

A BRACKET

This invention relates to a bracket, and particularly, but not exclusively, to a bracket for use in mounting a castor wheel to a container such as a large container of the type commonly used in commercial and industrial waste management. The invention is particularly directed to a bracket for locating and mounting a castor wheel onto a mounting surface of a container, a bracket assembly comprising the bracket, a container assembly comprising the bracket, and a method for mounting a castor wheel on a container.

A known castor mounting bracket consists of a first plate element on to which a castor wheel is affixable. Two legs extend from opposed ends of the plate, generally at an angle of about 90° from the plate. A further plate element then extends from each of the legs so that the further plates are parallel to the first plate but separated from it and not sharing the same plane. The further plates are significantly smaller than the first plate and are affixable to a mounting surface on the container by a suitable means, such as by weld.

Large solid waste containers are often exposed to high forces due to the nature in which the containers are treated. Known castor mounting brackets are a point of weakness in the design, particularly when impact forces are exerted on the castor wheels. Examples of such forces include when a container is lowered to the ground too rapidly from a waste collection vehicle which is emptying it. Often, two of the four wheels absorb the impact of the container hitting the ground as the angle at which the container is dropped is not perpendicular to the ground. Similarly, when a container rolls into a kerb a single castor wheel can absorb the impact of a full container coming to a sudden stop.

In these cases, and other similar situations, the forces experienced are shear forces that can shear the castor wheels away from the container. The mounting bracket absorbs these forces and maintains the castors' attachment to the container. However, the known mounting brackets are liable to twist and fail as a result of the forces they experience, particularly because their structure doesn't mitigate for excessive shear forces.

The alignment of a container's wheels is important to help the container be manoeuvred easily which in turn reduces the likelihood of accidental impacts of a single wheel against an obstruction such a kerb. Further, if the wheels are aligned then forces are more likely to be distributed evenly across them.

Known brackets require manual positioning when they are affixed to a container. The method of affixing a bracket to the mounting surface of a container typically involves a plurality of welds. The act of correctly positioning a bracket on a mounting surface and then maintaining that position during the welding process is difficult, time-consuming and hence, costly. A result of this is that the positioning of the bracket may be rushed at the 5 detriments of the alignment of the wheels.

According to a first aspect of the invention there is provided a bracket comprising a mounting face and a fixing face, which faces are spaced apart from one another, the 10 mounting face comprising a first end portion and a second end portion, the mounting face further comprising a locating portion positioned between the first and second end portions.

In embodiments of the invention, the bracket is affixable to a container. The container may be a large container of the type commonly used in commercial and industrial applications. 15 The container may have a mounting surface on the underside of the container and the container may have a plurality of mounting surfaces on the underside of the container located close to each corner.

The locating portion allows the bracket to be readily located at a predetermined location on a mounting surface of a container with minimal time or effort required by an assembler 20 of the container assembly.

The locating portion also provides improved structural strength to the bracket. The bracket is less prone to twisting and there are more sites at which the bracket may be affixed to a 25 mounting surface of a container, for example by weld.

In embodiments of the invention, the locating portion comprises a plurality of locating apertures adapted to engage with locating pins.

30 In such embodiments, a container's mounting surface may comprise locating pins.

The provision of locating apertures adapted to engage with locating pins allows the bracket to be readily located on a mounting surface of a container.

35 In embodiments of the invention, the bracket is symmetrical along two axes parallel to the mounting face.

In such embodiments, there may be a pair of locating apertures. If the bracket is symmetrical along two axes parallel to the mounting face and the locating apertures are engaged with the locating pins, then the initial orientation of the bracket does not affect its positioning. In other words, once the apertures are engaged with the locating pins, the
5 bracket will be appropriately positioned, independent of the bracket's initial orientation. This allows the bracket to be readily located on a mounting surface of a container without first having to ensure that the bracket is held at a predetermined orientation.

10 In embodiments of the invention, the mounting face is integrally formed with the fixing face.

In such embodiments, the bracket may be formed from a single sheet of material, such as a sheet of metal. This removes the need for joints between separate piece of material, which in turn strengthens the bracket. It also reduces the material and process costs required to form the bracket.

15 In embodiments of the invention, the fixing face comprises a first fixing portion and a second fixing portion.

20 In such embodiments, by forming the fixing face as two portions, the configuration of the bracket is improved.

In embodiments of the invention, the bracket comprises a first leg extending from the first end portion of the mounting face to a first end of the first fixing portion, and a second leg extending from the second end portion of the mounting plate to a first end of the second
25 fixing portion, a third leg extending from a first end of the intermediate portion to a second end of the first fixing portion and a fourth leg extending from a second end of the intermediate portion to a second end of the second fixing portion.

30 In such embodiments of the invention, there is therefore a total of four legs. This is double the number provided by known mounting brackets which generally comprise only two legs between the mounting face and the fixing face. The increased number of legs provides a greater level of support to the separation between the mounting face and fixing face, in turn making the bracket less likely to twist or buckle in response to shear forces.

35 In embodiments of the invention, the bracket comprises at least one gusset.

A gusset provides greater structural strength to a portion of the bracket. It acts to prevent the angle between two associated portions being deformed in response to a shear force. The provision of at least one gusset, therefore, improves the strength of such embodiments of the invention.

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In embodiments of the invention, a gusset is formed between a leg and an associated fixing portion.

10 In such embodiments of the invention, the separation between the mounting face and the fixing face is provided by the angle between the legs and their associated fixing portion. The inclusion of at least one gusset formed between a leg and an associated fixing portion, improves the strength and rigidity of that portion of the bracket and helps maintain the separation between the mounting and fixing face.

15 In embodiments of the invention, a gusset is formed between each leg and its associated fixing portion.

20 In such embodiments of the invention, each portion of the bracket comprising a leg and an associated is strengthened by comprising a gusset. The gussets solidify each of the angles associated with the fixing face and hence indirectly solidifies each of the angles associated with the mounting face. This provides rigidity to the each of the angles between the different portions of the bracket and improves the overall strength of the bracket.

25 In embodiments of the invention, the fixing face comprises a plurality of fixing apertures each of which is configured to engage with a fixing screw.

30 Such embodiments of the invention may therefore be readily affixed to castor wheels which comprise a rectangular shaped fixing plate with apertures configured to engage with a fixing screw, whereby the apertures of the bracket fixing face correspond with those of the castor wheel fixing plate. A castor wheel may be positioned so that it's fixing plate abuts with the fixing face of the bracket and each of the apertures comprised in the fixing plate and the fixing face are aligned. A fixing screw may then be engaged with each pair of fixing plate and fixing face apertures.

35 In embodiments of the invention, the mounting face and fixing face are parallel.

In such embodiments, the weight of the container may act perpendicularly through the fixing plate of the castor wheel which is preferable for reducing wear of the fixing means. In such embodiments, the fixing means may be a plurality of fixing screws which engage perpendicularly to the fixing plate. Therefore, the weight of the container acts parallel to
5 the axis of the fixing screws, this avoids any constant shear forces being applied to the screws or the apertures they engage with, hence reducing the wear.

According to a second aspect of the invention there is provided a bracket assembly comprising a bracket according to any one of the embodiments described according to the
10 first aspect of the invention, further comprising a fixing plate that is affixable to the fixing face.

In such embodiments, the bracket may be readily affixed to castor wheels via a fixing plate with apertures configured to engage with a fixing screw, whereby the apertures of the
15 bracket fixing face correspond with those of the castor wheel fixing plate.

In embodiments of the invention, the bracket assembly further comprises a plurality of fixing screws.

20 In such embodiments, a known castor wheel may be positioned so that its fixing plate abuts with the fixing face of the bracket and each of the apertures comprised in the fixing plate and the fixing face are aligned. A fixing screw may then be engaged with each pair of fixing plate and fixing face apertures.

25 According to a third aspect of the invention there is provided a container assembly comprising a bracket according to any one of the embodiments described according to the first aspect of the invention, further comprising a container, which container comprises a mounting surface, which mounting surface comprises a mount locator configured to engage with the locating portion of the bracket, and wherein the bracket is affixable to the
30 mounting surface.

In such embodiments, the bracket is readily affixable to the container. The container may be a large container of the type commonly used in commercial and industrial applications. The mounting surface may be located on a predetermined portion of the underside of the
35 container. The container may have a plurality of mounting surfaces on the underside of the container located close to each corner. The locating portion of the bracket may readily be located to the mount locators of the container.

In embodiments of the invention, the mount locator comprises a plurality of locating pins which engage with the locating apertures.

- 5 In such embodiments, the bracket may be readily located at a predetermined location on the mounting surface of the container by engaging the locating apertures with the locating pins.

- 10 In embodiments of the invention, instead of comprising a bracket only, a container assembly comprises a bracket assembly according to any one of the embodiments described according to the second aspect of the invention.

- 15 In such embodiments, a castor wheel may readily be affixed to a container. The container may be a large container of the type commonly used in commercial and industrial applications.

- 20 According to a fourth aspect of the invention there is provided a method of mounting a castor wheel on a container comprising the steps of: providing a container assembly according to the third aspect of the invention; abutting a castor wheel fixing plate against the bracket fixing face; affixing the fixing plate to the fixing face; locating the bracket mounting face to a predetermined position on a mounting surface of a container; and affixing the mounting face to the mounting surface.

- 25 By means of the present invention, a method is provided for mounting a castor wheel on a container by abutting a fixing plate of a castor wheel against a fixing face of a bracket and then affixing the fixing plate to the fixing face. Once the castor wheel is affixed to the bracket, the method involves locating a mounting face of the bracket to a predetermined position on a mounting surface of a container and then affixing the mounting face to the mounting surface.

- 30 In such embodiments, the fixing plate and fixing face may each have a plurality of apertures, whereby the apertures of the fixing plate and the apertures of the fixing face may be aligned with each other. The step of affixing the fixing plate to the fixing face may be performed by engaging a fixing screw through each aligned pair of fixing plate and fixing face apertures.
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The step of affixing the mounting face to the mounting surface may be performed using any suitable fixing means, such as welding.

According to a fifth aspect of the invention there is provided a method of mounting a castor wheel on a container comprising the steps of: providing a container assembly comprising a castor wheel fixing plate, a bracket comprising a fixing face and a mounting face, a container comprising a mounting surface; abutting a castor wheel fixing plate against a bracket fixing face; affixing the fixing plate to the fixing face; locating a bracket mounting face to a predetermined position on a container mounting surface; affixing the mounting face to the mounting surface.

By means of the present invention, a method is provided for mounting a castor wheel on a container by abutting a fixing plate of a castor wheel against a fixing face of a bracket and then affixing the fixing plate to the fixing face. Once the castor wheel is affixed to the bracket, the method involves locating a mounting face of the bracket to a predetermined position on a mounting surface of a container and then affixing the mounting face to the mounting surface.

In such embodiments, the container assembly may comprise a bracket assembly according to a second embodiment of the invention which comprises the castor wheel fixing plate and bracket comprising a fixing face and a mounting face of the present invention.

In such embodiments, the bracket may be a bracket according to the first aspect of the invention.

In such embodiments, the fixing plate and fixing face may each have a plurality of apertures, whereby the apertures of the fixing plate and the apertures of the fixing face may be aligned with each other. The step of affixing the fixing plate to the fixing face may be performed by engaging a fixing screw through each aligned pair of fixing plate and fixing face apertures.

The step of affixing the mounting face to the mounting surface may be performed using any suitable fixing means, such as welding.

The invention will now be described by way of example only with reference to the accompanying drawings in which:

Figure 1 is a schematic illustration of a bracket, according to an embodiment of the first aspect of the present invention, showing a top, isometric view of the bracket.

5 Figure 2 is a further schematic illustration of the bracket shown in Figure 1, here showing an underside, isometric view of the bracket.

Figure 3 is a further schematic illustration of the bracket shown in Figures 1 and 2, here showing a front view of the bracket.

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Figure 4 is a further schematic illustration of the bracket shown in Figures 1, 2 and 3, here showing a top view of the bracket.

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Figure 5 is a schematic illustration of a container assembly, according to an embodiment of the third aspect of the present invention, showing the bracket of Figures 1 to 4 being located on to a container mounting surface;

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Figure 6 is a further schematic illustration of the container assembly shown in Figure 5, here showing the bracket located on to the container mounting surface;

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Figure 7 is a schematic illustration of a container assembly, according to a further embodiment of the third aspect of the present invention, showing a bracket assembly, according to an embodiment of the second aspect of the present invention, mounted on a container mounting surface.

Figure 8 is a representation of a method of mounting a castor wheel on container according to the container assembly shown in Figure 7.

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Referring initially to Figures 1 to 4, a bracket according to an embodiment of the first aspect of the present invention, is defined generally by the reference numeral 2. The bracket 2 comprises a fixing face 4, which itself comprises a first fixing portion 6 and a second fixing portion 8.

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The bracket 2 further comprises a mounting face 10, which itself comprises a first end portion 12, a second end portion 14 and a locating portion 16.

The fixing face 4 and mounting face 10 are spaced apart from one another as shown in the figures. Extending from the first end portion 12 to a first end of the first fixing portion 6 is a first leg 22. Extending from the second end portion 14 to a first end of the second fixing portion 8 is a second leg 24. Extending from a first end of the locating portion 16 to a second end of the first fixing portion 6 is a third leg 26. Finally, extending from a first end of the locating portion 16 to a second end of the second fixing portion 8 is a fourth leg 28.

The locating portion 16 comprises locating apertures 30, which are adapted to engage with locating pins.

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The bracket 2 further comprises gussets 40 formed between each leg 22, 24, 26, 28 and its associated fixing portion 6, 8.

The fixing face 4 further comprises fixing apertures 40 which are configured to engage with a fixing screw, with two of the fixing apertures 40 positioned in each of the first and second fixing portions 6, 8.

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Referring now to Figures 5 and 6, a container assembly according to an embodiment of the third aspect of the present invention, is defined generally by the reference numeral 60. Figure 5 shows a portion of a container 62 with a mounting surface 64. In order to locate bracket 2 at a predetermined location on the mounting surface 64, the locating portion 16 of the bracket 2 is guided towards a mount locator 66. In this embodiment, the mount locator 66 comprises locating pins 68 which are adapted to engage with the locating apertures 30 comprised within the bracket 2. Guidelines are provided in Figure 5 to show the locating apertures 30 being guided towards the locating pins 68.

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Figure 6 shows the container assembly 60, once the bracket 2 has been correctly located on to the mounting surface 64 with the locating apertures 30 and locating pins 68 engaged. Once located, there are four affixing sites 70, at which the bracket 2 may be affixed to the container 62 via any suitable means, such as welding.

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Referring now to Figure 7, a container assembly according to a further embodiment of the third aspect of the present invention, is defined generally by the reference numeral 160. In this embodiment, the container assembly comprises a bracket assembly according to an embodiment of the second aspect of the present invention, the bracket assembly is defined generally by the reference numeral 50. The bracket assembly comprises a bracket 2

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according to an embodiment of the first aspect of the invention, and further comprises a castor wheel 52 with an adjoining fixing plate 54 and a plurality of fixing screws 56.

5 The bracket assembly 50 is located on a mounting surface 164 of a container 162 via a locating portion 16 of the bracket 2. The fixing plate 54 is fixed to the fixing face 4 of the bracket 2 by the engagement of fixing screws 56 with the fixing apertures 40 (shown in Figures 1a, 1b and 1d).

Referring now to Figure 8, a method for mounting a castor wheel on to a container is represented. The method of Figure 8 includes a first step 201 of providing a container
10 assembly 160. In a second step 202, a fixing plate 54, adjoining to a castor wheel 52, is abutted against a fixing face 4 of a bracket 2. In a third step 203, the fixing plate 54 is affixed to the fixing face 4. In a fourth step 204, a mounting face 10 of the bracket 2 is located to a predetermined position on a mounting surface 164 of a container 162. In a
15 fifth step 205, the mounting face is affixed to the mounting surface.

A castor wheel may therefore be mounted on a container by following the method represented in Figure 8 in providing a container assembly 160, abutting a fixing plate 54 against a fixing face 4 and then affixing the fixing plate 54 to the fixing face 4. The caster
20 wheel 52 is therefore mounted on the bracket 2. The method continues in locating the mounting face 10 to a predetermined position on a mounting surface 164 of a container 162 and then affixing the mounting face 10 to the mounting surface 164. Hence the castor wheel 2 is mounted on the container 162.

CLAIMS

1. A bracket comprising a mounting face and a fixing face, which faces are spaced apart from one another, in which:

the mounting face comprises a first end portion, a second, end portion, and a locating
5 portion positioned between the first and second end portions; and

the fixing face comprises a first fixing portion and a second fixing portion;

the bracket comprises a first leg extending from the first end portion to a first end of the
first fixing portion, a second leg extending from the second end portion to a first end of
the second fixing portion, a third leg extending from a first end of the locating portion to
10 a second end of the first fixing portion and a fourth leg extending from a second end of
the locating portion to a second end of the second fixing portion.

2. A bracket according to Claim 1, in which the locating portion comprises a plurality of
locating apertures adapted to engage with locating pins.

3. A bracket according to Claim 1, in which the bracket is symmetrical along two axes
15 parallel to the mounting face.

4. A bracket according to Claim 1, in which the mounting face is integrally formed with
the fixing face.

5. A bracket according to Claim 1, in which the bracket comprises at least one gusset.

6. A bracket according to Claim 5, in which a gusset is formed between a leg and an
20 associated fixing portion.

7. A bracket according to Claim 6, in which a gusset is formed between each leg and its
associated fixing portion.

8. A bracket according to Claim 7, in which the fixing face comprises a plurality of fixing
apertures each of which is configured to engage with a fixing screw.

9. A bracket according to Claim 1, in which the mounting face and fixing face are parallel.
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10. A bracket assembly comprising a bracket according to Claim 1, further comprising a
fixing plate that is affixable to the fixing face.

11. A bracket assembly according to Claim 10, in which the bracket assembly further comprises a plurality of fixing screws.

12. A container assembly comprising a bracket according to Claim 1, comprising a container, which container comprises a mounting surface, which mounting surface comprises
5 a mount locator configured to engage with the locating portion of the bracket, and in which the bracket is affixable to the mounting surface.

13. A container assembly comprising a bracket according to Claim 2, further comprising a container, which container comprises a mounting surface, which mounting surface comprises a mount locator, which mount locator comprises a plurality of locating pins which engage
10 with the locating apertures.

14. A container assembly comprising a bracket assembly according to Claim 10, further comprising a container, which container comprises a mounting surface, which mounting surface comprises a mount locator.

15. A method of mounting a castor wheel on a container comprising the steps of:
15 providing a container assembly according to Claim 12;
abutting a castor wheel fixing plate against a bracket fixing face;
affixing the fixing plate to the fixing face;
locating a bracket mounting face to a predetermined position on a mounting surface of a container;
20 affixing the mounting face to the mounting surface.