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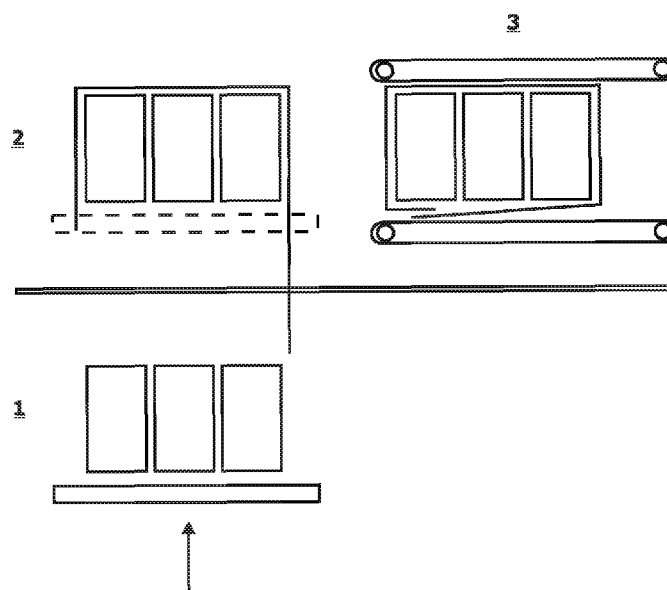


FIG. 1

(57) Abstract: The invention relates to a method for producing a multi-pack having a plurality of products, wherein the method comprises the following method steps: aligning a plurality of products provided for a respective multi-pack so that a strip-shaped packaging material or a strip-shaped packaging blank can subsequently be applied to the aligned products; strapping the aligned products with the strip-shaped packaging material or packaging blank; and fixing the opposing end regions of the strip-shaped packaging blank. According to the invention, it is provided in particular that the strip-shaped packaging material or the strip-shaped packaging blank consists in particular of a biocompatible and/or biodegradable material.



GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

Published:

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

METHOD AND APPARATUS FOR PRODUCING A MULTI-PACK HAVING A PLURALITY OF PRODUCTS

Description

5 The present invention relates generally to packaging methods and packaging equipment. For example, the packaging equipment can be packaging machines of a packaging line.

For the packaging of products such as beverage containers, the products can be grouped onto horizontal conveyor devices and combined into groups having a defined number of products via a packaging means. In this case, it is common to use packaging means
10 consisting of thermoplastic material and shrunk onto a group of articles/products. Such packaging materials, which are referred to as shrink wraps, are applied to the respective group of articles prior to temperature exposure and subsequently shrunk onto the respective group of articles.

There is an ongoing need to keep the consumption of packaging materials as
15 low as possible. In particular, it is desired to use packaging materials that come in particular from renewable sources where there is no competition for food production, in particular. After use, the material can be recycled in a simple manner and without great effort in the circular economy (recycling) and also allows other manners of disposal, for example by composting, without negative consequences for the environment. These positive properties of the selected
20 packaging materials can be optically facilitated by brown tones of an unbleached paper and/or cardboard packaging, which can be optionally printed, but is or will be only partially printed, in particular.

The underlying problem of the present invention is to specify a packaging method as well as a corresponding packaging machine with which a plurality of products can
25 be safely held together as a multi-pack, wherein as little material use as possible is necessary for this purpose.

With regard to the method, the underlying problem of the invention is solved by the subject matter of the independent claim 1. Advantageous further developments of the method according to the invention are specified in the dependent claims 2 to 7.

30 Accordingly, the invention relates in particular to a method for producing a multi-pack having a plurality of products, wherein the method comprises the following method steps:

- aligning a plurality of products provided for a respective multi-pack so that a strip-shaped packaging material or a strip-shaped packaging blank can subsequently be applied to the aligned products;
- strapping the aligned products with the strip-shaped packaging material or the strip-shaped packaging blank; and
- fixing the opposing end regions of the strip-shaped packaging blank.

With the method according to the invention, multi-packs can be produced that can be securely held together and can thus serve as a sales unit. A further advantage can be seen in that the use of a strip-shaped packaging blank requires as little use of the material as possible.

Preferably, the strip-shaped packaging material or the strip-shaped packaging blank consists in particular of a biocompatible and/or biodegradable material.

In this context, it is conceivable, for example, that the strip-shaped packaging blank consists of a material consisting substantially of fibers of plant origin.

Alternatively or additionally, the strip-shaped packaging blank can consist of a paper-containing material and/or a cellulose acetate-containing material.

According to implementations of the method according to the invention, it is provided that the aligned products are strapped with the strip-shaped packaging material in such a way that the top and bottom of the aligned products are covered at least regionally with the strip-shaped packaging material. In this context, in particular, it lends itself that the products are aligned in a single row, wherein the aligned products are then strapped with the strip-shaped packaging material in such a way that the opposing end faces of the product group formed by the aligned products are at least regionally covered with the strip-shaped packaging material.

This embodiment has the advantage that any barcodes applied to the individual products of the multi-pack can also be simultaneously covered with the strip-shaped packaging material.

Different solutions can be considered for fixing the opposing end regions of the strip-shaped packaging blank. For example, it is conceivable that the opposing end regions of the strip-shaped packaging blank are joined together, in particular with a hot melt or hot glue.

Alternatively, however, it is also conceivable that the opposing end regions of the strip-shaped packaging blank are fixed to a product of the group of products formed by the aligned products, in particular with a hot melt or hot glue.

With regard to the apparatus, the problem underlying the invention is solved by the subject matter of parallel claim 8, wherein advantageous further developments of the apparatus according to the invention are specified in the dependent claims 9 to 13.

Accordingly, the apparatus according to the invention serves to produce a multi-pack having a plurality of products, wherein the apparatus comprises for this purpose a device for aligning a plurality of products provided for a respective multi-pack, wherein this device is configured in such a way that the products are aligned so that a strip-shaped packaging blank can subsequently be applied to the aligned products.

The apparatus according to the invention further comprises a device for strapping the aligned products with a strip-shaped packaging blank. Furthermore, the apparatus comprises a device for fixing the opposing end regions of the strip-shaped packaging blank.

The apparatus according to the invention is in particular configured in order to perform the method according to the invention as described above.

The invention further relates to a multi-pack consisting of a plurality of products produced according to the method according to the invention.

The invention is described in greater detail below with reference to the accompanying drawings.

The following are shown:

FIG. 1 schematically, an exemplary embodiment of the method according to the invention for producing a multi-pack having a plurality of products; and

FIG. 2 a photograph of an exemplary embodiment of the multi-pack according to the invention.

FIG. 1 schematically shows the sequence of an exemplary embodiment of the method according to the invention. In the method, a multi-pack is formed from a total of three products arranged in a single row. Such a multi-pack is shown, for example, in FIG. 2.

The multi-pack has a strapping, which is embodied as a vertical “cummerbund.” This is understood to be a strapping which – as illustrated in FIG. 2 – covers the top and bottom of the aligned products at least regionally and preferably at least 80% and more preferably at least 90%, wherein the strapping further covers the opposing end faces of the group of products

formed by the aligned products, preferably at least regionally, and in particular at least 80%, and even more preferably at least 90%.

A strip-shaped packaging blank is used for strapping the aligned products provided for the multi-pack. The strip-shaped packaging blank is placed around the products preferably grouped in single rows and provided for the respective multi-pack, namely by lifting the compiled products with the aid of a lifting unit, so that the packaging blank can then pass under the products. The packaging blank is then turned over and fixed.

The fixing can occur, for example, by gluing, in particular hot-gluing.

In this context, it is conceivable that the opposing end regions of the strip-shaped packaging material are glued or joined to one another. Alternatively, however, it is also conceivable that the opposing end regions of the strip-shaped packaging blank are fixed to a product of the group of products formed by the aligned products, in particular through gluing.

The strip-shaped packaging blank is formed from a preferably continuous strip-shaped packaging material, in particular a cardboard paper strip, which is cut after the strapping and a corresponding tightening.

The packaging or strapping method has the advantage that the packaging material covers the top side of the products, in particular. This is particularly advantageous for beverage containers because the outflow opening, which requires special protection, is normally provided at the top of beverage containers.

Furthermore, any barcode existing on the products is preferably simultaneously covered with the packaging material so that it is also protected accordingly.

According to embodiments of the invention, the packaging material is formed by at least one laminar packaging blank, which takes the form of an elongated rectangle.

Preferably, a paper or a packaging material consistently substantially of paper and having a thickness of between 0.001 mm and 2.0 mm, in particular a thickness of between 0.005 mm and 0.5 mm, is used as the packaging material.

The packaging material serves in particular to mechanically hold the products/articles within the packaging unit (multi-pack). Due to the fact that the packaging material substantially all-encompassingly covers the bottom of the products, the top of the products, and the outwardly facing outer surfaces of the products, a good level of product protection for the products/articles is achieved. In addition, the packaging material provides a large surface area that can be used for product advertising and/or product information, for example by means of corresponding printing.

The packaging blanks can be provided at the outset in a correspondingly printed fashion, or the printing can be applied after completion or at the same time as the production of the packaging units.

5 The use of paper as a packaging material is particularly preferred with regard to sustainability. In particular, recycled paper can be used as a packaging material.

In addition, the amount of packaging material is reduced compared to conventional known cardboard packaging.

10 According to the flow diagram shown in FIG. 1, the products to be packaged initially enter the packaging facility. The products are then lifted into a pre-positioned cardboard/paper strip with the aid of a lifting unit, so that the products are punched into the cardboard/paper strip accordingly.

Then, the under-tab is applied and fixed, for example, with the aid of a hot-melt application. In a next step, the multi-pack formed in this way is compressed between two press belts running parallel to one another.

15 The invention arises from an overall consideration of all features disclosed herein.

Claims

1. A method for producing a multi-pack having a plurality of products, wherein the method comprises the following method steps:
 - aligning a plurality of products provided for a respective multi-pack so that a strip-shaped packaging material or a strip-shaped packaging blank can subsequently be applied to the aligned products;
 - strapping the aligned products with the strip-shaped packaging material or packaging blank; and
 - fixing the opposing end regions of the strip-shaped packaging blank,wherein the strip-shaped packaging material or the strip-shaped packaging blank consists in particular of a biocompatible and/or biodegradable material.
2. The method according to claim 1, wherein the strip-shaped packaging material or the strip-shaped packaging blank consists of a material consisting substantially of fibers of plant origin.
3. The method according to claim 1 or 2, wherein the strip-shaped packaging material or the strip-shaped packaging blank consists of a paper-containing material and/or a cellulose acetate-containing material.
4. The method according to any one of claims 1 to 3, wherein the aligned products are strapped with the strip-shaped packaging material or packaging blank in such a way that the top and bottom of the aligned products are covered at least regionally with the strip-shaped packaging material or packaging blank.
5. The method according to claim 4, wherein the products are aligned in a single row, and wherein the aligned products are strapped with the strip-shaped packaging material or packaging blank in such a way that the opposing end faces of the product group formed by the aligned products are at least regionally covered with the strip-shaped packaging material or packaging blank.

6. The method according to any one of claims 1 to 5,
wherein the opposing end regions of the strip-shaped packaging blank are joined together, in particular with a hot glue or hot melt.
7. The method according to any one of claims 1 to 5,
wherein the opposing end regions of the strip-shaped packaging blank are fixed to a product of the group of products formed by the aligned products, in particular with a hot glue or hot melt.
8. An apparatus for producing a multi-pack having a plurality of products, wherein the apparatus comprises the following:
 - a device for aligning a plurality of products provided for a respective multi-pack, wherein the device is configured in order to align the products in such a way that a strip-shaped packaging material or a strip-shaped packaging blank can subsequently be applied to the aligned products;
 - a device for strapping the aligned products with the strip-shaped packaging material or packaging blank; and/or
 - a device for fixing the opposing end regions of the strip-shaped packaging blank.
9. The apparatus according to claim 8,
wherein the strip-shaped packaging material or the strip-shaped packaging blank consists of a material consisting substantially of fibers of plant origin.
10. The apparatus according to claim 8 or 9,
wherein the strip-shaped packaging material or the strip-shaped packaging blank consists of a paper-containing material and/or a cellulose-containing material.
11. The apparatus according to any one of claims 8 to 10,
wherein the device for strapping the aligned products with the strip-shaped packaging material or the strip-shaped packaging blank is configured in order to strap the aligned products to the strip-shaped packaging material in such a way that the top and bottom of the aligned products are covered at least regionally with the strip-shaped packaging material.

12. The apparatus according to any one of claims 8 to 11,
wherein the device for fixing the opposing end regions of the strip-shaped packaging blank is configured in order to join the opposing end regions of the strip-shaped packaging blank together, in particular with a hot glue or hot melt.
13. The apparatus according to any one of claims 8 to 11,
wherein the device for fixing the opposing end regions of the strip-shaped packaging blank is configured in order to fix the opposing end regions of the strip-shaped packaging to a product of the product group formed by the aligned products, in particular with the aid of a hot glue or hot melt.
14. A multi-pack having a plurality of products, wherein the products are in a single row, in particular, and are strapped with a strip-shaped packaging blank in such a way that the strip-shaped packaging blank at least regionally covers the top and bottom of the aligned products and in particular at least regionally covers the opposing end faces of the group of products formed by the aligned products.
15. The multi-pack according to claim 14,
wherein the multi-pack is formed by a method according to any one of claims 1 to 7.

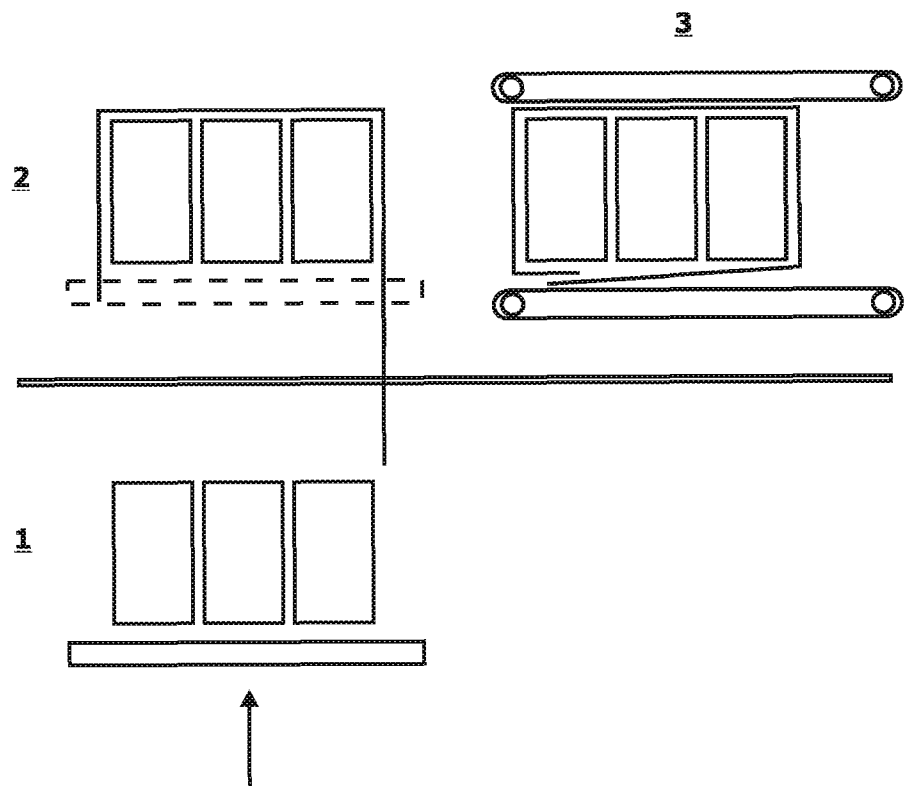


FIG. 1

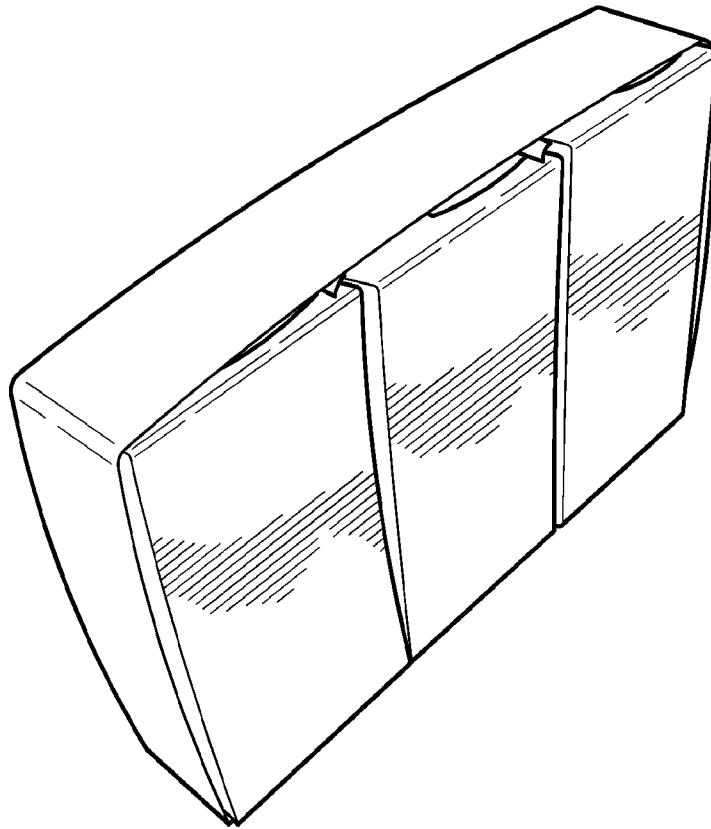


FIG. 2

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2022/019766

A. CLASSIFICATION OF SUBJECT MATTER INV. B65B13/02 B65B13/24 B65B13/32 ADD.		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) B65B		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal, WPI Data		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2011/056174 A1 (PERL KURT [DE]) 10 March 2011 (2011-03-10) paragraph [0013] - paragraph [0039] -----	1-3,8-10
X	CA 2 769 660 A1 (KRONES AG [DE]) 21 April 2011 (2011-04-21) page 2, line 6 - page 12, line 18 -----	1,8
X	US 10 597 487 B2 (EBERLE ULRICH [DE]; MOSCA GMBH [DE]) 24 March 2020 (2020-03-24) column 1, line 61 - column 4, line 67 -----	1-3,8-10
X	WO 2005/108050 A1 (CRANSTON DIVERSIFIED IND INC [US]; CRANSTON ALBERT E III [US]) 17 November 2005 (2005-11-17) page 7, line 15 - page 14, line 28 ----- -/-	1-3,8-10
☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance;; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance;; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 16 June 2022		Date of mailing of the international search report 18/08/2022
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Yazici, Baris

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2022/019766

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KR 100 818 359 B1 (SUNWOO ID CO LTD [KR]) 1 April 2008 (2008-04-01) paragraph [0012] - paragraph [0056] -----	1-3, 8-10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2022/019766

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims;; it is covered by claims Nos.:
1-3, 8-10

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2022/019766

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WO 2005108050	A1	17-11-2005	NONE	

KR 100818359	B1	01-04-2008	NONE	

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-3, 8-10

strip shaped packaging material consisting substantially
fibers of plant origin or paper-containing material or a
cellulose acetate containing material.

2. claims: 4-7, 11-15

a strapping method wherein the top and bottom of the aligned
products are covered, a strap joining method and a multi
pack.
