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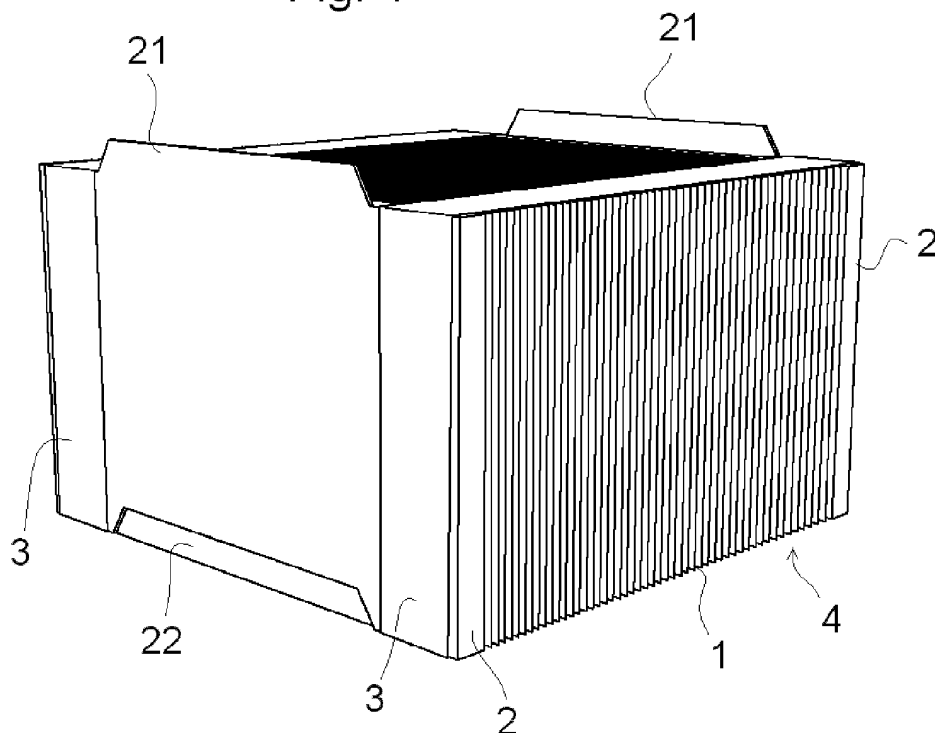
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(54) **Device for the formation of a package of envelopes.**

(57) Device for the formation of a package (4) of envelopes (1), vertically juxtaposed and stacked, said package comprising a front cover (2) and a back cover (2), both of a size equivalent to the size of the envelopes to be packed, and at least one wrapping strip (3) holding both covers and the envelopes included in the package,

said covers presenting, in their upper and lower edges, homologous attaching means (21, 22) coupled with tongue and groove in the stacking of the packages and the wrapping strip or strips being placed in a vertical plane that holds the upper and lower edges of the envelopes between the front and back covers.

**Fig. 1**



## Description

### Object of the invention

[0001] The present invention, as the name suggests, relates to a device for the formation of a package of envelopes, vertically juxtaposed and stacked, and arranged to supply an automatic inserter machine.

[0002] Automatically insertable envelopes are envelopes for letters or documents that are filled automatically in inserter machines. These machines manipulate a very large number of envelopes in an automatic manner, at a very high speed, due to which they need to be supplied with empty envelopes, all of which invariably placed in the same position for the machine to operate without interruptions, given that stops are very expensive, not only due to the waste of time, but also because an operative needs to intervene to resume the normal operation of the chain of insertion.

[0003] The envelopes are placed in a supply belt or line, coming from a package or box wherein they are traditionally brought from the envelope manufacturer. The transfer of the envelopes from each box to said supply line is carried out manually, where it is necessary for the operative to open the box, take out the envelopes, place them in the appropriate position, and leave the box in a container to be recycled.

[0004] This invention allows improving the efficiency of these insertion processes by minimizing the time necessary to unpack the product with respect to other typical envelope packing systems (i.e. cardboard boxes).

### Background of the invention

[0005] Some solutions are currently known, which envisage a package of envelopes formed by a front cover and a back cover, both of sizes equivalent to the envelopes to be packed, and a wrapping strip that holds both covers, in addition to the envelopes included in the package, similarly to the manner in which a bundle of any other product is formed. Specifically, document EP 1352845 of GPV envisages a block of envelopes fastened with a strip that wraps the package in a horizontal manner, holding two covers, front and back. This solution has several problems: firstly, the stacking of the packages of envelopes is carried out by means of rods that pierce the front and back covers, which greatly complicates the loading and formation of the pallet, as well as the unloading of the package of envelopes towards the insertion line. On the other hand, the wrapping strip is placed in the horizontal direction, because in the vertical direction it would prevent the passage of said rods, this assembly being the cause of several problems: the package of envelopes is unstable and may come apart very easily, simply by transferring it from the pallet to the insertion line, even more so if we take into account that we need to take it out from the rods structuring the column of packages in the pallet. On the other hand, this strip acts on the

intermediate area of the envelopes, where they have a smaller number of layers of paper, due to which the package normally collapses at this intermediate area where the strips pass, while the corners of the envelope tend to bend outwards. This deformation of the envelopes can also cause jams in the automatic inserter machine.

[0006] Document EP2173641 of AWA likewise envisages a package of envelopes, all of which are juxtaposed and stacked and located vertically in the same position, which is formed by means of grid cardboard forming an enclosure in the form of a band that holds the package of envelopes above and below, in addition to the front and back sides, only leaving the lateral edges of the envelopes uncovered. This solution solves some of the problems of the GPV patent, but it is very expensive, it generates waste equivalent to a conventional cardboard box, and its manipulation in the supply stage of the inserter machine is not easy either, given that it is necessary to break or cut the wrapping strip and transfer the envelopes manually because, since said strip occupies the bottom of the package of envelopes in its entirety, if the strip is pulled to attempt to remove it in this manner, the package of envelopes comes apart and the envelopes are displaced, which will cause a jam in the inserter machine if they are inserted in a disorderly manner and perfectly juxtaposed.

### Description of the invention

[0007] The objective of the invention is a device for the formation of packages of envelopes that overcomes the problems proposed by existing devices in the current state of the art. To achieve the foregoing, the invention envisages the formation of envelopes, wherein they are all vertically juxtaposed and stacked, in the same position, being protected in the front and in the back by means of two covers made of a rigid or semi-rigid material, which are of a size equivalent to the envelopes to be packed, the package being formed with at least one wrapping strip holding both covers and the envelopes making up the package.

[0008] According to a special characteristic of the invention, said covers present in their upper and lower edges attaching means homologous to one another, coupled with tongue and groove in the stacking of the packages. The enclosure is located in a vertical plane, such that it holds the upper and lower edges of the envelopes between the front and back covers and is constituted by two lateral strips that press the envelopes on the areas with more superimposed layers of paper. This way, the package of envelopes is perfectly stable and is not deformed when manipulated to load the pallet or to unload it and place it directly in the inserter machine. It does not bend either, given that the envelopes are held by the four corners, which are exactly the points where more layers of paper converge; therefore, the package and the envelopes are not hollowed out or deformed. Finally, the package of envelopes can be directly placed on the belt

supplying the inserter machine and proceed to cut and remove the tightening strip for the envelopes to simply remain in the appropriate position.

**[0009]** The attaching means existing in the edges of the front and back covers forming the package of envelopes also define, in addition to attaching means between two stacked packages, attaching or coupling means with a separating cover between layers of packages of envelopes, when stacked and placed in a pallet of packages of envelopes. This simple cover, made of cardboard or another equivalent recyclable material, is enough to structure the set of packages of envelopes in the pallet, without the need to include rods or other types of structural elements between packages. The separating covers between layers of envelopes present a series of slots to give way to the attaching means between the stacked packages and are such that they allow the placement of the columns of packages peripherally to one of the front or back covers arranged outwards, except at the corners, where logically at least one of the sides needs to be constituted by the edge of the packaged envelopes; this way, the surface of the envelopes exposed through the exterior of the pallet is minimal.

**[0010]** In terms of the attaching means existing in the edges of the front and back covers of the package, they can be constituted by flaps protruding upwards, in correspondence with the holes existing in the bases of the front and back covers. In a preferred embodiment of the invention, said flaps and holes are located in the external walls of the front and back covers.

**[0011]** The aforementioned attaching means located in the front and back covers of the package can also be constituted by a crenellation, the one in the upper edge being homologous to the one in the lower edge, such that they are coupled to one another in the stacking of the packages.

**[0012]** In terms of the material of the front and back covers closing the packages of envelopes in the front and in the back, they can be made of disposable cardboard, composed of protruding flaps and holes produced by lateral flattening, according to the same; or of any other rigid material, such as plastic, for example. If they are made of cardboard, they may be recycled along with the closing strips; if they are made of plastic, they may be reused, with the resulting savings in packaging materials, which would lead to benefits in economic and environmental terms.

**[0013]** Optionally, each package of envelopes includes a barcode or a QR code, which is inserted in the visible face of the tying or closing strip of the package, which may be read by any means for the location and identification of the package. Likewise, and in an optional manner, each pallet of packages of envelopes can include an RFID card, which may be read at the entrance of the place where the inserter machine is located in order to establish the type and model of the envelopes to be loaded into the machine.

## Description of the figures

**[0014]** In order to supplement the description being made and with the purpose of facilitating the comprehension of the characteristics of the invention, the present specification is accompanied by a set of drawings that represent the following in an illustrative rather than limitative manner:

Figure 1 shows a perspective view of a package (4) of envelopes (1) made with the device of the invention.

Figure 2 is a view equivalent to the preceding one during the process of formation of the package.

Figure 3 is a view of two packages (4) of stacked envelopes.

Figure 4 is a view of a pallet (7) loaded with packages (4) of envelopes.

Figure 5 shows a view of a package of envelopes with only one wrapping strip and still presenting two tongue and grooved flaps.

Figures 6 and 7 are two covers (2), made of plastic or other rigid or semi-rigid material, presenting attaching or connecting means other than the ones of the preceding embodiments.

## Preferred embodiment of the invention

**[0015]** As shown in the figures referenced above, the object of the device of the invention is to form a package (4) of envelopes for its transportation from the manufacturer to the place where they are to be inserted into an automatic machine, stacked and conveniently placed in a conventional pallet (7).

**[0016]** The envelopes (1) are placed juxtaposed, positioned in the vertical position, being jointly pressed by two covers (2), placed in front and in the back of the set of envelopes and subsequently tied with two strips (3), joined by ultrasound or by thermal welding, forming wrapping bands located in a vertical plane and next to the corners, with the purpose of firmly fastening the envelopes at this area, which is the thickest for having the largest number of layers of paper; such that the package, after being conveniently tied as shown in figure 1, does not bend, is not deformed, and keeps the envelopes forming a parallelepiped (4).

**[0017]** As shown in the figures, the covers (2) present protruding flaps (21), located in the upper edge, and in the lower part carvings (22) to which the flaps of the package (4), located below, are coupled, as shown in figure 3. In a preferred arrangement, represented in figures 1 to 4, these protuberances (21) and carvings (22) are located in the central area, such that they do not interfere in the placement of the strips (3) at both sides. Likewise, the protuberances (21) are located in the external face of the cover (2), as are the carvings (22), which are made by the pressing the external face thereof, such that the coupling with tongue and groove produced when two

packages (4) are stacked is carried out from the external face of the package, due to which dismantling a package from the pallet (7) transporting the same is very simple.

**[0018]** As shown in figure 4, covers (6) have been provided to form a pallet (7), which close the set of packages (4) above and also separate successive layers of packages (4). These covers have slots in which the flaps (21) fit, which are an extension of the front or back covers (2) of the package of envelopes. As shown in this figure, the distribution of said slots is such that it allows the placement of all the packages of envelopes (4) with their lateral flaps (2) directed outwards, except for the stack formed by each corner logically, wherein at least one side has to show the package of envelopes wherein these are seen by the edges.

**[0019]** In an alternative embodiment, the flaps (21) located in the front and back covers (2) are two, located next to the sides, and the tying strip (3) is only one, located in the center. See figure 5.

**[0020]** In an alternative embodiment, the front and back covers (2) present different tongue and groove coupling means, more specifically, the edges have alternating holes and protuberances, as shown in figure 6. In figure 7, the coupling is carried out as a crenellation, the protuberances and recesses existing in the upper edge and in the lower edge, respectively, being homologous.

**[0021]** The strips (3) are made of a non-elastic material, allowing the affixing of their extremities by ultrasound or by thermal welding to achieve a degree of compression in the envelopes of approximately up to  $4 \cdot 10^5$  Pa. On the other hand, the front and back covers (2) are made of medium density board (MD), of cardboard or plastic; in this last case, they are recoverable and reusable, while the others are recyclable in principle.

**[0022]** After sufficiently describing the nature of the invention, as well as an example of a preferred embodiment, we would like to note, for the relevant effects, that the materials, size, and arrangement of the elements described above may be modified, as long as it does not imply a modification of the essential characteristics of the invention, which are claimed below.

## Claims

1. Device for the formation of a package of envelopes, vertically juxtaposed and stacked, said package comprising a front cover and a back cover, both of a size equivalent to the size of the envelopes to be packed, and at least one wrapping strip holding both covers and the envelopes included in the package, **characterized in that** said covers present, at least in the central area of their upper and lower edges, homologous attaching means coupled with tongue and groove in the stacking of the packages, while the wrapping strips are placed in a vertical plane holding the upper and lower edges of the envelopes

between the front and back covers, and by both sides, holding the envelopes on the area with the most superimposed layers of paper.

2. Device according to claim 1, **characterized in that** the attaching means existing in the edges of the front and back covers forming the package of envelopes also define, in addition to attaching means between two stacked packages, attaching or coupling means with a separating cover between layers of packages of envelopes, when stacked and placed in a pallet of packages of envelopes.
3. Device, according to claims 1 and 2, **characterized in that** the arrangement of the separating covers between layers of envelopes presents a series of slots to give way to the attaching means between the stacked packages and are such that they allow the placement of the columns of packages peripherally to one of the front or back covers arranged outwards, except at the corners, where at least one of the sides needs to be constituted by the edge of the packaged envelopes.
4. Device, according to claim 1, **characterized in that** the attaching means existing in the edges of the front and back covers of the package are constituted by flaps protruding upwards, in correspondence with holes existing in the bases of the front and back covers.
5. Device, according to claims 1 and 2, **characterized in that** the attaching means existing in the edges of the front and back covers of the package are located in the external walls of the front and back covers.
6. Device, according to claim 1, **characterized in that** the attaching means existing in the edges of the front and back covers of the package are constituted by a crenellation, the one in the upper edge being homologous to the one in the lower edge, such that they are coupled to one another in the stacking of the packages.
7. Device, according to claim 1, **characterized in that** the front and back covers closing the packages of envelopes in the front and in the back are made of disposable cardboard, formed by protruding flaps and holes produced by lateral flattening, according to the same.
8. Device, according to claim 1, **characterized in that** the front and back covers closing the packages of envelopes are made of polyethylene or any other reusable plastic material.
9. Device, according to claim 1, **characterized in that** the wrapping strips (3) are firmly positioned by

means of a wrapping process by ultrasound or by means of thermal welding.

10. Device, according to claim 1, **characterized in that** a barcode or a QR code is inserted in the visible face of one of the wrapping strips, to be read by a machine.

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Fig. 1

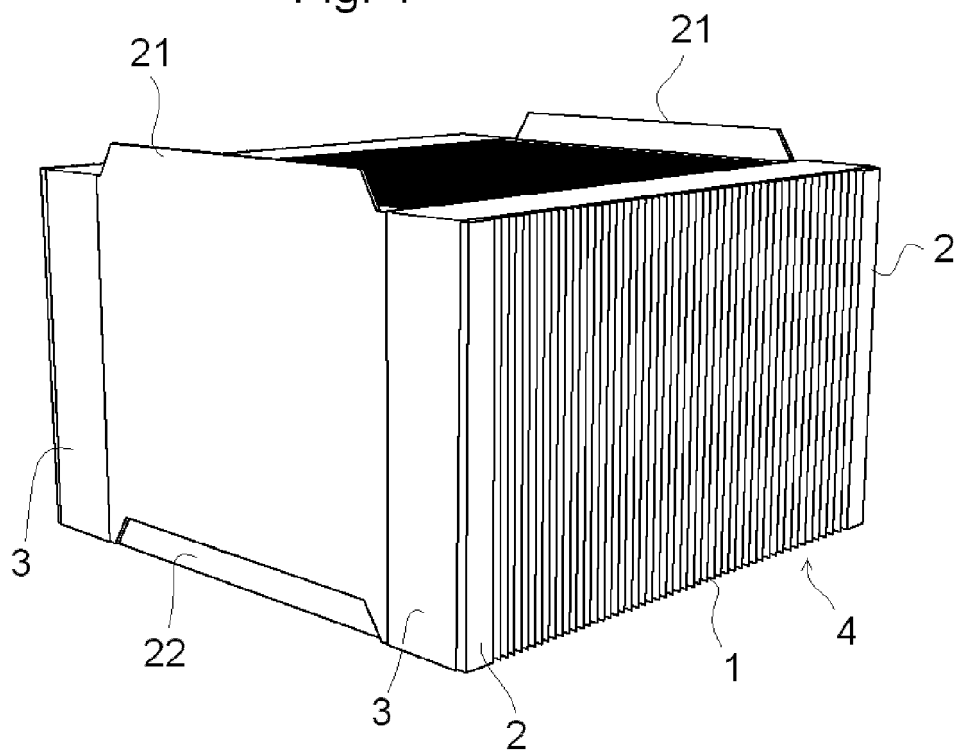


Fig. 2

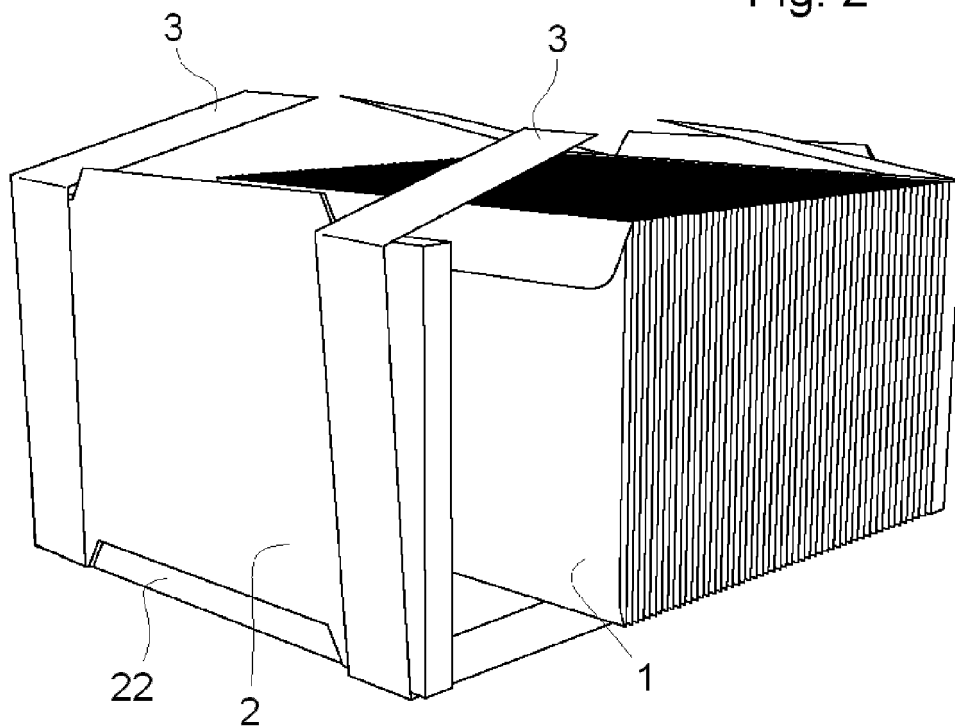
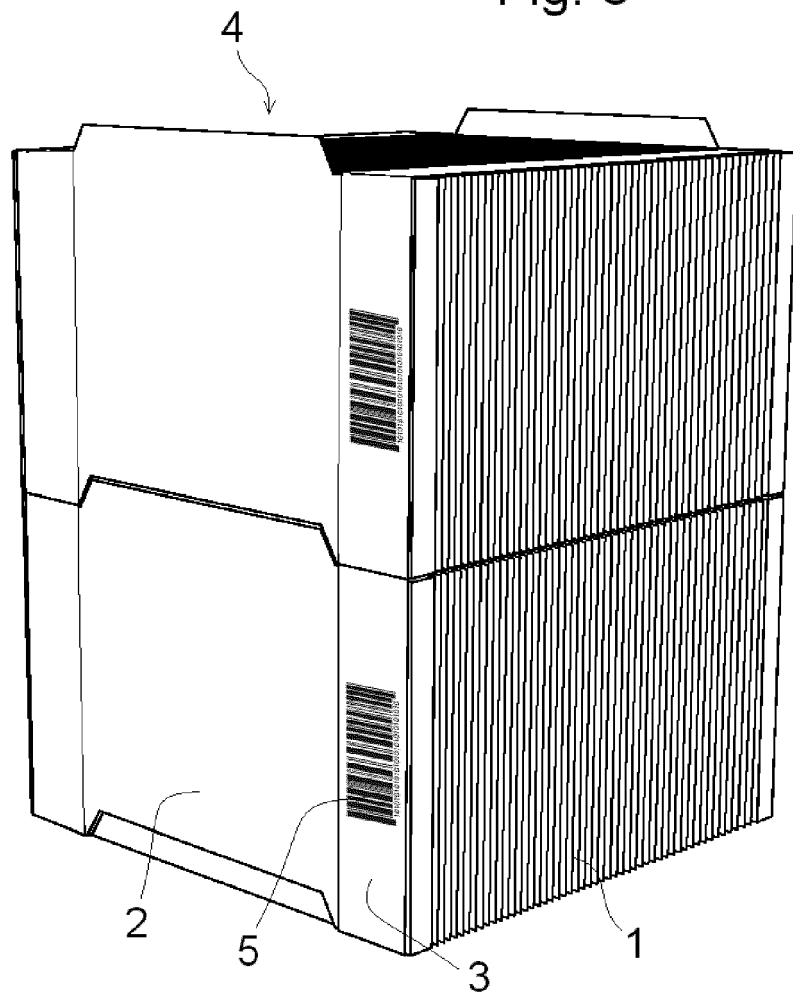


Fig. 3



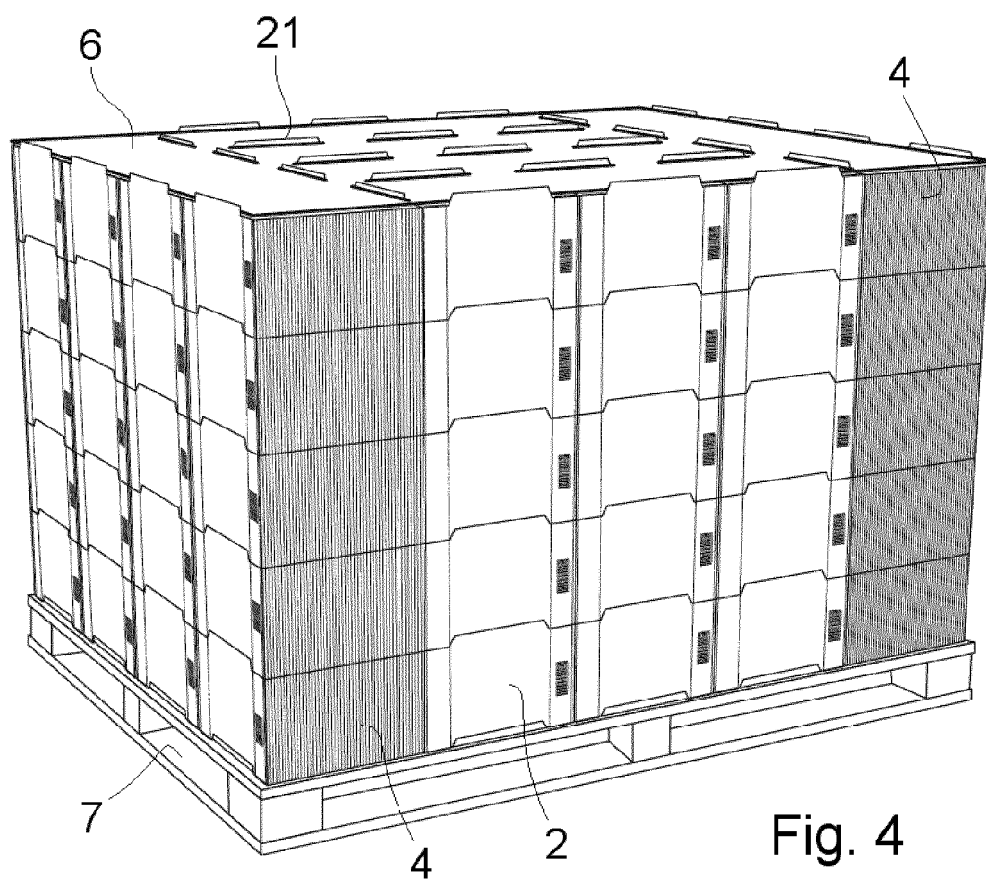


Fig. 4

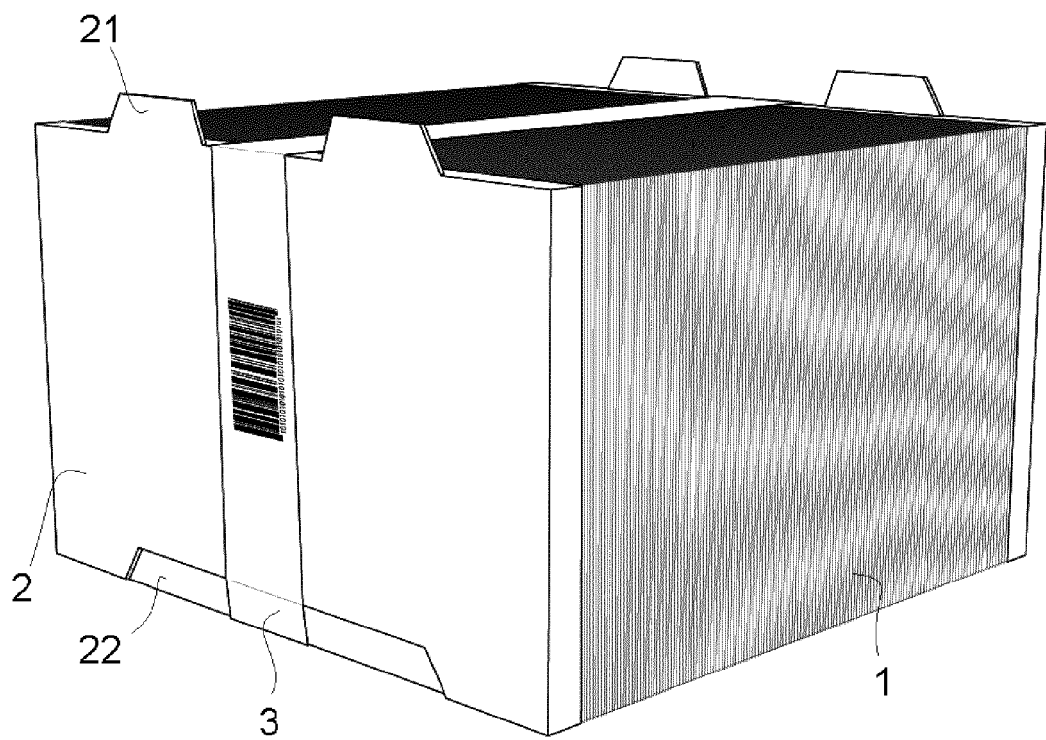
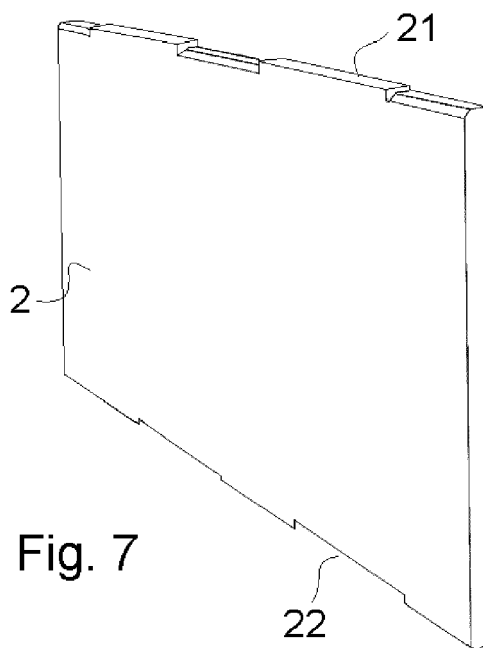
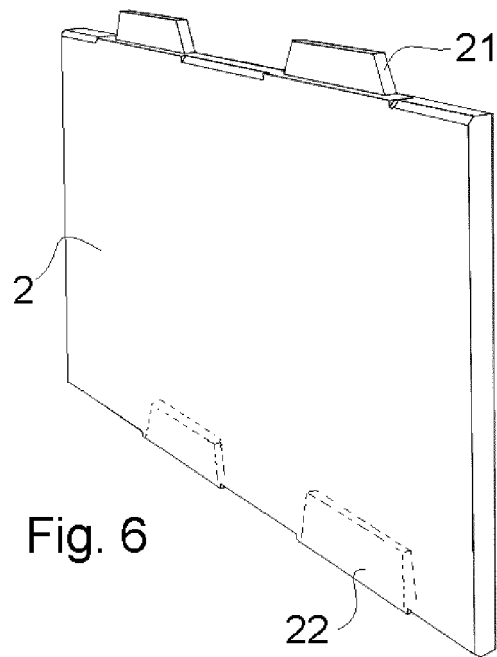


Fig. 5





## EUROPEAN SEARCH REPORT

Application Number  
EP 13 38 2261

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                  |                                                 |                                         |
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| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                  |                                                 |                                         |
| Place of search<br>The Hague                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                  | Date of completion of the search<br>20 May 2014 | Examiner<br>Mans-Kamerbeek, M           |
| CATEGORY OF CITED DOCUMENTS<br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document<br>T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>& : member of the same patent family, corresponding document |                                                                                                                                                  |                                                 |                                         |

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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.  
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