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Rétegelt címke újrahasznosítható tartályokhoz

Az európai szabadalom ellen, megadásának az Európai Szabadalmi Közlönyben való meghirdetésétől számított kilenc hónapon belül, felszólalást lehet benyújtani az Európai Szabadalmi Hivatalnál. (Európai Szabadalmi Egyezmény 99. cikk(1))

A fordítást a szabadalmas az 1995. évi XXXIII. törvény 84/H. §-a szerint nyújtotta be. A fordítás tartalmi helyességét a Szellemi Tulajdon Nemzeti Hivatala nem vizsgálta.

LAYERED LABEL FOR REUSABLE CONTAINERS

Description

The invention relates to a label which can be bonded to an object, more particularly to a reusable container, by means of wet glue, and which comprises an oriented plastics film, which, for removing the label, shrinks away from the object under the influence of heat.

A label of this kind is known from EP 0 951 004 A2. The label disclosed therein, which can be bonded to reusable bottles, shrinks back under the influence of heat, for example in a drinks bottle washing system, such that the holding power of the adhesive layer is overcome and the label detaches from the bottle, starting from the edge. The adhesive can also be wet glue, *inter alia*, as is conventionally used for gluing labels on drinks bottles. In the drinks industry, wet glue is preferred for gluing on labels, since labelling machines that are usually already available can be used for this purpose, while the use of self-adhesive labels, such as those known from EP 0 510 403 A1, require the use of specific labelling machines.

Paper labels are particularly suitable for wet gluing. After labelling, the water in the glue escapes through the paper pores, and, for removal, the washing water permeates the paper and dissolves the glue again.

In the drinks industry, plastics labels are also becoming increasingly important because they can be printed in a more precise and varied manner, have a glossy surface and are suitable for "no-label-look" applications, in which highly transparent film labels make it possible to view the bottle or the contents at the points at which said labels are blank.

However, processing plastics labels of this kind using wet glue is not without problems, since the wet glue only adheres poorly to the plastics material and it is particularly difficult for the water to escape immediately after labelling. If attempts are made to roll or massage the labels onto the object in order to increase the initial adhesive strength or to press out air bubbles and foam at the side, the label may move slightly.

For paper labels, the wet glue is often applied in a linear pattern in order to save on glue and to make it possible for the washing liquid to enter more rapidly between the label and the object. This linear pattern affects the appearance when transparent films are used and makes the above mentioned "no-label-look" application impossible.

Since plastics films are significantly less air-permeable than paper labels, bubbles form particularly easily under the plastics film.

Films which are both capable of shrinking and can absorb moisture are not available.

US 2001/0036542 A1 discloses a wet glue label based on a multilayer, metallised plastics film label. The label to be adhered onto a container, for example a bottle, using wet glue comprises biaxially oriented opaque films, of which at least the film on the glue side is formed as a foamed porous layer. The porous layer absorbs moisture from the wet glue and as a result improves the moistening and adherence of the wet glue to the label.

The problem addressed by the invention is therefore that of providing a label of the type mentioned at

the outset which can be rapidly and securely fastened to an object, in particular to a reusable container, for example a drinks bottle, by means of wet glue, and can be later removed again therefrom without difficulty.

This problem is solved according to the invention by the features specified in claim 1.

According to the invention, it is proposed to design the label of the type mentioned at the outset such that either it is provided, on its glue side, with a layer that absorbs the moisture from the glue, or it forms this layer. Said moisture-absorbing layer accelerates the drying of the glue after labelling and prevents the label from slipping immediately after labelling. When washing off the label, this layer absorbs washing water and facilitates the entry of water into the glue in order to dissolve it.

The layer that absorbs the moisture from the glue has swellable properties, with the aim of extracting the glue moisture as rapidly as possible from the glue.

The label can be textured on the glue side thereof in a way that increases the surface area. The increase in surface area on the glue side, also referred to below as the underside of the label, provides the wet glue with a gripping surface that is large enough for the label to adhere sufficiently to the object even immediately after labelling. Existing wet glue-labelling apparatuses can optionally be used for the labelling. For removal in hot washing liquid, for example in the liquor that is conventional in the drinks industry, the film shrinks back and detaches from the object, starting with the edges, the increased surface area of the underside of the label promoting the entry of the washing liquid.

In order to achieve this increase in surface area, the glue side of the label can be roughened mechanically or chemically or can be embossed or finely embossed in a way that increases the surface area; in this case an embossing depth of $< 200 \mu\text{m}$ is preferred, which can be approximately the thickness of the plastics sheet. Such a small embossing depth is sufficient to achieve the desired improved adhesion for the wet glue, but is also hardly visible when filled with wet glue and can also optionally be combined with the above-mentioned "no-label-look" applications.

The embossings can preferably form a ridge and groove pattern, it being possible for the width of said ridges and grooves to be $< 1 \text{ mm}$ and $< 2 \text{ mm}$, respectively. The ridge and groove pattern facilitates the penetration of the washing liquid under the label and accelerates the removal process.

The embossing depth, the groove width and the thickness of the plastics film can be selected such that either the upper side of the film remains substantially smooth while the underside carries the ridge and groove pattern, or the film is undulated on the upper side too if the grooves are selected so as to be particularly deep and wide in order to form channels for the glue moisture and washing liquid to pass through.

In one embodiment, the side of the label that is textured in a way that increases the surface area is itself formed by the oriented plastics film, thus making any intermediate layers between the plastics film and the wet glue unnecessary in a cost-effective manner. However, this does not exclude the provision of additional layers on the upper side of the label facing away from the wet glue, such as a decorative imprint, laminate layer, additional shrink film layers, etc.

Alternatively, a rough and matt paint layer can be provided on the glue side of the label, which layer provides the desired increase in surface area of the glue side. Said paint layer can be at least part of a decorative imprint applied to the underside of the oriented plastics film.

The label is preferably extensively perforated in an air-permeable or steam-permeable manner, in particular is needle punched, in order to facilitate the drying of the glue and the egress of air bubbles and foam

and to promote washing liquid penetrating the glue layer for subsequent removal again.

The oriented plastics film can generally be designed such that it shrinks by about 25 to 50 % at the temperatures used for the removal. In the drinks industry, the liquor (dilute sodium hydroxide) typically has a temperature of from 60 to 90 °C. This is sufficient to remove the label from the object without mechanical support in the form of brushes, high-pressure jets, etc. Films which shrink by 70 to 80 % at 120 to 130 °C are also possible for removing the label, for example using hot air, thermal radiation or superheated steam.

The oriented plastics film can carry an imprint on the underside thereof which faces the glue or on the upper side which faces away therefrom. The decorative imprint on the top face can be covered by a laminate layer in a protective manner.

The oriented plastics film preferably has a thickness of from 50 to 80 µm. The wet glue is preferably extensively applied at a thickness of from 20 to 50 µm. In this case, the quantity of glue used can be reduced by 50 % compared with paper labels. In principle, a partial glue application, for example in stripes or in a dot pattern, is sufficient, although the glue has to be applied over the entire surface area for "no-label-look" applications.

In addition, the labels according to the invention can be inexpensively produced and can be glued and removed simply.

The invention will be described in the following with the aid of embodiments and with reference to the accompanying drawings.

- Fig. 1 is an axial longitudinal section through a cylindrical bottle wall comprising a glued-on label of a first embodiment;
- Fig. 2 is a longitudinal section similar to Fig. 1, but with the label detaching;
- Fig. 3 is a cross section through a second embodiment of a label;
- Fig. 4 is a cross section through a third embodiment of the label
- Fig. 5 is a cross section through a fourth embodiment of the label.

Fig. 1 schematically shows a label 1 which can be used within the context of the invention, comprising a shrinkable oriented plastics film 3 as a substrate, the side 5 of which facing an object G (in this case for example a cylindrical drinks bottle) is textured so as to be increased in surface area, and said side in turn being in contact with wet glue 7 which holds the label 1 on the object G. The main direction of stretch R of the monoaxially or biaxially oriented film 3 extends in the axial direction A of the cylindrical object. To remove the label, it is heated and exposed to moisture (for drinks bottles typically dilute sodium hydroxide at 60 to 90 °C), as a result of which the film 3 shrinks in its main direction of stretch R' and the glue 7 partly dissolves, starting from the edge, such that the label gradually detaches from the object G, starting from the axial edge, as shown by the arrows P in Fig. 2.

All common film materials are possible as materials for the thermally shrinking plastics film 3, but in particular PET (polyethylene glycol terephthalate), PS (polystyrene) and PVC (polyvinyl chloride) or even PP (polypropylene), with a shrinkage of from 20 to 50 % of its original size occurring during removal, though additional degrees of shrinkage are also possible. Although for cylindrical drinks bottles the axial direction A thereof is preferred as the main direction of stretch R for the shrinkable film 3, other extension orientations are also generally possible, for example in the circumferential direction of the cylindrical object G or obliquely thereto, depending on the thickness or adhesive strength of the wet glue used, the shrinkage force of the label

material and a potential radius of curvature of the object G to be labelled.

Wet glue is understood here to mean a water-soluble, animal, plant or synthetic polymer, in this case with water as the solvent, in particular according to DIN 16920, for example casein-based glues or those based on synthetic raw materials, in particular those having high initial adhesive strength and transparency.

Fig. 3 is a cross section through a second embodiment of a label 1A that can be used within the context of the invention. Similarly to Fig. 1, the glue side or underside 5 of the oriented plastics film 3 is designed so as to increase the surface area, in this case by means of finely embossed ridges 5a and grooves 5b, the width R of the ridges 5a in this case being < 1 mm and the width of the grooves N being < 2 mm, at a groove depth T of < 200 μm , as shown in the enlarged detail in Fig. 2. Although in the glued state the grooves 5b are completely filled with glue 7 so as to be invisible from the outside, during the removal process they can open to form channels which promote water ingress to the underside of the label and thus to the glue.

The underside 5 of the film can also be roughened mechanically or chemically.

In this embodiment, the upper side of the oriented plastics film 3 is provided with an imprint 9, which in this case can be again covered by a laminate film 11. This label structure is also suitable for "no-label-look" applications.

In addition, the entire label 1A can be perforated with a plurality of for example needle-punched holes 13, which are intended to facilitate the passage of the moisture to and from the glue 7. This variant is possible in particular for non-"no-label-look" applications.

Fig. 4 shows an embodiment of a label 1B according to the invention having a similar layer structure to that of Fig. 3, though the oriented film 3 is provided with a swellable layer 15 on the glue side, which layer withdraws moisture from the glue 7 immediately after labelling and thus improves the adhesive action.

The material of the layer 15 can also be selected such that it partially dissolves due to the glue moisture and forms a blending zone 17 with the glue in which the glue 7 and the material of the layer 15 are mixed (shown on the right in Fig. 4). Suitable materials are, for example: water-based paints, polyvinyl alcohol and derivatives thereof (including in particular acetate), cellulose and derivatives thereof (including cellophane), polylactic acid and derivatives thereof, starch and derivatives thereof and casein, which has already been mentioned.

Fig. 5 shows another embodiment of a label 1C, the orientable plastics film 3 of which is in this case provided with an imprint 9 on the glue side or underside of the label, and to which film a matt paint layer 19 is again applied. The matt paint 19 inherently forms a rough surface 5 in order to increase the contact surface with the glue 7. The imprint 9 is protected by the oriented film 3. The matt paint layer 19 can form a visual background for the imprint 9.

In addition to the embodiments described, additional layers made of orientable or non-orientable plastics film, laminate film, paper, imprint material or the like can be arranged above or/and below the orientable plastics film 3 or the laminate film 11 or the swellable layer 15.

In all the embodiments, in particular the first and second embodiment, the oriented plastics film 3 can itself be alternatively or additionally produced from a swellable material, such as polylactic acid.

RÉTEGELT CÍMKE ÚJRAHASZNOSÍTHATÓ TARTÁLYOKHOZ

SZABADALMI IGÉNYPONTOK

1. Címke, amely egy tárgyra (G), különösen egy újrahasznosítható tartályra vízes enyvvel (7) ragasztható, és amely olyan húzott műanyag filmet (3) tartalmaz, amely a címke (1, 1A, 1B) tárgyról (G) történő leválasztásához hő hatására összezsugorodik, **azzal jellemezve**, hogy a címke (1, 1A, 1B) az enyv felőli oldalán (5) egy, az enyvből (7) a nedvességet felvevő és duzzadóképes réteggel (15) van ellátva, és/vagy a húzott műanyag film (3) önmagában egy, az enyvből (7) a nedvességet felvevő és duzzadóképes réteg.
2. Az 1. igénypont szerinti címke, **azzal jellemezve**, hogy az enyvből a nedvességet felvevő réteg (15) az enyv nedvessége révén feloldódik és az enyvvel (7) egy keverékzónát (17) alkot.
3. Az 1. vagy 2. igénypont szerinti címke, **azzal jellemezve**, hogy a nedvességet felvevő réteg (15) polivinil-alkoholból vagy származékaiból, különösen acetátokból, cellulózból vagy származékaiból, politejsavból vagy származékaiból, keményítőből vagy származékaiból, vagy kazeinből álló vízalapú lakkból van kialakítva.
4. Az előző igénypontok bármelyike szerinti címke, **azzal jellemezve**, hogy a húzott műanyag film (3) 60-90°C közötti hőmérsékleten 25-50 %-kal, és/vagy 120°C-nál magasabb hőmérsékleten 70%-nál nagyobb mértékben zsugorodik össze.
5. Az előző igénypontok bármelyike szerinti címke, **azzal jellemezve**, hogy a húzott műanyag film (3) az enyv (7) felőli alsó oldalán, vagy azzal átellenes felső oldalán egy rányomatot (9) hordoz.
6. Az 5. igénypont szerinti címke, **azzal jellemezve**, hogy felül fekvő a rányomat (9) esetén az egy fedőréteggel (11) van bevonva.
7. Az előző igénypontok bármelyike szerinti címke, **azzal jellemezve**, hogy a húzott műanyag film (3) azon az oldalán, amelyik a tárgytól (G) eltérő irányba néz legalább egy további réteggel (11), különösen egy lényegében nem-zsugorodó réteggel (11) van ellátva.
8. Az előző igénypontok bármelyike szerinti címke, **azzal jellemezve**, hogy a címke (1A) légáteresztő vagy gőzáteresztő furatokat (13) tartalmaz, amelyek a címke anyagába vannak préselve vagy lyukasztva.
9. Az előző igénypontok bármelyike szerinti címke, **azzal jellemezve**, hogy „láthatatlan címke” („No-Label-Look”) formában van kialakítva.
10. Az előző igénypontok bármelyike szerinti címke, **azzal jellemezve**, hogy a címke az enyv felőli oldalán (5) felületnövelő módon van kiképezve.
11. A 10. igénypont szerinti címke, **azzal jellemezve**, hogy a címke (1, 1A) enyv felőli oldala (5) felületnövelő módon mechanikusan vagy kémiai úton érdesített, vagy domborított vagy finom-domborított, vagy a címke (1C) enyv felőli oldala (5) egy durva vagy matt lakkréteggel (19) van ellátva.

Fig. 1

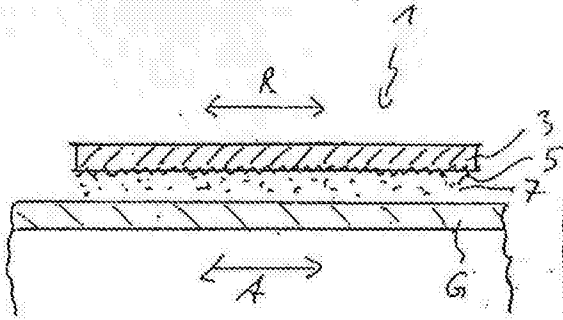


Fig. 2

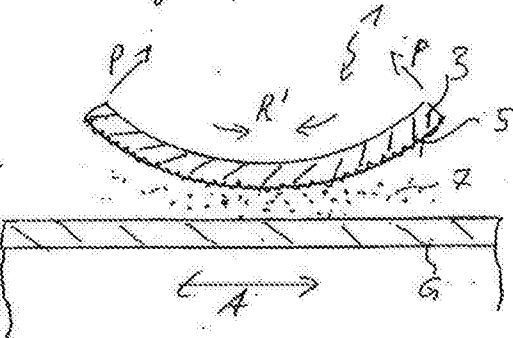


Fig. 3

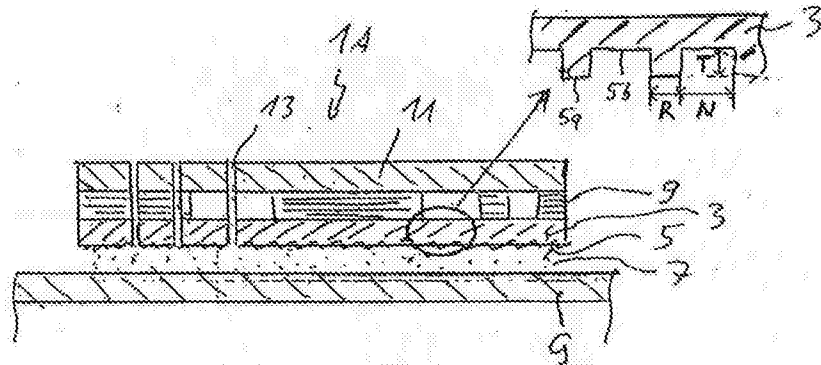


Fig. 4

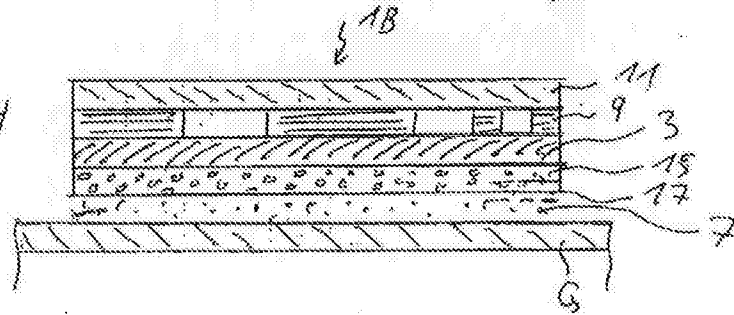


Fig. 5

