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Description

The present invention relates to a treating apparatus adapted to be used for treating, for example, a photosensitive material provided with a container, in order to spend and recover treating liquid.

A container suitable for holding such a treating liquid is the so-called bag-in-box type, which has "pore-in" and "pore-out" (access) ports and is the form of an inner bag which is held within an outer box made of corrugated cardboard.

This type of container is set in the treating apparatus and holds a treating liquid to be used in the treating apparatus. The container is used as a cassette type and, when one treating liquid is to be replaced by another treating liquid, another container is required to recover used liquid. This requires an extra space for replacement and, moreover, a cumbersome operation for replacement.

With a view to eliminating such a cumbersome operation, a type of container has been proposed in Japanese Patent Disclosure (KOKAI) NO. 58-52065, which comprises a first flexible container unit for holding a treating liquid, and a second flexible container unit, which is located outside of the first flexible container unit, for recovering spent liquid, the each container unit being provided with access ports for connection to an associated apparatus.

However, since the aforementioned container is made up of two container units equipped with access ports, it is difficult to correctly connect charging and discharging tubes relative each other with the container set in the treating apparatus. Therefore, there is a risk that a connection error will occur between the charging and discharging tubes. Furthermore, it is not easy to assemble the first and second flexible container units within an outer box because one of the container units is provided separate from the other container unit.

A type of container can be formed which comprises an outer box and inner container units integrally held within the outer box, each inner container unit being divided by a partition wall into two chambers. Due to two access ports provided on each container unit, the pliability of the container unit is lost, particularly at those flange areas of the access ports where a fusion bond is effected. When the inner container units are held within the outer box, bends and creases are more likely to be formed on the inner container units, so that when they are subjected to vibrations during the transportation thereof pinholes are likely to be formed at these bent and creased portions.

It is the object underlying the invention to permit the supply of a liquid cycle with unused liquid and **simultaneously** the removal of used liquid in the smallest possible space by means of a device

having an uncomplicated structure.

According to the characterizing portion of claim 1 the solution of the above described object lies in the fact that the inner elastical container which is divided into two parts by an elastic partition wall, releases unused liquid from one chamber and **simultaneously** receives used liquid in the other chamber due to the resulting unoccupied space. In this connection, the volume of the one chamber is decreased due to the elasticity of the partition wall, whereas the volume of the other chamber is increased, so that the overall volume of the two chambers remains unchanged and both chambers are arranged at the same geometrical position. This means that according to the invention only a single elastic holder is arranged in the device, wherein both chambers of this holder are provided for receiving the used liquid.

The EP-A-0 194 871 shows a liquid container and dispenser of that kind comprising a collapsible multilayer bag which is located within an inextensible outer casing. Liquid can be filled into a first interlayer space of the bag via a first inlet/outlet means against a counter pressure provided by an external pressure medium, such as air or water, in a second interlayer space, which is gradually bled off via a second inlet/outlet means. The first and the second interlayer space are separated by an elastical inner layer.

However, neither alone nor in a synopsis with the above mentioned generic state of the art does the EP-A-0 194 871 offer an indication as to providing the elastical container described therein as a releasing-and **simultaneously** as a receiving holder for the same liquid within a liquid cycle. On the contrary, the EP-A-0 194 871 explicitly designates one chamber of the elastical container as the sole pressure chamber by means of which the actual storage chamber can be pressed out. Furthermore, this box was obviously designed under a different problem definition for a completely different purpose, so that the restructuring of the two chambers into two used liquid storage chambers according to the invention can not be designated as being obvious when skipping a developing step representing the generic state of the art.

Fig.1 is an explanatory view showing a treating - liquid container according to one embodiment of the present invention.

Fig. 2 is a cross-sectional view showing an inner bag of the container of Fig. 1;

Fig. 3 is a view showing the outer appearance of a form of the container of Fig. 1;

Fig. 4 is a cross-sectional view showing an inner bag of Fig. 3;

Fig. 5 is a view showing the outer appearance of a treating-liquid container according to another embodiment of the present invention;

Fig. 6 is a view showing the outer appearance of an inner bag of Fig. 5;

Fig. 7 is a cross-sectional view, taken along line A-A, showing the container of Fig. 5; and

Fig. 8 is a cross-sectional view showing a variant of the container of Fig. 5.

The embodiments of the present invention will now be explained below, with reference to the accompanying drawings.

Embodiment 1

Fig. 1 is a view showing the outer appearance of a treating-liquid container according to one embodiment of the present invention. Outer rectangular box 1 is made of a rigid material, such as a corrugated cardboard, and has fixing section 4 about 45°-inclined at one corner side with a pair of access ports 2, 3 each closed by a cover at fixing section 4 of box 1. Inner bag 7 is disposed within outer box 1 and is made of a plastics film section and a laminate section as is shown in Fig. 2, bag 7 is formed as a elastical container with treating-liquid storage chamber 9 and used-liquid storage chamber 10 defined therein by elastical and impermeable partition wall 8. Access ports are different in size in the same direction and of such a type that they are fixed to the outer box.

A pair of fixing sections 4, 4 may be formed, unlike the single fixing section of Fig. 1, on the corner sides in a symmetrical fashion, that is, with one of fixing sections 4 and 4 located on one corner side and the other on the opposed corner side of the box. In this case, access ports 2 and 3 are opened not in the same direction but in the opposed direction, as is shown in Fig. 4.

If access ports 2 and 3 of different size are used in combination with covers 5 and 6 of different color, they can readily and positively be connected to an associated treating apparatus. A choice of a different color or size well serves the purpose if the color or size is applied to one of access ports or to one of covers 5 and 6. An inner sealing member may be initially employed for sealing to an open end of port 2 if port 2 is used as a "pour-out" one. If, in this case, an associated connector is connected to port 2 at the time of use, it is possible to prevent the user's hands and garments from being fouled due to the deposition thereon of used liquid.

Embodiment 2

Fig. 5 is a view showing the outer appearance of a container according to another embodiment of the present invention. Like the first embodiment, outer rectangular box 11 is made of a rigid material, such as corrugated cardboard and has fixing

section 12 about 45°-inclined at one corner side. Access ports 14 and 15 of inner bag 13 are fixed to fixing section 12. As is shown in Figs. 6 and 7, inner elastical container or bag 13 is made up of two main film sheets 16 and 17 and two buffer film sheets 18 and 19, which are made of, for example, polyethylene. The main and buffer sheets are overlappingly sealed at both ends. Access port 14 is provided at the main and buffer sheets in a manner to be fusion-bonded around the port to these sheets. Port 15 is provided at buffer films 18 in a manner to be fusion-bonded around the port to the buffer film 18. Main film 16 provides a partition wall whereby inner elastical container 13 is divided into two chambers, one of which serves as treating-liquid storage chamber 20 and the other as used-liquid storage chamber 21. Buffer films 18 and 19 should preferably be made of a material, such as polyethylene, whose pinholes are restricted to 1 or less in number under a Gelbofrex test (-10°C, 1500 times). Since a "blocking" phenomenon is liable to occur in those films having a low incidence of pin holes, the film should therefore be embossed.

In the container of the present invention, a treating liquid is held within the treating-liquid storage chamber at the time of use, with the used-liquid storage chamber remaining unoccupied. Thus the treating liquid is supported by such a double sheet film, and pinholes which would otherwise occur can be prevented from occurring at a bent portion (or portions) due to the buffering action of buffer films 18 and 19 on main films 16 and 17, respectively.

In the case where the contents of the bag are a barrier property, the inner elastical container be formed with a film of barrier property added thereto. In this case, if the outermost films are formed as films 22 and 23 of barrier property, access port 14 is fusion-bonded around the port to film 22, main film 16 and buffer film 18, and access port 15 is fusion-bonded around the port to film 22, as shown in Fig. 8, in which case a partition wall is defined by main film 16 and buffer film 18. Access port 15 is fusion-bonded around the port to film 22, with a partition wall defined by main film 16. Furthermore, films 22 and 23 may be formed as an intermediate film unit or the innermost film unit in place of using them as the outermost film unit. In this way, various forms may be selected according to the present invention.

In the container of the present invention, a treating liquid is initially held within the treating-liquid storage chamber, with the used-liquid storage chamber flattened or unoccupied. When, in these circumstances, the treating liquid is poured out of the treating-liquid storage chamber, that storage chamber correspondingly becomes flattened

and simultaneously, a corresponding amount of used liquid enters the used-liquid storage chamber. The inner elastical container can be of a size that corresponds to the amount of treating liquid originally occupying the treating-liquid storage chamber. This allows the use of as compact a container as possible.

Thus, a smaller liquid storage space can be used for the treating liquid of a treating apparatus. Since the access ports are initially determined as "pour-in" or "pour-out" ports, inadvertent connection of the "pour-in" and pour-out ports can easily be prevented. Moreover, correct connection can be readily determined by each port being a different size.

Since the port fixing section of the container is about 45°-inclined on one corner side, the "pour-out" port can readily be connected to the associated apparatus.

Even if the inner elastical container becomes bent at places within the container, as a result of the container being oscillated during transportation, there is no risk of pinholes occurring at these bent portions, since the inner elastical container is protected and cushioned by the buffer film.

Furthermore, since it holds only one inner, elastical container or bag the container of the present invention can be assembled more readily than its conventional counterparts.

Claims

1. A treating apparatus for treating, for example, a photosensitive material, which is provided with a container for simultaneously supplying a liquid circulation with treating liquid and removing used liquid therefrom, wherein said container comprises two elastically deformable chambers (9, 10), which are disposed in an outer rigid box (1) and each provided with an independent access port (2, 3), **characterized in** by the use of an elastical container being divided in two parts by an elastical and impermeable partition wall (8) so that the one chamber (9) absorbs that amount of used liquid which is delivered as treating liquid by the other chamber (10) at the same time.
2. The treating apparatus according to claim 1, characterized in that said access ports (2, 3) are different from each other in their size.
3. The treating apparatus according to claim 1, characterized in that said access ports (2, 3) are covered with their covers of different color.
4. The treating apparatus according to claim 1, characterized in that said inner elastical

container(7) is covered with a buffer film (18, 19).

Patentansprüche

1. Behandlungsvorrichtung zur Behandlung zum Beispiel von einem photoempfindlichem Material, die mit einem Behälter zur Versorgung eines Flüssigkeitskreislaufes mit Behandlungsflüssigkeit und gleichzeitiger Entsorgung verbrauchter Flüssigkeit aus dem Flüssigkeitskreislauf vorgesehen ist, wobei der Behälter zwei elastisch deformierbare Kammern (9, 10) aufweist, die in einem äußeren starren Kasten (1) angeordnet sind und jeweils mit einer unabhängigen Zugangsöffnung (2, 3) versehen sind, gekennzeichnet durch die Verwendung eines elastischen Behälters, der von einer elastischen und undurchlässigen Trennwand (8) zweigeteilt ist, so daß die eine Kammer (9) die Menge verbrauchter Flüssigkeit aufnimmt, die gleichzeitig von der anderen Kammer (10) als Behandlungsflüssigkeit abgegeben wird.
2. Behandlungsvorrichtung nach Anspruch 1 dadurch gekennzeichnet, daß sich die Zugangsöffnungen (2, 3) in ihrer Größe voneinander unterscheiden.
3. Behandlungsvorrichtung nach Anspruch 1 dadurch gekennzeichnet, daß die Zugangsöffnungen (2, 3) mit ihren Abdeckkappen unterschiedlicher Farbe abgedeckt sind.
4. Behandlungsvorrichtung nach Anspruch 1 dadurch gekennzeichnet, daß der innere elastische Behälter (7) mit einer Pufferfolie (18, 19) umgeben ist.

Revendications

1. Un appareil de traitement pour traiter par exemple un matériau photosensible, qui est pourvu d'un conteneur pour simultanément alimenter une circulation de liquide avec le liquide de traitement et en retirer le liquide usagé, dans lequel ledit conteneur consiste en deux chambres (9, 10) élastiquement déformables, qui sont placées dans une boîte (1) externe rigide et qui sont chacune pourvues d'un orifice d'accès indépendant (2, 3), **caractérisé** par l'utilisation d'un conteneur élastique divisé en deux parties par une paroi (8) de séparation, élastique et imperméable, de telle sorte que l'une des chambres (9) absorbe la même quantité de liquide usagé que la quantité de liquide de traitement délivrée par l'autre chambre (10) au même moment.

2. Un dispositif de traitement selon la revendication 1, **caractérisé** en ce que lesdits orifices d'accès (2, 3) diffèrent l'un de l'autre dans leur taille.

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3. Un appareil de traitement suivant la revendication 1, **caractérisé** en ce que lesdits orifices d'accès (2,3) sont fermés par des couvercles de couleurs différentes.

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4. Un appareil de traitement suivant la revendication 1, **caractérisé** en ce que ledit conteneur interne élastique est recouvert par une pellicule tampon (18, 19).

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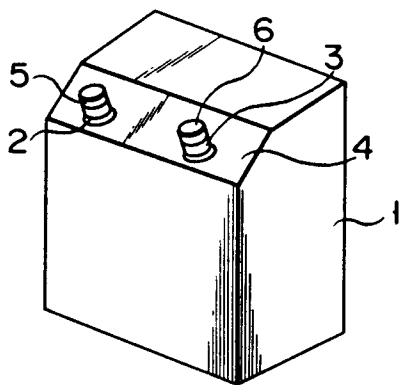


FIG. 1

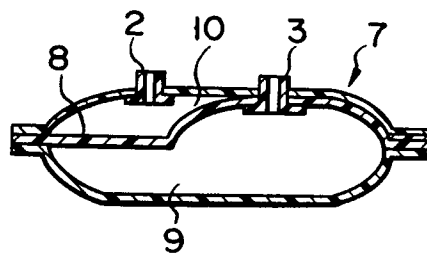


FIG. 2

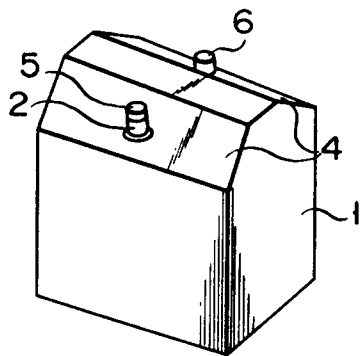


FIG. 3

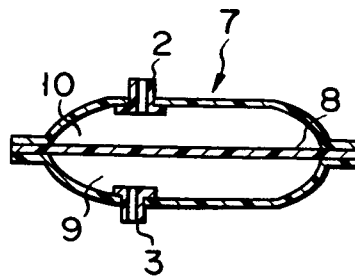


FIG. 4

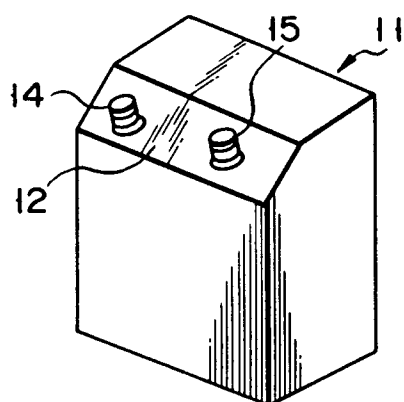


FIG. 5

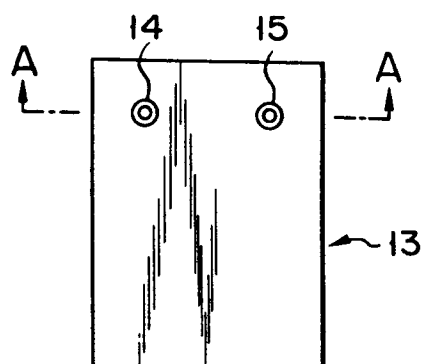


FIG. 6

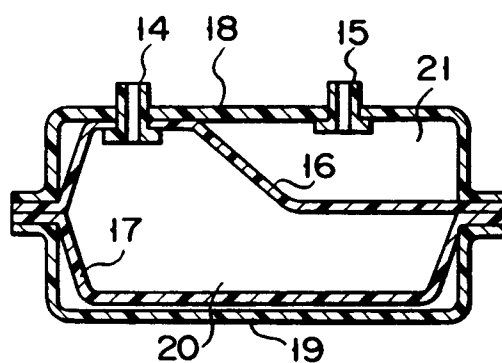


FIG. 7

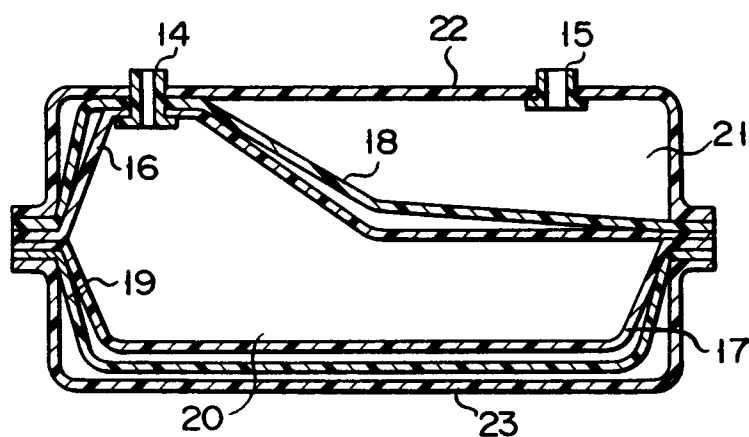


FIG. 8