

[54] **PACKAGE FOR DISPENSING AND DISPOSING OF PROCESSING LIQUIDS IN A DEVELOPING APPARATUS**

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[52] U.S. Cl. .... **95/89 R, 141/329, 222/94**

[51] Int. Cl. .... **G03d 3/06**

[58] Field of Search ..... **95/89 R, 89 L; 222/94, 83.5, 222/130; 221/97, 102; 141/329, 330; 184/1.5**

[56] **References Cited**

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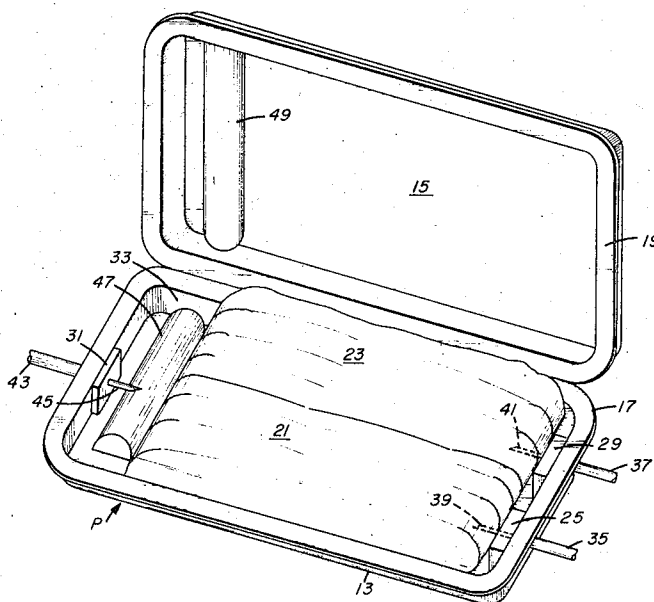
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[57] **ABSTRACT**

A relatively rigid hollow box contains one or more plastic bags holding the liquid chemicals. Self sealing rubber patches or capped necks connect the bags to a box wall so that hollow needles on the ends of discharge conduits can penetrate from outside the box into the bags for removing liquid therefrom. The wall of the box is also provided with a self sealing patch or a capped neck for penetration by a hollow needle on the end of a waste conduit for return of waste liquid to the space in the box outside of the bags.

**6 Claims, 8 Drawing Figures**



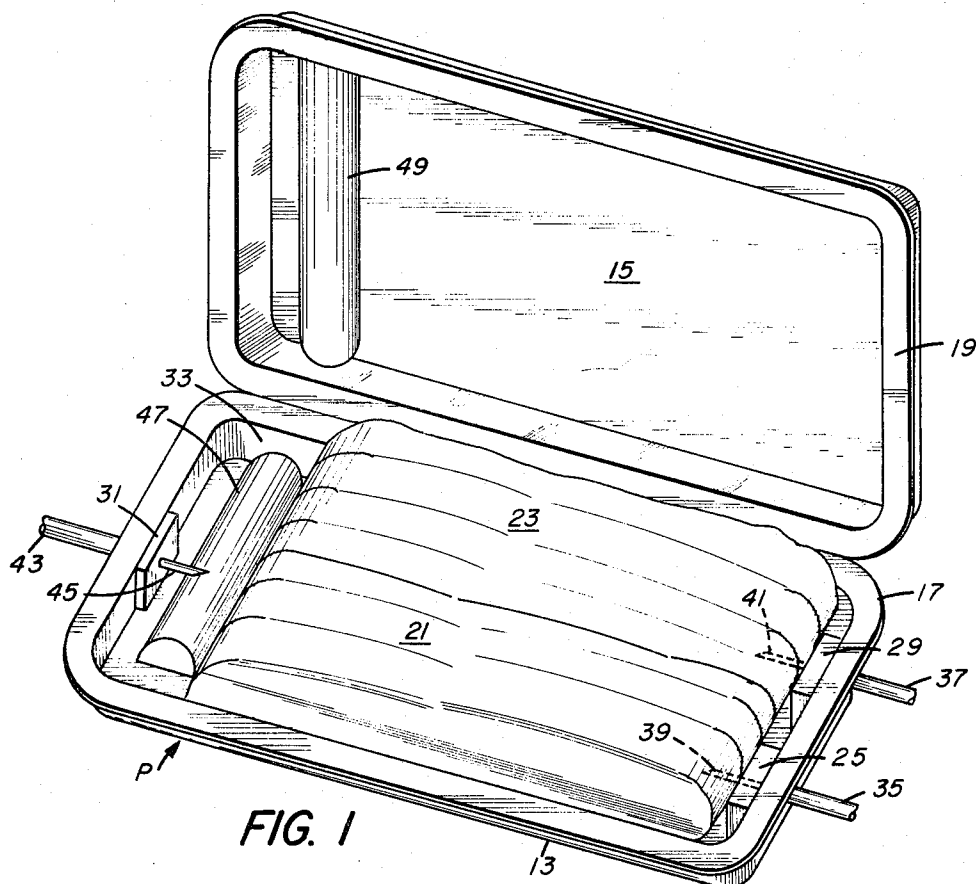


FIG. 1

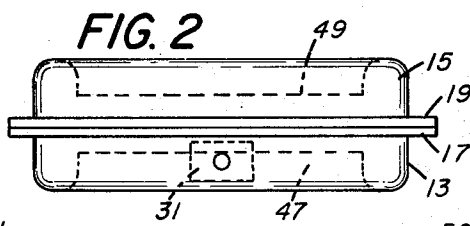


FIG. 2

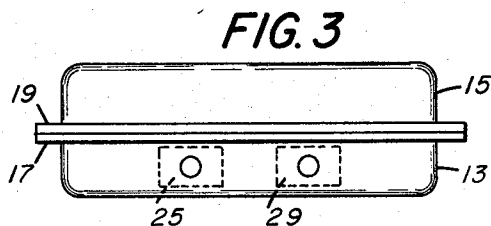


FIG. 3

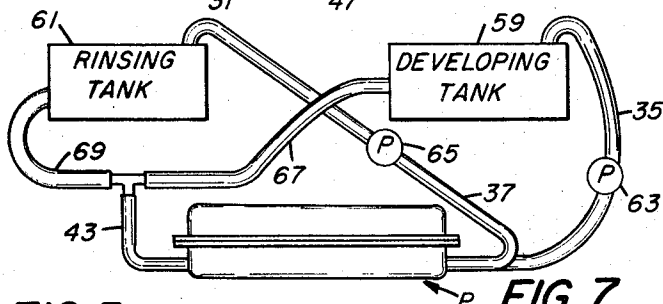


FIG. 4

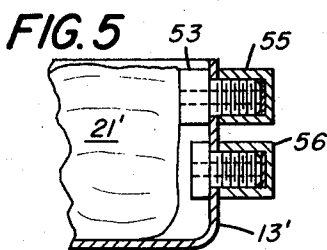


FIG. 5

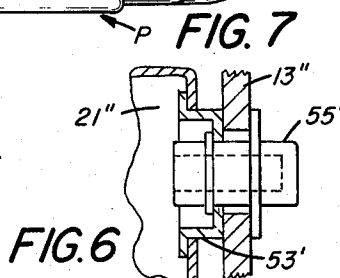


FIG. 6

FIG. 7

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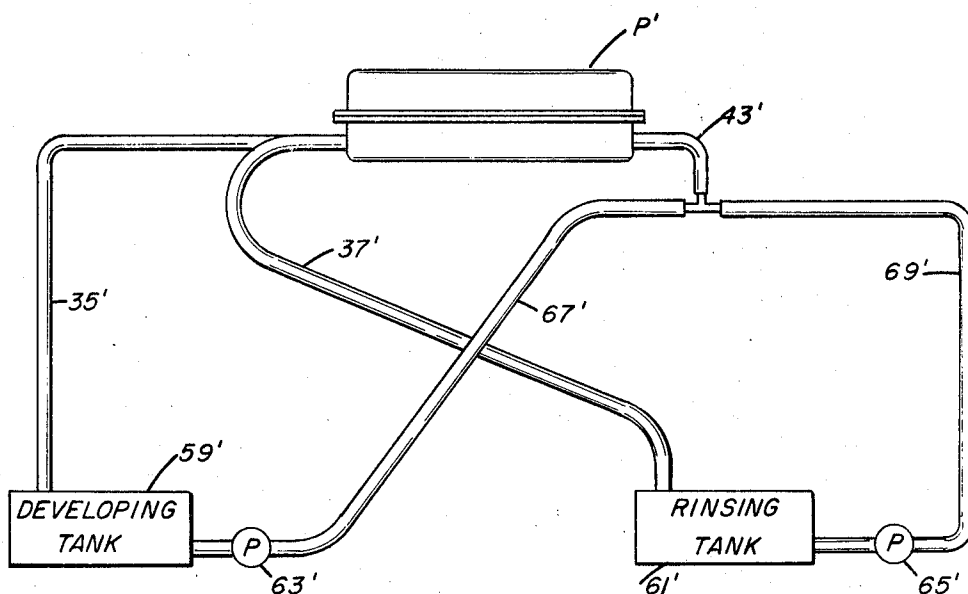


FIG. 8

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# PACKAGE FOR DISPENSING AND DISPOSING OF PROCESSING LIQUIDS IN A DEVELOPING APPARATUS

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

The present invention relates to a novel package for transporting one or more liquid chemicals to utilizing apparatus, which also serves a double purpose of receiving exhausted liquid chemicals for removal and disposal.

### 2. The Prior Art

It has been known to package a liquid in a flexible collapsible bag of plastic material within a relatively rigid outer container. At the point of use the liquid is withdrawn from the inner bag and the whole package is then disposed of. Reference is made, for example, to U.S. Pat. Nos. 2,597,715; 2,925,199; 2,815,887; 3,078,026; and French Pat. No. 364,277.

In the photographic developing art it has been customary to supply developer liquid and rinse liquid to the photographer who uses them for developing film, and then runs them to the drain and thence to a sewage disposal system. This procedure, of course, is detrimental in that the chemicals are materials that may corrode the drain system and may pollute the area to which they are delivered, such as a stream of lake. Furthermore, they may be of such a type that they cannot be degraded in a sewage disposal plant before discharge therefrom, and may even hinder sewage degradation.

## SUMMARY OF THE INVENTION

In accordance with my invention the problems of the prior art have been reduced or eliminated by providing a novel portable package wherein a hollow liquid-tight relatively rigid outer container is provided with one or more inner containers in the form flexible collapsible plastic bags or pouches for containing one or more chemicals, such as photographic developer liquid (a first photographic processing liquid) in one bag and rinse liquid (a second photographic processing liquid) in a second bag. This package is filled at the manufacturers plant, and then is carried from there to the point of use such as a photographic developing laboratory.

At the laboratory the inner bag or bags are connected to appropriate trays or other vessels and the liquid is withdrawn from the inner containers and is supplied to such vessels. As liquid is withdrawn, of course, the bags tend to collapse and leave space around the bags within the outer container. This space is utilized in my invention by withdrawing used or exhausted liquid from the vessels and delivering it into the outer container to fill such space. This can be done continuously when the supply is continuous, or as an intermittent procedure when the supply is intermittent. The package is then disconnected from the developer vessels and can be disposed of in any desired way, as by burning or by returning to a chemical plant for recovery or regeneration of chemicals.

## THE DRAWINGS

FIG. 1 is a perspective view of a package embodying the principles of the invention, shown in open condition simply for illustration;

FIG. 2 is an end elevational view of the package of FIG. 1, in closed condition, as seen from the left in FIG. 1;

FIG. 3 is an end elevational view of the package in closed condition as seen from the right in FIG. 1;

FIG. 4 is a fragmentary side elevational view, partly in section, showing how one of the inner container bags of FIG. 1 is joined to the outer container;

FIGS. 5 and 6 are views similar to FIG. 4 showing modified connections for the removal and return of liquids;

FIG. 7 is a schematic view showing the package of FIG. 1 connected to a series of trays for a photographic developing operation; and

FIG. 8 is a schematic view showing still another arrangement of the package of FIG. 1 connected to a series of trays for a photographic developing operation.

## THE PREFERRED EMBODIMENTS

Referring to FIG. 1, there is shown a package P comprising a hollow liquid-tight outer container or box of generally rectangular shape which is formed of a relatively rigid material such as aluminum, steel, or molded high density polyethylene, and comprises a bottom 13 and a top 15 having outstanding flanges 17 and 19, respectively, around their perimeters, with the two flanges being adapted to be sealed together when in juxtaposition. Sealing can be by suitable adhesive, by thermal heating sealing, or by ultrasonic heat sealing. Two concave sections make up the finished box, but one concave section could be used with a flat cover.

The rigid outer container is provided with two inner containers 21 and 23 which are in the form of collapsible bags or pouches formed of suitable flexible plastic material such as rubber, a vinyl resin, low density polyethylene, or other suitable material which is resistant to the chemicals to be transported.

The bags 21 and 23 are completely closed so as to prevent the escape of liquid therefrom. At one end of each bag there is provided a patch 25, 29 of a self-sealing material such as natural or synthetic rubber to permit access from outside the package for removing liquid from the bags. Each patch is adhesively joined to the end walls of the bags, and in turn is adhesively joined to the inner surface of an end wall of the outer container. While two separate patches have been shown, it is evident that a single patch extending across the ends of both bags could be used.

At its opposite end the outer container is provided with still another patch 31 of similar self-sealing material to permit the introduction of waste liquid from outside the package to the unoccupied space 33 around bags 21 and 23.

The purpose of the patches is to permit hollow needles, similar to hypodermic needles, to be inserted from outside the package P through the walls of the outer container and through the patches into the adjacent space. Upon withdrawal of the needles subsequently, the self-sealing material of the patches closes the hole made by each needle to prevent the escape of liquid from the package. Small access holes may extend through the wall of the outer container in register with the various patches if desired. However, when the outer container is a plastic material, the needles can be pushed through its walls without requiring access holes.

In the embodiment shown, two separate conduits 35 and 37 are provided with hollow needles 39 and 41 which penetrate through patches 25 and 29 into the respective bags 21 and 23 so that their liquid contents can be withdrawn. A third conduit 43 carries a hollow needle 45 which penetrates through the patch 31 into the space 33 for returning exhausted liquid to the package for subsequent transportation and disposal.

It is possible that when inserting needle 45 for restoring exhausted liquid to the package it might penetrate one of the bags 21, 23. In order to prevent this, there is molded into the bottom 13 of the outer container a pair of narrow transverse cavities forming on their inner sides convex protuberances 47 and 49 which extend transversely across the package. Protuberance 47 is located between the ends of the bags 21 and 23 and the patch 31. Thus, when needle 45 is inserted, it cannot be delivered past the wall 47 but will abut against it instead of penetrating the bags. The cavities on the outside of protuberances 47 and 49 also serve a second purpose of providing a hand hold for a person to grasp the container for transportation.

Alternatively, in the modification of FIG. 5 each bag such as 21' is provided with an integral neck 53 which projects through an aperture in the end wall of the outer container bottom 13' and is threaded at its outer end to receive a liquid-tight cap 55. Neck 53 includes an inner shoulder which abuts against the inner surface of the end wall, and the cap 55 abuts against the outer surface, thus assuring retention of the bag in position. The interior of cap 55 is lined with a self-sealing material so that a needle can be inserted into the inner container for withdrawing liquid. A similar capped neck 56 at the same end of the package can be provided for the return of liquid to the space surrounding the bags. The return needle will be sheltered within the neck so as to avoid penetrating the bags.

FIG. 6 shows a plug 55' having a pair of spaced external flanges which capture the end wall, and an internal flange on neck 53' therebetween. Such a design can be used for both removal and return of liquid as in FIG. 5.

Cap 55 and plug 55' can be of penetratable plastic such as polyethylene, or can have a small preformed hole for the needle. They can be lined with self sealing rubber, or made wholly thereof.

Now referring to FIG. 7, the manner of using the package P will be described. A tray or vessel 59 for developer liquid, and a second tray or vessel 61 for a rinse liquid are connected to the package P by conduits 35 and 37, and the liquids are transferred by forcing them out of the package by means of pumps 63 and 65. A film is first run through developer liquid in vessel 59, and then through vessel 61 for rinsing off the developer liquid.

Exhausted developer and rinse liquids are transferred by discharge conduits 67 and 69 to a common conduit 43, and thence back into the package P where they fill the space 33 around the bags 21 and 23.

In the arrangement shown in FIG. 7 package P is located on the floor below the vessels 59 and 61 so that gravity flow is employed for delivering the exhausted liquids back to package P. However, it is evident that the positions could be reversed, with package P being above the vessels 59 and 61, in which case the developer and rinse liquids could flow through conduits

35 and 37 by gravity, and the exhausted liquids would then be forced through conduit 43 by a pump. Such a reversed arrangement is shown in FIG. 8 wherein a package P' is located above a tray or vessel 59' for developer liquid, and a second tray or vessel 61' for a rinse liquid. The trays 59' and 61' are connected to the package P' by conduits 35' and 37', respectively, and the liquids are transferred by gravity feed from the package P'.

Exhausted developer and rinse liquids are transferred by pumping them through discharge conduits 67' and 69', respectively, to a common conduit 43', and thence back into the package P' where they fill the space around the bags 21 and 23.

It is evident from the foregoing description that there has been provided a novel package for transporting relatively small quantities of liquid to a point of use, and for subsequently receiving exhausted liquid and transporting it to a point of disposal. This apparatus is simple and compact, and inexpensive to construct, and is efficient in operation. The user, such as a photograph developing laboratory, can use this package rapidly, efficiently and with a minimum of the mess that is normally attached to use and disposal of liquid chemicals. Furthermore, it makes possible the disposal of such chemicals without incurring damage to the plumbing system, and without the development of environmental pollution.

The invention has been described in detail with particular reference to preferred embodiments thereof, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention.

I claim:

1. A package for transporting and supplying a first photographic processing liquid and a second photographic processing liquid to photographic processing apparatus, and for disposing of spent photographic processing liquids, said package comprising

a hollow liquid-tight outer container having end walls;

a first collapsible bag of flexible plastic within said container filled with a first photographic processing liquid;

a second collapsible bag of flexible plastic within said container filled with a second photographic processing liquid;

first means for establishing communication between said first bag and the outside of said outer container for removing liquid from said first bag, causing collapse of said bag;

second means for establishing communication between said second bag and the outside of said outer container for removing liquid from said second bag, causing collapse of said bag; and

third means for establishing communication between the outside of said outer container and a space within said outer container but outside of said bags, for returning spent processing liquids into said outer container;

said first, second and third means being carried by at least one of said end walls of said outer container and comprising self-sealing members of rubbery material adapted to be penetrated by tubular needles and to reseal upon withdrawing said needles,

and said first and second means also fluid-tightly engaging said bags.

2. A package in accordance with claim 1 wherein said first, second and third means are all located adjacent one another on the same end wall of said outer container. 5

3. A package in accordance with claim 2 wherein said first, second and third means are first, second and third necks, respectively, connected to said end wall, said first and said second necks being also connected to said first and second inner bags, respectively; said first, second and third necks each comprising an imperforate plastic material lined internally with said rubbery self-sealing members. 10

4. In photographic developing apparatus comprising a first tray for a first photographic processing liquid, a second tray for a second photographic processing liquid, supply means for severally supplying said liquids to said trays, and return means for removing used liquids from said trays, the improvement wherein: 15 20

said supply means is a portable package in accordance with claim 1;

said apparatus comprises first and second conduits severally connecting said first and second trays 25

with said first and second inner bags in said package, respectively;

said return means comprises third conduit means connected to outlets of both of said trays and to said third means for returning used liquid to said outer container; and

said first and second conduits and said third conduit means all have hollow needles on the ends thereof penetrating said first, second and third means, respectively.

5. In apparatus in accordance with claim 4, said portable package being located at a lower level than said trays whereby used liquid returns to said package under the influence of gravity; said apparatus also comprising pump means for pumping liquid through said first and second conduits to said trays.

6. In apparatus in accordance with claim 4, said portable package being located at a higher level than said trays whereby liquids flow through said first and second conduits to said trays under the influence of gravity; said apparatus also comprising pump means for pumping used liquid through said third conduit means to said outer container.

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