

- [54] **TWO-INGREDIENT CONTAINER SYSTEM**
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- [52] U.S. Cl. **206/47 A, 210/198, 210/64**
- [51] Int. Cl. **B65d 81/32**
- [58] Field of Search **206/47 A, 0.5, 46 F, 46 M, 206/46 PV; 210/198, 242, 64; 229/62; 53/135**

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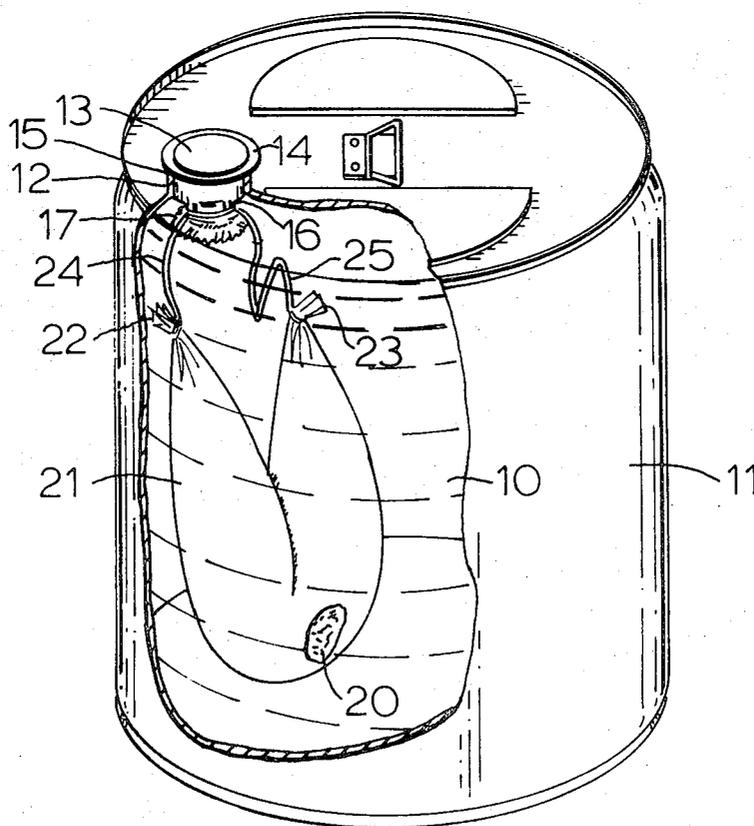
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[57] **ABSTRACT**

A two-ingredient container system. A drum for a main liquid, such as a solvent, has a bunghole at its upper end; a cap for the bunghole has a depending stem with a lower flange. A second ingredient, liquid or solid, is placed in a thin plastic tube of soft collapsible plastic and is tied by strings or similar means at both ends, and the strings are then tied to the stem of the cap. The tube-encased plastic is then put into the drum, either before or after the drum is filled with the main liquid. When the cap is taken off the bunghole, the strings are used to pull up one end of the tube sufficiently enough to be able to cut off that end and open it, and then the other end may be pulled up and used to shake the second ingredient into the liquid. The invention is particularly useful in combining materials such as dichlobenil with sodium methyl dithiocarbamate.

1 Claim, 6 Drawing Figures



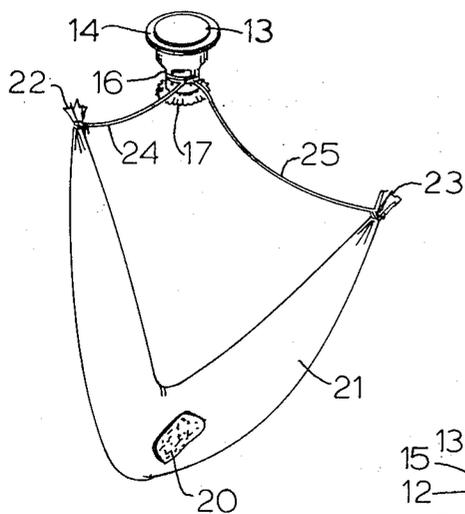


FIG. 1

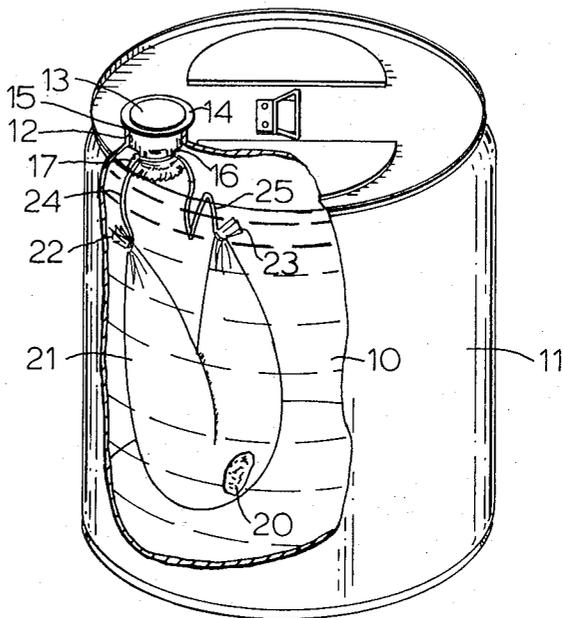


FIG. 2

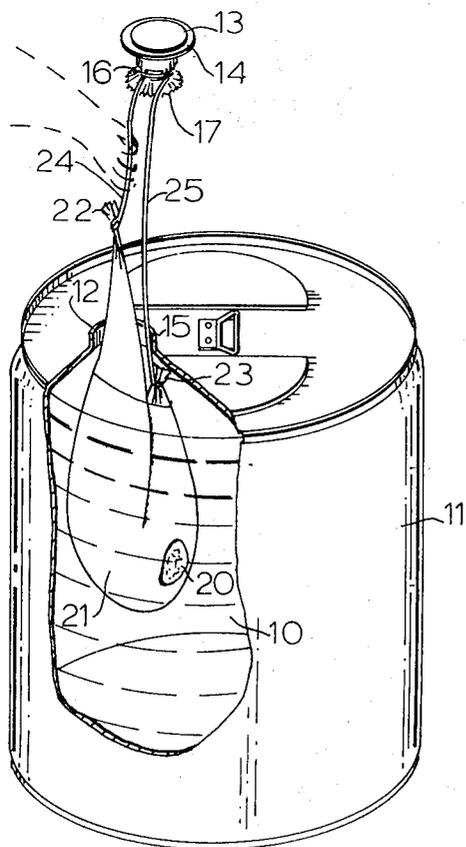


FIG. 3

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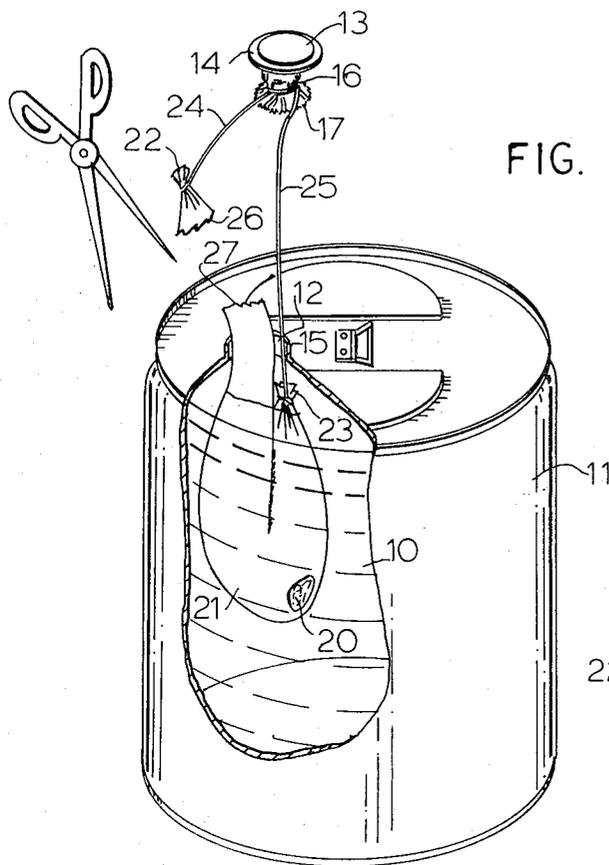


FIG. 4

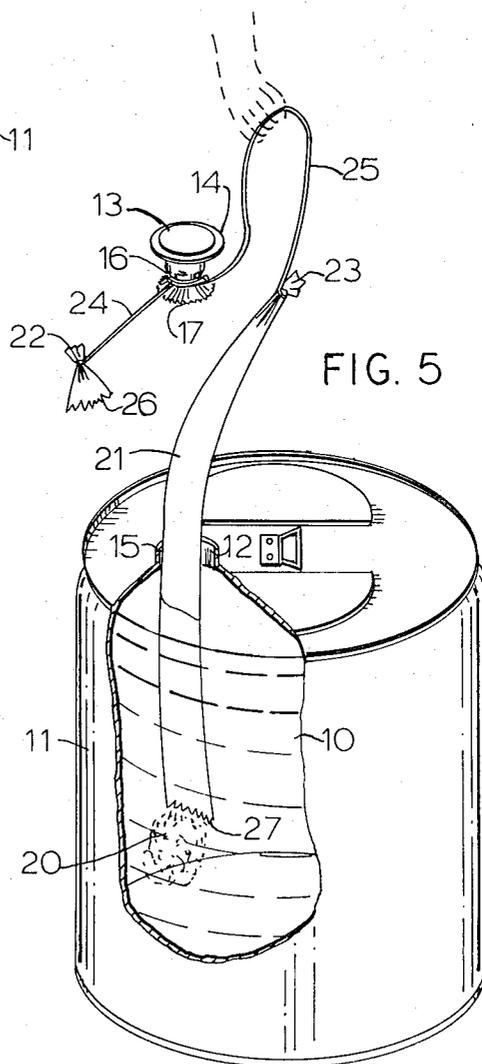


FIG. 5

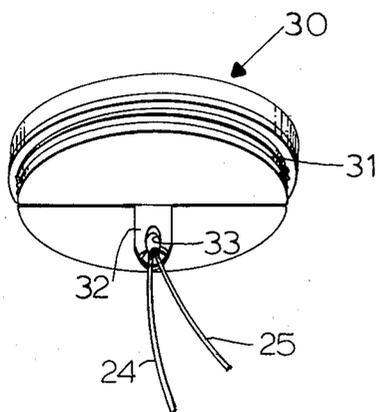


FIG. 6

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TWO-INGREDIENT CONTAINER SYSTEM

BACKGROUND OF THE INVENTION

This invention relates to a two-ingredient container system in which one ingredient is a solid and one ingredient is a liquid and in which it is desired to have a fresh mixture made shortly before use.

There are instances in which mixtures or solutions deteriorate upon standing or where for other reasons it is not desirable to mix them at the manufacturing plant, but to provide a system by which they can be mixed readily by the consumer. For example, wettable powders or colloidal clays with active surfaces tend to become muddy or gummy when packaged directly in a liquid and kept there for a substantial length of time, tending to settle to the bottom of the drum as a sticky mud. As a result, the material is not as floatable or dispersible when stirred later as would be a fresh addition of the same powder.

Sometimes such substances are packaged as two separate ingredients in two separate containers, but this is often undesirable, for the users frequently then store them separately and do not have both of them available when wanting to make the mixture. Also separate government registration may be required. Sometimes the containers are made to have two sections in them, and this sometimes gives satisfactory results, but at other times it is unsuccessful, because mixing still can be difficult, and because it is relatively expensive.

An example of where the invention is particularly useful may be helpful. In another patent application I have disclosed the use of some compositions for treating sewer pipes. It has been found that certain alkali metal alkyl dithiocarbamates, such as sodium methyl dithiocarbamate, when mixed with a suitable surfactant and with a suitable herbicide such as dichlobenil, is very effective. Usually the mixture can be made up in a manufacturing plant and under many conditions it is stable. However, it has been found that the stability endures only up to a temperature of approximately 85° to 90° F. Above that, the dichlobenil tends to volatilize more readily in the presence of the dithiocarbamate and to separate itself from it, so that it is less useful. Consequently, it has been found desirable to prepare the dichlobenil as a wettable powder and to employ the present invention for storage and shipment.

SUMMARY OF THE INVENTION

In the invention, the major ingredient, a liquid, is stored in a drum having a bunghole at its upper end. The bunghole has a cap with a depending stem that extends down into the bunghole, and at the lower end the cap has a flange. The second ingredient, solid or liquid, is stored in a thin plastic tube of soft collapsible plastic tied at both ends by string or other such means so that both ends are sealed. The tube is then placed inside the drum, with the ends of the strings tied to the cap. If the drum has not already been filled with the main liquid, it is then filled. When it is desired to use the mixture, the cap is taken off, and the strings signal at once to the user that he must make the mixture. He uses one of the strings to draw out one end of the tube, cuts off that end or otherwise opens it, and drops it back into the drum. Then he uses the other string to draw the other part of the tube partway out so that he can shake the material out from the tube into the drum. He then can dispose of the plastic tube, leaving the dry ingredient in

the liquid ingredient. The shaking of the bag helps to mix the material, and if necessary the drum can be shaken again, preferably after being closed, to achieve better mixture. Then the material can be used as a combined product to obtain maximum effect.

Other objects and advantages of the invention will appear from the following description of the preferred embodiment.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a view in perspective of a drum cap and a solids container tied to the cap, the combination embodying the principles of the invention.

FIG. 2 is a view in perspective of a drum incorporating the package for the solids in conjunction with its bunghole cap. A portion of the drum wall is broken away to show the solids container inside.

FIG. 3 is a view similar to FIG. 2 showing the first step in mixing the solid with the liquid. One end of the solids container is being withdrawn by the cap and string through the open bunghole.

FIG. 4 is a similar view showing one end of the tube having just been cut off.

FIG. 5 is a similar view showing the other end of the solids container withdrawn from the bunghole and used to shake out the solids container and mix the solid with the liquid.

FIG. 6 is a fragmentary view showing a modified form of cap.

DESCRIPTION OF A PREFERRED EMBODIMENT

As the drawings show, a main ingredient 10, a liquid, is contained in a conventional drum 11 having a bunghole 12. The bunghole 12 is normally closed by a cap 13 (FIGS. 1-5) having an upper flange 14 which is crimped down onto a locking flange 15 on the drum surrounding the bunghole. The cap 13 also has a depending stem portion 16 ending with a bottom flange 17. In FIG. 6 a modified form of cap 30 is shown, having screw threads 31 and a depending member 32 providing an opening 33.

In the present invention a second ingredient 20, which may be a solid or a liquid, is contained in a tube 21 of a soft flexible plastic such as polyethylene, one which is not soluble in the liquid 10. The second ingredient 20 is placed into the tube 21 with both ends 22 and 23 of the tube 21 open or with one end having been previously closed as by tying one end tight with a string. After the desired amount of solid is within the tube the other end is, or both ends 22 and 23 are, tied tight with string. The tube 21 is made of a suitable size and flexibility and when filled with the second ingredient 20 is left with a sufficient amount vacant or otherwise is enabled to be inserted into the bunghole 12. The strings 24 and 25 are made so tight that there is no leakage of liquid 10 into the tube 21. The ends of the strings 24 and 25 are tied to the stem 16 of the cap 13 (or to the opening 33 of the cap 30 in FIG. 6). Thus, before installation the second ingredient 20 and its package 21 appears as in FIG. 1, where the strings 24 and 25 tying the two ends 22 and 23 are tied to the cap stem 16, and when the tube 21 is inserted inside the drum 10 for shipment and storage, it is as shown in FIG. 2.

When it is desired to use the device, the bunghole cap 13 is freed from the bunghole 12, if it has been sealed, by a suitable uncrimping means and is raised out of the

bunghole 12. (The cap 30 of FIG. 6 is unscrewed from a threaded bunghole.) It carries with it, of course, the strings 24 and 25. One of the strings 24 is then used to raise one end 22 of the tube, as shown in FIG. 3. The other end of the tube 21 is still in the drum 10. When the end 22 has been lifted a sufficient amount above the bunghole 12 so that it can be cut off, this end 22 may then be cut off across a cut 26 as shown in FIG. 4, leaving an open end 27. The strings may be untied, instead of cutting the tube 21, but that usually takes longer and is unnecessary. Once it has been cut, the open end 27 is dropped back into the drum 10 through the bunghole 12. After that end 27 has been dropped back in, the other string 25 is preferably pulled out of the bunghole 12 so that the tube 21 can be shaken from the end 23 or near it, so as to shake the second ingredient 20 into the main liquid 10, thereby helping to disperse it and to get it all dissolved. Then, if the material is to be used, the entire combination of cap 13 and tube 21 and strings 24 and 25 can be discarded and the material poured from the drum, or the strings 24 and 25 can be cut from the cap 13 and the strings 24 and 25 and plastic 21 thrown away, with the cap 13 restored to use.

As indicated above, in a particular practice of the invention the second ingredient 20 may be dichlobenil or some other herbicide or insecticide or fungicide prepared in a wettable powder form or as a liquid. The main liquid 10 may be a suitable alkyl metal alkyl di-

thiocarbamate such as sodium methyl dithiocarbamate. This gives particular advantages which have already been alluded to.

I claim:

1. A sewer treatment package, including in combination:
 - a drum containing a liquid combination of a surfactant and an alkali metal alkyl dithiocarbamate, said drum having a bunghole at its upper end,
 - a cap for said bunghole having a depending portion that, when said cap closes said bunghole, extends down into said bunghole,
 - a thin plastic tube of soft collapsible plastic containing wettable powder dichlobenil that is to be dispersed in said liquid prior to use, said plastic being freely collapsible and insoluble in said liquid, and
- string means tied around both ends of said plastic tube closing them and preventing flow of said liquid into said tube, said string means being tied to said depending portion,
- whereby, when said cap is taken off said bunghole, said string means is used to pull up one end of said tube and open it, the opened end being let down into said drum while the other end is raised and shaken to empty said dichlobenil from said tube into said liquid.

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