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(54) **A device for packing objects**

(57) A device (10) for packing objects comprising at least two tubular elements (13) obtained by folding a substantially sheet-formed body (11), each tubular element (13) being provided with at least a main wall (12), in which at least a flap (120) is punched in the main wall (12) which flap (120) projects from the respective main wall (120) and is configured such as to be able to flex at least partially elastically internally of the respective tubular element (13), defining a concave impression (17) in the main wall (12) for housing at least an object (B) resting on the flap (120).

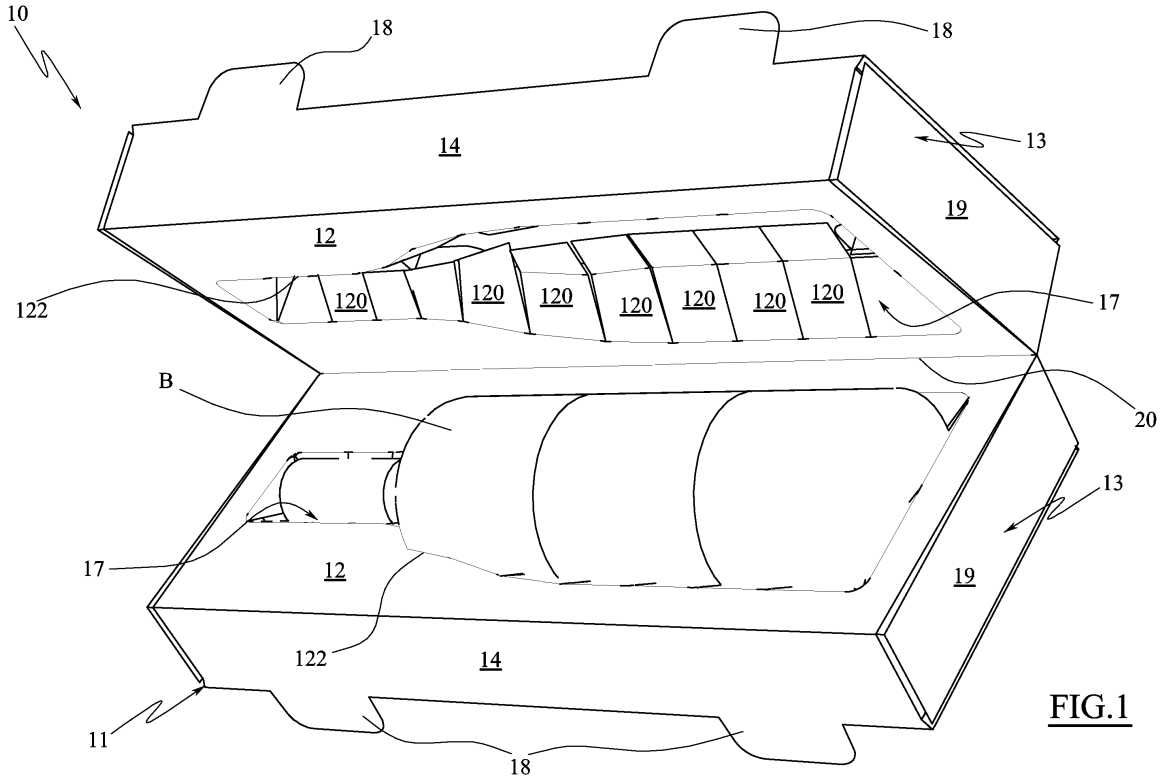

FIG.1

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Description

TECHNICAL FIELD

[0001] The present invention relates to a device for packing objects.

[0002] In greater detail, the present invention relates to a device for packing fragile or delicate objects, such as bottles, jars and the like, or any other object, where the packing device is made up of a substantially sheet-shaped, blanked and folded monolithic body.

PRIOR ART

[0003] Various types of devices for packing objects are known, especially for bottles and the like, for example realised using sheets of blanked cardboard, variously-shaped, which once folded assume various conformations in such a way as to define a more or less secure packing for the object.

[0004] Especially, though not limitedly, in the field of transport of bottles there exist packing devices which are made up of sheets of cardboard folded so as to define one or more tubular elements joined to one another.

[0005] Holes are realised in these sheets, for example circular, which once the packing device is formed, vertically superpose, generating a channel with an axis that is perpendicular to the axis of the tubular elements in which the bottle can be inserted for the packing thereof.

[0006] Examples of these packing devices are described in Italian patent no. IT 1 384 271, and European patent no. EP 1 787 915.

[0007] The packing devices of known type are however not free of drawbacks, among which the fact that the bottoms of the bottle, like other parts thereof, are resting directly on rigid structural parts of the packing device, for example the bottom or top, and this often results in the breakage of the bottles, especially if large, following violent jolting, such as accidental impacts or jumps directed along the axis of the bottle.

[0008] Further, though at the position of the holes made in the cardboard sheet tabs are made that can flex and tightly envelop the bottle, the intermediate portions of the object surrounded by transversal walls (at the position of the holes) are very delicate zones, as they can be literally cut by the transversal wall of the device if the packing is subjected to undesired jolts, or other sudden shear stresses with respect to the longitudinal axis of the bottle. Further, an example of a known-type packing device according to the preamble of claim 1, is disclosed in patent GB 2 330 129.

[0009] This packing device, however, defines a regular space, or impression, for example rectangular or octagonal, in which objects will be housed, the shape of which can even be irregular, or, in any case, different to the shape of the impression.

[0010] The flaps that fold along one or more predetermined fold lines for defining the impression are all identical to one another.

[0011] The folding of the flaps is such as to realise a form fit with the object they are destined to contain.

[0012] Further, the edge of the impression is defined partially by predefined fold lines, for folding the flaps, and partially by cut lines, which define corners (live edges at the cutting lines and bevelled at the fold lines) against which it can bump, thus breaking the object contained.

[0013] A further example of a packing device according to the prior art is shown in document DE 20 2005 006 072, which also shows an impression provided with two opposite flaps that can be folded so as to make room for the object to be contained.

[0014] The flaps do not even partially flex elastically under the weight of the object, as they are joined to the wall from which they branch by means of a fold line which is predefined and is such as to enable folding of the tab by 90° with respect to the wall and during the step of assembling the box, and can be glued in the folded position.

[0015] An aim of the present invention is to obviate the above-mentioned drawbacks in the prior art, with a solution that is simple, rational and relatively inexpensive.

[0016] The aims are attained by the characteristics of the invention as reported in the independent claim. The dependent claims delineate preferred and/or particularly advantageous aspects of the invention.

DESCRIPTION OF THE INVENTION

[0017] In particular, the invention relates to a device for packing objects comprising at least two tubular elements obtained by folding a substantially sheet-formed body, each tubular element being provided with at least a main wall, which main walls, in use, will be reciprocally facing one another.

[0018] With the invention, a plurality of flaps are blanked into the main wall, which flaps branches projectingly from the respective main wall and, each independently is configured so as to be able to at least partly flex elastically internally of the relative tubular element, defining overall a concave impression in the main wall for housing at least an object resting on the plurality of flaps, where the sides of the flaps joined to the main wall are aligned along an imaginary closed line which is neither pre-folded nor pre-scored (at most only partially scored).

[0019] With this solution, the objects contained in the device are particularly well-protected from any stress the device might be subject to, enabling an effective packing of the object even in critical transport conditions thereof. The flaps advantageously exhibit different shapes from one another.

[0020] For example, one or more of the flaps of the plurality of flaps exhibit different shapes from one or more of the flaps of the plurality of flaps.

[0021] For example, the variation in shape of the flaps is connected with the reciprocal position thereof and/or their position in the concave impression they define.

[0022] In an aspect of the invention, the flaps of the plurality of flaps are flanked to one another, for example so that they reciprocally contact along a score line when they are in the initial rest position thereof, and are able to overall define the impression.

[0023] In this way a concave impression can be provided which defines a substantially continuous cradle for the object and improves the housing thereof internally of the packing device and at the same time increases the contact surface between the packing device and the object contained therein. In practice, each flap of the plurality of flaps is adapted, following the at least partially elastic deformation, to the shape of the portion in contact with the flap of the object it supports.

[0024] In a further advantageous aspect of the invention, a side of the flap, joined to the respective main wall from which it branches, defines a portion of a profile, i.e. a substantially closed edge line, of the object to be contained.

[0025] The whole perimeter of the close border of each concave impression can advantageously be defined by the entirety of the sides joined to the main wall of the flaps.

[0026] In this way, the object contained between the facing impressions can never come into contact with a live edge (whether pre-folded or scored) for example a cut line of the main wall; this reduces or even eliminates the risk of breaking the object.

[0027] Alternatively, small sections of the closed bordering line of each concave impression can be defined by predefined cut lines or fold lines (missing flaps); the important thing is that these sections are not such as to be able to go into contact with the object contained in the concave impression, for example they should be distanced from one another and/or have modest dimensions, relative to the object supported by the flaps.

[0028] In a preferred embodiment, all the fold lines of the flaps defining each concave impression are contiguous, with no break in continuity.

[0029] With this solution, the flaps can flex with respect to the perimeter line defining the profile of the object, making a plurality of inclined rest surfaces available, which surfaces can yield at least partially elastically for the object, on all sides thereof; thus the object is totally surrounded by the yielding flaps and is therefore substantially maintained suspended internally of the tubular elements which define the packing device.

[0030] In order to enable the flap to maintain a certain elastic yieldability, at least one from between the flap and the respective tubular element is configured such that the flap can flex by an angle of not greater than 80°.

[0031] In practice, according to the object to be supported and other specific needs, the rigidity of each flap and/or the shape of each flap and/or the distance between the flap and the wall opposite the main wall of the tubular element can be appropriately configured so as to limit the flexion of the flap, so that the flap does not exceed a limit angle of 80°.

[0032] Further, the shape of the flaps can be different in accordance with the zone the flaps occupy in the concave impression they define.

[0033] In particular, the concave impression can exhibit an elongate conformation along a longitudinal axis, the shape of the flaps defining the impression being variable in accordance with the position thereof along the longitudinal axis. The shape of the flaps positioned in the central zone (with respect to the length of the concave impression) is advantageously different with respect to the shape of the flaps positioned in the end zones.

[0034] Further, the shape of the flaps defining the concave impression is variable according to the shape of the portion of object which each flap is destined to support.

[0035] Thanks to this solution, a different pressure is set up between each flap and the object supported according to the zone of the object which each flaps supports, defining overall a greater stability of the object in the concave impression.

[0036] In practice, the flaps supporting a heaviest portion or (radially) broadest portion of the object will flex by a greater angle that the flaps supporting a lighter or more tapered part of the object; in this way the object is not only optimally retained along the support direction (perpendicular to the main wall), but is also optimally retained in a parallel direction to the main wall. Also, the shape of the flaps in the central portion of the impression can exhibit a substantially different area (for example greater) than the area of at least a flap located at an axial end of the concave impression.

[0037] It is also possible for each impression to be realised by a longitudinal score and a plurality of transversal score-lines, for example substantially perpendicular and/or inclined to the longitudinal score-line.

[0038] The transversal scorings advantageously exhibit different lengths in accordance with the axial position thereof along the transversal score.

[0039] For example, at least a transversal scoring of the plurality of transversal score-lines proximal to an end of the longitudinal score-line is located at a distance from the same end of the longitudinal score-line.

[0040] At least a transversal score-line of the plurality of transversal score-lines proximal to an end of the longitudinal score-line is substantially V-shaped, with a concavity facing on the opposite side with respect to the longitudinal score-line, for example with the vertex located at the longitudinal score-line. To pack an object two devices as described above may be necessary, with the main walls facing so as to be located on one side and another of the object.

[0041] Further, the concave impressions defined by the plurality of flaps can have a different shape and/or dimension in the two superposed devices, according to needs.

[0042] In a preferred embodiment of the invention, the two tubular elements are advantageously obtained by folding a single monolithic sheet body and are joined to one another by means of a hinge fold interposed between the flanking main walls of the body, the main walls being

mobile between an open position and a closed position in which the main walls are substantially superposed; at least one of the main walls comprises at least one of the flaps.

[0043] In a preferred embodiment of the invention each of the main walls comprises at least one of the flaps and therefore a respective concave impression, each of which is able to accommodate a half of the object to be packed in the packing device.

[0044] In practice, the main walls, when in the closed position, can be arranged substantially at a median plane of the object, wrapping the object by means of the two concave impressions.

[0045] In a further aspect of the invention, the body of the device for packing is made of comprises foldable appendages able to removably block the body in the tubular configuration.

[0046] In practice each tubular element is constrained to maintain the conformation by a plurality of appendages branching from the same monolithic body that constitutes the packing device.

[0047] Each tubular element advantageously comprises at least two lateral walls from which lugs branches, which lugs are substantially rigid and projecting and are destined to extend beyond the plane defined by a bottom wall of the tubular element opposite the main wall.

[0048] In this way, the lugs define rest points for the device and can maintain the bottom walls of the device raised when the device is resting on a support plane.

[0049] In a variant of the invention, further, at least a portion of the monolithic body defining the packing device can be folded so as to form a containing box of the tubular elements in the closed position, for example a further pack of the type known as "American".

[0050] Further, a wall can branch from at least one from among the lateral walls and the bottom wall of at least a tubular element can branch, which wall can be foldable internally of the tubular element, an edge of which (facing towards the main wall) defines a support surface for the main wall.

[0051] In this way the zone of the main peripheral wall can be reinforced with respect to the concave impression, which overall becomes more rigid and less subject to deformations following the introduction of the object into the concave impression.

[0052] The body the device is made of is advantageously realised in a corrugated cardboard.

[0053] A further aspect of the invention relates to a method for packing objects which comprises a step of configuring, by folding, at least a device according to one or more of the preceding claims, resting at least an object on the flap (120) of a tubular element, resting the element of the other tubular element on the object, such that the object is interposed between the elements of each tubular element.

BRIEF DESCRIPTION OF THE DRAWINGS

[0054] Further characteristics and advantages of the invention will emerge from a reading of the description that follows, provided by way of non-limiting example, with the aid of the figures of the accompanying tables.

Figure 1 is an axonometric view of a first embodiment of a packing device, according to the invention, mounted in the open configuration and with an object in the packing position.

Figure 2 is an axonometric view of the packing device of figure 1 in disassembled configuration.

Figure 3 is an axonometric view of the packaging device of figure 1 in a first assembly position.

Figure 4 is an axonometric view of the packing device of figure 1 in a second assembly position.

Figure 5 is an axonometric view of the packing device of figure 1 in a third mounting position.

Figure 6 is an axonometric view of the packing device of figure 1 in the open position and assembled.

Figure 7 is an axonometric view of the packing device of figure 1 in the closed position and assembled.

Figure 8 is a perspective and transparent view from the bottom of the packing device of figure 7 with an object contained internally thereof.

Figure 9 is an axonometric view of the packing device of figure 7 further packed with a box body.

Figure 10 is a schematic front view of figure 9 where the arrangement of the bottle inside the further packing can be observed.

Figure 11 is an axonometric view of a second embodiment of a packing device according to the invention, in a disassembled configuration in which a box-shaped body is formed from the same body that the device is made of.

Figure 12 is an axonometric view of the packing device of figure 11 in a first mounting position.

Figure 13 is an axonometric view of the packing device of figure 11 in a second mounting position.

Figure 14 is an axonometric view of the packing device of figure 11 in the open position and assembled.

Figure 15 is an axonometric view of a third embodiment of a packing device, according to the invention, in disassembled configuration.

Figure 16 is an axonometric view of the packing device of figure 15 in a first mounting position.

Figure 17 is an axonometric view of the packing device of figure 15 in a second mounting position.

Figure 18 is an axonometric view of the packing device of figure 15 in the open position and assembled.

Figure 19 is a front axonometric view of figure 18 with objects in the packed position.

BEST WAY OF CARRYING OUT THE INVENTION

[0055] With particular reference to the figures, reference numeral 10 relates in its entirety to a device for

packing objects B, such as for example fragile, delicate objects or the like.

[0056] In the illustrated example, the objects B to be packed are substantially cylindrical, such as bottles, though the objects could also be any other.

[0057] In the illustrated embodiments the device 10 is composed of a substantially sheet-shaped monolithic body 11, blanked and folded (see figures 2, 11 and 15), which is appropriately shaped for conforming a pack that can be closed on one or more objects B for completely packing them.

[0058] In practice, the body 11 is obtained by blanking a continuous sheet of the material with which the body is realised.

[0059] The body 11 is advantageously made of corrugated cardboard or a plastic material or another material that can be conformed as a slim sheet that is suitable for being cut and folded.

[0060] Apart from the external edges (cut) of the body 11, the blanking of the continuous sheet produces through-cuts, or scored semi-cuts, at determined zones of the body, defining localised score-lines (continuous and thicker lines in figure 2) and/or localised longitudinal pressure-scorings which realise predetermined fold lines that facilitate and guide the folding of the body 11 (continuous and slimmer lines in figure 2).

[0061] The body 11 comprises the main walls 12 contiguous and joined to one another by means of a first hinge fold 20, which enables reciprocal rotation of the main walls 12 by at least 180° between an open position, in which they are flanked to one another, and a closed position, in which they are substantially superposed in plan view.

[0062] At least one of the main walls 12, in the example both, comprises at least a flap 120, obtained by blanking or cutting of the main wall, for example according to a first scored line 30, substantially C-shaped.

[0063] In practice, the flap 120 exhibits two or three sides separate from the main wall 12 and a side joined to the main wall and, therefore, branching projectingly from the main wall.

[0064] The flap 120 in practice is positioned in an internal zone of the main wall 12, distanced from the edges thereof.

[0065] In the illustrated examples, each main wall 12 advantageously comprises a plurality of flaps 120 flanked and contiguous to one another, a joined side of which to the main wall 12 is aligned along an imaginary closed line (not pre-scored or pre-folded), which defines, for example, a profile of an object B to be contained (see the thin broken line in figure 2).

[0066] In the illustrated embodiments, the object B to be contained is a bottle (in a prone position), so that the profile defined by the side joined to the main wall 12 of the flap 120 is conformed substantially as a lateral profile of a bottle having slightly larger dimensions that the bottle destined to be packed.

[0067] In practice, the imaginary closed line defining the profile is ideally obtained by joining the whole of the end points of the plurality of C-shaped score-lines which define each flap 120.

[0068] In a simplified embodiment of the invention, a single flap 120 could be included, while in an advantageous embodiment of the invention there are at least four flaps 120,for example realized by means of a first substantially straight longitudinal score-line 30, forked at opposite ends thereof.

[0069] By means of the first score-line 30, two substantially trapezoidal flaps are made (the larger base of which is the side joined to the main wall 12) and two substantially triangular flaps (the opposite bases of which are the respective sides joined to the main wall 12), such as to define a substantially rectangular profile.

[0070] The illustrated embodiments of the figures represent an evolution of the latter configuration of the first score-line 30, which comprises a plurality of branches branching from the straight central line and branching substantially perpendicular thereto from one side and the other thereof.

[0071] In practice, the branching of the first score-line 30 subdivides the two trapezoidal flaps into strips, more or less long and more or less wide according to needs, which define a same number of flaps 120.

[0072] The length of each branch defines the distance and inclination of the profile (defined by the sides joined to the main wall 12 of the flaps 120) from the straight central line of the score-line and therefore the length of the flaps 120. Some of the flaps 120 advantageously exhibit a predetermined fold line 121 substantially parallel to the side joined to the main wall 12 of the flap 120 and substantially located at a halfway point of the flap.

[0073] The body 11 is folded so as to configure at least two tubular elements 13 (see figures 8, 13 and 17), for example having a quadrangular section with identical walls two-by-two, a base of which is defined by the respective main wall 12.

[0074] The two tubular elements 13 are therefore joined to one another by means of the first hinge fold 20 and are therefore mobile, as are the main walls, between the open position and the closed position thereof.

[0075] Each tubular element 13 therefore comprises two lateral walls 14, 15 and a bottom wall 16.

[0076] Each tubular element 13 therefore defines an empty space interposed between the main wall 12 and the bottom wall 16 that is suitable for housing with a considerable margin at least a portion (in the example half) of one or more objects B to be contained, as will more fully emerge in the following, so that between the two bottom walls 16 (when the device 10 is in the closed position) at least an object B is contained.

[0077] In particular, each flap 120 made in the main wall 12 is configured so as to be able to flex at least partially elastically internally of the respective tubular element 13, defining a concave impression 17 in the respective tubular element 13 for housing at least an object B resting on the flap or flaps 120.

[0078] In practice, the flaps 120, as they flex, distance slightly from one another, defining gaps between then the overall area of which is always smaller than the occupied area by the object B, so that the object is always maintained resting on the flaps 120 and cannot insert internally the gaps.

[0079] The concave impressions 17 are, for example, superposable as shown in the figures, when the main walls 12 are in the closed position; in this way the object B is surrounded by the main walls 12, when the device 10 is closed, which is substantially arranged on a median plane of the object and closed between two shells, or cradles, defined by the concave impressions 17. Each flap 120, which if not stressed to flex (by the weight of the object B to be contained in the device 10) remains substantially coplanar to the main wall 12, and under the weight of the object B flexes internally of the respective tubular element 13, for example at the side joined to the main wall 12 of the flap, generating an induced fold 122 (see figures 1, 14 and 19) at the joined side of the flap.

[0080] Therefore, the concave impression 17 is generated in the main wall 120 with a concavity facing towards the outside of the tubular element 13, where the entirety of the folded flaps 120 defines a sort of cradle (or shell) which can supportingly house and surround the whole object B.

[0081] In order to prevent an excessive flexing of one or more of the flaps 120, which might overstress the material of which the main wall 12 is made, advantageously making the induced fold 122 free of any elastic resistance, at least one from among one or more of the flaps 120 and the respective tubular element 13 are configured so that the flap 120 can flex by an angle of not more than 80°.

[0082] In practice, the rotation of the flap 120 about the induced fold 122 is limited so that the angular travel of the flap 120 is not greater than 80°.

[0083] To do this it is possible, for example, to dimension the length of the flap and at the same time the distance between the main wall 120 and the bottom wall 16 of the tubular element, so that the flap 120 can flex at most up to the point of contact between the free end of the flap 120 and the bottom wall 16. Additionally or alternatively only the flap 120 can be dimensioned (by acting on the thickness, width and length thereof) so as to increase the resistance to flexion thereof.

[0084] In any case it is obviously important for the side joined to the main surface 12 of the flap 120 to be, at least at first, rigid and not pre-folded, so as to give the flap 120 a certain structural resistance to the induced flexion.

[0085] Each tubular element 13 of the body 11 comprises rest feet 18 which extend beyond the plane defined by the bottom wall 16 (on the opposite side with respect to the main wall 12) and which are associated to at least one from among the bottom wall 16 and the lateral walls 14, 15.

[0086] The rest feet are advantageously defined in a single piece with the body 11 and, in particular, comprise at least two lugs 18 substantially stiff (not folded) made in a single piece (for example by C-shaped cuts) with each lateral wall 14, 15 and prolonging them beyond the plane defined by the bottom wall 16. Different embodiments, however, are not excluded, where the rest feet can be made using feet associated solidly to the external surface of the bottom wall 16.

[0087] Further, each tubular element 13 comprises a pair of front walls 19 which close the opposite open ends of the tubular element.

[0088] In practice, the two front walls 19 of the main wall 12 of each tubular element 13 branch from opposite sides of the main wall 12, with an interposing of a respective second hinge fold 21 which enables rotation of the front walls 19 with respect to the main wall 12 by an angle of at least 90°.

[0089] The body 11 comprises a plurality of foldable appendages 190 able to removably block the front walls 19 to the other walls 12, 14, 15 and 16 of each tubular element 13, so as to maintain the tubular elements 13 stably formed in the assembled configuration.

[0090] In practice, the appendages 190 branch from the opposite axial ends (with respect to the axis of the tubular elements 13) of each lateral wall 14, 15 and of each front wall 19, which appendages 190 join at the respective wall 14, 15, 19 by means of a further preformed hinge fold which enables the folding of the appendages internally of the tubular element 13 and the reciprocal retaining of the walls constituting the tubular element.

[0091] In the following, three alternative embodiments of the device of the present invention will be described, where the reference numerals of the parts substantially having the same function are common to all the embodiments. In detail figures 1 to 10 illustrate a first embodiment of the device 10, suitable for packing an object B, from figure 11 to figure 14 a second embodiment of the device 10 is illustrated, also suitable for packing an object B, and figures from 15 to 19 illustrate a third embodiment of the device 10, suitable for packing a plurality of objects B (in the example 3 in number).

[0092] In the first embodiment the tubular elements 13 exhibit a longitudinal axis that is parallel to the first hinge fold 20.

[0093] In greater detail, one of the lateral walls 14, 15 departs from each main wall 12 (from the opposite sides with respect to the first hinge fold 20) and in particular a first lateral wall 14 destined to be the lateral wall furthest from the first hinge fold 20 when the tubular element 13 is in the assembled configuration, by means of the interposing of a third hinge fold 22, parallel to the first hinge fold 20.

[0094] The bottom wall 16 branches from each lateral wall 14 (from the opposite side with respect to the third hinge fold 22), by interposing of a fourth hinge fold 23, parallel to the first hinge fold 20 and discontinuous in sections by virtue of the cuts for realizing the lugs 18.

[0095] The other of the lateral walls 14, 15 branches from each bottom wall 16 (on the opposite side with respect to the fourth hinge fold 22), and in particular a second lateral wall 15 destined to be the closest lateral wall to the first hinge fold 20 when the tubular element 13 is in the assembled configuration, by interposing a fifth hinge fold 24, parallel to the first hinge fold 20 and also discontinuous in sections because of the scores, which realize the above-mentioned lugs 18.

[0096] The free end of each second lateral wall 15 advantageously exhibits a further reinforcing appendage that is foldable internally of the tubular element 13.

[0097] As shown in figures from 3 to 7, in order to assemble the device 10 starting from the body 11 in the extended configuration and planar, it is sufficient to fold the second lateral wall 15 substantially by 90° along the fifth hinge fold 24, folding both the second lateral walls 15 on the same side.

[0098] Following this, the bottom wall 16 is bent on the same side as the lateral walls 14 and 15, again by 90°, so that the reinforcing appendage and/or the end edge of the second lateral wall 15 rests below the main wall 12, at the first hinge fold 20.

[0099] In this way the walls 12, 14, 15 and 16 delimit the tubular element 13, which is closed at the opposite end by the front walls 19 with the aid of the appendages 190, as illustrated in figure 5.

[0100] By activating one or both the tubular elements 13 with respect to the first hinge fold 20 (on the opposite side with respect to the rotation set for forming the tubular elements 13) the device 10 can be passed between the open position (figure 6) and the closed position (figures 7 and 8).

[0101] Figure 8 shows how the object B contained in the device 10, once closed, is resting on the flaps 120, which keep it separate, in all directions from the walls 12,14,15,16 and 19 of the body 11.

[0102] In practice, the flaps 120 completely embrace the object in any direction (axial and circumferential) and maintain the object B in suspension internally of the device 10, functioning as a damper for the object B with respect to the stresses to which the device might be subjected.

[0103] Further, as the flaps 120 fold on the object and follow its profile, the area of contact between the main wall 12 and the object is increased, thus reducing the pressure the main wall 12 (in shear stress conditions) exerts on the walls of the object.

[0104] The device 10 of the above-described first embodiment can advantageously be further packed (singly or in group of a plurality of like devices) internally of a box pack 100, as shown in figures 9 and 10.

[0105] In particular, the box pack 100 is of the "American" type, i.e. it comprises four tube-folded flaps that are foldable on both the bottom and top so as to define a closed parallelepiped.

[0106] In practice, as visible in figure 9, one or more devices 10 can be contained substantially snugly in the box pack 100, for example stacked on one another (with the lugs 18 offset and flanked or stacked) or flanked according to needs.

[0107] Apart from functioning as a support for the device 10 internally of the box pack 100 or externally thereof the lugs 18 also function as spacer elements that maintain a certain gap between the external walls of the device 10 and the rest plane (internal walls of the box pack 100) thereof.

[0108] Also in the second embodiment (figures 11-14), the tubular elements 13 exhibit a longitudinal axis parallel to the first hinge fold 20.

[0109] In greater detail, one of the lateral walls 14, 15 branches from each main wall 12 (on the opposite side with respect to the first hinge fold 20), and in particular a first lateral wall 14 destined to be the more distant lateral wall from the first hinge fold 20 when the tubular element 13 is in the assembled configuration, by interposing a third hinge fold 22, parallel to the first hinge fold 20.

[0110] A first bottom 16 branches from a first lateral wall 14 (in the illustrated example the left wall 14) on the opposite side with respect to the third hinge fold 22, by an interposing of a fourth hinge fold 23, parallel to the first hinge fold 20 and discontinuous in sections because of the cuts which realise the above-mentioned lugs 18.

[0111] Another of the lateral walls 14, 15 branches from the first bottom wall 16 (on the opposite side to the fourth hinge fold 23), and in particular a second lateral wall 15 destined to be the closest lateral wall to the first hinge fold 20 when one of the tubular elements 13 is in the assembled configuration, by interposing a fifth hinge fold 24, parallel to the first hinge fold 20 and also discontinuous in sections because of the score-lines which realize at least two lugs 18.

[0112] A further second lateral wall 15 of the further tubular element 13 branches from the second lateral wall 15 (on the opposite side with respect to the fifth hinge fold 24) of the further tubular element 13, destined to be the closest lateral wall to the first hinge fold 20 when the other tubular element 13 is in the assembled configuration, by means of the interposing of a sixth hinge fold 25, parallel to the first hinge fold 20.

[0113] In practice, the second lateral walls 15 define a V-shaped vertex once folded about the sixth hinge fold 25, the vertex of which can be arranged parallel to and superposed on the first hinge fold 20 when the tubular elements 13 are in the assembled configuration.

[0114] A second bottom wall 16 branches from the second lateral wall 15, on the opposite side with respect to the sixth hinge fold 25, by interposing a seventh hinge fold 26, parallel to the first hinge fold 20 and discontinuous in sections because of the score-lines which will realise the above-mentioned lugs 18.

[0115] Further, a third lateral wall 14, which is a reinforcing wall, branches from the free end of the second bottom wall 16, by interposing an eighth hinge fold 27, parallel to the first hinge fold 20 and discontinuous in sections because of the score-lines which will realize the

lugs 18.

[0116] This third lateral wall 14 can be arranged parallel in contact with the first lateral wall 14 which is located on the opposite side with respect to the main walls 12, in practice defining a single first lateral wall therewith.

[0117] The device 10 of the second embodiment comprises means for supporting the main wall 12.

[0118] In practice, a substantially upturned-L-shaped small bridge 40 is realized from one of the second lateral walls 15 and the respective contiguous bottom wall 16, by means of a pair of parallel cuts that are perpendicular to the seventh (or fifth) hinge fold 16 located straddling the hinge fold, which bridge 40 is joined at the opposite ends, respectively to the bottom wall 16 and to the end of the second lateral wall 15 at the hinge line with the other second lateral wall 15.

[0119] In practice, when the second lateral wall 15 is folded by 90°, about the seventh hinge fold 26, with respect to the contiguous bottom wall 16, the section of the bridge 40 rising from the bottom wall 16 is arranged at 90° to it and the other section of the bridge 40 is arranged parallel to the bottom wall. In practice the bridge 40 exhibits a height that is substantially equal to the height of the second lateral walls 14 and the upper section defines a support surface for one of the main walls 12, when the tubular elements 13 are in the assembled configuration.

[0120] Further, a through-slit 41 is realised at the upper section of the bridge 40, which through-slit 41 can be placed below at least a flap 42 of the plurality of flaps 120 made in the main wall 12; the flap 42 is shaped (substantially as an arrow-head) so as to be folded in the respective tubular element 13 and inserted internally of the through-slit 41, substantially snugly, so as to reciprocally block the walls of the tubular element 13.

[0121] The device 10 of the above-described second embodiment could be arranged internally of an independent box pack 100 (as illustrated for the first embodiment) or, alternatively, can exhibit a box pack 100 ("American") realized in a piece with the body 11 with which the device 10 is realized.

[0122] In the second hypothesis, as shown in figures 11-14, the first lateral wall 14 opposite the one from which the bottom wall 16 is formed, is longitudinally extended over four tube-foldable flaps and provided with a foldable lateral bottom and a base for defining a closed parallelepiped that surrounds the assembled device 10.

[0123] As shown in figures 11-13, to assemble the device 10 starting from the body 11 in the laid-out configuration and planar, it is at first sufficient to fold the first lateral walls 15 on themselves, by rotating them by a right-angle in opposite directions about the sixth hinge fold 25, while at the same time proceeding with arranging the bottom walls 16 at right-angles with respect to the second lateral walls 15.

[0124] Then by folding the bottom wall 16 by 90° with respect to the first lateral wall 14 contiguous to it (figure 12) and the first lateral wall 14 by 90° with respect to the main wall 12 contiguous to it (figure 13) the two tubular elements (13) are formed (figure 13), delimited respectively by a main wall 12, two lateral walls 14, 15 and a bottom wall 16.

[0125] One of the two tubular elements 13 (the one in which the flap 42 is present) is completed by rotating by 90° the other first lateral wall 14 up to placing it in contact with the first lateral wall 14 described above and fixing them by means of a joint (in the figure a foldable appendage is shown, realized in one of the two first lateral walls 14 and joint-insertable in a respective first slit made in the other first lateral wall 14).

[0126] Each tubular element 13 is then closed at the opposite ends of the front walls 19 with the aid of the appendages 190, as illustrated in figure 14.

[0127] By activating one or both the tubular elements 13 in rotation with respect to the first hinge fold 20 (on the opposite side with respect to the rotation imposed on the body 11 so as to form the tubular elements), the device 10 can be passed between the open position (figure 6) and the closed position.

[0128] It can be observed how the object B contained in the device 10 is arranged in the concave impressions 17 defined in the main walls 12 exactly in the same way with respect to what is described above for the first embodiment.

[0129] To complete the packing of the device 10 with the box pack 100, it is sufficient to rotate the four flaps of the box pack 100 behind as shown in figure 14 and close the box pack 100 as known to an expert in the sector.

[0130] In the third embodiment (figure 15-19) the tubular elements 13 exhibit a longitudinal axis perpendicular to the first hinge fold 20.

[0131] In more detail, one of the front walls 19 branches from each main wall 12 (on the opposite side with respect to the first hinge fold 20), by interposing a second hinge fold 21 parallel to the first hinge fold.

[0132] A first lateral wall 14 branches from an edge (lower in the figure) perpendicular to the first hinge fold 20 of each main wall 12, by interposing a third hinge fold 22, perpendicular to the first hinge fold 20 and discontinuous in sections because of the score-lines which will realise the lugs 18.

[0133] A second part 15 branches from the further edge (opposite the first and upper in the figure) perpendicular to the first hinge fold 20 of each main wall 12, by interposing a fourth hinge fold 23, also perpendicular to the first hinge fold 20 and discontinuous in sections because of the score-lines which will realize one or more lugs 18 and/or recesses that will cooperate with the lugs, for stacking a plurality of devices 100.

[0134] The bottom wall 16 branches from each first lateral wall 14 (on the opposite side with respect to the third hinge fold 22), by interposing a fifth hinge fold 24, parallel to the third hinge fold 22 and discontinuous in sections because of the cuts that will realize the staggered lugs 18 and/or recesses.

[0135] A further reinforcing appendage branches from

each bottom wall 16 (on the opposite side with respect to the fifth hinge fold 24), which reinforcing appendage is foldable internally of the tubular element 13, by interposing a sixth hinge fold 25, parallel to the second hinge fold 21 and also discontinuous in sections because of the recesses that will realise lugs 18; the reinforcing appendage will superpose on the second lateral wall 15 when the tubular element 13 is assembled so as to facilitate the reciprocal fixing (for example a joint with appendages insertable in slits).

[0136] The device 10 of the third embodiment comprises means for supporting the main walls 12.

[0137] In particular, each bottom wall 16 comprises, in internal zones thereof, one or more cuts and folds that will define respective shelves 43 which are only partially detached from the bottom wall 16 and can rotate about the folds, moving into a substantially perpendicular position with respect to the bottom wall.

[0138] Each bottom wall 16 extends laterally into a plane 44 that is foldable by means of interposing a ninth hinge fold 45 (parallel to the first hinge fold 20). Each plane 44 comprises one or more through-slots 46 aligned with the folds of the shelves 43 and able to house the shelves when arranged at a right-angle with respect to the bottom wall 16 and the plane 44 is folded superiorly thereto (see figure 16).

[0139] In practice, the shelves 43 are maintained at a right angle with the bottom wall by means of the first plane 44.

[0140] The upper edge of the shelves 43 is shaped so as to define a support surface for the main wall 12.

[0141] Further, the upper edge of the shelves 43 defines a salient projection able to insert in a slit 47 realised in the main wall.

[0142] The main wall 12 advantageously exhibits three groups of flaps 120 able to define respective three distinct profiles (and therefore three concave impressions 17) for three respective objects B to be contained in the device 10.

[0143] Each intermediate zone between the profiles is supported by the shelves 46, which are two in number.

[0144] As shown in figures from 15 to 18, to assemble the device 10 starting from the body 11 in the extended and planar configuration (figure 15) it is sufficient to fold, as described above, the shelves 43 and the planes 44 (figure 16). Next the first lateral walls 14, 15 and the bottom wall 16 are folded below the main walls 12, so as to configure the two tubular elements 13 (figure 17) each delimited by the walls 14, 15 and 16 and the main wall 12.

[0145] Each tubular element 13 is therefore closed at the opposite ends by the front walls 19 with the aid of the appendages 190, as illustrated in figure 18.

[0146] By rotating one or both the tubular elements 13 with respect to the first hinge fold 20 the device 10 can be passed between the open position (figures 18 and 19) and the closed position.

[0147] In figure 19 each object B contained in the device 10 can be seen to be resting on the flaps 120, which keep it separate, in all directions, from all the walls 12, 14, 15, 16 and 19 of the body 11 exactly as happens in the first and second above-described embodiments.

[0148] The device 10 of the above-described third embodiment can further be packed singly or together with other like devices (for example stacked) internally of a box pack 100 (for example "American").

[0149] Lastly, it is however possible for the device 10 to be realised with two bodies, for example in which they are together configured like the above-described body 11 and separated (by a cut) at the hinge fold 20.

[0150] In this case, the two tubular elements 13 that are formed following the folding would not be joined to one another, but in any case superposable (even at a reciprocal distance), for the housing of objects B also larger than the depth of the tubular elements. In this way each concave impression 17 can embrace a portion of the object B and the retaining of the device 10 thus-obtained in a packed configuration of the object B is effected by an external box pack 100. The invention as it is conceived is susceptible to numerous modifications and variants, all falling within the scope of the inventive concept.

[0151] Further, all the details can be replaced by other technically-equivalent elements.

[0152] In practice, the materials used, as well as the contingent shapes and dimensions, can be any according to requirements, without forsaking the scope of protection of the following claims.

Claims

1. A device (10) for packing objects comprising at least two tubular elements (13) obtained by folding a substantially sheet-formed body (11), each tubular element (13) being provided with at least a main wall (12), **characterized in that** a plurality of flaps (120) is punched in the main wall (12) which plurality of flaps (120) branches projectingly from the respective main wall (12), sides of which flaps that are joined to the main wall (12) being aligned along an imaginary closed and not pre-folded line, the flaps being configured such as to be able to flex at least partially elastically internally of the respective tubular element (13), defining a concave impression (17) in the main wall (12) for housing at least an object (B) resting on the flap (120), wherein the flaps (120) exhibit different shapes to one another.

2. The device (10) of claim 1, wherein the flaps (120) are flanked to one another and are able overall to define the impression (17).

3. The device (10) of claim 1 or 2, wherein a side of each flap (120), joined to the respective main wall (12) from which it branches, defines a portion of a profile of the object (B) to be contained.

4. The device (10) of claim 1, wherein at least one from between the flap (120) and the respective tubular element (13) is configured such that the flap (120) can flex by an angle of not greater than 80°.

5. The device of claim 1, wherein the tubular elements (13) are obtained by folding a single monolithic body (11) and are joined to one another by means of a hinge fold (20) interposed between the flanking main walls (12) of the body (11), the main walls (12) being mobile between an open position and a closed position in which the main walls (12) are substantially superposed, at least one of the main walls (12) comprising at least a concave impression (17) defined by a plurality of the flaps (120).

6. The device (10) of claim 1, wherein the body (11) comprises foldable appendages (19, 190) able to removably block the body (11) in the tubular configuration.

7. The device (10) of claim 1 or 5, wherein each tubular element (13) comprises at least two lateral walls (14, 15) from which lugs (18) branch, which lugs are substantially rigid and projecting and are destined to extend beyond the plane defined by a bottom wall (16) of the tubular element opposite the main wall (12).

8. The device (10) of claim 1, wherein at least a portion of the body (11) is able to be folded such as to conform a box (100) for containing the tubular elements (13) in the closed position.

9. The device (10) of claim 1, wherein at least a tubular element (10), comprising at least two lateral walls (14, 15) and a bottom wall (16) opposite the main wall (12), comprises a further wall (40, 43) foldable internally to the tubular element (13), branching from at least one of the lateral walls (14, 15) and the bottom wall (16), an edge of which defines a rest surface for the main wall (12).

10. The device (10) of claim 1, wherein the body (11) is made of a corrugated cardboard.

11. A method for packing objects (B) which comprises a step of configuring, by folding, at least a device according to one or more of the preceding claims, resting at least an object (B) on the plurality of flaps (120) of a tubular element (13), resting the plurality of flaps (120) of the other tubular element (13) on the object (B), such that the object (B) is interposed between the flaps (120) of each tubular element (13).

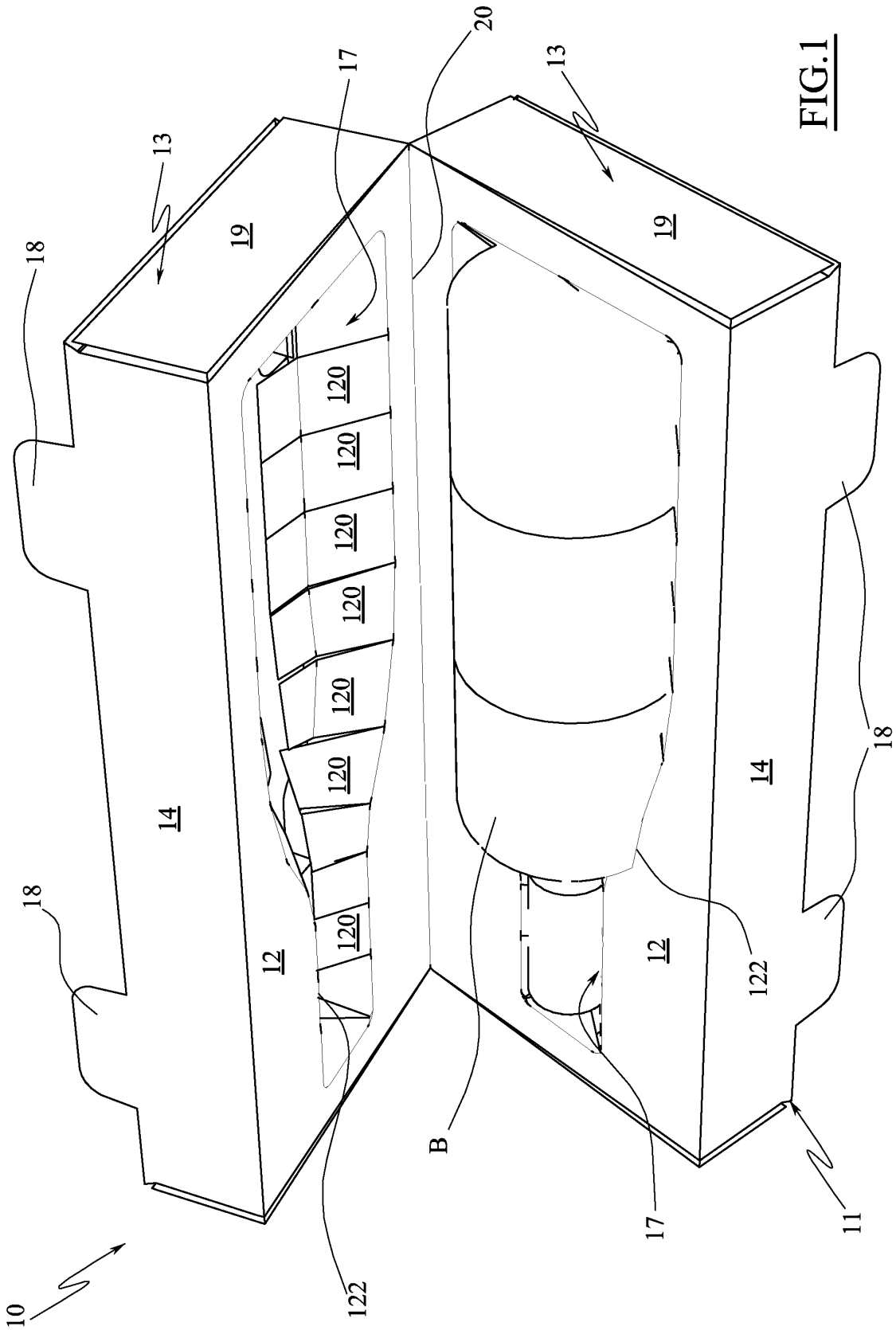


FIG.1

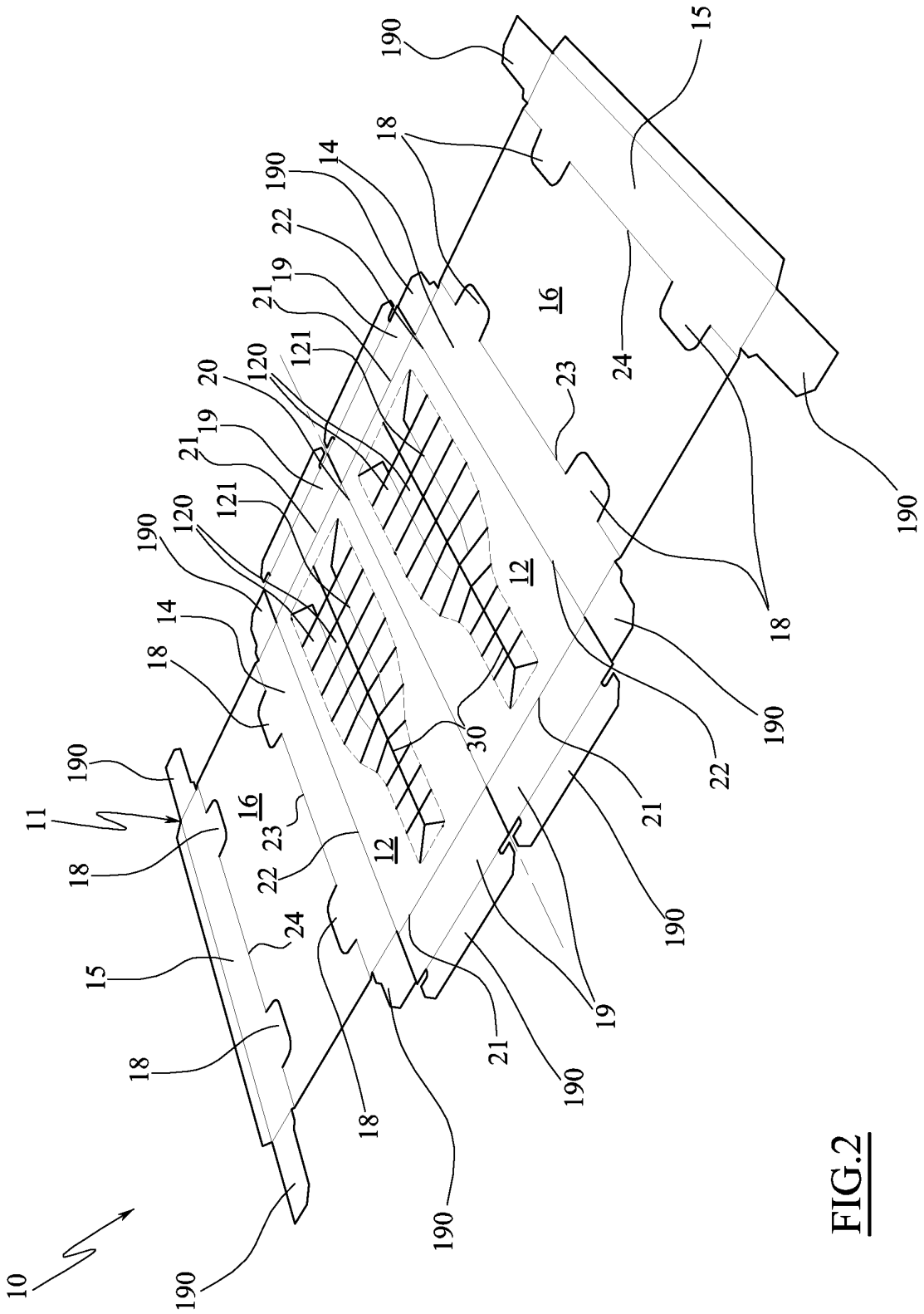


FIG.2

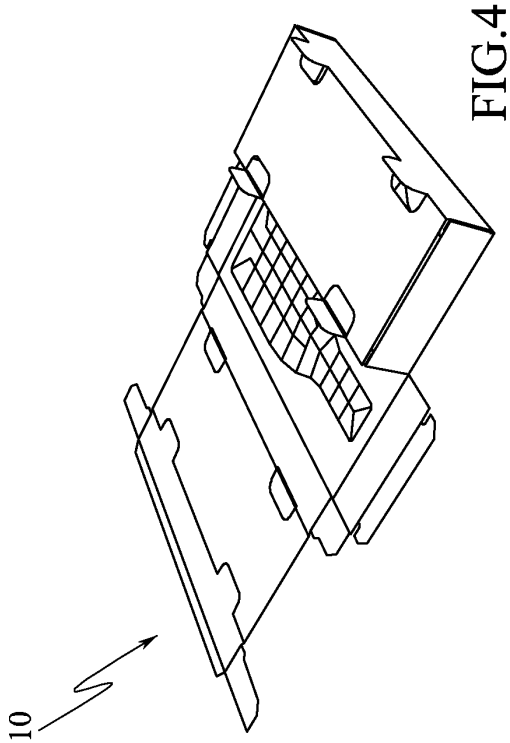


FIG.4

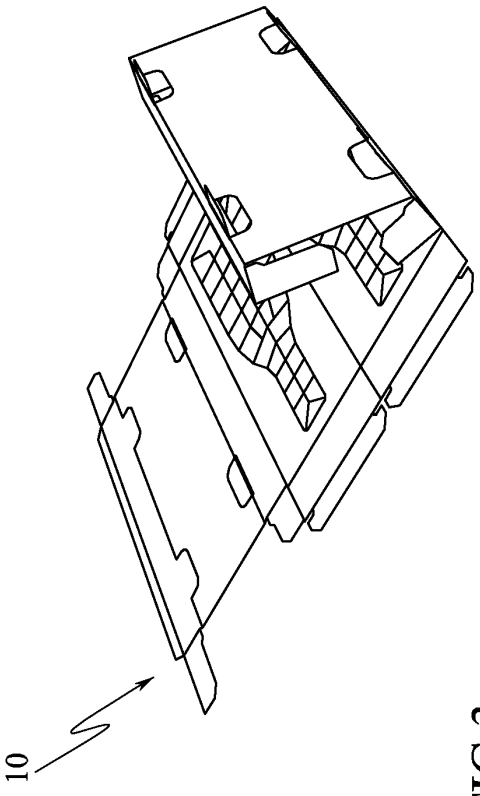


FIG.3

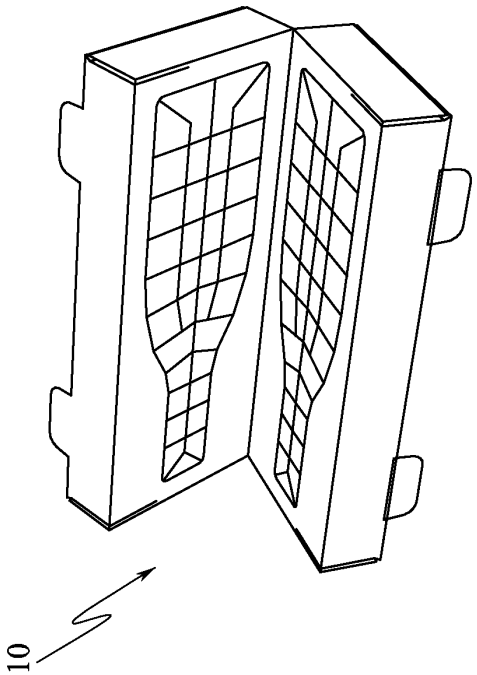


FIG.6

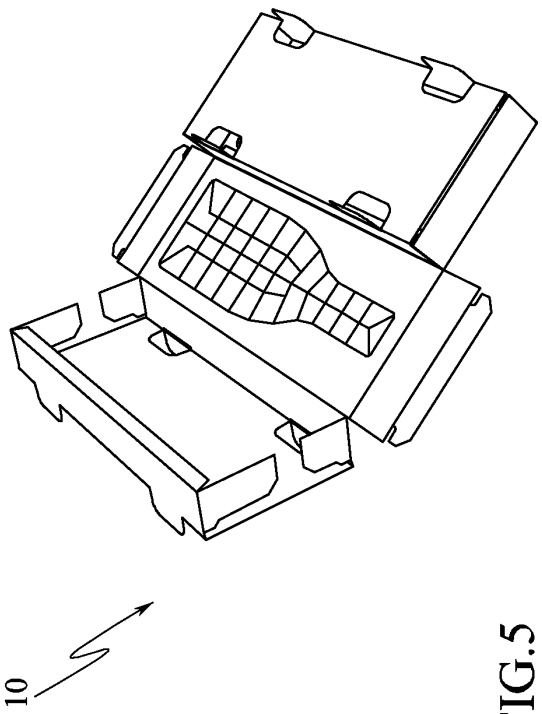


FIG.5

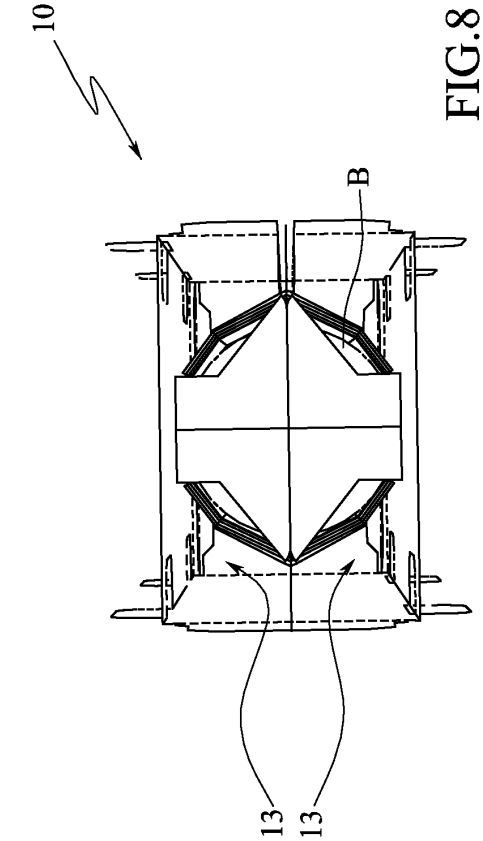


FIG.8

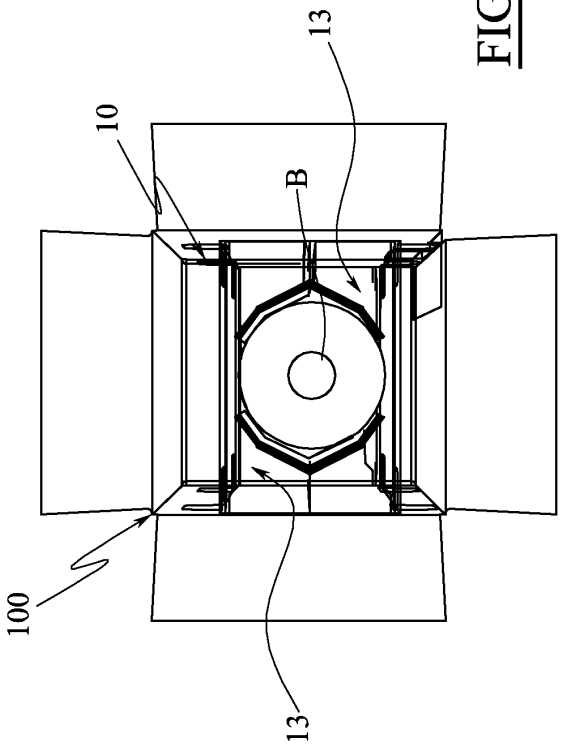


FIG.10

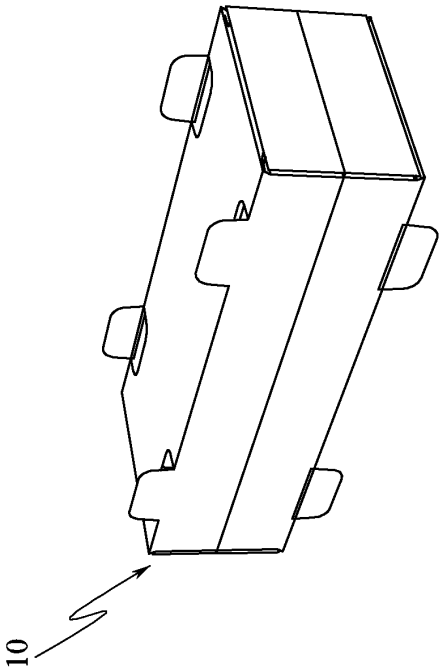


FIG.7

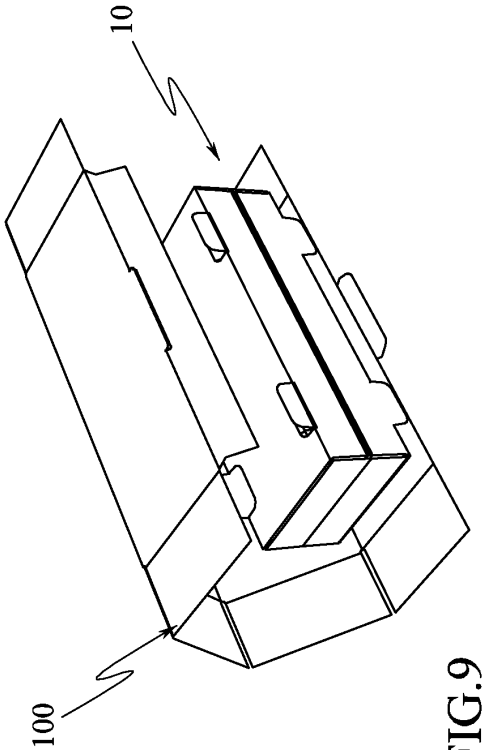
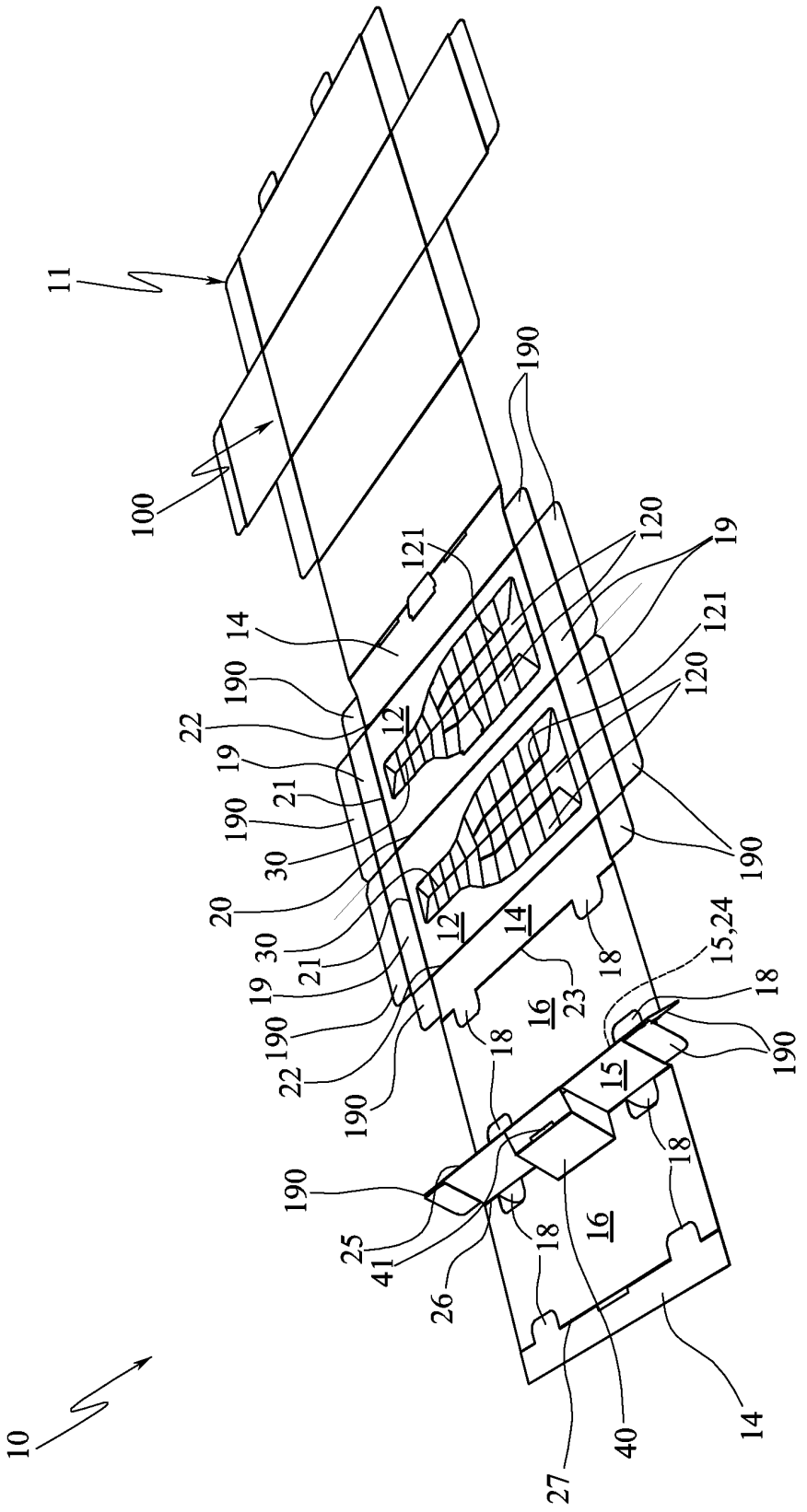


FIG.9


11
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120
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FIG.11

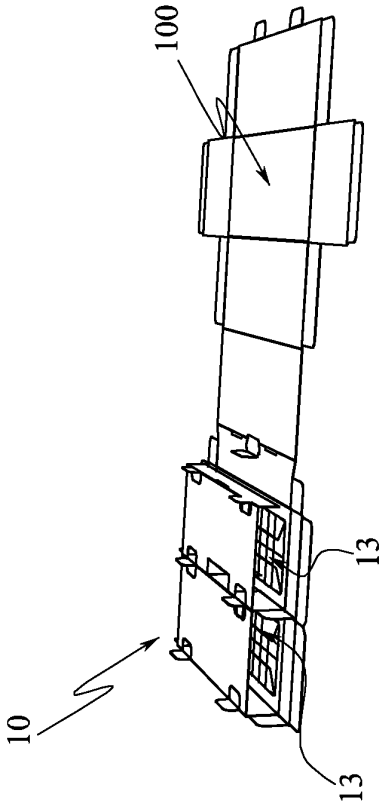

FIG.13

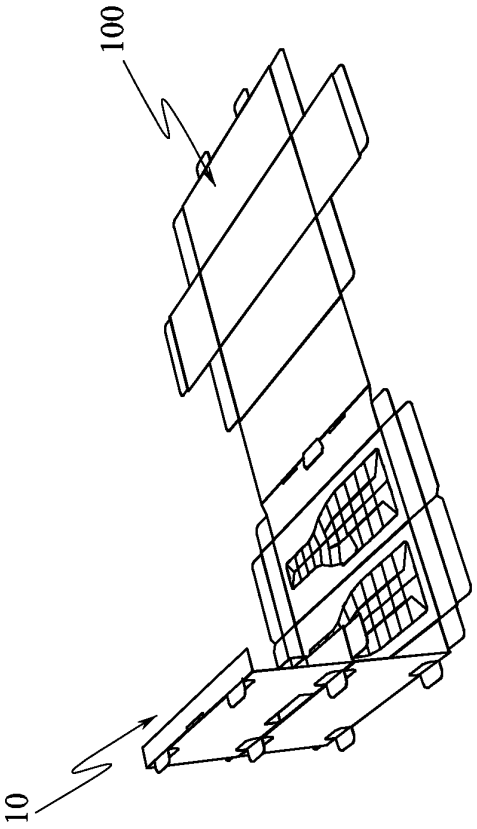

FIG.12

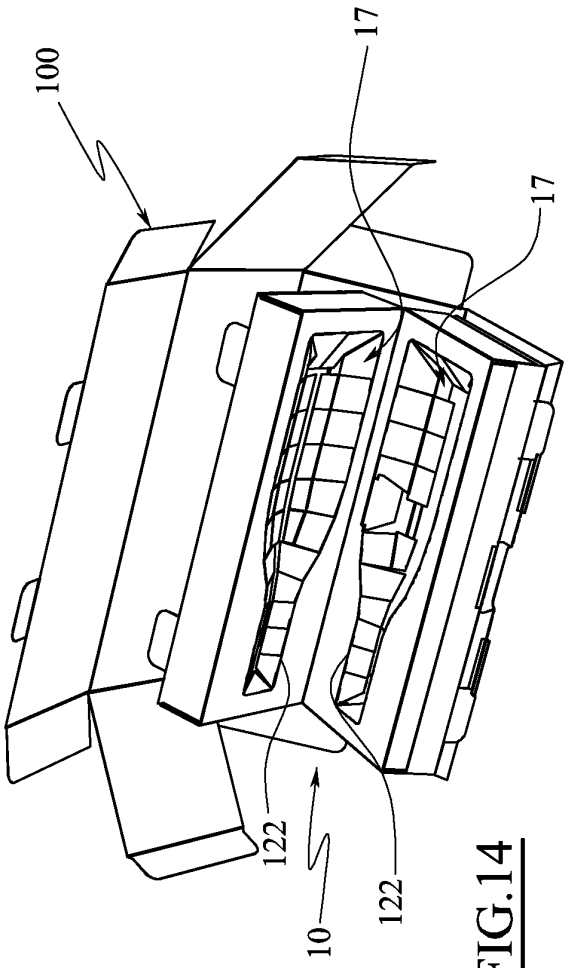

FIG.14

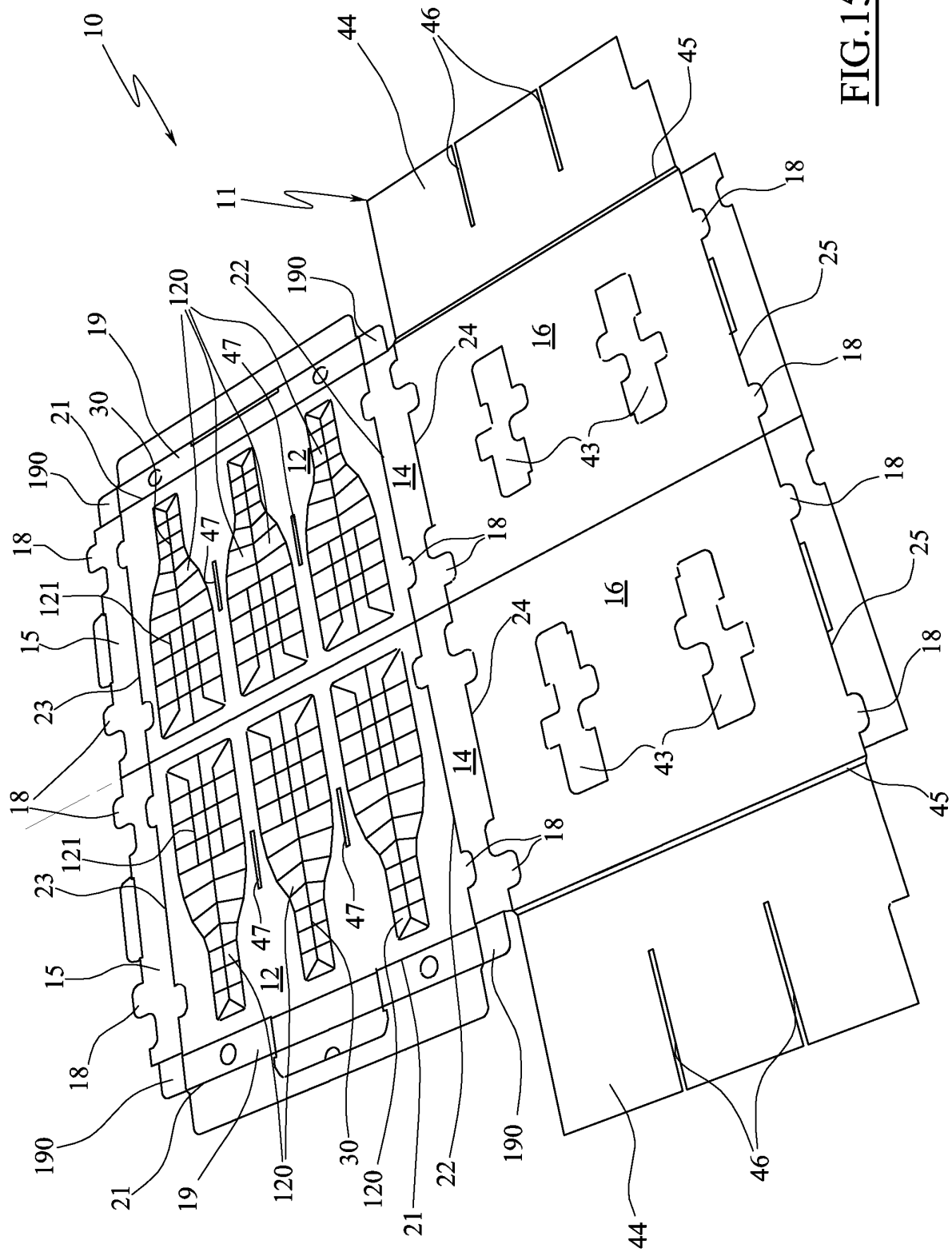

FIG.15

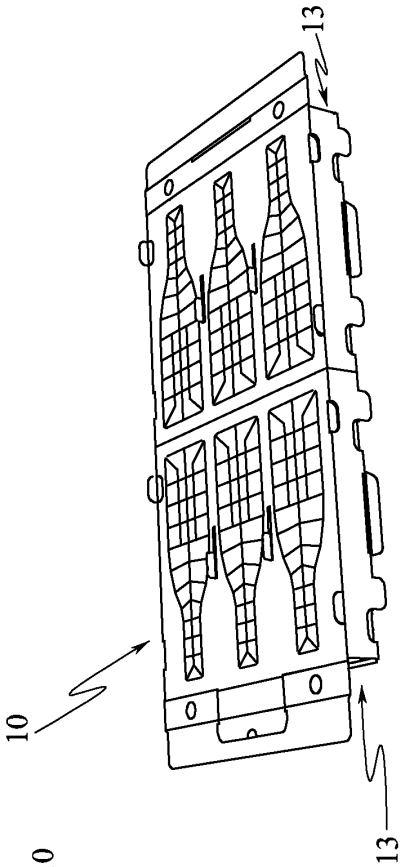

FIG.17

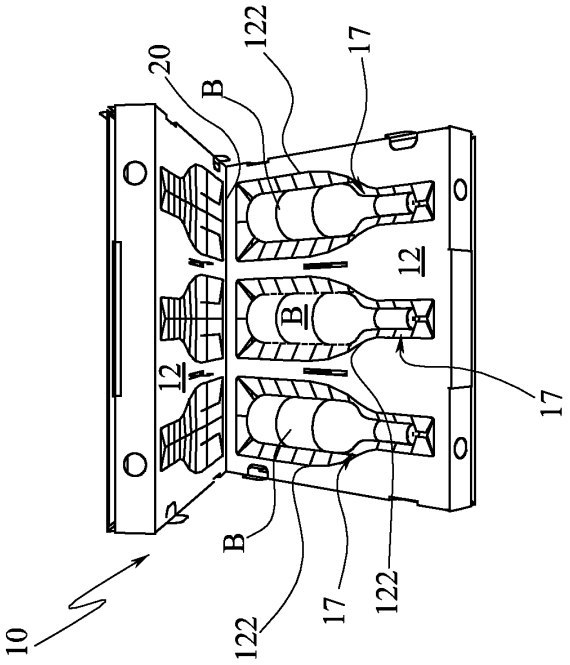

FIG.19

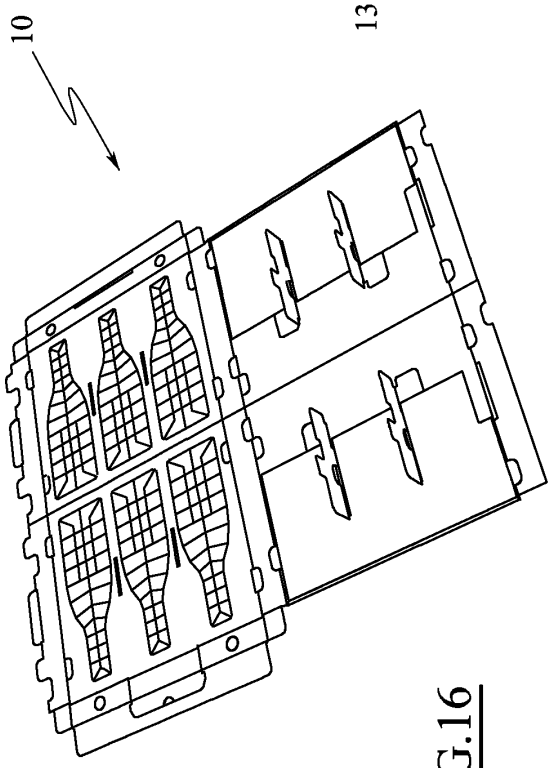

FIG.16

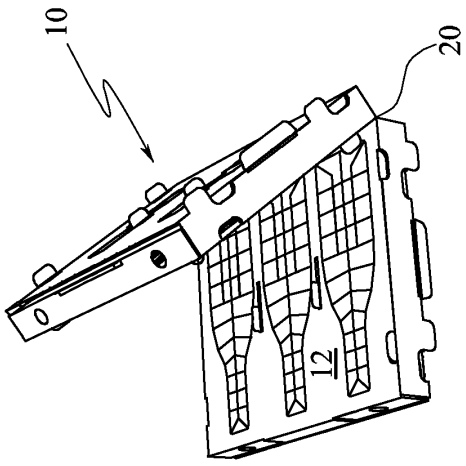

FIG.18

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EUROPEAN SEARCH REPORT

Application Number
EP 13 19 4370

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 Y	GB 2 330 129 A (STAFFORDSHIRE TABLEWARE LTD [GB]) 14 April 1999 (1999-04-14) * page 3, paragraph 6 - page 5, paragraph 2; figures 1-2 *	1-6,8, 10,11 7,9	INV. B65D77/04 B65D5/489 B65D5/50
Y	FR 2 813 289 A1 (ASSIDOMAN CENTRAL PAC [FR]) 1 March 2002 (2002-03-01) * page 10, line 26 - page 11, line 16; figures 1-14 *	7	
Y	CH 413 716 A (GATTINI GERMAIN [FR]) 15 May 1966 (1966-05-15) * page 2, lines 44-55; figures 1-6 *	9	
X	US 2 126 407 A (PAYNE FREDERICK S ET AL) 9 August 1938 (1938-08-09) * page 1, column 2, line 19 - page 2, column 2, line 14; figures 1-10 *	1-6,8, 10,11	
X	DE 20 2005 006072 U1 (EDELMANN CARL GMBH & CO KG [DE]) 17 August 2006 (2006-08-17) * paragraph [0038] - paragraph [0042]; figures 1-9 *	1-6,8, 10,11	TECHNICAL FIELDS SEARCHED (IPC) B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	13 February 2014	Grondin, David

CATEGORY OF CITED DOCUMENTS

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1

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13-02-2014

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

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