



(11)

EP 4 282 783 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
29.11.2023 Bulletin 2023/48

(51) International Patent Classification (IPC):
B65F 1/14 ^(2006.01) **B65F 1/16** ^(2006.01)

(21) Application number: **23174998.7**

(52) Cooperative Patent Classification (CPC):
B65F 1/1484; B65F 1/16

(22) Date of filing: **24.05.2023**

(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 ME MK MT NL
NO PL PT RO RS SE SI SK SM TR**
Designated Extension States:
BA
Designated Validation States:
KH MA MD TN

(71) Applicant: **ESE World B.V.**
6199 AM Maastricht-Airport (NL)

(72) Inventor: **Den Boer, Reinier**
5658PK Eindhoven (DE)

(74) Representative: **Müller, Thomas**
Boschetsrieder Straße 20
81379 München (DE)

(30) Priority: **25.05.2022 DE 102022113289**

(54) **INDICATOR ELEMENTS FOR WASTE COLLECTION CONTAINERS**

(57) The present invention relates, inter alia, to a waste collection container (10), in particular a large waste collection container, having a container body (11) comprising a side wall, a container bottom (18) and an insertion opening, and comprising a lid device (24) for closing the insertion opening. Meanwhile, it has become common practice to provide waste collection containers (10)

with different indicator elements by means of which different information regarding the waste collection container (10) is provided. According to the invention, the waste collection container has, among other things, an indicator system comprising different types of indicator elements (44, 50, 51, 52).

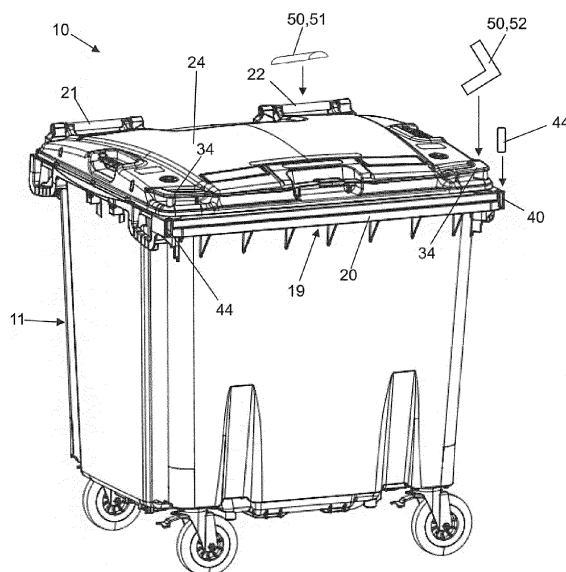


Fig. 10

Description

[0001] The present invention relates firstly to an indicator element for displaying and/or providing information relating to a waste collection container according to the preamble of claim 1. Furthermore, the invention relates to a corresponding indicator system with a number of indicator elements according to the preamble of claim 7. Finally, the invention also relates to a waste collection container with the features according to the preamble of claim 10.

[0002] The present invention is particularly directed to the field of waste collection containers. Waste collection containers are widely known in the state of the art. First of all, they consist of a container body that serves to receive and hold the waste. The container body consists of a container bottom and a side wall which projects upwards from the container bottom. At the upper end of the side wall there is an insertion opening which is delimited by an upper edge of the container body. As a rule, the container body has an approximately rectangular, pot-shaped form. For better manageability of the waste collection container, it has a drive gear, which usually consists of a number of wheel devices, two wheel devices, three wheel devices or four wheel devices for example, which are arranged below the container bottom in its corner areas or laterally to the container bottom. In order to be able to maneuver the waste collection container, it has one or more handle elements, in particular in the area of the upper edge of the container body. The open upper side of the container body, which provides the insertion opening through which the waste is filled, is closed by means of a lid device. For this purpose, the lid device is hinged to the container body.

[0003] In the meantime, it has become common practice to provide waste collection containers of the type mentioned with different indicator elements by means of which different information regarding the waste collection container is provided.

[0004] The present invention is based on the object of further optimising such waste collection containers, which are known per se, in the direction of such indicator elements.

[0005] This object is solved according to the invention by the indicator element with the features according to the independent claim 1, which represents the first aspect of the invention, the indicator system with the features according to the independent claim 7, which represents the second aspect of the invention, and by the waste collection container with the features according to the independent claim 10, which represents the third aspect of the invention. Further features and details of the invention will be apparent from the dependent claims, the description, and the drawings. Features and details described in connection with one aspect of the invention also apply in full in connection with the other aspects of the invention, and vice versa, so that with regard to the disclosure of one aspect of the invention, full reference

is also made to the disclosure of the other aspects of the invention.

[0006] In all aspects, the present invention is directed to the use of indicator elements. An indicator element is in particular a device by means of which certain information is displayed and/or provided. This information may be of a very different nature, but in the present case it always relates to the field of waste collection containers or the contents of such a waste collection container. The information may be of a qualitative and/or quantitative nature, indicating certain conditions, processes and states, and the like. The invention is not subject to any limitations in this respect. In the following, some preferred embodiments will be described.

[0007] The indicator elements according to the invention and the indicator system according to the invention are preferably used in combination with waste collection containers or as parts of waste collection containers. In the following, the basic structure, and the basic mode of operation of such a waste collection container are therefore first described.

[0008] For example, the waste collection container can be a waste collection container as described at the beginning, so that to avoid repetition, full reference is also made to the corresponding explanations above. In one embodiment, the waste collection container is, for example, a two-wheeled or three-wheeled waste collection container, in particular with a capacity of up to 400 litres. In another embodiment, the waste collection container is a large waste collection container with a capacity of up to 1,700 litres, for example with a capacity of 1,100 litres. However, the invention is not limited to specific container sizes.

[0009] The waste collection container comprises a container body which in turn comprises a side wall, a container bottom and an insertion opening. The side wall projects upwards from the container bottom and ends in an upper edge of the container body, which delimits the insertion opening formed at the upper end of the side wall. These mentioned components delimit the receiving space of the container in which the waste is collected and stored at least temporarily. The term waste basically includes all types of refuse, but also recyclable materials, which can be collected in such a container.

[0010] According to one aspect the waste collection container is provided to receive one sort of waste. According to a different embodiment, the waste collection container is provided to receive two or more sorts of waste at the same time. In this case the container preferably comprises two or more compartments which can be either realised by using partition walls or by using additional containers which are placed in the receiving space of the - main - container body.

[0011] The container body can, for example, have a rectangular, pot-shaped form in plan view. A pot is in particular a vessel, which is open at the top for receiving and holding the waste.

[0012] In one embodiment, the side wall is formed from

four side wall segments. The side wall segments abut each other in corner areas, which are preferably rounded corner areas. In one embodiment, a first side wall segment is formed as a rear side, a second side wall segment is formed as a front side, and a third and fourth side wall segment are formed as transverse sides extending between the rear side and the front side. In such an embodiment, the container body has in particular a rectangular or approximately rectangular shape.

[0013] In addition, the waste collection container comprises a drive gear. A drive gear is in particular the entirety of the components by means of which the container can be moved. The drive gear comprises a plurality of wheel devices, in particular two wheel devices, three wheel devices or four wheel devices, wherein the wheel devices are arranged in the region of the container bottom on the side wall or below the container bottom and extend below the container bottom. The wheel device is preferably arranged in a corner region of the container body, preferably in the region of the container bottom or below the container bottom. In case of a four wheel container, which in particular is a large waste collection container, two or more of these wheel devices, for example all four wheel devices, can be designed as a steering wheel device. At least one wheel device has a braking device. Each wheel device can have its own individual axle, but it is also conceivable that two wheel devices are coupled to each other via a common axle.

[0014] The open upper side of the container body, i.e. the insertion opening through which the waste is filled in, is preferably closed by means of a lid device. For this purpose, the lid device is hinged to the container body, in particular it can be swivelled or pivoted. The lid device can be made of one or more parts. For example, the lid device may be a hinged lid which is usually hinged to the side of the container body. In another embodiment, the lid device may be a hinged lid, such as a flat lid, which is hinged, in particular via hinges, to the upper edge of the container body, in particular to the upper rear edge. The lid device can also be a round lid, a sliding lid, or the like.

[0015] This type of waste collection container is often discharged into waste collection vehicles. For this purpose, the waste collection vehicles have a chute with a lifting device. By means of the lifting device, the waste containers are gripped, lifted, and tilted into a receiving area of the waste collection vehicle. For this purpose, large waste containers have, preferably on their side wall segments, corresponding trunnion elements which are pick-up pins and which cooperate with the lifting device. The lid device opens and the waste in the waste collection container falls into the receiving area of the waste collection vehicle. As a rule, the waste collection vehicles also have a pressing device, which in particular has a pressing plate construction. The waste poured into the receiving area is pressed together by the pressing device and is pushed into the collection container of the waste collection vehicle. it starts to become common practice

that the discharging process is performed automatically or autonomously and therefore that the lifting device is going to work accordingly. Thus, it will become essential that the lifting device correctly detects and recognizes the waste collection container and its position and alignment, such that the lifting device can grip and handle the waste collection container properly.

[0016] In order to be able to selectively mount various container components, for example an additional handle device and/or a trunnion device and/or a communication device, on the container body, the waste collection container may comprise a receiving device. The receiving device is arranged or formed on the upper edge or in the region of the upper edge of the container body for optionally receiving and, in particular, releasably holding additional container components. The receiving device is in particular a type of adapter device, i.e. a connecting element, via which additional container components can be mounted on the container body. The receiving device may comprise at least one receiving profile element which is provided for receiving and holding the additional container components on the container body. The receiving profile element comprises a receiving leg which cooperates with corresponding components of the container component to be fastened. The receiving profile element of the receiving device and the additional container component are inserted into each other, by way of a plug-in connection for example.

[0017] Such waste collection containers are usually made of robust materials, such as metal or hard plastics.

[0018] According to the first aspect of the invention, there is provided an indicator element for displaying and/or providing information concerning a waste collection container, in particular a large waste collection container, which comprises the features of independent claim 1.

[0019] The indicator element is provided for, in particular detachable, attachment to the waste collection container. This means that the indicator element is arranged on the waste collection container in its intended use. The indicator element can initially be manufactured as an independent component which is subsequently connected to the waste collection container. If the connection is non-detachable, the indicator element will be destroyed if it is attempted to be removed. If a detachable connection is made, the indicator element can be replaced and exchanged, if necessary, for example also retrofitted.

[0020] According to the invention, the indicator element comprises a first leg having a first end and a second leg having a first end connected to the first end of the first leg. The legs are components that meet at a point. In this case, the second leg projects from the first leg at an angle, preferably at a right angle. The legs can have the same length or a different length in relation to each other. For example, the length of the first leg can be shorter than the length of the second leg. Such an embodiment allows the indicator element to be viewed from different angles, and the information provided by the indicator el-

ement can get acquired from different viewing directions. In one embodiment described in connection with the waste collection container according to the invention, the information of the indicator element can be acquired both from above in plan view and from a lateral viewing direction.

[0021] In one embodiment, the first leg and/or the second leg are designed as a surface element. In particular, a surface element is a planar element for defining a structure. In particular, the surface element has a length and width in the first and second dimensions that are greater than the extension in the third dimension, i.e. its height or thickness respectively.

[0022] For example, the two legs can each have the same width and/or the same thickness.

[0023] In one embodiment, the indicator element is L-shaped. An L-form is characterised by the two legs touching at one point and projecting from each other, preferably at right angles. One leg is in particular longer than the other leg.

[0024] In another embodiment, the first leg and the second leg each have a curved course, the second leg in particular having a stepped course.

[0025] Preferably, the indicator element is designed in such a way that its shape corresponds to a corresponding recess in the waste collection container, to which the indicator element is connected in its intended use. An example of this embodiment is explained below in connection with the waste collection container according to the invention.

[0026] The invention is not limited to specific embodiments for the indicator element.

[0027] According to the invention, the indicator element further comprises a fastening device which is located on the first leg and/or on the second leg and which is provided for fastening the indicator element to the waste collection container, in particular in a detachable manner. In one embodiment, the fastening device projects from the first leg and/or the second leg, for example at a right angle.

[0028] In one embodiment, the first leg has an outwardly facing surface and an inwardly facing surface. Similarly, the second leg has an outwardly facing surface and an inwardly facing surface. The fastening device is provided on the inwardly facing surface of the first leg and/or the second leg and projects therefrom, in particular perpendicularly.

[0029] The invention is not limited to certain types of fastening devices. For example, the fastening device may be provided to create a plug-in connection, a snap-in connection, a clip connection, or a screw connection. The fastening device is then, for example, a screw, bolt, pin, or the like. For latching, the fastening device can additionally have a latching nose, which is preferably provided at the free end of the fastening device.

[0030] The indicator element according to the first aspect of the invention may perform one or more different functions, either individually or in any combination. For

example, the indicator element may be a coloured indicator element. In this case, information is provided via the colour of the indicator element. Alternatively, or additionally, the indicator element may be an indicator element for fraction indication. A fraction, i.e. waste fraction, is in particular a specific type of waste. The indicator element thus provides information about the waste fraction received in the waste collection container and at least temporarily stored or to be stored. Different waste fractions can be assigned to different colours. By means of the colours of the indicator elements located on the waste collection container, it is then possible to quickly and precisely identify what kind of waste fraction is stored in the waste collection container or what kind of waste fraction may be filled into the waste collection container. Often, a waste collection container comprises several separate compartments. These can then be identified by different indicator elements. Alternatively, or additionally, the indicator element may be a reflector element. Alternatively, or additionally, the indicator element may be an element for providing a reference point, for example for an automatic lift system. According to these embodiments the indicator element may have a reflective outer surface, at least in parts, and/or a specific colour, at least in parts, that differs from the colour of the container body, such that the indicator element can get distinguished from the container body.

[0031] Preferably, at least two indicator elements spaced apart from each other are used in such a case. According to one embodiment, the indicator elements are provided in a line at the waste collection container. This is because two indicator elements, which then provide two reference points, define a functional line that is recognised by the automatic lift system. With regard to a waste collection container, this means that at least one, preferably two such indicator element(s) is/are arranged or formed on the waste collection container. Alternatively, or additionally, the indicator element can be an element for identification, for example for identification of the waste collection container or the waste stored in the waste collection container.

[0032] According to the second aspect of the invention, there is provided an indicator system for displaying and/or providing information concerning a waste collection container, in particular a large waste collection container, which comprises the features of independent claim 7. The indicator system, which is a whole consisting of various individual components, can comprise different types of indicator elements, which are referred to below as first indicator elements, second indicator elements, third indicator elements and fourth indicator elements in order to distinguish between different indicator types. One or more indicator elements of each indicator type can be realised. The indicator system can have any combination of different types of indicator elements.

[0033] The indicator system comprises at least one indicator element according to the first aspect of the invention, so that at this point full reference is made to the

explanations on the first aspect of the invention, as well as to the general description of the invention. In the following, this indicator element is referred to as the first indicator element.

[0034] The first indicator element of the indicator system is in particular provided to get, advantageously detachably, connected to the waste collection container and to being connected in the intended use of the indicator element. Preferably, the at least one first indicator element may be arranged or formed on/in the container body, for example on/in the upper edge of the container body, in particular on/in a comb device, preferably on/in a corner area, in particular on/in an edge. In one embodiment, two first indicator elements are provided which are spaced apart from one another, preferably one each at/in a corner region of the container body, for example at/in the upper edge of the container body, in particular at/in a comb device, a comb bar for example, preferably at/in a corner region, in particular at/in an edge. The at least one first indicator element can for example be inserted or received, i.e. in a recess, in the container body, for example at/in its upper edge, for example at/in the comb geometry preferably at/in a corner region, in particular at/in an edge. For example, it can be fixed by means of a plug-in connection, for example with a fixing pin or locking pin. Further details on this are described below in connection with the waste collection container according to the invention.

[0035] In one embodiment, the indicator system comprises at least one second indicator element which is provided as a, in particular coloured, indicator element for fraction indication, and which is provided to be arranged or formed on/on a handle element of the waste collection container, and/or on/on an upper edge of the waste collection container, and/or on/on an additional lid of the lid device of the waste collection container, and being provided thereon in intended use.

[0036] The fraction element is an element which provides information about the waste fraction received and at least temporarily stored in the waste collection container. In this respect, reference is made to the corresponding explanations on the first indicator element according to the first aspect of the invention and is referred to in full.

[0037] In one embodiment of the indicator system, at least one second indicator element is provided to be arranged or formed on the outer surface, in particular on a handle element, of a lid of the waste collection container and/or on or in an upper edge of the waste collection container, in particular of the container body of the waste collection container. In a corresponding embodiment of the waste collection container, the first indicator element is arranged or formed on the outer surface, in particular on a handle element, of the lid of the waste collection container and/or on or in an upper edge of the waste collection container, in particular of the container body of the waste collection container. In the case of a corresponding arrangement or formation on the lid, it can be

recognised when the lid is closed for which fraction the waste collection container is intended. In this case, the lid itself can take over the function of the second indicator element. In connection with a handle element, the second indicator element can be pressed onto a handle element, for example, if the handle element is a flat handle element. In this case, the shape of the second indicator element corresponds in particular to the shape of the handle element. If the handle element is a round handle element, the second indicator element can, for example, be slipped over the handle element so that it fits around the handle element, at least in parts. In this case, the second indicator element preferably has a longitudinally open cylindrical shape. In such a case, the second indicator element may be a clip-on element or clamping element provided to be brought into, preferably releasable, connection with a handle element of the waste collection container.

[0038] It is often the case, especially in an industrial environment, that the waste collection container is constantly open or that the lid is even removed. In order to still be able to recognize which waste fraction the waste collection container is intended for in such a case, it can be advantageous if the at least one second indicator element is arranged or formed on the upper edge area of the container body.

[0039] In another embodiment, the second indicator element may be provided to be arranged or formed on an auxiliary lid of the lid of the waste collection container. In relation to the waste collection container, this means that the second indicator element is arranged or formed on an auxiliary lid of the lid of the waste collection container. In another embodiment, the second indicator element may be such an additional lid itself. The colour on the additional lid or the colour of the additional lid then indicates which waste fraction may be filled into the waste collection container via this additional lid at this point.

[0040] According to one embodiment, the indicator system comprises at least one third indicator element, which comprises or is designed as at least one sensor element, preferably for level measurement and/or for fraction detection and/or an interface from a sensor element to an external receiving device and/or to a sensor element and/or a communication module for communication with an external receiving device, which is/are preferably arranged in a housing. With regard to the waste collection container, this means that at least one such third indicator element is arranged or formed on the waste collection container. The third indicator element can, for example, be integrated in the lid and optionally also have a handle element for operating the lid. Or the third indicator element is mounted on the container body or integrated therein.

[0041] The third indicator element is preferably an easily recognisable module, for example by a certain colouring, for example a signal colour, that is preferably integrated in the container design, for example in the lid or in the container body. It may comprise the aforemen-

tioned components, either individually or in any combination, or at least interfaces with these components, for example if the sensor elements are located elsewhere in the waste collection container. Corresponding third indicator elements can also be arranged or formed in a trunnion device of the waste collection container, for example.

[0042] In a further embodiment, the indicator system comprises at least one fourth indicator element which has an interchangeable insert with the possibility of applying text or Braille. With regard to the waste collection container, this means that at least one such fourth indicator element is arranged or formed on the waste collection container. For example, the fourth indicator element may preferably be slidably arranged on the lid, preferably on a handle bar of the lid. Such a fourth indicator element is preferably mounted in the centre of the front handle bar of the lid device and can be easily displaced to the right and left via catches below the handle bar. The fourth indicator element can be used, for example, to indicate the fill level by attaching stickers under the indicator element. Other possible applications are conceivable.

[0043] According to the third aspect of the invention, a waste collection container, in particular a large waste collection container, is provided which comprises the features of independent claim 10. The waste collection container, for the design of which reference is also made to the general description of the invention above and referred to in full, comprises a container body having a side wall, a container bottom, and an insertion opening. Furthermore, the waste collection container comprises a lid device for closing the insertion opening. According to the invention, the waste collection container comprises at least one indicator element according to the first aspect of the invention, or an indicator system according to the second aspect of the invention. In order to avoid repetition, reference is therefore also made to the full content of the explanations on the first and second aspects of the invention, as well as to the general description of the invention.

[0044] In an embodiment in which the waste collection container comprises at least one first indicator element according to the first aspect of the invention, the at least one first indicator element, preferably two or more such first indicator elements, is/are arranged or formed on/in the container body, in particular on/in the upper edge of the container body, in particular on/in a comb device, a comb bar for example, preferably on/in a corner area or on/in an edge. The two or more first indicator elements are preferably provided in a line, as explained further above.

[0045] In a preferred embodiment, two first indicator elements are provided which are spaced apart from each other, preferably one each at/in a corner region of the container body, such as at/in the upper edge of the container body, in particular at/in a comb device, a comb bar for example, preferably at/in a corner region, in particular at/in an edge.

[0046] The first indicator element, comprising two legs projecting from each other, in its/their mounted state, can be seen from several angles, for example directly from above, especially when the lid device is open or removed, but also from preferably both the front and lateral side.

[0047] In one embodiment, the container body comprises a recess for the first indicator element, which is formed in the container body, for example in the upper edge of the container body, such as in the comb geometry. Preferably, the first indicator element is located in a recess in the comb geometry. In particular, the recess has a geometry that is adapted to the geometry of the first indicator element, or vice versa. In this way, the first indicator element in its installed state, i.e. in its intended use, fits into the arrangement surface and does not protrude.

[0048] The at least one first indicator element can, for example, be inserted or recessed, i.e. in a recess, in the container body, for example on/in its upper edge, for example on/in the comb geometry, preferably on/in a corner area, in particular on/in an edge. For example, it can be fixed by means of a plug-in connection, for example with a fixing pin or locking pin.

[0049] Waste collection containers appropriately equipped with first indicator elements are particularly suitable for operation with automated lift systems on waste collection vehicles, for example on autonomously or partially autonomously operating waste collection vehicles, for example if these operate with image recognition. In such a case, the first indicator elements can, for example, be reflector elements or indicator elements for generating reference points, via which, for example, the comb or functional lift functions, for example also trunnion devices, can be recognised. This is also described with respect to the first aspect of the invention, and full reference is made to this disclosure as well. A coloured design of the first indicator elements also allows conclusions to be drawn about the waste fraction in the waste collection container.

[0050] In one embodiment, the waste collection container is characterised by at least one second indicator element, which is provided as a, in particular coloured, indicator element for fraction display, wherein the at least one second indicator element is arranged or formed on the outer surface, in particular on a handle element, of the lid device of the waste collection container and/or on or in an upper edge of the waste collection container, in particular of the container body of the waste collection container, and/or on an additional lid of the lid device of the waste collection container. Or the second indicator element is such an additional lid. In this respect, in order to avoid repetitions, reference is also made here in full to the corresponding explanations in connection with the indicator system according to the invention.

[0051] Corresponding second indicator elements can be arranged, for example, snapped or clipped into place at the desired location, for example on the handle bars of a lid. They are then preferably firmly mounted on the

lid and cannot be removed without causing damage only to the indicator element as for temper evident signalisation. In addition, first indicator elements can be used. For example, colours can be used to identify waste fraction and emptying intervals or to adapt the design to company colours.

[0052] By using coloured first and/or second indicator elements on grey or black waste containers, the waste collection containers can be used flexibly and can be made of up to 100% recycled material. Up to now, different coloured waste collection containers are used in order to indicate what kind of waste fraction is to be deposited into the waste collection container. In view of the stronger focus on the circular economy, the focus has been laid on using recycled materials for manufacturing new waste collection containers. Due to this, the number of available colours decreases. Therefore, container bodies are often manufactured which are coloured in black or gray. The colour indication of different waste fractions has therefore been shifted to other components, such as the coloured indicator clips. Thus, coloured indicator clips can solve such problems. Furthermore, coloured first indicator clips, if they are used as elements for providing reference points, are clearly distinguishable from the rest of the container body.

[0053] In one embodiment, the waste collection container comprises at least one third indicator element, which has or is designed as at least one sensor element, preferably for level measurement and/or for fraction detection and/or an interface from a sensor element to an external receiving device and/or to a sensor element and/or a communication module for communication with an external receiving device, which is/are preferably arranged in a housing. In this respect, in order to avoid repetition, reference is also made here in full to the corresponding explanations in connection with the indicator system according to the invention. Furthermore, the waste collection container may comprise at least one fourth indicator element as described in connection with the indicator system according to the invention.

[0054] The invention will now be explained in more detail by means of examples of embodiments with reference to the accompanying drawings. The following is shown:

Figure 1 depicts the basic structure of a waste collection container in the form of a large waste collection container in which the indicator elements and the indicator system according to the invention are used;

Figures 2 to 6 depict different views of a first embodiment of a first indicator element according to the invention;

Figures 7 to 9 depict different views of a second embodiment of a first indicator element according to the invention; and

Figures 10 to 13 depict different views of a waste collection container in which various in-

dicator elements of an indicator system according to the invention are realised.

[0055] The Figures depict a large waste collection container 10, which has a filling volume of 1,100 litres.

[0056] The general configuration of the large waste collecting container 10 according to the invention is shown in Figure 1. The waste collection container 10 consists of a container body 11, which is used to receive and store waste. The container body 11 has a rectangular, pot-shaped contour in plan view. The container body 11 consists of a container bottom 18 and a side wall 12. The side wall 12 in turn consists of a front side 13, a rear side 14 and two transverse sides 15, 16, wherein the individual segments of the side wall 12 abut each other in corner areas 28, which are formed as rounded corners. Side wall 12 and the container bottom 18 delimit a receiving space 17 (see Figure 13). For better manageability of the large waste collection container 10, a drive gear 26 with four wheel devices 27 is provided on the container bottom 18. The open upper side of the container body 11 forms an insertion opening 33 (see Figure 13), which is delimited by the upper edge 19 of the container body 11, via which the waste is filled in, and which is closed by means of a lid device 24. For this purpose, the lid device 24, which is a hinged lid, is hinged to the container body 11, for example to its rear side 14, via a fastening device 23 in the form of a hinge device. For filling the container body 11, the lid device 24 is folded open. For better handling of the large waste collection container 10, two handle elements 21, 22 are arranged or formed on its rear side 14, namely at the greatest possible distance from one another in a transition region between a transverse side 15, 16 and the rear side 14 of the side wall 12. Additional handle elements 25 for better handling of the large waste collection container 10 are located on the transverse sides 15, 16 in the region of the upper edge 19 of the container body 11, nearby the corner areas 28.

[0057] To enable the waste collection container 10 to be emptied into a waste collection vehicle, the upper edge 19 comprises a comb device 20 in form of a comb bar which engages with a lifting device of the waste collection vehicle during the emptying process. For stability reasons, the comb device 20 has a honeycomb structure 20a (see Figure 6).

[0058] In order that additional container components can be arranged on the container body 11, the large waste collection container 10 comprises a receiving device 30. The receiving device 30 is provided in the region of the upper container edge 19 on at least one transverse side 16. It consists of two receiving profile elements 31, 32, which are each formed as hollow receiving profile elements. With a respective first end 31a, 32a, the receiving profile elements 31, 32 are connected to the upper edge 19 of the container body 11, as can be seen in Figure 13. The receiving profile elements 31, 32 project downwards from the upper container edge 19 in the di-

rection of the container bottom 18. At their respective second end 31b, 32b, the receiving profile elements 31, 32 each comprise an insertion opening 31c, 32c, via which respective corresponding components of the additional container components to be fastened can be pushed into the receiving profile elements 31, 32. Fixing openings 31d, 32d in the receiving profile elements 31, 32 serve to allow the additional container components to be fixed to the receiving profile elements 31, 32, and thus to the container body 11. The receiving profile elements 31, 32 are provided at a distance from each other on the upper edge 19 of the container body 11.

[0059] Figures 2 to 6 show a first embodiment of a first indicator element 44 according to the invention, which is arranged at the upper edge 19 of the container body 11 on the outside of the comb device 20. Preferably, two such first indicator elements 44 are provided, each arranged in a corner 29 of the comb device. They are provided in a line.

[0060] The first indicator element 44 is provided for providing information, in particular for providing reference points for an automated lift system, wherein the first indicator element 44 is preferably a reflector element, and wherein the first indicator element 44 is optionally coloured.

[0061] The first indicator element 44 is arranged on/in the container body 11, in particular on/in the upper edge 19 of the container body 11, in particular in the comb device 20, preferably on/in a corner 29, i.e. on/in a corner region. Two first indicator elements 44 are provided, which are spaced apart from one another, preferably one each at/in a corner 29 of the comb device 20. The first indicator elements 44 are preferably aligned in a line such that they are capable of working together with an automated lifting device of a waste collection vehicle.

[0062] For receiving the first indicator element 44, the comb device 20 comprises a recess 40, as shown in Figure 2. As can be seen from Figures 3 and 4, the first indicator element 44 has a first leg 45 and a second leg 46, which are connected to each other via respective first ends 45a, 46a and project from each other at a right angle. The legs 44, 45 are formed as surface elements and are rounded at their respective second ends 45b, 46b. The legs 45, 46 each have an outwardly directed surface 45c, 46c, as well as an inwardly directed surface 45d, 46d. A fastening device 47 in the form of a fastening pin 48 projects at a right angle from the inwardly directed surface 45d of the first leg, and a latching nose 49 is formed at the free end of the fastening pin. The first indicator element 44 is L-shaped. The first indicator element 44 is preferably coloured.

[0063] The first indicator element 44 interacts with the recess 40 in the comb device 20. The recess 40 has a first area 41 corresponding in size and shape to the second leg 46 of the first indicator element 44. A second area 42 of the recess 40 corresponds in size and shape to the first leg 45 of the first indicator element 44. The recess 40 also has a receiving opening 43 into which the

fastening pin 48 of the first indicator element 44 is inserted. The first indicator element 44 is inserted into the recess 40, whereby it is aligned flat and flush with the comb device 20 and does not protrude beyond the comb device 20. This is shown in Figure 5. As can be seen in particular here, the first indicator element 44 can be seen or captured in this way from several angles, preferably from all sides, in particular from top, from the front side and/or from the lateral side. If the first indicator element 44 is coloured, it can also assume the function of an indicator element for fraction identification.

[0064] Thus, appropriately equipped waste collection containers 10 are particularly suitable for interacting with automated lift systems on waste collection vehicles, for example on autonomously or partially autonomously operating waste collection vehicles.

[0065] Figure 6 shows the comb device 20 with its honeycomb structure 20a from below. It can be seen how the fastening pin 48 of the first indicator element 44 interacts with its latching nose 49 with the receiving opening 43 of the recess 40 in the comb device 20.

[0066] Figures 7 to 9 show a second embodiment of a first indicator element 44. In terms of its basic structure and function, the first indicator element of Figures 7 to 9 corresponds to the first indicator element of Figures 2 to 6. In this respect, reference is made to the corresponding explanations above.

[0067] In contrast to the first embodiment, the first indicator element 44 and the corresponding recess 40 in the comb device 20 according to Figures 7 to 9 have a different design. Here, the first leg 45 and the second leg 46 of the first indicator element 44 each have a curved course, whereby the second leg 46 in particular has a stepped course.

[0068] Figures 10 to 13 show different views of a waste collection container in which different types of indicator elements of an indicator system according to the invention are realised.

[0069] As shown in Figure 10, two second indicator elements 50 are provided, which are used for fraction detection and are therefore coloured. One second indicator element 51 embraces the rear handle element 22, while a further second indicator element 52 is arranged on a front handle element 34 of the lid device 24, for example is plugged onto it. Both the indicator element 51 and the indicator element 52 are adapted in size and shape to the handle element 22, 34 to which they are connected. In addition, first indicator elements 44 are also received on the comb device 20 in corresponding recesses 40. As can be seen in Figure 11, the second indicator element 50 can also be a correspondingly coloured additional cover 53, 54.

[0070] Figures 12 and 13 show an embodiment in which a third indicator element 60 in the form of a communication device is detachably arranged on the container body 11 of the large waste collection container 10 via the receiving device 30. The third indicator element 60 comprises the actual communication module 61,

which operates wirelessly and is designed in particular as an NFC element or RFID element. A fixing leg 62 is pushed from below into the insertion opening 32d of one of the hollow receiving profile elements 32. Fixation can then be effected by means of suitable fixing elements.

List of reference numerals

[0071]

10 (Large) Waste collection container
 11 Container body
 12 Sidewall
 13 Front side
 14 Rear side
 15 Transverse side
 16 Transverse side
 17 Receiving space
 18 Container bottom
 19 Upper edge of the container body
 20 Comb device
 20a Honeycomb structure
 21 First handle element
 22 Second handle element
 23 Fastening device
 24 Lid device
 25 Additional handle elements
 26 Drive gear
 27 Wheel device
 28 Corner area
 29 Corner
 30 Receiving device
 31 Receiving profile element (receiving hollow profile element)
 31a First end of the receiving profile element
 31b Second end of the receiving profile element
 31c insertion opening
 31d Fixing opening
 32 Receiving profile element (receiving hollow profile element)
 32a First end of the receiving profile element
 32b Second end of the receiving profile element
 32c Insertion opening
 32d Fixing opening
 33 Insertion opening
 34 Handle element

 40 Recess
 41 First area of recess
 42 Second area of recess
 43 Receiving opening
 44 First indicator element
 45 First leg
 45a First end of the first leg
 45b Second end of the first leg
 45c Outwardly facing surface
 45d Inwardly facing surface
 46 Second leg

46a First end of the second leg
 46b Second end of the second leg
 46c Outwardly facing surface
 46d Inwardly facing surface
 5 47 Fixing device
 48 Fixing pin
 49 Latching nose

 50 Second indicator element
 10 51 Second indicator element for handle element
 52 Second indicator element for handle element
 53 Additional lid
 54 Additional lid

 15 60 Third indicator element
 61 Communication module
 62 Fixing leg

20 Claims

1. An indicator element (44) for displaying and/or providing information relating to a waste collection container (10), in particular a large waste collection container, which is provided for, in particular detachable, attachment to the waste collection container (10), **characterized by**
 - a first leg (45) having a first end (45a) and a second leg (46) having a first end (46a) connected to the first end (45a) of the first leg (45) and projecting from the first leg (45) at an angle, preferably at a right angle, and
 - a fastening device (47) which is provided on the first leg (45) and/or on the second leg (46) for fastening, in particular detachably, to the waste collection container (10) and which projects, in particular, from the first leg (45) and/or the second leg (46).
2. The indicator element (44) according to claim 1, **characterized in that** the indicator element (44) is L-shaped, or **in that** the first leg (45) and the second leg (46) each have a curved course, the second leg (46) having in particular a stepped course.
3. The indicator element (44) according to claim 1 or 2, **characterized in that** the first leg (45) and/or the second leg (46) is designed as a surface element.
4. The indicator element (44) according to anyone of claims 1 to 3, **characterized in that** the first leg (45) comprises an outwardly directed surface (45c) and an inwardly directed surface (45d), **in that** the second leg (46) comprises an outwardly directed surface (46c) and an inwardly directed surface (46d), **in that** the fastening means (47) is provided on the inwardly directed surface (45d, 46d) of the first leg (45) and/or

the second leg (46) and projects therefrom, in particular perpendicularly.

5. The indicator element (44) according to anyone of claims 1 to 4, **characterized in that** the fastening device (47) is provided for producing a plug-in connection, a snap-in connection, a clip connection, or a screw connection. 5
6. The indicator element (44) according to anyone of claims 1 to 5, **characterized in that** the indicator element (44) is a coloured indicator element, and/or that the indicator element (44) is an indicator element for fraction indication, and/or that the indicator element (44) is a reflector element, and/or that the indicator element (44) is an element for providing a reference point, and/or that the indicator element (44) is an element for identification. 10
7. An indicator system for displaying and/or providing information relating to a waste collection container (10), in particular a large waste collection container, comprising a number of indicator elements, in particular comprising a number of different types of indicator elements, comprising at least one first indicator element (44), **characterised in that in that** the at least one first indicator element (44) is designed as an indicator element according to anyone of claims 1 to 6, and **in that** the at least one first indicator element (44) is provided in particular to be connected to an upper edge (19) of the container body (11) of a waste collection container (10), in particular to a comb device (20) of the waste collection container (10). 15
8. The indicator system according to claim 7, **characterized in that** the indicator system comprises at least one second indicator element (50, 51, 52) which is provided as a, in particular coloured, indicator element for fraction indication, and which is provided to be arranged or formed on/on a handle element (21, 22, 34) of the waste collection container (10), and/or on/on an upper edge (19) of the waste collection container, and/or on/on an additional lid (53, 54) of the lid device (24) of the waste collection container (10). 20
9. The indicator system according to anyone of claims 7 or 8, **characterised in that** the indicator system comprises at least one third indicator element (60) which comprises or is designed as at least one sensor element, preferably for level measurement and/or for fraction detection and/or an interface from a sensor element to an external receiving device and/or to a sensor element and/or a communication module (61) for communication with an external receiving device, which is/are preferably arranged in a housing. 25

10. A waste collection container (10), in particular a large waste collection container, with a container body (11), comprising a side wall (12), a container bottom (18) and an insertion opening (33), and comprising a lid device (24) for closing the insertion opening (33), **characterised in that** the waste collection container (10) comprises at least one indicator element (44) according to anyone of claims 1 to 6, or an indicator system according to anyone of claims 7 to 9. 30
11. The waste collection container (10) according to claim 10, **characterised in that** the waste collection container (10) comprises at least one, preferably two, first indicator element(s) (44) according to anyone of claims 1 to 6, and **in that** the at least one first indicator element (44) is arranged or formed on/in the container body (11), in particular on/in the upper edge (19) of the container body (11), in particular on/in a comb device (20), preferably on/in a corner region (29) or on/in an edge. 35
12. The waste collection container (10) according to claim 11, **characterised in that** the container body (11) comprises a recess for receiving the first indicator element (44). 40
13. The waste collection container (10) according to anyone of the claims 10 to 12, **characterised by** at least one second indicator element (50, 51, 52), which is provided as a, in particular coloured, indicator element for fraction indication, and in that the at least one second indicator element (51, 52) is provided on the outer surface, in particular on a handle element (21, 22, 34), of the lid device (24) of the waste collection container (10) and/or on or in an upper edge (19) of the waste collection container (10), in particular of the container body (11) of the waste collection container (10), and/or on an additional lid (53, 54) of the lid device (24) of the waste collection container (10), or in that the second indicator element (50) is such an additional lid (53, 54). 45
14. The waste collection container (10) according to anyone of claims 10 to 13, **characterized in that** the waste collection container (10) comprises at least one third indicator element (60) which comprises or is designed as at least one sensor element, preferably for filling level measurement and/or for fraction detection and/or an interface from a sensor element to an external receiving device and/or to a sensor element and/or a communication module (61) for communication with an external receiving device, which is/are preferably arranged in a housing. 50

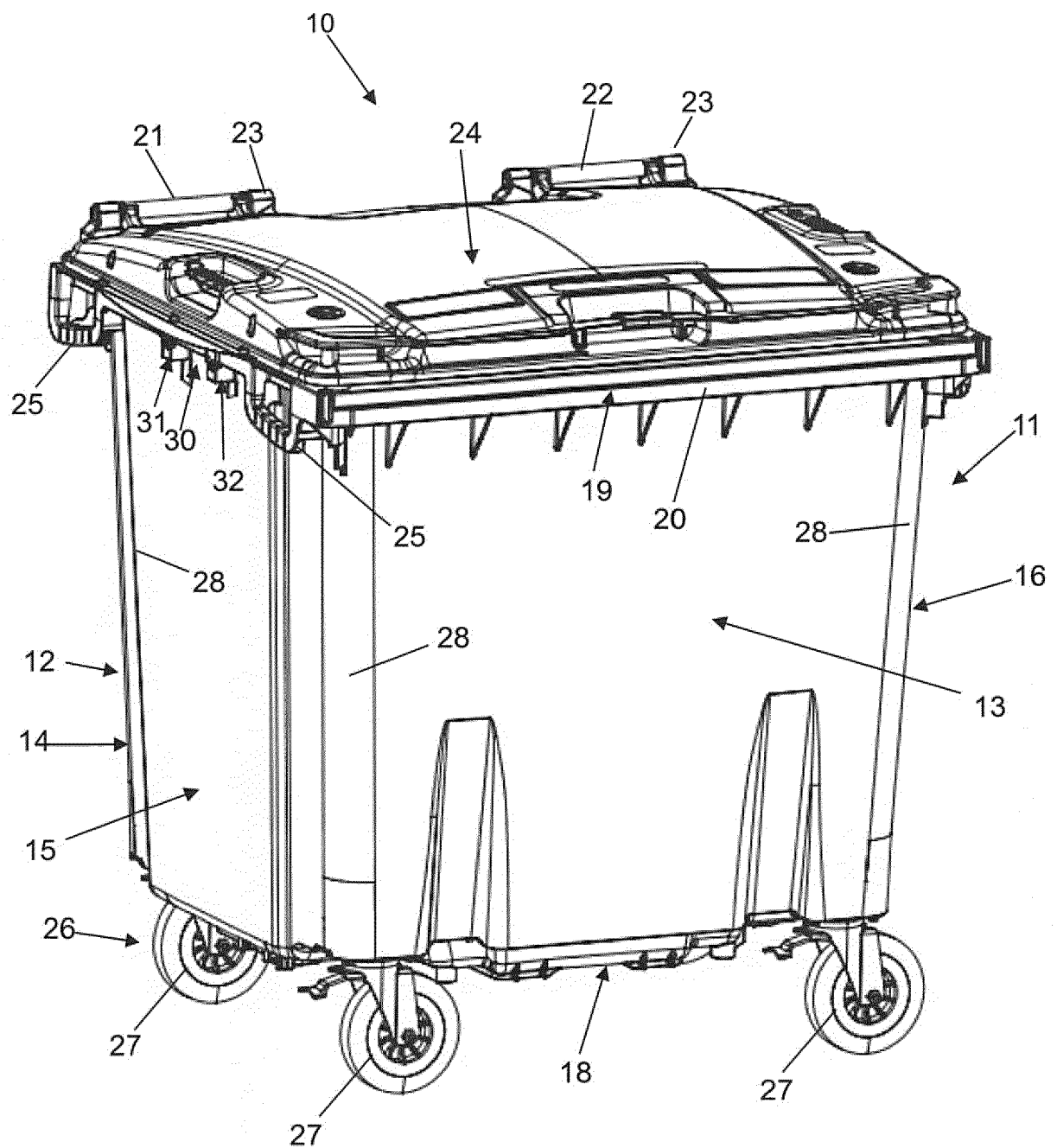


Fig. 1

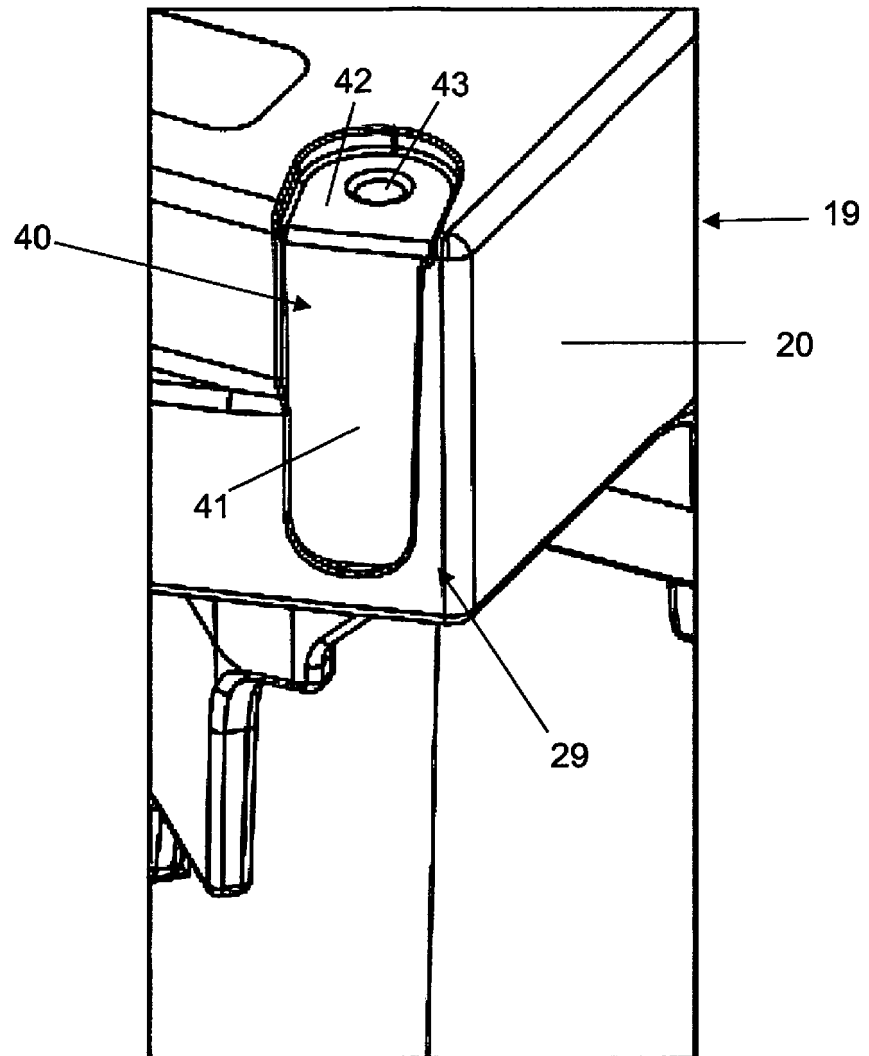


Fig. 2

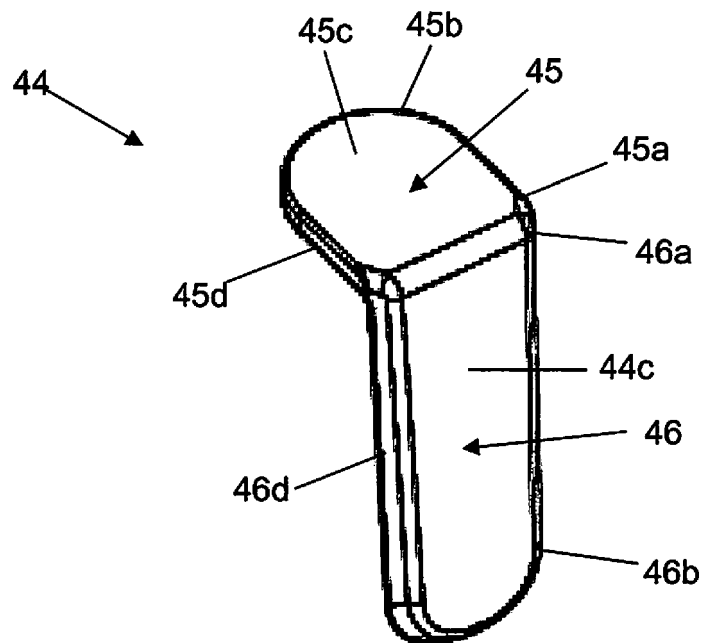


Fig. 3

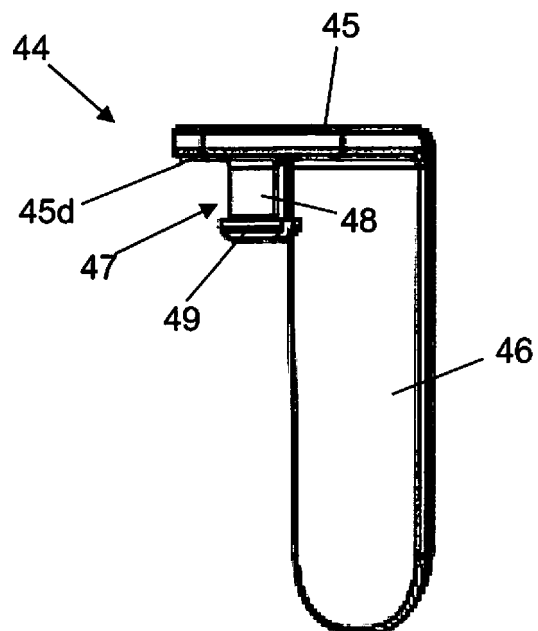


Fig. 4

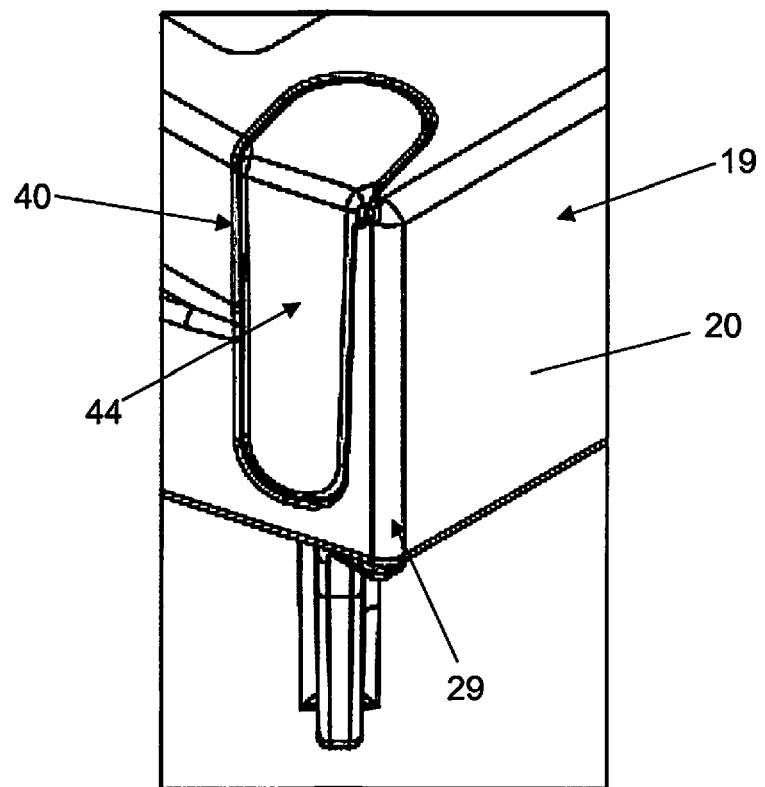


Fig. 5

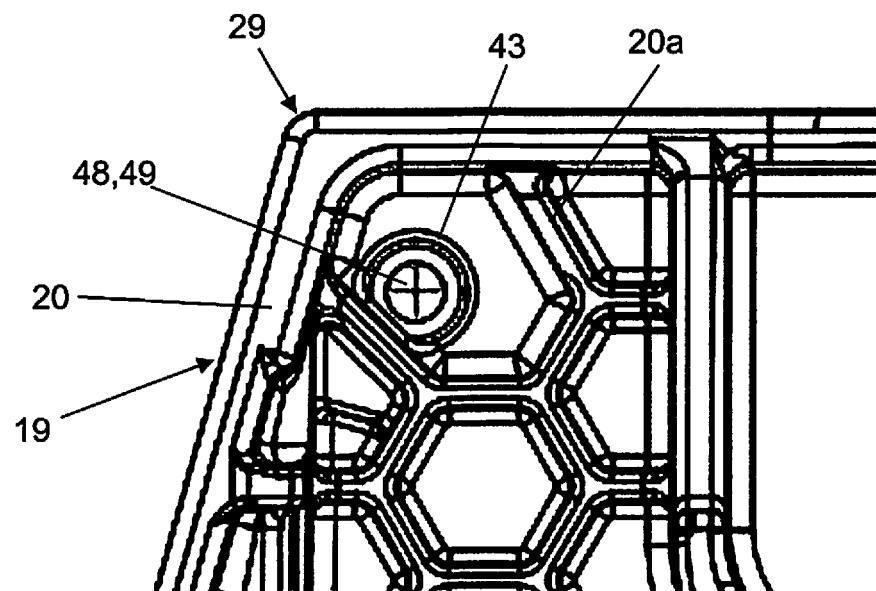


Fig. 6

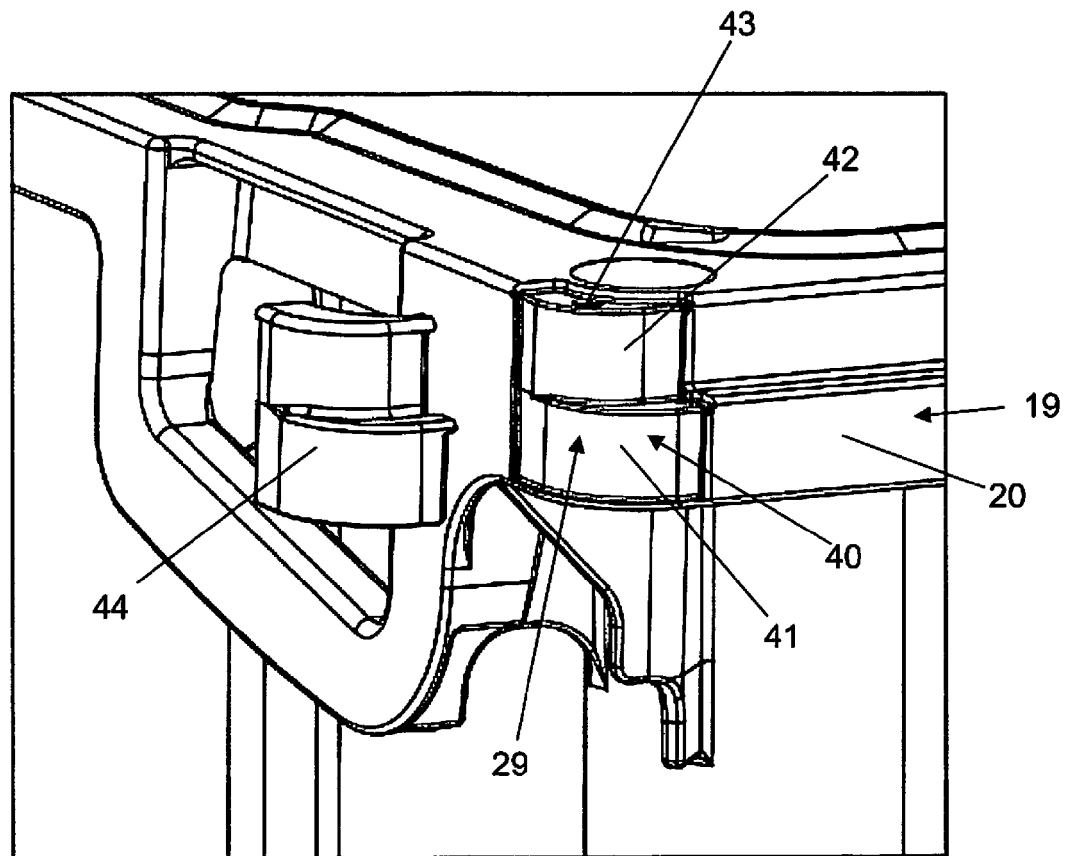


Fig. 7

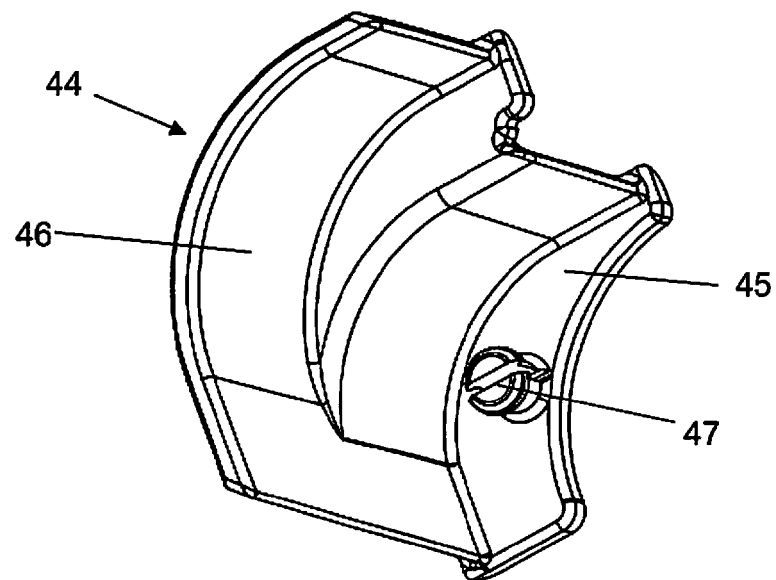


Fig. 8

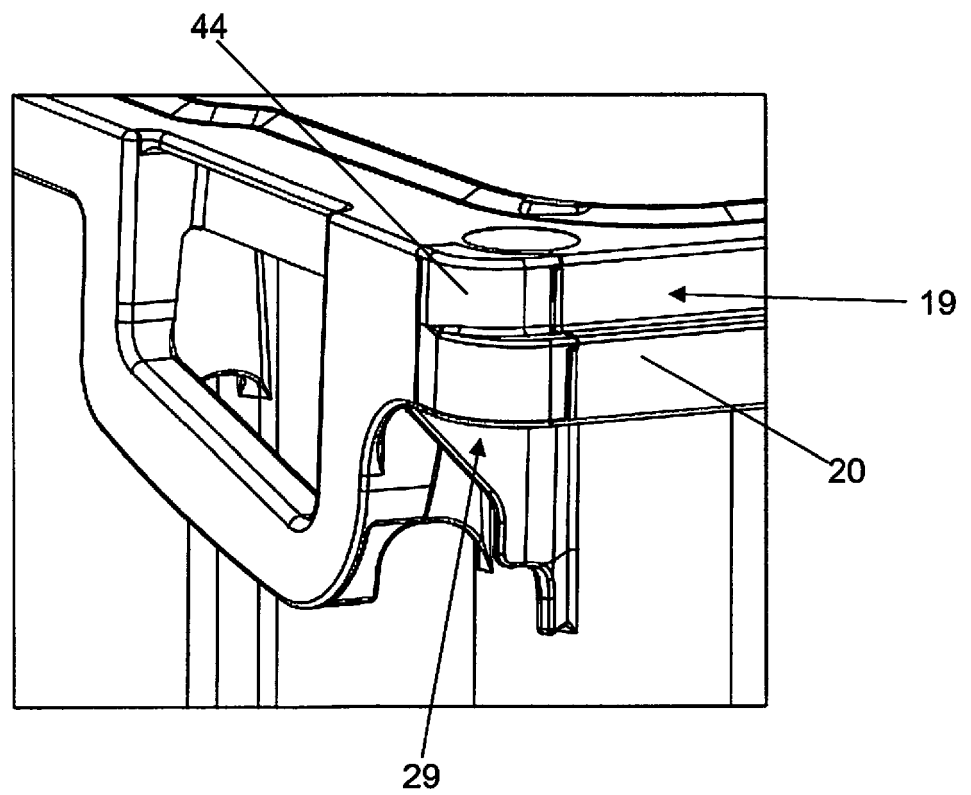


Fig. 9

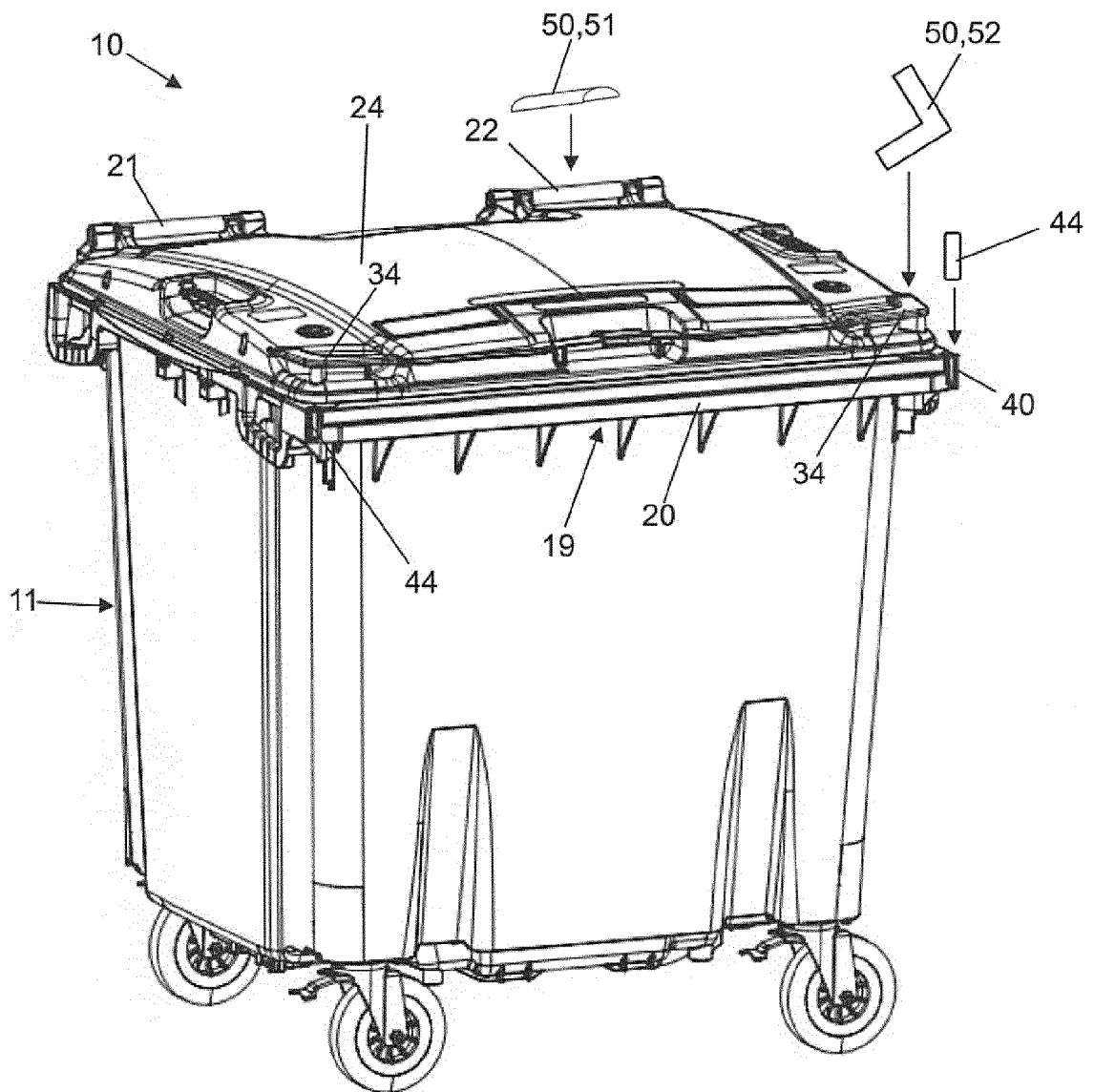


Fig. 10

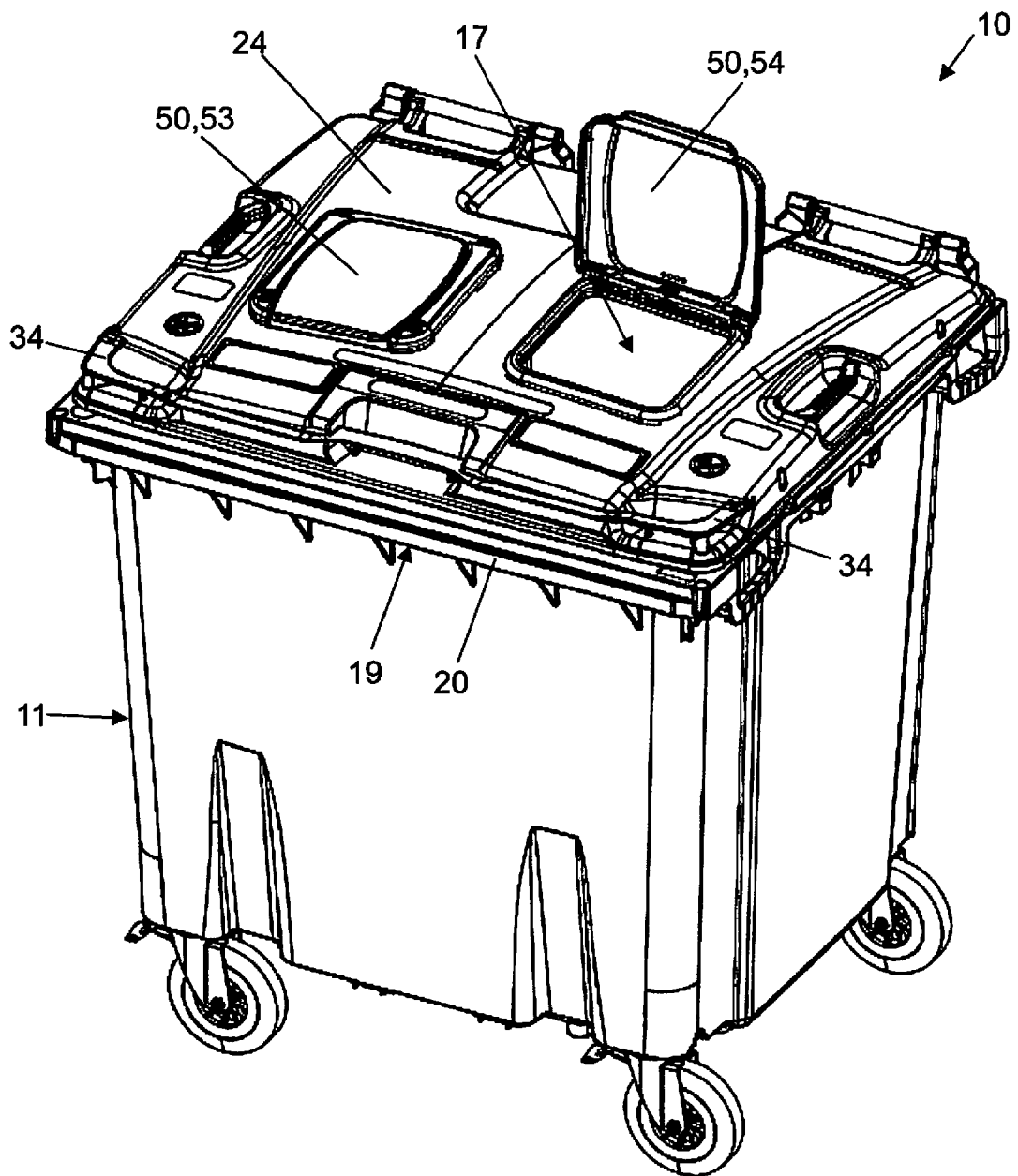


Fig. 11

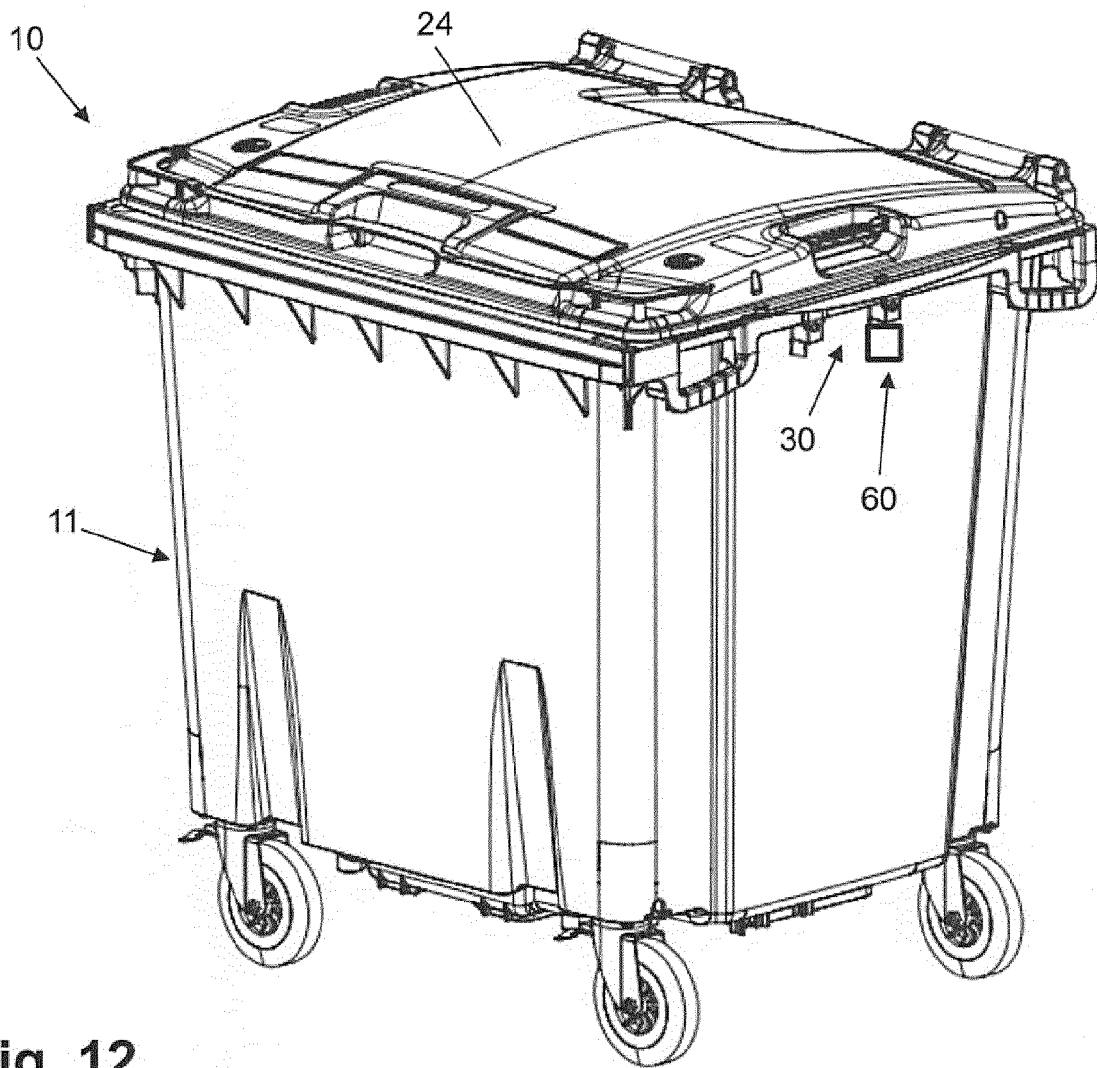


Fig. 12

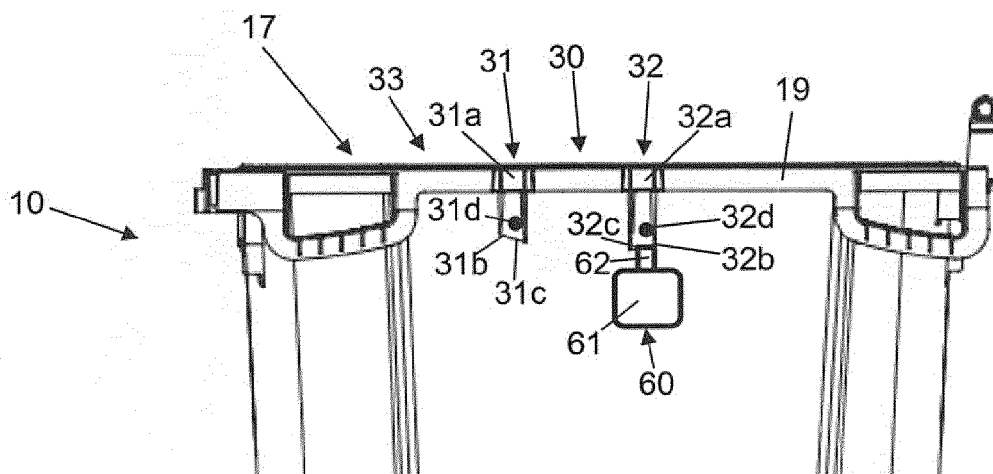


Fig. 13



EUROPEAN SEARCH REPORT

Application Number

EP 23 17 4998

5

10

15

20

25

30

35

40

45

50

55

1

EPO FORM 1503 03.82 (P04C01)

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	EP 2 388 210 B1 (PLASTIC OMNIUM CIE [FR]) 21 September 2016 (2016-09-21)	1-4, 6, 7, 10, 11	INV. B65F1/14
Y	* the whole document *	8, 9, 13, 14	B65F1/16

X	US 2011/192856 A1 (GONZALEZ MIGUEL [US] ET AL) 11 August 2011 (2011-08-11)	2, 5-7, 10-12	
Y	* the whole document *	8, 9, 13, 14	

X	DE 198 20 487 A1 (STREUBER SULO EISENWERK F [DE]) 18 November 1999 (1999-11-18)	1-7, 10, 11	
Y	* column 4, line 11 - column 6, line 13; figures *	8, 13	

X	DE 92 12 243 U1 (MOBA-ELECTRONIC GESELLSCHAFT) 19 November 1992 (1992-11-19)	1-7, 10, 11	
Y	* page 5, last paragraph - page 7, paragraph 3; figures *	8, 9, 13, 14	

Y	EP 3 505 464 A1 (PLASTIC OMNIUM SYSTEMES URBAINS [FR]) 3 July 2019 (2019-07-03) * claims 1,2,3; figure 1 *	9, 14	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 5 October 2023	Examiner Serrano Galarraga, J
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	

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

EP 23 17 4998

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.

05-10-2023

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2388210	B1	21-09-2016	EP 2388210 A1
		FR 2960225 A1	23-11-2011
			25-11-2011
US 2011192856	A1	11-08-2011	US 2011192856 A1
		US 2012292331 A1	11-08-2011
			22-11-2012
DE 19820487	A1	18-11-1999	AT E234778 T1
			15-04-2003
		DE 19820487 A1	18-11-1999
		DK 0955250 T3	23-06-2003
		EP 0955250 A1	10-11-1999
		ES 2192812 T3	16-10-2003
		PT 955250 E	29-08-2003
DE 9212243	U1	19-11-1992	NONE
EP 3505464	A1	03-07-2019	EP 3505464 A1
		FR 3068959 A1	03-07-2019
			18-01-2019