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(54) **Gastight package containing liquid absorbing products**

(57) The invention relates to a gastight package containing liquid absorbing tissue products within a protective gas atmosphere and especially an inert gas atmosphere. This enables the maintenance of physical

and biological properties of the tissue products during storage and/or at high temperatures in summer.

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Description

Technical Field

[0001] The invention relates to packaging liquid absorbing products like hygiene products such as toilet paper, kitchen towels, facial wipes, handkerchiefs, napkins or wiping products etc., being rolled, folded or arranged in layers. The products can be made of tissue paper or non-woven and can be dry as well as moist tissues or non-wovens with or without additives.

[0002] In this context, hygiene or wiping products primarily includes all kinds of dried creped tissue paper as well as wet creped paper and cellulose or pulp wadding or all kinds of non-wovens, or combinations, laminates or mixtures thereof.

[0003] Thereby, a tissue paper is defined as a soft absorbent paper having a basis weight below 65 g/m^2 and typically between 10 and 50 g/m^2 . Its density is typically below 0.6 g/cm^3 , preferably below 0.30 g/cm^3 and more preferably between 0.08 and 0.20 g/cm^3 . Moist tissue paper webs are usually dried by the so-called Yankee drying, the through air drying or the impulse drying. The fibres contained in the tissue paper are mainly pulp fibres from chemical pulp, mechanical pulp, thermo mechanical pulp, chemo-mechanical pulp and/or chemo-thermo mechanical pulp. The fibres may also be recycled fibres. The tissue paper may also contain other types of fibres enhancing, for instance, strength, absorption or softness of the paper. Tissue paper may even be converted to the final tissue product in many ways, for example embossed, laminated to a multi-ply product, rolled or folded.

[0004] The term non-woven is applied to a wide range of products, which in terms of their properties are located between groups of paper and cardboard on the one hand, and textiles on the other hand. Non-wovens may also be called textile-like composite materials, which represent flexible porous fabrics that are not produced by the classic methods of weaving web and weft or by looping. In fact, non-wovens are produced by intertwining cohesive or adhesive bonding of fibres, or a combination thereof. The non-woven material can be formed of natural fibres, such as cellulose or cotton fibres, but can also consist of synthetic fibres, such as PE, polypropylene (PP), polyurethane (PU), polyester, nylon or regenerated cellulose, or a mix of different fibres. The fibres may for example be present in the form of endless fibres of prefabricated fibres of a finite length, as synthetic fibres produced in situ or in the form of staple fibres.

[0005] Typical properties of these hygiene and wiping products include the ready ability to absorb tensile stress energy, their drapability, good textile-like flexibility, properties which are frequently referred to as bulk softness, a high surface softness, a high specific volume with a perceptible thickness. As high a liquid absorbency as possible and, depending on the application, a suitable

wet and dry strength as well as an interesting visual appearance of the outer product surface. These properties, among others, allow these hygiene and wiping products to be used for example as cleaning wipes: paper or non-woven wipe, windscreen cleaning wipe, industrial wipe, kitchen paper, or the like; as sanitary products: for example toilet paper, paper or non-woven handkerchiefs, household towels, towels, and the like; cosmetic wipes: for example facials and as serviettes or napkins, just to mention some of the products that can be used. Furthermore, the hygiene and wiping products can be dry, moist, wet or pre-treated in any manner. In addition, the paper products can be present in the form of single web rolls, rolls having detachable sheets, piles of sheets, folded piles having interconnected, detachable sheets, single web piles and the like.

[0006] Due to the above description, the products can be used for personal and household use as well as commercial and industrial use.

Background Art

[0007] From WO 93/17933 a storing and dispensing system for pre-moistened tissues or granular products is known comprising a container which is closable in a fluid tight manner and a pouch having a sealed dispensing aperture which after opening can be placed in the container. This kind of packaging results in a better protection of tissues or granules upon accidental falling and prevents contamination of the container by for instance mould growth due to contact with wet tissues.

[0008] A vacuum-packaged tissue paper is known from JP 07285584. This vacuum-packaging intends to make a product volume small by compression, making the storage and transport of products convenient and increasing moisture resistance.

[0009] EP 0 175 448 B1 discloses a form-fill-seal machine and method with capability for providing a vacuum or inert gas atmosphere within a package containing foodstuff.

[0010] From EP 0 613 824 A3 a washcloth in a damp and airtight package is known, wherein the washcloth is impregnated with a washing active agent containing water.

[0011] A package of scent impregnated tissues is known from US 4,458,810. The scent impregnated tissues are provided in a substantially airtight container having a resealable lid. The tissues have disposed between selected ones thereof individual scent-carrying layers carrying a scent-producing material therewith. The container and lid ensure that the tissues and layers remain in a virtually hermetically sealed environment.

Disclosure of invention

[0012] It is the problem (object) of the invention to maintain the physical and biological properties of tissue products during storage and/or at high temperatures,

especially in summer.

[0013] This problem is solved by special packaging using a gastight package containing liquid absorbing tissue products within a protective gas atmosphere.

[0014] Such packaging during storage and/or at high temperatures in summer prevents the physical and biological properties of tissue products changing in an unwelcome manner. Tissue products in general, in particular kitchen towels, thus packaged maintain absorption speed for liquids. Tissue products treated with lotion, such as facial wipes, handkerchiefs or toilet paper, thus packaged maintain physical and biological properties without developing any unpleasant rancid smell caused by oxidation etc. Finally, in case of long-term storage and high temperatures, there is no risk of contamination with bacteria and fungi.

[0015] Preferably, the protective gas is nitrogen, carbon dioxide, nitrous oxide etc. The tissue products may be provided with agents (lotion) and/or preservatives. The protective gas may be an inert gas.

[0016] Preferably, the gastight package comprises a ritable envelope enabling the user to easily open the package just before use of the tissue products. The ritable envelope may be provided with a sealed perforated line combined with a flap to be gripped by hand in order to rift the package by breaking the perforation line. The perforation line can also be a closed line encompassing a part of the envelope, which can be gripped in order to tear off this part and rift open the envelope. Anyway, such a perforation line should be sealed in order to maintain the package in a gas tight manner before opening. Also, other known means could be used for rifting the envelope.

[0017] The gas tight package could also include a resealable opening, even though the inert gas environment will be lost once the package is opened. A resealable opening would still offer every advantage and protection that a resealable opening would imply.

[0018] The package could also be of any form and shape, e.g. a packaging wrapper, a pouch, a box etc.

[0019] It is within the knowledge of an expert how to prepare a gastight package containing an inert gas atmosphere. For other products this is described in EP 0 175 448 B1.

[0020] The protective gas can be applied to the package during processing the package. For this step the package should be gas tight and the protective gas is introduced into the inner space of the completed package by piercing a gas introduction needle through the envelope. The hole made by the needle is sealed as soon as the needle is withdrawn so that no protective gas escapes. For this any suitable conventional technique for adding the protective gas to the package can of course be used so that a gas tight package according to the invention can be achieved.

Claims

1. A gastight package containing liquid absorbing tissue products within a protective gas atmosphere.
2. A gastight package according to claim 1, comprising nitrogen, carbon dioxide, nitrous oxide etc as protective gas.
3. A gastight package according to claim 1, comprising inert gas as protection gas.
4. A gastight package according to claim 1 or 2, comprising tissue products being provided with agents and/or preservatives.
5. A gastight package according to claim 1, comprising a ritable envelope.



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EUROPEAN SEARCH REPORT

Application Number
EP 03 00 1246

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.7) B65D
Place of search MUNICH		Date of completion of the search 29 July 2003	Examiner Galli, M
CATEGORY OF CITED DOCUMENTS 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 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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 03 00 1246

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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