

A CONTAINER HANDLE

The present invention relates to a container handle for attachment to a container. The present invention has particular application for containers such as PET (polyethelene terephthalate) bottles, which are formed by stretch blow moulding and it will be convenient to describe the invention in relation to that application. However, it should be appreciated that the invention has wider application and is not to be understood as restricted to the particular application described.

PET bottles can be formed by a process involving both injection and stretch blow moulding. In such a process, raw material is formed into a tube-like structure known as a "preform" or a "parison", which is then stretch blow moulded into the desired bottle shape. In this process, it is not possible to produce the bottle with a handle of the desired kind, such as that shown in Figure 1 and thus, it is necessary to produce a separate handle and to attach this to the PET bottle either during manufacture of the bottle, or subsequent to its manufacture.

In one process, the handle is fitted into the blow mould and the PET bottle stretch blown about connecting portions of the handle. In a different process, the PET bottle is stretch blown and the handle is fitted to it retrospectively. In the former process, the handle is inserted into the blow mould either by a robot arm, or by a production worker, however neither provides a satisfactory result. The robot arm is expensive to install and maintain, while the production worker is exposed to a safety risk, in that a malfunction of the mould could result in the mould clamp closing on the worker's arm. Thus, for economy and safety, the latter process is adopted.

To maximise the efficiency of this latter process, the handle is required to be easily and quickly fitted to the PET bottle. Additionally, the handle is required to be securely fixed to the bottle, such that it is impossible or difficult to remove and can support the weight of the filled bottle. One proposed solution to the above requirement is illustrated in Figure 2. In this figure, the plastic handle 10 includes a gripping portion 11 and arms 12 depending therefrom. Lugs 13

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2

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REPLACED SHEETS		SG
☒	Description : paged ... 2 ... to paged ... 9 ...	
☒	Claim(s) : paged ... 10 ... to paged ... 11 ...	
☒	Drawing(s) : paged ... 12 ... to paged ... 18 ...	
☐	Abstract : paged ... to paged ...	
DATE OF RECEIPT		2/11/96

extend from the arms 11 and these lugs are received in recesses moulded into the bottle 14.

Advantageously, the handle 10 can be pushed into engagement with the bottle 14 by flexing of the arms 11 and 12, but conversely, it is also relatively easily pulled out of attachment with the bottle due to the flexible nature of the arms. Thus, this handle does not provide a satisfactory solution.

It is an object of the invention to provide a handle for attachment to a container which overcomes or at least alleviates one or more of the difficulties associated with previous handles.

According to the present invention there is provided a handle for a container, said handle including a gripping portion, a pair of spaced apart attachment portions depending from said gripping portion and a locking arm depending from a first one of said attachment portions, each of said attachment portions including engagement means for engagement with co-operating portions of said container, at least one of said attachment portions being flexibly movable toward the other to facilitate engagement of said engagement means with said co-operating portions, said locking arm being movable from an inoperative position in which said at least one attachment portion is flexibly movable toward the other, to an operative position in engagement with the second one of said attachment portions in which flexible movement of said at least one attachment portion towards the other is prevented.

Preferably the locking arm is flexibly and integrally connected to the first one of the attachment portions such that it is flexibly pivotable about that connection, between the inoperative and operative positions. The locking arm preferably has a disposition in the inoperative position, in which it is tilted towards the gripping portion. With that disposition, all that is necessary to move the locking arm into the operative position is to push the locking arm so that it pivots about its connection to the first attachment portion in a direction away from the gripping portion.

In a preferred arrangement, the second of said attachment portions includes means to locate an end section of the locking arm so as to maintain the locking arm in the operative position. In one form, the locating means takes



the form of a recess, which receives and locates the end section. The recess may take any suitable form, but in one form is channel-like, having a base and two substantially parallel walls depending therefrom. In this arrangement, the end section is required to ride over a first of the recess walls to be received
5 within the recess. To assist this movement, the first recess wall can include an inclined outer surface, while the end section can also include such an inclined surface. The flexible nature of the locking arm, and/or the attachment portions allows this riding-up action to take place.

In order to assist in arriving at an understanding of the present invention,
10 a preferred embodiment is illustrated in the attached drawings. However, it should be understood that the following description is illustrative only and should not be taken in any way as a restriction on the generality of the invention as described above

Figure 1 shown a known type of bottle with an integral handle.

15 Figure 2 shows a PET bottle with a known handle attached thereto.

Figure 3 shows a PET bottle with a handle according to an embodiment of the invention attached thereto.

Figure 4 shows a detailed perspective view of the handle shown in Figure 3.

20 Figure 5 shows a detailed view of a section of the handle.

Figure 6 shows a further detailed view of the section of the handle shown in Figure 4.

Figure 7 shows a PET bottle with a handle attached thereto in the first stage of the attachment process.

25 Figure 8 shows a PET bottle with a handle according to the alternative embodiment of the invention attached thereto.

Referring to Figure 3, a bottle 100 is shown with a handle 101 attached thereto. The handle 101 is shown in more detail in Figure 4 and therefore reference will now be made to that figure.

30 The handle 101 of Figure 4 is an injection moulded plastic handle which includes a gripping portion 102, attachment portions 103 and 104 and a locking arm 105. The gripping portion 102 is configured for convenient gripping by a



user of the container 100. It can therefore take any suitable configuration. In the embodiment illustrated, the gripping portion 102 includes flange portions 106 which are separated by a web portion 107. This construction provides the gripping portion with a required level of strength and stiffness. At the bottom end of the gripping portion 102 is an extension section 108 and this section 108 extends from the flange and web portions 106 and 107 to the lower attachment portion 104. The attachment portion 104 is integrally connected to the extension portion 108 and the junction between these portions is an elbow 109.

At the other end of the gripping portion 102 is attached the upper attachment portion 103. The gripping portion 102 extends beyond the junction with the attachment portion 103 to create a projection 110.

Each attachment portion 103 and 104 includes engagement means for engagement with co-operating portions of the container 100. In the embodiment illustrated, the engagement means comprises protruding members 111 and 112. Each of the protruding members 111 and 112 is formed by a U-shaped member depending from the outer surface of the respective attachment portions. The protruding members are configured to be received within recesses formed in the blow-moulded container, in a well provided for receipt of the handle 101. The recesses 113 and 114 can be seen in Figure 3. The protruding members 111 and 112 are required to be a neat fit within the recesses 113 and 114 respectively, although there is no requirement for the projecting members to accurately match the internal profile of the recesses.

The upper attachment portion 103 further includes locating means to locate an end section of the locking arm 105. The locating means takes the form of a recess 115 provided at the free end 116 of the attachment portion 103. The recess 115 is shown in more detail in Figures 5 and 6 and reference will now be made to those figures. The recess 115 includes a first wall 117, a base 118 and a second wall 119. Each of the first and second walls are substantially perpendicular to the base 118 and thus the recess 115 has a rectangular or channel-like configuration. The first wall 117, as shown, extends



6. Nov. 1996 14:47

POF SYDNEY 61 2 4152755

No. 2446 P. 6/13

to a height lower than that of the second wall 119, although the relative heights of these walls is not important and they could, for example, be of equal height, or of inverse proportion.

The recess 115 is adapted to receive the end section 120 of the locking arm 105 and thus the walls 117 and 119 are required to have sufficient height to accommodate the end section 120, such that it is prevented from release from the recess 115 under normal conditions. The end section 120 has a first flange 121 and a second flange 122. The end section 120 further has a body 123 which includes a sloping face 124. The width W of the body 123 is substantially equal to the width between the first and second walls 117 and 119 of the recess 115 such that the body 123 can be received within the recess 115. The location of the flanges 121 and 122 are such as to rest against the flat surfaces 125 and 126 of the first and second walls 117 and 119, when the body 123 is received within the recess 115. This arrangement is shown in Figure 6.

Figure 5 is illustrative of the handle 101 with the locking arm 105 in an inoperative position in which it exerts no influence on the flexible movement of the attachment portion 103. This arrangement is also shown in Figure 7 and reference will be made to both of these figures. In these figures, the attachment portion 103 is free to flex unrestrained in a direction toward the lower attachment portion 104. The amount of flexibility available to the upper attachment portion 103 will depend on the properties of the plastic material of the handle, as well as the beam structure of the attachment portion and the type of connections to the gripping portion 102. The attachment portion 103 may be constructed so as to have little flexibility, or higher flexibility as desired.

The lower attachment portion 104 may equally be flexible relative to the gripping portion 102 and in the embodiment illustrated, that flexibility is most likely to occur in the region of the elbow 109, although this attachment portion may also be flexible through its length. In practice, the elbow 109 enables the attachment portion 104 to flex relative to the gripping portion 102 more readily than the attachment portion 103, but that is only a characteristic of this



6. Nov. 1996 14:47

POF SYDNEY 61 2 4152755

No. 2446 P. 7/13

particular form of the invention and either or both attachment portions may have a flexible characteristic.

The flexible nature of one or both of the attachment portions 103 and 104 enables the handle 101 to be easily and quickly fitted to the bottle 100 and the mechanism by which this is achieved will now be described.

As can be seen from Figure 7, the handle 101 is inserted into engagement with the container 100 with the locking arm 105 in the inoperative position, tilted or inclined toward the gripping portion 102. With the locking arm 105 in this position the attachment portions 103 and 105 can flex toward each other so that the protruding members 111 and 112 ride over the sloping shoulders 127 and 128 of the bottle 100. The flexible nature of the attachment portions 103 and 104 enables the handle 101 to simply be pushed into the well 129 of the bottle 100 and the resiliency of the attachment portions allows them to snap back so that the protruding members 111 and 112 automatically enter the recesses 113 and 114.

Entry of the protruding members 111 and 112 into the respective recesses 113 and 114 under the effect of the attachment portion resiliency, is not however sufficient to prevent the handle 101 from being easily removed from engagement with the bottle 100, by pulling the handle in the opposite direction to which it has been inserted. Thus, the locking arm 105 is moved from the inoperative positions of Figures 5 and 7, to the operative positions of Figures 3,4 and 6. This is an equally simple procedure to that of the handle insertion and simply requires that the locking arm 105 be pushed away from the gripping portion 102, into engagement with the recess 115 of the attachment portion 103. Referring to Figure 5, engagement of the end section 120 within the recess 115 is facilitated by the provision of the sloping face 124, which rides up over the first wall 117 before snapping into the recess 115.

To enable the end section to ride over the first wall 117, either or both of the attachment portions 103 and 104 flex outwardly pushing the protruding members 111 and 112 deeper into the respective recesses. Thus, the recesses 113 and 114 are required to have a depth sufficient to accommodate



such movement, although the amount of movement required is a matter of millimetres.

With the end section 120 received in the recess 115, the locking arm 105 becomes a locking strut which prevents movement of the attachment
5 portions 103 and 104 towards each other and thus the protruding members 111 and 112 are fixed within the recesses 113 and 114 respectively and the handle 101 is securely attached to the bottle 100. It is difficult to displace the end section 120 of the locking arm 105 from within the recess 115 because the construction of the handle 101 is such as to bias the end section into the
10 recess 115. Thus, the attachment portions must be flexed away from each other to disengage the end section from the recess, but this does not readily occur. Alternatively, the locking arm 105 could be bent, to displace the end section from the recess, but again, the construction of the locking arm does not facilitate this. Furthermore, the locking arm in the operative position is
15 supported against the internal surface 130 (Figure 7) of the well 129.

In order to ensure that the attachment portions remain biased toward each other so that the end section 120 remains engaged within the recess 115, the recesses 113 and 114 can be configured in a wedge shape, as seen in
20 Figures 3 and 7, so that as the protruding members 111 and 112 extend further into the recesses the configuration of the recesses is such as to resist that movement. The resistance is only provided as the protruding members near full receipt within the recesses and serves to bias the protruding members out of the recesses and thus securely engaging the end section 120 of the locking arm in the recess 115.

25 The handle 101 as illustrated in the attached figures is simple and easy to attach to a bottle or other container. It requires only two movements, one being to engage the protruding members 111 and 112 in the recesses 113 and 114 respectively and the second to engage the end section 120 of the locking arm 105 in the recess 115. The handle 101 can be fitted to a bottle without the
30 expense of a robot arm and without endangering production workers and advantageously is manufactured in a one piece construction.



6. Nov. 1996 14:48

POF SYDNEY 61 2 4152755

No. 2446 P. 9/13

The handle 101 can be modified so that the locking arm 105 extends from the upper attachment portion 103 and that arrangement is shown in Figure 8. In that figure, the handle 201 has the same constructional qualities as that of the handle 101 and thus, the same reference numerals for the same parts have been used, plus 100. The handle 201 is fitted to the bottle 200 in substantially the same manner as the handle 101 is fitted to the bottle 100, inserting the protruding members 211 and 212 into the recesses 213 and 214 respectively and then moving the locking arm 205 in the direction A, from the inoperational position shown in Figure 7, to an operational position in which the end section 220 is engaged within the recess 215. The adoption of either form of handle 101 or 201, is a matter of choice, as the handles will operate in the same manner once fully installed.

Those skilled in the art will appreciate that there may be many variations and modifications of the configuration described herein which are within the scope of the present invention.



6. Nov. 1996 14:49

POF SYDNEY 61 2 4152755



The claims defining the invention are as follows:

1. A handle for a container, said handle including a gripping portion, a pair of spaced apart attachment portions depending from said gripping portion and a locking arm depending from a first one of said attachment portions, each of said attachment portions including engagement means for engagement with co-operating portions of said container, at least one of said attachment portions being flexibly movable toward the other to facilitate engagement of said engagement means with said co-operating portions, said locking arm being movable from an inoperative position in which said at least one attachment portion is flexibly movable toward the other, to an operative position in engagement with the second one of said at least one attachment portion in which flexible movement of said attachment portions towards each other is prevented.
2. A handle according to claim 1, wherein said locking arm is flexibly connected to said first one of said attachment portions and is flexibly pivotable about said connection between said inoperative and said operative positions.
3. A handle according to claim 2, wherein in said inoperative position, said locking arm is tilted toward said gripping portion and wherein said locking arm is pivoted away from said gripping portion into said operative position.
4. A handle according to any preceding claim, wherein said second one of said attachment portions includes locating means to locate an end section of said locking arm so as to maintain said locking arm in said operative position.
5. A handle according to claim 4, wherein said locating means comprises a recess which receives and locates said locking arm end section.
6. A handle according to claim 5, wherein said recess includes a base and two spaced-apart, substantially parallel walls extending therefrom, said end section riding over an outer surface of one of said walls prior to being received within said recess.
7. A handle according to claim 6, wherein said outer surface is inclined to facilitate riding of said end section thereover.
8. A handle according to claim 6 or 7, wherein said end section includes an inclined face to facilitate riding of said end section over said outer surface.



6. Nov. 1996 14:49

POF SYDNEY 61 2 4152755



9. A handle according to any one of claims 6 to 8, wherein said one of said walls extends to a lesser extent from said base than the other of said walls.
10. A handle according to any one of claims 6 to 9, wherein the ends of said walls remote from said base are formed as planar surfaces, which face
- 5 complementary planar surfaces provided at the base of said end sections.
11. A handle according to any preceding claim, in which said engagement means includes a protruding member extending in a direction substantially opposite to the direction of flexible movement of said attachment portions toward each other, which protruding members are received in recesses
- 10 provided in said container.
12. A handle according to claim 11, wherein said protruding members extend from an outer surface of said attachment portions.
13. A container having a handle according to any preceding claim, attached thereto.

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