FLUID COUPLING DEVICE

Inventor: Alfred Fluster, 1560 S. McPherrin, Monterey Park, Calif. 91754

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Field of Search 141/5, 25, 106, 285, 310, 141/311, 312, 319, 363-367, 375, 382-389, 391; 211/74; 248/346

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ABSTRACT

A coupling device for transferring viscous fluid, such as catsup, from one bottle to another bottle. A lower coupling section of the device is secured to the mouth of an upright bottle. The other bottle is positioned inverted in an upper, flared section of the device with its mouth adjacent the mouth of the upright bottle, separated by a flange. An air passageway is formed in the upper coupling section and extends through the flange into the lower coupling section enabling air in the upright bottle to be displaced by fluid transferred from the inverted bottle. The flared section defines a funnel which extends from a shoulder formed in the upper coupling section and which enables bottles of various different sizes to be positioned therein.

4 Claims, 4 Drawing Figures
FLUID COUPLING DEVICE
FIELD OF THE INVENTION
The field of art to which the invention pertains includes the field of fluid coupling devices, particularly with respect to a coupling device for enabling fluid in a partially filled container to be transferred to another partially filled container.

BACKGROUND AND SUMMARY OF THE INVENTION
The use of condiments, such as catsup, in restaurants results in numerous partially filled condiment bottles. It has been found economically feasible to combine the contents of partially filled bottles so that little waste occurs. To provide a rapid as well as sanitary transfer of the condiments from one bottle to the other, coupling devices have been designed which enable the contents of one bottle to be transferred to a second bottle without spillage, for example, the device in U.S. Pat. No. 3,620,267. There the patentee attempts to enable displaced air to escape by forming an annular expansion chamber in the coupling device. The expansion chamber is designed to encourage air bubbles to form and quickly penetrate through the fluid front advancing from the bottle being emptied. However, it has been found that such an expansion chamber does not readily provide the desired pressure relief. After periodic use of the coupling device, the condiments tend to harden in the expansion chamber necessitating its continual replacement. Further, the fluid transfer between bottles is relatively slow, due to the inadequate displacement of the air from the bottle being filled and the coupling device must be made of different sizes for each transferring bottle.

In order to overcome the attendant disadvantages of prior art fluid transfer coupling devices, the present invention provides a passageway which enables displaced air in the bottle being filled to be rapidly released so that the fluid is quickly displaced from a transferring bottle to the bottle being filled. The present invention accommodates transferring bottles of various sizes and configurations. Support means is provided for preventing movement of the transferring bottle during the procedure. The bottle being filled is secured to the coupling device preventing leakage of the fluid.

Particularly, the fluid coupling device comprises an upper coupling section into which the top portion of a bottle can be inverted. The mouth of the receiving, upright bottle is secured into a lower coupling section of the coupling device. The mouths of each of the bottles are thus juxtaposed, separated by a flange defined by the coupling section. An air passage way is formed in the upper coupling section and extends through the flange to be adjoining part of the coupling device. Air in the lower bottle is readily displaced by fluid in the inverted bottle. A funnel is integrally formed with the upper coupling section and flares outwardly at its opening enabling bottles of various sizes and configurations to be supported by the upper coupling section.

The advantages of this invention, both to its construction and mode of operation will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings, in which like referenced numerals designate like parts throughout the figures.

BRIEF DESCRIPTION OF THE DRAWINGS
FIG. 1 is a partial perspective view of the fluid coupling device shown interconnecting a pair of bottles;
FIG. 2 is a cross-sectional view of the fluid coupling device of FIG. 1 taken along the line 2—2 thereof;
FIG. 3 is a cross-sectional view of the fluid coupling device taken along the line 3—3 of FIG. 2; and
FIG. 4 is a bottom view of the fluid coupling device taken along the line 4—4 of FIG. 2.

DETAILED DESCRIPTION
Referring now to FIG. 1 there is shown a fluid coupling device 12 constructed in accordance with principles of the invention. The fluid coupling device is utilized to transfer fluid from an inverted bottle 14 to an upright bottle 16. Normally the bottles 14 and 16 are both partially filled with similar types of fluid and it is desirable to fill one of the bottles. While the invention is illustrated and described as transferring fluid between bottles, it should be understood that metal, cardboard or plastic containers could be utilized with the invention as well. In addition, while the invention is described as transferring a condiment fluid, such as catsup from a first bottle to a second bottle, other fluids or condiments could be transferred as well.

Referring now to FIG. 2, there is shown a cross-sectional view of the fluid coupling device 12 with the inverted bottle 14 and upright bottle 16 illustrated in dotted lines. The coupling device 12 is formed of a generally cylindrical member 20 which is divided into an upper coupling section 22 and a lower coupling section 24. An inwardly extending flange 28, whose interior periphery 32 defines an opening, separates the interior surface of the upper and lower coupling sections 22 and 24. The flange 28 is formed in a plane perpendicular to the axis of the cylindrical member 20. The bottom surface 34 of the flange 28 defines one end of the lower coupling section and the top surface 36 of the flange 28 defines one end of the upper coupling section 22.

The interior wall 38 of the upper coupling section 22 contains a plurality of longitudinally extending grooves 42 which form air passageways as will be explained hereinafter. As can be seen in cross-sectional view in FIG. 3, three grooves 42 are illustrated, each spaced 120° apart. The invention can be designed with more or less than three grooves as well. The grooves 42 extend from an upwardly facing interior shoulder 44 formed at the top surface of the upper coupling section 22 to the flange 28 and terminate at the bottom surface 34.

A funnel 46 forms an upward extension of the upper coupling section 22 and is joined thereto at the interior shoulder 44. The funnel 46 has an outer diameter equal to the cylindrical member 20, and an inner diameter equal slightly greater than the interior wall 38 at the junction with the upper coupling section. The funnel then flares outwardly to a port 52 into which containers such as the inverted bottle 14 are inserted.

The lower coupling section 24 contains an interior wall surface 62 which extends from the flange bottom surface 34 to a generally circular opening 64. A plurality of inwardly extending lugs 66, which can be seen in FIG. 4, extend inwardly into the opening 64. The lugs 66 are spaced 120° apart.
The lugs 66 enable the upright bottle 16 to be inserted with its opening positioned into the lower coupling section 24. A tight fit is formed between the bottle and the coupling section as the lugs 66 lock onto the bottle serrations and the mouth of the upright bottle 16 is secured to the bottom surface 34 of the flange 28. Typically, catsup bottles and the like of different sizes and configurations have identically sized mouths; therefore, the coupling section 24 will fit the usual commercial bottle regardless of size. Occasionally there is an exception in which event the coupling section can be designed for each different size bottle mouth.

The mouth 74 of the inverted bottle 14, from which the fluid is transferred defines an aperture 72. As illustrated in FIG. 2 the mouth 74 is positioned adjacent the top flange surface 36. An enlarged serration 76 on the bottle rests adjacent the interior shoulder 44 and prevents the inverted bottle 14 from wobbling when positioned in the funnel 46. The funnel 46 of the coupling device enables bottles of different sizes to be inserted into the port 52. It is only necessary that the serration 76 of the inverted bottle 14 rest against the interior shoulder 44.

The bottle aperture 72 should have an opening less than the opening of the flange 28 so that when fluid is transferred from the inverted bottle 14, no hanging up of the fluid occurs adjacent the top surface 36 of the flange 28. The fluid is transferred from the inverted bottle 14 to the upright bottle 16 through the opening in the flange 28. Air which is displaced in the bottle 16 can move through grooves 42 enabling a constant relatively rapid flow of fluid from the inverted bottle 14. When the upright bottle 16 is full, the inverted bottle removed from the coupling section and the full bottle 16 is then twisted so that it is free of the lugs 66 and ready for use.

I claim:
1. A coupling device for transferring viscous fluid from the mouth opening of a first bottle to the mouth opening of a second bottle, comprising:
an upper coupling section into which the mouth of a first bottle is insertable and a lower coupling section into which the mouth of a second bottle is insertable;
an annular flange between said coupling sections whereby said mouths are disposable adjacent to each other on opposite sides of said flange, said flange having a periphery which defines an opening for said transfer of fluid;
an annular shoulder in said upper coupling section for positioning said first bottle, spaced upwardly from said flange;
a funnel flared outwardly above said shoulder wherein bottles of different sizes can be positioned in said upper coupling section; and
a continuous air passageway formed in said upper coupling section shoulder and said flange for enabling air in said second bottle to be displaced by fluid in said first bottle.
2. A coupling device in accordance with claim 1 wherein the periphery of said flange defines an opening greater than the mouth opening of said first and second bottles.
3. A coupling device in accordance with claim 1 wherein said lower coupling section forms a tight fit with said second bottle mouth.
4. A coupling device in accordance with claim 3 wherein said lower coupling section includes lugs for securing said second bottle mouth to said lower coupling section.

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