

Title: Closure for container

The invention is directed to closures for containers, said closures having an image present on one of its surfaces.

As is well known, closures for containers, such as crown corks, screw caps and flip caps, are often provided with some kind of printing. For example, crown corks tend to have a print distinguishing the trademark of the producer, or some other distinguishing print. Metal closures also are commonly provided with some image, for example instructions for opening or identification of the content of the container. Due to the nature of the material, plastic closures are seldomly provided with high quality imprints, because it is rather expensive to provide a high quality image on a plastic surface.

The provision of an image on metal closures is generally done by off-set printing a lacquer image onto the surface of the metal sheet from which the closures are then prepared, usually by cutting and stamping. Due to the nature of the technique it is customary to produce large numbers of closures having the same imprint. Changing the image is quite laborious and time consuming, as the print plate for each colour needs to be cleaned. Moreover, for multicolour (>2 colours) applications a second production run is needed, as usually a maximum of two print plates is used per run.

As a consequence it is customary to produce large numbers of metal closures, having the same image, at the same time, with a limited numbers of colours.

Images on plastic closures are usually applied by some form of screen printing. Screen printing is a laborious technique, slow and expensive, and accordingly not often used in multicolour applications (>2 colours). Screen printing, even in the highest quality, usually only produces an image

of, at most, reasonable quality on a plastic surface of a closure.

With metal closures there is the additional problem that due to the method of production by cutting, rolling
5 and/or and stamping, the image or part of the image may become damaged due to the machining of the metal. This problem has been overcome by using a high quality lacquer, but this adds to the costs of the product. It could be a great advantage if the image could be applied on the finished
10 closure instead of on the starting material.

It would be highly desirable if it would be possible to provide closures with varying images, at relatively low cost, using short production runs, i.e. frequent change-over of image. This would make it possible to provide the closures
15 with images, not only identifying the contents, optionally also containing short term promotional markings.

Further, it would also be highly desirable in case it would be possible to provide a high quality, durable image on a closure at relatively low cost, using simple techniques.

20 There is also a need, as indicated above, for a method to apply a high quality image on a plastic closure, as up to now it is only possible to provide images of low quality at relatively high cost on plastic closures.

The present invention provides a solution to the
25 above given desiderata, which solution is based on the use of image transfer techniques on said closures.

Accordingly, the invention is directed to a closure for a container, comprising a closure member having at least one surface, having provided at such surface an image
30 provided by an ink only label, said image at least consisting of an adhesive layer and an image layer. Optionally, a protective layer is provided on top of said image layer. An image may be applied on one surface or on two surfaces of the closure.

35 In the context of the present invention the term image transfer is used in one embodiment as a labelling

system, wherein a removable backing layer is reverse printed with a suitable ink and subsequently overprinted with adhesive. Important in the image transfer technique is the absence of a transparent or opaque supporting film on the image, once it has been transferred to the surface. At that stage, the image (label) only consists of adhesive, ink materials, optionally with a clear protective coating. A general disclosure of this technique is for example disclosed in WO-A 9005088 and WO-A 9005353. Other embodiments of the image transfer system are disclosed in WO-A 9734810, WO-A 0735292, WO-A 9735291 and WO-A 9735290, the contents of all six applications is incorporated herein by way of reference.

In accordance with the invention the images can be transferred to the closures in any suitable stage of the manufacture of the closures. Generally, it will be preferred, in the case of metal closures, to apply the images on the, optionally precoated, metal sheet, before cutting and stamping into closures. It has been found that by suitable selection of the adhesive and image materials, it is possible to cut and stamp the closures from the sheets, without damaging the image materials. Generally, the resilience of the image materials, ink and adhesive, optionally combined with protective layer, is such that it is even possible to apply the image on the skirt of crown corks, or on the edges of covers, without damaging the quality thereof. In the case of plastic closures, the most suitable moment of applying the image on the closure depends on the nature of the manufacturing process of the closure. In the case of deforming of the closure, such as with lids for bread spread cups, by drawing of a plastic sheet, it may be possible to apply the image prior to manufacture on the plastic sheet. In other situations the image will generally be applied on the finished product.

As indicated above, the image transfer process as such is known from various publications. However, up to now

it has never been disclosed for use in relation to closures for containers, with the advantages thereof as discussed above.

In general the closures to be contemplated within the scope of this invention are all closures for containers on which an image can be applied by image transfer as defined herein. Examples are pry-off crown corks, metal or plastic screw caps, metal or plastic flip caps, metal or plastic rip caps, corks, metal or plastic twist off caps, metal or plastic foil or film closures and ceramic or plastic cap stoppers. The material of the closure can be selected freely, but preferred are metal and plastic closures, but also ceramic, glass, wood, cork and rubber closures can be used herein.

Detailed description of the invention

The preferred embodiment of the label and application according to the present invention will be described first with references to the figure which shows the closure member surface (1) and the label positioned for application. The label is printed on a film substrate (10) which may be any thin film, preferably oriented polypropylene or polyester. (14) is a protective coating which may or may not be employed, depending on the type and source of the film available. (12) is a release material which coats the film. It may be silicone which is generally applied after the film manufacture. (20) represents all the printed ink material, which may be permanent or removable. Depending on the label graphics and opacity requirements the ink materials may be as many as five (5) different colors in one or more layers, some of which may overlay another. (30) and (40) represent two (2) layers of adhesive depending on the labelled surface uniformity and rigidity of the closure being labelled. It is also possible to use only one adhesive layer.

Upon application, all of the printed materials are transferred from the release coated film substrate. The printed ink materials can be vinyl, acrylic or urethane resin based, colored with pigments. The printed adhesive can be a urethane modified acrylic, heat activatable adhesive or any other suitable heat activatable adhesive. For heat activatable adhesive to achieve and maintain tack quickly it may be necessary to heat the closure before the label adhesive is in contact with it. It is also possible to use a pressure sensitive adhesive.

Many options are available for heating. Hot air, additional flame heaters, gas fired infra-red panels and electric ceramic panels can all be used.

The method of label application whereby the printed ink materials are transferred from the film substrate to the closure surface, utilises the tactile characteristics of the adhesive to overcome the bond of the ink layer 14 to the coating 12.

Many silicone coated polymer films may be used for the printed substrate.

Conventional nip rollers and stepping motor are used to advance the film to the next label and position it accurately, using a printed mark to trigger an optical scanning device.

Protection of the ink against scratching by casual handling as well as insuring its weatherability when subjected to outdoor storage may be achieved with the application of a coating, such as an acrylic based wax water emulsion. This is applied by a roll applicator which is supplied from a wet roller with a controlled amount of coating. The coating extends well past the edges of the ink pattern and seals the edges from intrusive moisture. It is also possible to have a protective coating present already on the transfer label.

Claims

1. Closure for a container, comprising a closure member having at least one surface, having provided at said surface an image provided by an ink only label, said image at least consisting of an adhesive layer and an image layer.
- 5 2. Closure according to claim 1, wherein said label is further provided with a protective layer on top of said image layer.
3. Closure according to claim 1 or 2, wherein said adhesive is selected from the group of pressure sensitive
10 adhesives and heat activatable adhesives.
4. Closure according to claims 1-3, said closure being selected from the group of metal closures, plastic and ceramic closures.
5. Closure according to claim 4, said closure being
15 selected from the group of crown corks, metal or plastic screw caps, metal or plastic flip caps, rip caps, corks, twist off caps and ceramic cap stoppers.