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(54) **Improved packaging method and apparatus**

(57) Method for stabilizing a stack of pre-packed units, preferably comprising discrete stacked products, comprising the steps of wrapping said stack in a first wrapping material and wrapping said stack in a second material, whereby said second material comprises different physical properties from said first wrapping material.

EP 2 835 314 A1

Description

TECHNICAL FIELD

[0001] The invention pertains to the technical field of packaging stacked compressible products in a stable manner, in particular packaging disposable absorbent articles such as diapers, which may be pre-packed in e.g. open cartons which are stacked on a pallet.

BACKGROUND

[0002] Consumer products such as baby diaper bags are often packed in tray cartons, stacked on pallets, provided with edge protectors and wrapped with stretch film.

[0003] For example, document WO 1996/041753 A1 discloses a package comprising an array of at least two substantially rectangular flexible packs, each pack comprising flexible articles which have been compressed in a direction of compression to between 20% and 70% of their uncompressed volume encased in a flexible bag, the array comprising four side faces, a top face and a bottom face, a flexible wrapper wrapped around at least a part of the side faces of the array, the wrapper forming a tube having a tube section extending beyond the top face of the area Y, the tube section being folded transversely to the side faces to at least partly cover the top face and attachment means for maintaining the folded-over tube section in its folded over position.

[0004] The packages of the prior art require great quantities of stretch film, they require the use of expensive edge protectors and frequently do not have sufficient stability, often at the expense of transportation safety and logistical handling. The use of low-cost repackaging materials such as tray cartons or so-called shelf-ready packaging cartons which usually feature retrieval openings shows distinct disadvantages.

[0005] There remains a need in the art for an improved packaging method and apparatus for resolving at least some of the problems mentioned above.

[0006] The invention thereto aims to provide a wrapping that increases the stability of the packages (e.g. baby diaper cartons on pallets) significantly reducing at the same time the need for stretch film and edge protectors.

SUMMARY OF THE INVENTION

[0007] The present invention provides a method for stabilizing a stack of products, preferably pre-packed units comprising discrete stacked products, in particular products such as absorbent articles, the method comprising the steps of wrapping said stack in a first wrapping material and wrapping said stack in a second material, whereby said second material comprises different physical properties from said first wrapping material.

[0008] By the term "pre-packed" as used herein, is meant that one or more absorbent articles are packed in a single unit before being stacked.

[0009] By the term "wrapping material" as used herein, is meant a bendable material, preferably a sheet material of which the thickness is smaller, more preferably much smaller than its width or length, such as a sheet, a film or a foil. In a particularly preferred embodiment, said wrapping material is capable of being rolled up.

[0010] In an embodiment, said first material and/or said second material is provided as a banderole. In a preferred embodiment, said banderole of said first material comprises a width which is different than, e.g. less than or greater than, a width of said banderole of said second material. In an alternative embodiment, said banderole of said first material comprises a width which is equal to a width of said banderole of said second material.

[0011] By the term "banderole" or "sleeve" as used herein, is meant a sheet material of essentially constant width, which can be rolled up or rolled off in a direction perpendicular to the width-direction.

[0012] In an embodiment, said second material is different from said first wrapping material. In another embodiment, said second material is the same as said first wrapping material. Preferably said second material is wrapped around said stack with a tension which is different than a tension which the first material is wrapped around the stack with. In an embodiment, said first material is a conventional wrapping material, such as polyethylene, and/or said second material comprises paper.

[0013] In a preferred embodiment, the first and/or second material is essentially free from an adhesive component such as glue or tape.

[0014] In an embodiment, said first material comprises a low tensile strength and/or high stretching properties, such as a high elasticity. In an embodiment, said second material comprises a high tensile strength. In an embodiment, said second material comprises a second tensile strength which is substantially greater than a first tensile strength of said first material.

[0015] In a particularly preferred embodiment, said first material and said second material are wrapped jointly around said stack. In an alternative embodiment, said wrapping steps are performed subsequently, hereby wrapping said stack in said first material before wrapping said stack in said second material. In another embodiment, said wrapping steps are performed at least partially simultaneously.

[0016] In an embodiment, at least one and preferably all of said units are compressible, such as bags, open cartons, closed cartons or shelf-ready boxes. As an example, these units may comprise absorbent articles, or such as pre-wrapped set of absorbent articles.

[0017] In an embodiment, three or more wrapping materials are used, such as 3, 4, 5, 6 or more materials. These materials could comprise the first or the second wrapping material, and/or these materials could comprise wrapping materials with physical properties which are different from the first and/or second wrapping material. These materials could comprise different materials than the first and second wrapping materials.

[0018] In an embodiment, said stack is wrapped in said first material by x turns and said stack is wrapped in said second material by y turns. Hereby, preferably x is at least one, more preferably at least two, and smaller than 50, more preferably smaller than 25. Preferably, y is at least one, more preferably at least two, and smaller than 50, more preferably smaller than 25. In a preferred embodiment, x and y can be determined independently in order to increase the stability of the stack.

[0019] By the term 'turn' as used herein, is meant that a material is wrapped around the stack over a peripheral side surface area which comprises essentially one circumference. In particular, if the wrapping material's width is smaller the height of the stack, more than one turn is needed to cover the complete peripheral side surface with at least one layer of wrapping material.

[0020] In a second aspect, the present invention provides an apparatus for wrapping and stabilizing a stack of products, preferably pre-packed units comprising absorbent articles. In an embodiment, the apparatus comprises a wrapping mechanism, a first holder for holding a first wrapping material and a second holder for holding a second wrapping material.

[0021] In an embodiment, said wrapping mechanism comprises a turntable, a rotating arm and/or a rotating ring wrapper.

[0022] In an embodiment, said first holder is provided with a first wrapping material and/or said second holder is provided with a second wrapping material.

[0023] In an embodiment, said first holder comprises roll means arranged to allow a first roll of first wrapping material to be rollably mounted on said first holder and/or said second holder comprises roll means arranged to allow a second roll of second wrapping material to be rollably mounted on said second holder.

[0024] In an embodiment, said apparatus comprises three or more holders, such as 3, 4, 5, 6 or more holders, each holding a wrapping material.

[0025] In an embodiment, said apparatus is arranged to perform a method according to the present invention.

[0026] In a further aspect, the present invention provides a stack comprising products, preferably pre-packed units, preferably comprising discrete stacked products, in particular products such as absorbent articles, said stack comprising a first wrapping material and a second material, different from said first wrapping material.

[0027] In an embodiment, a peripheral side surface of said products or pre-packed units is covered with at least one layer of said first material and at least one layer of said second material, preferably whereby essentially all peripheral side surfaces of said products or pre-packed units are essentially completely covered with at least one layer of said first material and at least one layer of said second material.

[0028] By the term "peripheral side surface of said products or pre-packed units" as used herein, is meant the side surface of the products or units which, when they

are stacked, make up the peripheral surface of the stack, i.e. the surface of the stack which can be seen from the side.

[0029] In an embodiment, said stack comprises the shape of a parallelepiped, a beam, a prism or a cylinder. In an embodiment, said stack comprises a pallet onto which said pre-packed units are stacked.

[0030] In preferred embodiments, said absorbent articles comprise disposable hygienic products, such as diapers, baby diapers, incontinence diapers, pull-on diaper pants.

DESCRIPTION OF FIGURES

[0031]

Figure 1 shows a schematic top view of an embodiment according to the invention. Herein, a feed arm can be recognised.

Figure 2 shows a perspective view of an embodiment according to the invention, wherein some parts are cut away to better illustrate other parts.

DETAILED DESCRIPTION OF THE INVENTION

[0032] The present invention concerns a method, an apparatus for stabilizing a stack of products, preferably pre-packed units, preferably said units comprising absorbent articles, as well as a stack comprising pre-packed units which preferably comprise absorbent articles.

[0033] Unless otherwise defined, all terms used in disclosing the invention, including technical and scientific terms, have the meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. By means of further guidance, term definitions are included to better appreciate the teaching of the present invention.

[0034] As used herein, the following terms have the following meanings:

[0035] "A", "an", and "the" as used herein refers to both singular and plural referents unless the context clearly dictates otherwise. By way of example, "a compartment" refers to one or more than one compartment.

[0036] "About" as used herein referring to a measurable value such as a parameter, an amount, a temporal duration, and the like, is meant to encompass variations of +/-20% or less, preferably +/-10% or less, more preferably +/-5% or less, even more preferably +/-1% or less, and still more preferably +/-0.1% or less of and from the specified value, in so far such variations are appropriate to perform in the disclosed invention. However, it is to be understood that the value to which the modifier "about" refers is itself also specifically disclosed.

[0037] "Comprise," "comprising," and "comprises" and "comprised of" as used herein are synonymous with "include", "including", "includes" or "contain", "containing",

"contains" and are inclusive or open-ended terms that specifies the presence of what follows e.g. component and do not exclude or preclude the presence of additional, non-recited components, features, element, members, steps, known in the art or disclosed therein.

[0038] The invention provides an apparatus and a method of stabilizing stacked products by means of two different materials, preferably provided as banderoles or sleeves. Palletized goods may be, but are not limited thereto, for example baby diapers bags in open cartons.

[0039] These materials may comprise very different physical properties. In order to stabilise a cargo of this kind, it is common to wrap a pallet of stacked units with a film 6. This film is wound onto roll 2 and can be unwound as it is being wrapped around the stack. A typical width of the film is 500 mm. This can be done using the functionality of turntable stretch wrapping machines or rotary arm or ring rotor stretch wrapping machines.

[0040] Considering this usual manner of cargo securing, a banderole/sleeve of an unrolled sheet of film 6 from film roll 2 is customary, showing a high degree of elasticity and high resilience.

[0041] The purpose of the present invention is the stabilization of the stack 5, whereby the individually stacked units or products show a low degree of resistance against deformation, with a high-resilience stretch film, without deforming the units significantly.

[0042] A further purpose of the invention is to provide a way of securing cargo, whereby the loosening of individual products from the assembly and their break-out from the cargo securing is prevented.

[0043] A further purpose of the invention is to provide cargo securing preventing individual units or products from losing their height due to their compressibility.

[0044] The invention is further described by the following non-limiting examples which further illustrate the invention, and are not intended to, nor should they be interpreted to, limit the scope of the invention.

EXAMPLES

[0045] The invention is illustrated in figures 1 and 2, showing a roll 1 of the first material of a tensile banderole/sleeve, a roll 2 of a second material of a conventional wrapping film, a turntable 3 of a conventional wrapping machine, a support arm 4 for supporting the roll 1 of the first material and the roll 2 of the second material, a stack 5 of unstable products or pre-packed units of products on a pallet, the width 6 of the conventional wrapping film, the feeding 7 of second banderole/sleeve to the package and the width 8 of the banderole/sleeve of the second material.

[0046] Pursuant to the invention a second material is provided as a banderole or sleeve which can be unrolled from a roll 2 of a wrapping apparatus.

[0047] Pursuant to the invention, the width of the second banderole/sleeve 8 is wide enough to embrace a specific layer of products or pre-packed units of products,

or several product layers or unit layers at the same time.

[0048] Pursuant to the invention a more tensile material (e.g. kraft paper) is wound on the second roll 2. The material is then attached to the pallet over a feeding conveyance 7. This material is then clamped between the material and the package. The rotation of the turntable 3, the rotary arm, or the ring causes the material 8 to be taken along. After an arbitrarily determined wrap count, the turntable 3, the rotating arm or the ring stop. The material 8 can then be cut off in a manual or automated manner.

[0049] Because of the high tensile strength of the second banderole/sleeve material, the pallet develops an increased resistance to lateral loads such as those occurring due to inertial forces in transportation.

[0050] It is supposed that the present invention is not restricted to any form of realization described previously and that some modifications can be added to the presented example of fabrication without reappraisal of the appended claims.

Claims

1. Method for stabilizing a stack of pre-packed units, preferably comprising discrete stacked products, comprising the steps of wrapping said stack in a first wrapping material and wrapping said stack in a second material, **characterized in that** said second material comprises different physical properties from said first wrapping material.
2. Method according to claim 1, whereby said first material and/or said second material is provided as a banderole.
3. Method according to claim 2, whereby said banderole of said first material comprises a width which is different than a width of said banderole of said second material.
4. Method according to any of the claims 1 to 3, whereby said first material comprises a low tensile strength and/or high stretching properties, such as a high elasticity, and/or whereby said second material comprises a high tensile strength.
5. Method according to any of the claims 1 to 4, whereby said second material comprises a second tensile strength which is substantially greater than a first tensile strength of said first material.
6. Method according to any of the claims 1 to 5, whereby said first material and said second material are wrapped jointly around said stack or whereby said wrapping steps are performed at least partially simultaneously, or whereby said wrapping steps are performed subsequently, hereby wrapping said

stack in said first material before wrapping said stack in said second material.

one layer of said second material.

7. Method according to any of the claims 1 to 6, whereby at least one and preferably all of said units are compressible, such as bags, open cartons, closed cartons or shelf-ready boxes. 5
8. Method according to any of the claims 1 to 7, whereby three or more wrapping materials are used, such as 3, 4, 5, 6 or more materials. 10
9. Method according to any of the claims 1 to 8, whereby said stack is wrapped in said first material by x turns, whereby x is at least one and smaller than 50, and whereby said stack is wrapped in said second material by y turns, whereby y is at least one and smaller than 50. 15
10. Apparatus for wrapping and stabilizing a stack of pre-packed units comprising absorbent articles, the apparatus comprising a wrapping mechanism, a first holder for holding a first wrapping material and a second holder for holding a second wrapping material. 20
25
11. Apparatus according to claim 10, whereby said wrapping mechanism comprises a turntable, a rotating arm and/or a rotating ring wrapper, and whereby said first holder comprises roll means arranged to allow a first roll of first wrapping material to be rollably mounted on said first holder and/or said second holder comprises roll means arranged to allow a second roll of second wrapping material to be rollably mounted on said second holder, preferably whereby said first holder is provided with a first wrapping material and/or said second holder is provided with a second wrapping material. 30
35
12. Apparatus according to any of the claims 10 to 11, comprising three or more holders, such as 3, 4, 5, 6 or more holders, each holding a wrapping material. 40
13. Apparatus according to any of the claims 10 to 12, whereby said apparatus is arranged to perform the method according to any of the claims 1 to 9. 45
14. Stack comprising pre-packed units preferably comprising discrete stacked products, said stack comprising a first wrapping material and a second material, different from said first wrapping material. 50
15. Stack according to claim 14, whereby a peripheral side surface of said pre-packed units is covered with at least one layer of said first material and at least one layer of said second material, preferably whereby essentially all peripheral side surfaces of said pre-packed units are essentially completely covered with at least one layer of said first material and at least 55

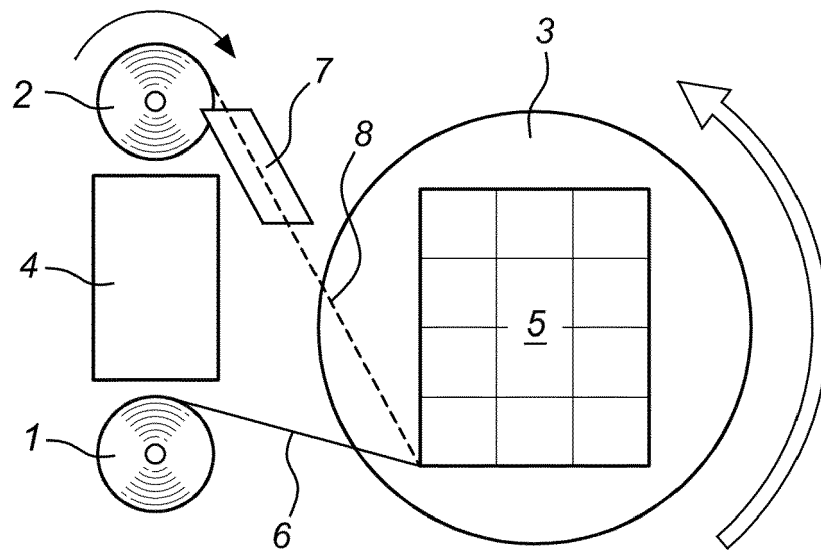


Fig. 1

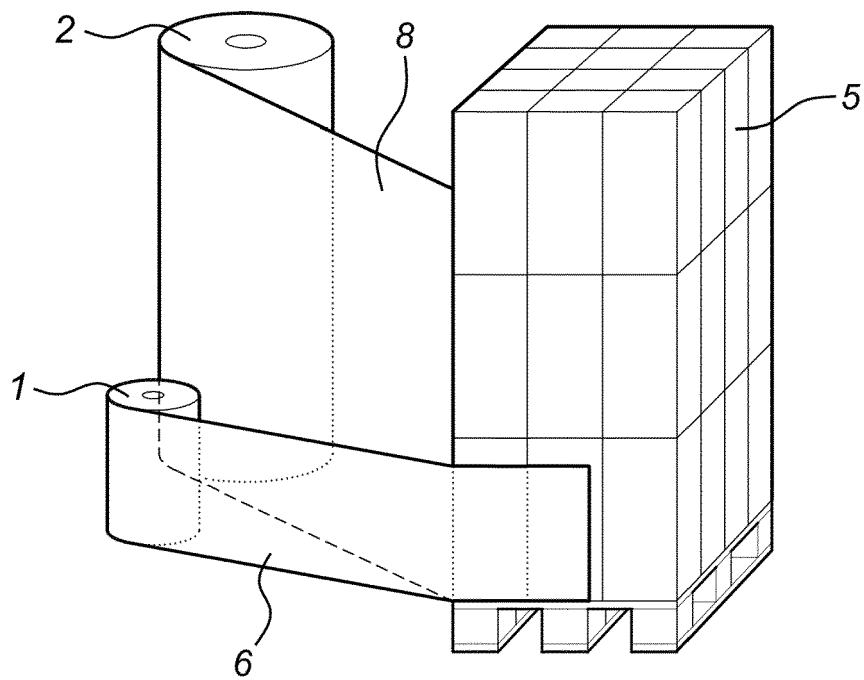


Fig. 2



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**ANNEX TO THE EUROPEAN SEARCH REPORT
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