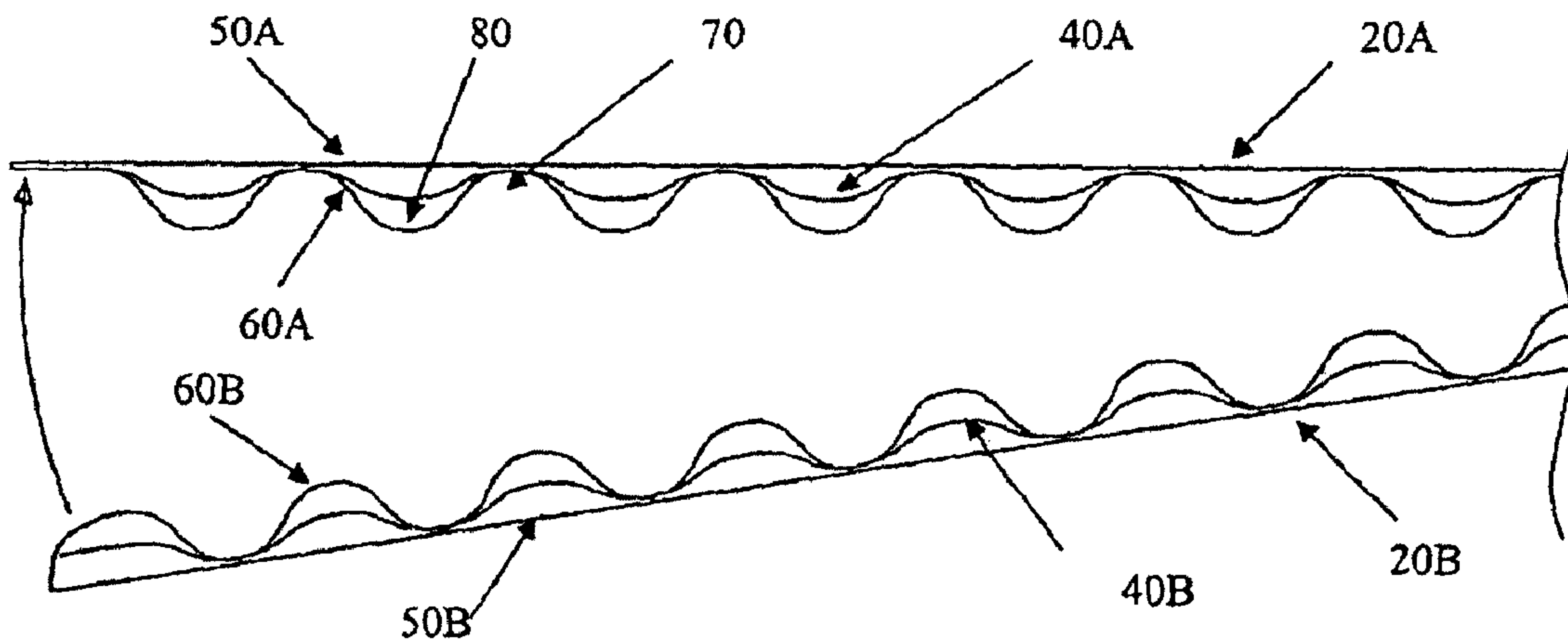




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(54) **Titre : DISPOSITIF DE PROTECTION DE PORTE**
(54) **Title: DEVICE FOR PROTECTION OF A DOOR**



(57) **Abrégé/Abstract:**

This invention relates to a door protection device (20B) pivoting about an axis and being applied against a wall (20A) when in the open position, characterized in that it comprises a portion (40A) added on to outside surface of the door (20B) and a portion (40A) added on to the wall, so that, in the open position of the door, the portions nest together, the two portions of the device being aligned along the same axis of direction perpendicular to the pivoting axis of the door.

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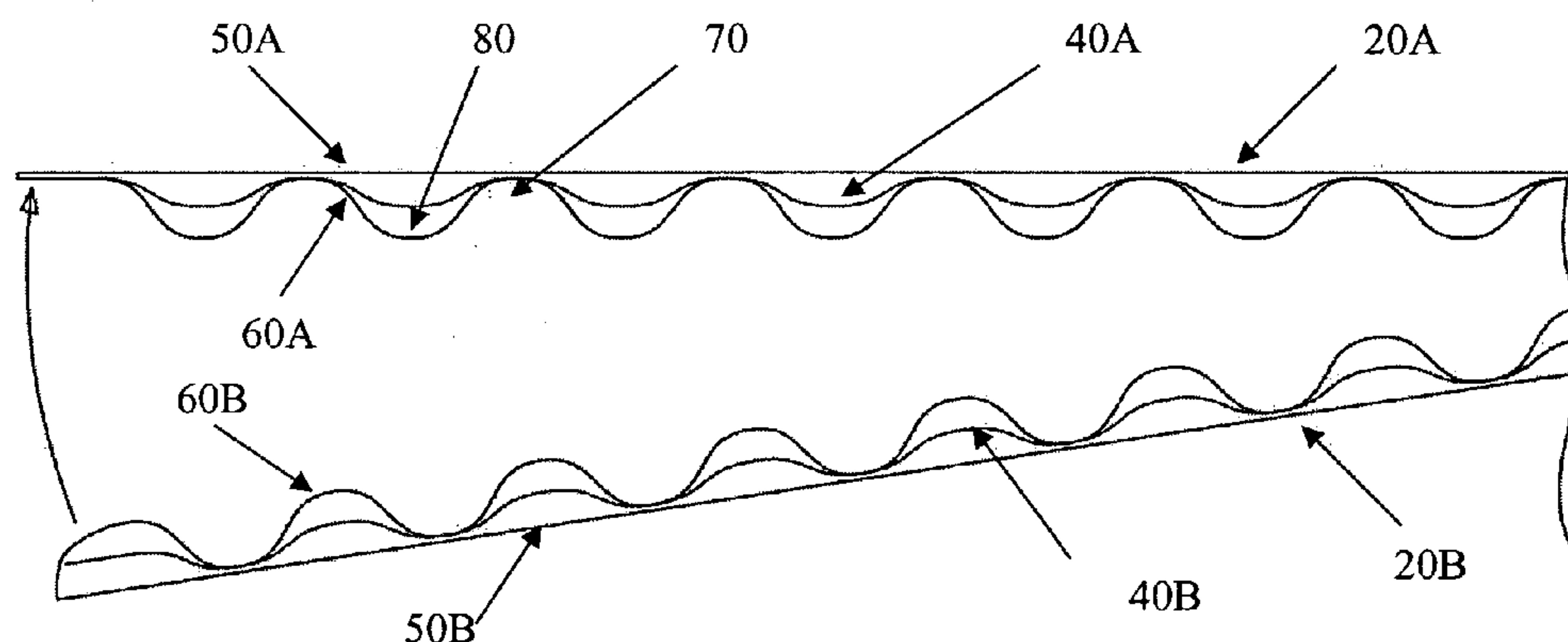
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(54) Title: DOOR PROTECTION DEVICE

(54) Titre : DISPOSITIF DE PROTECTION D'UNE PORTE



(57) Abstract: This invention relates to a door protection device (20B) pivoting about an axis and being applied against a wall (20A) when in the open position, characterized in that it comprises a portion (40A) added on to outside surface of the door (20B) and a portion (40A) added on to the wall, so that, in the open position of the door, the portions nest together, the two portions of the device being aligned along the same axis of direction perpendicular to the pivoting axis of the door.

(57) Abrégé : La présente invention concerne un dispositif de protection d'une porte (20B) pivotant autour d'un axe et s'appliquant en position d'ouverture contre une paroi (20A), caractérisé en ce qu'il comporte une partie (40A) rapportée sur la surface extérieure de la porte (20B) et une partie (40A) rapportée sur la paroi, de manière qu'en position d'ouverture de la porte les parties s'emboîtent l'une dans l'autre, les deux parties du dispositif étant alignées suivant un même axe de direction perpendiculaire à l'axe de pivotement de la porte.

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En ce qui concerne les codes à deux lettres et autres abréviations, se référer aux "Notes explicatives relatives aux codes et abréviations" figurant au début de chaque numéro ordinaire de la Gazette du PCT.

Device for protection of a door

This invention concerns a device for protection of a door.

TECHNICAL DOMAIN

This invention relates to any type of door, panel that opens and, more generally, to any panel making it possible to close an opening completely or partially.

More precisely, this invention concerns pivoting doors against which various types of impacts may be exerted: impacts against the walls toward which the doors swing, impacts with moving objects thrown against the said doors or blocking the path of the door, or others... The intensity of the mechanical and acoustic impact depends on the force with which the door or the object is impelled. Mechanical impact may lead to damage to the materials used for the finishing of the door: bending, scratching or other. Furthermore, acoustic impact may cause discomfort in the individuals in the vicinity of the said door.

Moreover, in airplanes, the flight personnel distribute tray meals to the passengers with the aid of meal carts. The carts are kept in compartments arranged in a pantry unit, hereinafter referred to as the unit. The pantry of an airplane ("galley" in English) is the part where food is stored and prepared during the flight. Each compartment of the said unit is closed by a pivoting door.

It should be noted that when deterioration is caused by the handling of the doors of the said units or that of the carts (which can weigh up to about a hundred kilos), this damage can be repaired only during a specific time: that of stopover. Repairs therefore are difficult and costly.

In addition, the airline companies want a rapid repair for the visual comfort of the passengers.

Furthermore, the companies also wish to reduce, or even eliminate, all the noise pollution accompanying a flight. Thus, the acoustic impacts caused with the door of the pantry unit should be minimized. Finally, the esthetic appearance of a cabin is a significant factor: any unsightly damage to the equipment should be eliminated. The outward appearance of the components making up the cabin is part of the selection criteria for airline companies.

PRIOR ART

Figure 1 depicts an existing type of unit 1 provided in airplane pantries. The doors 2 (2A, 2B, 2C) of the compartments 3 (3A, 3B, 3C respectively) of the unit commonly are provided with horizontal protection devices 4 (4A, 4B, 4C respectively) composed of thermoplastic materials or of rubber.

The flight personnel gain access to the carts stored inside the compartments 3 by opening the doors 2 as widely as possible, ideally with an angle of opening of 180°. In order to accomplish this, the protection devices 4A, 4B and 4C arranged respectively on each of the doors of the compartments 3A, 3B and 3C are offset vertically in relation to each other and, more particularly, are arranged at different heights on each of the doors. In this way, the protection devices cannot touch and do not hinder the complete opening of the doors.

As Figure 1 shows, however, the different protection devices 4 form several discontinuous horizontal lines parallel to all the other continuous horizontal lines making up the unit. The lack of horizontal alignment of the protection devices 4 introduces an unsightly discontinuity.

In addition, the rectangular shape of the protection devices 4 presents an angular shape that can slow down the movement of the carts passing close to the pantry unit.

Finally, the acoustic intensity of the impact of a device 4 against a metal door 2 is relatively substantial and represents a discomfort on board.

One object of this invention is to propose a new device for protection of a door making it possible to retain the advantages of the existing devices while providing a more attractive esthetic contour.

EXPLANATION OF THE INVENTION

In order to accomplish this, this invention proposes a device for protection of a door pivoting around an axis and, in opening position, fitting against a wall, characterized in that it comprises a part added onto the outer surface of the door and a part added onto the wall, so that in opening position of the door the two parts fit into one another, the two parts of the device being aligned along the same axis in a direction perpendicular to the axis of pivoting of the door.

In a further aspect, the present invention provides a group comprising a door pivoting around an axis, a wall and a protection device of the door fitting in opening position against the wall, the protection device comprising a first part added into the outer surface of the door and a second part added into the wall, so that in opening position of the door the parts fit into one another, characterized in that the protection device extends in a general elongated shape, such as a section of slender form, the two parts of the device being aligned along a same longitudinal axis in a direction perpendicular to the axis of pivoting of the door, the two parts comprising correspondingly a series of depressions and projections along the said longitudinal axis of the parts.

In this way, the two parts of the device opposite one another do not hinder one another at the time of opening of the door.

In addition, their alignment along the same axis improves the esthetics of the whole.

Furthermore, such an arrangement facilitates the installation of the device on the door and the wall.

The invention thus applies to a whole formed by a door and a wall close to one another.

3a

According to a specific form of the invention, the two parts fit into one another so that in completely open position, the distance between the door and the wall is less than the sum of the thicknesses of the said parts.

The parts have surfaces comprising correspondingly at least one depression and/or one projection so as to interpenetrate in opening position of the door.

According to one characteristic, the said at least one projection comprises a thickness that varies along a direction parallel to the axis of pivoting of the door.

According to a particular embodiment, the two parts comprise corresponding undulating surfaces. The symmetry of the forms and the roundness provided by the said parts makes it possible not to block the advance of the carts and to facilitate the sliding thereof along the doors or their rebound on the doors,

According to one characteristic, in complete opening position, the two parts are joined together to form a solid component.

According to another characteristic, the axis of pivoting of the door is vertical and in particular the device is arranged horizontally, that is, the two parts of the device are aligned along the same horizontal axis.

According to another aspect, the invention applies to a device for protection of a door of a compartment, the device being the one briefly explained above, and the wall against which the door fits in opening position is made up of a door and an adjacent compartment.

The invention also concerns doors equipped with this type of device as well as the units, for example the pantry units of an aircraft, equipped with such doors.

More particularly, the invention applies to a door pivoting around an axis and intended to fit in opening position against a wall, characterized in that the said door comprises a part added onto the outer surface of the door and which is intended to fit into a part added onto the wall in opening position of the said door, the door part extending along an axis in a direction perpendicular to the axis of pivoting of the door.

The invention also has as a purpose a unit that comprises a door such as briefly explained above and a wall against which the door fits in opening position.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects, advantages and characteristics of the invention will become apparent upon reading of the description that is going to follow, presented by way of non-limitative example with reference to the attached drawings in which:

- Figure 1 is a front view of a unit provided with protection devices of known type;
- Figure 2 is a front view of a unit provided with protection devices according to this invention;
- Figures 3 to 5 are views from above schematically illustrating different positions of the doors of a unit equipped with a device according to this invention at the time of opening of one of them, Figure 5 depicting the complete opening position of the said door;
- Figures 6 and 7 are respectively a side view and a front view of a part of the protection device according to this invention.

DETAILED DESCRIPTION OF THE INVENTION

The protection device is presented in the description that follows in the illustrative and non-limitative context of pantry units in airplanes. The protection device may be used in any other application necessitating a mechanical and/or acoustic protection for a door opening against a wall (outer wall, other door or other).

As Figure 2 shows, the units 10 provided in airplane pantries comprise compartments 30 (30A, 30B, 30C) adjacent two by two, of oblong parallelepipedal shape and in which the meal carts are kept. The carts hold tray meals intended for the passengers. The compartments 30 make it possible to maintain the trays at a chosen preservation temperature. The adjacent compartments 30 (30A, 30B, 30C) each are closed by a door 20 (20A, 20B, 20C respectively) pivoting around a vertical axis. In this description, the vertical direction is considered as the direction perpendicular to that of the floor on which the unit 10 is resting. On Figure 2, the compartment 30B is closed by a door 20B pivoting around a vertical axis A. The door 20B pivots between a closing position, depicted on Figure 2 and in which the compartment is closed, and a complete

opening position in which the door 20B is in contact with the door 20A of the adjacent compartment 30A (Figure 5).

Protection devices 40A, 40B, 40C according to the invention are added respectively onto the outer surface of the doors 20A, 20B and 20C of compartments 30A, 30B and 30C. The outer surface of a door, of the door 20B for example, is the surface visible to the flight personnel; it is also the surface intended to fit, in opening position of the compartment involved, against a wall, in this case against the door 20A. A protection device 40 extends mainly in a general elongated shape and is made up, for example, of a section of slender form. The longitudinal shape of the device 40 is laid out horizontally and parallel to the horizontal upper and lower edges of the door 20.

As shown on Figures 3 to 5, the device 40 comprises two parts 40A and 40B: one part 40B added onto the outer surface of the door 20B and one part 40A added onto the wall 20A toward which the door 20B pivots. In opening position of the door 20B, the parts 40A and 40B fit into one another, thus making it possible to open the door 20B even more.

In this embodiment illustrated on Figure 2, the wall is made up of the door 20A of the unit 1. As Figures 3 to 5 show, the respective surface 50A, 50B of each part 40A and 40B of the device 40 respectively joined to the door and to the wall is flat in order to facilitate fastening of the parts 40A and 40B respectively onto the doors 20A and 20B. This fastening is accomplished by any type of known means (gluing, screwing and/or other).

The surface 60A, 60B of each part 40A and 40B of the device 40, opposite the surface 50A, 50B, is the surface intended to rest, in opening position, respectively against the surface 60B, 60A of the corresponding part 40B, 40A. The surface 60 of each part 40A and 40B of the device 40 comprises at least one depression and/or one projection. In the form illustrated on Figures 3 to 5, the device 40 comprises, at the surface 60, a succession of depressions 70 and projections 80.

The depression or depressions and/or the projection or projections respectively of the part 40A and of the part 40B have complementary shapes. In complete opening

position, the complementary shapes are joined together to form a component with a thickness less than the sum of the thicknesses of the parts 40A and 40B as depicted on Figure 5. The thickness of a part 40A (40B respectively) is the maximum orthogonal distance existing between the surface 50A (50B respectively) and the surface 60A (60B respectively). Thus, in complete opening position, the parts 40A and 40B complement one another so that the maximum orthogonal distance between the surface 50A of the part 40A and the surface 50B of the part 40B is less than the sum of the thicknesses of the parts 40A and 40B. In particular this distance is less than the double thickness of devices 4 of known type such as the one shown on Figure 1 and which are superposed in the case of a horizontal alignment of these devices 4 on each of the doors 2A, 2B and 2C. As a matter of fact, the devices 4 of known type are solid, homogeneous, oblong parallelepipedal moldings just as the surface 6 opposite the surface 5 added to the door of the said molding is flat. For this reason, in opening position, the moldings situated opposite one another hinder the complete opening of the door.

In the embodiment depicted on Figure 5, in opening position, the parts 40A and 40B together form a component more or less with the thickness of a single device 4 of existing type (such as depicted on Figure 1). More precisely, the parts 40A and 40B, in opening position of the door 20B, form a section with thickness practically equivalent to the greatest thickness of a projection of a part 40A or 40B.

In this way, the parts 40A and 40B are arranged on the same axis perpendicular to the axis of pivoting of the door 20B, in this case horizontal. It therefore is not necessary to offset them along the axis of pivoting, that is, vertically, in order to prevent them from colliding at the time of opening of the door and forming an excess thickness restricting the clearance of the door. The parts of the device with complementary shapes therefore can be added at identical heights on the doors of the unit, which facilitates their positioning. In addition, this invention improves the esthetic appearance of the pantry unit by providing continuous, thus more harmonious, lines.

The depressions and projections may have any type of shapes allowing the interpenetration of the two parts 40A and 40B of the device 40. Thus, the projection has, for example, a rectangular shape for a toothed or comb surface, a triangular shape, a semicircular, oval or other shape. The surface 60 also may have a complex shape as soon as it comes into correspondence with the surface against which it fits in opening position and it conforms to the fitting-in characteristics previously described.

In the embodiment illustrated on Figures 3 to 7, the depressions and projections are of rounded shape and thus form an undulating surface 60. The rounded shape has the advantage of presenting only slight friction during the advance of a cart parallel to the unit. The shape of the surface 60 makes it possible to have the cart slide or rebound on the doors of the unit depending on the angle of approach of the cart in relation to the doors.

In the embodiment illustrated on Figures 3 to 5, each of the projections 80 has a thickness variable vertically and, for example, several thicknesses: a maximum thickness at the center of the projection and thicknesses less than the maximum thickness on the upper and lower edges. This variation in thickness is visible on Figure 7, which is a front view of a part 40 of the device. The depression provided in correspondence with the projection follows the surface of the central portion of maximum thickness of the projection but, in the embodiment illustrated, does not comprise concave portions along the edge in order to follow the contours of the upper and lower portions of lesser thickness of the projection.

Thus, any type of surface may be provided with horizontal, vertical or other fitting-in means.

Figure 6 depicts the device 40 seen from the side and shows the semi-oval contour of the projections of the parts 40A and 40B.

Each of the parts making up the device 40 is composed of a cushioning material such as a thermoplastic material, an elastomer or other. The cushioning material used provides numerous advantages:

- cushioning the impacts between the doors;

- cushioning the impacts resulting from meal carts handled in the vicinity of the doors; the devices also make it possible, because of their elasticity, to move the carts away by rebound;
- the smooth surface provided by this type of material allows the parts of the device made of this material not to constitute obstacles or generate friction likely to hinder the advance of the carts.

Furthermore, the material used is a material for mechanical but also acoustic cushioning. As a matter of fact, the impact between doors takes place precisely between two protection devices and no longer between a protection device and a metal door. The acoustic level of the impact therefore is reduced.

We Claim:

1. Group comprising a door pivoting around an axis, a wall and a protection device of the door fitting in opening position against the wall, the protection device comprising a first part added into the outer surface of the door and a second part added into the wall, so that in opening position of the door the parts fit into one another, characterized in that the protection device extends in a general elongated shape, such as a section of slender form, the two parts of the device being aligned along a same longitudinal axis in a direction perpendicular to the axis of pivoting of the door, the two parts comprising correspondingly a series of depressions and projections along the said longitudinal axis of the parts.
2. Group according to claim 1, characterized in that the two parts fit into one another so that in completely open position, the distance between the door and the wall is less than the sum of the thicknesses of the parts.
3. Group according to claim 1 or 2, characterized in that the said at least one projection comprises a thickness that varies along a direction parallel to the axis of pivoting of the door.
4. Group according to any one of claims 1 to 3, characterized in that the parts comprise corresponding corrugated surfaces.
5. Group according to any one of claims 1 to 4, characterized in that in complete opening position, the two parts are joined together so as to form a solid component.
6. Group according to any one of claims 1 to 5, characterized in that the axis of pivoting of the door is vertical.
7. Group according to claim 6, characterized in that the device is arranged horizontally.
8. Group according to any one of claims 1 to 7, characterized in that the parts constituting the protection device are made up of a clamping material.

9. Group according to any one of claims 1 to 8, characterized in that the two parts of the device fit into one another due to a thickness extending along a direction perpendicular to the outer surface of the door and to the wall.
10. Group according to any one of claims 1 to 9, characterized in that the door is the door of a compartment and the wall is made up of a door of an adjacent compartment.
11. Group according to any one of claims 1 to 10, characterized in that it comprises a unit having the door as a door.
12. Group according to claim 11, characterized in that the unit is a galley unit of an aircraft.
13. Use of the group according to any one of claims 1 to 12 in an aircraft.
14. An aircraft characterized in that the aircraft comprises a pantry having at least one group according to any one of claims 1 to 12.
15. A pantry in an aircraft comprising at least one group according to any one of claims 1 to 12.

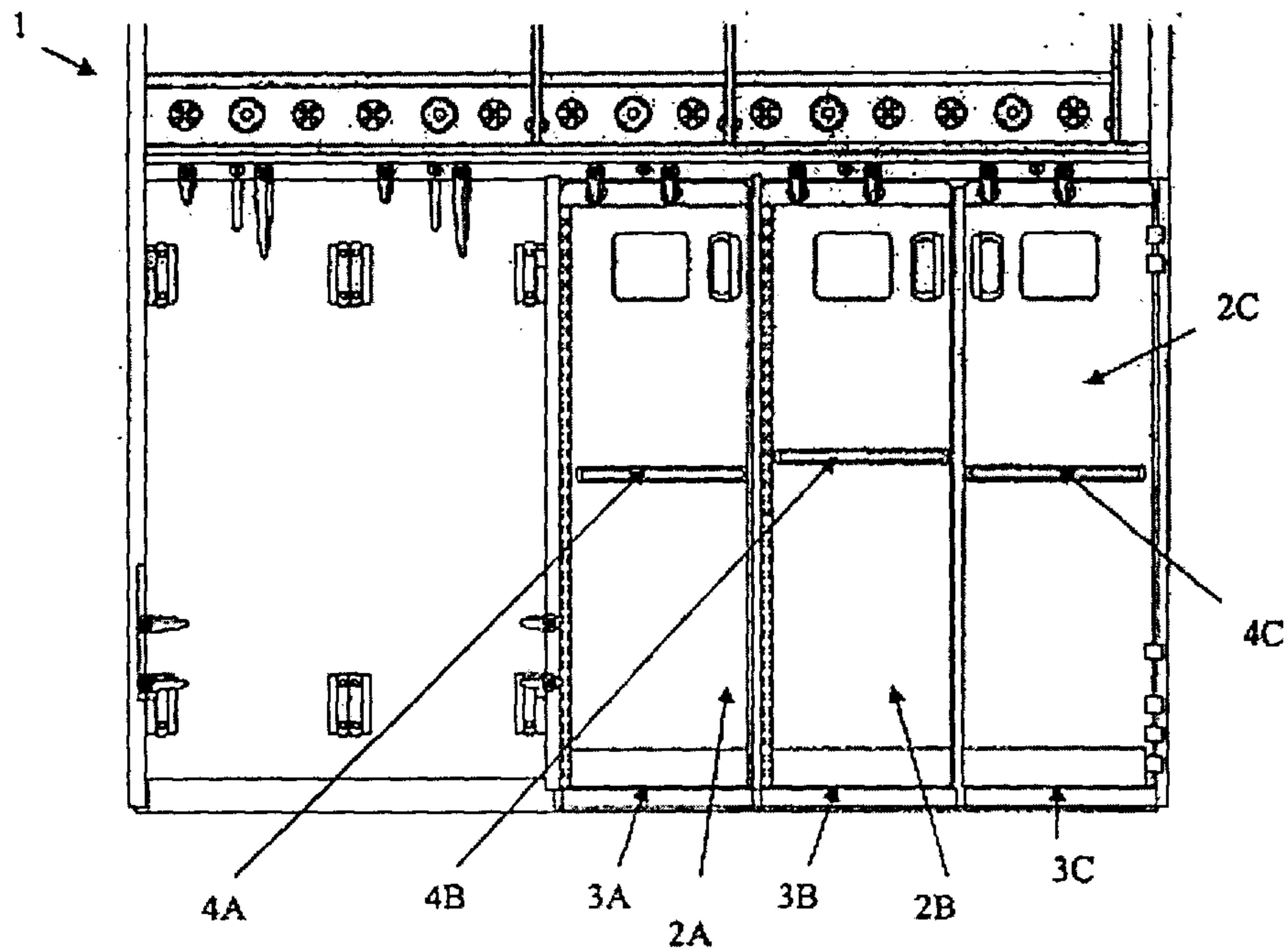


FIG.1

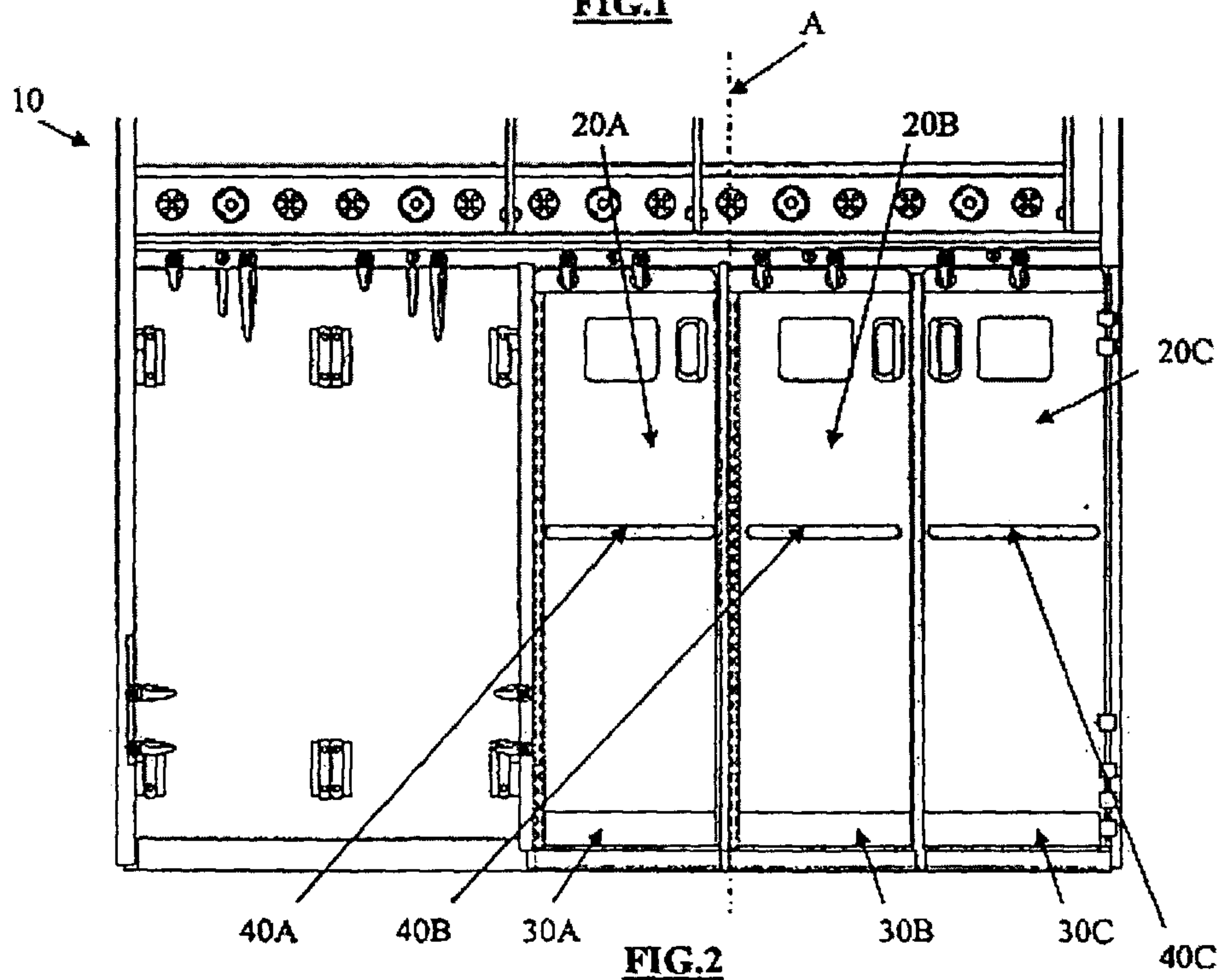


FIG.2

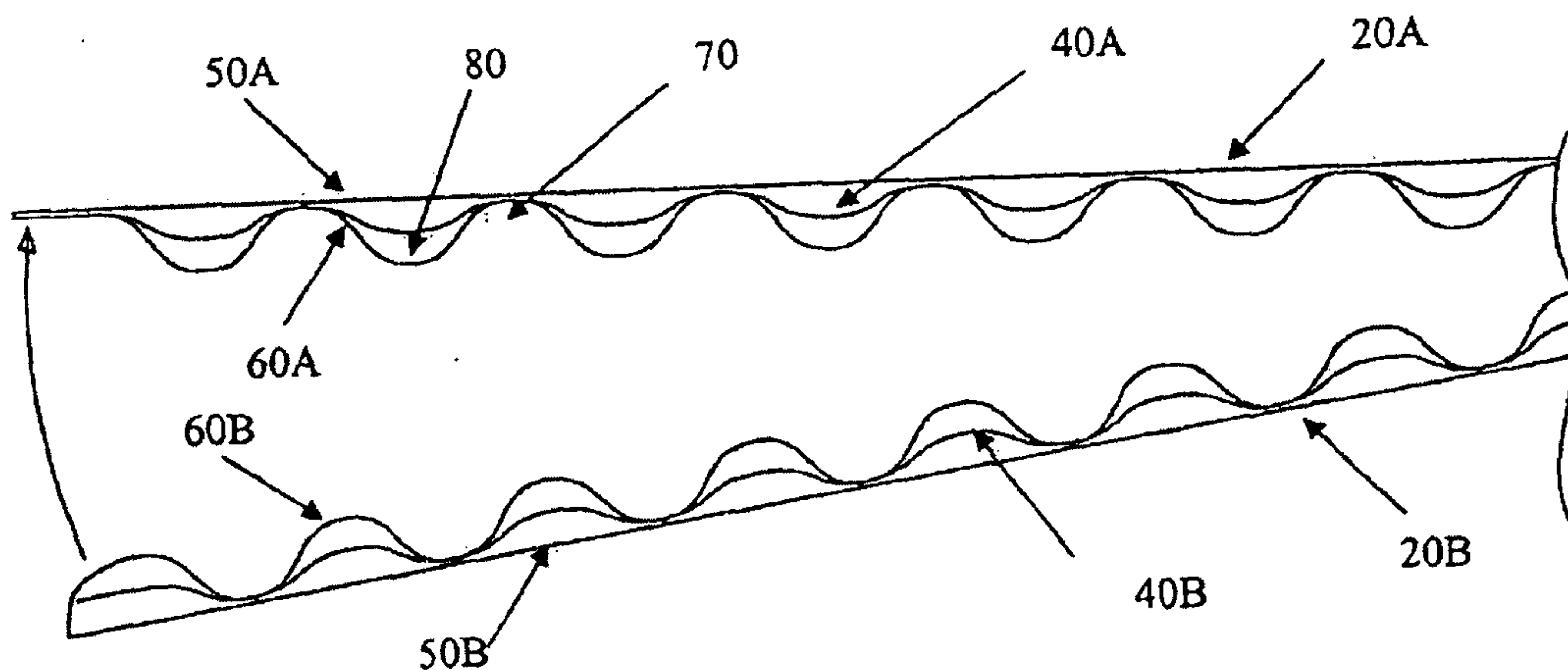


FIG. 3

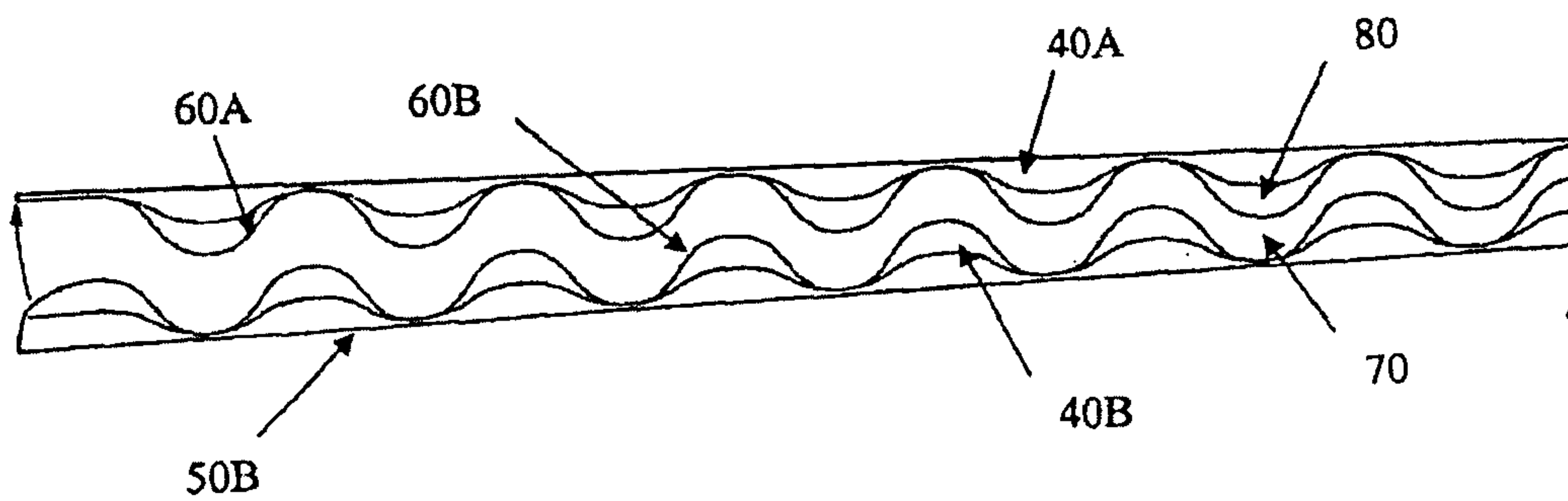


FIG. 4

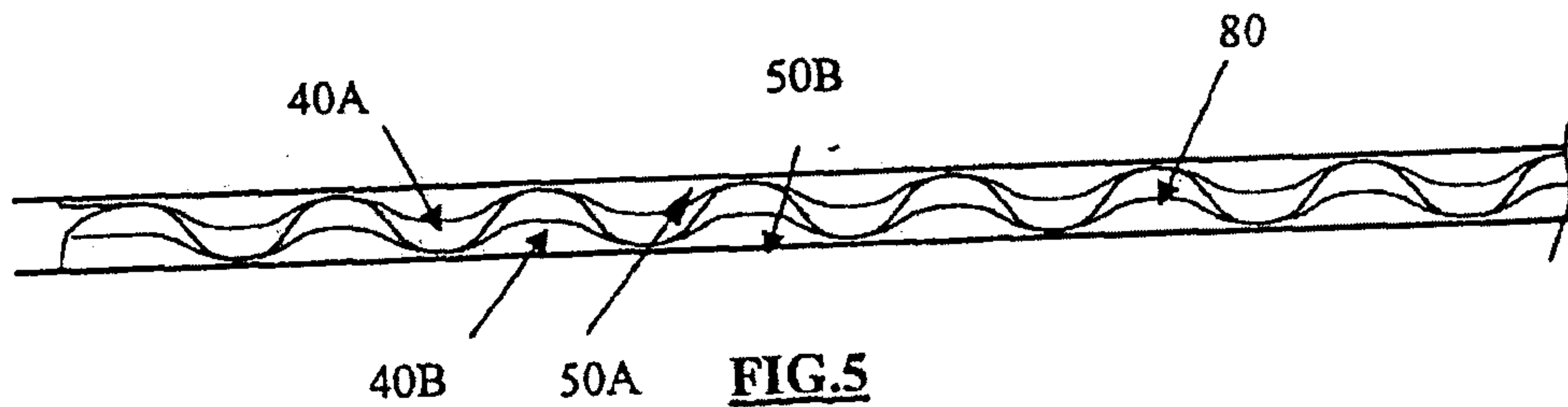


FIG. 5



FIG. 6

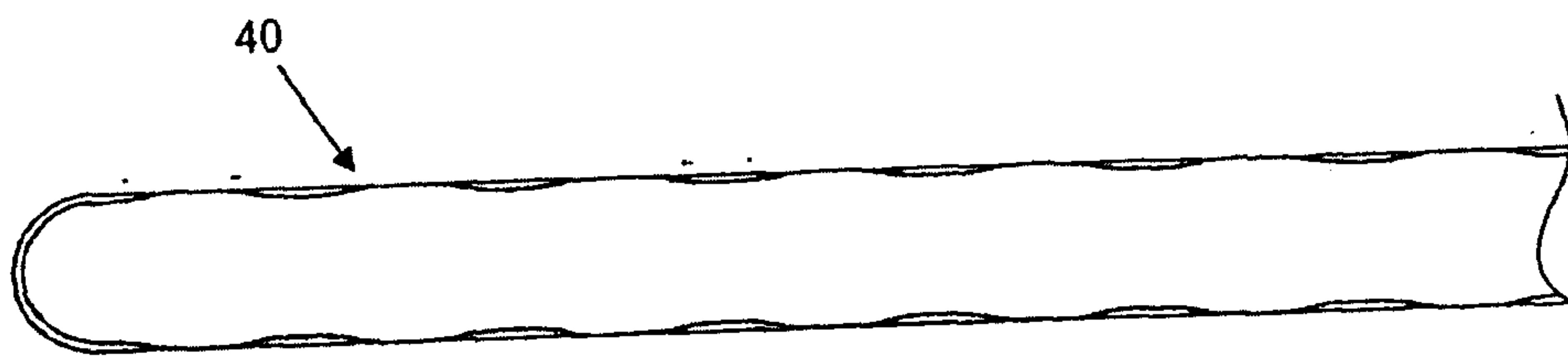


FIG. 7

