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(54) **Carton package with improved inside printing**

(57) The present invention relates to carton packages with an improved inside printing. The inside surface of the carton packages of the present invention is provided with a continuous printing except along the fold

lines. By this folding of the canons and erecting them on the filling apparatus is improved while still providing the appearance of a completely printed inside surface.

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to carton packages with an improved inside printing. The inside surface of the carton packages of the present invention is provided with a continuous printing except along the fold lines. Folding of the cartons and their behaviour in the filling apparatus line during erection and filling is improved, while still providing the appearance of a completely printed inside surface.

BACKGROUND OF THE INVENTION

[0002] Carton boxes, also referred to as cardboard boxes, are widely used for packaging all kinds of articles. Due to latest trends in lifestyle there is a growing demand for more holistic design and styling experiences, which also include the packaging of a product. This includes printings on the inside surfaces of the packages, i.e. the carton boxes.

[0003] Carton boxes are conventionally produced from flat printed pieces of carton board, which are printed using roll-fed or sheet-fed presses. Subsequently, the individual printed pieces are die-cut and weakness lines are punched to enable a consistent folding in the following canon box construction, filling and closing steps. Weakness lines are also referred to as score lines, crease lines or folding lines. The technical principle is that part of the carton board fibres is broken, while another part remains intact thus allowing a consistent folding. The cut carton pieces are finally folded in a flattened configuration, glued and supplied to a packing line for filling.

[0004] Among other factors, the consistent quality of these weakness lines is crucial for the mechanical behaviour of the empty carton boxes folded in a flattened configuration in the subsequent filling operation. It is beneficial to keep the force required to erect a flattened carton in the carton filling machine constant. It is also beneficial to keep the tendency of the erected canon to collapse again consistently at a low level (spring-back force).

[0005] Conventional canon board has a coating (also referred to as liner or finish) on one surface only while the other surface is porous and uncoated. The surface having that coating is generally used as the external surface for its smoother and more shiny appearance and for its better suitability to be printed. In fact during printing moisture is introduced into the canon board. In case of surface priming, the ingress of moisture is minimized by the coating located on the carton board surface. In case of printing on the uncoated porous surface of the canon there is no such protection, and the moisture is fully absorbed by the carton board. The absorbed moisture from the printing ink represents a problem when creating the weakness lines, as it softens the board fibres. Therefore they oftentimes do not break at the required extent when

the fold lines are applied. This again results in poor folding and oftentimes poor appearance of the folds created. Also it results in a higher erection force and spring-back force when the flat carton sheet is erected in the carton filling machine, which may reduce the reliability and consistency of the subsequent carton filling operation.

[0006] Therefore, there exists a continuing need to provide cartons with a substantially continuous printing on the inside surface, ranging from 0 to 100% area coverage, which enables carton be reliably provided with fold lines.

SUMMARY OF THE INVENTION

[0007] The present inventors have found that the above problems can be solved by providing a package carton comprising a wall having an inside surface and an outside surface, and an interior enclosed by the wall, wherein the inside surface of the wall is provided with at least one fold line and is further provided with a printing, and wherein the printing pares out the area of the weakness line.

[0008] The fact that the priming does not extend into the region where the fold line is present avoids the above-stated disadvantages while still providing a substantially continuous printing on the inside.

DETAILED DESCRIPTION OF THE INVENTION

[0009] Substantial continuous" printing as used herein refers to a printing on the inside surface of the canon, which appears to the consumer as substantially not comprising areas without the printed pattern or scheme, although in the area of the fold lines no printing is present. This visual effect is achieved by a very small non-printed region along the fold lines, which substantially becomes non-visible once the carton is erected. Preferably, the distance from the edge of the printed area to the weakness line is 10 mm. More preferably, that distance is 5 mm, even more preferably that distance is 3mm. Most preferably, the distance from the edge of the printed area to the weakness line is 1mm.

[0010] The benefit of the solution outlined above is that while obtaining the visual perception of an almost fully printed inside, the carton's mechanical properties erection force and spring back force do not increase versus an non-insider printed reference carton.

[0011] This advantage is particularly relevant in the case of canon boxes having an internal surface where the carton is coated or lined and is consequently porous.

[0012] The dimensions and values disclosed herein are not to be understood as being strictly limited to the exact numerical values recited. Instead, unless otherwise specified, each such dimension is intended to mean both the recited value and a functionally equivalent range surrounding that value. For example, a dimension disclosed as "40 mm" is intended to mean "about 40 mm".

Claims

1. A package carton comprising a wall having an inside surface and an outside surface, and an interior enclosed by the wall, wherein the inside surface of the wall is provided with at least one weakness line and is further provided with a printing, **characterized in that** the weakness lines are arranged such that they are located outside the printing.

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2. The package carton of claim 1 wherein the inside surface of the carton is not coated or lined with any other material.
3. The package canon of claim 1 or 2, wherein the printing does not extend closer to the weakness line than 10 mm, preferably 5 mm, more preferably 3 mm and most preferably 1 mm.

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4. A process for making carton boxes, the process comprising the steps of, in any order,

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 - providing a printing to a piece of carton material, and
 - applying weakness lines to the piece of carton material

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characterized in that the weakness lines are arranged such that they are located outside the printing.

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5. The process of claim 4 wherein the surface of the piece of carton board to which the printing is provided is not coated or lined with any other material.

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6. The process of claim 4 or 5, wherein the printing does not extend closer to the weakness line than 10 mm, preferably 5 mm, more preferably 3 mm and most preferably 1 mm.

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EUROPEAN SEARCH REPORT

Application Number
EP 06 01 6196

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
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Place of search		Date of completion of the search	Examiner
Munich		3 January 2007	Balz, Oliver
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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