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(71) Applicant: **Luzi, Alessandro**
00186 Rome (IT)

(72) Inventor: **Luzi, Alessandro**
00186 Rome (IT)

(54) DEVICE FOR A SEPARATE COLLECTION OF WASTE, APPLIED TO A DOMESTIC TRASH CAN

(57) Device (120) for a separate collection of waste, to be applied to a domestic trash can (100), in order to divide its inner space in different sections, and to adapt it to a separate collection in respect to two, three or four separate bags, characterized in that comprising:
- a belt (121) supporting some braces (122, 123, ...), said belt (121) to be applied to the outer walls of the top side (101) of a trash can (100); the belt (121) being adaptable and variable in length, i.e. by a clasp with a slot (124), in respect to different types and/or sizes of trash cans (100), having an inner contact surface made of a material that is adhesive to the same trash can (100), and an outer surface having some protuberances (125a, 125b, 125c, ...) that allow the belt (121) to be pulled out, so that the other components of the device (120) can be installed;
- some braces (122, 123, ...) supporting some bags (150) or multi-bags (160), said braces (122, 123, ...) being of elastic type, and having the inner side made of the same adhesive material belonging to said belt (121); the braces (122, 123, ...) are placed in a diagonal direction, and their ends (122a, 122b) and (123a, 123b) are fixed to the belt (121) of the trash can (100), they include some grooves (122c, 122d, 122e, 122f, ...) at a specific distance that allow the proper insertion and installation of the respective bags (150) or multi-bags (160);
- some environment compatible bags (150) or multi-bags (160), where multi-bags (160) are composed of more single bags (165, 166), so that to achieve more collection sections in the trash can (100), i.e. two, three or four sections, in order to achieve a separate collection of waste; the bags (150) or multi-bags (160) can be fixed either in the grooves (122c, 122d, 122e, 122f, ...) of the diagonal braces (122, 123,...), and under the supporting belt (121) installed on the trash can (100); by pulling a line of prefixed holes (164) on the multi-bag (160) it is possible to uninstall, remove and exchange each of the single bags (165, 166), in an autonomous and independent way in respect to the other part of the structure.

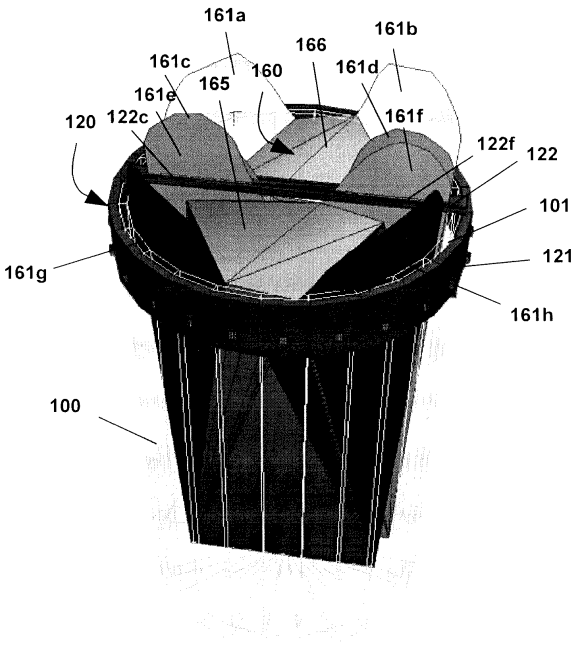

Fig. 6

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Description

[0001] The present invention regards a device for a separate collection of waste, applied to a single bag domestic trash can, in order to divide its inner space in different sections, and to adapt it to a separate collection in respect to two, three or four separate bags.

[0002] The device presents at least three innovative characteristics.

[0003] The first is to comprise a belt, supporting some braces, to be applied to the outer walls of a trash can. The belt is adaptable and variable in length in respect to different types and/or sizes of trash cans, having an inner contact surface made of a material that is adhesive to the same trash can, and an outer surface having some protuberances that allow the belt to be pulled out, so that the other components of the device can be installed.

[0004] The second is to comprise some braces, supporting some multi-bags; the braces are of elastic type and have the inner side made of the same adhesive material belonging to said belt; they are placed in a diagonal direction, and their ends are fixed to the belt of the trash can, they include some grooves at a specific distance that allow the proper multi-bags to be installed.

[0005] The third is to comprise some environment compatible multi-bags, that define more collection sections, i.e. two, three or four sections, in order to achieve a separate collection of waste; the multi-bags can be fixed either in the grooves of the diagonal braces, and under the supporting belt installed on the trash can; by pulling a line of prefixed holes it is possible to uninstall, remove and exchange each single bag, in an autonomous and independent way in respect to the other part of the structure; the multi-bags have a specific shape, including a profile with respective wings at the upper side, so that an installation of the braces at the grooves is allowed, and have some holes so that the upper end of the bag can be closed on itself; an additional element keeps the upper part of the bag closed on itself, that is a very useful situation, in case of a bag dedicated to the wet waste or to the food waste.

[0006] As known, in state of the art some examples of trash cans exist, that are divided in more sections in order to achieve a separate collection of waste.

US 5190183 (McNaughton et al.) essentially discloses an apparatus for dividing a trash receptacle into sections for the source separation of waste items and recycle materials. The apparatus is designed to be attached to the top opening of a trash receptacle, and facilitates the use of liner bags placed within the sections to produce sections for separating and storing the various types of trash and recyclables. The apparatus is adjustable to fit the top of various sizes of trash containers and is further adjustable in size, shape and the number of sections it divides into without inhibiting the use of the container lid. The apparatus can be configured to divide the container into thirds, halves or one half and two quarters to facilitate the separation of recyclables.

US 5246119 (Heffner) discloses an arrangement for presorting recyclable materials that includes a certain number of plastic bags, each of them being associated to a sector of a container, that can be connected each to the adjacent one, up to fill all the inner space of a container. The bags have a connection and a disconnection mechanism, so that they can be added or removed, each independently to the others. The general structure is composed of bags that are connected each other, up to run a 360° angle and fill all the inner container.

There are no additional supporting items, except some adhesive stripes or other items that assure the connection of the bags to the container.

In the field of waste bins, recycling, composting, household waste sorting, waste management, waste reduction, source separation, home decor, and office equipment: Waste bin divider kits are adaptable tools designed to convert single-stream waste bins into multi-stream sorting bins to allow users to easily sort any combination of recyclables, organics, and waste within most typical waste bins in configurations to suit the specific requirements of local sorting programs or user preferences. Waste bin dividers consist of a mounting and receiving clip with an integrated and customizable identification window and a dually adjustable bag frame that adjusts to fit within waste bins of varied size and shape. The dually adjustable bag frame can be used with a wide range of disposable, repurposed, and reusable consumer bags such as freezer bags, cereal bags, chip bags, produce bags, bread and milk bags.

WO 2015/139124 A1 (Atkinson) discloses an arrangement including an adjustable belt supporting a bag to be inserted in a container. The belt, composed with other adjacent belts, can achieve a real frame that supports a series of independent bags, each of them associated to a different type of waste, achieving therefore a separate collection of waste. The means for attaching the adjacent belts each other, and attaching the belts to the lateral walls of the container, are given by specific clip hooks. The general arrangement permits to attach the multiple bags each other, and to adapt the general shape to different geometries, according to shape and size of the outer container.

Additional examples of devices for separate collection of domestic waste are disclosed by further documents that are less relevant, as i.e.: US 4905853, US 5033641, US 5085342, US 5183228, US 8950620, WO 2002/026595 A1, WO 2012/126132 A1.

[0007] Therefore, from a general point of view, US 5190183 (McNaughton et al.) discloses a rigid structure, radially adjustable, where some independent bags can be attached independently each other, by using a small spring or clip mechanisms. US 5246119 (Heffner) does not include a proper supporting structure, however it includes an attaching and lateral bags composition mechanism, that allows to add or remove each of them, inside a container, one independently to the others. WO 2015/139124 A1 (Atkinson) discloses a mechanism in-

cluding an adjustable belt, however that is placed at the top border of each single bag, and then laterally attached to other similar belts in order to achieve a frame, that is attached in turn to the container by using specific or clips attachments.

[0008] Therefore, it arises from the above examples that there are no existing devices achieving all the objectives of the present invention. That is, a device including a supporting structure composed of an adjustable belt that adapt itself to the upper border of a trash can, including one or more braces that are connected to said belt according to a diagonal direction, and that represent the elements on which some multi-bags are attached by passing their upper sides through some appropriate grooves. The multi-bags can be of a specific type, at the beginning being laterally attached each other, but separable by pulling a line of prefixed holes; they have a profile with respective wings at the upper side so that the same multi-bags can be installed easily to the general supporting structure.

[0009] Therefore, the present invention overcomes all the drawbacks of the solutions disclosed from the prior art, and the main objective is to propose a device for a separate collection of waste, to be applied to a domestic and single-bag trash can, in order to divide its inner space in different sections, and to adapt it to a separate collection in respect to two, three or four separate bags.

[0010] Another objective is that the device comprises an arrangement with a belt that would be adaptable and variable in length, in respect to different types and/or sizes of trash cans, that the belt could be slightly pulled outside in order to install some braces supporting some multi-bags, where the braces have their ends connected to the belt on the trash can, and the braces have some grooves, at a specific distance, that allow the installation of an appropriate collecting multi-bag.

[0011] Another further objective is to include some environment compatible multi-bags, so that to achieve more collection sections in the trash can, i.e. two, three or four sections, in order to achieve a separate collection of waste, and in order that the same multi-bags can be steadily connected to the trash can.

[0012] Another objective is that it could possible to uninstall, remove and exchange the multi-bags, for each section, in an autonomous and independent way in respect to the other parts of the structure.

[0013] Another further objective is to include an additional mechanism so that it is possible to keep the upper part of a bag closed on itself, that is a very useful situation, in case of a bag dedicated to the wet waste or to the food waste, in order to prevent the emission of bad odors.

[0014] Finally, a further objective is that the device installation process on a standard domestic trash can, could be practical, comfortable and effective, and in the same way, the installation or removal of a multi-bag into/from the trash can, could be practical, comfortable and effective.

[0015] Therefore it is specific subject of the present invention a device for a separate collection of waste, to be applied to a domestic trash can, in order to divide its inner space in different sections, and to adapt it to a separate collection in respect to two, three or four separate bags, characterized in that comprising:

- a belt supporting some braces, said belt to be applied to the outer walls of the top side of a trash can; the belt being adaptable and variable in length, i.e. by a clasp with a slot, in respect to different types and/or sizes of trash cans, having an inner contact surface made of a material that is adhesive to the same trash can, and an outer surface having some protuberances that allow the belt to be pulled out, so that the other components of the device can be installed;
- some braces supporting some bags or multi-bags, said braces being of elastic type, and having the inner side made of the same adhesive material belonging to said belt; the braces are placed in a diagonal direction, and their ends are fixed to the belt of the trash can, they include some grooves at a specific distance that allow the proper insertion and installation of the respective bags or multi-bags;
- some environment compatible bags or multi-bags, where multi-bags are composed of more single bags, so that to achieve more collection sections in the trash can, i.e. two, three or four sections, in order to achieve a separate collection of waste; the bags or multi-bags can be fixed either in the grooves of the diagonal braces, and under the supporting belt installed on the trash can; by pulling a line of prefixed holes on the multi-bag it is possible to uninstall, remove and exchange each of the single bags, in an autonomous and independent way in respect to the other part of the structure.

[0016] In addition to that expressed before, the invention is characterized by some significant advantages: the fact of representing a universal device that is adaptable to different types and sizes of the existent domestic trash cans; the fact of implementing the current standards and rules for the separate collection of waste; the fact of decreasing the amount of space occupied in the houses in respect to the use of a larger number of trash cans; the fact of making bags and multi-bags available in the form of rolls, with a tear mechanism; the fact of proposing a low cost device, suitable for all the existent domestic trash cans, and that is, at the same time, environment compatible, practical, fast and easy to be used.

[0017] The present invention is now being described according to non limiting examples, with particular reference to the figures of the enclosed drawings, where:

Figure 1 is a perspective view of a standard domestic trash can for the collection of waste;

Figure 2 is a perspective view of the same trash can of **Figure 1,** to which a device of the present invention has been applied, in order to achieve a separate col-

lection of waste;

Figure 3 is a perspective view of a detail in the same device of **Figure 2** in order to achieve a separate collection of waste;

Figure 4 is a perspective view of a single bag for waste collection, that represents a single module belonging to a multi-bag, that belongs in turn to the device of the present invention;

Figure 5 is a perspective view of a multi-bag for waste collection, that belongs in turn to the device of the present invention;

Figure 6 is a perspective view of a set composed of a trash can for waste collection, to which a device of the present invention, having two sections with respective multi-bag, has been applied in order to achieve a separate collection of waste;

Figures 7-10 are perspective views, that represent a sequence of respective steps related to the installation and connection of the upper ends of a bag to a brace belonging to the device, by bending them on themselves, making them to pass through grooves that are into the brace, making them to pass through respective holes that are into the bag, in order to achieve a steady connection with a related knot;

Figures 11 - **13** are top views, showing different embodiments of the present invention, where the inner space of the waste trash can has been divided respectively in two, four and three sections.

Figure 14 is a top perspective view of a detail in the embodiment of the present invention, where the inner space of the waste trash can has been divided in three sections;

Figure 15 is a top view of the same embodiment of the present invention of **Figure 14,** to which an additional element has been applied, that keeps the upper part of a bag closed on itself;

Figure 16 is a top perspective view of the same embodiment of the present invention of **Figure 15,** to which an additional element has been applied, that keeps the upper part of a bag closed on itself, and where that bag has been fully represented.

[0018] It is underlined that only few of the many conceivable embodiments of the present invention are here described, which are just some specific non-limiting examples, having the possibility to describe many other embodiments based on the disclosed technical solutions of the present invention.

[0019] **Figure 1** shows a standard domestic trash can **100** for the collection of waste. Instead, **Figure 2** shows the same trash can **100** where a device **120** of the present invention has been installed. It allows to divide the inner space of the trash can **100** in different sections, and to adapt it to a separate collection of waste in respect to two, three or four separate bags.

With reference to **Figure 3,** the device **120** essentially comprises: a belt **121** to be applied to the outer walls of the top side **101** of a trash can **100;** some supporting braces **122, 123,** ... placed in a diagonal direction, with their ends **122a, 122b** and **123a, 123b** that are fixed to the same belt **121** of the trash can **100;** some bags **150** or multi-bags **160,** fixed either in the grooves **122c, 122d, 122e, 122f, ...** of the diagonal braces **122, 123,...,** and under the supporting belt **121** installed on the trash can **100.**

The belt **121** is adaptable and variable in length, i.e. by a clasp with a slot **124,** in respect to different types and/or sizes of trash cans **100.** Its inner contact surface is made of a material that is adhesive to the same trash can **100.** Its outer surface has some protuberances **125a, 125b, 125c, ...** that allow the belt **121** to be pulled out, so that the other components of the device **120** can be installed.

The braces **122, 123, ...** support some bags **150** or multi-bags **160.** They are of elastic type, and have the inner side made of the same adhesive material belonging to said belt **121.** The braces **122, 123, ...** include some grooves **122c, 122d, 122e, 122f, ...** at a specific distance that allow the proper insertion and installation of the respective bags **150** or multi-bags **160.**

Some environment compatible bags **150** or multi-bags **160** can be used, where multi-bags **160** are composed of more single bags **165, 166.**

Once they are installed into the trash can **100,** more collection sections are achieved, i.e. two, three or four sections, in order to achieve a separate collection of waste. By pulling a line of prefixed holes **164** on the multi-bag **160** it is possible to uninstall, remove and exchange each of the single bags **165, 166,** in an autonomous and independent way in respect to the other part of the structure.

[0020] With reference to **Figures 3 and 4,** said bags **150** have a specific shape including wings **151a, 151b, 151c, 151d** at the upper side, in order to be installed in grooves **122c, 122d, 122e, 122f** of the braces **122,** and have some holes **152a, 152b, 152c, 152d, ...** in order to close each of the ends **151a**, **151b** of the bags **150** on themselves.

In such a way, the same bags **150** can be steadily connected to their respective section in the trash can **100.**

[0021] With reference to **Figures 5 and 6,** said multi-bags **160** are composed of more single bags **165, 166** connected by prefixed holes **164.** Each of them has a specific shape including wings at the upper side: the bag **166** with the wings **161a, 161b, 161c, 161d** and the bag **165** with the wings **161e, 161f, 161g**, **161h**, in order to be installed in grooves **122c, 122d, 122e, 122f** of the braces **122,** and has some holes **162a, 162b, 162c, 162d, ...** in order to close each of the ends **161a**, **161b** of the bags **160** on themselves.

In such a way, the same multi-bags **160,** by their single bags **165, 166** can be steadily connected to their respective sections in the trash can **100.**

[0022] With reference to **Figures 15 and 16,** the device **120** of the present invention can include an additional element **140.** It comprises in turn a structure composed of two arms **141a, 141b** connected by their respective ends to two rings **142a, 142b** that are steadily connected

to respective braces **132, 131** of the device **120** installed on the trash can **100.**

A flexible housing **143** is connected at the center of said arms **141a, 141b,** having a ring shape with a variable diameter.

In such a way, it is possible to keep the upper part **144** of a bag **145** closed on itself, that is a very useful situation, in case of a bag dedicated to the wet waste or to the food waste.

[0023] **Figures 11 - 13** show different embodiments of the present invention, where the inner space of the waste trash can has been divided respectively in two, four and three sections.

[0024] The embodiment shown in **Figures 6 and 11,** with a division in two sections, comprises a unique brace **122** supporting bags **150** or multi-bags **160.** It is of elastic type, and has the inner side made of the same adhesive material belonging to said belt **121.** The brace **122** is placed as a diameter of the trash can **100,** and its ends **122a, 122b** are fixed to the belt **121;** the brace **122** includes some grooves **122c, 122d, 122e, 122f,** at a specific distance, that allow the proper insertion and installation of the respective bags **150** or multi-bags **160.**

[0025] The embodiment shown in **Figures 2, 3 and 12,** with a division in four sections, comprises two braces **122, 123** supporting bags **150** or multi-bags **160.** They are of elastic type, and have the inner side made of the same adhesive material belonging to said belt **121.** The braces **122, 123** are placed as diameters of the trash can **100** and they cross each other according to an angle of 90°, where a first brace **123** passes through a hole **126** placed into a second brace **122,** and their ends **122a, 122b** and **123a, 123b** are fixed to the belt **121;** the braces **122, 123** include some grooves **122c, 122d, 122e, 122f, ...,** at a specific distance, that allow the proper insertion and installation of the respective bags **150** or multi-bags **160.**

[0026] The embodiment shown in **Figures 13 - 16,** with a division in three sections, comprises three braces **130, 131, 132,** or a primary brace **130, 131** and a secondary brace **132,** supporting bags **150** or multi-bags **160.**

They are of elastic type, and have the inner side made of the same adhesive material belonging to said belt **121.** The braces **130, 131, 132** are placed as rays of the trash can **100** and they cross each other according to an angle of 120°, where the three braces **130, 131, 132** are connected at one of their ends, or the secondary brace **132** passes through a hole **126** placed on the primary brace **130, 131,** with their ends fixed to the belt **121;** the braces **130, 131, 132** include some grooves at a specific distance that allow the proper insertion and installation of the respective bags **150** or multi-bags **160.**

[0027] Furthermore, the present invention permits to achieve a process to steadily connect a bag **150** to its respective section in a trash can **100,** by using a device **120** for a separate collection of waste, according to the technical features, as above described. **Figures 7 - 10** show a sequence of steps, related to the installation and connection of the upper ends of a bag to a brace belonging to the device, by bending them on themselves, making them to pass through grooves that are into the brace, making them to pass through respective holes that are into the bag, in order to achieve a steady connection with a related knot.

In particular, the process comprises the following steps:

- a bag **150** is placed inside the trash can **100** where the device **120** has been previously installed, with the respective brace **122** having its ends fixed on the belt **121;**
- the ends **151a** and **151b** are moved, from the bottom to the top, and are directed to pass through the respective grooves **122c** and **122f** of the brace **122,** up to make them to go out from the upper side;
- the ends **151a** and **151b** are bended, laterally on themselves, and moved from the top to the bottom, and are directed to pass through the respective grooves **122d** and **122e** of the brace **122,** up to make them to go out from the lower side;
- the ends **151a** and **151b** are longitudinally compressed and squeezed, and are directed forward from the rear side, by passing through the respective holes **152a** and **152d,** up to make them to go out from the front side of the bag **150;**
- a knot is made at each of said ends **151a** and **151b** on themselves, so that they are, blocked at their position on the brace **122.**

[0028] An alternative embodiment of the present invention is represented by a device that is portable and appropriate for travelling, and able to achieve a separate collection of waste, by construction of a specific structure. It can be made of plastic or metal, and achieves a structure composed of: a circular base that is placed in a horizontal direction; at least two circular sections placed in a horizontal direction, at a specific distance each other and in respect to said circular base; a series of rods that compose a supporting bar, to which said circular base and sections are attached; a circular cover covering the upper side of the structure; and a tissue, that is wrapped around as a cylinder, covering the radial part of the structure.

The circular base is placed in a horizontal direction, has an outer radial border with a surface made of velcro, and further comprises a threaded vertical housing, in order to insert a rod by a screwing operation.

The series of rods, with their respective ends that are threaded each other in a complementary way, are placed in a vertical direction, with a first rod screwed into said housing, and the other rods screwed each other at their respective ends, one following the other, along the vertical direction, in order to compose a supporting bar.

The circular sections have an outer radial border with a surface made of velcro, and include a hole at the same radial border, so that they can be placed in a horizontal direction, at a specific distance each other and in respect

to said circular base, they can be connected by a screw and can be laterally supported by said supporting bar, at the points of the rods that pass through said holes.
The circular cover has the same size of the circular base, and it is connected at the upper side of the structure through a mechanism, so that it can be opened and closed, by pulling a specific protuberance on it.
The flexible tissue is made of a synthetic material, that is wrapped around as a cylinder in order to contain said circular base and said circular sections inside, being radially connected to them by a velcro mechanism.

[0029] Therefore, the above components are composed of: a circular base, a series of rods, at least two circular sections, a circular cover, a flexible tissue. The components can be disassembled and can be contained in a small space, constrained at the lower side by said circular base, and constrained at the upper side by said circular cover, that connects itself perfectly according to its velcro mechanism, so that a kit that is portable and appropriate for travelling, allowing a separate collection of waste can be achieved.

[0030] Therefore, the above examples show that the present invention reaches all the expected objectives. In particular, it permits to achieve a device for a separate collection of waste, to be applied to a domestic and single-bag trash can, in order to divide its inner space in different sections, and to adapt it to a separate collection in respect to two, three or four separate bags.

[0031] Further according to the invention, the device comprises an arrangement with a belt that is adaptable and variable in length, in respect to different types and/or sizes of trash cans, that the belt can be slightly pulled outside in order to install some braces supporting some multi-bags, where the braces have their ends connected to the belt on the trash can, and the braces have some grooves, at a specific distance, that allow the installation of an appropriate collecting multi-bag.

[0032] Furthermore, some environment compatible multi-bags are included, so that to achieve more collection sections in the trash can, i.e. two, three or four sections, in order to achieve a separate collection of waste, and in order that the same multi-bags can be steadily connected to the trash can.

[0033] Then, according to the invention, it is possible to uninstall, remove and exchange the multi-bags, for each section, in an autonomous and independent way in respect to the other parts of the structure.

[0034] Furthermore, an additional mechanism is included, so that it is possible to keep the upper part of a bag closed on itself, that is a very useful situation, in case of a bag dedicated to the wet waste or to the food waste, in order to prevent the emission of bad odors.

[0035] Finally, according to the invention, the device installation process on a standard domestic trash can, results to be practical, comfortable and effective, and in the same way, the installation or removal of a multi-bag into/from the trash can, results to be practical, comfortable and effective.

[0036] The present invention has been described by making reference to some non limiting examples and following some preferred embodiments; however it goes without saying that modifications and/or changes could be introduced by those skilled in the art without departing from the relevant scope, as defined in the enclosed claims.

Claims

1. Device (120) for a separate collection of waste, to be applied to a domestic trash can (100), in order to divide its inner space in different sections, and to adapt it to a separate collection in respect to two, three or four separate bags, **characterized in that** comprising:

   - a belt (121) supporting some braces (122, 123, ...), said belt (121) to be applied to the outer walls of the top side (101) of a trash can (100); the belt (121) being adaptable and variable in length, i.e. by a clasp with a slot (124), in respect to different types and/or sizes of trash cans (100), having an inner contact surface made of a material that is adhesive to the same trash can (100), and an outer surface having some protuberances (125a, 125b, 125c, ...) that allow the belt (121) to be pulled out, so that the other components of the device (120) can be installed;
   - some braces (122, 123, ...) supporting some bags (150) or multi-bags (160), said braces (122, 123, ...) being of elastic type, and having the inner side made of the same adhesive material belonging to said belt (121); the braces (122, 123, ...) are placed in a diagonal direction, and their ends (122a, 122b) and (123a, 123b) are fixed to the belt (121) of the trash can (100), they include some grooves (122c, 122d, 122e, 122f, ...) at a specific distance that allow the proper insertion and installation of the respective bags (150) or multi-bags (160);
   - some environment compatible bags (150) or multi-bags (160), where multi-bags (160) are composed of more single bags (165, 166), so that to achieve more collection sections in the trash can (100), i.e. two, three or four sections, in order to achieve a separate collection of waste; the bags (150) or multi-bags (160) can be fixed either in the grooves (122c, 122d, 122e, 122f, ...) of the diagonal braces (122, 123,...), and under the supporting belt (121) installed on the trash can (100); by pulling a line of prefixed holes (164) on the multi-bag (160) it is possible to uninstall, remove and exchange each of the single bags (165, 166), in an autonomous and independent way in respect to the other part of the structure.

2. Device (120) for a separate collection of waste, according to previous claim 1, **characterized in that**:

- said bags (150) have a specific shape including wings (151a, 151b, 151c, 151d) at the upper side, in order to be installed in grooves (122c, 122d, 122e, 122f) of the braces (122), and have some holes (152a, 152b, 152c, 152d, ...) in order to close each of the ends (151a, 151b) of the bags (150) on themselves,

so that the same bags (150) can be steadily connected to their respective section in the trash can (100).

3. Device (120) for a separate collection of waste, according to previous claim 1, **characterized in that**:

- said multi-bags (160) are composed of more single bags (165, 166) connected by prefixed holes (164), and they have a specific shape including wings at the upper side: the bag (166) with the wings (161a, 161b, 161c, 161d) and the bag (165) with the wings (161e, 161f, 161g, 161h) in order to be installed in grooves (122c, 122d, 122e, 122f) of the braces (122), and have some holes (162a, 162b, 162c, 162d, ...) in order to close each of the ends (161a, 161b) of the bags (160) on themselves,

so that the same multi-bags (160), by their single bags (165, 166) can be steadily connected to their respective sections in the trash can (100).

4. Device (120) for a separate collection of waste, according to one or more of previous claims, **characterized in that** further comprising:

- an additional element (140), that in turn comprises a structure composed of two arms (141a, 141b) connected by their respective ends to two rings (142a, 142b) that are steadily connected to respective braces (132, 131) of the device (120) installed on the trash can (100); a flexible housing (143) is connected at the center of said arms (141a, 141b), having a ring shape with a variable diameter,

so that it is possible to keep the upper part (144) of a bag (145) closed on itself, that is a very useful situation, in case of a bag dedicated to the wet waste or to the food waste.

5. Device (120) for a separate collection of waste, to be applied to a domestic trash can (100), in order to divide its inner space in two sections, according to previous claim 1, **characterized in that** comprising:

- a unique brace (122) supporting bags (150) or multi-bags (160), said brace (122) being of elastic type, and having the inner side made of the same adhesive material belonging to said belt (121); the brace (122) is placed as a diameter of the trash can (100), and its ends (122a, 122b) are fixed to the belt (121), the brace (122) includes some grooves (122c, 122d, 122e, 122f), at a specific distance, that allow the proper insertion and installation of the respective bags (150) or multi-bags (160).

6. Device (120) for a separate collection of waste, to be applied to a domestic trash can (100), in order to divide its inner space in four sections, according to previous claim 1, **characterized in that** comprising:

- two braces (122, 123) supporting bags (150) or multi-bags (160), said braces (122, 123) being of elastic type, and having the inner side made of the same adhesive material belonging to said belt (121); the braces (122, 123) are placed as diameters of the trash can (100) and they cross each other according to an angle of 90°, where a first brace (123) passes through a hole (126) placed into a second brace (122), and their ends (122a, 122b) and (123a, 123b) are fixed to the belt (121), the braces (122, 123) include some grooves (122c, 122d, 122e, 122f, ...), at a specific distance, that allow the proper insertion and installation of the respective bags (150) or multi-bags (160).

7. Device (120) for a separate collection of waste, to be applied to a domestic trash can (100), in order to divide its inner space in three sections, according to previous claim 1, **characterized in that** comprising:

- three braces (130, 131, 132), or a primary brace (130, 131) and a secondary brace (132), supporting bags (150) or multi-bags (160), said braces (130, 131, 132) being of elastic type, and having the inner side made of the same adhesive material belonging to said belt (121); the braces (130, 131, 132) are placed as rays of the trash can (100) and they cross each other according to an angle of 120°, where the three braces (130, 131, 132) are connected at one of their ends, or the secondary brace (132) passes through a hole (126) placed on the primary brace (130, 131), with their ends fixed to the belt (121), the braces (130, 131, 132) include some grooves at a specific distance that allow the proper insertion and installation of the respective bags (150) or multi-bags (160).

8. Process to steadily connect a bag (150) to its respective section in a trash can (100), by using a device

(120) for a separate collection of waste, according to one or more of previous claims from 1 to 7, said process being **characterized by** the following steps:

- a bag (150) is placed inside the trash can (100) where the device (120) has been previously installed, with the respective brace (122) having its ends fixed on the belt (121);
- the ends (151a) and (151b) are moved, from the bottom to the top, and are directed to pass through the respective grooves (122c) and (122f) of the brace (122), up to make them to go out from the upper side;
- the ends (151a) and (151b) are bended, laterally on themselves, and moved from the top to the bottom, and are directed to pass through the respective grooves (122d) and (122e) of the brace (122), up to make them to go out from the lower side;
- the ends (151a) and (151b) are longitudinally compressed and squeezed, and are directed forward from the rear side, by passing through the respective holes (152a) and (152d), up to make them to go out from the front side of the bag (150);
- a knot is made at each of said ends (151a) and (151b) on themselves, so that they are blocked at their position on the brace (122).

9. Device (120) that is portable and appropriate for travelling, and able to achieve a separate collection of waste, according to previous claim 1, made of plastic or metal, **characterized in that** achieving a structure composed of:

- a circular base that is placed in a horizontal direction, and having an outer radial border with a surface made of velcro, further comprising a threaded vertical housing, in order to insert a rod by a screwing operation;
- a series of rods, having their respective ends that are threaded each other in a complementary way, that are placed in a vertical direction, having a first rod screwed into said housing, and the other rods being screwed each other at their respective ends, one following the other, along the vertical direction, in order to compose a supporting bar;
- at least two circular sections, having an outer radial border with a surface made of velcro, that include a hole at the same radial border, so that they can be placed in a horizontal direction, at a specific distance each other and in respect to said circular base, they can be connected by a screw and can be laterally supported by said supporting bar, at the points of the rods that pass through said holes;
- a circular cover, having the same size of the circular base, that is connected at the upper side of the structure through a mechanism, so that it can be opened and closed, by pulling a specific protuberance on it;
- a flexible tissue made of a synthetic material, that is wrapped around as a cylinder in order to contain said circular base and said circular sections inside, being radially connected to them by a velcro mechanism.

10. Device (120) that is portable and for travelling, for a separate collection of waste, according to previous claim 9, **characterized in that**:

- said components are composed of: a circular base, a series of rods, at least two circular sections, a circular cover, a flexible tissue; said components can be disassembled and can be contained in a small space, constrained at the lower side by said circular base, and constrained at the upper side by said circular cover that connects itself perfectly according to its velcro mechanism,

so that a kit that is portable and appropriate for travelling, allowing a separate collection of waste can be achieved.

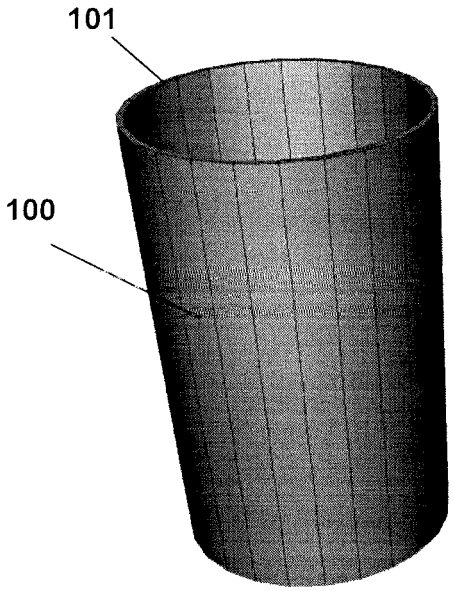


Fig. 1

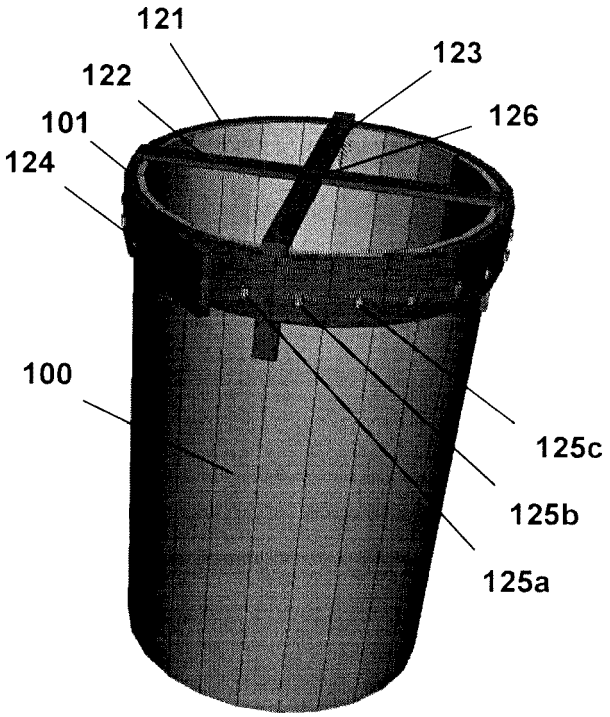


Fig. 2

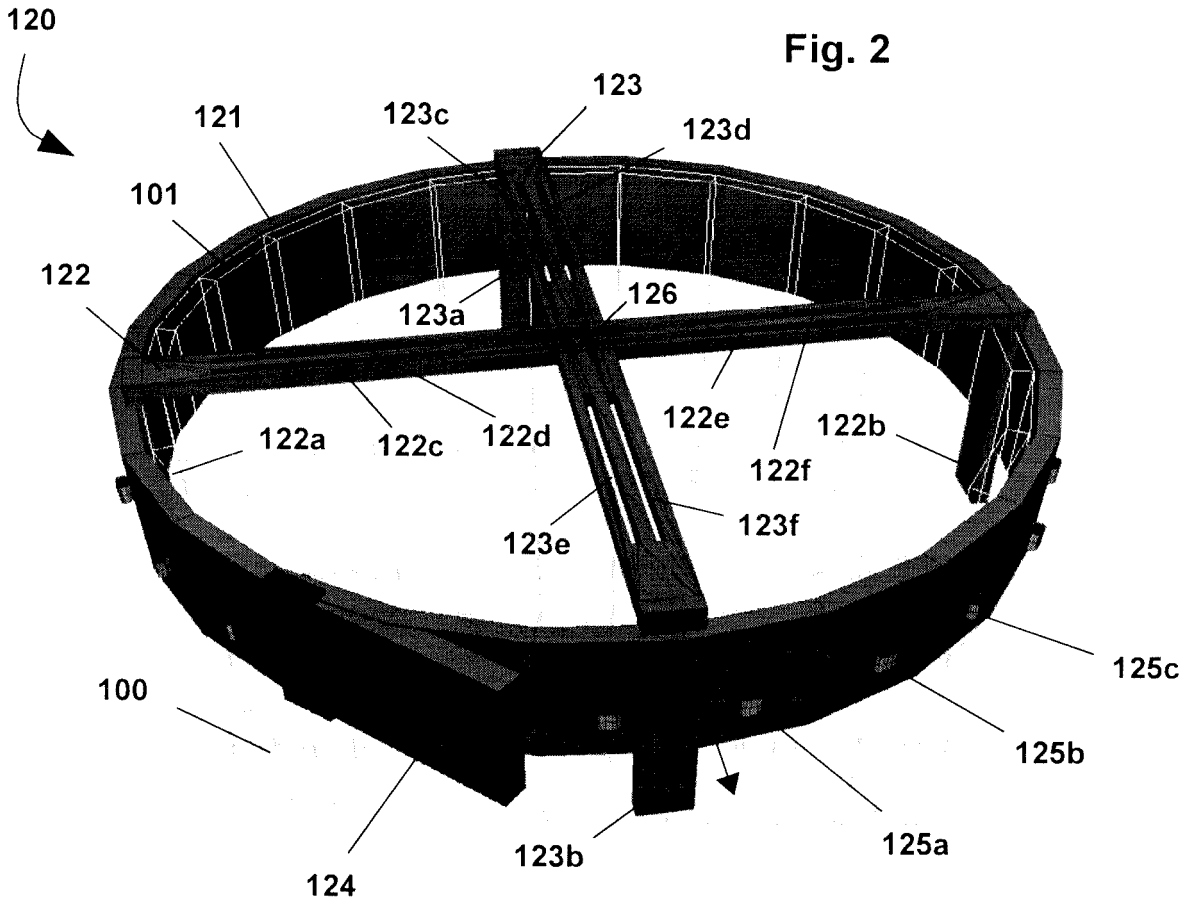


Fig. 3

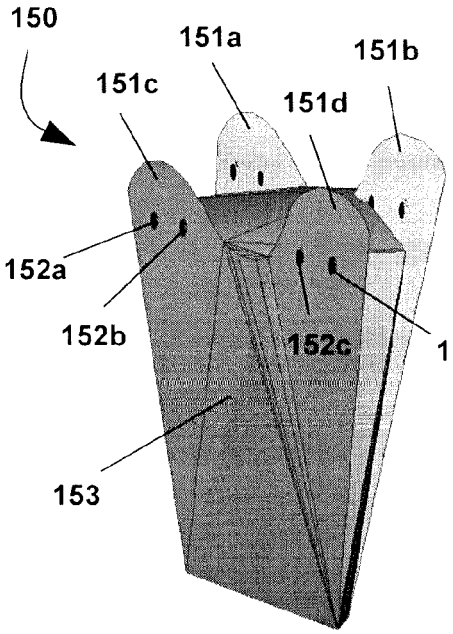


Fig. 4

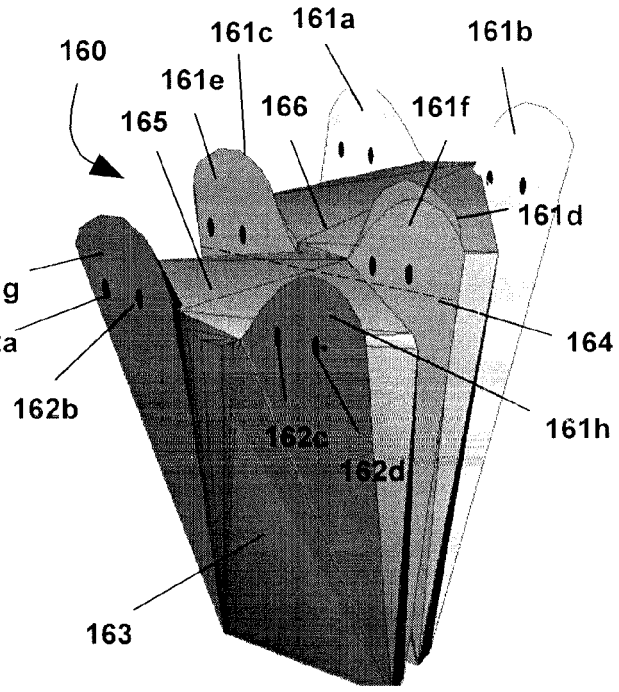


Fig. 5

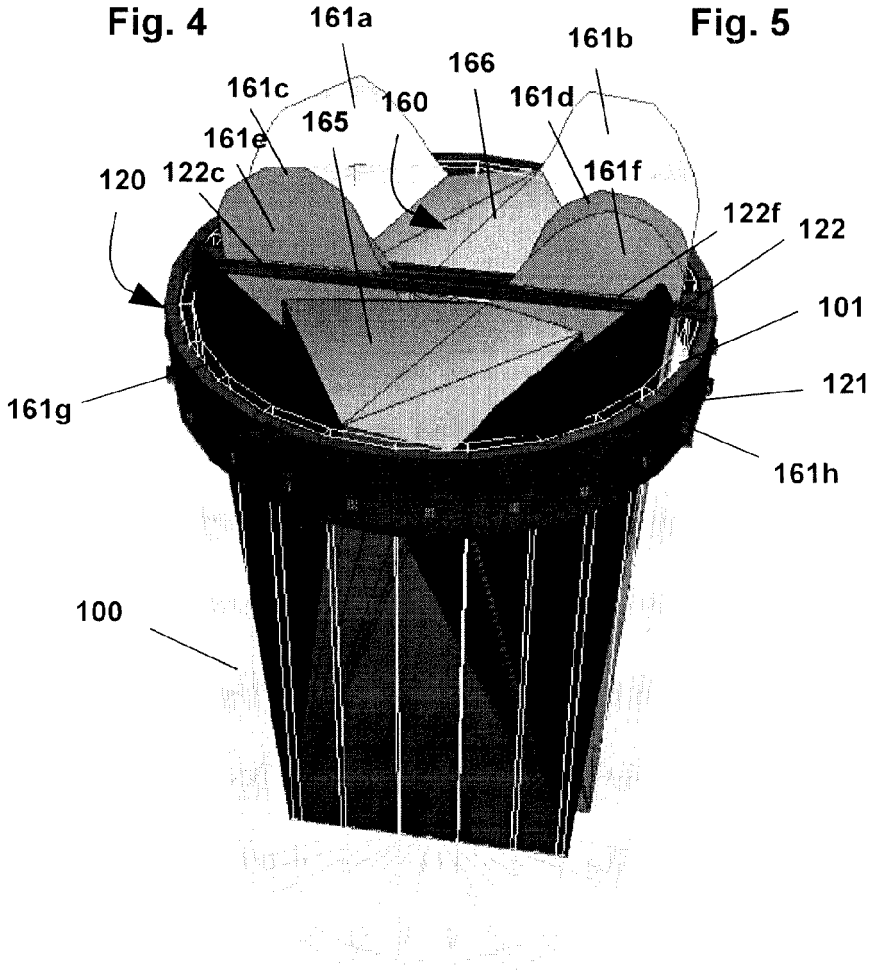


Fig. 6

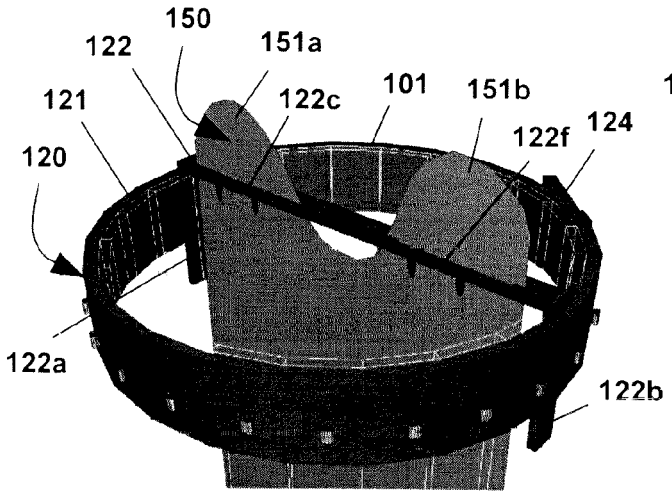


Fig. 7

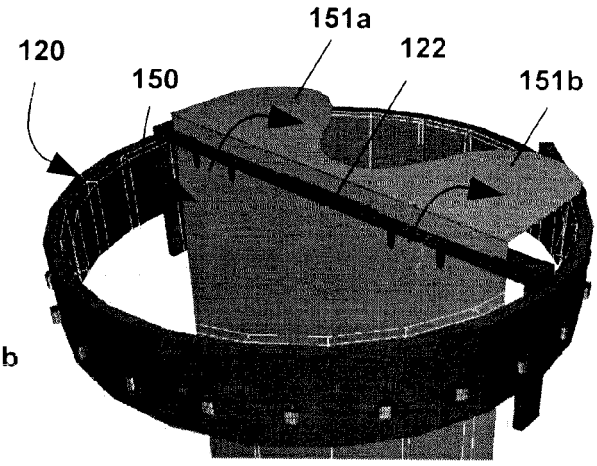


Fig. 8

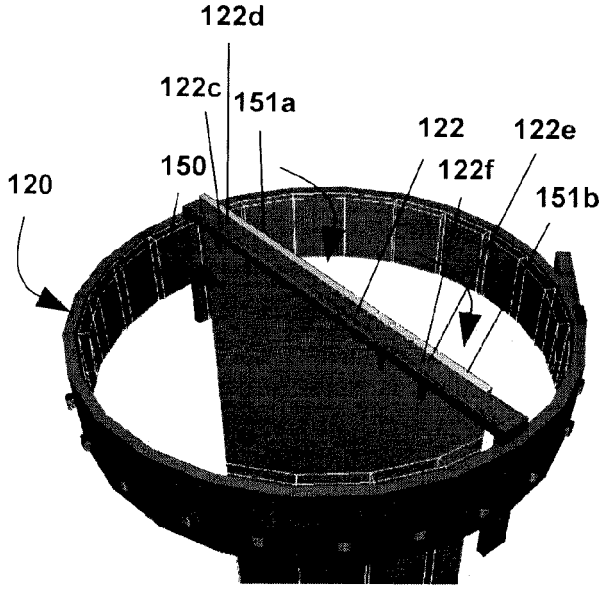


Fig. 9

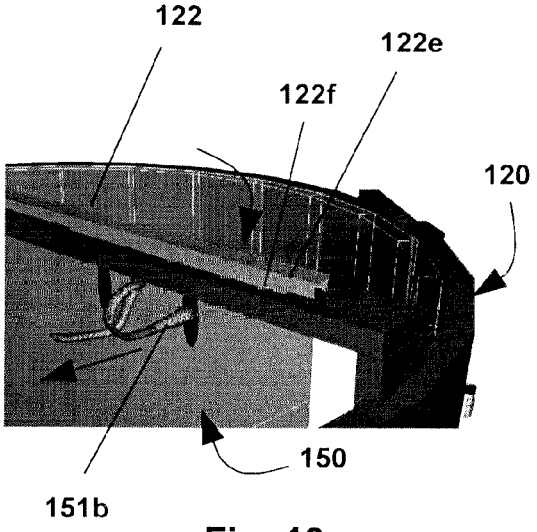


Fig. 10

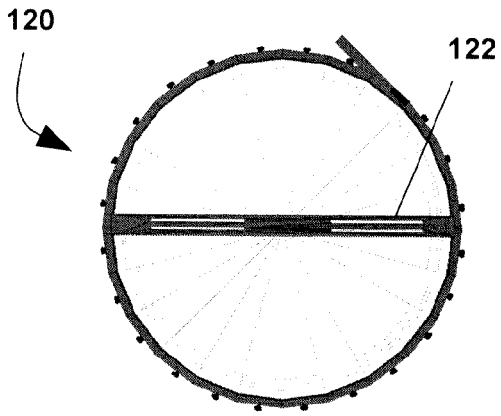


Fig. 11

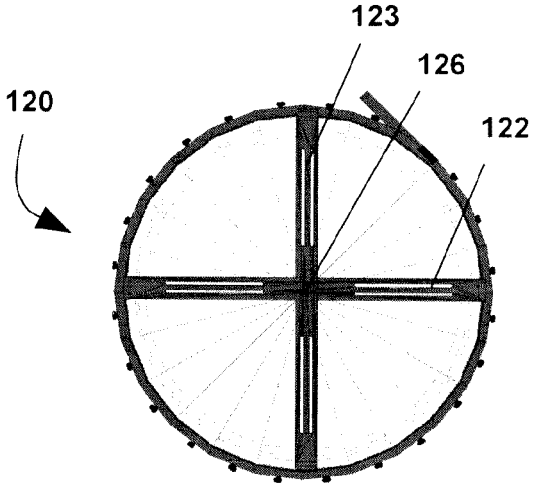


Fig. 12

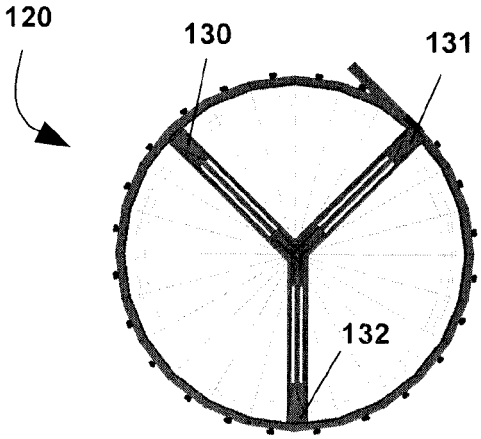


Fig. 13

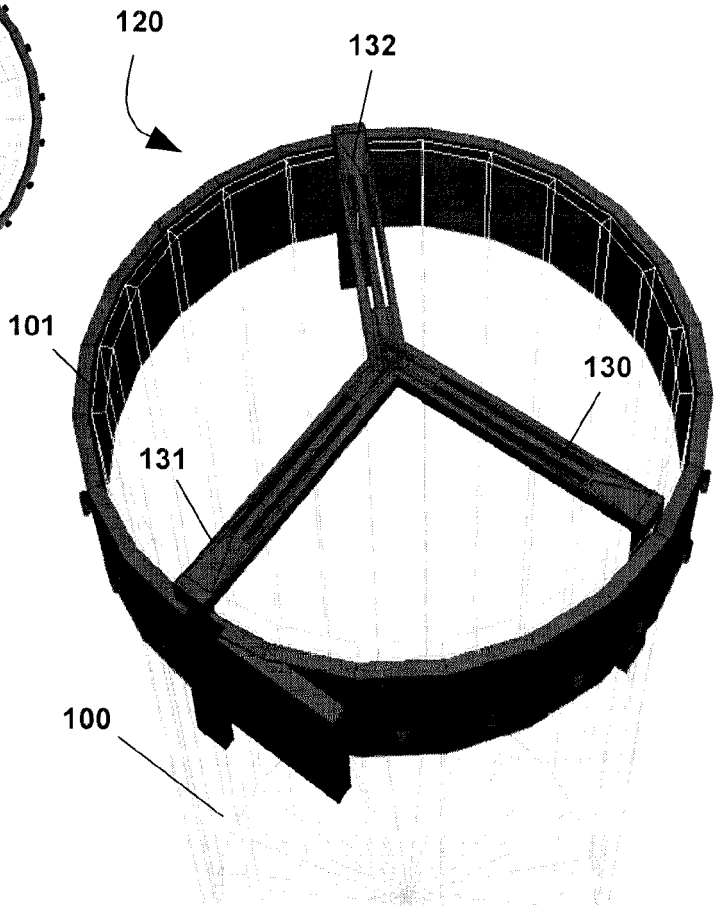
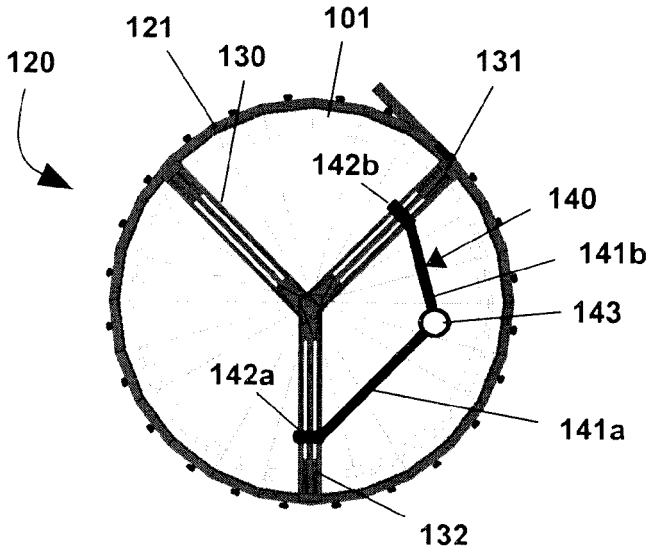


Fig. 14


120
121
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142b
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141b
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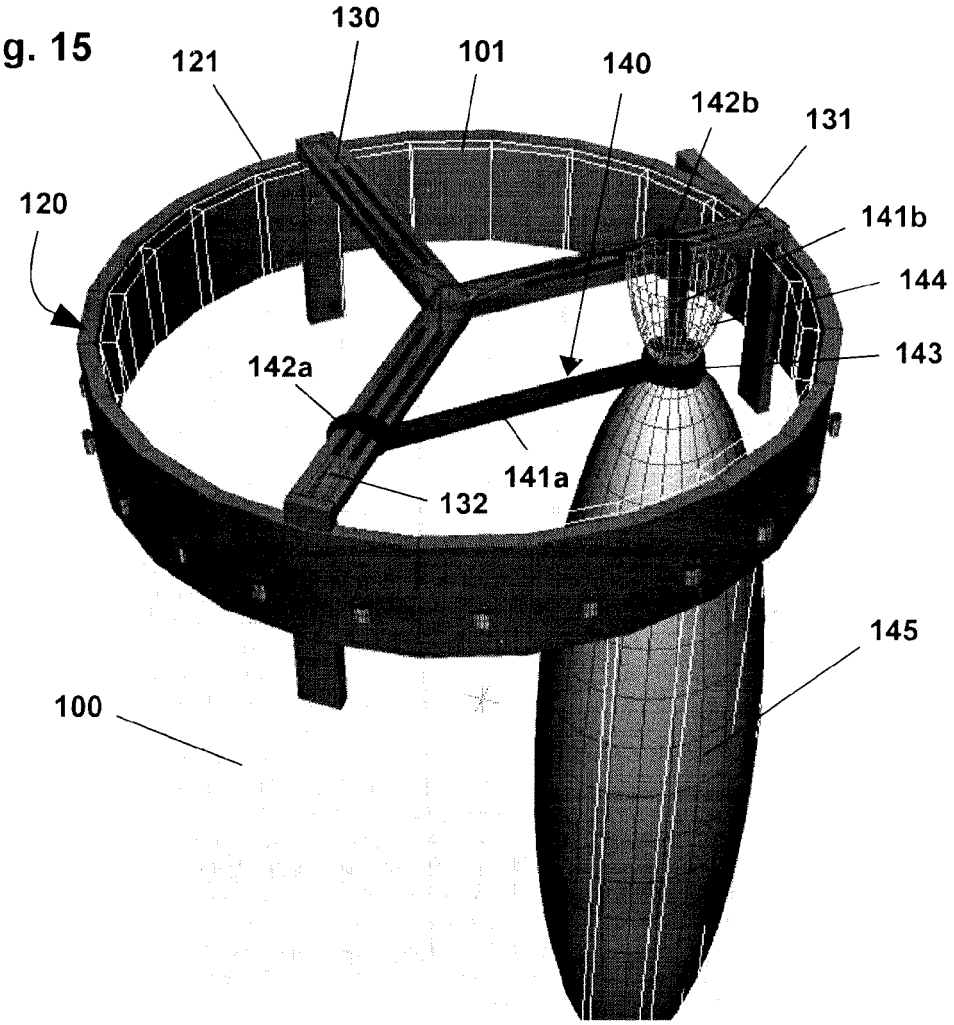
142a
141a
132

Fig. 15


130
121
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142b
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141b
144
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142a
141a
132
145
100

Fig. 16

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EUROPEAN SEARCH REPORT

Application Number
EP 18 42 5086

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	US 5 193 713 A (GREATHOUSE DAN L [US] ET AL) 16 March 1993 (1993-03-16) * figures 1-5 * * the whole document *	1-3,5-10	INV. B65F1/00 B65F1/06 B65F1/14
Y	US 4 967 900 A (GOSSETT DIANNE [US]) 6 November 1990 (1990-11-06) * figures 1-2 * * column 2, lines 10-62 *	1-3,5-10	
Y	US 2013/223766 A1 (GEBHARDT TERRY [US]) 29 August 2013 (2013-08-29) * abstract; figure 1 *	2,3,8	
A,D	WO 2015/139124 A1 (ATKINSON DAVID [CA]) 24 September 2015 (2015-09-24) * abstract; figures 1-5 *	1-10	
			TECHNICAL FIELDS SEARCHED (IPC) B65F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	8 May 2019	Pardo Torre, Ignacio

CATEGORY OF CITED DOCUMENTS

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08-05-2019

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5193713 A	16-03-1993	NONE	
US 4967900 A	06-11-1990	NONE	
US 2013223766 A1	29-08-2013	NONE	
WO 2015139124 A1	24-09-2015	CA 2847203 A1	19-09-2015
		WO 2015139124 A1	24-09-2015

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

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Patent documents cited in the description

- US 5190183 A, McNaughton **[0006] [0007]**
- US 5246119 A, Heffner **[0006] [0007]**
- WO 2015139124 A1, Atkinson **[0006] [0007]**
- US 4905853 A **[0006]**
- US 5033641 A **[0006]**
- US 5085342 A **[0006]**
- US 5183228 A **[0006]**
- US 8950620 B **[0006]**
- WO 2002026595 A1 **[0006]**
- WO 2012126132 A1 **[0006]**