SEPARATOR OF ITEMS OF BOTTLE TYPE AND ASSOCIATED TEMPLATE

BACKGROUND

This invention relates to a separator of items of the cylindrical bottle type arranged in a box for transportation, where the separator prevents the contact and optimizes the separation between them both in longitudinal and transverse direction and it is applicable for cylindrical bottles of different size and form.

This invention also relates to a cardboard template to form the separator of items of the bottle type.

DESCRIPTION OF THE PRIOR ART

Separators are used inside of boxes or containers in order to generate separate cavities to isolate the objects contained each other, avoiding contact between them, especially when they are made of a material subject to breaking and a package is needed capable of protecting the bottles by preventing direct contact between them, so that to avoid possible impacts and scratches that can also damage labels, with the resulting loss of quality for the product.

Several solutions have been developed related to the use of sheets, cardboard plates or buffering materials arranged among bottles, where the main challenge is always to get an efficient separator capable of avoiding contact among bottles efficiently, but at the same time being cheap to produce and easy to install.

Another challenge is related to the wide variety of bottles, as for example, bottles for wine, since these can be of different type, such as bottles of straight body, inverted cone body or the so-called Burgundy type, which are bottles with a rather straight bottom area with a wide shoulder area upwards. Additionally, among these types of bottles there is great variety regarding size, both in height and in diameter, so that separators already developed are not always useful for this kind of bottles.

Although some separators have been designed that could be useful for a wide range of bottles, these separators normally have many parts or foils of materials of height weight in grams, which involve high costs in material and production. An example of these separators is the spacer described in the Argentinean priority patent document AR050390, Lattanzi, published on 10/25/2006, which is made up by two or three rectangular plates joint each other by a vertical adhesive strip, where the external plates cover the sides of bottles protecting them against impacts. In this case it is possible to see that this separator could be applied to different types and sizes of bottles, but with the drawback of not being cheap to produce, because it is not only made of three sheets, but irregular in the protection it provides, because the bottles located in the center are separated by three sheets of material, while the bottles on the sides are separated by only one sheet. In the embodiment of two sheets, this would be useful only for three bottles arranged on one side of the separator, with a second separator being necessary in order to separate bottles in boxes of six units, because six is the usual number of bottles arranged in export boxes.

Also another kind of separators has been developed trying to solve the same problem of protecting bottles. Those used the most are the separators formed by a

multiplicity of parts separated each other with a common axis, forming orthogonal bands that can fold each other so that to collapse the separator in the piling condition. These solutions, however, are more complex to manufacture, need materials of high weight in grams, because by being made by just one sheet and without any kind of fold, they need a certain degree of stiffness to become operative, and they are little effective, especially due to the number of parts to be bound afterwards and that can easily disengage at their installation. An example of this kind of separators can be seen in documents US2009/72016, Molle; US4544092, Palmer; US4000845, Zeller; US 2673656, Cunningham, and US3997102, Jones. All of them describe separators for bottles made up by independent parts or bands with engaging slots each other, which, as mentioned before, show the drawback of having a multiplicity of parts and the incapacity of just one single kind of separator being useful for all sizes and types of bottles, because the cuts they have for the engagement of parts are placed in a fixed way, so that once assembled, the separator have fixed-size cavities that are not useful for all sizes.

Another kind of separators are of the bellows type, where bands of material are folded and joined fixedly, generating containing cavities, such as those described in documents US4096984, Gardner or in US3301460, Harrison. The main disadvantage of these separators is the amount of material used and the little flexibility they provide to be used in any kind of sizes of bottles, because their cavities have a fixed size.

Other developments of bottle separators have tried to make surface lighter, reduce the amount of different parts and the number of folis, getting quite efficient designs in terms of manufacture, because despite their cuts of complex shape, these

separators are made of just one sheet with foldable flaps, so that with one central plate they get to separate bottles to both sides. Examples of these cases can be seen in patents US3263893, Weiss; FR2396691, Beghin-Say; FR2105513, Lafarge Emballage; US4294398, Chidsey; and US3662879, Helms.

Although these separators are good in terms of saving material, because they use only one sheet, they are not useful for all kind of bottles, because it has been seen that some of them can be useful for bottles with straight body, buy they are not capable of protecting bottles of the normal cone type or inverted cone type. This deficiency is especially given, because when working with one single sheet, the flaps folded into opposite sides have a different shape; thus, while the protect bottles in a good way at their bottom, they do not protect at the upper part, or they can protect bottles being in opposing rows well, but it is not the same with adjacent bottles in the same row.

This deficiency can be clearly noted in patent US3662879, because although it is said that it is useful for different types and shapes of bottles, they don’t do this with one single separator, but offering instead a different form of separator for each type of bottle. Thus, it is possible to see in figure 2 that there is a one-single sheet separator with flaps of one kind at its ends and flaps of another kind in the central zone. This condition of different forms of flaps makes the manufacture of the separator more expensive and its does guarantee its use for all types of bottles, because as the area of a flap to be protected increases, a portion of the area is taken from another flap or the central area of the separator is reduced. Additionally, while more flaps are manufactured from one sheet, their resistance is reduced, as is the

case of providing more flaps of small size in foils of thin material, which can easily break or bend during the process of placement of the separator between bottles.

In this kind of one-sheet separators, also the stiffness conditions that can be provided by the separator is affected, if it is manufactured in a thin material and if it lacks any kind of folding. Thus, these separators are normally of a high weight in grams, i.e. above 300 g/m2 and up to 500 g/m2, which make the cost of the separator more expensive and can affect the flexibility that is sometimes necessary for their flaps and pivot line.

This is why this invention overcomes the problems of the state of the art by providing a separator for cylindrical bottles formed from a cardboard template, which has a simple shape, of low cost, easy to install and which form allows optimizing the separation between bottles in all directions of the separator and when applied in a wide range of forms and sizes of bottles, preferably wine bottles.

In the bottles of wine, the complexity is given because the most used are normally of several types; for example, some of them have a straight cylindrical body (from the base to the shoulder of the bottle), i.e. in the whole height of the body it has the same diameter. Also one of the most used are those with inverted cone form, where the diameter in the bottle shoulder is greater than the base diameter. We also have the bottles called Burgundy, which have a lower area which is normally straight or slightly conic, and one portion of the shoulder which is clearly longer and merges with the bottle neck area. Among these kinds of bottles many varieties of sizes can be found, so that in order to determine where the contact among bottles is produced when being packaged in a box for transport, a wide range of measures is generated

in order to determine the points where the separator should act preventing the contact among bottles.

Therefore, in the case of straight wine bottles there are several sizes, which diameter can be between minimum 73 mm and maximum 78.6 mm, and the height of the body can be between minimum 174 mm and maximum 201.6 mm, which the contact between these straight bottles is produced in the whole the height of the body along a vertical line.

In inverted cone bottles there are also different sizes, where the greater diameter, i.e. the most important one, because it is there where bottles touch each other, can be between 77.6 mm and 86.7 mm for the greatest bottles. As to their height from the bottom to the shoulder, they have between 175.7 mm and 201.6 mm. In this case, the critical point of contact of bottles is the area of greater diameter, which is located at the upper end of the body, which coincides with the shoulder.

For Burgundy type bottles, i.e. those with a straight cylindrical bottom portion, it can be seen that the variation in size ranges between bottles of 78.3 mm diameter and 88 mm diameter at their bottom or lower area, also having a height between 80 mm and 115 mm. In this kind of bottles, the critical contact area between them can be found in the cylindrical area, which is the one with the greatest diameter of bottle.

As already seen, there is a great variety of sizes according to the different types of bottles, but for the separator to be applicable to all these varieties, we must consider that for the diameter of all bottles the range is between minimum 73 mm and 88 mm. As to the critical height, the range is from the bottom to 201.6 mm, which would correspond to the highest point of inverted cone bottles, and 174 mm to the lowest point of shoulder of straight bottles. Therefore, an average bottle includes an

approximate diameter of 76 mm and a height of 201.6 mm, this being the greatest height of the body seen in all bottles of wine. This, however, does not imply that it cannot be used with bottles of another format.

DESCRIPTION OF THE INVENTION

This invention relates to a separator of items, specifically for cylindrical bottles. The main purpose of this is to provide a separator of bottles arranged in a box for their transport, ordered in two parallel rows of three bottles each, where the separator prevents contact between them both in longitudinal (the two parallel rows) and transverse (bottles in the same row) direction. It is also applicable for cylindrical bottles of inverted cone body and straight body with a wide shoulder area as the Burgundy type or a shorter shoulder area, as the straight cylindrical ones, wherein this separator is of low manufacture cost, easy to assemble and has two directions of insertion; thus it can be placed in any of them.

Even another objective of the present invention is to provide a separator of bottles with pivoting flaps having portions or bands of proper width and length to protect a wide range of bottles.

Another objective of the present invention is to provide a separator of bottles with flaps of proper size, which prevents its easy breaking due to manipulation.

Even another objective of the present invention is to provide a separator of bottles with areas of material of proper thickness in order to protect and prevent contact between the two rows of bottles.

An additional objective is to provide a separator easy to insert between bottles, which allows its introduction in any vertical direction, so that the operator should not think or decide which direction to select.

Another objective of the present invention is to provide a separator of bottles of a resistant and flexible material, so that the flaps may fold easily and bend surrounding the bottles.

Another objective of the present invention is to provide a cardboard template to form a separator of bottles meeting the objectives mentioned above.

In an aspect of the present invention there is provided a separator of items of bottle type for use in a box, said separator comprising: a longitudinal partition wall configured to separate two opposing rows of bottles, a set of vertical foldable flaps configured to separate bottles of the same row, and a first sheet and a second sheet, wherein each sheet has a central partition wall and two vertical flaps, with each flap comprising two adjacent vertical portions, a first vertical portion that is distal to the central partition wall and a second vertical portion that is proximal to the central partition wall located with respect to vertical folding lines that join each flap to their corresponding sheet; wherein the first vertical portion that is distal to the central partition wall has the same height as said central partition wall; wherein the central partition wall of the first sheet comprises two separating vertical portions formed by cutting lines, said cutting lines being formed by a vertical section and two inclined sections; and wherein the central partition wall of the second sheet comprises separating upper and lower portions generated each one by cutting lines, said cutting lines being formed by one vertical section and one inclined section.

The separator can be manufactured of any kind of cellulosic laminated material of the cardboard or plastic type, with a weight in grams not exceeding 350 g/m2. Thus, a sufficiently resistant and light separator can be obtained, but also flexible and of proper thickness to produce enough separation between bottles.

The separator is comprised of longitudinal partitioning and a set of vertical flaps, wherein the longitudinal partitioning is made by two parallel sheets and separates the two parallel rows, while the set of vertical flaps is generated by cutting lines and vertical folding lines on the sheets, wherein these flaps, by deploying outwardly, prevent the lateral contact of the bottles in the same row.

In the longitudinal partitioning, a central area can be seen, as well as upper and lower edges and side edges, wherein each sheet making up the partitioning comprises a partition wall and two vertical flaps, which are symmetrical and equidistant each other according to an imaginary vertical central axis. Said flaps are in turn made up by two adjacent vertical portions, one distal portion and one proximal portion.

According to an embodiment of the invention, each sheet has a different configuration, wherein the first sheet has lateral flaps with a centered cutting line half height of the sheet, so that said foldable flaps may pivot in two vertical folding lines, each one located at the upper and lower ends of the sheet, while in a second sheet that is part of the separator, the side flaps have two cutting lines, each located at the upper and lower end of the sheet, so that said foldable flaps may pivot on a vertical folding line centered according to the height of the sheet.

Flaps are located on the side edges of the sheets, where the flap of a sheet has a common vertical pivot with the flap of the opposing sheet and unfolds to each side of the partition wall around said vertical folding lines.

In the case of the first sheet, which has two folding lines by flap, said folding flaps are vertically aligned in the same axis and each one has a height that is approximately equivalent to a fourth of the sheet's total height, while the folding lines of each flap are laterally displaced to each end of the partition wall in relation to an imaginary plane going through the bottles of the same row and touching the partition wall perpendicularly.

In the second sheet, the folding lines have a height approximately comprising the central third portion of the sheet's height and are laterally displaced to each end

in relation to an imaginary plane going through the bottle in the same row and touching the partition wall perpendicularly.

In both sheets, this lateral displacement of the folding lines is equal to a fourth diameter of the average bottle and when the separator is installed between the bottles, this generates the bending of the flaps and in order to surround the inside quadrant of the lateral bottles' perimeter, shortening the distance between the partition wall and the distal portion of each flap, making said distal portion to become close to the partition wall's central area and being located between the bottles of the same row and prevents the lateral contact between them just at the height of the tangency line between bottles.

In both sheets, without considering the flaps, the body of the partition wall has a total width of at least two diameters and a half of the average bottle and a height covering from the bottom of the bottle to at least 6 mm above the shoulder of the tallest bottles.

In the first sheet of the separator, the partition wall comprises separating vertical laterally-projecting portions generated by a central cutting line, where said separating portions are located in the middle area of height of the partition wall, and have a width corresponding to half the diameter of the bottle and a height above a third of the partition wall's height.

In the case of the second sheet, the partition wall has upper and lower separating portions projecting from the side edges, which are generated by horizontal tilted cutting lines followed by vertical cutting lines practiced in the four vertexes of the partition wall, wherein said separating portions have a width corresponding to half the diameter of the average bottle and a height of at least one third the height of the

partition wall, with these portions acting to prevent the contact between the bottles of the ends of the opposing rows.

Thus, once the two sheets that make up the separator are parallel each other and each of them has its two flaps folded outwards, the two opposing rows of bottles are separated by the area of the partition wall of each sheet and by the upper and lower separating portions of the second sheet together with the central separating portion of the first sheet that covers the vertically cut area of the second sheet.

This way, the central bottles of each opposing row are separated by the central area of the partition wall and the side bottles of each opposing row are separated by the set of side separating portions of each sheet, where the separating portions of the first sheet cover the mid area of the separator's total height in its side edges, and the upper and lower separating portions of the second sheet cover the upper and lower area of the separator's total height in the same side edges of the partition wall.

Advantageously, when the flaps of both sheets of the separators unfold, a vertical continuous surface is formed in the side ends of the separator preventing the contact between the bottles located on each side of the ends thereof, regardless of its size, type and form.

Also advantageously, the flaps of both sheets unfold from the ends of the partition wall to the center, so that the bottles of the ends push the flaps contrary to the closing direction thereof, thus generating a greater force of pressure from the flap against the central bottle and thus providing a greater separation area among the bottles located in the same line.

In both sheets, the distal portion of the flaps has a width at least one third the diameter of the average bottle and a height equivalent to the partition wall's total height. This provides a separator that covers the body height of all possible bottles totally and thanks to the width being at least one third the diameter of the bottles, it also ensures that whichever the size of the bottle, there always will be a portion of the separator preventing the contact of adjacent bottles in the same row.

This margin increased both for height and width of distal portions ensures the lateral protection of the bottles in the same row, especially because the flaps of the separator are not of double sheet as the partition wall, but of only one sheet.

In both sheets, the proximal portion of the flaps is the portion located between the distal portion and the vertical folding line, from which the flap emerges, with a width equivalent to half the diameter of the average bottle, and in the case of the second sheet a height not greater than two quarters of the partition wall's height, while in the first sheet, each folding line has a height not greater than one fourth of the total partition wall's height.

By being lower than the distal portion, the proximal portion's height allows the flap to easily bend surrounding the bottles, while its width is the result of the width required for the upper and lower separating portions of the partition wall, so that when being bent and surrounding the bottles, the distance of the distal portion becomes shorter in relation to the partition wall. This results in the distal portion to be located covering the tangential point of contact of the bottles of the same row when becoming closer to the partition wall, because if said flaps do not bend, the distal portion would be beyond the point where the bottles touch each other and hence the contact between them would not be prevented.

In both sheets, the vertical folding lines are parallel each other and are separated each other by a lateral distance between them equal to one diameter and a half an average bottle. Thus, when the flaps bend surrounding the lateral bottles, the flaps become closer to the center, allowing the distal portions of the flaps to be located in the tangency line where the central bottles touches the lateral ones in the same row.

In both sheets, the horizontal sections of the cutting lines that generate each flap have an inclination and a joining vertex with the vertical section of said cutting lines, which is rounded, wherein this characteristic is useful in such a way that when the separator is inserted between the bottles, the edges do not tear the labels of the bottles, because when inserting the separator, this is introduced vertically downstream and when the separators are straight, they impact the edges of the labels in a parallel way and damage said labels. When they are instead cut in an inclined and rounded way, the impact with the label is no longer parallel, preventing the labels from being torn and detached.

When the separator is installed between bottles with the flaps already deployed outwardly, the proximal portion of the flaps bends surrounding the lower quadrant of the applicable lateral bottle’s perimeter, and the distal portion remains in the contact point of the perimeter of the adjacent bottles in the same row, while in the opposing rows of bottles, they are longitudinally separated by the partition wall, where the central bottles are separated each other by the central area of the partition wall, which is fully flat and comprises the total height of the partition wall, while the lateral bottles of each opposing row are separated each other by the set of upper and

lower separating portions of the second sheet and by the central separating portion of the first sheet remaining between the first two portions.

Second, the invention is associated with a cardboard template to form the separator of items of the bottle type described above, which comprises a foil where the four flaps are configured with each comprising a distal portion and a proximal portion, wherein each flap is configured by cutting lines and vertical folding lines, with the vertical folding lines being located in the longitudinal direction of the foil and displaced to a respective imaginary plane in an equidistant way, thus forming a displacement which is equal to about a fourth the diameter of a bottle.

The template comprises a central transverse folding ridge along the foil, which in turn comprises a central weakened section and two lateral cut sections, thus generating the foil to be made up by two sheets joined in said common central folding ridge.

In a first type of template made up by two different types of sheets, the first sheet has four folding lines, two of them aligned in the same pivoting axis from which a flap is born, and the other two aligned in a different pivoting axis, but parallel to the first one, where the other flap is born from the same sheet. Thus, there are two folding lines born from the ends of the central pre-cut section of the template's central ridge, while the other two folding lines reach the opposite end of said folding ridge.

The second sheet of the template shows two folding lines from which the respective flaps are born, with the folding lines being located in the mid section of height of the sheet and are, each of them, in turn aligned with each pivoting axis of the first sheet's flap, with a special separation between them which is equal to one diameter and a half of a bottle.

The partition wall of the first sheet and the partition wall of the second sheet have a greater width which is equal to at least two diameters and a half of the bottle and total height that covers from the bottom to the bottle's shoulder.

The partition wall of the first sheet comprises vertical separating portions laterally projected and located in the mid area of the partition wall's height, generated by a cutting line, where said separating portions have a width corresponding to half the diameter of the bottle and a height above one third of the partition wall's height.

The cutting lines of the first sheet are formed by a central vertical, parallel section displaced outwards the vertical folding line, followed in both ends by inclined horizontal, converging each other sections, which end when finding the vertical folding line.

The partition wall of the second sheet comprises upper and lower separating portions generated by cutting lines, where said separating portion have a width corresponding to half the diameter of the bottle and its height is at least one fourth the height of the partition wall.

The cutting lines of the second sheet are each formed by a vertical, parallel section displaced outwards the vertical folding line and a horizontal inclined section, which end when finding the vertical folding line.

The distal portion of the flaps of the second sheet has a width at least one third the diameter of the average bottle and a height equivalent to the partition wall's total height, while the proximal portion has a width equivalent to half the diameter of bottles and a height not greater one third the partition wall's height.

The distal portion of the flaps of the first sheet has a width at least one third the diameter of the average bottle and a height equivalent to the partition wall's total

height, while the proximal portion has a width equivalent to half the diameter of bottles and a height not greater one third the partition wall's height.

The vertical folding lines of the first sheet are parallel and separated each other by a distance equal to one diameter and a half of bottles. The vertical folding lines of the second sheet are parallel and separated each other by a distance equal to one diameter and a half of bottles.

The common folding ridge has a central weakened joining portion between both sheets, which width is equal to the separation width between vertical folding lines in both sheets.

In the second kind of template, this is made up by a foil folding in two equal sheets, unlike the other type of template with is made up by two different sheets. In the second case, the equal sheets correspond to the second sheet described in the first kind of template.

According to an embodiment of the invention, the template comprises one single foil folded in two sheets joined around the central transverse folding line or ridge, which fold around said folding line in order to form a one single part separator of items of the bottle kind.

According to another embodiment, the template comprises two independent sheets joining each other in a parallel way, and it can be fixed through adhesive lines placed on the opposing faces between the sheets.

In a different embodiment, the separator can be applied to twelve-bottle packs ordered in four rows of three bottles each, where the two central rows are separated each other by the normal configuration of the separator, while the rows of each end are separated from the two central ones by the alternative configuration of the

separator, where the latter is conceived by independent sheets, placing each sheet separately between one end row and one central row.

DESCRIPTION OF THE FIGURES

A detailed description of the invention will be performed together with the figures that are part of this presentation, where it can be seen that:

Figure 1 shows an isometric view of the separator in assembled condition.

Figure 2 shows an isometric view of the separator in assembled condition according to an opposing face shown in figure 1.

Figure 3 shows an upper plan view of the separator installed between the bottles and inside a box.

Figure 4 shows a cross-section upper plan view of a detail of the area where the flap is folded in relation to the partition wall. This view is presented only for reference in order to show the curvature experienced by the flap and the approach effect to the partition wall due to said curvature.

Figure 5 shows a front elevated view of the separator with its flaps unfolded and showing a first type of sheet.

Figure 6 shows a front elevated view of the separator with its flaps unfolded and showing a second type of sheet.

Figure 7 shows an upper plan view of the separator not installed, but with flaps folded.

Figure 8 shows a front elevated view of a first embodiment of the template that makes up the separator.

Figure 9 shows a front elevated view of a second embodiment of the template that makes up the separator.

Figure 10 shows a front elevated view of an alternative embodiment of the template to make up the separator of separate sheets.

Figure 11 shows a front elevated view of an alternative embodiment of the template to make up the separator of separate sheets.

Figure 12 shows a front elevated view of the separator of the first embodiment installed between the bottles.

Figure 13 shows a side elevated view of the separator of the first embodiment installed between bottles of inverted cone shape.

Figure 14 shows a front elevated view of the separator of the second embodiment installed between the bottles.

Figure 15 shows a side elevated view of the separator of the second embodiment installed between bottles of inverted cone shape.

Figure 16 shows a front elevated view of the template to make up the first embodiment of the separator.

Figure 17 shows a front elevated view of the template to make up the second embodiment of the separator.

Figure 18 shows a schematic view of the separator in front view of the first sheet, where the scheme of contact point in the flaps is shown as produced among bottles of the same row.

Figure 19 shows a schematic view of the separator in front view of the first sheet, where the scheme of contact point in the partition wall is shown as produced among bottles of opposing rows.

Figure 20 shows a schematic view of the separator in front view of the second sheet, where the scheme of contact point in the flaps is shown as produced among bottles of the same row.

Figure 21 shows a schematic view of the separator in front view of the second sheet, where the scheme of contact point in the partition wall is shown as produced among bottles of opposing rows.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention refers to a separator (1) of items of the cylindrical bottle type, which, according to the embodiment shown in **FIG. 3**, are arranged in a box (A) for transport, ordered in two parallel rows (B) of three bottles each, one central (C) and lateral (D) rows, where the separator prevents the contact among them both in longitudinal and transverse direction and it is applicable for inverted cone body, cone body and straight body bottles.

According to the preferred embodiment illustrated in **FIG. 1**, the separator (1) comprises a longitudinal partition wall (10) and a set of foldable vertical flaps preventing the lateral contact between bottles in the same row, where the separator (1) comprises a first type of sheet (11) and a second type of sheet (12), where the sheet (11) has a central partition wall (110) and two vertical, symmetrical and equidistant flaps (111) each other, with each flap (111) having two adjacent vertical portions, one distal portion (112) and one proximal portion (113).

While the sheet (12), best illustrated in **FIG. 2**, has a central partition wall (120) and two vertical, symmetrical and equidistant flaps (121) each other, with each flap

(121) having two adjacent vertical portions, one distal portion (122) and one proximal portion (123).

As it can be noted in **FIG. 3**, the flaps (111) and (121) are joined to their respective sheet (11), (12) through a vertical folding line (114), (124) and said folding lines are laterally displaced with respect to an imaginary plane (E), which is best illustrated in **FIG. 4**, which is perpendicular to the partition wall (110), (120) going through bottles (C, D) of the same row (B) of bottles, where this displacement (*x*) is approximately equal to a fourth of the bottle diameter.

In reference to **FIG. 5**, it is noted that the vertical folding lines (114) of the first type of sheet (11) are two by flap (111), an upper folding line and a lower one, located in the same vertical lines; the central partition wall (110) has a greater width (*a*) of at least two diameters and a half the bottle and a total height (*b*) covering from the bottom to the bottle shoulder. The partition wall (110) in turn comprises two separating vertical portions (115) located in the mid area of the partition wall (110) height with a width (*c*) corresponding to at least half the diameter of the bottle and a height (*d*) greater than one third the partition wall (110) height, generated by a cutting line (116).

The cutting lines (116) of the sheet (11) are formed by a central, parallel vertical section (117) displaced outwards the vertical folding lines (114) followed in both ends by horizontal inclined sections (118), which are converging each other and ending when finding the vertical folding line (114).

Going on with the same **FIG. 5**, the distal portion (112) of flaps (111) has a width (*g*) of at least one third the bottle diameter and a height (*h*) equivalent to the partition wall (110) height (*b*), while the proximal portion (113) has a width (*i*)

equivalent to at least half the diameter of bottles and a height (*j*) of about one fourth the partition wall (110) height.

In reference to **FIG. 6**, it is noted that the vertical folding lines (124) of the second type of sheet (12) are one by flap (121) located in the mid area of height of each flap (121), while the central partition wall (120) has a greater width (*a*) of at least two diameters and a half the bottle and a total height (*b*) covering from the bottom to the bottle shoulder.

The partition wall (120) of the sheet (12) comprises separate upper (125) and lower (126) portions generated by cutting lines (127), where said separating portions (125) and (126) have a greater width (*e*) corresponding to at least half the diameter of the bottle and its height (*f*) is at least of fourth the partition wall (120) height.

The cutting lines (127) of the sheet (12) are each formed by a vertical, parallel section (128) displaced outwards the vertical folding line (124) and by a horizontal inclined section (129) ending when finding the vertical folding line (124).

Going on with the same **FIG. 6**, it can be noted that the distal portion (122) of flaps (121) has a width (*k*) of at least one third the bottle diameter and a height (*l*) equivalent to the partition wall (110) height (*b*), while the proximal portion (123) has a width (*m*) equivalent to at least half the diameter of bottles and a height (*n*) greater to one third the partition wall (110) height.

As it can be seen in **FIG. 7**, in the sheet (11), the folding lines (114) of a flap (111) are parallel to the vertical folding lines (114) of the other flap (111), while the vertical folding line (124) of a flap (121) is parallel to the vertical folding line (124) of the other flap (121) and are laterally separated each other by a distance (*ñ*) which is equivalent to one diameter and a half of the bottles.

According to an embodiment of the separator, which is better seen in **FIG. 8**, the same is comprised of a one-part template (2) formed by two different sheets, one corresponding to the first type of sheet (11) and the other one corresponding to the second type of sheet (12), joined and folded each other around a common central transverse folding ridge (21) having a central weakened joining portion (22) between both sheets (11) and (21), which width (ñ') is equal to the separation width (*ñ*) between vertical folding lines (114), (124) of each sheet.

According to another embodiment of the separator, which is better seen in **FIG. 9**, the same is comprised of a one-part template (3) formed by two equal sheets of the second type of sheet (12), joined and folded each other around a common central transverse folding ridge (31) having a central weakened joining portion (32) between both sheets (12) and (21), which width (a') is equal to the width (*a*) of the partition wall (120).

According to another embodiment, which is better seen in **FIG. 10**, the separator is formed from a sheet of the first type (11) and a sheet of the second type (12), which are independent and that can be joined by adhesive lines (13) placed in a central area of the partition wall (110) and the partition wall (120) of each sheet.

According to another embodiment, which is better seen in **FIG. 11**, the separator is formed from two independent sheets of the second type (12) that can be joined by adhesive lines (14) placed in a central area of the partition wall (120) of each sheet.

As illustrated in **FIG. 12** and **FIG. 13,** when the separator (1) formed by one sheet (11) and one sheet (12), is installed between the bottles with flaps (111) and (121) unfolded outwardly, the proximal portion (113) of the flaps (111) and the

proximal portion (123) of the flaps (121) bend, thus surrounding the inside quadrant of the corresponding lateral bottle perimeter (D); while the distal portion (112) of the flaps (111) and the distal portion (122) of the flaps (121) remains in the contact point of the perimeter of the adjacent bottles (C, D) in the same row; and while between the opposing rows (B) of bottles, the central bottles (C) remain separated each other by the partition wall (110) and (120), and the bottles (D) of each end remain separated in the area of shoulder and the lower area by the upper (125) and lower (126) separating portions of the partition wall (120) of sheet (12), respectively; while the central area of the bottles (D) remains separated by the vertical separating portions (115) of the partition wall (110) of the first sheet (11).

As illustrated in **FIG. 14** and **FIG. 15,** when the separator (1) formed by two sheets (12), is installed between the bottles with flaps (121) unfolded outwardly, the proximal portion (123) of the flaps (121) bend, thus surrounding the inside quadrant of the corresponding lateral bottle perimeter (D); the distal portion (122) of the flaps (121) remains in the contact point of the perimeter of the adjacent bottles (C, D) in the same row; while between the opposing rows (B) of bottles, the central bottles (C) remain separated each other by the partition wall (120), and the bottles (D) of each end remain separated in the area of shoulder and the lower area by the upper (125) and lower (126) separating portions of the partition wall (120).

The separator of items is useful to separate cylindrical bottles that can be arranged in a box (A) for transport, ordered in parallel two rows (B) of three bottles each, once central (C) an two lateral (D) ones, as seen in **FIG. 3.**

In reference to **FIG. 16**, the separator is formed by a cardboard template (2), which is in turn comprised of a foil folded in two sheets through a central folding ridge

(21), which is transverse to the foil length, where said sheets are different each other (11, 12) configured by a central partition wall (110, 120) and two flaps (111, 121), comprising each a distal portion (112, 122) and a proximal portion (113, 123), where each flap (111, 121) originates from cutting lines (116, 127) from a vertical folding line (114, 124), with those vertical folding lines (114, 124) being located in the template's longitudinal direction and, as better seen in **FIG. 3** and **FIG. 4**, they are laterally displaced with respect to an imaginary plane (E) perpendicularly to the partition wall (110, 120), thus forming a displacement (*x*) which is approximately equal to fourth the diameter of a bottle.

The vertical folding lines (114) of the sheet (11) are two by ach flap (111), one upper and another lower, located in the same vertical line, and the vertical folding lines (124) of the second sheet (12) are one by each flap (121) located in the mid area of the height of each flap (121); while the partition wall (110) of the first sheet (11) and the partition wall (120) of the second sheet (12) have a greater width (*a*) of at least two diameters and a half the bottle and a total height (*b*) covering from the bottom to the bottle shoulder.

The partition wall (110) of the first sheet (11) comprises vertical separating portions (115) laterally projected and located in the mid area of the partition wall (110) height, generated by a cutting line (116), where said separating portions (115) have a width (*c*) corresponding to at least half the diameter of the bottle and a height (*d*) greater to a third of the partition wall (110) height.

The cutting lines (116) of the first sheet (11) are formed by a central vertical, parallel section (117) displaced outwards the vertical folding line (114), followed in

both ends by inclined horizontal, converging each other sections, which end when finding the vertical folding line (114).

The partition wall (120) of the second sheet (12) comprises upper (125) and lower (126) separating portions generated by cutting lines (127), where said separating portions (125), (126) have a width (*e*) corresponding at least to half the diameter of the bottle and its height (*f*) is at least one third the height of the partition wall (10).

The cutting lines (127) of the second sheet (12) are each formed by a vertical, parallel section (128) displaced outwards the vertical folding line (124) and a horizontal inclined section (129), which end when finding the vertical folding line (124).

The distal portion (112) of the flaps (111) has a width (*g*) at least one third the diameter of the bottle and a height (*h*) equivalent to the partition wall (110) height, while the proximal portion (113) has a width (*i*) equivalent to half the diameter of bottles and a height (*j*) not greater than one third the partition wall (110) height; while distal portion (122) of the flaps (121) has a width (*k*) at least one third the diameter of the bottle and a height (*l)* equivalent to the partition wall (120) height; while the proximal portion (123) has a width (*m*) equivalent to half the diameter of bottles and a height (*n*) not greater than one third the partition wall (120) height.

The vertical folding lines (114) of the first sheet (11) are parallel and separated each other by a distance (*ñ*) equal to one diameter and a half of bottles; while the vertical folding lines (124) of the second sheet (12) are parallel and separated each other by the same distance (*ñ*), which is equal to one diameter and a half of bottles. The common folding ridge (21) has a central weakened joining portion (22) between

both sheets (11) and (12), which width (*ñ'*) is equal to the separation width (*ñ*) between vertical folding lines (114), (124).

According to another embodiment of the invention, better seen in **FIG. 17**, the separator is formed by a cardboard template (3), which is in turn comprised of a foil folded in two sheets (12) through a central folding and joining ridge (31), which is transverse to the foil length, where said sheets (12) the same each other, configured by a central partition wall (120) and two flaps (121), comprising each a distal portion (122) and a proximal portion (123), where each flap (121) originates from cutting lines (127) from a vertical folding line (124), with those vertical folding lines (124) being located in the template's longitudinal direction and, as better seen in **FIG. 3** and **FIG. 4**, they are laterally displaced with respect to an imaginary plane (E) perpendicularly to the partition wall (120), thus forming a displacement (*x*) which is approximately equal to fourth the diameter of a bottle.

Going on with the same **FIG. 17**, the vertical folding lines (124) of the sheets (12) are one by each flap (121) located in the mid area of height of each flap (121); while the partition wall (120) has a greater width (*a*) of at least two diameters and a half the bottle and a total height (*b*) covering from the bottom to the bottle shoulder, where this partition wall (120) comprises separating upper (125) and lower (126) portions generated by cutting lines (127), where said separating portions (125), (126) have a width (*e*) corresponding to at least half the diameter of the bottles and its height (*f*) is at least one fourth the height the partition wall (120).

The cutting lines (127) of the sheets (12) are each formed by a vertical, parallel section (128) displaced outwards the vertical folding line (124) and a horizontal inclined section (129), which end when finding the vertical folding line

(124). The distal portion (122) of the flaps (121) has a width (*k*) at least one third the diameter of the bottle and a height (*l*) equivalent to the partition wall (120) height, while the proximal portion (123) has a width (*m*) equivalent to half the diameter of bottles and a height (*n*) not greater one third the partition wall (120) height.

The vertical folding lines (124) of the sheets (12) are parallel and separated each other by a distance (*ñ'*) which is equal to one diameter and a half of the bottles; while the common folding ridge (31) has a central joining portion (32) weakened between both sheets (12), which width (a') is equal to the width (*a*) of the partition wall (120).

In reference to **FIG. 18, 19, 20** and **21**, there a scheme is seen showing the different parts of the separator operating according to the different types of bottles (straight, inverted cone and Burgundy type). Thus in **FIG. 18**, it is seen that the distal portion (112) of flaps (111) of the sheet (11) cover the total height and width to the possible contact points between bottles in the same row. Likewise, in **FIG. 19** it is seen that the central area of the partition wall (110) operates by separating the central bottles of opposing rows, while the lateral separating portions (115) operate by separating the lateral bottles of opposing rows in their mid area.

FIG. 20 shows that the distal portion (122) of flaps (121) of sheets (12) operates by separating central and lateral bottles in the same row in all its height.

Additionally, **FIG. 21** shows that the central portion of the partition wall (120) operates by separating central bottles of opposing rows, while the upper separating portions (125) operate by laterally separating bottles in the shoulder area and the lower separating portions (126) operate by laterally separating bottles in the lower area.

CLAIMS

1. A separator of items of bottle type for use in a box, said separator comprising:

a longitudinal partition wall configured to separate two opposing rows of bottles,

a set of vertical foldable flaps configured to separate bottles of the same row, and

a first sheet and a second sheet,

wherein each sheet has a central partition wall and two vertical flaps, with each flap comprising two adjacent vertical portions, a first vertical portion that is distal to the central partition wall and a second vertical portion that is proximal to the central partition wall located with respect to vertical folding lines that join each flap to their corresponding sheet;

wherein the first vertical portion that is distal to the central partition wall has the same height as said central partition wall;

wherein the central partition wall of the first sheet comprises two separating vertical portions formed by cutting lines, said cutting lines being formed by a vertical section and two inclined sections; and

wherein the central partition wall of the second sheet comprises separating upper and lower portions generated each one by cutting lines, said cutting lines being formed by one vertical section and one inclined section.

2. The separator of items in a pack according to claim 1, wherein it is made up from a one-part template comprised of two sheets, where one of which corresponds

to a first sheet and the other one to the second sheet, joined and folded each other around a central transverse common folding ridge.

3. The separator of items in a pack according to claim 2, wherein the common folding ridge has a central joining portion weakened between both sheets and, which width is equal to a separation width between vertical folding lines of each sheet.

4. A separator of items in a pack according to claim 1, wherein the first sheet and the second sheet are independent each other and joined each other by adhesive lines placed in the central area of the partition wall of each sheet.

5. A separator of items in a pack according to any one of the preceding claims, wherein the first vertical portion of the flaps are configured to bend.

6. A cardboard template to form a separator of items of the bottle type according to claim 1, comprising: a blank folded in two sheets through a central folding ridge, which is transverse to the blank length, where said sheets are different each other and configured by a central partition wall and two flaps, comprising each a first vertical portion and a second vertical portion;

wherein the first vertical portion has the same height as said central partition wall;

wherein the first cutting lines are formed by a vertical section and two inclined sections; and

wherein the second cutting lines are formed by one vertical section and one inclined section.

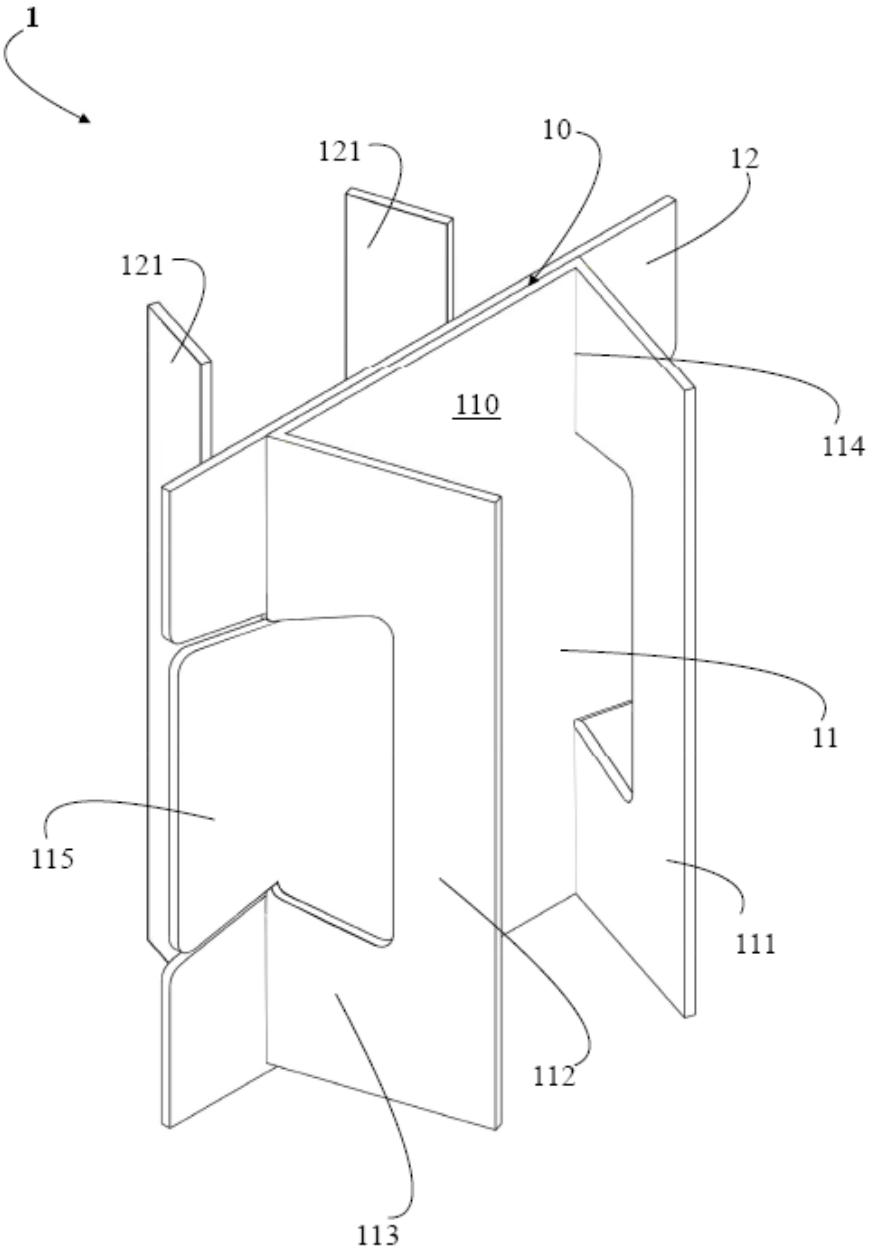

FIG. 1

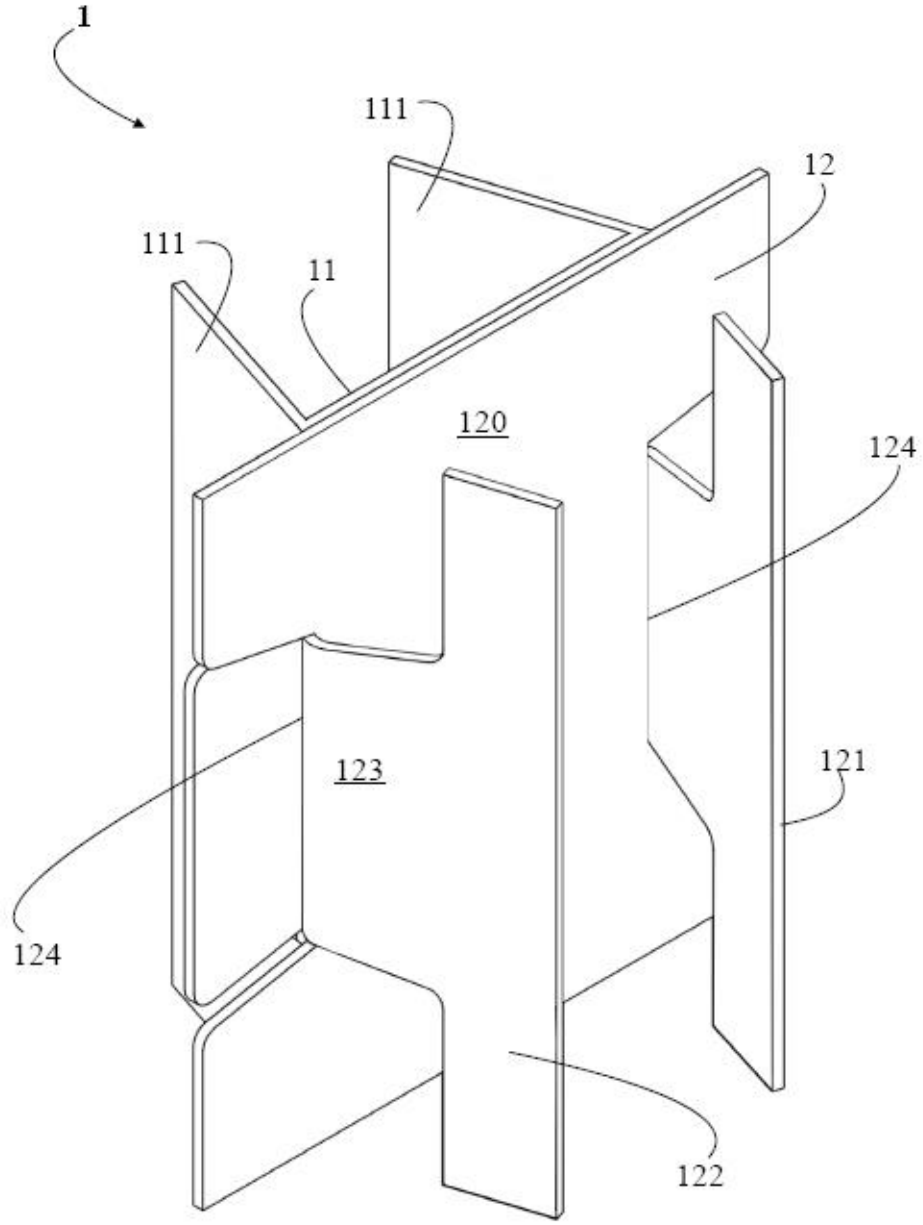

FIG. 2

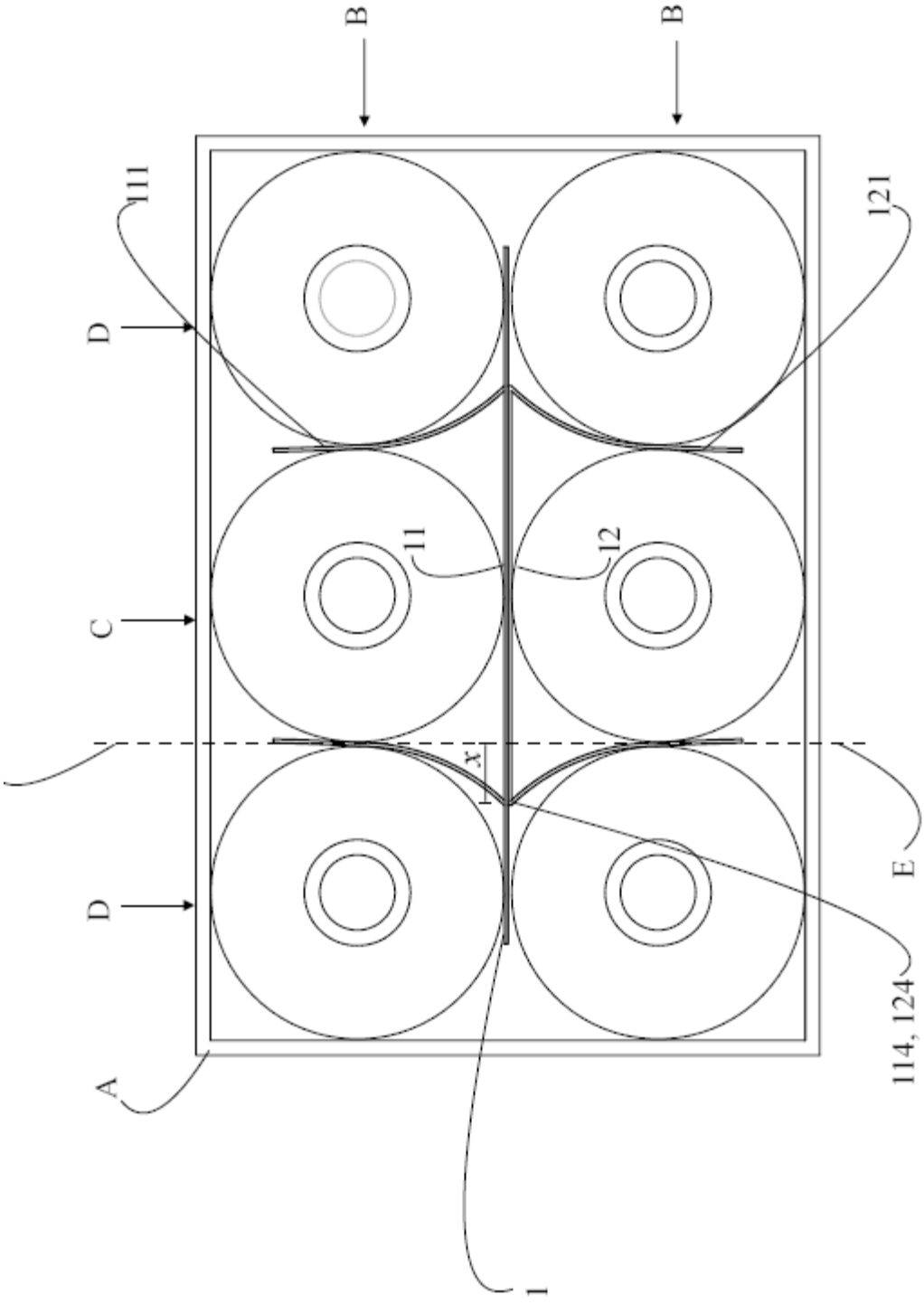

FIG. 3

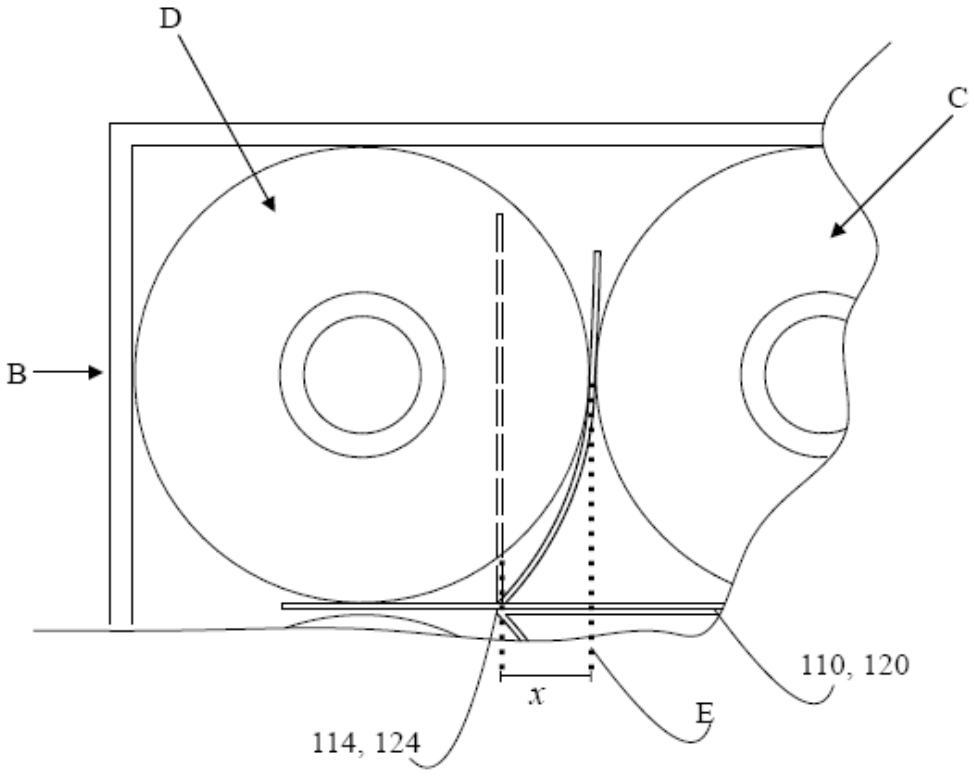

FIG. 4

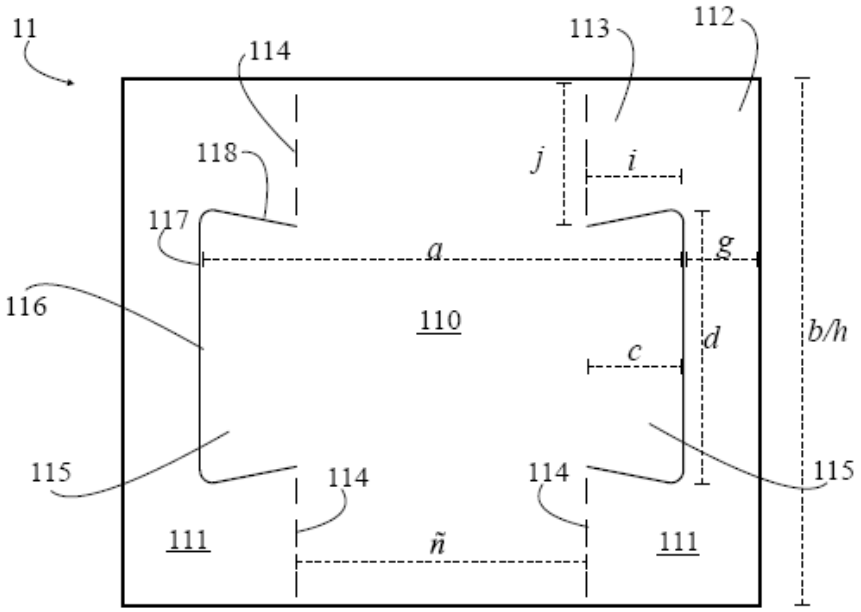
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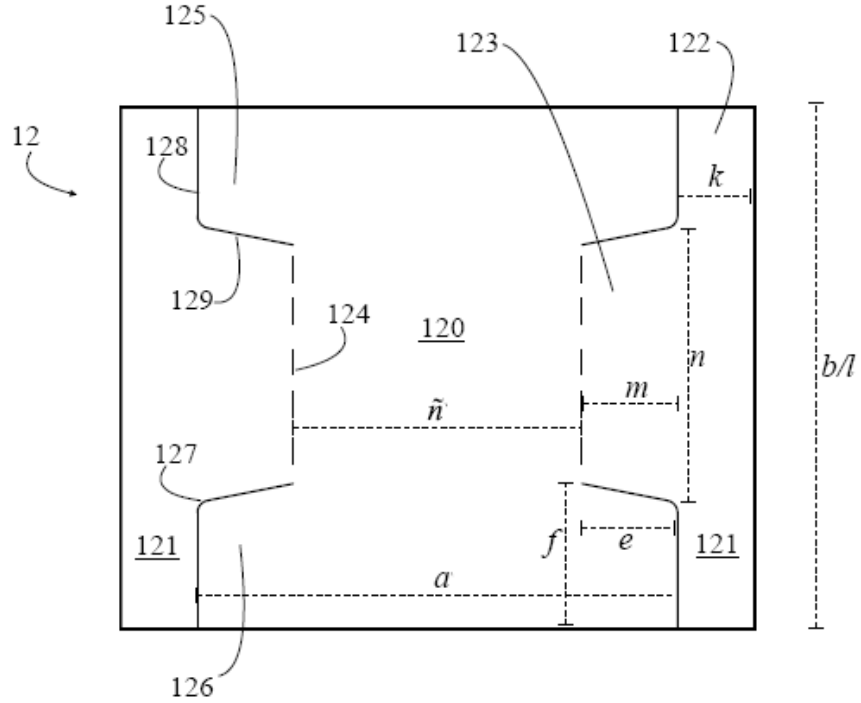
FIG. 5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121
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126

FIG. 6

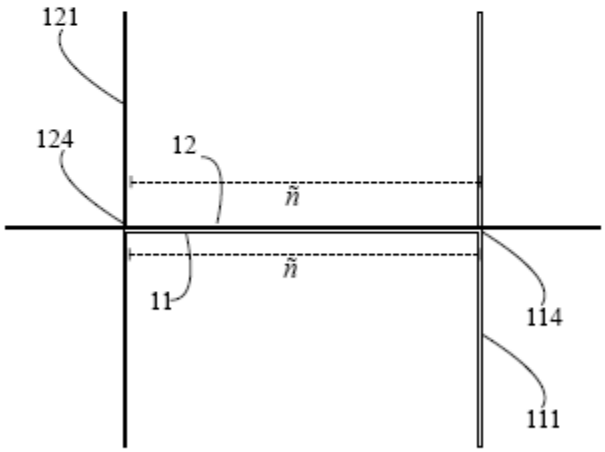


FIG. 7

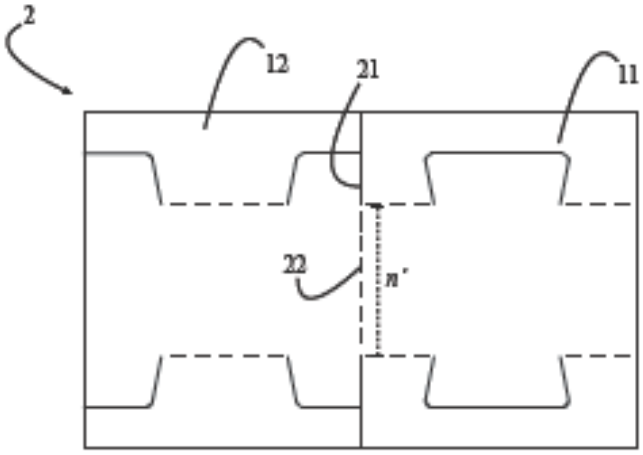


FIG. 8

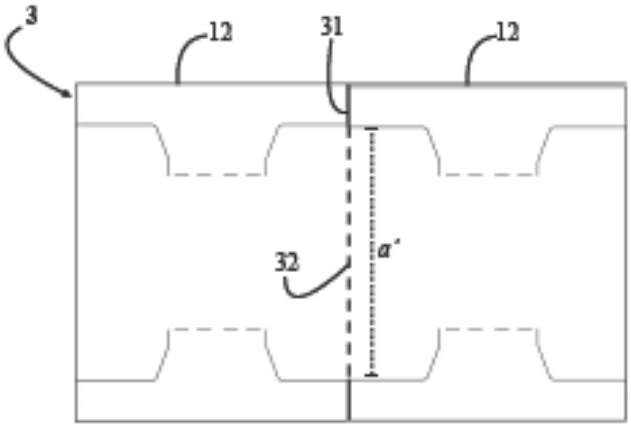


FIG. 9

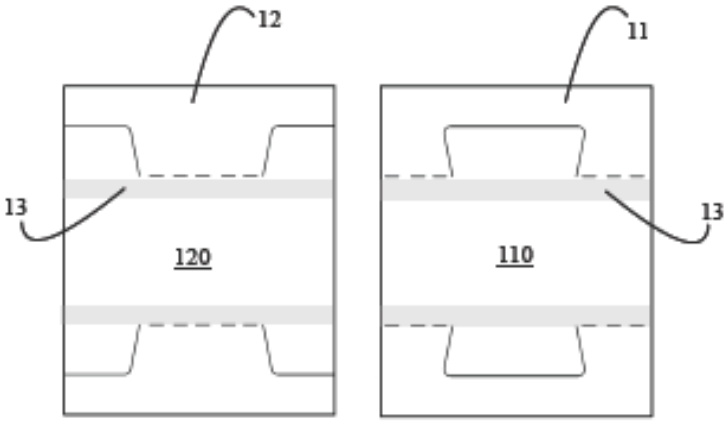


FIG. 10

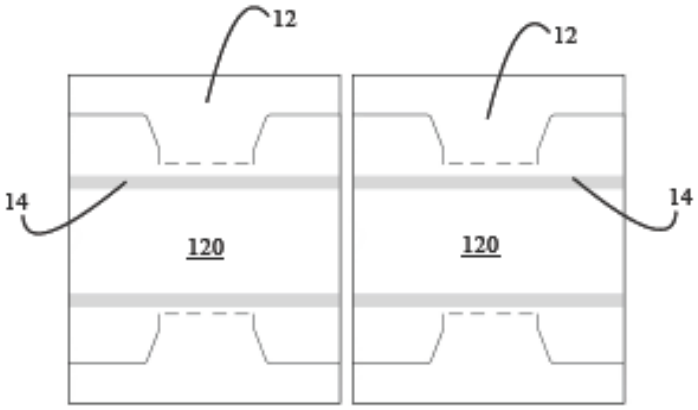


FIG. 11

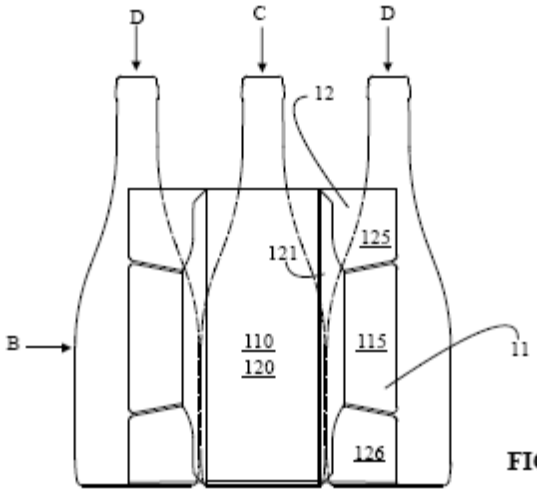


FIG. 12

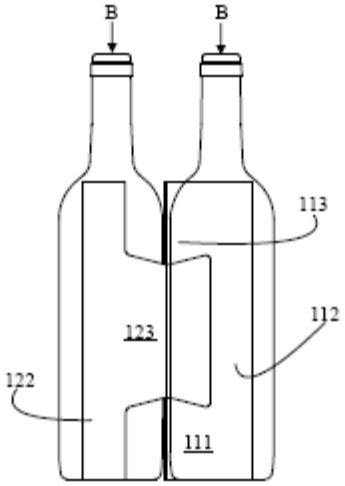


FIG. 13

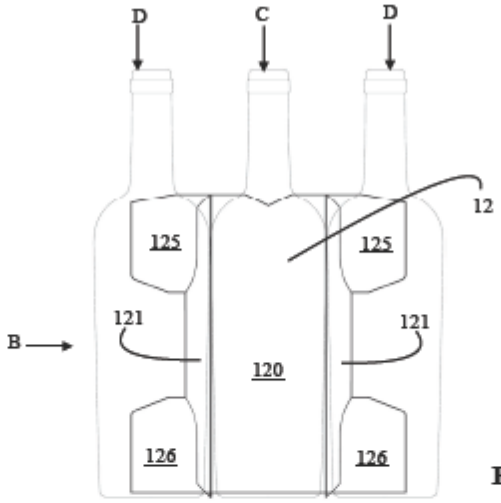


FIG. 14

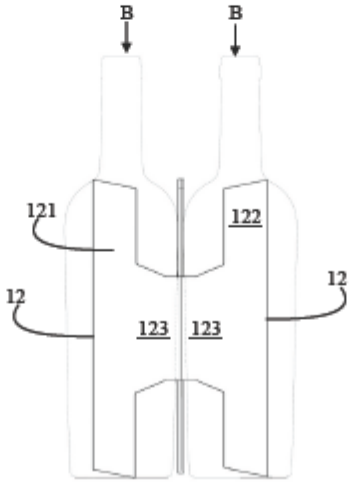
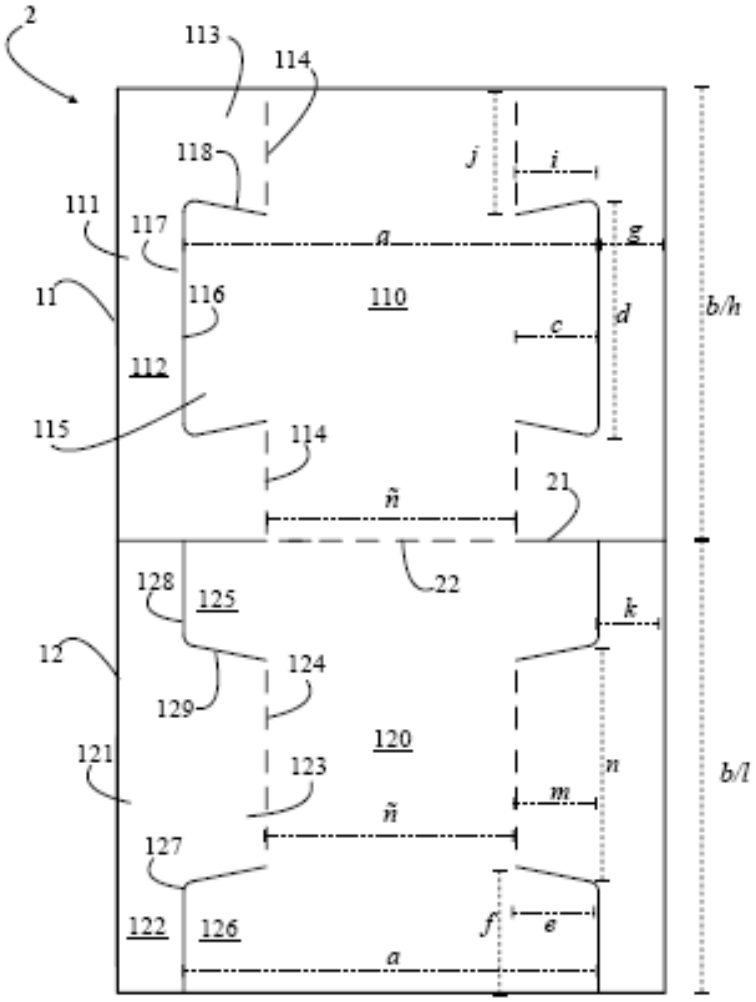


FIG. 15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126
a

FIG. 16

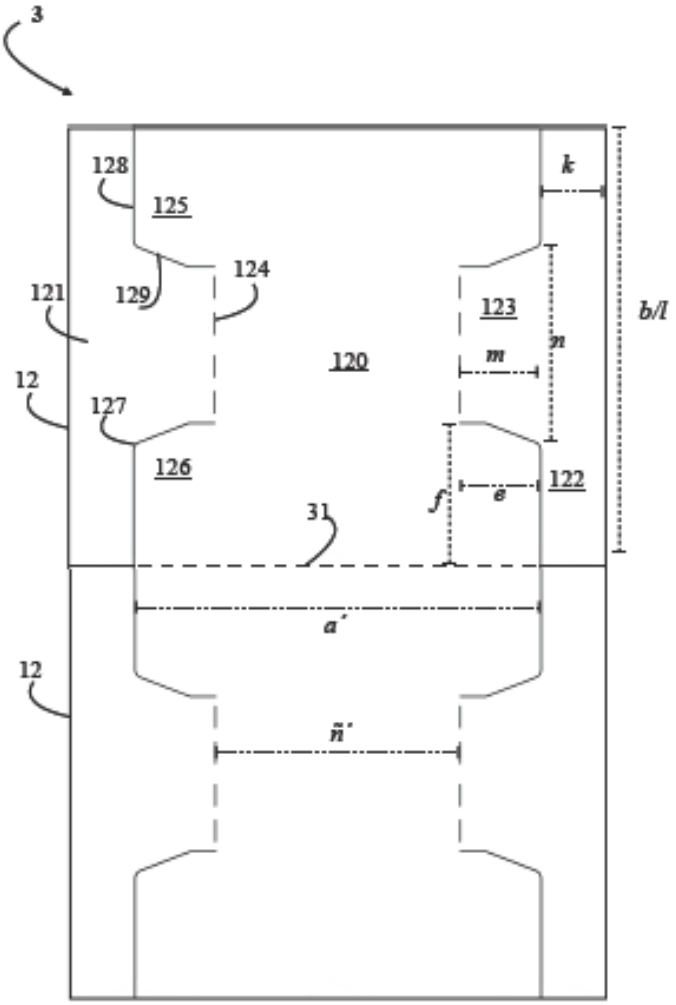
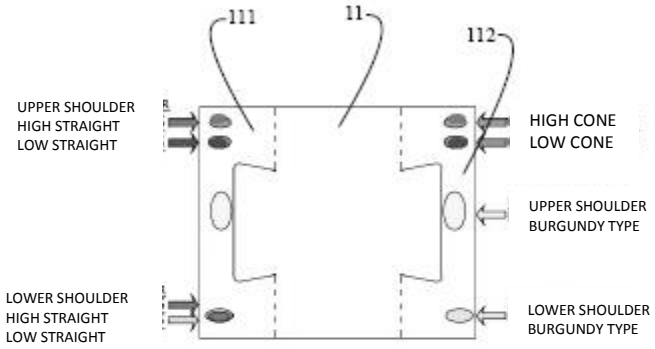


FIG. 17


111
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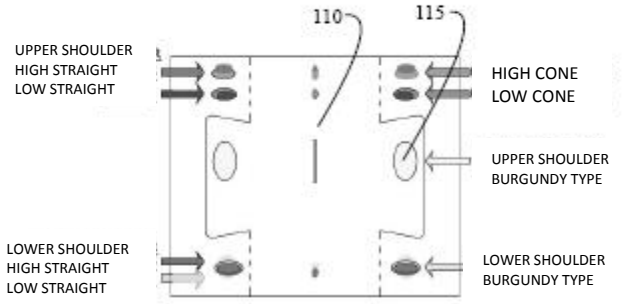
112
UPPER SHOULDER
HIGH STRAIGHT
LOW STRAIGHT
HIGH CONE
LOW CONE
UPPER SHOULDER
BURGUNDY TYPE
LOWER SHOULDER
HIGH STRAIGHT
LOW STRAIGHT
LOWER SHOULDER
BURGUNDY TYPE

FIG. 18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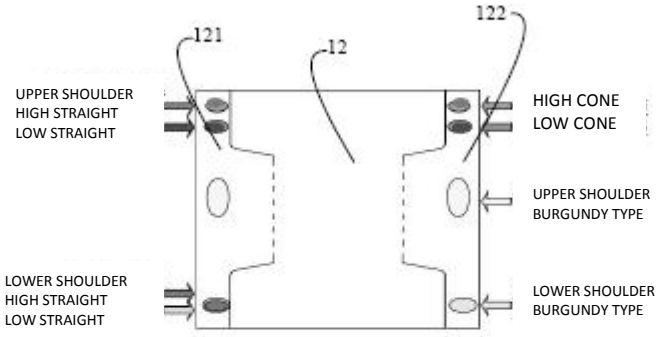
LOW CONE
UPPER SHOULDER
BURGUNDY TYPE
LOWER SHOULDER
HIGH STRAIGHT
LOW STRAIGHT
LOWER SHOULDER
BURGUNDY TYPE

FIG. 19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LOW STRAIGHT
HIGH CONE
LOW CONE
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BURGUNDY TYPE
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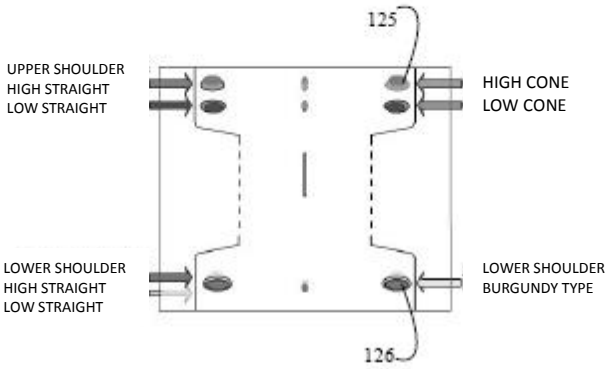
HIGH STRAIGHT
LOW STRAIGHT
LOWER SHOULDER
BURGUNDY TYPE

FIG. 20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LOW STRAIGHT
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LOW CONE
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HIGH STRAIGHT
LOW STRAIGHT
LOWER SHOULDER
BURGUNDY TYPE
126

FIG. 21