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Remarks:
Claims 16-17 are deemed to be abandoned due to non-payment of the claims fees (Rule 45(3) EPC).

## (54) Packaging for aligning articles and associated assembly of packaging and merchandise

(57) A packaging (1) comprising a container (3) provided with an article take-out opening (4), a push member (8) for articles (2), which is connected to a pull element (9) having a longitudinal axis, and which push member is slidably arranged between a first end (6) of the container and a second end (5) of the container, and wherein the pull element extends between the push member and said first end of the container, and the push member is provided with a push surface (11) which projects laterally, a stabilization element (12) attached to the push member, which ensures that during movement of the push member with the concomitant displacement of the products present in the container, the angle included by said push surface and the longitudinal axis of the pull element remains sufficiently small to prevent products present in the container from falling over, wherein the stabilization element is compressible in a direction parallel to the longitudinal axis of the pull element to an extent such that a state is reached where the thickness of the stabilization element is equal to the thickness of one or several layers of plate material, and the packaging is provided with spring means which pre-tension the push member, in the compressed state thereof, in the direction of an expanded state. The stabilization element may have an inverted V-shape.

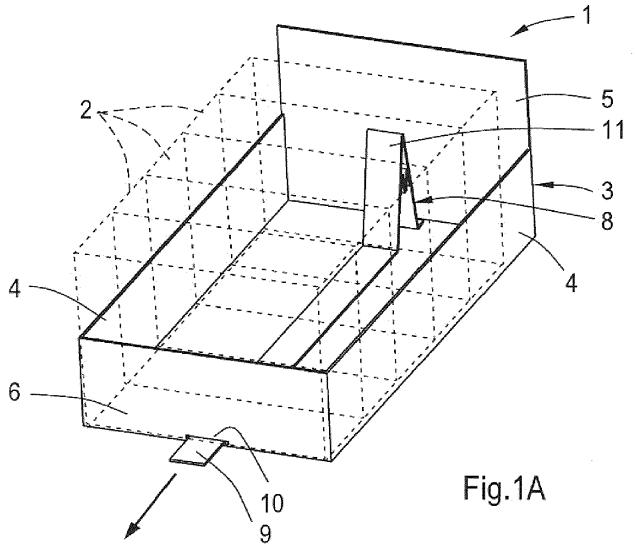


Fig.1A

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## Description

**[0001]** The invention relates to packaging for aligning articles according to the preamble of claim 1. Such packagings are known and are used, inter alia, to package comparatively narrow, elongate packagings, such as soft drinks in bottles or cartons, tubes of toothpaste, such that they are in an upright position with the narrow end pointing downwards, and subsequently they are displayed in an aligned manner in a shop so that they can be taken out by customers of the shop.

**[0002]** United States patent application US 2005/0258113 A1 discloses a device for manually aligning or fronting merchandise items in a display box. The merchandise is supported above the base of the container with product support rails. A pull member is positioned between the support rails. Merchandise is pulled forward by pulling the pull member forward. In an embodiment, the pull member is comprised of an elongate, flat pull rod and a push member arranged perpendicularly to the longitudinal direction thereof. In another embodiment, the pull member is comprised of a pull rod and a triangle positioned on or formed at said pull rod, which triangle is composed of three cardboard faces whose transverse axes are parallel to one another and one of said transverse axes forms a push member situated perpendicularly to the pull rod.

**[0003]** A drawback of said device resides in that the push member is either not stable and hence the products readily fall over or the push member takes up potential storage space in the container.

**[0004]** It is an object of the invention to provide a device which removes or mitigates said drawback, in particular a device which both stabilizes the products in the container and takes up less space.

**[0005]** This object is achieved by means of a device according to the preamble with the characteristics of claim 1.

**[0006]** As the stabilization element in compressed state has substantially zero thickness, i.e. only the thickness of one or several layers of plate material, it hardly takes up any space at the expense of the maximum number of products that fit in the packaging. At the same time, the spring means which pre-tension the push member in the compressed state thereof in the direction of an expanded state, ensure that the stabilization effect is available when needed, i.e. as soon as the products are pushed in the direction of the opening by the push member and hence are no longer maintained in an upright position by the wall of the container situated behind the push member.

**[0007]** An additional advantage of the packaging according to the invention resides in that the pull element and the stabilization element are not visible to the user as long as the packaging comprises products. This is desirable from an aesthetic point of view. In addition, the pull element and the stabilization element can be mounted in the container in a very simple manner, namely they basically only have to be placed in the container.

**[0008]** In an advantageous embodiment, the stabilization element has a inverted V-shape the legs of which are mutually pivotally connected and, in addition, one of said legs forms the push member which at the free end thereof is pivotally connected to the pull element. This embodiment can be realized in a single piece, for example of cardboard, in a simple and inexpensive manner, and when the thickness and composition are properly selected, its spring force is such that it pre-tensions the stabilization element.

**[0009]** In an embodiment of the packaging according to the invention, the other leg is provided at the free end thereof with a flange which is directed transversely to the plane of said leg. This has the advantage that the leg is more rigid and more readily slidable, particularly in the direction of the take-out opening of the container. Said flange may be an edge of the leg folded to one side, but also an attached strip projecting on both sides.

**[0010]** In another embodiment of the packaging according to the invention, the push surface and the stabilization element jointly comprise a zigzag shape the legs of which are mutually pivotally connected, and the free end of one of the two outer, i.e. extreme, legs is pivotally connected to the pull element. Said zigzag shape enables a very stable push surface to be achieved.

**[0011]** In yet another embodiment of the packaging according to the invention, the spring means are formed by flexible material which forms part of the pivoted joints, such as cardboard or some synthetic resins. This enables a simple construction and hence lower manufacturing costs. In the case of cardboard, recycling of used and discarded packagings is readily possible.

**[0012]** If the spring means comprise a V-shaped auxiliary element, which is attached to the stabilization member, and which may be provided between two legs of a stabilization member comprising at least one larger V-shape, a combination of substantial spring force and a low cost price can be readily achieved.

**[0013]** If the auxiliary element is provided on the outside of the apex of a stabilization member comprising at least one larger V-shape, for example glued to one of the sides of the apex, it is capable of enhancing the product-stabilizing effect of the stabilization member.

**[0014]** In an embodiment, the pull element is elastic in order to apply a pre-tension to the push member situated behind products in the direction of the first end of the container. This can be achieved, for example, because the pull element comprises an elastic foil, possibly a latex-like foil, wherein the colours of the latex may possibly indicate the spring force.

**[0015]** When the length of the elastic pull element is larger than the distance between the first end of the container and the second end of the container, it becomes easy to obtain a sufficiently large spring force over a sufficiently large distance covered by the push member to push all the products as far as the take-out opening, even the last remaining product. Said pull element may be at-

tached to the outside of the container, so that the container itself is used to pre-tension the pull element and no additional parts are required. Additionally, in said case, it becomes possible to tension the pull element when the packaging is placed in a shop, so that the pull element, and also other parts of the packaging, remains unloaded until that moment in time, leading to an increased service life thereof.

**[0016]** The invention also relates to a packaging for aligning articles according to claim 14 and sub-claims 15 and 16. This packaging provides a simple construction that can be manufactured at low cost, and which is intended to push the products present in the container automatically towards the take-out opening of the container.

**[0017]** Finally, the invention relates to a composition of a number of merchandise items in a packaging according to any one of the claims 1 to 16. Said composition offers similar advantages as the packaging.

**[0018]** The invention will be explained in greater detail with reference to the figures, in which similar parts are indicated by means of the same reference numerals.

Figure 1A is a perspective view of a first embodiment of the device according to the invention, in which the push member of the device is in a first position,

Figure 1B shows a corresponding perspective view of the first embodiment of the device according to the invention, in which the push member of the device is in a second position,

Figure 2A is a longitudinal sectional view in the plane II-II of the embodiment shown in Figures 1A and 1B, in which the push member is clearly visible,

Figures 2B to 2D show longitudinal sectional views of, respectively, a second, a third, and a fourth embodiment of the device according to the invention, which are provided with the same container as in the first embodiment, yet containing different push members,

Figures 3A and 3B show longitudinal sectional views of, respectively, a fifth and a sixth embodiment of the device according to the invention, which are provided with the same container as in the first embodiment, yet containing different pull elements,

Figures 4A and 4B show, respectively, a perspective view and a longitudinal sectional view of a seventh embodiment of the device according to the invention, which is provided with the same container as in the first embodiment, yet containing a different pull element and a different push member.

**[0019]** Figure 1A shows a packaging 1 accommodating, indicated by means of dashed lines and in such a way that they appear to be transparent, the contours of five articles 2 in the form of thin, beam-shaped soup packets which are in an upright position in a container 3 formed by a cardboard box shaped like a shoe box having two lowered side walls 4, a high rear wall 5 and a lowered front wall 6. The walls 4, 5 and 6 bound an article take-out opening 7 the side of which that is situated near front wall 6 is intended to be used for taking articles out of the container 3. What is not shown is a lid which fits on the container 3 and which, in combination with said container, forms a beam-shaped box which is suitable for the regular transport from, for example, a distribution centre to a supermarket.

**[0020]** Inside the container 3, there is provided a push member 8, which is attached to an elongate pull element 9 which is situated between said elongate pull element 9 and the lowered front wall 6 of the container 3 and which protrudes to the exterior through a slot 10 in the front wall 6. The push member 8 and the pull element 9 are slidable along the longitudinal axis of the pull element 9 between both ends of the container 3, i.e. the front wall 6 and the rear wall 5 thereof.

**[0021]** The push member 8 has a push surface 11 which includes an angle with the pull element and which projects laterally from the pull element to prevent products present in the packaging from falling over. A stabilization element 12 in the form of a face is attached to the push member 8.

**[0022]** In the position of the push member 8 shown in Figure 1A, said push member is situated next to the rear wall 5, and the stabilization element 12 is positioned between the push member 8 and the rear wall 5. In the position shown in Figure 1B, which is obtained after the pull element 9 has been pulled forward at the front wall 6 by a user, the stabilization element 12 is in a folded-out state with respect to the push member 8, as a result of which the push member 8 and the stabilization element 12 form an inverted V-shape, of which an end of one leg is pivotally connected to the pull element 9 and the end of the other leg has an edge 13 folded in the direction of the rear wall 5, which folded edge facilitates the sliding of the push member 8 together with the stabilization element 12.

**[0023]** In Figure 1B, a part 16 that can be torn off the pull element is shown in dotted lines. A user can tear off a small length from part 16 after each aligning step.

**[0024]** As is shown in Figure 2A, a V-shaped spring 14 is provided between the inverted V-shape of the push member 8 and the stabilization element 12, which ensures, on the one hand, that the larger V-shape is folded out as soon as the push member 8 loses contact with the rear wall and, on the other hand, precludes that the angle between the longitudinal axis of the pull element 9 and the push surface 11 exceeds angle $\alpha$, which is approximately 120 degrees in this example. This angle depends inter alia on weight and dimensions and the like of the packaged product, and is chosen such that each time the angle made by the push surface 11 and the longitudinal axis of the pull element 9 remains small enough to prevent products present in the packaging from falling over.

**[0025]** In Figure 2B, the push member is substantially identical to the push member shown in Figures 1a and 1b, but differs in that it is provided with a lip 15 which

projects upwards from the push surface 11 and which is glued thereto, said lip serving to make sure that products engaging the lip remain in an upright position. Like the push member and the pull element, the lip 15 is made of cardboard, in the embodiment shown, and is capable of exerting some spring force. The lip 15 forms part of V-shaped auxiliary elements of the push member 8, wherein each time one leg of the V-shape is glued to the push surface 11.

**[0026]** Figure 2C shows an embodiment of the packaging according to the invention which is substantially identical to the embodiment shown in Figure 2B, with this difference that the upward extending lip 15 of Figure 2B is substituted with a downward extending lip 17. As a result, the spring force exerting part near the push surface 11 is in a slightly more elevated position, while the height of the lip is the same.

**[0027]** In Figure 2D, the push surface 8 is connected with a zigzag-shaped stabilization element 12 the legs of which are mutually pivotally connected, as a result of which they can be moved together and apart, like an accordion, over the bottom 21 of the container 3, and thus stabilize the push member 8.

**[0028]** In addition, Figures 2A-2D each comprise a stabilization auxiliary member 14 provided between the stabilization element 12 and the push member 8, which stabilization auxiliary member helps to preclude that the stabilization element and the push member move too far apart and hence helps to prevent that the position of the push member 8 becomes too oblique to still be able to adequately keep the products in the container 3 in an upright position. In another embodiment, however, said stabilization auxiliary member 14 can be dispensed with, for example, because the material used for the stabilization element 12 is such that the lateral protrusion of the push surface 11 from the pull element 9 remains sufficient to keep the products in the container from falling over.

**[0029]** Figures 3A and 3B show the application of an elastic pull element 9. Here, use is made of a push member 8 with a stabilization element 12, as shown in Figures 1A, 1B and 2A, i.e. according to the first embodiment of the invention shown in these figures. Here, however, the pull element 9 is not made of cardboard but of an elastic material, namely a foil-like latex elastic material, and it extends from the push member 8 over the inside of the bottom of the container 3 to the opening 10 in the front wall 6 and then over the outside of the bottom of the container 3 to a slot 17 in the rear wall 5 of the container 3. The end portion of the pull element 9 is provided with a fillet, not shown, which is attached to the end portion by means of a glued joint, and which is detachably hooked into the slot 17. By virtue of its large length, the pull element 9 ensures that the soup packets 2 in the container 3 are always pressed towards the front wall 6 by the push member 8 to which, as mentioned hereinabove, the pull element is attached. The pulling force is largest when the container 3 is filled with soup packets 2, which is when the largest pull force is required to overcome the friction force exerted by the soup packets on the bottom of the container 3. At the appropriate strength of the pull element, i.e. the latex elastic material, the tensile force is large enough to keep the last soup packet 2 in an upright position and make it move towards the front wall 6.

**[0030]** The embodiment of the packaging according to the invention shown in Figure 3B has an elastic pull element 9, just like the embodiment shown in Figure 3A, which in this case, however, is situated entirely inside the container 3 by placing an insert in the form of a plate 18 on the bottom 21 of the container 3 and providing the pull element 9, from the push member 8, first along the top of the inserted plate 18, in the longitudinal direction thereof, and then folding it around the front side and guiding it along the bottom in the direction of the rear wall 5 and subsequently attaching it, near this wall 5, to the inserted plate 18. The inserted plate 18 used here is thinner at the location of the pull element 9 than at either side thereof, so that in the lateral direction, at either side of the pull element, tracks are formed along which the soup packets 2 can slide freely without contacting the pull element, so that the pull element can contract and expand in the longitudinal direction of the inserted plate 18 without being hindered by the soup packets 2 (or any other products in the container).

**[0031]** Figure 4A shows an embodiment of the invention in which the pull element 9 is not provided underneath the products in a horizontal plane, but vertically, and it is in the form of a double pull element, as a result of which three product spaces are obtained which are separated from one another by the pull elements 9 serving as partitions. This is useful, for example, in the case of tubes of toothpaste, i.e. products having a comparatively small base which easily fall over in various directions. As a result, the front wall 6 also has two openings 10 to allow passage of the two pull elements 9. The pull elements are attached to a zigzag-shaped element 20, which comprises both the push member 8 with push surface 11 and the stabilization element 12. The zigzag-shaped element 20 has a stabilizing function, i.e. the push surface 11 is maintained substantially at right angles (at an angle $\alpha$ of approximately 90 degrees) to the side walls in the container; the pull elements 9 make sure that the push surface 11 also remains parallel to the front wall 6 and rear wall 5 of the container 3.

**[0032]** In a non-shown variant of the embodiment shown in Figure 4, the two vertical partitions are fixedly arranged in the container, and the push member, stabilization element including the zigzag-shaped element 20 have recesses through which said two partitions extend. Here, the pull element 9 is arranged either in a vertical position next to the partitions, or in a horizontal position at the bottom of the container 3.

**[0033]** All embodiments shown are made of cardboard with the exception of elastic elements which, as mentioned hereinabove, are made of latex or the like. In addition, in all embodiments shown, when the push member

lies against the rear wall 5 of the container 3, a compressed state of the stabilization element 12 occurs, and an expanded state thereof occurs when the push member is at a distance from the rear wall, so that, in the latter case, the stabilizing effect of the push member 8 is obtained by means of the stabilization element 12.

**[0034]** The embodiments shown only serve to illustrate the present invention. Variants within the scope of the invention are conceivable to those skilled in the art, such as a cylindrical container instead of a beam-shaped container.

## Claims

**1.** A packaging (1) for aligning articles (2), comprising:

- a container (3) at least one side of which is provided with an article take-out opening (4),
- a push member (8) for articles present in the container, which may be pivotally or non-pivotally connected to a pull element (9) having a longitudinal axis, which push member is slidably arranged between a first end (6) of the container situated close to the article take-out opening and an oppositely situated second end (5) of the container, and wherein the pull element extends between the push member (8) and said first end (6) of the container (3), and the push member is provided with a push surface (11) which projects laterally from the pull element at an angle to the longitudinal axis of the pull element,
- a stabilization element attached to the push member, which ensures that during movement of the push member in the direction of said first end of the container with the concomitant displacement of the products present in the container, the angle included by said push surface and the longitudinal axis of the pull element remains sufficiently small to prevent products present in the container from falling over,

**characterized in that**

- the stabilization element is compressible in a direction parallel to the longitudinal axis of the pull element to an extent such that a state is reached where the thickness of the stabilization element is at the most equal to the thickness of one or several layers of plate material, which state is referred to as compressed state, and
- the packaging is provided with spring means which pre-tension the push member, at least in the compressed state thereof, in the direction of an expanded state in which the stabilization element is suitable to fulfil its stabilizing function.

**2.** The packaging according to claim 1, **characterized in that** the stabilization element has an inverted V-shape the legs of which are mutually pivotally connected and, in addition, one of said legs forms the push member which at a free end thereof is pivotally connected to the pull element.

**3.** The packaging according to claim 2, **characterized in that** the other leg is provided at the free end thereof with a flange which is directed transversely to the plane of said leg.

**4.** The packaging according to claim 1, **characterized in that** the push surface and the stabilization element jointly comprise a zigzag shape the legs of which are mutually pivotally connected, and the free end of one of the two outer legs is pivotally connected to the pull element.

**5.** The packaging according to any one of the preceding claims, **characterized in that** the spring means are formed by flexible material which forms part of the pivoted joints.

**6.** The packaging according to any one of the preceding claims, **characterized in that** the spring means comprise cardboard.

**7.** The packaging according to any one of the preceding claims, **characterized in that** the spring means comprise a V-shaped auxiliary element, which is attached to the push member.

**8.** The packaging according to claim 7, **characterized in that** the auxiliary element is provided between the push member and the stabilization member.

**9.** The packaging according to claim 7, **characterized in that** the auxiliary element is provided on the outside of the apex of a stabilization member comprising at least one larger V-shape.

**10.** The packaging according to any one of the preceding claims, **characterized in that** the pull element is elastic in order to apply a pre-tension to the push member situated behind products in the direction of the first end of the container.

**11.** The packaging according to claim 10, **characterized in that** the pull element comprises an elastic foil.

**12.** The packaging according to claim 9 or claim 10, **characterized in that** the length of the pull element is larger than the distance between the first end of the container and the second end of the container.

**13.** The packaging according to any one of the claims 10 to 12, **characterized in that** the pull element is detachably or undetachably attached to the outside

of the container.

**14.** The packaging for aligning articles, comprising

- a container at least one side of which is provided with an article take-out opening,
- a push member for articles present in the container, which is pivotally or non-pivotally connected to a pull element having a longitudinal axis, which push member is slidably arranged between a first end of the container situated close to the article take-out opening and an oppositely situated second end of the container, and wherein the pull element extends between the push member and said first end of the container, and the push member is provided with a push surface which projects laterally from the pull element,

**characterized in that** the pull element is elastic in order to apply a pre-tension to the push member situated behind products in the direction of said first end of the container.

**15.** The packaging according to claim 14, **characterized in that** the length of the pull element is larger than the distance between said first and second ends of the container.

**16.** The packaging according to claim 14 or claim 15, **characterized in that** the pull element is detachably or undetachably attached to the outside of the container.

**17.** A composition of a number of merchandise items in a packaging according to any one of the preceding claims 1 to 16.

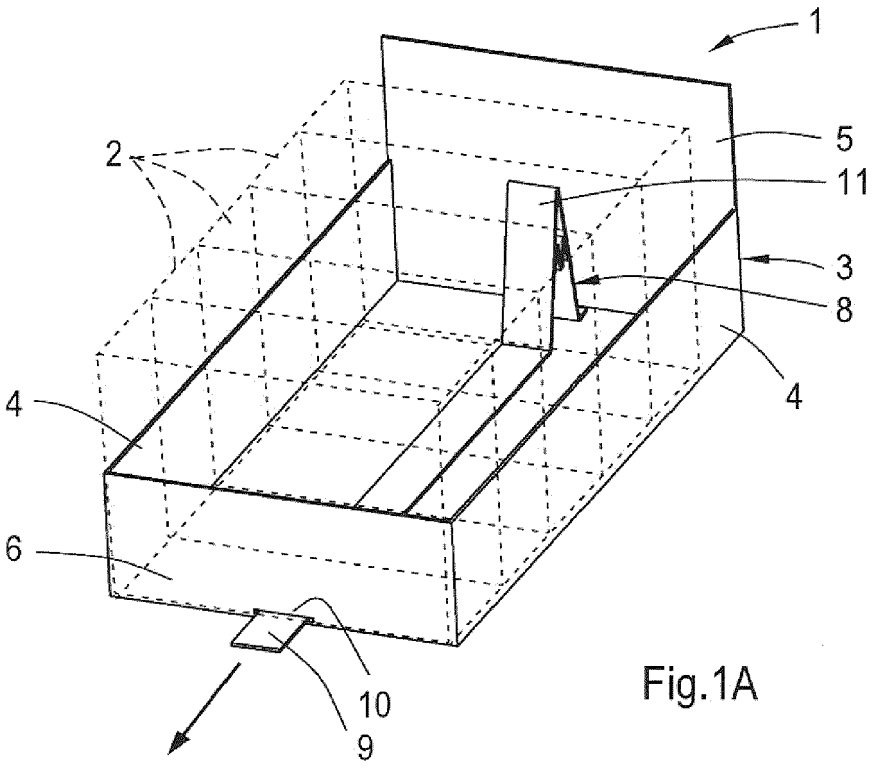



Fig.1A

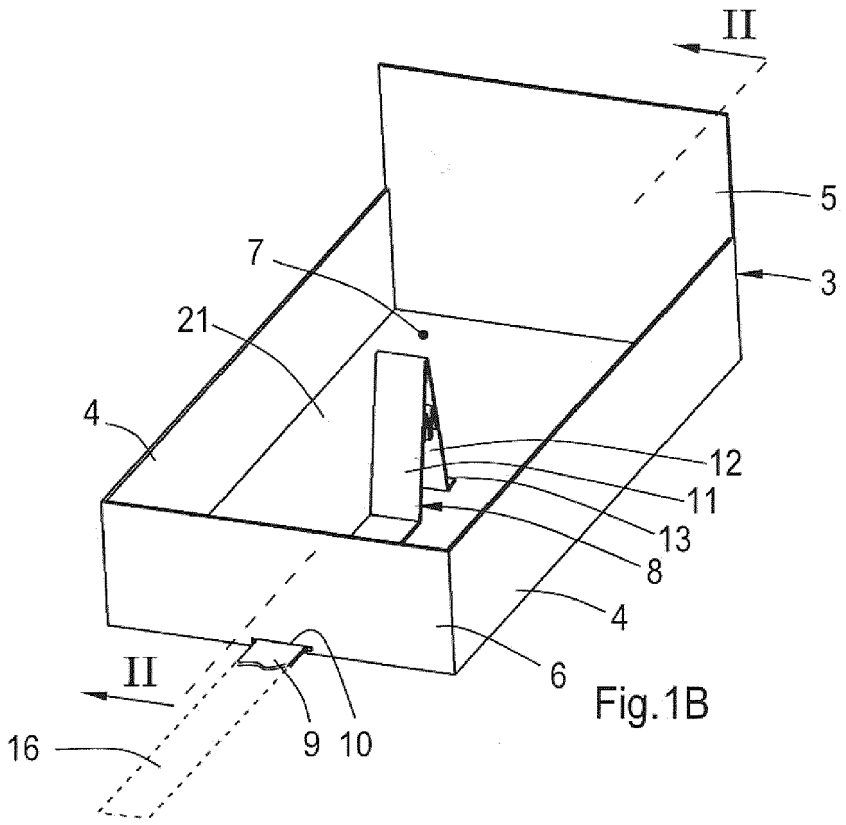



Fig.1B

Fig.2A

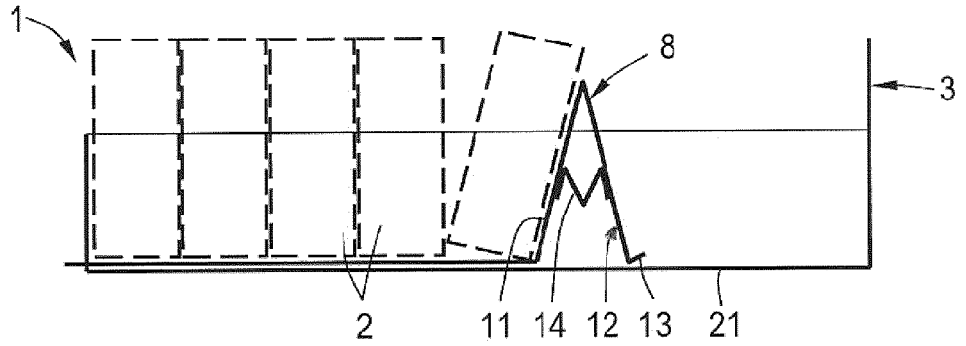



Fig.2B

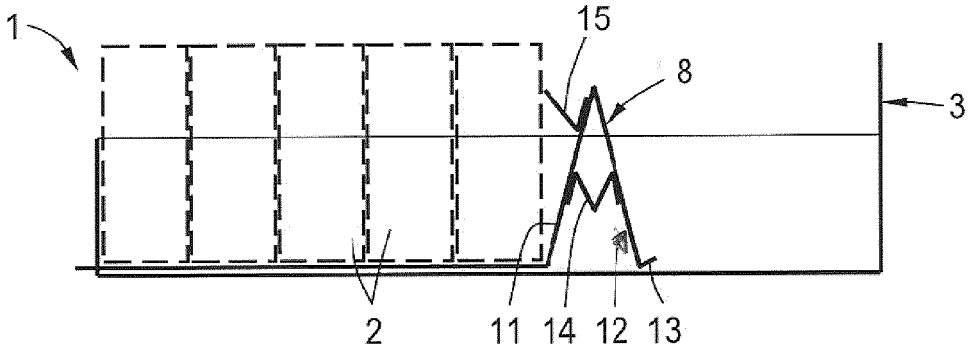



Fig.2C

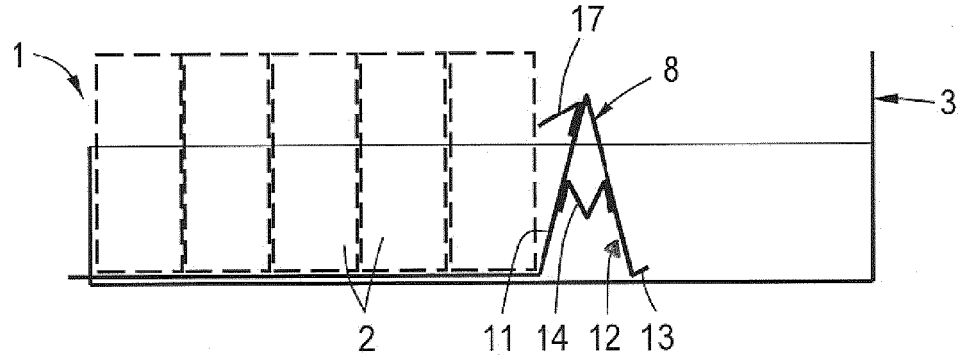
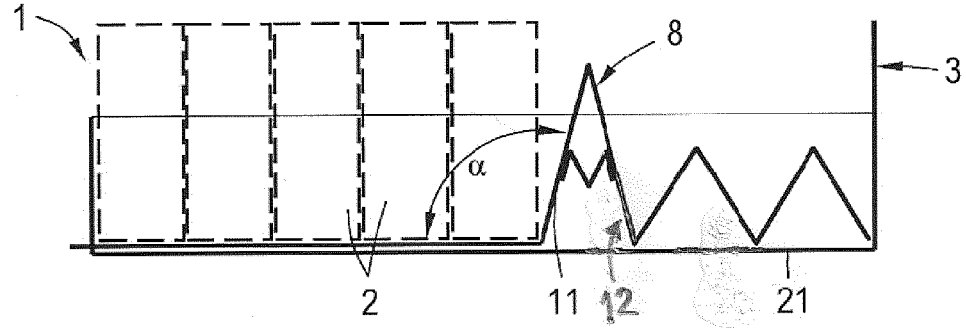



Fig.2D



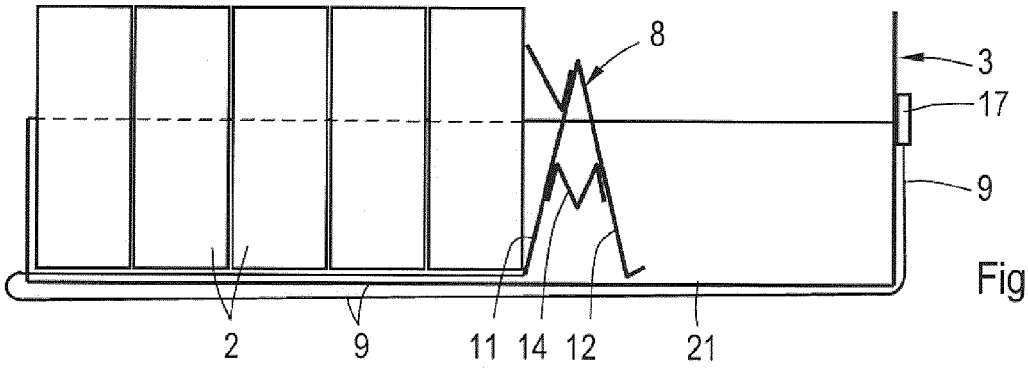



Fig.3A

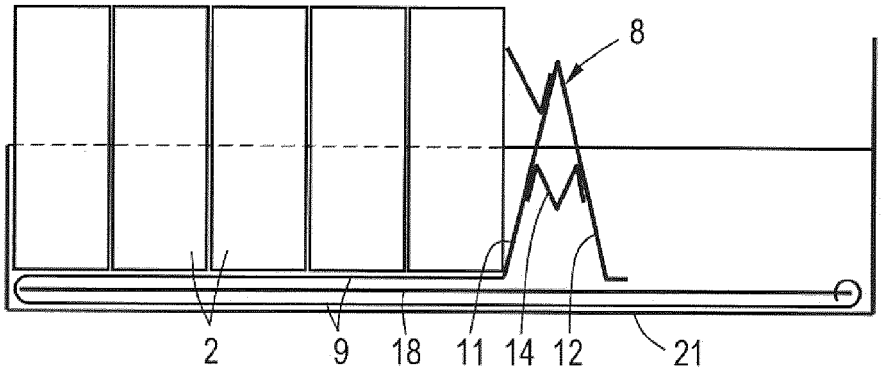



Fig.3B

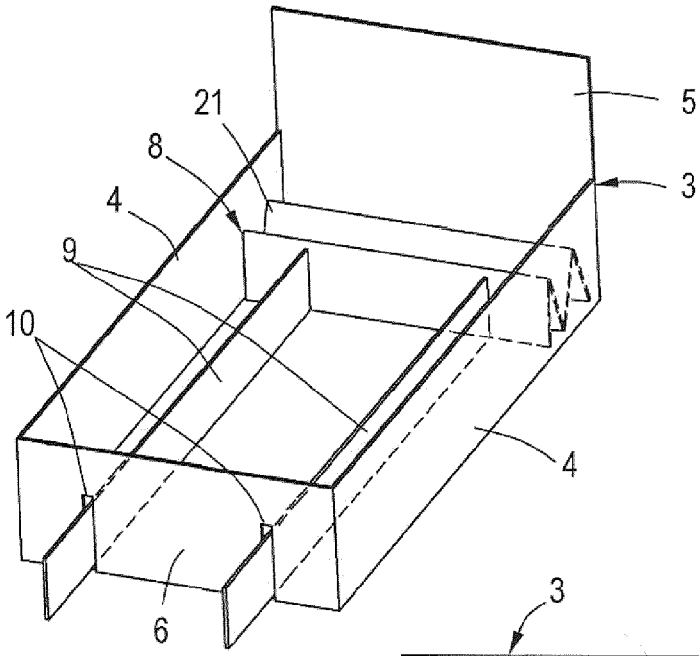



Fig.4A

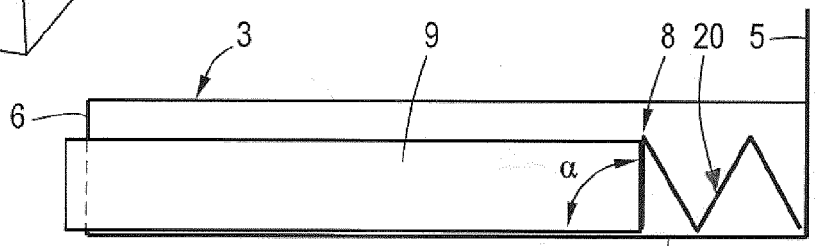



Fig.4B

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# EUROPEAN SEARCH REPORT

Application Number
EP 13 17 1082

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
|---|---|---|---|
| X | WO 2011/151410 A1 (FINK BERNHARD [AT]; KERSTAN PETER [AT]; KRAINZ MICHAEL [AT]) 8 December 2011 (2011-12-08) | 14,15 | INV. B65D5/52 B65D83/00 |
| A | * abstract; figures 1-5 * | 1-13 | A47F1/12 B65D25/10 |
| X | DE 10 2005 056162 A1 (MTC TRADING COMPANY GMBH [DE]) 12 July 2007 (2007-07-12) | 14,15 | B65D5/50 |
| A | * abstract; figure 1 * | 1-13 | |
| X | US 6 076 670 A (YERANOSSIAN KARL [US]) 20 June 2000 (2000-06-20) | 14,15 | |
| A | * the whole document * | 1 | |
| A | US 4 588 093 A (FIELD FRANK P [US]) 13 May 1986 (1986-05-13) * abstract; figures 1-3 * | 1 | |
| A | DE 42 11 569 A1 (LUX ERICH [DE]) 14 October 1993 (1993-10-14) * abstract; figures 1,2 * | 1 | |
| A | DE 20 2006 007162 U1 (SCA VERPACKUNG & DISPLAY VERTR [DE]) 28 December 2006 (2006-12-28) * the whole document * | 1 | TECHNICAL FIELDS SEARCHED (IPC) A47F B65D |

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| The Hague | 12 March 2014 | Mans-Kamerbeek, 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

1

EPO FORM 1503 03.82 (P04C01)

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Application Number
EP 13 17 1082

## CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☒ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

## LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

## ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 13 17 1082

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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12-03-2014

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---|---|---|
| WO 2011151410 A1 | 08-12-2011 | AT 509916 A1<br>WO 2011151410 A1 | 15-12-2011<br>08-12-2011 |
| DE 102005056162 A1 | 12-07-2007 | NONE | |
| US 6076670 A | 20-06-2000 | NONE | |
| US 4588093 A | 13-05-1986 | NONE | |
| DE 4211569 A1 | 14-10-1993 | NONE | |
| DE 202006007162 U1 | 28-12-2006 | NONE | |

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

## REFERENCES CITED IN THE DESCRIPTION

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### Patent documents cited in the description


- US 20050258113 A1 **[0002]**