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 [21] Appl. No. **805,319**
 [22] Filed **Mar. 7, 1969**
 [45] Patented **Nov. 16, 1971**

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[54] **BOTTLE TRANSFER COUPLING DEVICE**
4 Claims, 6 Drawing Figs.

[52] U.S. Cl..... **141/364,**
 141/310, 141/319, 141/383
 [51] Int. Cl..... **B65b 1/06,**
 B65b 3/06, B67c 3/00
 [50] Field of Search..... 141/310,
 319, 364, 382-389; 285/35, 383

ABSTRACT: A device for transferring viscous fluids, such as catsup, from one bottle to another wherein an expansion chamber is provided between the pouring spouts of the bottles to enhance the downward flow of catsup by relieving the central portions thereof to permit air displaced from the lower bottle to bubble up through the flowing catsup into the upper bottle.

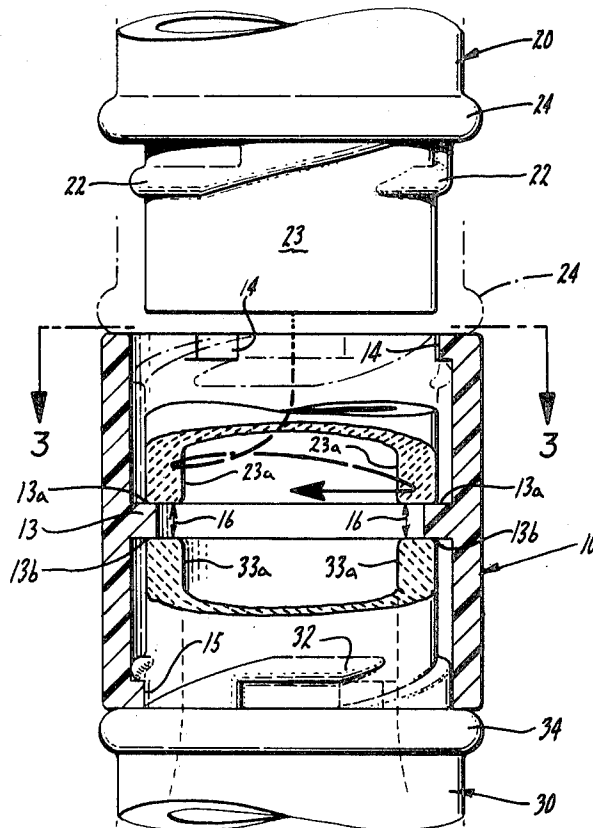


Fig. 1

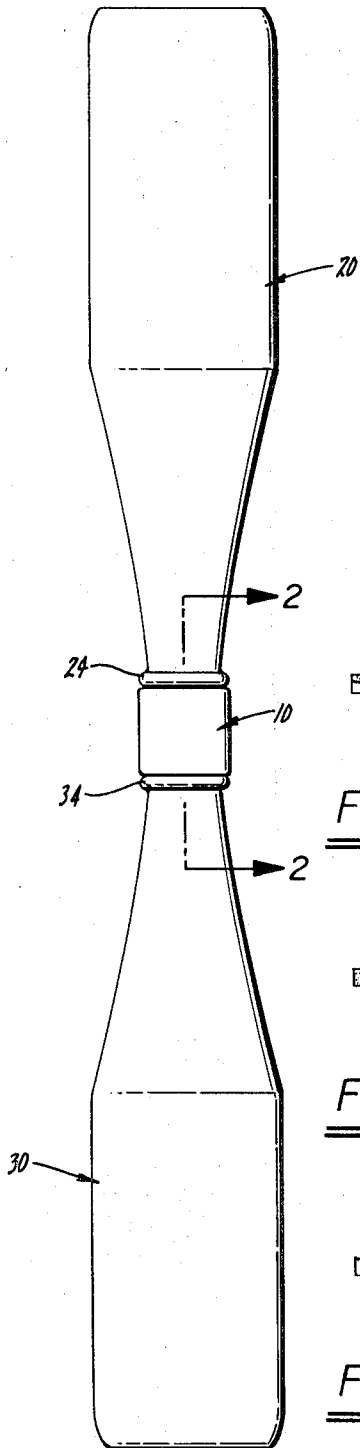
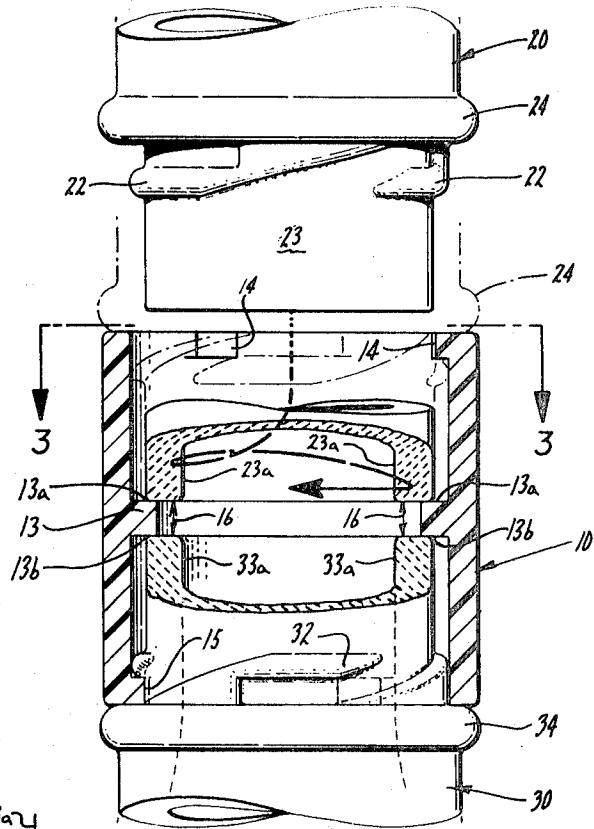


Fig. 2

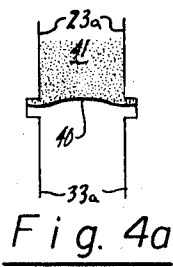


Fig. 4a

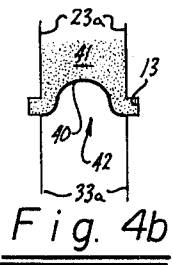


Fig. 4b

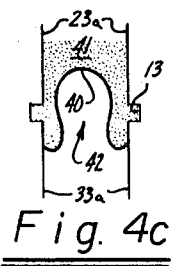


Fig. 4c

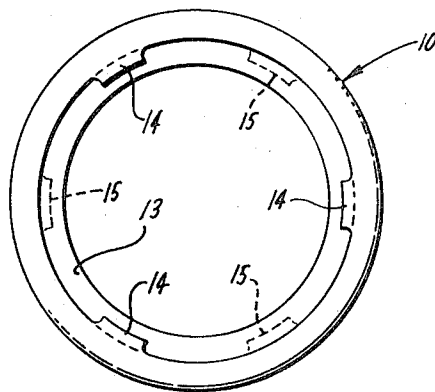


Fig. 3

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BOTTLE TRANSFER COUPLING DEVICE

BACKGROUND OF THE INVENTION

This invention pertains to a device for speeding the transfer of the contents of one bottle into another bottle and is particularly useful in transferring catsup from one bottle to another.

For example, restaurant managers do not like to serve condiments, such as catsup, in bottles that are less than substantially full. Thus, they must either throw away the partially emptied bottles or transfer their contents to other bottles. Time consumed in pouring the catsup from one bottle to another is wasteful and the procedure generally unsightly.

Coupling devices have heretofore been tried for holding one bottle in an inverted position with respect to a second bottle to facilitate the drainage of viscous fluids from one bottle to the other. Typically, these coupling devices include no provision for escape of air from the bottle being filled. Thus, when the fluid being transferred has completely filled the passageway between the two bottles, the remaining air still trapped in the lower bottle prevents the fluid from entering.

Thus, other types of coupling devices have been tried with venting means which permits the trapped air to escape. With these vented couplings, problems such as clogging and leaking can occur. There is, therefore, a need for a new and improved bottle transfer coupling device which quickly and neatly passes viscous fluids, such as catsup, from one bottle into another.

SUMMARY OF THE INVENTION AND OBJECTS

The transfer device of the present invention provides an expansion chamber formed between the confronting ends of the pouring spouts of two bottles held upright, one above the other, the upper bottle being inverted. This expansion chamber facilitates and encourages the escape of air from the lower bottle into the upper bottle and, hence, the flow of fluid from the upper to the lower bottle.

It is, in general, an object of the present invention to provide a new and improved coupling device for holding one bottle in an inverted position above another bottle for hastening drainage of viscous fluids from the upper bottle to the lower bottle.

Another object of the invention is to provide a bottle coupling device of the above character in which an expansion chamber is formed to speed the escape of air from the lower bottle into the upper bottle.

Another object of the invention is to provide a bottle coupling device of the above character which can be easily connected to and disconnected from the pouring spouts of the bottles in a clean and sanitary condition.

Additional objects and features of the invention will appear from the following description in which the preferred embodiment is set forth in detail in conjunction with the accompanying drawing.

DESCRIPTION OF THE DRAWING

FIG. 1 is an elevational view of a coupling device embodying the present invention, showing the manner in which one bottle can be held in an inverted position above another.

FIG. 2 is an enlarged cross-sectional view, taken generally along line 2—2 in FIG. 1.

FIG. 3 is a plan view of the coupling device shown in FIGS. 1 and 2.

FIGS. 4a, 4b and 4c illustrate progressively the formation of a bubble in catsup flowing through the coupling device from the upper bottle to the lower bottle to permit air to pass from the lower bottle into the upper bottle.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In FIG. 1, a coupling device 10 embodying the present invention is used to couple bottles 20 and 30. Bottle 20 is supported in an inverted position above bottle 30 to permit the contents of upper bottle 20 to drain into lower bottle 30.

Coupling device 10 comprises in general a body having an upper sleeve portion 11, a lower sleeve portion 12, and an annular rib portion 13.

Sleeve portions 11 and 12 are generally cylindrical in shape and are adapted for receiving the pouring spouts or neck portions 23 and 33 of bottles 20 and 30. Bottles 20 and 30 are illustrated as being similar types of bottles, so that coupling device 10 is reversible. Thus, either of sleeve portions 11 and 12 is suitable for engaging the neck portion of bottles 20, 30. As will be more fully discussed hereinafter, sleeve portions 11 and 12 include threads for engaging the interrupted threads on bottles 20, 30.

Annular rib 13 extends around the interior of the body intermediate the upper and lower sleeve portions thereof. Rib 13 extends radially into coupling device 10 far enough whereby the end portions of pouring spouts 23, 33 abut the upper and lower surfaces 13a, 13b of rib 13 when the spouts are fully inserted into sleeves 11, 12. Rib 13 does not, however, extend as far inwardly as the projected longitudinal extension of the cylindrical inner surfaces 23a, 33a of spouts 23, 33. In this manner, an annular expansion chamber 16 is formed between the ends of pouring spouts 23, 33 adjacent to annular rib 13. Expansion chamber 16 serves to greatly enhance the flow between bottles 20 and 30, as is discussed fully hereinafter.

Sealing means is provided to prevent leakage of the viscous fluid from bottles 20, 30 when their pouring spouts are connected together by coupling device 10. Thus, annular rib 13 includes upper and lower sealing surfaces 13a, 13b, respectively, adapted for sealably engaging the ends of pouring spouts 23, 33 when fully inserted into coupling device 10.

For bottles of a type having shoulders, such as 24, 34, the ends of sleeves 11, 12 are spaced a predetermined distance from the interior sealing surfaces 13a, 13b so as to abut tightly against the shoulders when the pouring spouts are fully inserted into sealed relation with surfaces 13a, 13b within the coupling device.

Sleeves 11, 12 further include thread means for engaging corresponding threads on the pouring spouts of the bottles. Preferably, for use with conventional catsup bottles having multiple threads, such as threads 22, 32, sleeves 11, 12 include a plurality of circumferentially spaced lugs 14 and 15. Lugs 14, 15 extend radially inwardly and correspond in number to the number of threads 22, 23 of the bottles. Lugs 14, 15 lie proximate the end surfaces of sleeves 11, 12 and preferably flush therewith.

With threads of this type, coupling device 10 can be quickly and securely attached to bottles 20 and 30 while forming a dual sealed condition for each sleeve. A substantially more rigid coupling between the bottles has been observed to result when the coupling device is secured to the bottle with threads. Furthermore, better seals are obtained between the bottle surfaces and the coupling device when they are drawn tightly together by threads.

Coupling device 10 is preferably fabricated from any suitable tough and semirigid material, such as plastic, nylon or hard rubber molded as a unitary construction.

Operation and use of the bottle transfer coupling device may now be briefly described as follows: Let it be assumed that a viscous fluid, such as catsup, is to be transferred from bottle 20 to bottle 30. Pouring spouts 23 and 33 are first inserted into sleeve portions 11 and 12, and the bottles placed in a standing position, with bottle 20 inverted above bottle 30. It is then intended that the catsup in bottle 20 shall drain downwardly by force of gravity into bottle 30, and when all of the catsup has been drained from bottle 20, the bottles are disconnected from coupling device 10, and coupling device 10 is cleaned for reuse.

It has been observed that annular expansion chamber 16 greatly enhances and speeds the transfer of catsup from bottle 20 to bottle 30. Without expansion chamber 16, air cannot readily escape from bottle 30 since the wall of "front" 40 of the mass of catsup in the bottleneck is difficult for the lower

air to penetrate, particularly when the passageway between the bottles is filled with catsup. Expansion chamber 16, however, encourages air bubbles 42 to form and quickly penetrate through the catsup "front" 40 advancing from bottle 20 to bottle 30, and these bubbles 42 permit air displaced from bottle 30 to escape upwardly into bottle 20. It has been observed that expansion chamber 16 causes this enhanced fluid transfer by aiding in the development of the upwardly moving air bubbles 42.

Thus, by causing that portion of the catsup 41 crawling or advancing along the wall surface 23a radially outwardly, thereby relieving pressure in the central portion of the flowing catsup "front" or mass 41, the center of the "front" 40 shall be weakened and more readily penetrated by a rising air bubble.

The surface tension in the downwardly flowing catsup mass 41 adhering to the enlarging wall in the region of the zone of enlargement between bottles draws the surface radially outwardly to weaken the center of the advancing "front" 40 of fluid to render it more readily susceptible to penetration by a rising air bubble 42. Thus, the lower air displaced by the downwardly moving fluid is more easily displaced by virtue of the presence of the annular chamber 16.

It has further been observed that as annular expansion chamber 16 is made taller, i.e., as the separation between the confronting ends of pouring spouts 23 and 33 is made greater, the rate of flow from bottle 20 to bottle 30 is correspondingly increased. Likewise, the rate of bubble formation is increased, indicating that air is moving more rapidly from bottle 30 to bottle 20 to quicken the flow.

Although the bottle transfer coupling of the present invention has been described with particular reference to catsup and catsup bottles, it can also be used for transferring other viscous fluids between containers. In such other applications, it may be necessary to alter the shape of the upper and lower sleeve portions of the device to conform to the pouring spouts of the containers. Further, the annular expansion chamber residing between the confronting bottle ends conceivably can be formed by means other than those described above. However, the above represents a presently preferred embodiment.

It is apparent from the foregoing that a new and improved bottle transfer coupling device has been provided which hastens the transfer of highly viscous fluids between bottles in a manner maintaining dual seals providing a neat and tidy bottle top after completing the transfer.

It is further evident that where the pouring spouts are the same, the coupling becomes interchangeable with either bottle.

I claim:

1. In a coupling device for transferring viscous fluids from a

first bottle having a pouring spout of predetermined internal diameter to a second bottle of like character, a coupling body construction having first and second sleeve portions adapted for receiving the pouring spouts of the first and second bottles, said sleeve portions being provided with means for engaging external threads formed on the pouring spouts of said bottles, and an annular rib portion extending around the interior of the body between the sleeve portions to provide a limiting abutment for engaging the ends of said pouring spouts and holding said ends a predetermined distance apart, said rib portion having an internal diameter greater than the internal diameter of said pouring spouts and cooperating with said pouring spouts to form an annular expansion chamber between the ends of said spouts adjacent said rib portion.

2. In apparatus for transferring a fluid substance from one container to another, one of said containers being held in a position vertically above the other container, the confronting portions of said containers being formed with openings of predetermined cross-sectional area for passing the fluid substance, a coupling device including means for engaging the confronting portions of the containers and holding said confronting portions a predetermined distance apart, said coupling device being formed to provide an enclosed region intermediate the confronting portions of the containers in communication with the openings therein, said region having a greater cross-sectional area than said openings.

3. In a combination for transferring a viscous fluid from one container to another, a first bottle having a neck portion of predetermined internal diameter, a second bottle of like character, and a coupling device comprising a body having upper and lower sleeve portions engaging the neck portions of said bottles and holding said first bottle in an inverted position above said second bottle with said neck portions in vertical registration, each of said sleeve portions being provided with a plurality of circumferentially spaced apart lugs proximate its outer end, said lugs extending radially inward from the internal walls of said sleeve portions and engaging external threads on the neck portions of said bottles, said coupling device being formed to include an annular rib extending around the interior of said body intermediate the neck portions of the bottles, said rib having a greater internal diameter than said neck portions and cooperating with the confronting ends of said neck portions to form between said confronting ends a region of greater cross-sectional area than the flow passageways formed by the internal walls of said neck portions.

4. A coupling device as in claim 1 wherein the means for engaging external threads includes a plurality of circumferentially spaced apart lugs proximate the outer ends of said sleeve portions, said lugs extending radially inward from the internal walls of said sleeve portions.

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