Title: HARNESS-MOUNTED RECEPTACLE

Abstract

In its preferred form the invention is particularly adapted as a body-mounted container for use in harvesting fruit from trees and the like. The receptacle comprises five principal components, which are a frame (1), a container (2), a harness (3), a brace (9) and a securing means (10). The harness (3) comprises at least two straps (6, 7) with each end of the straps (6, 7) being individually attached to the frame (1). The receptacle is characterised in that the securing means (10) is located on the frame (1) or about a point of balance (X) of the receptacle, and one end of each of the straps (6, 7) of the harness (3) is attached to the frame (1) at or about one side of the point of balance (X) while the other end of each of the straps (6, 7) is attached to the frame (1) at or on the opposite side of the point of balance (X).
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HARNESS-MOUNTED RECEPTACLE

TECHNICAL FIELD

This invention relates to a harness-mounted receptacle which can be used as a body mounted container and which is particularly useful in fruit picking or in other forms of harvesting.

BACKGROUND ART

Generally when harvesting fruit, the picker wears a harness-mounted receptacle into which the harvested fruit is placed. Typically such a receptacle is in the form of an open mouthed flexible bag which has a suitable harness to enable the bag to be worn by the picker and which allows the hands of the picker to be free. Because the bag must be of a moderately substantial size to allow the picker to harvest an optimum amount of fruit, the harness generally consists of shoulder straps which are designed to distribute the weight of the bag and the harvest as efficiently as possible on the person wearing the bag. To assist the picker, many of the bags also have means to maintain the mouth of the bag in a substantially open condition.

To maintain the bag and also the mouth of the bag in a position that will enable ready access to the interior of the bag, the harness generally consists of shoulder straps attached to the front and rear of the bag. An example of a harness-mounted receptacle of this form is provided by New Zealand patent specification 64456.

In harness-mounted receptacles of the type exemplified by NZ 64456 the front straps tend to interfere with ready access to the bag and this detracts from the ease of use of the bag so that the picker's time and motion is not employed to the best advantage. This can lead to a deterioration in the quality of the work. In addition, the harvested fruit in the bag can cause a substantial downward pull on the bag which can result in the mouth of the bag being presented downwards whereby loading becomes more difficult.

A further disadvantage with the known forms of bags is that the bags are not designed to distribute the weight of the harvested fruit in the most efficient manner possible and this can result in premature fatigue and back strain.
To some extent an attempt to address this latter mentioned problem was made in the harness-mounted receptacle taught and illustrated in New Zealand patent specification 232608. However, while an improvement over the prior art, the design advocated does not fully address the optimal distribution of fruit within a fully laden fruit picking bag. Instead the invention relies on a brace portion extending substantially perpendicularly to the bag mouth to maintain the bag mouth at an optimal picking presentation angle and to balance the load. This system results in considerable force being applied to the thighs and midriff of the picker. That force must be counterbalanced by the back muscles acting through the harness, and hence the problems with fatigue and back strain are not successfully alleviated.

It is therefore an object of the present invention to provide an improved bag which will minimise the above disadvantages.

**SUMMARY OF THE INVENTION**

In a broad aspect this invention provides a receptacle comprising:

- a container having an open mouth;

  - a frame which has a portion that, in use, will face the body of the wearer, the frame being adapted to support the open mouth of the container;

  - a harness comprising at least two straps with each end of the straps being individually attached to the body facing portion of the frame,

  - a brace having one end attached to the container at a position distal from the open mouth of the container;

  - securing means on the frame to enable the other end of the brace to be secured to the frame;

characterised in that the securing means is located on the frame at or about a point of balance of the receptacle, and one end of each of the straps is attached to the frame at or on one side of the point of balance, while the other end of each the straps is attached to the frame at or on the opposite side of the point of balance.
Preferably one end of each of the straps is attached to the frame at or about the point of balance.

Desirably the frame is of substantially crescent shape having a convex front portion and a concave rear portion, with the concave rear portion being adapted in use to bear against the wearer's body.

Conveniently the harness is comprised of two straps, the ends of which are attached to the frame.

Advantageously the straps forming the harness are attached to the frame in a manner such that the point of attachment of the straps that depend from the front of the body of the wearer, when in use, are innermost from the point of attachment of the straps that pass around the rear of the shoulders of the wearer.

Preferably the container has an opening at the end distal from the mouth with opening being closed when the other end of the brace is attached to the frame.

Conveniently the container is a flexible bag.

Desirably the brace comprises a bracing strap.

Expediently the bag has an opening at its bottom end to which the bracing strap is attached, such that the bracing strap will hold the bottom end of the bag closed until the contents of the bag are to be discharged.

**BRIEF DESCRIPTION OF THE DRAWINGS**

A preferred embodiment of the invention will now be illustrated, by way of example only, with reference to the accompanying drawings in which:

**Figure. 1** illustrates a perspective view of a preferred form of the receptacle;
Figure. 2 is a partly diagrammatic side view of the receptacle; and,

Figure. 3 is a diagrammatic plan view of the frame of the receptacle.

DESCRIPTION OF PREFERRED EMBODIMENTS

In its preferred form the receptacle, as illustrated in the drawings, is particularly adapted as a body-mounted container for use in harvesting fruit from trees and the like.

The receptacle comprises five principal components, which are the frame 1, the container portion 2, the harness portion 3, the bracing strap 9 and the anchor 10.

The frame 1 is preferably formed from a semi-malleable substance such as aluminium. In a highly preferred form the frame 1 is of a crescent shape, with the portion 1a of the frame being of a concave shape while the remainder of the frame 1 forms the front convex portion 1b. It will be understood other shapes of the frame 1 are contemplated, a principal requirement being that the rear portion 1a fit comfortably on the body of the wearer.

The container portion 2 comprises a bag 2a which may be essentially of a tubular shape and formed of a resilient tough material as is known in the art. The bag 2a has a mouth 4 which is suitably attached to the frame 1 as illustrated so that, in use, the bag 2a will depend from the frame 1 and the mouth 4 of the bag 2a will be held in an open position by the frame 1.

The harness portion 3 is preferably formed from two straps 6 and 7 of substantially equal length which are so shaped and constructed that in use the straps 6 and 7 may extend over the shoulders of the wearer and cross over at the wearer's back. The straps 6 and 7 are attachable by suitable attachment means to the frame 1 at four points 6a, 6b and 7a, 7b such that the ends of the straps 6 and 7 which cross behind the wearer are closer to the outside of the frame 1 as illustrated.

The strap 9 has one end suitably attached to the lower end of the bag 2a and an attachment means such as the anchor 10 is provided so the free end of the strap 9 can be removably attached to the frame 1.
When the free end of the strap 9 is attached to the anchor 10, the lower end of the bag 2a will be held closed. When the strap 9 is removed from the anchor 10 the lower end of the bag 2a will open so the contents of the bag 2a can be discharged without requiring the wearer to first remove the receptacle.

Optionally, at least the upper portion of the container portion 2 can be of a substantially rigid material forming an open bottomed bucket which is suitably attached to the frame 1. In this modification, a bag which can be similar to the form of the bag 2a described above, can depend from the bottom of the bucket.

Preferably the attachment points 6a and 7a of the harness straps and also the particular location of the anchor 10 are arranged so that they lie on a balance line X (see Figure 3).

The balance line X is the neutral point of the receptacle and in effect forms the centre of gravity of the receptacle which does not substantially change even when the container 2 is laden with fruit.

As can be seen diagrammatically from Figure 2, when a load is placed within the container 2, a substantial portion of the weight is transferred by the strap 9 to the anchor 10 and therefore the moment of force is downwards and towards the front of the receptacle as indicated by the arrow 20.

Accordingly, the weight of the contents of the receptacle is transferred to the attachment points 6a and 7a and the downwards movement is resisted by the straps 6 and 7 as indicated by the arrow 23. The remainder of the weight of the receptacle is exerted on the rear of the receptacle as indicated by the arrow 21 and this will tend to pivot the frame 1 about the centre of gravity as shown by the curved arrow 24 (see Fig 2) and therefore the front of the frame 1 will tend to pivot upwardly in the direction of the curved arrow 24. This pivotal movement will be resisted as shown by the arrow 25 resulting from the attachment of the straps 6 and 7 by their anchorage points 6b and 7b so the weight of the produce within the receptacle will have a minimum influence in tilting the frame 1 from the optimum position.
It is necessary that the anchor point 10 be approximately on the balance line X as indicated, however it is to be understood the actual location of the anchor points can vary dependant upon the size of the receptacle and the load to be carried. The balance line however must always lie on a notional line through the attachment points 6a,7a, or at least between the attachment points 6a,7a and the attachment points 6b,7b.

A receptacle when constructed in accordance with the foregoing description will have the particular advantage that when worn, the support from the anchorage of the straps nearest the centre of the frame 1 together with the support on or near the balance line X of the strap 9 will result in maintaining the orientation of the frame 1 into a natural working position. In addition, because the majority of the weight of the receptacle is on or about the balance line X, the centre of balance of the receptacle is brought closer to the body of the wearer and thus result in enhanced comfort levels with consequent less back strain and fatigue whilst at the same time allowing for optimum holding capacity.

It will be appreciated that changes may be made to the above described embodiment of the invention without departing from the principles herein. In this regard, the present invention may be adapted for use with different types of receptacles and may be directed for use in different types of harvesting.

It will be understood that the invention is not limited to the particular embodiments described or illustrated, but is intended to cover all alterations or modifications which are within the spirit and scope of the appended claims.
CLAIMS

1. A receptacle comprising:
   a container having an open mouth;

   a frame which has a portion that, in use, will face the body of the wearer, the
   frame being adapted to support the open mouth of the container;

   a harness comprising at least two straps with each end of the straps being
   individually attached to the body facing portion of the frame,

   a brace having one end attached to the container at a position distal from the
   open mouth of the container;

   securing means on the frame to enable the other end of the brace to be
   secured to the frame;

characterised in that the securing means is located on the frame at or about a point
of balance of the receptacle, and one end of each of the straps is attached to the
frame at or on one side of the point of balance, while the other end of each the
straps is attached to the frame at or on the opposite side of the point of balance.

2. A receptacle according to claim 1 wherein one end of each of the straps is attached
to the frame at or about the point of balance.

3. A receptacle according to claim 1 or 2 wherein the frame is of substantially crescent
shape having a convex front portion and a concave rear portion, with the concave
rear portion being adapted in use to bear against the wearer's body.

4. A receptacle according to any one of the preceding claims wherein the harness is
comprised of two straps, the ends of which are attached to the frame.
5. A receptacle according to claim 4 wherein the straps forming the harness are attached to the frame in a manner such that the point of attachment of the straps that depend from the front of the body of the wearer, when in use, are innermost from the point of attachment of the straps that pass around the rear of the shoulders of the wearer.

6. A receptacle according to any one of the preceding claims wherein the container has an opening at the end distal from the mouth with opening being closed when the other end of the brace is attached to the frame.

7. A receptacle according to claim 6 wherein the container is a flexible bag.

8. A receptacle according to claim 7 wherein the brace comprises a bracing strap.

9. A receptacle according to claim 8 wherein the bag has an opening at its bottom end to which the bracing strap is attached, such that the bracing strap will hold the bottom end of the bag closed until the contents of the bag are to be discharged.

10. A receptacle substantially as herein described or exemplified with reference to the accompanying drawings.
**INTERNATIONAL SEARCH REPORT**

**A. CLASSIFICATION OF SUBJECT MATTER**

Int Cl*: A01D 46/22

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC A01D 46/22, A01G 19/06

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

AU:IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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Date of the actual completion of the international search

19 February 1996

Date of mailing of the international search report

11th March 1996

Name and mailing address of the ISA/AU

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