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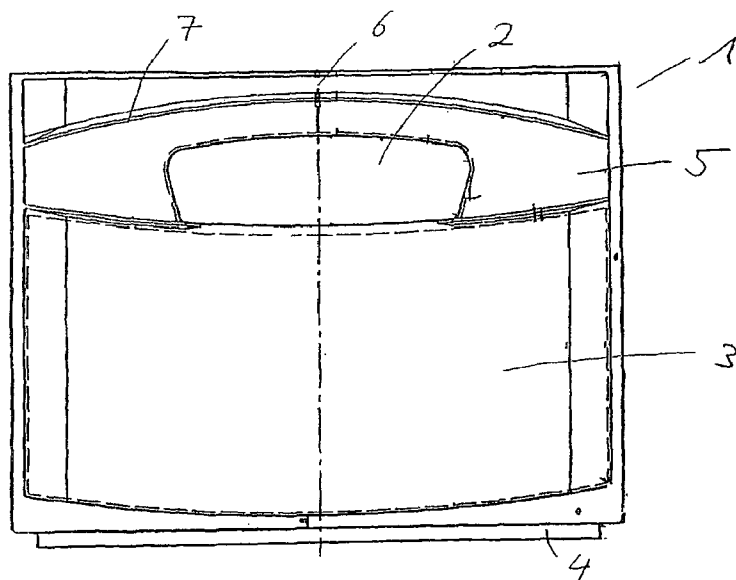
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(57) **Abstract:** The invention relates to a method for producing a plastic container, in addition to a corresponding plastic container, in particular a bottle crate (1). Said container comprises a base (4) and/or container walls (3), which are configured from at least one first plastic. At least one section (5), consisting of a second plastic that is different from the first, is provided on the base (4) and/or the container walls (3), said first and second plastics being rigidly interconnected by a material union and/or positive fit.

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A Two-Component Plastic Container

The present invention relates to a plastic container in accordance with the preamble of claim 1 and further relates to a method of producing a plastic container.

Plastic containers have versatile uses in a great many areas of everyday life. Apart from the usual functional purposes which such plastic containers are required to fulfil, such as acting as a reliable receptacle for specific objects, for example bottles in a crate, this kind of container must increasingly meet further demands that are, in addition, more complex as a result. In this way, the original function as a receptacle is being supplemented by the need to meet demands regarding ease of use, convenient handling and the overall aesthetic appearance, particularly in those instances in which the container is itself on sale or functions as sales packaging, such as is the case with crates for transporting and/or storing bottles. This entails the simultaneous compliance with a whole host of requirements, which to an extent conflict with one another. For example, the aforementioned type of crate is expected to meet not only demands relating to the ease of manufacture, heavy-duty use, reliable retention of bottles etc., but also requirements in terms of attractive design and convenient handling, such as are met, for instance, by the well-known dividable crates with regard to their ease of carrying.

Nevertheless, tight restrictions are placed on the design options, especially when economically viable manufacturing and the requisite everyday heavy-duty use are taken into account. In this way, for example, the prior art makes it possible to achieve the required heavy-duty nature in that crates for transporting and/or storing bottles, in particular, are to be produced from a single material, with the crate then being produced from this material in an integral manner or as a result of bonding together several individual parts. In this case, there is very little leeway in terms of optimizing handling or creating the exterior design. As far as designing the external appearance is concerned, it is thus merely known on the basis of the prior art that crates should be printed with appropriate brand designations or symbols relevant to the particular brewery or beverage manufacturer. Furthermore, a few improvements to the structural design were made with regard to handling, such as designing the

handle area in a particular way or dividing the crate up into various sections that can be individually carried and then re-assembled to form a whole crate again.

Even though these design options do undoubtedly exist and although the handling of plastic containers, especially crates for transporting and/or storing bottles, has been improved in certain ways, the existing proposals are by no means adequate.

It is therefore the present invention's object to make available a plastic container, particularly a crate for transporting and/or storing bottles, which plastic container, while being simple to produce and offering a heavy-duty nature that can cope with everyday use, permits greater user convenience and better design scope.

The aforementioned object is solved by a plastic container comprising the features of claim 1 and by a method comprising the features of claim 15. The subject matter of the dependent claims represents advantageous embodiments.

The starting point for the present invention is the realization that the design options for a plastic container, particularly a crate for transporting and/or storing bottles, can be enhanced in every respect if the container is produced in a simple manner not only from a single plastic material, but if use can be made of different materials which exhibit varying properties, for example with respect to their physical and chemical properties such as elasticity, hardness, firmness, colour, etc. The use of at least one second or a plurality of additional different plastic materials does, of course, enable, on the one hand, a variety of designs and, on the other hand, makes it possible to use the suitable plastic in line with the requirements for different sections of the plastic container or crate. On the one hand, the wall regions of the plastic container, in particular, can thus be constructed from varyingly coloured plastic materials, thereby permitting aesthetic designs or colour-contrast areas for attaching labels or the direct formation of coloured labels by means of additional plastics. On the other hand, it makes possible the specific choice of plastic for different sections of the plastic container, for example by enabling a softer elastic plastic material to be provided in the handle region of a crate, this plastic material exhibiting soft touch characteristics. As specified by the invention, completely new design options are therefore opened up in the field of plastic con-

ainers, especially crates for transporting and/or storing bottles. This overcomes the prior art's previous restriction to a single plastic as regards a whole plastic container or crate or at least the prior-art restriction to a single plastic as concerns a plastic container's individual parts which are movably connected together. Instead, those members of a plastic container which are arranged in relation to one another in a rigid, tight-fitting or secure manner, particularly wall regions of a plastic container, can, in accordance with the present invention, likewise be made from different plastic materials. As a result, the design scope and range of possible applications for such a plastic container are substantially broadened. If the plastic is moulded on, in particular if it is sprayed on, the plastic may be the same material as that of the containers, though preferably this plastic material may exhibit other properties, for example transparency.

Although two or more plastics can form an integral or form-locked (positive) joint by means of various mould-on techniques, such as adhesive bonding, especially heat-sealing, sealing, clipping on, slipping on or the like, the preference is for the second plastic to be sprayed onto the first plastic (of which there is at least one), whereby the specific meaning of the term "spraying on" here is that the second plastic is applied to the first plastic as a coating which is thin, planar and preferably covers a large area.

Moreover, edge-like spraying is possible, for example with abutting edges, in order, for instance, to form a side portion with different materials, the wall portions with a different material adjoining one another with abutting edges. An interlocking engagement is possible so as to intensify the abutment. In this way, for instance, the side walls of a crate can have a transparent form, whereas the corner regions are opaque.

When a spray-on technique is used to apply the second plastic as a planar, thin coating, the sprayed-on plastic preferably has a layer thickness of several millimetres; in particular, the layer thickness of the sprayed-on plastic ranges from 0.1 mm to 10 mm and preferably ranges from 0.5 mm to 5 mm.

The plastic sprayed on in a planar manner can, preferably be sprayed not only on one side of the container wall, but on both sides as well, and in particular here on both sides within the

region of a handle recess, thus obtaining a handle member composed of the second plastic, this handle member comprising just a thin coat of the sprayed-on plastic.

The use of a suitable material is thus able to enhance considerably the ease with which a plastic container, especially a crate for transporting and/or storing bottles, is carried, if an elastic and soft material is chosen as the sprayed-on plastic that is used to make the plastic coating in the handle region. In this case, a soft touch is obtained, which results in pleasant carrying characteristics.

The second plastic is preferably sprayed onto the first plastic within a region that is bordered by a sealing strip, to be precise either by a protruding sealing lip or a sealing groove protruding into the first plastic. These measures make it possible to demarcate the sprayed-on region clearly and so permit neat, well-defined terminating edges for the sprayed-on plastic.

The spray-on region for the second plastic may contain ribbed or lamellar structures which increase, on the one hand, the rigidity or firmness of the plastic container composed of the first plastic, whereby filling up with the second plastic can then, in turn, obtain a smooth, clean surface that likewise increases the user's ease of carrying especially within the region of the handle recess whenever the user has to take hold of the plastic container in this region. Furthermore, this manner of interlocking the sprayed-on second plastic with a ribbed or lamellar structure or with apertures provided in the first plastic member serves to increase the adhesive strength of the second plastic on the first plastic. The apertures, which may be provided, for example, in the region of the ribbed structure too, ensure that a plastic applied on both sides is readily anchored on the first plastic. In addition, further means for interlocking the two plastic materials, such as mutually engaging ribs, teeth or the like, may be analogously provided for this purpose. This is nonetheless beneficial not only for an integral joint between the first plastic and the second plastic as a result of spraying the second plastic onto the first plastic, but also if the other, aforementioned bonding techniques are used.

A particular preference is for a runner to be provided within the first plastic, especially when a second plastic is sprayed on in the region of a handle recess, for example in the region of the handle web, through which the second plastic can be injected. This has proved

particularly effective when the plastic is to be sprayed on both sides of the handle recess and the injection mould encloses the container wall from both sides. The provision of a runner in the first plastic then makes it possible to apply the second plastic simply from above without having to provide a corresponding runner on the injection mould. In this case, of course, the runner outlet ports are located in the regions on both sides of the container wall that is to be coated with the second plastic.

An important aspect of the present invention for which protection is, of course, claimed too, represents an embodiment of a handle member having a second, particularly softer and more elastic material which makes it particularly convenient to carry the container (crate) as a result of the handle's special touch characteristics.

In such an embodiment, it is also advantageous if the surface of the handle member or handle recess is additionally adapted to the shape of the hands, with a substantially smooth surface being preferred.

The aforementioned differences between the first plastic (of which there is at least one) and the second plastic (of which there is at least one) may refer to any chemical and/or physical properties, especially to hardness, stretch, toughness, colour, composition and the like.

The preferred application of the second plastic onto the first plastic by means of spraying is effected in accordance with the invention in a simple manner in that a semi-finished product, i.e. a finished plastic container or corresponding container part composed of the first plastic is positioned in relation to an injection mould such as to produce a cavity into which the second, different plastic can be injected. The cavity can be made available either by the injection mould per se, with the container or container part composed of the first plastic then being positioned inside this injection mould, or the container or container part composed of the first plastic is itself part of the injection mould, which causes the cavity to be produced between the injection mould and the first plastic. Once the second plastic has been injected into this cavity, the finished container or container part can be released from the injection mould, provided that the second plastic is already dimensionally stable and adheres to the first plastic in a sufficiently secure manner.

Further advantages, characteristics and features of the present invention will be explained in the following detailed description of a preferred exemplary embodiment on the basis of the attached drawing. The sole, purely schematic drawing depicts a side wall of a crate for transporting and/or storing bottles as specified by the invention.

The side view depicted in the sole figure shows a side wall 3 of a crate 1, in which crate a handle recess 2 is provided within the side wall 3. Furthermore, part of the base 4 of the crate 1 can be seen in this side view.

The crate 1 or the side walls 3 and the base 4 are made from a material that is commonly used to make the aforementioned type of crate, such as polyolefin, polyethylene or polypropylene. The crate can be made integrally from this material or multi-sectionally as a result of bonding corresponding individual parts.

In accordance with the invention, a planar region 5 that is positioned at least to an extent around the handle recess 2 is provided on the crate 1 at the side wall 3; it is into this planar region 5 that a further plastic, which differs from that plastic or those plastics from which the side walls 3 or the base 4 are made, is injected. Since, in the exemplary embodiment depicted, the region with the second, sprayed-on plastic not only extends across the outside of the crate 1, but also encloses the inside area of the crate and the lateral and upper boundaries of the handle recess 2, the second, sprayed-on plastic region 5 forms a handle member which additionally extends in a planar fashion along the outer and inner surfaces of the side wall 3.

In the present, preferred exemplary embodiment, this second plastic exhibits rubber-like characteristics, and therefore has soft touch characteristics as a result of the greater elasticity and lower firmness or hardness. This considerably enhances the ease with which the crate may be carried, because whoever carries the crate encounters a handle that is soft and pleasant to touch. The large-area application within the region 5 on the side wall 3, moreover, gives rise to a design feature which lends the crate an attractive appearance, especially when the second plastic is colour-contrasted with the first plastic.

To facilitate spraying on the second plastic within the region 5 and to ensure in particular a neat outward appearance, the spray-on region 5 is demarcated by a wrap-around sealing strip 7 which is designed, in the present exemplary embodiment, as a web that protrudes slightly from the side wall 3. This web 7 makes sure that when an injection mould is positioned above the side wall 3, a seal is produced by the web 7, so that the plastic to be sprayed on is positioned in the region 5 alone. This ensures both ease of manufacture and a top-quality appearance. This sealing measure is essential if a clear-cut demarcation is to be obtained between the two plastic surfaces or plastic compounds, since the sprayed-on melt is liquid and the aim is to stop the molten plastic from spreading to other surface areas of the crate. It must be borne in mind here that the spray-on process occurs under pressure. Instead of a sealing strip, any other suitable sealing edge, shoulder or recess can be used, too, provided it is suitable for ensuring that the melt can emerge or spill over via the region chosen for spraying. The sealing lip, edge, rib or groove may have any kind of contour, for example it may be at an angle (bevelled) or curved relative to the remaining planar area, provided that it is at any rate ensured that the sprayed-on plastic compound is divided into clearly defined chambers across the desired mould-on region.

In the depicted exemplary embodiment, moreover, there is formed at 6 within the side wall 3 a runner which has its inlet port at the upper side of the side wall 3 and its outlet ports in the region 5 on the inside and outside of the side wall 3. This easily makes it possible for an injection mould, for example in the shape of a plate that terminates with the sealing strip 7, to be mounted on the inside and outside of the side wall 3, and for the second plastic that is to be sprayed on to be injected from the upper side of the side wall 3. This second plastic then fills up the space between the injection mould or moulds, in the shape of a plate which juts out, and that region 5 of the side wall 3 which is set back with respect to the sealing strip 7.

Claims

1. A plastic container comprising a base and/or container walls which are made of at least one first plastic, **characterized in that**, on said base and/or said container walls, at least one region is made of a second plastic, said first and second plastics forming an integral and/or form-locked rigid joint with one another.
2. A plastic container according to claim 1, **characterized in that** the second plastic is preferably different from the first plastic or plastics.
3. A plastic container according to claim 1 or claim 2, **characterized in that** said second plastic is sprayed onto said first plastic.
4. A plastic container according to any of claims 1 to 3, **characterized in that** said second plastic is positioned in a planar manner on one and/or both sides of said first plastic.
5. A plastic container according to any of claims 1 to 3, **characterized in that** said second plastic is positioned in a planar manner over a large area.
6. A plastic container according to claim 4 or 5, **characterized in that** said second plastic has a thickness of 0.1 – 10 mm.
7. A plastic container according to claim 4 or 5, **characterized in that** said second plastic has a thickness of 0.5 – 5 mm
8. A plastic container according to any of the preceding claims, **characterized in that** said second plastic is sprayed in a planar manner around a handle recess within said first plastic.
9. A plastic container according to any of the preceding claims, **characterized in that** said second plastic is sprayed onto said first plastic in a region which is demarcated by a sealing strip.
10. A plastic container according to claim 9, **characterized in that** the region is demarcated by a protruding sealing lip, sealing shoulder or sealing groove.

11. A plastic container according to any of the preceding claims, characterized in that said second plastic is sprayed onto said first plastic in a region which has a ribbed or lamellar structure, said ribs or lamellae being enclosed by said second plastic.
12. A plastic container according to claim 11, **characterized in that** said ribs or lamellae is covered in a planar or level manner by said second plastic.
13. A plastic container according to any of the preceding claims, **characterized in that** said first plastic comprises apertures which are penetrated by said second plastic.
14. A plastic container according to claim 13, **characterized in that** said second plastic is positioned in particular on both sides of said first plastic.
15. A plastic container according to any of the preceding claims, **characterized in that** said first plastic comprises a runner by means of which said second plastic is sprayed on.
16. A plastic container according to claim 15, **characterized in that** first plastic comprises a runner in the region of the handle web.
17. A plastic container according to claim 15 or 16 characterized in that said second plastic is sprayed on by means of a runner on both sides in the region of said handle recess.
18. A plastic container according to any of the preceding claims, **characterized in that** said first and second plastics are interlocked by mutually engaging ribs, teeth or the like.
19. A plastic container according to any of the preceding claims, **characterized in that** said second plastic is disposed on said first plastic as a result of adhesive bonding.
20. A plastic container according to claim 19, **characterized in that** the adhesive bonding comprises heat-sealing, sealing and/or catching.
21. A plastic container according to any of the preceding claims, **characterized in that** said second plastic forms a handle member of said container and is formed such as to produce soft touch characteristics as a result of rubber-like characteristics.

22. A plastic container according to any of the preceding claims, ~~characterized in that~~ said second plastic forms a handle member of said container, said handle member essentially having a smooth surface.
23. A plastic container according to claim 23, **characterized in that** said handle member has a surface formation that is adapted to the shape of the hands.
24. A plastic container according to any of the preceding claims, **characterized in that** said first plastic is provided with openings for anchorage with said second plastic.
25. A plastic container according to claim 24, **characterized in that** said openings comprise through-apertures.
26. A plastic container according to any of the preceding claims, **characterized in that** said second plastic differs from said first plastic in terms of its chemical and/or physical properties.
27. A plastic container according to claim 26, **characterized in that** said second plastic differs from said first plastic with respect to hardness, stretch, impact toughness, firmness, colour, composition and the like.
28. A plastic container according to any of the preceding claims, ~~characterized in that~~ said container is a container for transporting and/or storing bottles.
29. A method of producing a plastic container **characterized in that** a container or container member is made of a first plastic, that said container or container member made of said first plastic is positioned at least in part in relation to an injection mould, that a second plastic is injected into the cavity of said injection mould and/or into the cavity between said injection mould and said first plastic, and that said plastic container is released from said injection mould after said second plastic has set sufficiently.
30. A method according to claim 29, **characterized in that** said container made of said first plastic forms part of said injection mould.

31. A method according to claim 29 or claim 30, ~~characterized in that~~ said container made of said first plastic comprises a sealing strip.
32. A method according to claim 31, **characterized in that** the sealing strip is in the shape of a protruding sealing lip or in the shape of a groove which receives a sealing lip of said injection mould.
33. A method according to any of claims 29 to 32, **characterized in that** said container is a container in accordance with any of claims 1 to 28.
34. A plastic container substantially as herein described with reference to the accompanying drawing.

