim 1, with the body (11) and the cover (13) having a spacing therebetween larger than 6 cm.

3. The waste container as claimed in claim 1, with the upper end (116) of the peripheral wall (111) of the body (11) including a top end face (117) facing upward, with the perimeter wall (121) of the hollow frame (12) including a lower end (126) having a bottom end face (127) and defining the lower opening (123), with the perimeter wall (121) further including an inner flange (124) extending inward from the lower end (126) thereof and perpendicular to the vertical direction, with the inner flange (124) being spaced from the bottom end face (127) of the perimeter wall (121) in the vertical direction, forming a skirt (128) abutting and surrounding the upper end (116) of the peripheral wall (111) of the body (11), and with the inner flange (124) abutting the top end face (117) of the peripheral wall (111) of the body (11).

4. The waste container as claimed in claim 3, with the peripheral wall (111) of the body (11) including an annular bend (114) extending inward from the upper end (116) thereof and perpendicular to the vertical direction, with the annular bend (114) including the top end face (117) and a bottom face (119) opposite to and spaced from the top end face (117) in the vertical direction, and with the inner flange (124) including a plurality of spaced hooks (125) extending downward from an inner edge (129) thereof and coupled with the bottom face (119) of the annular bend (114).

5. The waste container as claimed in claim 4, further comprising, in combination: a ring (14) mounted in the through-hole (120) of the perimeter wall (121) of the hollow frame (12), with the ring (14) having L-shaped cross sections and including a vertical section (142) parallel to the vertical direction and a horizontal section (144) perpendicular to the vertical section (142), with the vertical section (142) having a bottom end face (146) resting on the inner flange (124), and with the vertical section (142) abutting the perimeter wall (121) and adapted for clamping an open end edge of the garbage bag (15) between the vertical section (142) and the perimeter wall (121).

6. The waste container as claimed in claim 4, with the body (11) being made of stainless steel, and with the hollow frame (12) being made of plastic.

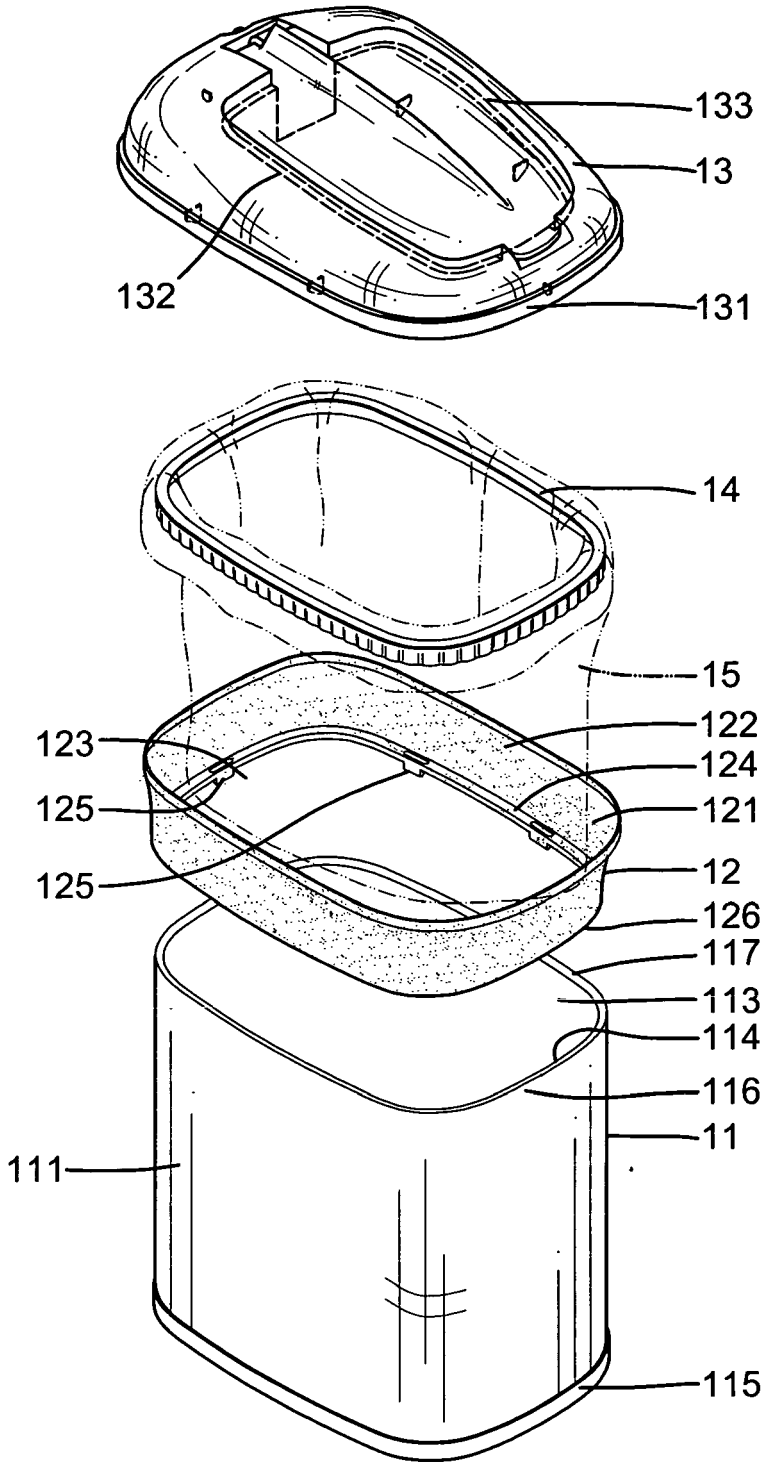

133
13
132
131
14
15
123
122
124
125
121
125
12
126
117
113
114
116
11
111
115

FIG.1

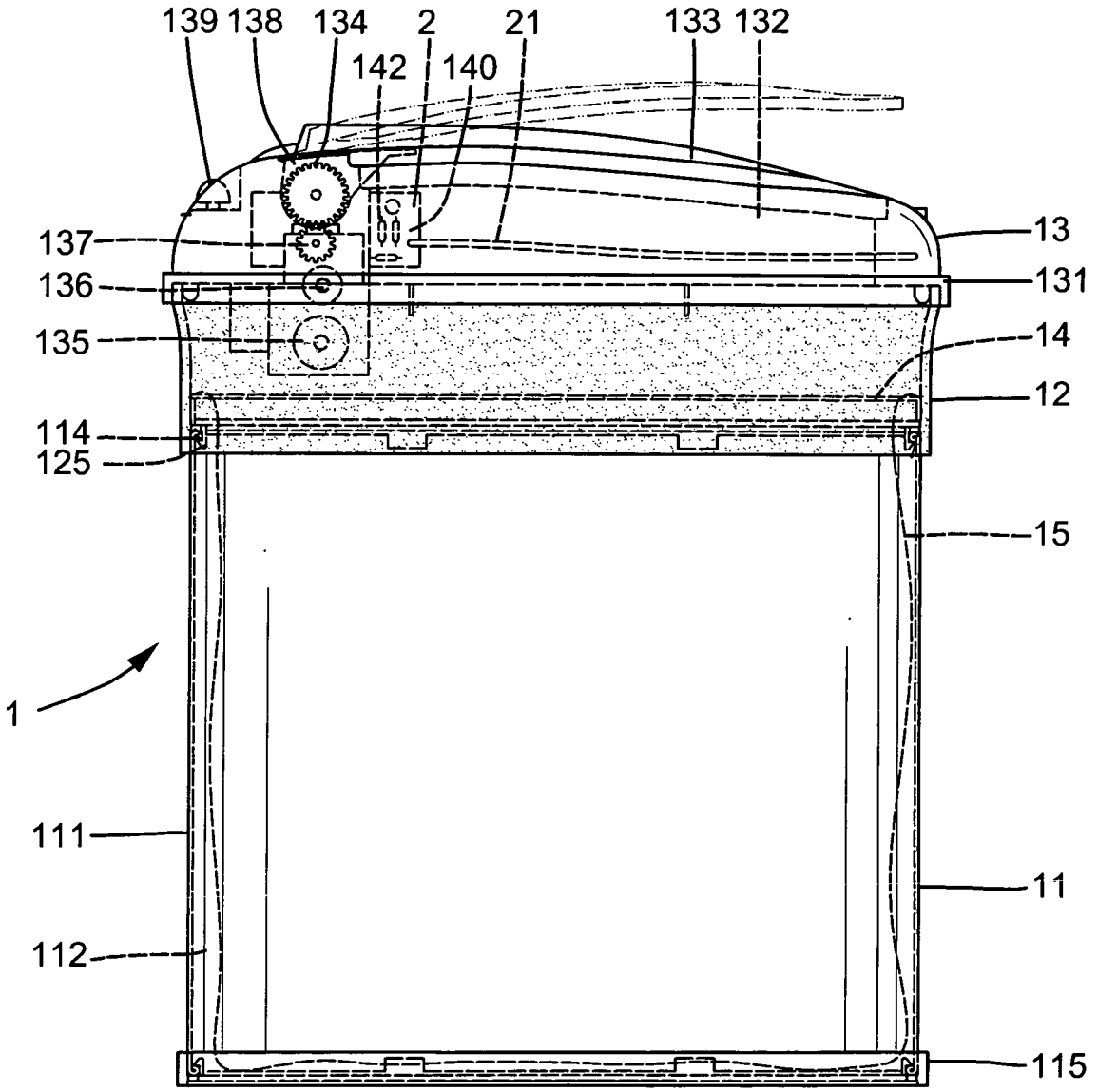

139
138
134
2
21
133
132
142
140
137
13
136
131
135
14
12
114
125
15
1
111
11
112
115

FIG.2

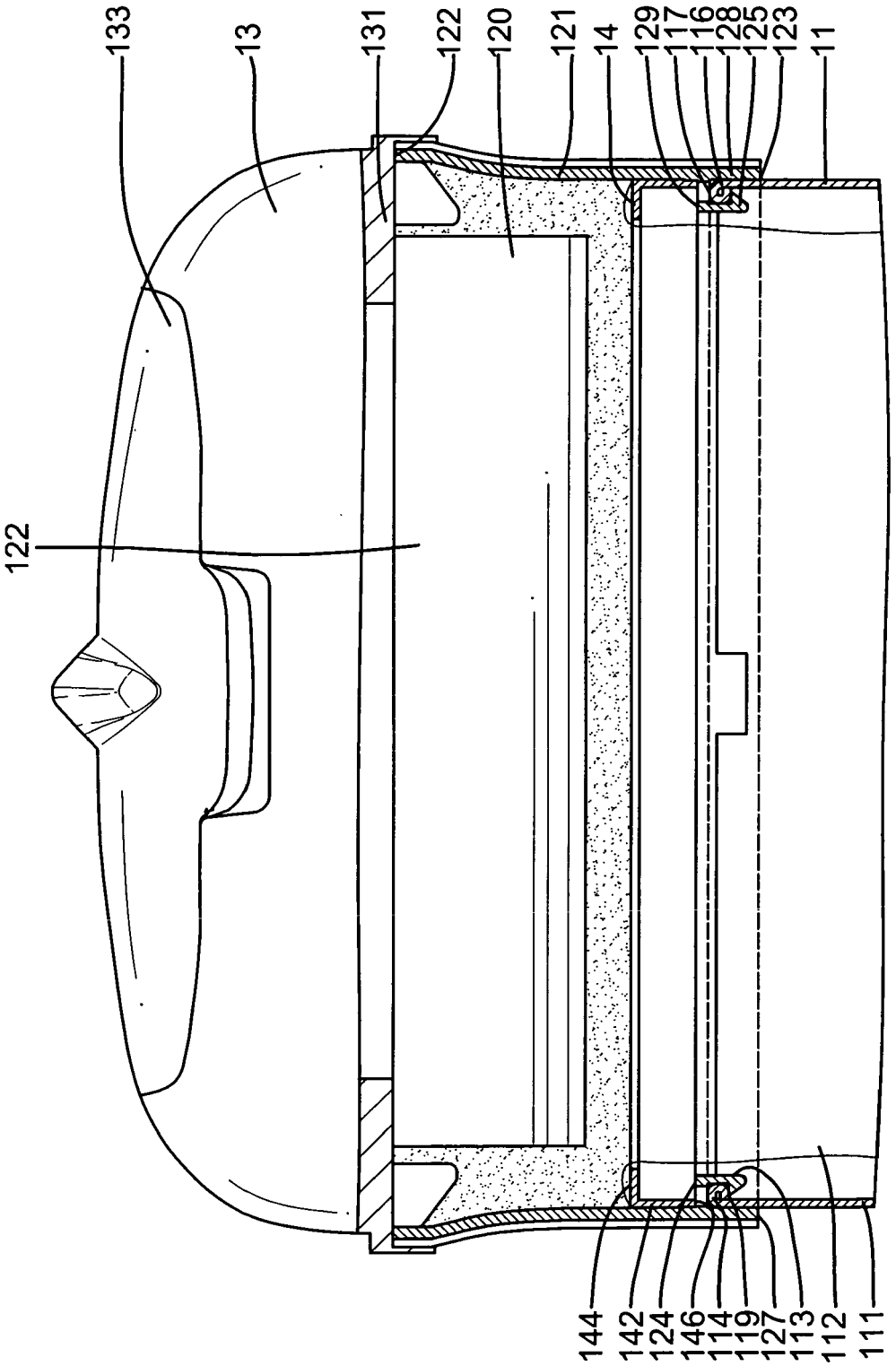

133
13
131
122
120
121
14
129
117
116
128
125
123
11
122
144
142
124
146
114
119
127
113
112
111

FIG.3

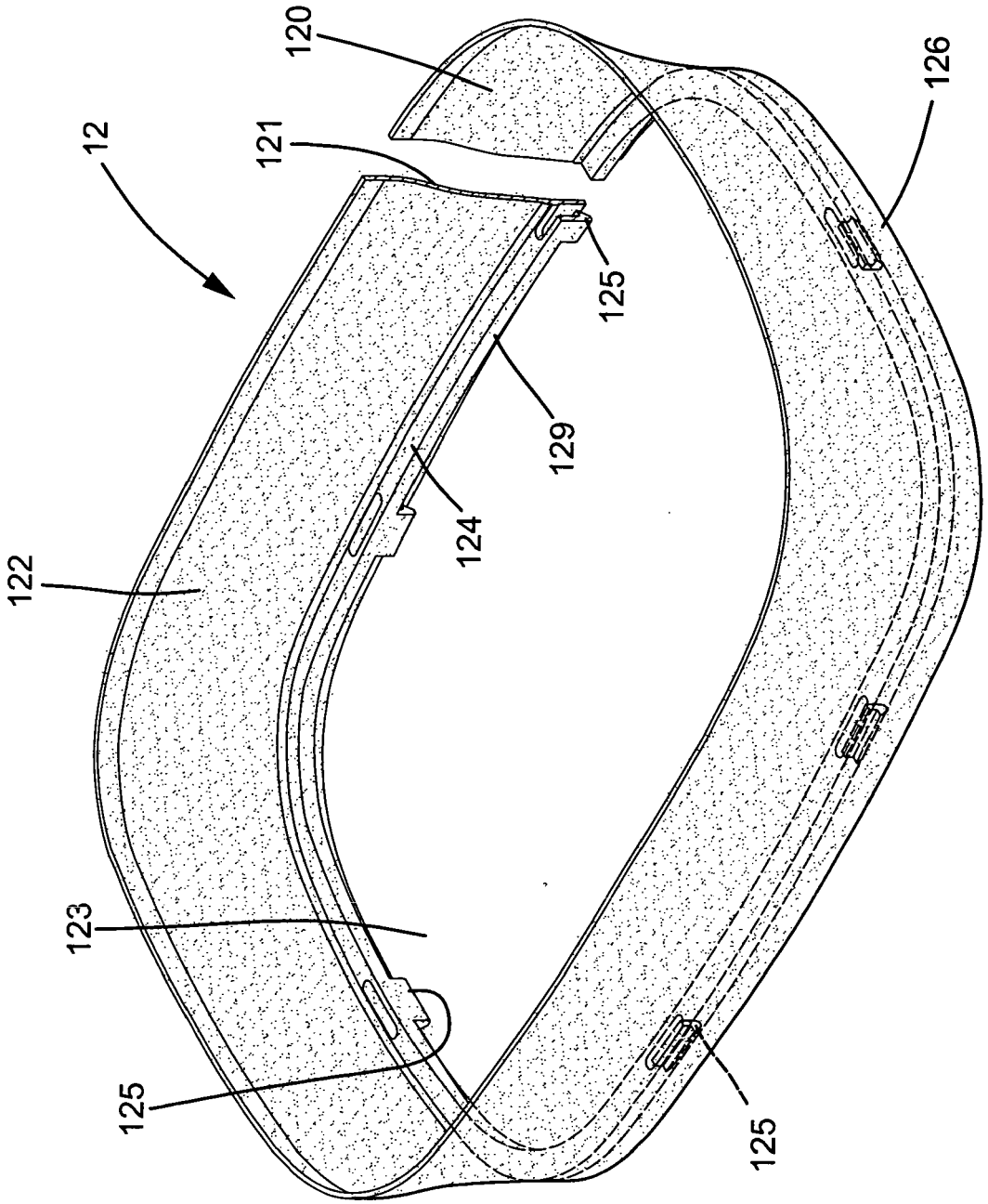


FIG.4

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 08 36 0014

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 6 774 586 B1 (T. SHIH) 10 August 2004 (2004-08-10) * column 2, line 29 - column 4, line 17 * * figures 1-12 * -----	1	INV. B65F1/16 ADD. B65F1/06
A	US 2006/214620 A1 (C. CHAN) 28 September 2006 (2006-09-28) * paragraph [0018] - paragraph [0026] * * figures 1-8 * -----	1	

TECHNICAL FIELDS SEARCHED (IPC)

B65F

1 The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	21 October 2008	Smolders, Rob

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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 08 36 0014

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.

21-10-2008

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6774586 B1	10-08-2004	NONE	
US 2006214620 A1	28-09-2006	NONE	

EPO FORM P0459

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