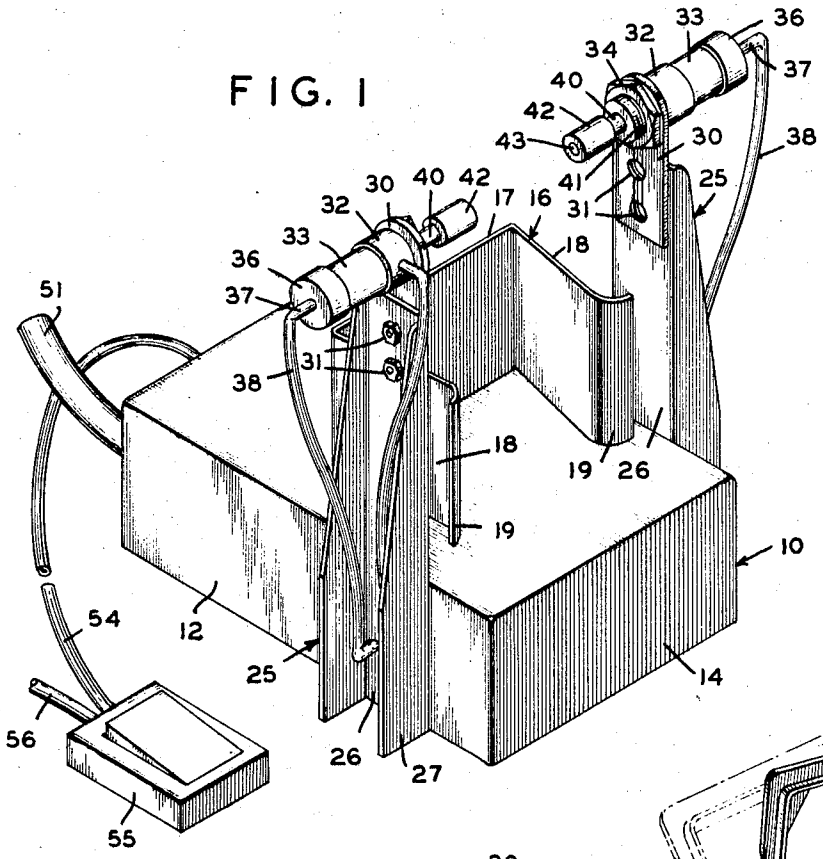
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HANDLE APPLICATOR

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FIG. 1



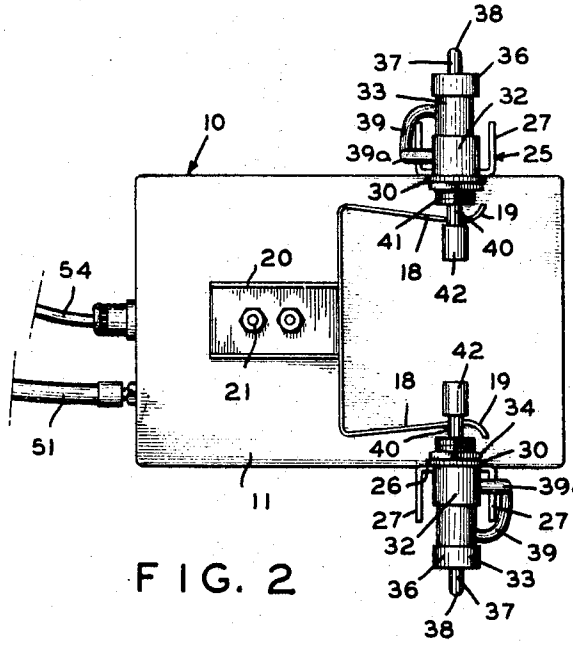


FIG. 2

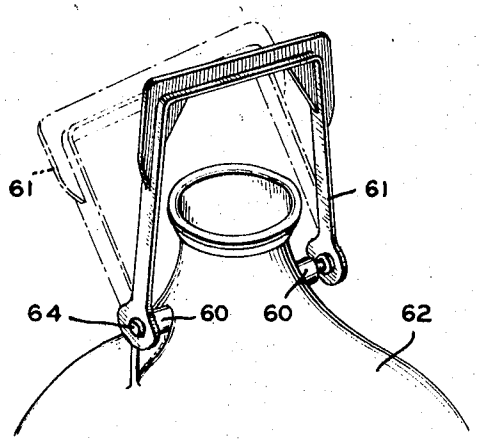


FIG. 6

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HANDLE APPLICATOR

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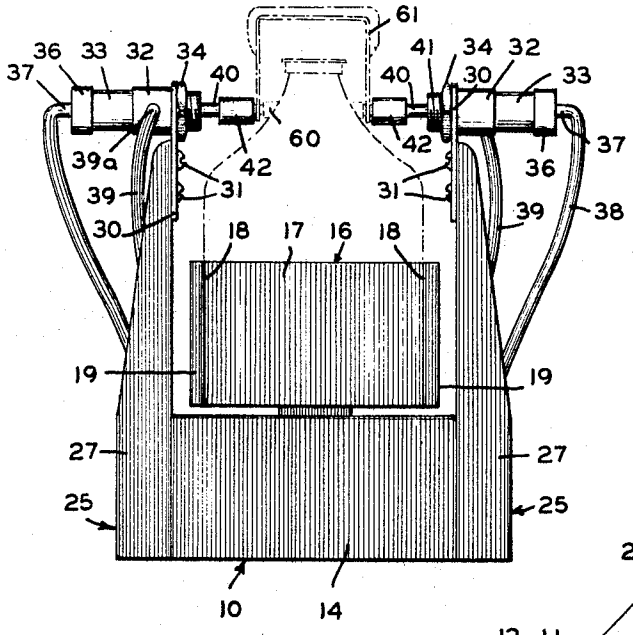


FIG. 3

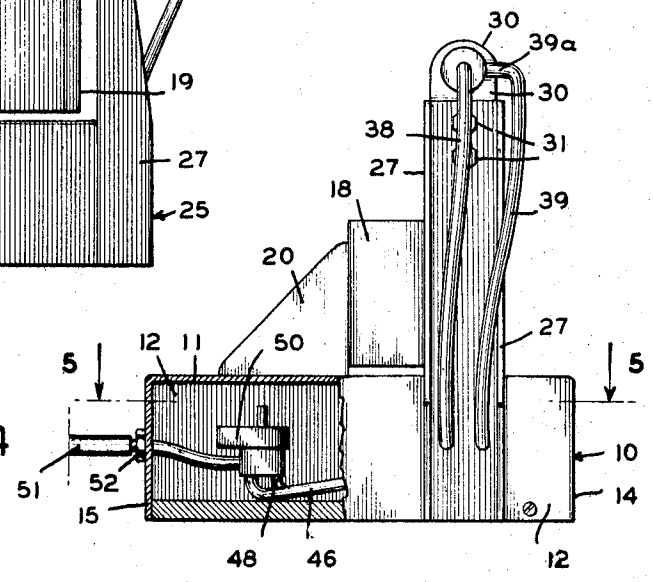


FIG. 4

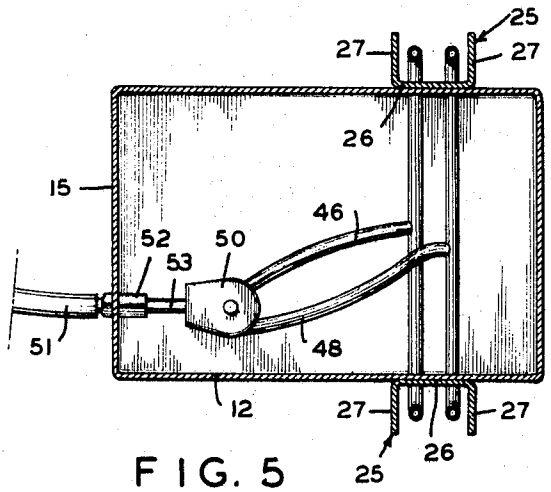


FIG. 5

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FIG. 7

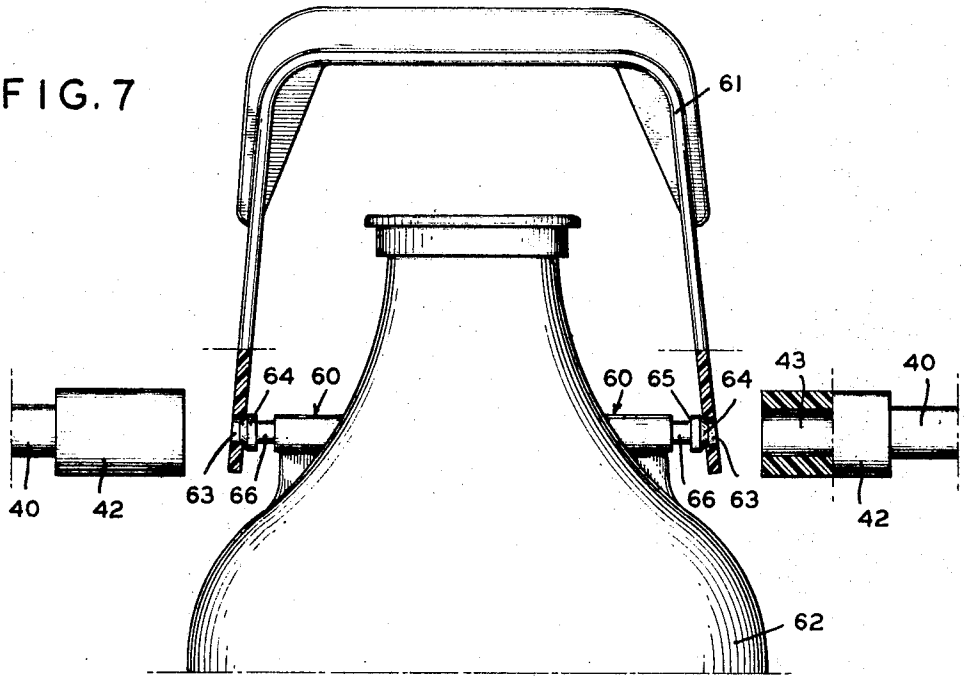


FIG. 8

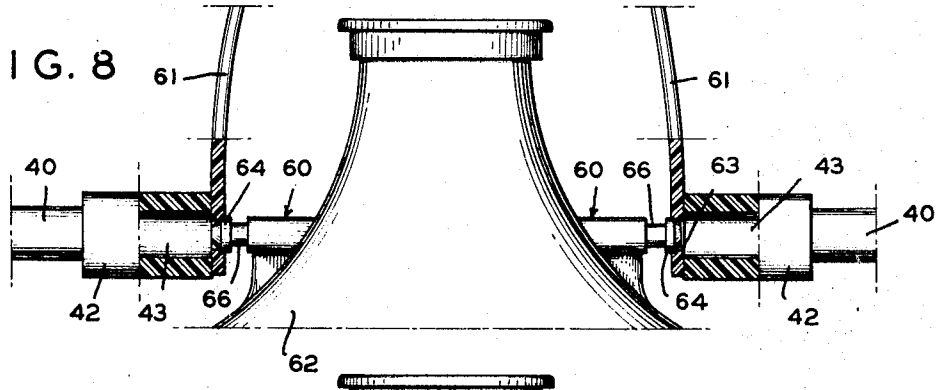
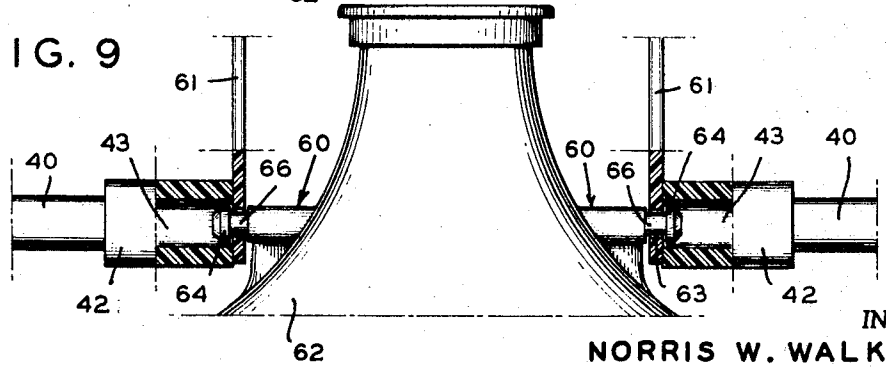


FIG. 9



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3,524,241

HANDLE APPLICATOR

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Int. Cl. B23p 19/04, 11/00, 11/02
U.S. Cl. 29—208 7 Claims

ABSTRACT OF THE DISCLOSURE

Apparatus for attaching a substantially U-shaped bail-type plastic handle provided with apertured depending extremeties to a container provided with complementary opposed retaining means for engaging said apertured extremities to provide an unseparable pivotal association therewith, said apparatus including means for positioning said container and handle in aligned relationship for interengagement, and fluid actuated means adjacent each depending apertured extremity of said handle operable to forcibly engage each of said depending handle extremities with the adjacent complementary retaining means.

This invention relates to a handle attaching apparatus and more particularly to a holder and force applying mechanism whereby a container such as a plastic bottle may be positioned and a pivotal bail-type handle may be attached to said bottle.

It is an object of the present invention to provide a relatively simple, compact apparatus for positioning a container and applying a handle thereto.

A further object of the invention is the provision of apparatus of the class set forth whereby an operator may readily and in a minimum of time apply adequate and properly located force to attach the extremities of an arched thermoplastic handle to a thermoplastic container, and without the necessity of softening the plastic by heat or other means.

Other objects and advantages of the invention will be apparent from the following description in conjunction with the accompanying drawings wherein:

FIG. 1 is a perspective of apparatus in accordance with the present invention;

FIG. 2 is a top plan view thereof;

FIG. 3 is an elevational view thereof;

FIG. 4 is a side elevational view thereof with parts broken away for purposes of clarity;

FIG. 5 is a horizontal sectional view taken on the line 5—5 of FIG. 4;

FIG. 6 is a fragmentary perspective view on an enlarged scale illustrating a handle attached to a container; and

FIGS. 7, 8 and 9 are enlarged detailed views illustrating the progressive steps of attaching a handle to a container in accordance with the present invention.

Briefly stated, the present invention includes a supporting base housing portions of the apparatus and including retaining means for holding a receptacle in predetermined position, a fluid operated ram mounted at each side of the base and projecting in alignment with engaging means on said receptacle in position to engage the end portions of a bail-type handle, a valve within the supporting base and operatively connected to the rams, and a remote control for said valve, whereby an operator can use both hands to position a container and a handle for application of the latter to the container and can operate the remote control by a foot pedal or the like.

With further reference to the drawings, the apparatus of the present invention includes a base or housing **10**

providing a supporting surface **11**, and including side walls **12**, and end walls **14** and **15**. The base preferably is produced from sheet metal providing a rigid structure.

Mounted on the supporting surface **11** of the base is a substantially U-shaped clamping member **16** having a flat central web portion **17** and side members **18** which may be inwardly inclined and have outwardly curved leading edges **19** to facilitate the reception of an object or container between the side members **18**. The web **17** is attached to the supporting surface **11** by any desired means such as by the bracket **20**, bolts or other fastening means **21** being provided to insure a fixed association.

At each side of the base **10** a vertical bracket **25** is mounted having its lower end even with the lower edge of the side wall **12** and extending substantially above the base. Each bracket **25** includes a web **26** and side members **27** which decrease in width from about the level of the floor of the base to the upper end of the bracket. The brackets are secured to the sidewalls **12** by welding or other suitable fastening means.

At the top of each of the bracket **25** a plate-like extension **30** is mounted on the web **26** by suitable fastening means **31**. Preferably the plates or bracket **30** are vertically adjustable and each of the plates has an aperture located above the bracket **25** which receives the barrel **32** of an air cylinder or ram **33** which is provided with a threaded extremity for engagement with a nut **34** whereby the air cylinder is retained securely within its associated aperture.

Each of the rams has an end cap **36** which receives an end **37** of a fluid line **38**. A second fluid line **39** has an end **39*a*** connected to the air cylinder **33** on the remote side of a reciprocabel piston housed therein as is well known in this art. Extending inwardly of the plate **30** is a shaft **40** attached to the piston member within the cylinder, the shaft extending through a bushing **41**. Mounted on the extremity of the shaft **40** is a substantially cylindrical tip **42** provided with a bore **43** for a purpose to be described hereafter. The ram **33** is of a conventional double acting fluid operated type that is well known in the art.

The fluid lines **38**, **39** extend through the web **26** and side walls **12** into the supporting base **10** and through lead lines **46** and **48** are connected to a solenoid actuated distributing valve **50**. The distributing valve is supplied with air under pressure from a suitable source (not shown) by means of a hose **51**, connection **52**, and line **53** and is electrically operated by cable **54** connected through switch **55** to supply line **56**.

While various items of equipment may be used in accordance with well known practices, an air cylinder Model No. 30901–0010 by Schrader, a 4-way midget solenoid valve catalog No. LB8345B1 by Asco, and a foot switch, Model No. 419–S by Linemaster have been found to perform satisfactorily.

The supply air is preferably on the order of 60 to 80 p.s.i. and the solenoid valve operates on the conventional 110 volt, 60 Hertz, single phase electrical power.

The tips **42** are preferably of austenitic stainless steel, although other materials may be used.

The apparatus is especially designed for engaging the end portions of a bail-type handle **61** with pins or the like **60** of a container such as a bottle **62**. The handle and the bottle ordinarily are produced from thermoplastic materials such as polyethylene, polypropylene, or other suitable olefins. The plastic is of a nature that has some flexibility but resists stretching and returns to its orignial shape after a distorting force below its elastic limit is removed. In view of the load carrying capacity of the bottle, a strong handle is required, the assembly of the type under consideration requiring mechanical means or assistance due to the force required to effect attachment.

As shown in FIGS. 6 through 9, the handle **61** has apertures **63** adjacent its end portions. The bottle has pins **60** extending from the opposite sides and suitably positioned and mounted, preferably near the shoulder of the bottle. Each pin has an enlarged head **64** which tapers outwardly to reduced diameter and a portion **65** contiguous to the neck **66** which projects sharply outwardly from the latter. The aperture **63** is slightly larger than the neck **66** and smaller than the main portion of the enlarged head **64**. The handle must be forcibly pressed and expanded over the latter in order to engage the neck as indicated in FIGS. 7 through 9, the plastic returning to its original dimension after such expansion. The tips **42** of the rams have a bore **43** of sufficient size so that the rim or body of the tip engages the end portion of the handle around the aperture and permits reception of the enlarged head of the pin when the handle is pressed onto the latter. In such operation the tapered portion of the head is forced into the aperture in the handle, expanding the same until it snaps onto the neck portion of the pin.

In operation the operator positions a bottle as indicated in FIG. 3 within the clamp **16**. The height of the rams is adjusted, if necessary, by adjustment of plates **30** and the position of the bracket **20**, until the center line of the rams is in alignment with the center line of the pins. Then with the pins of the bottle aligned with the rams, the handle is placed over the pins on the bottle, the operator having both hands free for this purpose. The operator then presses the switch **55** to operate the rams in order to force the end portion of the handle over the pins. In order to facilitate the latter, the handle may be moved so as to pivot on the pins while ram pressure is applied. The operation is carried out with the plastic at ambient temperature, below softening temperature and without any softening agent.

While the operation as described is performed with the operator positioning the bottles and the handles manually, apparatus for automatically conveying bottles to the handle applying station, for positioning the handles, and for removing the bottles after completion of the operation may be provided.

It will be obvious to those skilled in this art that various changes may be made in the invention without departing from the spirit and scope thereof. Therefore, the invention is not considered limited by that which is shown in the drawings and described in the specification and reference is had to the claims for summaries of the essentials of the invention and of the novel features of construction and novel combinations of parts for all of which protection is desired.

What is claimed is:

1. Apparatus for attaching the extremities of a plastic handle to a container for pivotal engagement therewith, the handle being provided with an aperture adjacent each extremity thereof and the container having opposed mounting means for engagement with the apertures in said handle, each of said engaging means including an enlarged head and a reduced neck portion, the outer surface of each enlarged head being tapered to a slightly reduced diameter and the portion of said enlarged head which is contiguous to the reduced neck portion projecting sharply outwardly therefrom to provide an abutment against removal of a handle extremity after attachment, the apertures in said handle being of a diameter in excess of that of the reduced neck portions and less than that of the enlarged heads, the inherent resiliency of said plastic handle permitting pressing the extremities thereof over said enlarged heads and onto said neck portions, said apparatus comprising retaining means for positioning a container in handle applying position, and pressure applying means carried by said retaining means for engaging the handle extremities in surrounding relationship with respect to the apertures therein and forcing each enlarged head portion of said opposed mounting means through the associated handle aperture.

2. Apparatus as set forth in claim **1** where the container holding means includes a base portion and the pressure applying means include hydraulic cylinders supported adjustably upon brackets mounted upon said base portion.

3. Apparatus as set forth in claim **1** where the container holding means includes a base portion and retaining means for the container is mounted upon said base portion.

4. Apparatus as set forth in claim **1** where the pressure applying members are hydraulic cylinders, and remotely operated switch means is provided for supplying fluid under pressure to said hydraulic cylinders.

5. Apparatus as set forth in claim **4** where the hydraulic cylinders are double acting.

6. Apparatus as set forth in claim **1** where the pressure applying means comprises hydraulic cylinders mounted on opposite sides of the container retaining means, said hydraulic cylinders being disposed in axial alignment and extending toward each other at an elevation above said container retaining means.

7. Apparatus as set forth in claim **2** where each pressure applying means includes a handle engaging tip provided with a centrally located bore for the reception of the enlarged head of the handle engaging means after handle attachment has been completed.

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U.S. Cl. X.R.

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