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(71) Applicant: **Cartobol, S.A.**
08174 Sant Cugat del Valles (Barcelona) (ES)

(72) Inventors:
- **TEIXIDOR CASANOVAS, Pedro**
E-08005 Barcelona (ES)
- **SERRAS VILA, Pedro**
E-08029 Barcelona (ES)

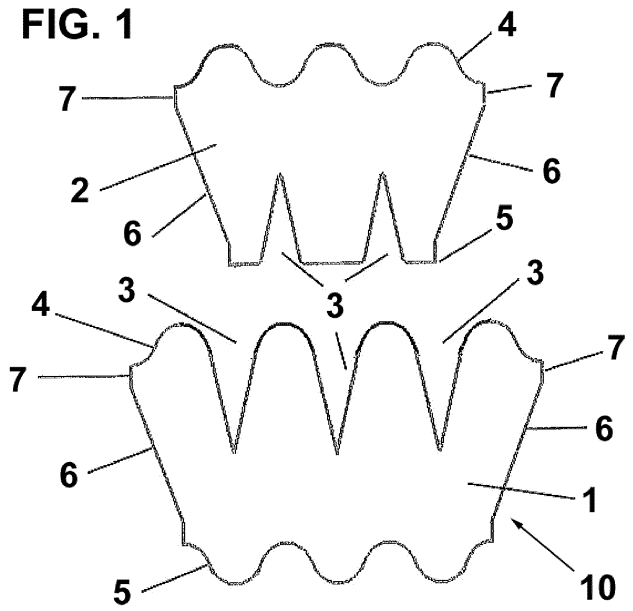
(74) Representative: **Carpintero Lopez, Francisco et al**
Herrero & Asociados, S.L.
Alcalá 35
28014 Madrid (ES)

(54) SEPARATOR FOR BOTTLE CARRIERS, METHOD AND MACHINE FOR POSITIONING SAID SEPARATOR IN A CARRIER

(57) The present invention relates to bottle separator comprising at least first sheet (1) and at least a second sheet (2) which are provided with complementary grooves (3) engageable to each other defining a plurality of housings for the bottles, said first sheet (1) and second sheet (2) defining, according to their use position inside the carrier, an upper edge (4), a lower edge (5) and sides (6), and is characterized in that each side (6) of the first sheet (1) and second sheet (2) comprises a side projection (7) perpendicular to said upper edge (4). The invention also relates to a method and a machine for placing said separator in a bottle carrier.

The invention can be used to place separators more easily inside bottle carriers.

FIG. 1



EP 2 789 544 A1

Description

[0001] The present invention relates to a separator for bottle carriers defining a plurality of housings for the bottles, preventing the bottles from touching one another during transport and storage in the carrier.

[0002] The present invention also relates to a method and to a machine for placing the bottle separator in a carrier.

Background of the Invention

[0003] Glass bottles for wine and other alcoholic beverages, for example, are usually transported in carriers placed side by side.

[0004] These bottles include an identification label that must be kept intact until the time of use. To prevent the label from deterioration and possible tears, the bottles must not be in contact with one another during transport, because friction between two bottles may otherwise damage the label.

[0005] To solve this drawback, different types of separators that are placed inside bottle carriers are known.

[0006] The separators known today are usually formed by several sheets that are coupled or adhered to each other and cover the entire carrier, some sheets being transverse sheets and others being longitudinal sheets, and they together define housings for the bottles.

[0007] The main drawback is that these separators are very complex when they are to be placed in the fastest and simplest way possible inside the carrier in an automated process, such that complex and expensive machines are necessary to be able to place such separators.

[0008] Furthermore, they take up tremendous space during transport and storage with respect to what they should considering their weight due to empty spaces.

[0009] Patent US 3,966,111 describes a separator for bottle carriers formed by two types of sheets coupled to each other by means of complementary grooves. This separator has the drawback that it must be assembled before being introduced into a carrier, such that the placement cost increases considerably.

[0010] Therefore there is an obvious need for a separator for bottle carriers that is comfortable and easy to place and at the same time has the lowest cost possible, for example, by taking full advantage of the material available in a cardboard panel for die cutting.

[0011] An additional objective of the present invention is to provide the simplest and least expensive method and machine possible that allow placing a separator of the type formed by two sheets engageable to each other in a bottle carrier or in a group of bottles before they are introduced in a carrier.

Description of the Invention

[0012] The method and machine of the invention successfully solve the mentioned drawbacks with the separator, having other advantages that will be described below.

[0013] The separator for bottle carriers of the present invention comprises at least a first sheet and at least a second sheet which are provided with complementary grooves engageable to each other defining a plurality of housings for the bottles, said first sheet and second sheet defining, according to their use position inside the carrier, an upper edge, a lower edge and sides, characterized in that each side of the first sheet and second sheet comprises a side projection perpendicular to said upper edge.

[0014] Therefore, the distance between the straight sections of a sheet substantially correspond to the width or length of the carrier where the separator is placed, which allows simple placement of the separators inside the carrier.

[0015] Advantageously, said sides are inclined with respect to said upper edge and lower edge, such that the upper edge of the sheets is longer than the lower edge of said sheets.

[0016] As a result of this feature, it is even simpler to place the sheets forming the separator of the present invention since the length of the lower edge is less than the inner space available in the carrier, but as a result of the inclination, in the area where the labels of the bottles are located, the length thereof is enough to achieve its gap function.

[0017] Furthermore, the invention allows placing the separator with machines having a simplified design.

[0018] Advantageously, said inclination is identical for each of the sides of said first sheet/sheets and said inclination is identical for each of the sides of said second sheet/sheets. Furthermore, said inclinations of the first sheet/sheets and second sheet/sheets are preferably identical to each other.

[0019] Therefore, a series of separators can be formed from a single die cut panel, such that the manufacturing cost of the separator of the present invention is very low.

[0020] Advantageously, said grooves have a V shape, such that coupling the sheets to each other is simpler.

[0021] If desired, the lower edge and/or upper edge of said sheets has a corrugated profile for saving material.

[0022] According to one embodiment for a 12-bottle carrier, a separator is formed by two first sheets and three second sheets, each first sheet comprising three V-shaped grooves and each second sheet comprising two V-shaped grooves for coupling to each other.

[0023] According to one embodiment for a 6-bottle carrier, a separator is formed by one first sheet and two second sheets, the first sheet comprising two V-shaped grooves and each second sheet comprising one V-shaped groove for coupling to each other.

[0024] The inclination of the sides of the sheets is preferably comprised between 30° and 60°, although it may have any suitable value.

[0025] Advantageously, said first and second sheets are previously die cut in a single panel including the exact number of sheets for forming a number n of separators,

which allows saving considerable storage space and reduces transportation costs.

[0026] According to an alternative embodiment, said grooves have a substantially rectangular shape, and said corrugated profile comprises substantially rectangular corrugations, the convex parts of which are complementary to the concave parts.

[0027] According to a second aspect, the present invention also relates to a method for placing a separator as described above in a bottle carrier, characterized in that it comprises the steps of:

- providing a carrier with a plurality of bottles therein;
- placing at least a first sheet provided with V-shaped grooves between some of said bottles, such that said V-shaped grooves of the first sheet/sheets are arranged with their most open part facing up; and
- placing at least a second sheet provided with V-shaped grooves perpendicular to said first sheet/sheets, such that said V-shaped grooves are arranged with their most open part facing down, coupling with the V-shaped grooves of said first sheet/sheets.

[0028] Therefore, placing the separator inside the carrier is very fast and simple since it does not require a prior step of assembling the separator.

[0029] Advantageously, said steps are performed with the carrier in motion, and said placing of the sheets is performed by letting them fall into the carrier.

[0030] The machine for placing bottle separators where the bottles are placed on a conveyor belt comprises means for placing said separators between said bottles and is characterized in that said means for placing the separators comprise:

- guides on which a plurality of separators are placed;
- a stop element retaining said plurality of separators; and
- a drive element driving a separator towards the gap between said end of the guides and the drive element itself, causing said separator to fall through said gap.

[0031] Advantageously, the machine of the present invention also comprises a pushing element pushing said plurality of separators towards one of the ends of said guides.

[0032] Advantageously, said stop element presses against said separators in the upper part of the separator closest to said end of the guides.

[0033] Furthermore, said stop element is advantageously horizontally movable, such that it regulates the contact surface between the separator closest to said end of the guides and the drive element.

[0034] According to a preferred embodiment, said stop element is a cylinder, although it may have any other suitable shape.

[0035] Said guides are preferably inclined towards said drive element and one or several of said guides are movable with respect to said drive element to allow only one separator to pass.

[0036] Advantageously, said pushing element is movable with respect to said guides, such that the number of separators that are placed on the guides can be varied, and furthermore, the pushing element will gradually move due to gravity as the separators are being placed.

[0037] Advantageously, said drive element is a rotating element actuated by means of a motor, preferably by means of a stepper motor or a servomotor.

[0038] According to a preferred embodiment, said drive element is a band placed between two rollers, providing a coefficient of friction that is sufficient for driving only one separator.

[0039] The machine for placing bottle separators of the present invention also preferably comprises a detector associated with said motor which detects the passage of said bottles placed on said conveyor belt, such that said detector allows regulating the motor and determining when a separator must be placed in order to place it in the suitable position.

[0040] If desired, the machine for placing bottle separators of the present invention can also comprise an intermediate receiver for housing a plurality of separators before they are placed between the bottles.

[0041] Said intermediate receiver preferably comprises a plurality of housings for housing said separators, each housing comprising a stop movable between a retention position for retaining the separators and a release position for releasing the separators, in which the separators are simultaneously placed between the bottles.

[0042] According to one embodiment, the machine of the present invention can also comprise an accelerator placed at the outlet of the drive element.

[0043] Said accelerator is preferably formed by two rollers between which said separators pass.

[0044] With the machine of the present invention, separators can be placed in a simple manner by simply inserting the separators between the bottles.

Brief Description of the Drawings

[0045] Drawings schematically depicting a practical embodiment only by way of non-limiting example are attached to help better understand the preceding description.

Figure 1 is a plan view of a first sheet and second sheet forming a separator of the present invention according to a first embodiment for a 12-bottle carrier;

Figure 2 is a plan view of a first sheet and second sheet forming a separator of the present invention according to a second embodiment for a 6-bottle carrier;

Figure 3 is a plan view of a panel formed by a set of sheets forming several separators of the present in-

vention according to the embodiment for a 12-bottle carrier; and

Figure 4 is a plan view of a panel formed by a set of sheets forming several separators of the present invention according to the embodiment for a 6-bottle carrier;

Figure 5 is a schematic side view of a machine of the present invention according to a first embodiment;

Figure 6 is a schematic side view of a machine of the present invention according to a second embodiment;

Figure 7 is a perspective view of the means of placing the separators;

Figure 8 is a schematic front view of two separators placed on the guides;

Figure 9 is a schematic plan view of the intermediate receiver for the prior reception of three separators placed simultaneously on a conveyor belt;

Figure 10 is a schematic front view of said intermediate receiver;

Figure 11 is a plan view of a first sheet and second sheet forming a separator of the present invention according to an additional embodiment; and

Figure 12 is a plan view of a panel formed by a set of sheets forming several separators of the present invention according to an additional embodiment.

Description of the Preferred Embodiments

[0046] Two preferred embodiments of separators, one for 12-bottle carriers (Figure 1) and another for 6-bottle carriers (Figure 2), are described below.

[0047] The separator of the present invention (generally identified by means of reference number 10) is formed by first sheets 1 and second sheets 2 coupled to each other by means of complementary grooves 3.

[0048] The first sheets 1 are longer than the second sheets 2, said first sheets 1 being arranged longitudinally inside the carrier and said second sheets 2 being arranged transversely inside the carrier.

[0049] In its position inside the carrier, each sheet 1, 2 defines an upper edge 4, a lower edge 5 and sides 6.

[0050] Said sides 6 are inclined with respect to the upper edge 4 and lower edge 5, i.e., they form an angle other than 90° with said edges. Said angle is preferably comprised between 30° and 60°. The upper edge 4 is therefore longer than the lower edge 5.

[0051] Therefore, placing the sheets 1, 2 between the bottles is simpler, since the lower edge 5 does not in any way hinder their placement.

[0052] Each side of the first sheet 1 and second sheet 2 comprises a substantially straight section or side projection 7 perpendicular to said upper edge, such that the distance between the straight sections or side projections 7 of a sheet substantially corresponds to the width or length of the carrier where the separator 10 is placed.

[0053] Furthermore, to facilitate coupling the sheets 1, 2 to each other, the grooves 3 have a V shape, such that coupling is easier as a result of the greater width in the their outer part. If desired, a cut (not depicted in the drawings) can be provided in the first sheets 1, in the vertex of the V-shaped grooves 3. This cut allows better coupling between sheets 1, 2.

[0054] To obtain sheets 1, 2 having greater height with minimum material use, said upper edge 4 and lower edge 5 have a corrugated profile. If desired, the height of one of said sheets 1, 2 can be substantially identical to the height of the carrier in which they are placed.

[0055] Furthermore, it must be indicated that the lower edge 5 can comprise recesses, as depicted in Figure 8. These recesses allow the sheets 1, 2 to adapt perfectly to the guides 40 of the machine for placing the separators 10, which will be described below.

[0056] As a result of the inclined sides and the corrugated profile of their edges, it is possible to obtain the suitable height and width dimensions with minimum material and at the same time obtain several separators of the present invention from a single panel, as seen in the drawings.

[0057] To obtain the sheets 1, 2 of the separator 10, it will only be necessary to die cut the shape of said sheets which will allow using almost the entire panel as it is complementary to the adjacent sheets. The only part of the panel that is not used is the part corresponding to the grooves 3.

[0058] Particularly, providing panels such as those depicted in Figures 3 and 4 is envisaged such that the sheets 1, 2 are previously die cut and separated from one another before being placed in the carrier. Furthermore, each panel will have an exact number of sheets for a number n of carriers.

[0059] The advantage of this arrangement using panels of the separator 10 of the present invention is that it saves considerable storage space and reduces transportation costs.

[0060] In the embodiment for a 12-bottle carrier, the separator 10 of the present invention is formed by two first longitudinal sheets 1 and by three second transverse sheets 2, such that the number of grooves of the first sheets 1 is three (corresponding to the number of second sheets 2) and the number of grooves of the second sheets 2 is two (corresponding to the number of first sheets 1).

[0061] In turn, in the embodiment for a 6-bottle carrier, the separator of the present invention is formed by one first longitudinal sheet 1 and two second transverse sheets 2, such that the number of grooves of the first sheet 1 is two (corresponding to the number of second sheets 2) and the number of grooves of the second sheets 2 is one (corresponding to the number of first sheets 1).

[0062] Although the sheets 1, 2 forming the separator 10 of the present invention can be made of any suitable material, they will preferably be made of compact, low-cost cardboard that has the additional advantage of being

recyclable and being made of recycled material.

[0063] According to a second aspect, the present invention also relates to a method for placing a separator 10 in a bottle carrier. Said method comprises the steps of:

- providing a carrier with a plurality of bottles 20 therein;
- placing at least a first sheet 1 provided with V-shaped grooves between said bottles 20, such that said V-shaped grooves of the first sheet/sheets are arranged with their most open part facing up; and
- placing at least a second sheet 2 provided with V-shaped grooves perpendicular to said first sheet/sheets 1, such that said V-shaped grooves are arranged with their most open part facing down, coupling with the V-shaped grooves of said first sheet/sheets 1.

[0064] Furthermore, said steps of the method of the present invention can be performed with the carrier in motion. Particularly, said placing of the sheets 1, 2 is performed by letting them fall into the carrier.

[0065] The machine of the present invention used for placing separators between a plurality of bottles 20 placed on a conveyor belt 11 is described below. Said bottles 20 can already be placed in a carrier or can simply be a group of bottles 20 which will be placed in a corresponding carrier for transport after placing the separators.

[0066] The separators 10 are placed in groups on a plurality of guides 40. The number of guides 40 depends on the configuration of the separators 10.

[0067] To facilitate moving the separators 10 along these guides 40, the latter are inclined forward (according to the forward movement direction of the conveyor belt 11). Furthermore, said guides have a curved section in their upper part which adapts to a curved portion of the separators, as can be seen in Figure 4. This curved configuration allows there to be more contact surface between the guides 40 and the separators 10.

[0068] The machine of the present invention comprises:

- a pushing element 50 pushing said plurality of separators 10 towards one of the ends of said guides 40;
- a stop element 60 retaining said plurality of separators 10 in the direction opposite the direction in which said pushing element 50 pushes the separators 10; and
- a drive element 70 driving a separator 10 towards the gap between said end of the guides 40 and the drive element itself 70, causing said separator 10 to fall through said gap.

[0069] Therefore, said plurality of separators 10 is placed between said pushing element 50 and said stop element 60.

[0070] The stop element 60 is in contact with the upper part of the separator 10 which is in contact with the drive element 70, such that the contact surface between the separator 10 and the drive element 70 can be regulated through said vertically and horizontally movable stop element 60. This regulation is important so that the separators 3 are placed individually between the bottles 2, i.e., the drive element only drives one separator 10.

[0071] To achieve this individual placement of the separators 10, the gap between the front end (according to the forward movement direction of the conveyor belt 11) of one or several of the guides 40 and the drive element 70 can also be regulated so that it allows only one separator 10 to fall. This regulation is performed by moving said guides 40 by means of a control (not depicted).

[0072] Said stop element 60 is preferably a cylinder, although it could have any other suitable shape.

[0073] In turn, the drive element 70 is preferably a band placed between two rollers. Said band is of a suitable material to obtain sufficient coefficient of friction with a separator 10 for driving the separators 10 individually.

[0074] Furthermore, said band is actuated by means of a stepper motor or servomotor (not depicted) to allow driving a separator 10 and causing it to subsequently fall.

[0075] The machine of the present invention also comprises a detector 12 associated with said motor which detects the passage of the bottles 20, such that it will send a corresponding signal so that the separators 10 are placed in the correct position between the bottles 20.

[0076] Said drive element 70 does not necessarily have to be a band, rather it could also be a roller, for example.

[0077] The machine of the present invention works as follows:

The separators 10 must first be placed on the guides 40, and the bottles 20 are then placed on the conveyor belt 11.

[0078] Once the conveyor belt 11 starts to move, the detector 12 will detect the passage of a group of bottles 20 or a carrier in which the bottles 20 are placed. The detector 12 will send the signal about such passage to the motor, such that the motor will act sequentially when the bottles 20 are located in the suitable position for placing a separator 10.

[0079] When the bottles 20 reach the suitable position, the drive element 70 will be rotated by means of the motor, driving a single separator 10 and causing it to fall through the gap between the drive element 70 and the front end of the guides 40. The separator 10 will fall and be placed in the suitable position between the bottles 20.

[0080] Then, when the bottles 20 are located in the next position where another separator 10 must be placed, the drive element 70 will again be actuated by means of the motor. It must be indicated that the conveyor belt 11 is in motion at all times, since the motor is what regulates the moments in which the separators 10 are placed.

[0081] When a separator 10 leaves the set of separa-

tors 10, the pushing element 50 will press against said set of separators 10 by gravity, such that the front separator will be in contact with the drive element 70 for the next placement. However, it must be indicated that said pushing element 50 is not essential since, depending on the inclination of the guides 40, it is possible to place the separators in the suitable position without said pushing element.

[0082] If desired, instead of placing the separators 10 directly in their position between the bottles 20, it is possible to use an intermediate receiver 80, which is schematically depicted in Figures 9 and 10.

[0083] According to this alternative, instead of letting the separators 10 fall between the bottles 20, they will be placed in housings defined in said intermediate receiver 80. Each housing of the intermediate receiver 80 comprises a stop 90 movable between a retention position for retaining the separators 10 and a release position for releasing the separators 10, in which the separators 10 are simultaneously placed between the bottles 20.

[0084] Said intermediate receiver 80 is transversely movable with respect to the conveyor belt 11, such that the separators 10 will be gradually placed in their housings while said intermediate receiver 80 moves on the conveyor belt (arrow A).

[0085] In this position, the separators 3 are left to fall simultaneously, and said intermediate receiver 80 will then return to its former position (arrow B). It must be indicated that this entire process of placing separators 10 by means of the intermediate receiver 80 is performed with said intermediate receiver 80 in motion.

[0086] When there is a group formed on the conveyor belt 11, the group cannot be rotated to adapt to the needs for dispensing the separators 10, this intermediate receiver 80 being necessary for this reason.

[0087] Figure 6 depicts a second embodiment of the machine of the present invention. This embodiment differs from the previously described embodiment due solely to the presence of an additional accelerator 13 placed at the outlet of said drive element 70 and before placing the separator 10 in position. Said accelerator 13 is preferably formed by two rotating rollers between which the separators 10 pass.

[0088] This embodiment allows placing the separators 10 continuously, i.e., the drive element 70 and the accelerator 13 work continuously, the use of a stepper motor or servomotor being unnecessary.

[0089] To allow correctly placing the separators 10, the rotational speed of the accelerator 13 is greater, for example, three times greater, than the rotational speed of the drive element 70,.

[0090] Figures 11 and 12 show an additional embodiment of the separator 10 of the present invention. For the sake of simplicity, the same reference numbers used in the first embodiment depicted in Figures 1 and 2 are used in this embodiment.

[0091] As seen in Figure 11, this embodiment of the separator 10 is also formed by two sheets 1, 2 engageable to each other by means of grooves 3 provided in said sheets 1. Unlike the first embodiment, said grooves 3 are substantially rectangular-shaped.

[0092] Said sheets 1, 2 also comprise side projections or substantially straight sections 7 which also allow adapting to the inner length or width of the carrier where the separators 10 are placed.

[0093] It must be indicated that the width of said grooves 3 substantially corresponds to the radius of the cylindrical part of the bottles of the carrier where the separator of the present invention is to be placed. Furthermore, the height of said sheets 1, 2 substantially corresponds to the height of the cylindrical part of the bottles of the carrier where the separator of the present invention is to be placed, such that the bottles do not touch one another.

[0094] The sheets 1, 2 according to this additional embodiment also comprise an upper edge 4 and a lower edge 5. As seen in Figure 11, the upper edge 4 of one of the sheets 1 is corrugated with its substantially rectangular corrugations, and the lower edge 5 of another sheet 2 is also similarly corrugated with substantially rectangular corrugations, such that the convex part of the corrugations coincides with the concave part of the corrugations.

[0095] To prevent the bottles in a carrier from touching one another, the distance A indicated in Figure 11, which is substantially identical to the diameter of a bottle, has also been provided. This distance A can be defined as the distance between central points of two adjacent convex parts of the corrugations forming the upper edge 4 or lower edge 5 of each of the sheets 1, 2.

[0096] As a result of this shape of the sheets 1, 2, a plurality of separators 10 is obtained from a single panel (depicted in Figure 12), using all the material of the panel without any intermediate cropping. Said grooves 3 preferably have slightly inclined sides to facilitate the gap of the sheets 1, 2 once die cut.

[0097] It must be indicated that the number of grooves 3 can vary depending on the carrier in which it is to be placed. Therefore, the sheets 1, 2 forming a separator 10 for a 12-bottle carrier are depicted in Figure 11, but these sheets may comprise only two grooves 3 and only one groove 3, respectively, for a 6-bottle carrier.

[0098] Although reference has been made to a specific embodiment of the invention, it is obvious to a person skilled in the art that the described machine is susceptible to a number of variations and modifications and that all the mentioned details can be replaced with other technically equivalent details without departing from the scope of protection defined by the attached claims.

Claims

1. Separator for bottle carriers comprising at least a first sheet (1) and at least a second sheet (2) which are provided with complementary grooves (3) en-

gageable to each other defining a plurality of housings for the bottles, said first sheet (1) and second sheet (2) defining, according to their use position inside the carrier, an upper edge (4), a lower edge (5) and sides (6), **characterized in that** each side (6) of the first sheet (1) and second sheet (2) comprises a side projection (7) perpendicular to said upper edge (4).

2. Separator for bottle carriers according to claim 1, wherein said sides (6) are inclined with respect to said upper edge (4) and lower edge (5), such that the upper edge (4) of the sheets (1, 2) is longer than the lower edge (5) of said sheets (1, 2).

3. Separator for bottle carriers according to claim 2, wherein said inclination is identical for each of the sides (6) of said first sheet/sheets (1) and/or for each of the sides (6) of said second sheet/sheets (2).

4. Separator for bottle carriers according to claim 3, wherein said inclinations of the first sheet/sheets (1) and the second sheet/sheets are identical to each other.

5. Separator for bottle carriers according to claim 1, wherein said grooves (3) have a V shape.

6. Separator for bottle carriers according to claim 1, wherein the lower edge (4) and/or the upper edge (5) of said sheets have a corrugated profile.

7. Separator for bottle carriers according to claim 1, wherein a separator is formed by two first sheets (1) and by three second sheets (2), each first sheet (1) comprising three V-shaped grooves (3) and each second sheet (2) comprising two V-shaped grooves, for coupling to each other.

8. Separator for bottle carriers according to claim 1, wherein a separator is formed by one first sheet (1) and two second sheets (2), the first sheet (1) comprising two V-shaped grooves (3) and each second sheet (2) comprising one V-shaped groove (3), for coupling to each other.

9. Separator for bottle carriers according to claim 2 or 3, wherein the inclination of the sides (6) of the sheets is comprised between 30° and 60°.

10. Separator for bottle carriers according to any of the preceding claims, wherein said first sheet (1) and second sheet (2) are previously die cut in a single panel including the exact number of sheets (1, 2) for forming a number n of separators.

11. Separator for bottle carriers according to claim 1, wherein said grooves (3) have a substantially rectangular shape.

12. Separator for bottle carriers according to claim 6, where said corrugated profile comprises substantially rectangular corrugations, the convex parts of which are complementary to the concave parts.

13. Method for placing a separator according to any of claims 1 to 12 in a bottle carrier, **characterized in that** it comprises the steps of:

- providing a carrier with a plurality of bottles therein;
- placing at least a first sheet (1) provided with V-shaped grooves (3) between some of said bottles, such that said V-shaped grooves (3) of the first sheet/sheets (1) are arranged with their most open part facing up; and
- placing at least a second sheet (2) provided with V-shaped grooves (3) perpendicular to said first sheet/sheets (1), such that said V-shaped grooves (3) are arranged with their most open part facing down, coupling with the V-shaped grooves (3) of said first sheet/sheets (1).

14. Method according to claim 13, wherein said steps are performed with the carrier in motion.

15. Method according to claim 13, wherein said placing of the sheets (1, 2) is performed by letting them fall into the carrier.

16. Machine for placing bottle separators (10) according to any one of claims 1 to 12, the bottles being placed on a conveyor belt (11), said machine comprising means for placing said separators (10) between said bottles (20), **characterized in that** said means for placing the separators (10) comprise:

- guides (40) on which a plurality of separators (10) are placed;
- a stop element (60) retaining said plurality of separators (10); and
- a drive element (70) driving a separator (10) towards the gap between said end of the guides (40) and the drive element (70) itself, causing said separator (10) to fall through said gap.

17. Machine for placing bottle separators according to claim 16, also comprising a pushing element (50) pushing said plurality of separators (10) towards one of the ends of said guides (40).

18. Machine for placing bottle separators according to claim 16, wherein said stop element (60) presses against said separators (10) in the upper part of the separator (10) closest to said end of the guides (40).

19. Machine for placing bottle separators according to claim 16 or 18, wherein said stop element (60) is horizontally movable, such that it regulates the contact surface between the separator (10) closest to said end of the guides (40) and the drive element (70).

20. Machine for placing bottle separators according to any of claims 16 to 19, wherein said stop element (60) is a cylinder.

21. Machine for placing bottle separators according to claim 16, wherein said guides (40) are inclined towards said drive element (70).

22. Machine for placing bottle separators according to claim 16 or claim 21, wherein one or several of said guides (40) are movable with respect to said drive element (70) to allow only one separator (10) to pass.

23. Machine for placing bottle separators according to claim 16, wherein said pushing element (50) is movable with respect to said guides (40).

24. Machine for placing bottle separators according to claim 16, wherein said drive element (70) is a rotating element actuated by means of a motor.

25. Machine for placing bottle separators according to claim 24, wherein said motor is a stepper motor or a servomotor.

26. Machine for placing bottle separators according to claim 16 or 24, wherein said drive element (70) is a band placed between two rollers.

27. Machine for placing bottle separators according to claim 16, also comprising a detector (12) associated with said motor which detects the passage of said bottles (20) placed on said conveyor belt (11).

28. Machine for placing bottle separators according to claim 16, also comprising an intermediate receiver (80) for housing a plurality of separators (10) before they are placed between the bottles (20).

29. Machine for placing bottle separators according to claim 28, wherein said intermediate receiver (80) comprises a plurality of housings for housing said separators (10), each housing comprising a stop (90) movable between a retention position for retaining the separators (10) and a release position for releasing the separators (10), in which the separators (10) are simultaneously placed between the bottles (20).

30. Machine for placing bottle separators according to any of claims 16 to 29, also comprising an accelerator (13) placed at the outlet of the drive element (70).

31. Machine for placing bottle separators according to claim 30, wherein said accelerator (13) is formed by two rollers between which said separators (10) pass.

FIG. 1

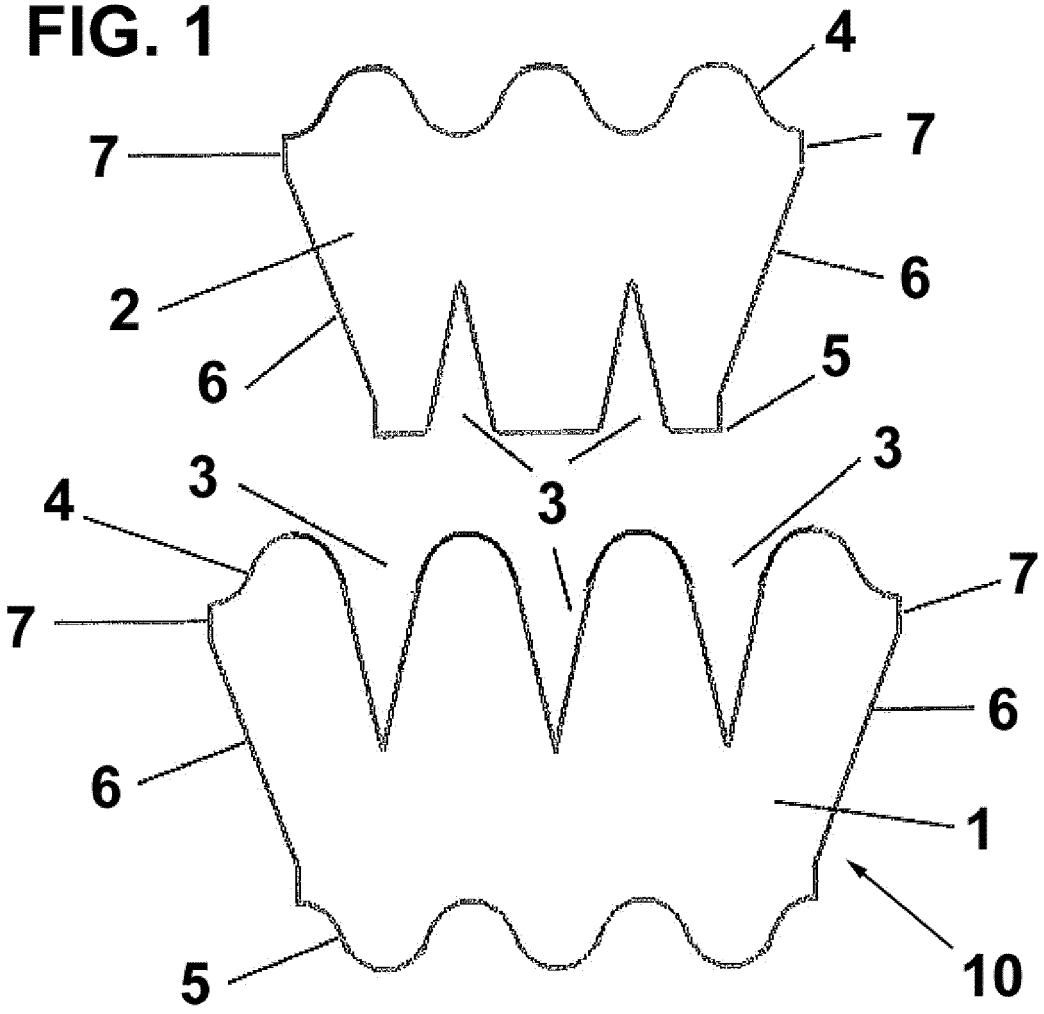


FIG. 2

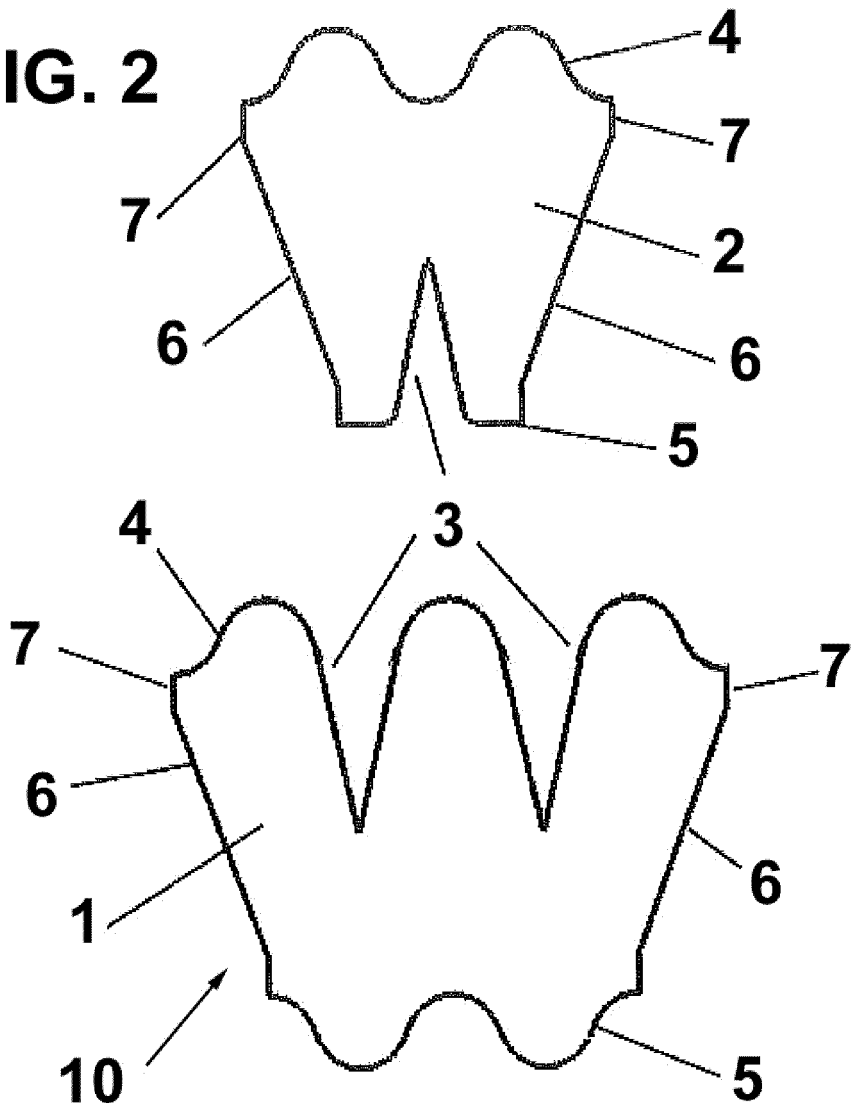


FIG. 3

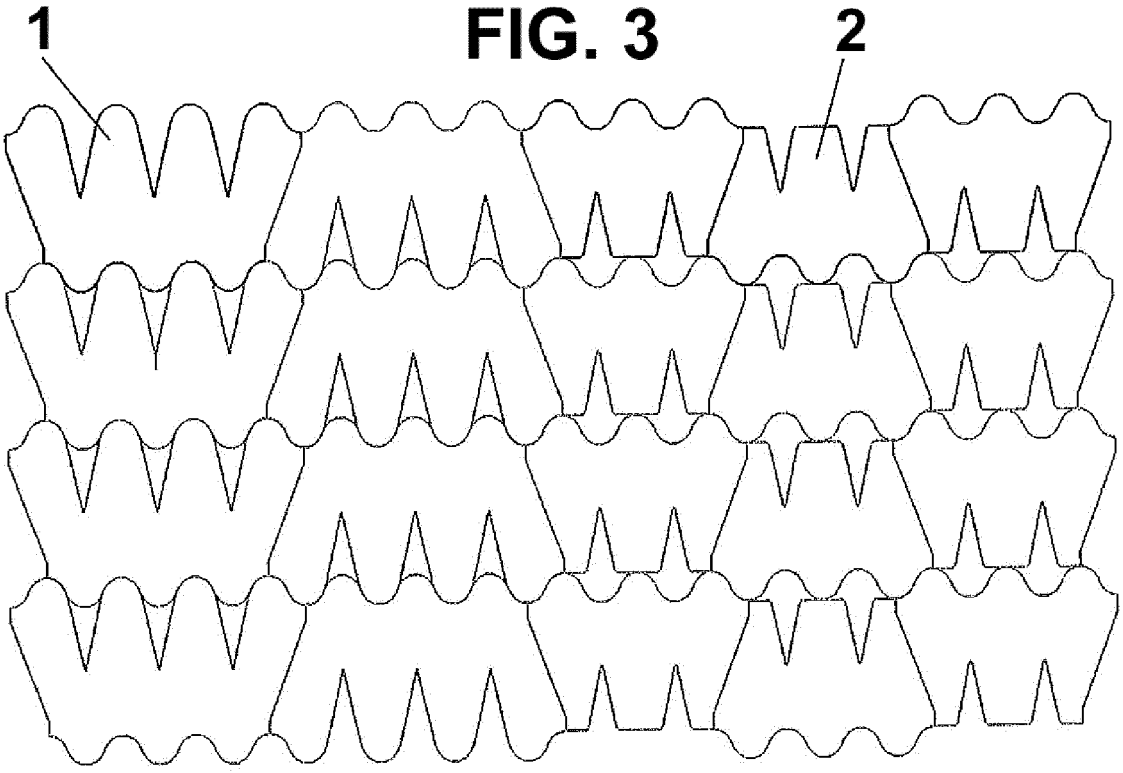


FIG. 4

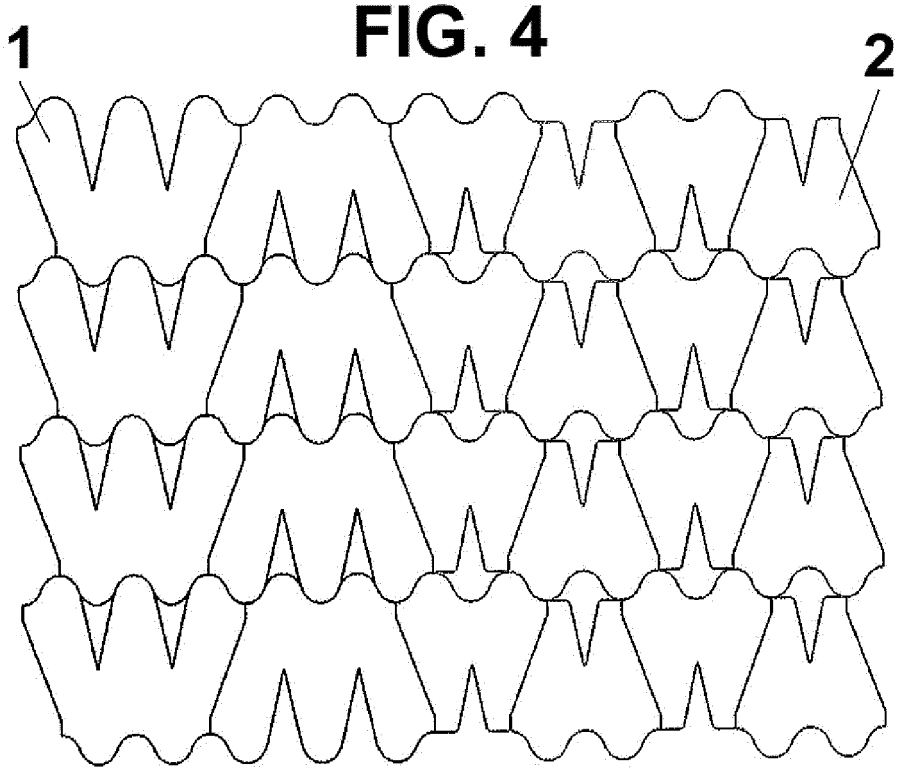
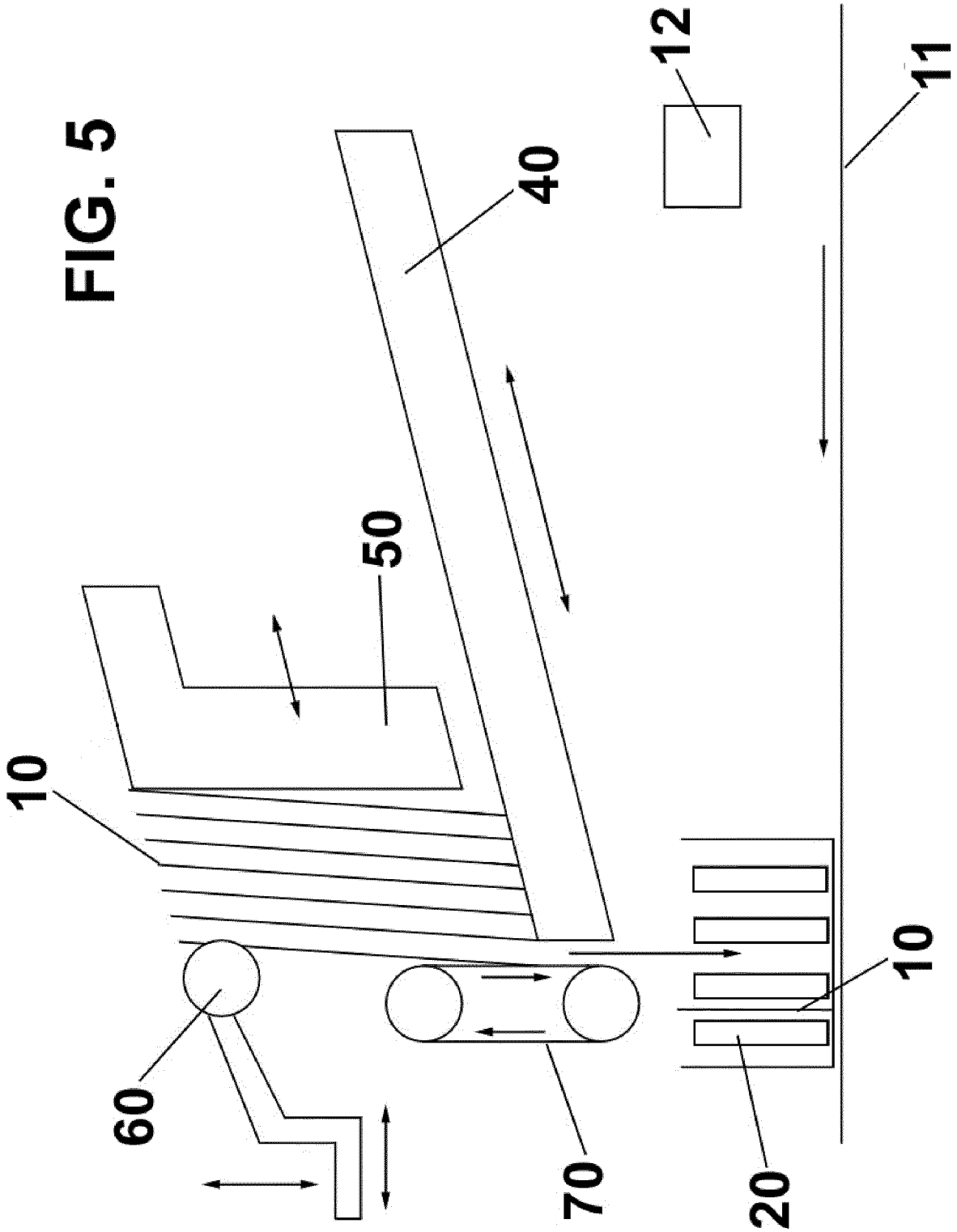


FIG. 5



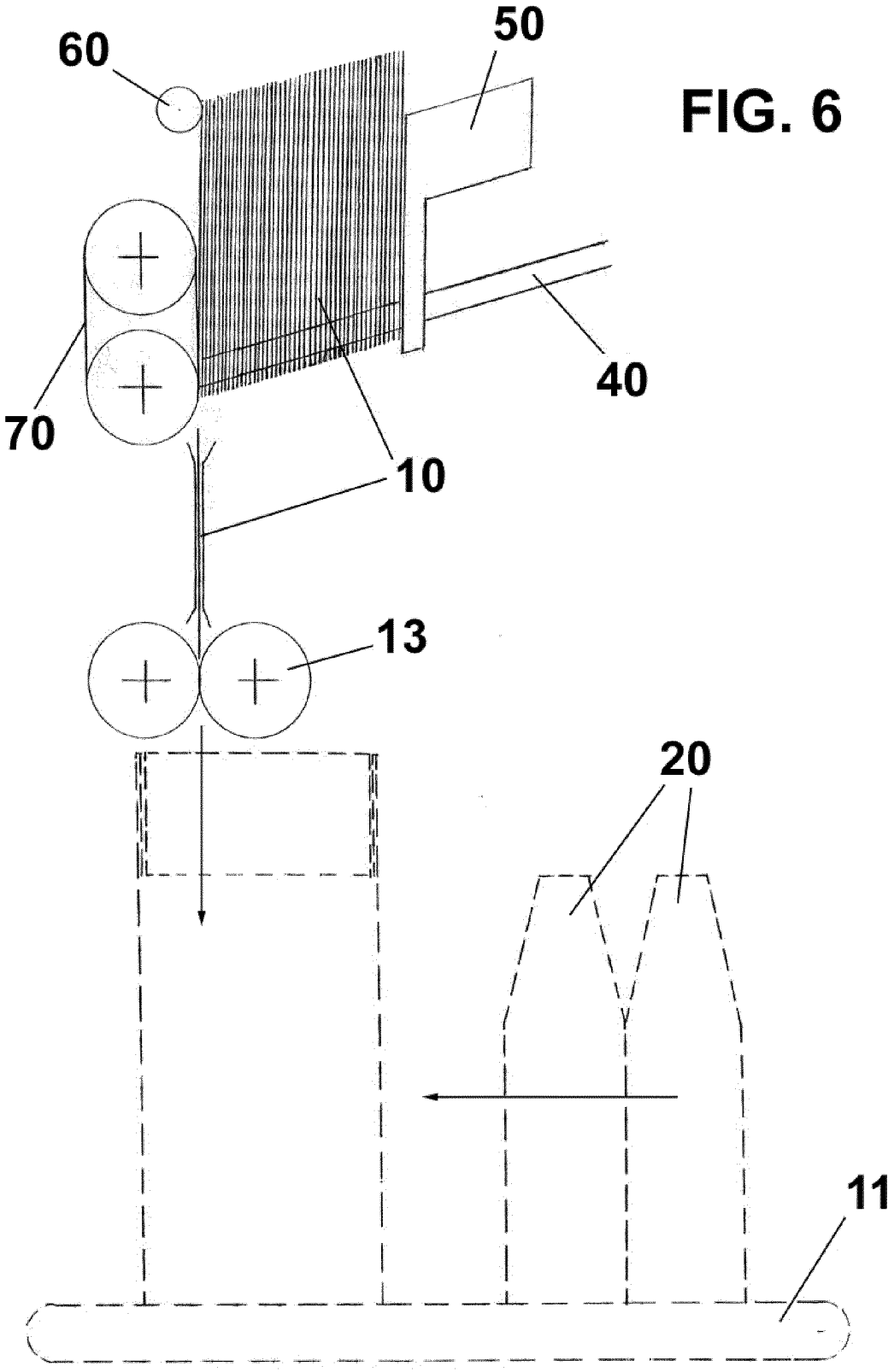


FIG. 6

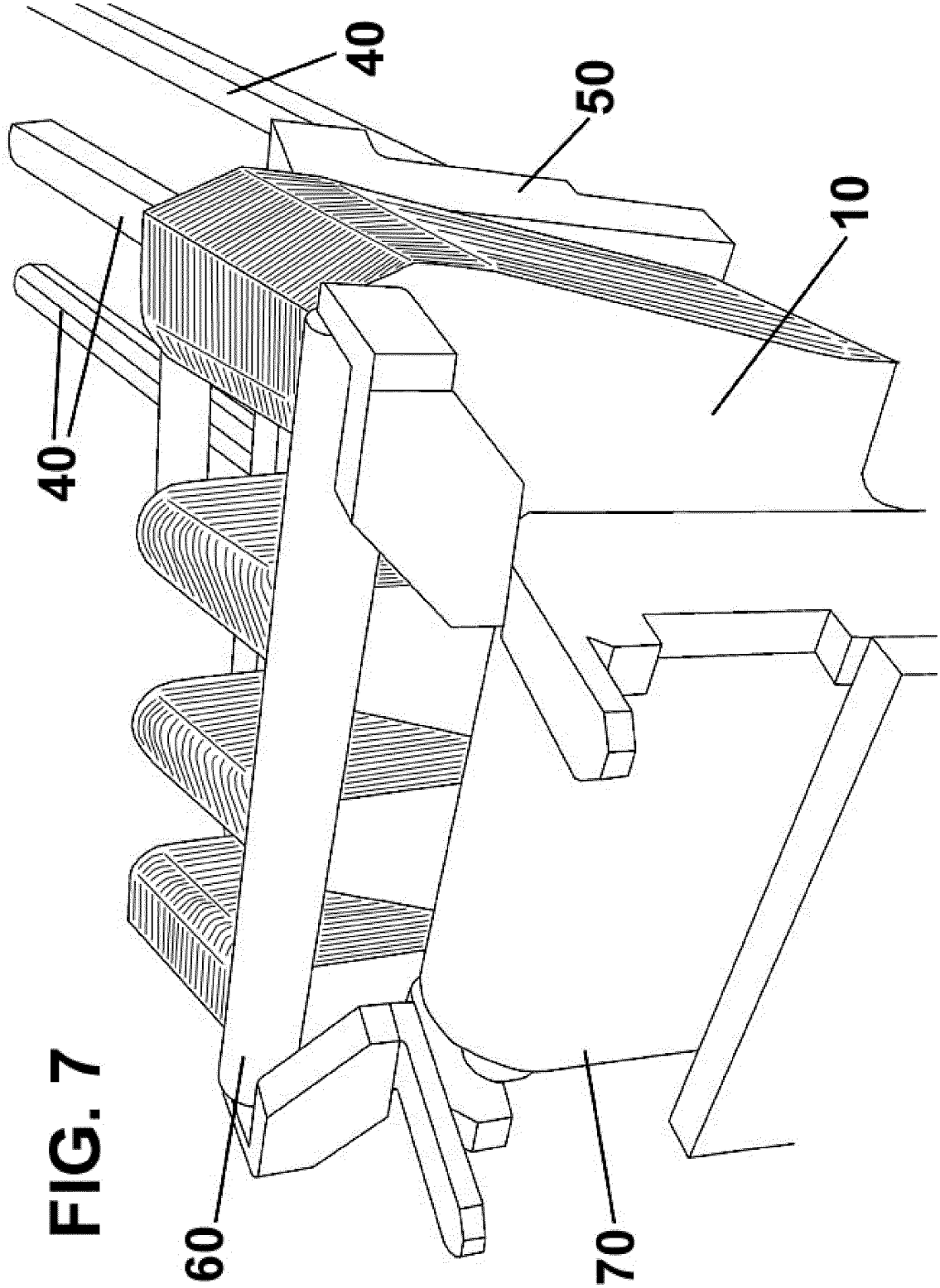
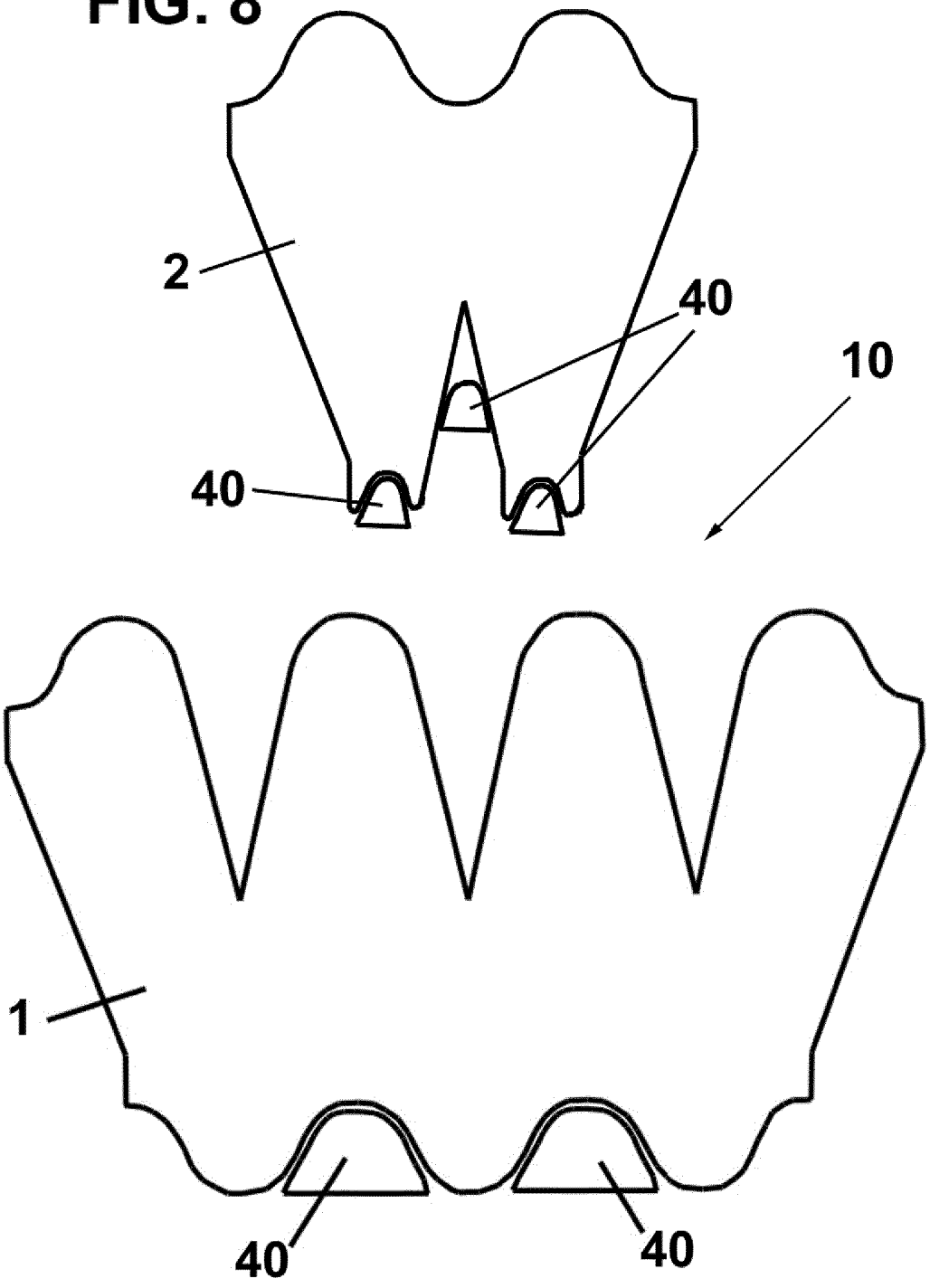


FIG. 7

FIG. 8



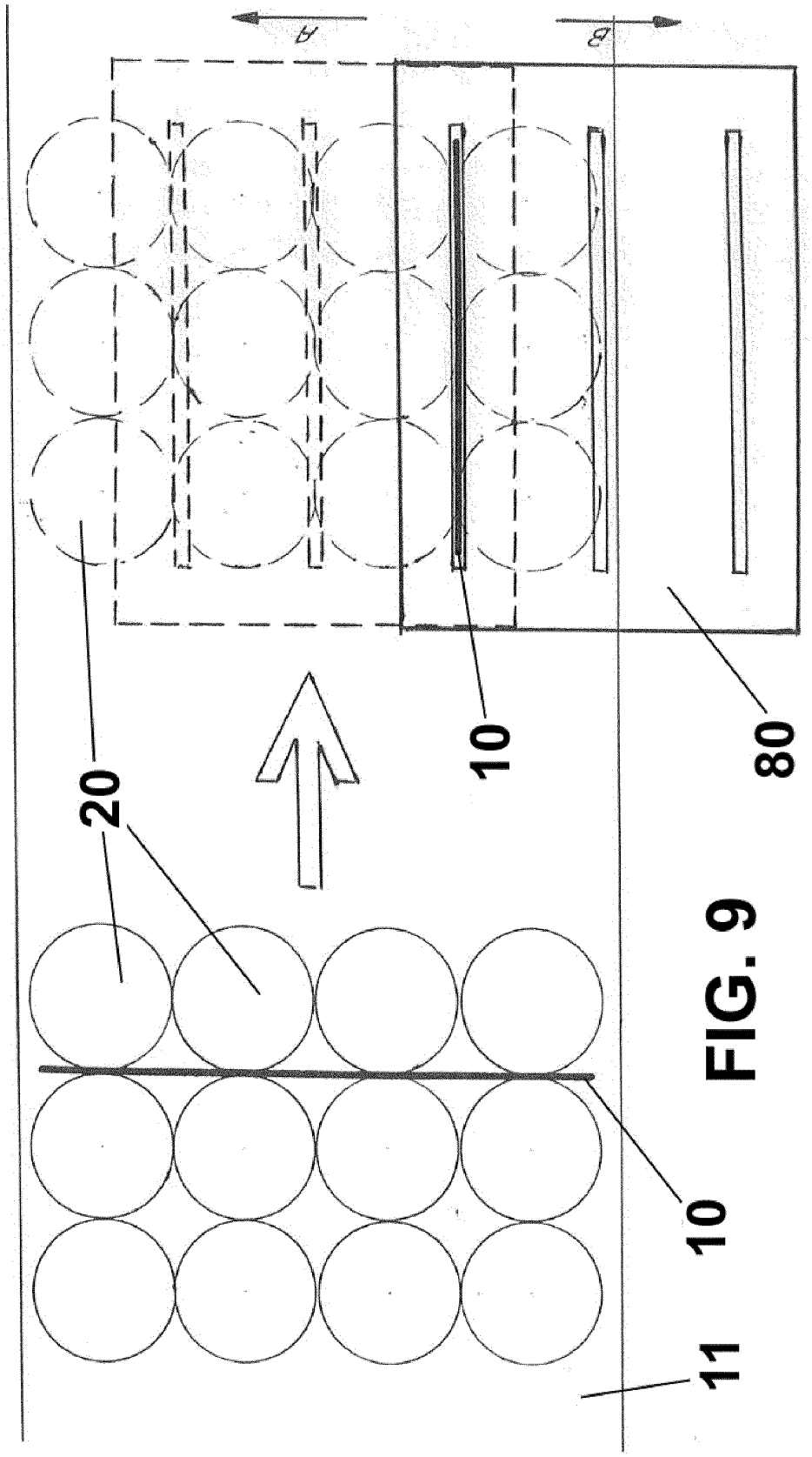


FIG. 9

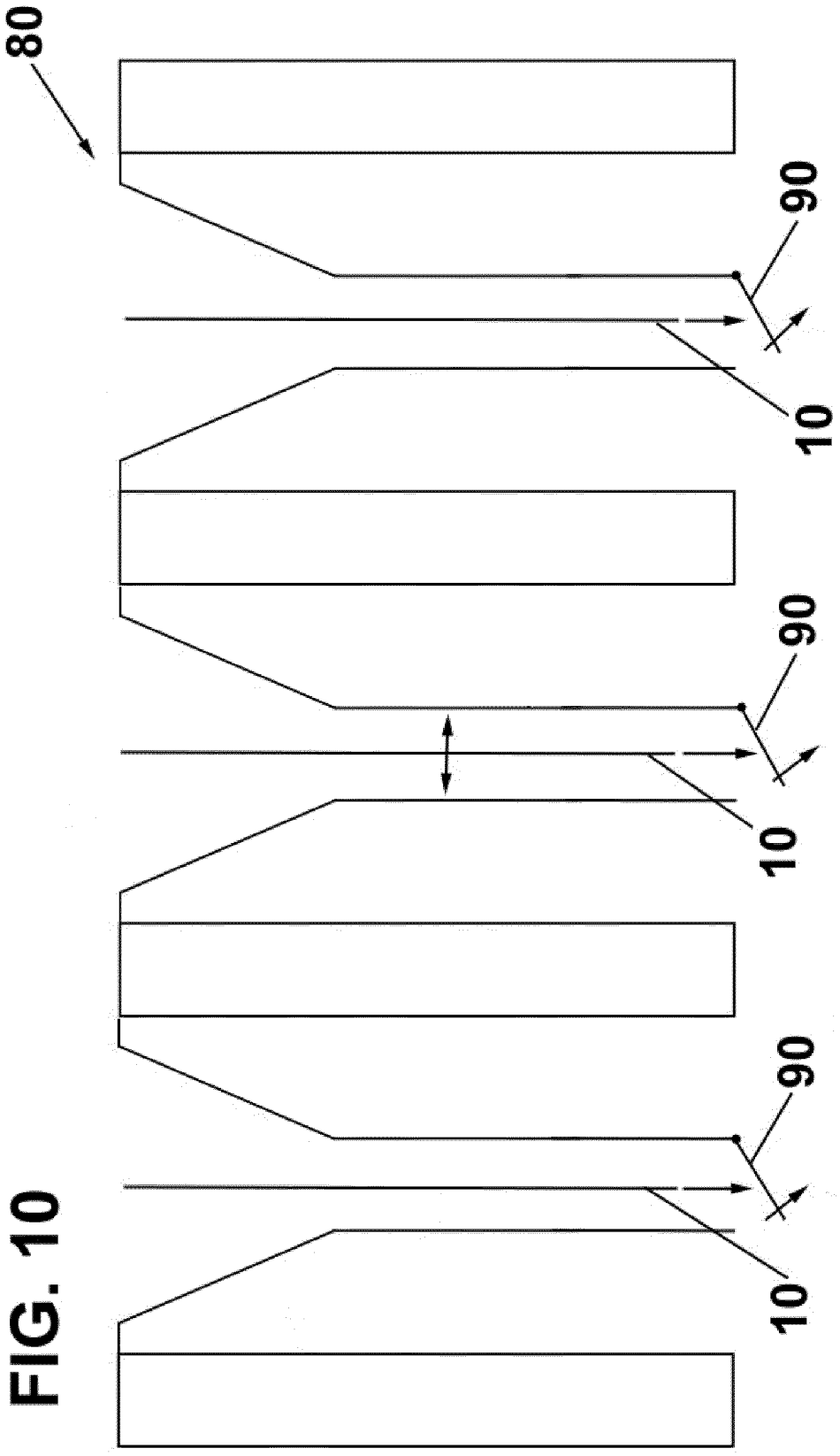


FIG. 10

FIG. 11

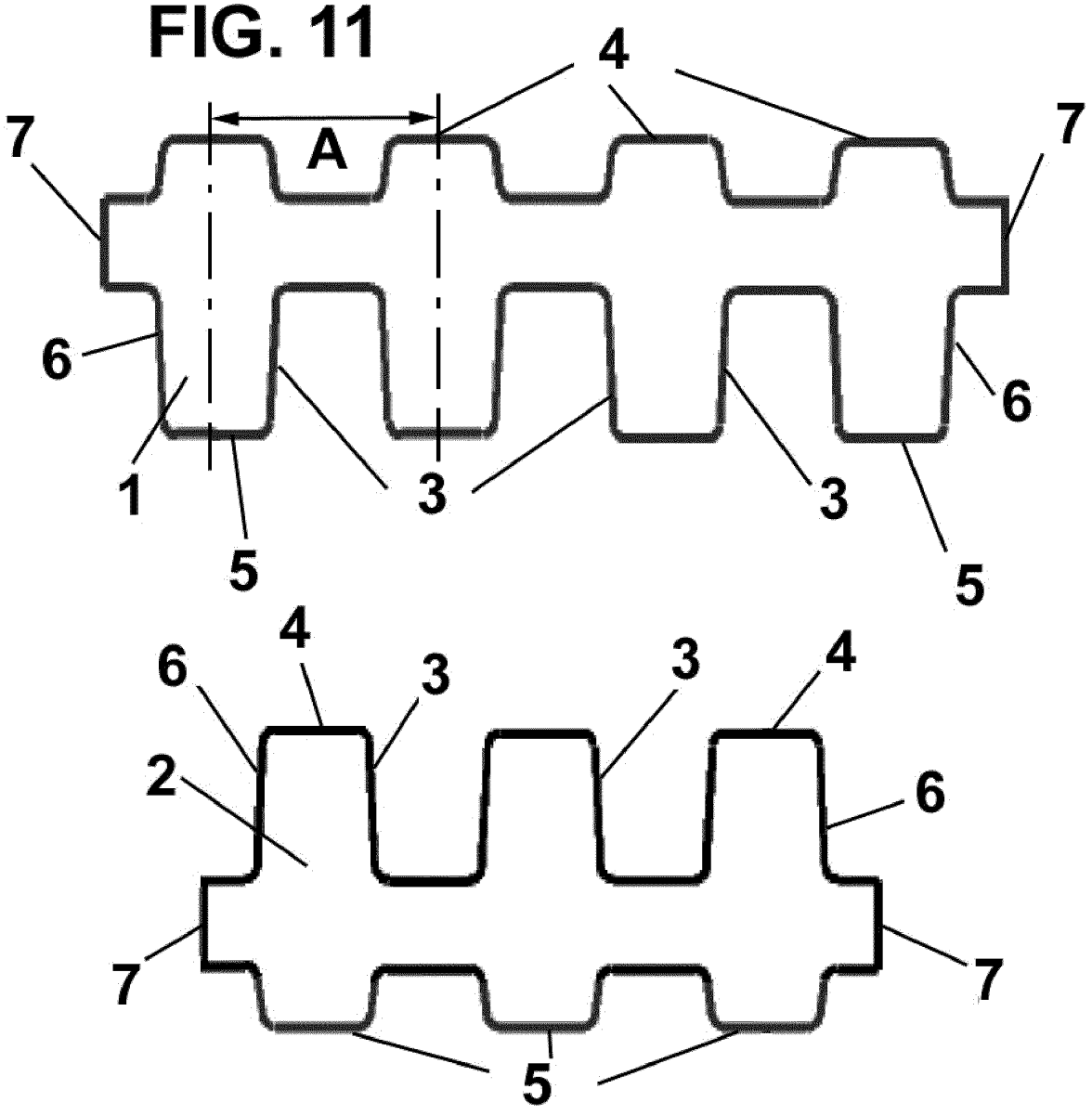
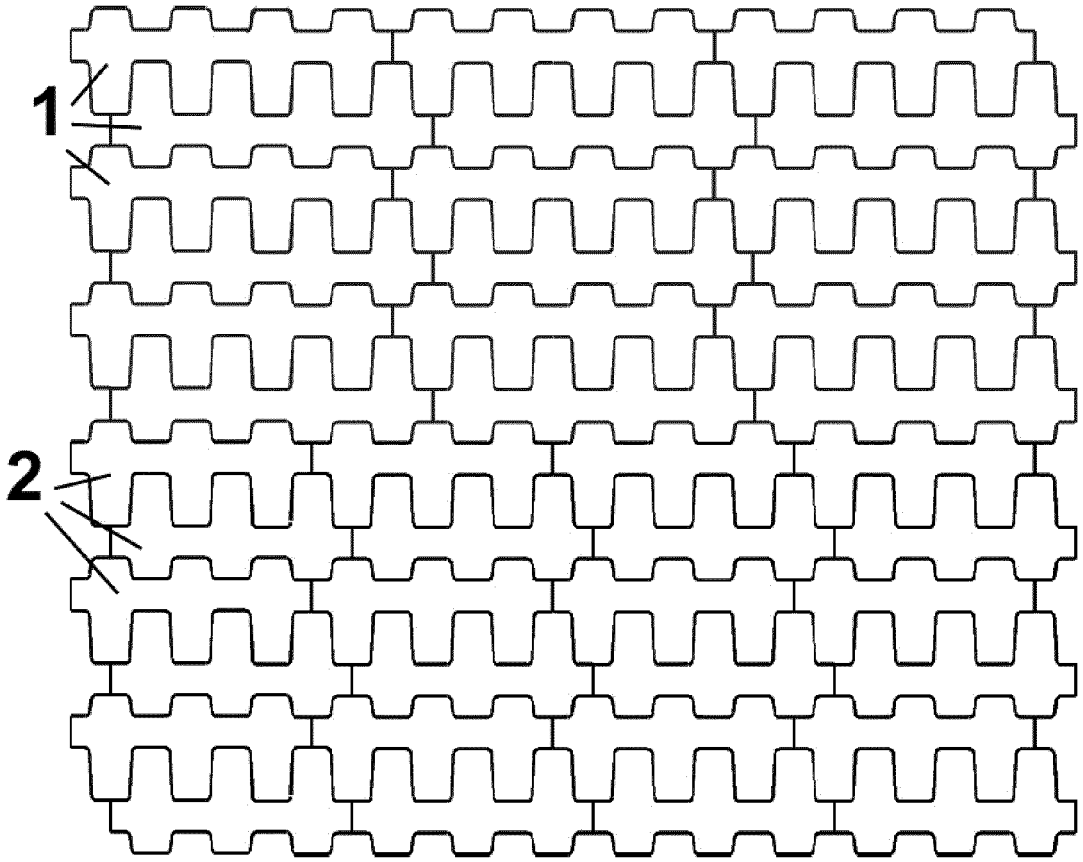


FIG. 12



INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2012/070801

A. CLASSIFICATION OF SUBJECT MATTER

B65B61/20 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B65B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, INVENES, WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 3350836 A (DILLON CHADBURN L ET AL.) 07/11/1967, description; figures 1 - 13.	1-12
X		13-18, 21-27, 30-31
Y	ES 2213992T T3 (SMURFIT PARNALLAND) 01/09/2004, description; figures 1 - 13.	1-12
A	US 5626002 A (FORD COLIN P ET AL.) 06/05/1997, description; figures 1 - 10.	1-31
A	JP 61104918 A (RENGO CO LTD) 23/05/1986, figures 1 - 12; AN JP-22012984-A	1-31
A	US 2254097 A (KEMBLE WOOD DAVID) 26/08/1941, description; figures 1 - 4.	1-31

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
10/04/2013	**(12/04/2013)**
Name and mailing address of the ISA/ OFICINA ESPAÑOLA DE PATENTES Y MARCAS Paseo de la Castellana, 75 - 28071 Madrid (España) Facsimile No.: 91 349 53 04	Authorized officer J. Moreno Rodriguez Telephone No. 91 3495556

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2012/070801

C (continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of documents, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5476217 A (MONCRIEF FRANK ET AL.) 19/12/1995, description; figures 1 - 6.	1-31

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/ES2012/070801

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
US3350836 A	07.11.1967	NONE	
ES2213992T T3	01.09.2004	PT989061E E	31.05.2004
		EP0989061 A1	29.03.2000
		DE69913628T T2	23.09.2004
		AT256598T T	15.01.2004
		FR2783503 A1	24.03.2000
		FR2783502 A1	24.03.2000
		FR2783501 A1	24.03.2000
US5626002 A	06.05.1997	ZA9610375 A	23.06.1997
		MX9606155 A	30.08.1997
		WO9721592 A1	19.06.1997
		NZ319886 A	28.07.1998
		JPH11506078 A	02.06.1999
		EP0808274 A1	26.11.1997
		CA2209722 A1	19.06.1997
		BR9606692 A	01.06.1999
		AU7250996 A	03.07.1997
		AU700669B B2	14.01.1999
JP61104918 A	23.05.1986	NONE	
US2254097 A	26.08.1941	NONE	
US5476217 A	19.12.1995	NO962722 A	15.08.1996
		FI961962 A	09.05.1996
		ZA9509114 A	27.05.1996
		CO4440656 A1	07.05.1997
		WO9613437 A1	09.05.1996
		NZ293482 A	24.04.1997
		JPH09507458 A	29.07.1997
		JP3569918B2 B2	29.09.2004
		ES2170162T T3	01.08.2002
		EP0737151 A1	16.10.1996
		DE69525442T T2	10.10.2002
		CA2177719 A1	09.05.1996
		BR9506345 A	05.08.1997
		AU3594695 A	23.05.1996
		AU683185B B2	30.10.1997
		AT213213T T	15.02.2002

Form PCT/ISA/210 (patent family annex) (July 2009)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 3966111 A **[0009]**