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• **Igelbrink, Michael**

49170 Hagen a. T.W. (DE)

• **Ducrocq, Isabelle**

38390 Bouvesse Quirieu (FR)

(74) Representative: **Remy, Vincent Noel Paul**

Lhermet La Bigne & Remy

11, Boulevard de Sébastopol

75001 Paris (FR)

(71) Applicant: **COMPAGNIE PLASTIC OMNIUM**

69007 Lyon (FR)

(72) Inventors:

• **Wolf, Horst**

32805 Horn Bad Meinberg (DE)

(54) **Waste collection container**

(57) The invention relates to a waste collection container provided with wheels and/or with a collar (5). The

wheels and/or the collar involve a rib (6', 18). The rib has a curved free edge with no angular points.

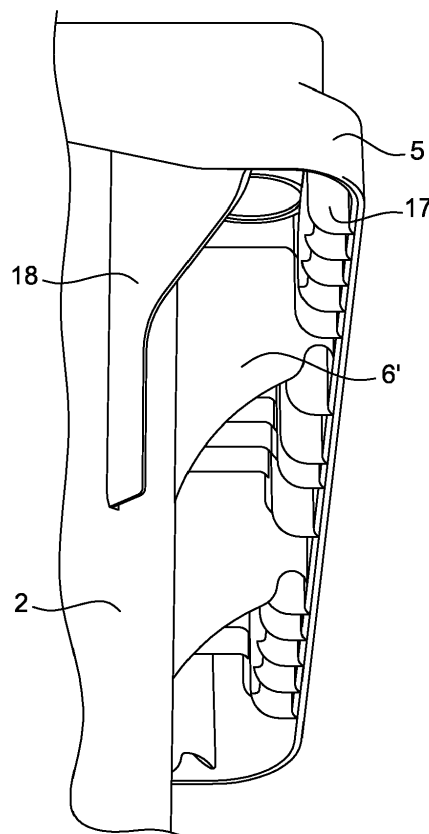


Fig. 5

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Description

[0001] The invention relates to a waste collection container of the type including wheels and/or a collar for gripping.

[0002] In particular from Document FR 2 768 707, a waste container is known that comprises a bin provided with a collar for gripping the bin. The collar is placed at the edge of the top opening of the bin for inserting waste into the bin.

[0003] The collar serves to stiffen the bin and to enable the bin to be gripped when it is full of waste in order to be picked up and emptied out into a collection skip. Given the material from which the bin is made, ribs are essential for reinforcing the collar and for enabling it to withstand the high levels of stress to which it is subjected, in particular while the bin is being emptied out.

[0004] Document EP 0726 172 also discloses a container for collecting waste and comprising a bin provided with wheels enabling it to be moved over the ground. The wheels are carried by an axle that is mounted on bearings, which bearings are constituted by ribs molded integrally with the bin. Those ribs are formed in a setback in the wall constituting the bottom of the bin and enabling the axle carrying the wheels to be received therein.

[0005] In both of those examples of the state of the art, the ribs are defined by at least two substantially parallel rectilinear edges, one of which is secured to the wall of the bin, and by a third edge that is free, i.e. it does not touch any of the walls of the bin. In the state of the art, that third edge is rectilinear.

[0006] When bins are inspected for maintenance purposes, it is frequently found that these ribs are cracked or broken. Under such circumstances, it is necessary to replace the entire container, since the ribs are molded integrally with the bin and they cannot be replaced separately.

[0007] The present invention seeks to propose a solution to the problem of the ribs of containers cracking or breaking.

[0008] To this end, the present invention provides a waste-collection container of the type comprising a bin molded out of plastics material and provided with wheels enabling it to move over the ground and/or with a collar enabling the bin to be gripped in order to be emptied out into a skip of a collector truck, at least one of the wheels being carried by an axle mounted on a bearing constituted by a rib integrally molded with the bin, the collar being locally reinforced by ribs molded integrally with the bin, at least one of said ribs being defined by an outline including at least a first edge touching or integral with the bin, a parallel second edge opposite to the first edge, and a free third edge connecting an end of the first edge to an end of the second edge. This bin is characterized in that the free third edge is curved and does not have any angular points.

[0009] By means of the invention, stress concentrations are reduced in the free third edge of the rib, and the

rib is given the capacity to deform a little, thereby enabling the rib to provide high resistance to the stresses to which it is subjected.

[0010] In a first embodiment invention, the third edge presents a length that is at least 10% longer than the distance between the two ends it interconnects.

[0011] In another embodiment of the invention, comparable with the preceding embodiment, the third edge follows a rolled-up curve.

[0012] In another embodiment of the invention the rib is in the form of a trapezoid with a first long side integral with the bin, a second long side parallel to the first but shorter than the first long side, a free third side, and a fourth side substantially perpendicular to the first and second sides.

[0013] The invention applies equally well to the ribs of collars as to the ribs constituting a wheel axle bearing. In order to make the invention easier to understand, there follows a description of embodiments given as non-limiting examples with reference to the accompanying diagrammatic drawings, in which:

- Figure 1 is an elevation view of a bin of a waste-collection container of the invention;
- Figure 2 is a fragmentary view from beneath of the collar of the Figure 1 container;
- Figure 3 is a section view on III-III of one of the ribs of Figure 2;
- Figure 4 is a close-up view of two ribs forming a bearing of the container of Figure 1; and
- Figure 5 is a view from beneath of the collar of a variant of the Figure 1 container.

[0014] The container 1 shown in Figure 1 comprises a bin 2 having a top opening for receiving waste. This opening is covered by a lid 3 that is mounted on hinges 4.

[0015] In known manner, the opening for receiving waste in the container is surrounded by a peripheral collar 5 that can be seen in Figure 2.

[0016] The collar is reinforced by ribs 6 molded integrally with the bin 2, only two of which being visible in Figure 2. The function of these ribs 6 is to reinforce the collar 5 so as to enable it to withstand the bin being lifted by means of a gripper that engages under the collar. This operation is performed when the bin is emptied into a waste-collection truck.

[0017] The bin of Figure 5 also includes two wheels 7 that are mounted on an axle 8, which axle is carried by two bearings 9. Each of the bearings is constituted by a vertical rib molded integrally with the bin 2.

[0018] It can be seen more clearly in Figure 4 how the ribs 9 form the bearings for the axle 8.

[0019] In known manner, the wall constituting the bottom of the bin 2 presents a setback 10 that serves to receive the axle 8 carrying the wheels 7.

[0020] As can be seen in Figure 3, each rib 6 is integral both with the side wall of the bin 2 and with the collar 5. Thus, the rib 6 is defined by an outline formed by four

edges, namely a vertical first edge 6a that is connected to the bin 2, i.e. that is integral therewith, an opposite second edge 6b that is parallel to the first edge 6a, but shorter than said first edge 6a, a free third edge 6c that connects the bottom end 13 of the first edge 6a to the bottom end 14 of the second edge 6b, and a fourth edge 6d that is substantially perpendicular to the first and second edges 6a and 6b.

[0021] In the example shown, the collar 5 presents a setback 5a, such that the second edge 6b also presents a setback and is subdivided into two portions. This specific feature of the example shown changes nothing to the definition of the second edge, which is parallel with and opposite to the first edge.

[0022] It can be seen that with the exception of the third edge 6c, which is free, the other three edges of the rib are integral either with the bin 2 (for the first edge 6a), or with the collar 5 (for the second and fourth edges 6b and 6d).

[0023] In the same manner, and as can be seen in Figure 4, the ribs 9 are integral with the wall constituting the bottom of the bin 2 over the full height of the setback 10, such that they are connected both to the substantially horizontal portion 11 and to the substantially vertical portion 12 of said bottom wall.

[0024] Thus, each rib 9 possesses an outline constituted by four edges, namely a first edge 9a that is integral with the vertical portion 12 of the bottom wall of the bin, a parallel second edge 9b opposite to the first edge 9a, a third edge 9d connecting together the bottom ends 15 and 16 of the first and second edges, and a fourth edge 9c connecting together the top ends of the first and second edges. The second edge 9b is free, i.e. it is not connected to any portion of the bin. The third edge 9c is also free, in accordance with the invention. The fourth edge 9d is integral with the bottom wall of the bin 2 in its horizontal portion 11.

[0025] It can clearly be seen, both in Figure 3 and in Figure 4, that the ribs 6 and 9 possess respectively third edges 6c and 9c that are free, which edges are curved and of lengths longer than the distances between their two ends.

[0026] Furthermore, these third edges 6c and 9c do not possess any angular points.

[0027] More precisely, the third edge 6c of the rib 6 has a unwound length equal to 71,6mm, while the distance between the points 13 and 14 is equal to 67mm.

[0028] Concerning the rib 9, the rolled-out length of the third edge 9c is equal to 214mm, while the distance between the points 15 and 16 is equal to 158mm.

[0029] In each case, the length of the third edge is more than 10% longer than the distance between the ends that it interconnects.

[0030] The curve followed by the third edge 6c of the rib 6 has a wound-up shape that gives said third edge 6c resilience that results from the fact that this edge can "unwind" in the event of high strain being exerted on the rib 6, without excessive levels of stress becoming con-

centrated at any particular point of the third edge of said rib.

[0031] The third edge 9c of the ribs 9 presents an S-shape that also gives it resilience because this edge is capable of "unwinding" in the event of high traction being exerted on the rib, without excessive levels of stress appearing at any particular point thereof.

[0032] In Figure 5, there can be seen another possible shape for the free third edge 6'c of the rib of the collar 6'.

[0033] This particular shape combines two concave portions: a top portion 61'c of small radius of curvature, and a bottom portion 62'c of large radius of curvature, these two portions 61'c and 62'c being united by a convex portion 63'c of intermediate radius of curvature. Once more, the free third edge 6'c of the rib 6' is curved and presents no angular points. It is capable of "unwinding" in the event of high traction.

[0034] In the example of Figure 5, between the ribs 6', the collar includes other reinforcing ribs 17, but these reinforcing ribs do not directly connect the collar 5 to the wall of the bin 2. Therefore they are not covered by the definition of ribs of the invention.

[0035] In contrast, a corner rib 18 presents a third edge 18c that is free and curved, without any angular points.

This rib 18 is covered by the definition of the invention.

[0036] It should naturally be understood that the embodiments described above do not present any limiting character and that they may receive any desirable modification without thereby going beyond the ambit defined by the claims.

Claims

1. A waste-collection container of the type comprising a bin (2) molded out of plastics material and provided with wheels (7) enabling it to move over the ground and/or with a collar (5) enabling the bin (2) to be gripped in order to be emptied out into a skip of a collector truck, a wheel (7) being carried by an axle (8) mounted on a bearing (9) constituted by a rib integrally molded with the bin, the collar (5) being locally reinforced by ribs (6, 6', 18) molded integrally with the bin, at least one of said ribs (6, 6', 9, 18) being defined by an outline including at least a first edge (6a, 9a) touching or integral with the bin (2), a parallel second edge (6b, 9b) opposite to the first edge, and a free third edge (6c, 6'c, 9c, 18c) connecting an end of the first edge (13, 15) to an end of the second edge (14, 16), **characterized in that** the free third edge is curved and does not have any angular points.
2. A container according to claim 1, wherein the length of the third edge (6c, 9c) is at least 10% longer than the distance between the two ends (14, 16) that it connects together.

3. A container according to claim 1 or claim 2, wherein the free third edge (6c) has a wound-up shape.
4. A container according to claim 1 or claim 2, wherein the free third edge (9c) is S-shaped. 5
5. A container according to any one of claims 1 to 4, wherein the rib presents an outline of trapezoidal shape with a first long side (6a, 9a) integral with the bin, a second long side (6b, 9b) parallel to the first, a free third side (6c, 9c), and a fourth side (6d, 9d) that is substantially perpendicular to the first and second sides. 10

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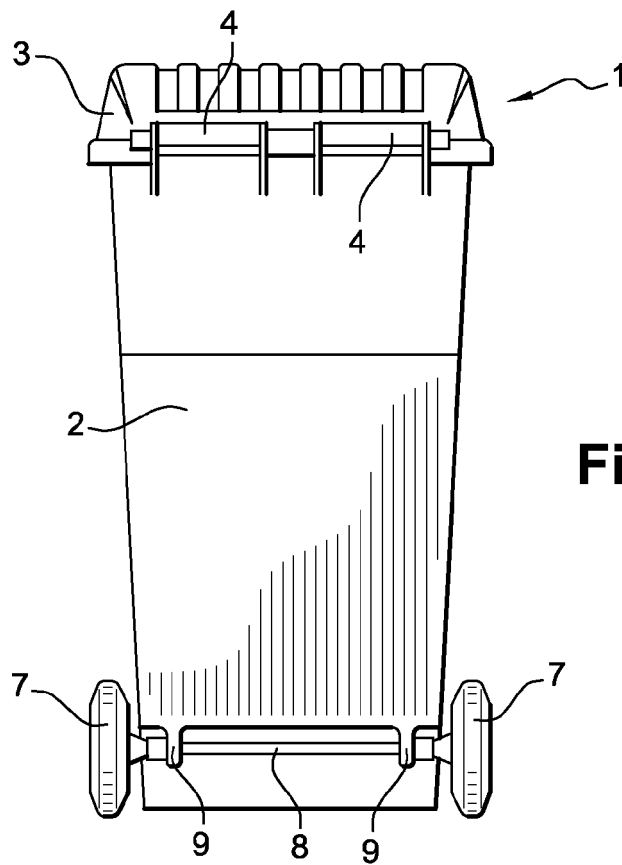


Fig. 1

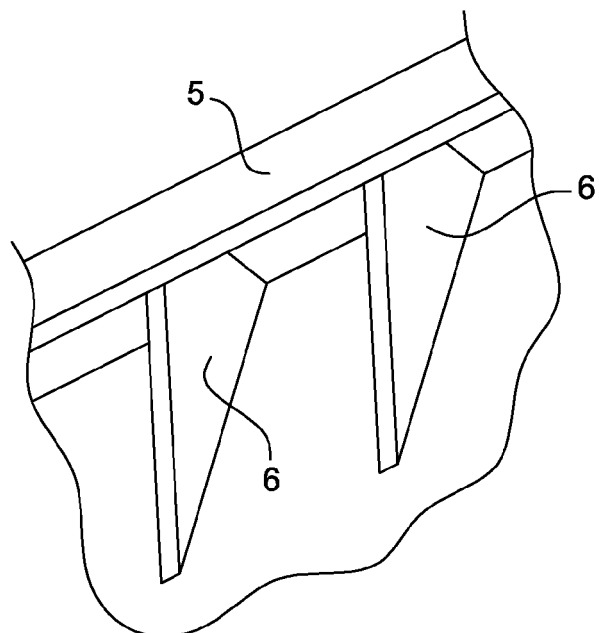


Fig. 2

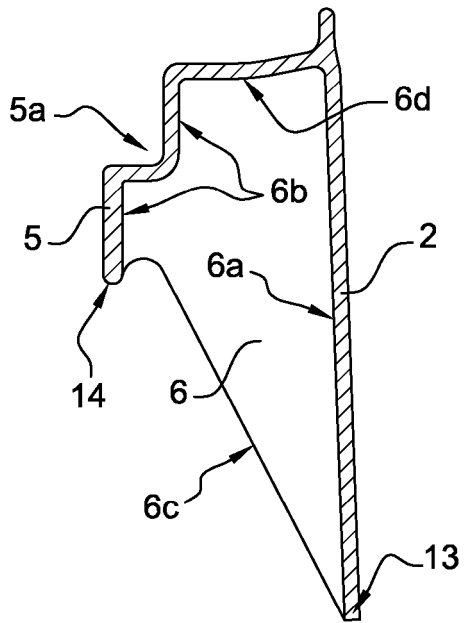


Fig. 3

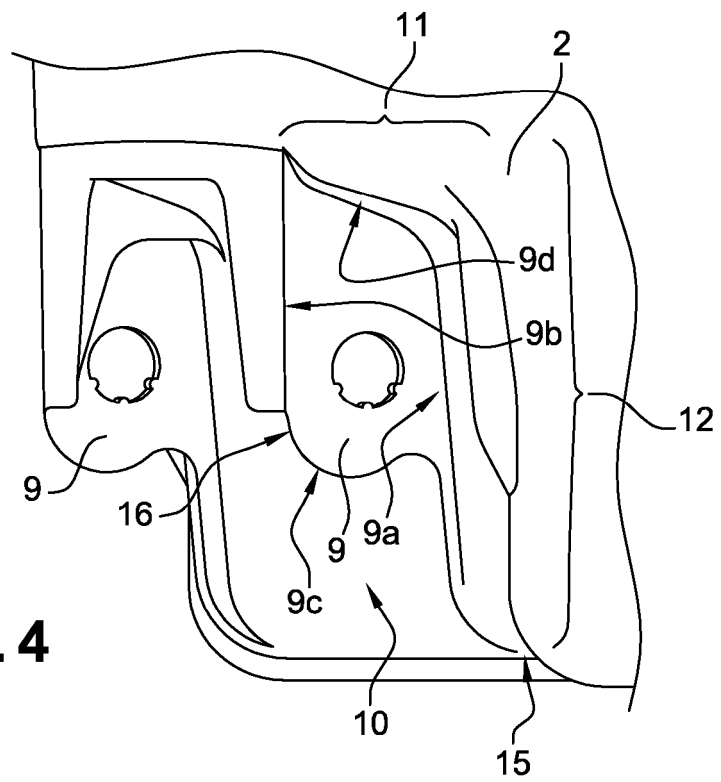


Fig. 4

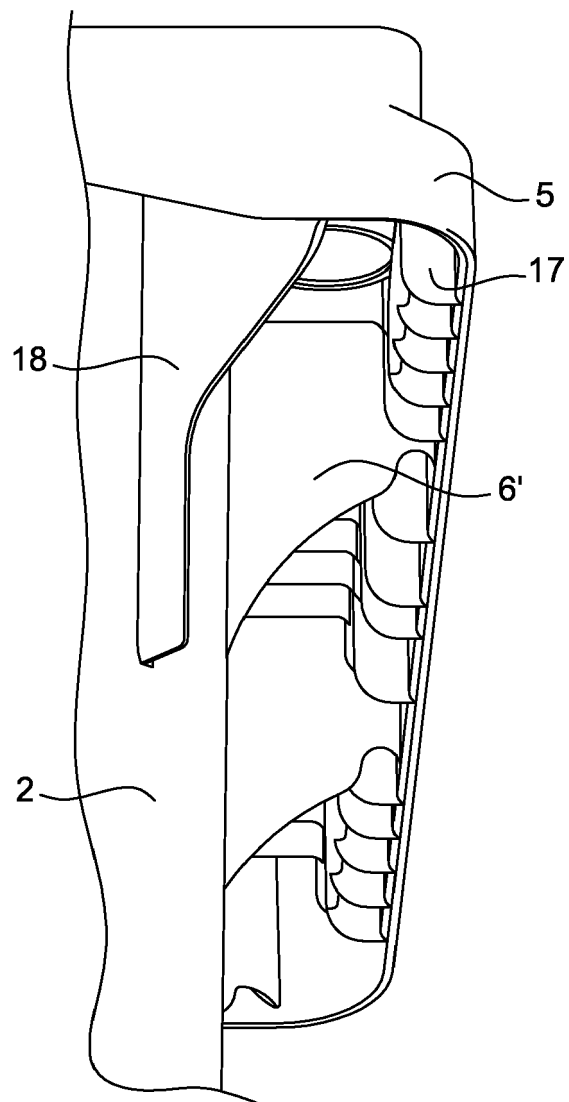


Fig. 5



EUROPEAN SEARCH REPORT

Application Number
EP 11 16 1762

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	* paragraph [0029]; figures 4,4a * -----	4	
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A	* page 9, line 6 - page 12, line 9 * * figures 1-3 * -----	5	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			B65F
Place of search		Date of completion of the search	Examiner
The Hague		30 September 2011	Smolders, Rob
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

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

EP 11 16 1762

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
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30-09-2011

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REFERENCES CITED IN THE DESCRIPTION

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- FR 2768707 [0002]
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