

Frame element for packaging flat items and wrapper made from such elements

The present invention relates to a frame element for packaging flat items as well as the wrapping obtained by associating such elements.

- 5 The present invention relates more particularly to an element designed to form all or part of a frame protecting substantially flat items or products during the storage and/or transport thereof.
- 10 A flat item refers to a product whereof the thickness is in particular smaller than its other dimensions.
These items may have a generally parallelepiped, cylindrical, polygonal, or any other complex shape.
- 15 Such a frame element is in particular applicable in the field of logistics for the packaging and delivery of flat and fragile products or equipment, particularly such as flat-screen televisions, glass panels, paintings, etc.
- 20 In general, the large flat items are packaged in containers such as wooden or cardboard boxes in which they are immobilized by shims and protected from any impacts by particles (pellets or beads) of a honeycomb material (polystyrene), fibers, optionally combined with other wrapping elements.
- 25 However, these protection means use significant volumes of disparate elements and different materials whereof both the transport to the packaging site and the subsequent management, after use, pose bulk, recycling and therefore cost problems.
- 30 The present invention aims to resolve these technical problems in a satisfactory manner by proposing a solution making it possible to cover and protect the thickness of these flat items effectively and compactly.
- 35 This aim is achieved according to the invention using a frame element to package flat items, characterized in that it comprises at least one first profile and a second profile connected, longitudinally and in a same piece, by a flexible

hinge and each including an axial groove for receiving the item that is laterally delimited by two series of notches; the respective notches of said profiles, adjacent to said hinge, being provided with contact stops ensuring blocking of the two profiles in a relative angular position where their respective grooves are open across from the edge of the item to be protected.

According to one advantageous feature, said notches are configured and positioned such that two identical elements are superimposed inversely and head-to-tail by interlocking of the first and second profiles.

According to another feature, the notches of one of the series of the first profile are made up of an inner projection with a straight wall outwardly extended by a transverse shoulder.

According to one advantageous alternative, the notches of one of the series of the second profile are separated by outer flat portions inwardly extended by undercuts.

According to another alternative, the notches of at least one of the series of the first profile are provided with underlying shock-damping cells.

Preferably, the second profile is provided with a single underlying longitudinal cavity to damp shocks.

According to one specific embodiment, the frame element comprises more than two articulated profiles.

According to one specific alternative, said stops are formed by inclined faces extending at the inner end of the first and second profiles, on either side of the hinge.

According to another alternative, the frame element according to the invention comprises means for locking the contact stops.

These locking members are preferably made up of a lug supported by the second profile and whereof the face turned toward the first profile bears against the outer transverse shoulder of the immediately adjacent notch while the corresponding
5 projection is housed in the opposite undercut.

According to still another particular embodiment, said notches are made in the form of triangular teeth.

10 According to still another alternative designed to facilitate the storage and transport of the frame elements, said flexible hinge is designed so as to allow folding of the two profiles at a 180° angle relative to one another, at least toward the back.

15 In that case, the profiles of the inner faces of the two profiles are complementary to allow them to interlock or be pressed after folding 180° toward the back.

Another aim of the invention is a wrapper made by associating
20 one or more frame elements as previously described for the packaging of flat items.

The frame element according to the invention makes it possible to offer ergonomic and cost-effective packaging for products
25 whereof the flat shape and fragility make the handling and delivery operations difficult and delicate for manufacturers, carriers, users and consumers.

The frame element according to the invention has a simple
30 structure, made in a single piece and whereof the production and placement are easy to implement industrially.

This frame element can be used as is by being mounted on the peripheral edge of the item or associated with a container
35 forming an outer enclosure, optionally sealed and hermetic, depending on the nature of the item to be packaged.

The structure of this element is self-supporting by being removably fixed on the thickness of the article and is adapted

to different sizes and type of flat items without significant alterations being necessary.

The protection obtained is remarkable because, aside from the
5 shimming and the support for the item, any impacts are greatly damped and/or absorbed by dedicated means, supported by the frame itself and making it possible to save the packaged item from any damage.

10 It also allows significant material savings, in particular because it is a single piece and can easily be reused multiple times.

Lastly, its storage is particularly cost-effective owing to the possible of compact interlocking of several identical elements.

15 The invention will be better understood upon reading the following description, accompanied by drawings in which:

Figure 1 shows a perspective view of one embodiment of the
20 frame element of the invention in the deployed position.

Figure 2 shows a perspective view of the frame element of figure 1 in the folded position.

25 Figures 3A and 3B show perspective views, respectively before and after stacking of two frame elements according to the embodiment of figures 1 and 2.

Figure 4 shows a perspective view of a flat item packaged using
30 frame elements according to the embodiment of figures 1 and 2.

Figures 5A and 5B are respectively top and transverse cross-sectional views along plane AA of the first profile of a frame element according to the invention.

35 Figures 6A and 6B are respectively top and transverse cross-sectional views along plane BB of the second profile of a frame element according to the invention.

Figures 7A and 7B are diagrammatic perspective views of one alternative embodiment of the frame element of the invention.

5 The frame element shown in the figures assumes, in the free state, the form of a single elongated piece comprising at least one first profile 1 and one second profile 2 of the same width, longitudinally connected by a flexible hinge 3.

10 Each of the profiles 1, 2 includes an axial groove 10, 20 in which the peripheral edge of the flat item P (shown in figure 4) is housed like a listel.

15 The frame element is preferably made with a deformable honeycomb material (of the expanded polystyrene type), which makes it possible to engage the edge of the flat item forcibly in the groove 10, 20 and to ensure good mechanical strength of the assembly by jamming.

20 A relative elasticity of the material may reinforce the gripping in the groove and the pressing of the profiles 1, 2 on the planar peripheral faces of the article P.

25 This groove is delimited, laterally and on each profile, by flanks made up of two parallel series of notches 11, 12, 21, 22.

In the embodiment shown in figures 1 and 2, the notches are made in the form of substantially triangular teeth.

30 However, the invention does not rule out different profiles of these notches, as long as they still allow the superposition of several elements under the conditions set out below.

35 Likewise, according to one alternative not shown, at least one of the profiles may have a curve so as to mount the element on all or part of an item whereof the edges are not rectilinear.

The respective notches 12a, 22a of the two profiles 1, 2 that are adjacent to the hinge 3 are provided with contact stops associated with locking members that will be described below.

These stops lock the two profiles in a position where they extend here perpendicular relative to one another while locally forming a corner, as shown in figure 2.

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It is, however, possible to provide that these stops ensure locking at an angular orientation different from 90°, adapted to the specific contours and profile of the flat item to be packaged.

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In this position, which corresponds to the use of the element according to the invention, the respective grooves 10, 20 of the profiles 1, 2 are connected and are open in a jaw toward the inside of the angle and across from each other to receive

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the corners and edges of the flat item P, like a frame.

The hinge 3 being closed, it is positioned in the corners of the flat item, as shown in figure 4.

More generally, it is also possible to fasten the frame element according to the invention along a straight edge of the flat item P without folding the hinge 3 like a border, without it being necessary to lock the two profiles in their respective position.

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The flexible hinge 3 is of a type known in itself and is made up of a thin area of the component material of the element, preferably situated in a median position between the profiles 1, 2. This hinge allows the elastic folding of the two profiles relative to one another.

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The notches 11, 12, 21, 22 are configured and positioned such that two identical elements can be superimposed in an inverted and head-to-tail manner by co-snapping of the first and second profiles, as shown in figures 3A, 3B.

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The notches 12 of one of the two series of the first profile 1 are made up of an inner projection 121 with a straight wall outwardly extended by a transverse shoulder 122 (figures 1, 2, 5A and 5B), while the notches (22) of one of the series of the

second profile 2 are separated by outer flat portions 222 extended inwardly by undercuts 221.

5 The notches 11, 21 of the other series of the two profiles 1, 2 are identical, as shown in figure 2.

The profile of the undercut 221 of the second profile 2 is adapted to receive, by snapping, the projection 121 of the notch 12 across from the first profile 1 during the stacking of
10 two elements, as shown in figures 3A, 3B.

To that end, the projections 121 and the undercuts 221 are formed on the first side of the element, as shown in figure 2.

Jointly, the shoulders 122 of the first profile 1 bear against
15 the flat portions 222 of the second profile 2.

A first stack is very compact and offers a very reduced bulk.

Another optimal storage method for the frame elements will be described hereafter.

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The stops are formed by inclined faces 13, 23 extending at the inner end of the first and second profiles 1, 2, respectively, on either side of the hinge 3.

These inclined faces are designed to bear against each other
25 during closing of the hinge, as shown in figure 2.

More specifically, in the illustrated embodiment, the groove 20 of the second profile 2 is situated at a higher level than that of the groove 10 of the first profile 1, as shown in figure 1.

30 In this configuration, the inclined faces 13 of the notches 11, 12a of the first profile 1 come into contact with the inclined face 23 of the second profile 2 whereof the surface is larger.

The locking members here are made up of a lug supported by the
35 notch 22a of the second profile 2 and whereof the face 23a, turned toward the first profile 1, bears against the outer transverse shoulder 122a of the immediately adjacent notch 12a while the corresponding projection 121 is housed in the opposite undercut 221, as shown in figure 2.

The notches of at least one of the series (and here the notches 12) of the profile 1 are provided with underlying cells 14 ensuring damping of shocks.

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The second profile 2 is provided with a single underlying longitudinal cavity 24 damping shocks.

10 In the illustrated embodiment, in particular in figure 2, the cells 14 and the cavity 24 are made on the same side of the two profiles 1, 2, but it is possible to position them on two opposite sides if needed.

The cells 14 and the cavity 24 thus form hollowed areas for absorbing kinetic energy that may be communicated to the parcel
15 incidentally during impacts (drop, shock, tec.), thereby preserving the integrity of the item.

If necessary, the longitudinal cavity 24 may serve as an ergonomic compartment making it possible to receive accessories
20 of the item to be packaged.

According to one alternative not shown, the element comprises more than two profiles.

25 The profiles are then articulated relative to one another like a bicycle chain and cover the perimeter of the item P very closely by gripping it.

30 The second profile 2 can be mounted on the lower part of the flat item P so as to offer a base to the parcel thus formed, as shown in figure 4.

To that end, the end walls of the longitudinal cavity 24 are advantageously oriented arching and, if applicable, reinforced so as to ensure better stability.

35 In the alternative illustrated by figures 7A and 7B, the profiles 1, 2 have been shown in a simplified form.

In this alternative, the flexible hinge 3 is more particularly adapted and designed to allow elastic folding in both directions.

The folding of the two profiles toward one another in the closing direction has already been described.

Figures 7A and 7B illustrate the folding of the two profiles toward the rear (opening direction shown in figure 7A by the
5 arrow) at a 180° angle relative to one another.

The 180° amplitude was not necessary for closing folding as previously described, the purpose of which was to protect the corners of a flat item.

10 However, in this other alternative, the folding is more particularly designed to also allow and facilitate the packaging and transport of the frame elements themselves.

In fact, to reduce the bulk of the frame elements for storage, transport, then delivery thereof to the usage site, it is
15 advantageous to fold the two profiles back against one another as shown in figure 7B.

In that case, the outer faces or backs 15, 25 of the two profiles 1, 2 will be planar (figures 7A, 7B) or their profiles
20 will be complementary to allow them to be snapped together or pressed back to back after folding 180° toward the back.

CLAIMS

1. A frame element to package flat items (P), comprising at least one first profile (1) and a second profile (2) connected, longitudinally and in a same piece, by a flexible hinge (3) and each including an axial groove (10, 20) for receiving the item wherein said groove is laterally delimited by two series of notches (11, 12, 21, 22) configured and positioned such that two identical elements are superimposed inversely and head-to-tail by interlocking of the first and second profiles, the respective notches (12a, 22a) of said profiles, adjacent to said hinge, being provided with contact stops ensuring blocking of the two profiles (1, 2) in a relative angular position where their respective grooves (10, 20) are open across from the edge of the item to be protected.

2. The frame element according to claim 1, characterized in that the notches (12) of one of the series of the first profile (1) are made up of an inner projection (121) with a straight wall outwardly extended by a transverse shoulder (122).

3. The frame element according to one of the preceding claims, characterized in that the notches (22) of one of the series of the second profile (2) are separated by outer flat portions (222) inwardly extended by undercuts (221).

4. The frame element according to one of the preceding claims, characterized in that the notches (12) of at least one of the series of the first profile (1) are provided with underlying shock-damping cells (14).

5. The frame element according to one of the preceding claims, characterized in that the second profile (2) is provided with a single underlying longitudinal cavity (24) to damp shocks.

6. The frame element according to one of the preceding claims, characterized in that it comprises more than two articulated profiles.

7. The frame element according to one of the preceding claims, characterized in that said stops are formed by inclined faces (13, 23) extending at the inner end of the first and second profiles, on either side of the hinge (3).

8. The frame element according to one of the preceding claims, characterized in that it comprises means for locking the contact stops.

9. The frame element according to claim 4 characterized in that the locking members are preferably made up of a lug supported by the second profile and whereof the face (23a) turned toward the first profile (1) bears against the outer transverse shoulder (122a) of the immediately adjacent notch (12a) while the corresponding projection (121) is housed in the opposite undercut (221).

10. The frame element according to one of the preceding claims, characterized in that said notches (11, 12, 21, 22) are made in the form of triangular teeth.

11. The frame element according to one of the preceding claims, characterized in that said flexible hinge (3) is designed so as to allow folding of the two profiles (1, 2) at a 180° angle relative to one another, at least toward the back.

12. The frame element according to one of the preceding claims, characterized in that the profiles of the inner faces of the two profiles (1, 2) are complementary to allow them to interlock or be pressed after folding 180° toward the back.

13. A wrapper made by associating one or more frame elements according to any one of the preceding claims for the packaging of flat items (P).