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REQUEST FOR A STANDARD PATENT
AND NOTICE OF ENTITLEMENT

The Applicants identified below request the grant of a patent to the nominated persons identified below for an invention described in the accompanying standard complete patent specification.

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[54] Invention Title: CONTAINER WITH DETACHABLE HANDLE

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[60] Details of Provisional Application:

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Applicant states the following:

The said actual inventor made the invention in the course of his employment with the Applicant and has acknowledged the Applicant's entitlement to the invention and right to make application for the grant of a patent in its name.

DATED: 19 January, 1995

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Attorneys for:
ACI OPERATIONS PTY. LTD.
A container which includes:-

(a) a body portion which has a base and side walls which extend therefrom;

(b) a neck portion which includes an attachment surface, the diameter of which varies so that there is a first section of larger diameter and a second section which is of reduced diameter; and

(c) a detachable handle which is cooperatively attached to the container being connected about said attachment surface and which includes a hand gripping portion which is spaced from the body of the container and a container securement portion which includes at least two arms, the terminal ends of which are spaced apart and which extend away from the hand gripping portion and the inner surfaces of which extend around the neck portion of the container;

wherein the arms of the detachable handle are sufficiently flexible and resilient to outwardly open and clamp about the attachment portion of the neck when the handle and container are oriented such that the arms are in tension and the inner
surface of the arms bear upon the larger diameter of the attachment surface and sufficiently spaced apart and flexible so to allow detachment of the handle from the container when the handle and container are oriented such that the inner surfaces of the arms bear upon or are adjacent to the section of the attachment surface of reduced diameter.
Invention Title: CONTAINER WITH DETACHABLE HANDLE

The following statement is a full description of this invention, including the best method of performing it known to applicant(s):-
CONTAINER WITH DETACHABLE HANDLE

This invention relates to a container which incorporates a detachable handle. The invention has particular application when used for containers made from plastics material where the container comprises a neck or shoulder portion of reduced diameter.

The invention is hereinafter described with reference to a plastic container such as that used to hold beverages such as fruit juices. However, it will be readily appreciated that the invention has much broader application and that the detachable handle can be effectively utilized with a range of different containers where it is desired to incorporate a lifting or pouring handle sometime after the manufacture of the container.

In the last decade or so, there has been increasing consumer demand for larger volume containers for the purchase of various beverages. For example, it is now quite common for producers to utilize a plastic container for containing a fruit juice or similar beverage having a volume in excess of 1.0 litre. Two litre containers are now quite commonly used. One difficulty with such containers is that they are awkward to handle and manage, especially upon initial opening. Pouring a beverage from a full container without spillage can be difficult. A firm grip around the body of the container can result in part of the beverage spurting out of the opening of the container in an uncontrolled way.

One obvious solution is to blow mould a container incorporating a handle. However, not all consumers want a handled bottle and a handle is sometimes not desired due to limitations in storage space or for cost or aesthetic reasons. Further, blow moulding of a bottle comprising an integral handle requires different moulds.

It is thus an object of the present invention to provide a container which incorporates a detachable handle where the handle is easy to attach and detach from the neck of the container. (In this specification the term "neck" is used to describe that portion of the container below the closure attachment finish (usually a screw thread) which is of reduced diameter or dimension when compared to the largest diameter or dimension of the container body). It is also an object of the invention to provide a container incorporating a detachable handle, the design of
which is such that the container will not look incomplete if the handle is not present. Previous arrangements for incorporating a separate handle have been such that the container itself has appeared to have some part missing or in some way incomplete when the handle is not present as a result of the means by which the handle and the bottle have co-operated.

The present invention overcomes problems and deficiencies of previous designs by providing a container which incorporates a modified neck design shaped to cooperate with a separate handle so that the handle may be easily attached to the neck of the container and thereafter moved into a position at which it is firmly secured to the container.

Thus, in accordance with the present invention, there is provided a container which includes:-

(a) a body portion which has a base and side walls which extend therefrom;
(b) a neck portion which includes an attachment surface, the diameter of which varies so that there is a first section of larger diameter and a second section which is of reduced diameter; and
(c) a detachable handle which is cooperatively attached to the container being connected about said attachment surface and which includes a hand gripping portion which is spaced from the body of the container and a container securement portion which includes at least two arms, the terminal ends of which are spaced apart and which extend away from the hand gripping portion and the inner surfaces of which extend around the neck portion of the container;

wherein the arms of the detachable handle are sufficiently flexible and resilient to outwardly open and clamp about the attachment portion of the neck when the handle and container are oriented such that the arms are in tension and the inner surfaces of the arms bear upon the larger diameter of the attachment surface and sufficiently spaced apart and flexible so to allow detachment of the handle from the container when the handle and container are oriented such that the inner surfaces of the arms bear upon or are adjacent to the section of the attachment surface of reduced diameter.

Preferably, the attachment surface of the neck portion is ovaloid or elliptical in cross section. This enables the detachable handle to be attached to the
container neck over the section of reduced diameter and then to be moved into clamping securement to the section of larger diameter by rotation through 90°.

In a non stressed and unsecured disposition it is preferred that the opening between the two resilient arms be of sufficient size so that the handle may be readily detached or attached to the container.

When the detachable handle is in its non stressed disposition, the outline of the inner surfaces of the arms preferably generally describes a semi-circular profile (or a partial circular profile of greater extent) having a diameter smaller than the diameter of the first section of the attachment surface but greater than the reduced diameter of the second section of the attachment surface. The inner surfaces of the resilient arms are preferably shaped to conform with the shape of the container neck when in the secured disposition.

The bottle and handle desirably incorporate means for properly aligning the handle onto the attachment surface. Such means can be achieved by a number of different configurations well recognised in the art. For example, the attachment surface can incorporate one or more indentations shaped to engage corresponding teeth or ribs on the inner surfaces of the resilient arms.

Most preferably, the outside surface of the neck of the container and the inside surface of the resilient arms include cooperating means such that the handle will click into position when it is in the correct orientation. An example of such cooperating means includes lugs or ribs located on the container neck and corresponding indentations on the inner surface of the resilient arms of the handle securement portion. Of course, alternative arrangements such as including the lugs on the inner surface of the resilient arms and the indentations on the surface of the bottle might also be utilized.

In one preferred embodiment, indentations are provided on either side of the larger diameter section. Correspondingly shaped ribs are positioned on the inner surfaces of both of the resilient arms at opposite positions so to engage within the indentations when the handle and container are oriented at the point of maximum securement (i.e. when the shape of the neck has forced the resilient arms into their most open and hence most stressed disposition). It will be clear that additional indentations and lugs can be provided to more securely lock and locate the handle into this position and the preferred detachment position.
Alternatively or additionally, the resilient arms may incorporate grooves, lips or protrusions shaped to cooperate with a corresponding section formed into the neck portion of the container.

The neck portion of the container may be modified to incorporate an upper neck flange having an overhanging portion behind which the resilient arms may be located. In this embodiment, the upper neck flange and the overhanging portion form a groove into which the resilient arms of the handle may be pushed to form a very positive engagement. In such an embodiment, the arms may also incorporate means to interconnect with the upper neck flange or the overhanging portion.

In any of these arrangements, the bottle may also include a lower neck ring or seat upon which the bottom of the resilient arms of the handle may be located. Most preferably the container includes both the upper neck flange and the lower neck ring between which the resilient arms may be located so to more securely hold the detachable handle in position. The lower neck ring may also include a peripheral upstand so to form a lower groove. The embodiments including a lower neck ring are particularly useful when the container is being used for hot filling. Plastic bottles will shrink on hot filling and the handle may as a result become loose. With the embodiments including both an upper neck flange and a lower neck ring, the detachable handle will be retained in secure attachment even on hot filling being wedged between the upper neck flange and the lower neck ring. As it is the oriented parts of the bottle that tend to shrink on hot filling, the handle is preferably also connected to the bottle at a point which is not oriented. Generally, it is convenient to utilize a bottle in which the part of the neck portion which is above the neck ring is not oriented - being formed by injection moulding.

The lower neck ring and the rest of the bottle can be conveniently formed by blow moulding.

In an alternative arrangement the resilient arms include a top flange which extends inwardly from a depending skirt shaped to conform with the neck of the container. In this embodiment, the container includes an upper most seat portion at the top of the neck on which this flange is adapted to sit.

In use, the detachable handle is connected to the container by first orienting and positioning the opening between the resilient arms adjacent to, and
then onto, the smaller diameter portion of the attachment surface of the neck. Subsequent rotation of the handle securement portion so that the inner surfaces of the arms bear upon the larger diameter section of the attachment surface causes outward opening of the resilient arms to a more stressed disposition so to bring about clamping of the handle about the neck of the container.

When an elliptical or ovaloid cross section is used in the neck portion of the container, the handle may be placed around the neck of the container, initially at the smaller diameter portion and then rotated through 90° to the maximum diameter portion of the neck to bring about tight clamping of the detachable handle to the neck portion of the container.

It is preferred that the smaller diameter portion of the neck be approximately equal to or slightly less than the distance between the container attachment opening between the two resilient arms of the handle securement portion of the handle in its unstressed disposition. This facilitates easy initial attachment of the handle to the container. The larger diameter portion of the neck should be of such increased diameter so to substantially outwardly open the two resilient arms to bring about a tight clamping of these arms about the neck of the container.

The handle gripping portion of the handle may be of any suitable shape to enable ready gripping by the hand. One suitable arrangement utilizes a substantially L-shaped section comprising a first section which extends away from the container substantially perpendicular to the axis of the container when the handle is attached and a second section which extends downwardly substantially parallel to the axis of the container. Preferably, the handle gripping portion is of such size and shape that when the handle is attached to the container it does not extend substantially beyond the outermost width of the container body. This allows containers having the handle of the invention attached thereto to be packed in abutting arrangement without the handles on the respective containers interfering with each other.

The handle gripping portion and the container securement portion are preferably integral. The handle can be moulded from any suitable material but it is desirably formed from materials such as PET, polypropylene or PVC. When the container is formed from PET, it is preferred that the handle also be made
from PET so that the combination can be discarded and recycled without detachment.

The invention is hereinafter described with reference to a preferred embodiment as illustrated in the drawings wherein:

Figure 1 is a perspective view of a container having a detachable handle attached to the neck thereof in accordance with the invention;

Figure 2 is a side view of the bottle shown in Figure 1;

Figure 3 is a top view of the container and handle shown in Figure 1;

Figure 4 is a perspective view of an alternative embodiment of the invention showing a container with a detachable handle connected thereto;

Figure 5 is the side view of the bottle shown in Figure 4;

Figure 6 is a top view of the container and handle as shown in Figure 4; and

Figure 7 is a perspective view of a further alternative embodiment of the invention.

With reference to Figure 1, there is shown a container 1 to which there has been attached a detachable handle 2. The handle 2 is attached to container 1 by clamping securement to neck portion 3. The handle comprises a handle gripping portion 4 and a container securement portion 5 which are integrally connected.

Container securement portion 5 comprises two outwardly extending resilient arms 6 which together when viewed from above are in the shape of a "C" (see Figure 3). The resilient arms 6 are shaped so to closely conform to the surface of the neck portion 3 when in position as shown in each of Figures 1 to 3. The resilient arms 6 in the embodiment shown extend about significantly more than half of the circumference of the neck portion 3. The handle gripping portion 4 includes a first portion 7 which extends away from the container perpendicular to the axis of the container 1 and a second portion 8 intended to be the part of the handle clasped by the hand. Preferably, the outer most surface 9 of the second portion 8 of the handle gripping portion 4 does not extend out beyond the plane 10 parallel to the axis of the container which touches the outermost surface of the container in the direction of the handle. The container 1 includes a seat portion 11 at the top of the neck 3 upon which a flange 12 (best seen in Figure 3) of the container securement portion 5 is adapted to sit. Turning to Figure 2, it can be seen that it
is not necessary for the container securement portion 5 to be in continuous contact with the outer surface of the neck portion 3 as can be seen at sections 3a and 3b.

In Figure 3, flange 12 is shown seated on seat portion 11. It will be noted that the neck portion 3 is ovaloid in shape. The resilient arms 6 have been opened outwardly from their unstressed state by the camming action of the neck 3 and seat portion 11 on the arms when the handle is rotated onto the largest diameter section of the attachment surface of the neck portion as shown in Figure 3. The detachable handle is easiest attached by inserting the container neck between the opening of the resilient arms 6 with the bottle disposed 90° from the orientation shown in Figure 3 where the diameter of the neck is shortest. The edges 13 of flange 12 are preferably angled in to provide a lead in for initial attachment of the handle to the bottle. Once attached, the handle is clamped tightly into position by rotating through 90° to the position shown in Figure 3.

The handle is retained in the correct position by cooperating ribs 14 and indentations 15 on the outer surface of the neck 3 and the inner surface of the resilient arms 6 respectively.

In the alternative embodiments shown in Figures 4 to 7, like reference numbers refer to like parts of the bottle and handle that have already been described. Turning to Figure 4, bottle 1 is illustrated which includes a lower neck ring 16 having an upper surface 17 upon which the resilient arms 6 can be located. As with the embodiment shown in Figure 1, the resilient arms and the ovaloid attachment surface both incorporate corresponding ribs and indentations so that the handle may be clicked into and locked in position when the bottle and handle are oriented as shown in Figures 4 to 6. The resilient arms are located between lower neck ring 16 and upper neck flange 18.

In the further alternative embodiment shown in Figure 7, bottle 1 includes upper neck flange 18 which additionally incorporates an overhanging portion 19. The portion of the bottle above the upper neck flange 18 is the screw finish of the container for the attachment of a closure. The resilient arms 6 of the handle 2 are located between lower neck ring 16 and upper neck flange 18 and held securely in place by fitting behind the overhanging portion 19 of neck flange 18.
The invention provides an effective secure and easy way to manufacture a container having a detachable handle in which the handle may be optionally used and attached by consumer or manufacturer.

Various modifications and additions may be made to the various components and features of the container as hereinbefore described without departing from the spirit or ambit of the present invention as defined in the following claims.
The claims defining the invention are as follows:-

1. A container which includes:-
   (a) a body portion which has a base and side walls which extend therefrom;
   (b) a neck portion which includes an attachment surface, the diameter of which varies so that there is a first section of larger diameter and a second section which is of reduced diameter; and
   (c) a detachable handle which is cooperatively attached to the container being connected about said attachment surface and which includes a hand gripping portion which is spaced from the body of the container and a container securement portion which includes at least two arms, the terminal ends of which are spaced apart and which extend away from the hand gripping portion and the inner surfaces of which extend around the neck portion of the container;

   wherein the arms of the detachable handle are sufficiently flexible and resilient to outwardly open and clamp about the attachment portion of the neck when the handle and container are oriented such that the arms are in tension and the inner surface of the arms bear upon the larger diameter of the attachment surface and sufficiently spaced apart and flexible so to allow detachment of the handle from the container when the handle and container are oriented such that the inner surfaces of the arms bear upon or are adjacent to the section of the attachment surface of reduced diameter.

2. A container as claimed in claim 1 wherein the attachment surface of the neck portion is ovaloid or elliptical in cross section.

3. A container as claimed in either one of claims 1 or 2 wherein the resilient arms of the detachable handle include a depending skirt shaped to conform with the attachment surface of the neck portion when the handle and container are oriented such that the inner surfaces of the arms bear upon the larger diameter of the attachment surface.

4. A container as claimed in claim 3 wherein the resilient arms include a top flange which extends inwardly from the depending skirt and wherein the neck portion of the container includes a seat portion located above the attachment surface onto which the flange is adapted to sit.
5. A container as claimed in any one of the previous claims wherein the container includes a neck ring located immediately beneath the attachment surface such that the handle can be attached and located around the neck portion immediately above the said neck ring.

6. A container as claimed in any one of the previous claims wherein the resilient arms of the detachable handle extend around more than one half of the circumference of the neck portion of the container.

7. A container as claimed in any one of the previous claims wherein the attachment surface and the inside surface of the resilient arms include members which will cooperate with each other when the handle is secured to the attachment surface of the neck portion.

8. A container as claimed in claim 7 wherein said cooperating members include lugs or ribs located on the attachment surface of the neck portion and corresponding indentations on the inner surfaces of the resilient arms.

9. A container as claimed in claim 7 wherein the cooperating members include lugs or ribs located on the inner surfaces of the resilient arms of the handle and corresponding indentations are included on the attachment surface of the neck portion.

10. A container as claimed in any one of the previous claims wherein the detachable handle comprises a first section which extends away from the container substantially perpendicular to the axis of the container and a second section which extends downwardly substantially parallel to the axis of the container.

11. A container as claimed in any one of the previous claims wherein the handle gripping portion of the detachable handle is of such size and shape that it does not extend substantially beyond the outermost width of the body portion of the container.

12. A container as claimed in any one of the previous claims wherein the securement portion of the detachable handle and the gripping portion of the detachable handle are integral.
13. A container substantially as hereinbefore described with particular reference to what is shown in any one of the drawings.

Dated: 19 January, 1995

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ABSTRACT

A container which includes:-

(a) a body portion which has a base and side walls which extend therefrom;
(b) a neck portion which includes an attachment surface, the diameter of which varies so that there is a first section of larger diameter and a second section which is of reduced diameter; and
(c) a detachable handle which is cooperatively attached to the container being connected about said attachment surface and which includes a hand gripping portion which is spaced from the body of the container and a container securement portion which includes at least two arms, the terminal ends of which are spaced apart and which extend away from the hand gripping portion and the inner surfaces of which extend around the neck portion of the container;

wherein the arms of the detachable handle are sufficiently flexible and resilient to outwardly open and clamp about the attachment portion of the neck when the handle and container are oriented such that the arms are in tension and the inner surface of the arms bear upon the larger diameter of the attachment surface and sufficiently spaced apart and flexible so to allow detachment of the handle from the container when the handle and container are oriented such that the inner surfaces of the arms bear upon or are adjacent to the section of the attachment surface of reduced diameter.