

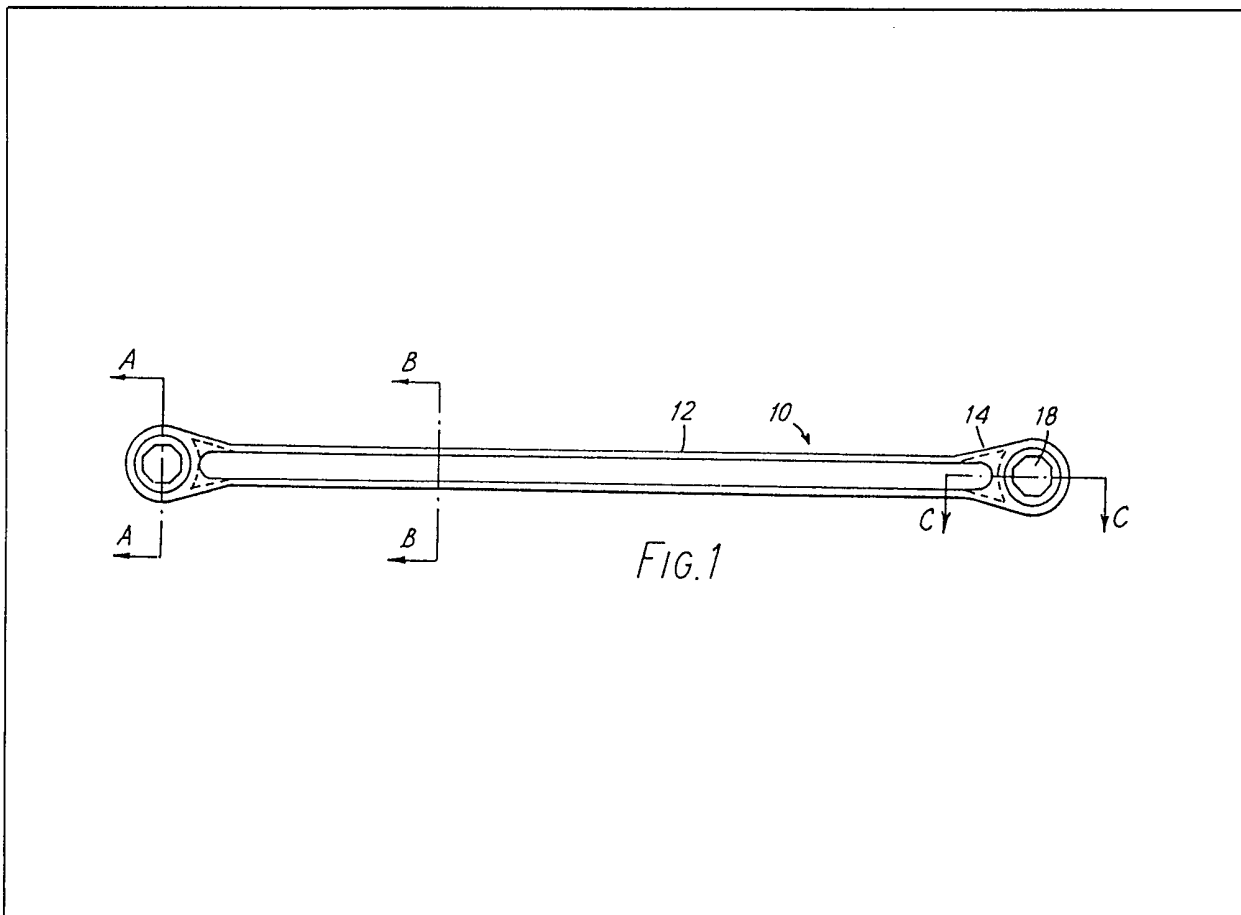
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(54) **Handle assemblies**

(57) A handle assembly for a plas-
tics paint-drum has a pair of fixing
elements (30, Fig. 5) which are
rigidly fixed to the drum, and a

handle element 10 which is located
pivotally on the fixing elements (30)
but is lockable in at least one posi-
tion, such as in a carrying position
and in a position with the handle
element clear of the mouth of the
drum. The fixing elements (30) pre-
ferably have non-circular spigots
(36) over which complementary
socket portions 14 of the handle
element 10 fit, the material (e.g.
polypropylene) of the elements be-
ing sufficiently resilient to allow
pivoting. The fixing elements (30)
may have ribs (42) to facilitate ul-
trasonic welding to the drum.



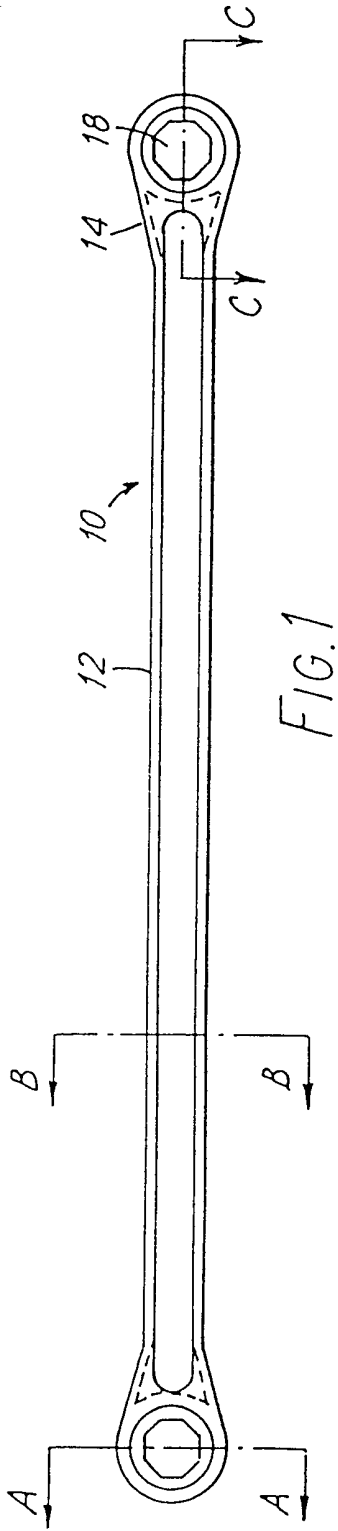


FIG. 1

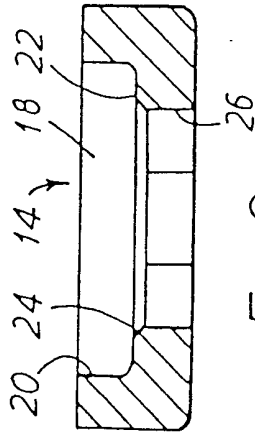


FIG. 2

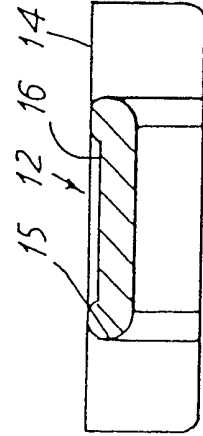


FIG. 3

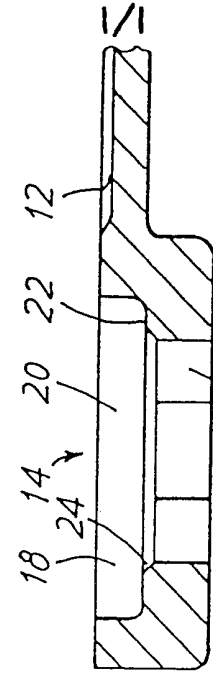


FIG. 4

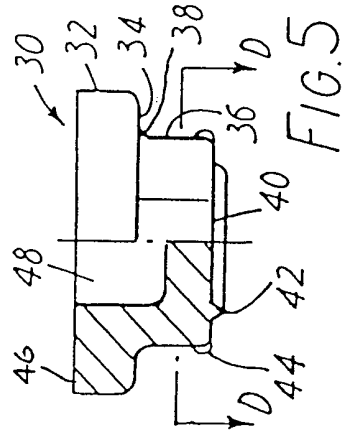


FIG. 5

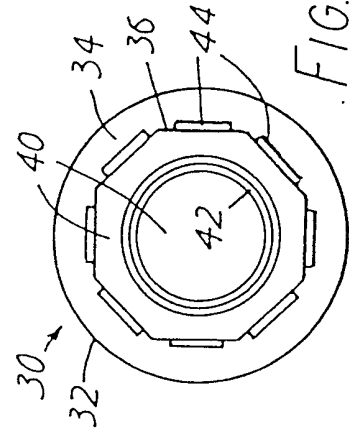


FIG. 6

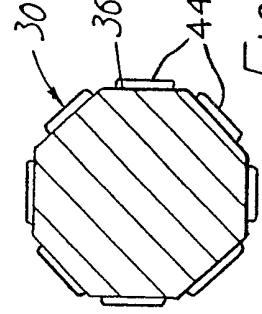


FIG. 7

SPECIFICATION

Handle assembly

5 The present invention relates to a handle assembly, and particularly to a handle assembly suitable for a container of, for example, paint.

10 Paint containers, such as tins and drums, are often provided with handles in the form of wire loops. These may be secured to lugs provided on the sides of the container, or by means of a loop of wire encircling the container. With such conventional handle assemblies, there is a risk that the handle will spring up during filling of the container, causing the paint (or other liquid) being filled into the container to be splashed around.

20 According to the present invention, there is provided a handle assembly comprising an elongate handle portion and a pair of fixing elements for securing to an article, each fixing element and each end region of said handle portion having a respective engagement means such that each end region of the handle element can be connected to a fixing element so as to be pivotable thereto and lockable in at least one relative configuration.

30 The engagement means may comprise respective formations, one of which provides a non-circular socket and the other a non-circular projection insertable therein so as to be restrained against rotation, but there being sufficient resilience to permit relative rotation of the formations when sufficient force is applied. For example, the socket and projection may have similar cross sections which are polygonal, or part-circles with one or more flat sides. Suitably, the entire assembly is made of a plastics material, e.g. polypropylene.

In another aspect, the invention provides an article including a handle assembly.

45 In a still further aspect the invention provides a method of attaching a handle to an article.

A preferred embodiment of the present invention will now be described with reference to the accompanying drawings, in which:

50 *Figure 1* is a plan view of a handle;

Figures 2-4 are sectional views of *Fig. 1*, as a larger scale, taken along A-A, B-B and C-C respectively;

55 *Figure 5* is an elevational view of a handle fixing lug, half sectioned in a radial plane;

Figure 6 is a plan view of the lug (seen from below relative to *Fig. 5*); and

Figure 7 is a section on the line D-D in *Fig. 5*.

60 The embodiment of the present invention which is shown in the drawings consists of a handle element and two fixing lugs. The handle element 10 consists of an elongate flexible strap portion 12 having, at each end, a socket portion 14. The handle element 10

may be a unitary moulding, e.g. of polypropylene. As may be seen from *Fig. 3*, the strap portion 12 has thickened lateral portions 15 connected by a web portion 16, the whole having a U-section.

70 The two socket portions 14 are identical. As may be seen from *Figs. 2* and *4*, each portion 14 is formed so as to be somewhat thicker than the strap portion 12. Each socket portion 14 is penetrated by a stepped orifice 18. At the side of the socket portion 14 which faces outwardly in use (the upper side in *Figs. 2* to *4*), the orifice has a cylindrical portion 20 of a maximum diameter. This narrows via a radial step surface 22 and a bevel 24 to an inner polygonal portion 26. This portion, which in the illustrated embodiment is of octagonal section, extends to the inner face of the socket portion 14.

85 The two fixing lugs 30 are identical, and one is shown in *Figs. 5* to *7*. Each lug 30 has a radially outer surface which is broadly complementary to the stepped orifices 18 of the socket portions 14. Thus, there is a cylindrical portion 32 of the maximum diameter, an inward radial step surface 34, and a polygonal (here octagonal) portion 36 which is connected to the step surface 34 via a radiused portion 38.

95 The inner axial end face 40 of the lug is generally planar, but with an upstanding annular rib 42 whose cross-section approximates to an equilateral triangle.

100 The faces of the polygonal portion 36 have small projecting nibs 44. As seen from *Figs. 5* and *6*, the nibs are located near the inner axial end face 40. They are elongate, extending in a radial plane of the lug 30.

105 The outer axial end face 46 of the lug is generally planar, penetrated by a central blind orifice 48 which extends axially some way beyond the radiused portion 38.

110 The preferred method of securing the handle assembly to a container made of a plastics material is by ultrasonic welding. A lug 30 is inserted into each socket portion 14 of a handle element 10. The handle element is then bent into a U-shape, positioned to embrace the container, with the ribs 42 on the end faces 40 of the lugs 30 contacting the side wall of the container through the orifices 18 in the handle element 10. Ultrasonic welding horns are placed against the outer axial end faces 46 of the lugs. (Alternatively they may be inserted into the blind orifices 48). The welding horns are activated for about 1 second, and the annular ribs 42 serve as energy directors to initiate the welding action and lead to satisfactory connections. The horns can then be removed.

125 The handle element 10 is now secured to the container, and is pivotable about the fixing lugs. The pivoting requires a certain force, and tends to occur in discrete steps determined by the polygonal form of the portions

26 and 36. Thus, with the illustrated octagonal portions, the handle can be indexed in 45° steps. The handle will remain in any such step position, with no tendency to move of its own accord.

In an alternative embodiment, the polygonal socket and lug portions are replaced by portions whose cross-section are circles having four symmetrically disposed flat sides (i.e. each section is a square having the corners rounded as arcs of a circle). Thus the handle has step positions corresponding to 'filling' and 'carrying' configurations. As a further alternative, the cross-sections could be circles with single flat sides, so that the handle locks only in a filling configuration.

In order to allow pivoting of the handle, with a reasonable level of force being required to effect pivoting, it has been found suitable to make the lugs and the handle element of moulded polypropylene, with the radial dimensions of the lugs 30 being somewhat smaller than those of the corresponding parts of the socket portions 14.

The axial extent of the polygonal (or other non-circular) portion 36 of the lugs 30 is somewhat greater than that of the corresponding portion 26 of the handle element 10, and the nibs 44 serve to snap into the socket portions 14 thereon so that they will locate and hold the handle element and fixing lug together prior to and during the securing of the handle assembly to the wall of the container.

If desired the container wall may be decorated, e.g. by an in-mould labelling technique. In this case the label may have a pair of cut-outs near its top edge to allow the fixing lugs 30 to be sealed directly to the side wall of the container. The use of such cut-outs may be desirable particularly if the label is of laminated construction, e.g. comprising paper and plastics. If the label is made of a plastics material compatible with that of which the container is made, the cut-outs may be dispensed with and the handle may then be secured to the label.

CLAIMS

1. A handle assembly comprising an elongate handle portion and a pair of fixing elements for securing to an article, each fixing element and each end region of said handle portion having a respective engagement means such that each end region of the handle element can be connected to a fixing element so as to be pivotable relative thereto and lockable in at least one relative configuration.

2. A handle assembly according to claim 1 wherein engagement means comprise respective formations, one of which provides a non-circular socket and the other a non-circular projection insertable therein so as to be restrained against rotation, but there being

sufficient resilience to permit relative rotation of the formations when sufficient force is applied.

3. A handle assembly according to claim 2 wherein the socket and projection have similar cross sections which are polygonal, or part-circles with one or more flat sides.

4. A handle assembly according to claim 2 or 3 wherein the non-circular projection has one or more radially extending nibs at its inner end region, such that a said socket can be pushed over them, whereafter they restrain its removal.

5. A handle assembly according to any preceding claim wherein said handle portion is a unitary plastics moulding.

6. A handle assembly according to any preceding claim in which each fixing element has rib means on the side intended for attachment to an article, said rib means facilitating attachment by ultrasonic welding by serving as energy directors.

7. A handle assembly substantially as herein described with reference to and as illustrated in the accompanying drawings.

8. A method of providing an article with a handle assembly according to any preceding claim including the step of adhering a pair of said fixing elements to it.

9. A method according to claim 8 wherein the fixing elements are ultrasonically welded to plastics portions of the article.

10. A method of providing an article with a handle assembly substantially as herein described with reference to and as illustrated in the accompanying drawings.

11. An article furnished with a handle assembly according to any of claims 1 to 7.