

ABSTRACT

Temporary pad printing on even outer surface of a glass container, removing temporary print from its surface and again temporary pad printing on the even outer surface of same glass container.

This invention relates to temporary pad printing on an even outer surface of a glass container using organic ink with colour(s) and shade(s) of any quality and hardener, removing that temporary print from its surface and again doing temporary pad printing on the even outer surface of same glass container using organic ink with colour(s) and shade(s) of any quality and hardener. The process for removal of temporary printing from the surface of glass container comprises preferably five-stage treatment consisting of first washing the containers by passing through water at normal climatic room temperature; passing through a mixture of hot water between normal temperature to 60 degree C and 1-2.5% sodium hydroxide; passing through mixture of hot water at temperature in the range between 60-80 degree C and 2.5 to 7% sodium hydroxide and optionally in the presence of an additive like SU; passing through a mixture of hot water at the temperature between normal temperature to 60 degree C and 1-2.5 % sodium hydroxide, and finally with the water at normal climatic room temperature, wherein the water preferably used is soft water. Alternately any chemical which can remove the printed matter, may be used, in lieu of sodium hydroxide. The increase or decrease in temperature from one stage to another stage does not exceed 40 to 42 degree C and is very well within the permissible limits of thermal shock resistance to prevent cracking of glass surface.

ORIGINAL

CLAIM

1. A process for removing a temporary pad print printed on an even outer surface of a glass container having the steps of:-

removing temporary pad printed matter from the outer even surface of the glass container by a five stage process involving a first stage of washing with water at ambient temperature, second stage of passing the containers through a mixture of hot water at temperature upto 60°C and sodium hydroxide wherein the concentration of NaOH is 3-4%, third stage of passing the container through a mixture of hot water which is at temperature between 60-80°C and sodium hydroxide wherein the concentration of NaOH is 4-7%, fourth stage of washing with hot water at temperature upto 60°C and fifth stage of washing the containers with water at ambient temperature, temperature gradient from one stage to another not exceeding 40 to 42°C, wherein the temporary pad print having a mixture of organic ink/colours/shades, solvent and optionally a

hardner in which the ratio between ink/colours/shades and hardner is 5 : 0.01 to 2 by wt. and the solvent is in amount of 5 to 40%.

2. A process for removing a temporary pad print printed on an even outer surface of a glass container as substantially described and illustrated herein.

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FIELD OF INVENTION

This invention relates to a process for temporary pad printing/reprinting on an even outer surface of a glass container.

The invention has particular beneficial use for industries using glass containers for packaging their products. Such industries would like to use glass containers again and again for filling of different products or same product in order to save their capital investment. The invention is also useful for printing additional matter, wherever required, on even glass surfaces which may be bearing permanent printed matter by any methods like screen printing such as silk screening, Acl(Applied colour Labelling) method, etc. The additional matter, which may from time to time, be required to be printed on a glass surface, may be promotional ad 'like buy one, get one' or may be changed price whenever price change occurs, or may be picture logo relating to a forthcoming event like a festival. The invention is specifically very beneficial for the small scale industry with low capital investment who may like to use the same containers for different product, or use it for one product at one time and later use it for different product or to use the left-over stock of glass containers bearing temporary printed matter, for different product, by pad printing new matter relevant to the product to be later packaged therein.

PRIOR ART

Glass containers used for packaging generally bear printed matter, trademark, pictures, designs and the like. Such printed matter is generally relevant for a specific product packed in the glass container. There are different methods known in the art for decorating outer surface of a glass container by printing on the glass surface. These include screen printing like silk printing, ACL (Applied Colour Labelling), decal applying. Broadly speaking, these methods like silk printing, ACL, Decal Printing require that the colours used for printing should be thermally bondable to the glass to withstand handling of the container. The colours should not get partially or wholly removed by whatever type of rinse or detergent wash. The colours used for printing, therefore, generally incorporate special high temperature activated binders by which the colouring ingredients are bonded to the glass surface. Such heat activated binders are either inorganic such as ceramic like glass frit, as in the case of Applied Colour Labelling (ACL) or may be organic. An organic binder requires to be heated to about 350 to 550 degree F for bonding the colours to the glass surface whereas inorganic binders like glass frit require heating schedules over 800 degree F, more typically at 1100-1200 degree F.

In the silk screening method, the colours used for printing are generally in the form of a viscous paste. These are applied by pressing or squeezing on a stencil in the form of a fine screen, which is placed on the surface of the glass container. When the screen is separated from the container, the coloured printed matter remains on the container over the delineated area. For permanent bonding, the glass containers are subjected to heating process.

The offset printing process is generally used to apply organic colours.

In decal applying, the colours to be used for printing, are carried on a temporary backing sheet, which is generally paper, on to which the colour layer is adhered by wax. The colours generally used are inorganic. The other side of the backing sheet is also coated with a layer of wax or other suitable heat effective adhesive which enables temporary adhering of the colour layer to the glass container, prior to permanent bonding. On heating to 225 to 300°F, the decals get released from the backing and get temporarily adhered to the surface of glass container. On further heating to about 800°F, the printed matter in colour, gets permanently bonded to the glass container

The above methods have several disadvantages. A disadvantage of the above method is that the colours used for printing are costly.

Another disadvantage of the above methods is that after heating, the printed matter in colour, gets permanently bonded to the glass surface and become part of the glass.

Still another disadvantage of the above methods of printing, is that these methods require expensive equipment and machinery.

Further disadvantage of the above methods of printing is that matter once printed on a glass surface cannot be removed and therefore no change can be made to the matter already printed on the glass surface.

Still further disadvantage of the above methods is that these require heating chamber/lehar for heating to a high temperature for permanent bonding of coloured printed matter to the glass surface.

Yet further disadvantage of the above methods is that in case of change in the printed matter that may be necessitated for statutory warning, promotional ad or any policy guidelines laid down by Government, the existing stock of glass container would have to be discarded causing huge avoidable expenditure.

OBJECTS OF PRESENT INVENTION

An object of the present invention is to propose a process for temporary pad printing/reprinting on an even outer surface of a glass container, which may or may not be already bearing printed matter.

Another object of the present invention is to propose a process for temporary pad printing/reprinting on an even outer surface of a glass container, by removing the temporary printed matter thereon and reprinting the matter, which may be same or different.

Still another object of the present invention is to propose a process which is repeatable any number of times.

Further object of the present invention is to propose a process to minimize the cost in decoration of even outer surface of a glass container.

STATEMENT OF INVENTION

According to this invention there is provided a process for removing a temporary pad print printed on an even outer surface of a glass container having the steps of:-

removing temporary pad printed matter from the outer even surface of the glass container by a five stage process involving a first stage of washing with water at ambient temperature, second stage of passing the containers through a mixture of hot water at temperature upto 60°C and sodium hydroxide wherein the concentration of NaOH is 3-4%, third stage of passing the container through a mixture of hot water which is at temperature between 60-80°C and sodium hydroxide wherein the concentration of NaOH is 4-7%, fourth stage of washing with hot water at temperature upto 60°C and fifth stage of washing the containers with water at ambient temperature, temperature gradient from one stage to another not exceeding 40 to 42°C, wherein the temporary pad print having a mixture of organic ink/colours/shades, solvent and optionally a hardner in which the ratio between ink/colours/shades and hardner is 5 : 0.01 to 2 by wt. and the solvent is in amount of 5 to 40%.

Alternately any chemical which can remove the printed matter, may be used, in lieu of sodium hydroxide. The water inside the container is drained out and the required product is filled in the container and the mouth of the container is tightly closed so that the product filled therein does not come out while tilting or turning inside down during temporary pad printing. When the outer surface of the container becomes dry, the temporary pad.....

printing is done on the even surface of the glass container. For glass containers bearing permanent print by silk screening or by ACL method, printing of additional matter that may be required to be printed on the even glass surface, is carried out by temporary pad printing, removing it whenever required by the said process of removal, and the printing by temporary pad printing on the even outer surface of same glass container. For glass containers bearing temporary print, such printed matter is removed by the above process of removal of print and printing the matter that may be required to be printed by temporary pad printing on the even outer surface of the glass container. For glass containers bearing temporary print but requiring printing of only an additional matter, such additional print is done by temporary pad printing, and removed whenever required by the said process of removal and printing by temporary pad printing.

DESCRIPTION OF INVENTION

This invention proposes a process of pad printing using organic ink/colour(s)/shades(s), solvent and optionally a hardener, on even glass surface, of a glass container removing the printed matter and temporary pad printing.

The process is repeatable. The need for invention arises when a glass container is used for packaging a certain product but is likely to be later used for packing a different product or the left-over printed glass containers bearing temporary printed matter, which instead of being discarded, are to be later used for packaging a different product after removing the a matter already printed thereon and printing fresh matter pertinent to the product to be later packaged therein by temporary pad printing.

These situations demand that matter, if already printed in the surface of a glass container be removed and such removal is possible if original print is in temporary pad printing.

There may also be need for printing additional matter on the surface of a glass container bearing permanent printed matter that may be printed by methods like silk screening, ACL etc. Such additional printing may become necessary as a result of promotional scheme that may be launched by an industry, or for printing additional information like flavour change, addition of a flavour etc or for incorporation of an additional nutrient or for printing price changes, or for printing a logo picture relating to an important event/festival ect. For repeatability of the process, the additional printing is done in temporary pad printing to enable the printed matter to be removed and fresh matter to be printed whenever required.

For removal of temporary pad printed matter, for the purposes of reprinting fresh matter, such removal of print is carried out by preferably a five-stage process consisting of

a first stage of washing with water at ambient temperature, second stage of passing the containers through a mixture of hot water at temperature upto 60°C and sodium hydroxide, third stage of passing the container through a mixture of hot water at temperature between 60-80°C and sodium hydroxide, fourth stage of washing with hot water at temperature upto 60°C and fifth stage of washing the containers with water at ambient temperature, temperature gradient from one stage to another not exceeding 40 to 42°C, the concentration of sodium hydroxide during said second stage is 3-4% and concentration of sodium hydroxide during said third stage is 4-7%.

Alternately any chemical which can remove the printed matter, may be used, in lieu of sodium hydroxide. The care is taken that the temperature difference between two stages does not exceed 40 degree C to degree C and is within the permissible limit of thermal shock resistance for glass containers to prevent cracking of glass surface. By this treatment, the matter already printed on the outer even surface of a glass container, by pad printing gets removed. Removal of printed matter optionally includes step of scrubbing, blowing, steaming, wiping for removal of any stubborn matter on the surface of glass container, before subjecting to five-stage removal process or after five-stage removal process.

After removal of printed matter as above, the liquid, if any, inside the container is drained out. The container is then filled with the desired product to be filled therein and the mouth of the container is tightly closed so that the product packaged in the container does not come out during tilting or turning upside down. When the outer surface of the glass container, becomes dry, temporary pad printing of the required matter is done on the outer surface of the glass container by pad printing machine.