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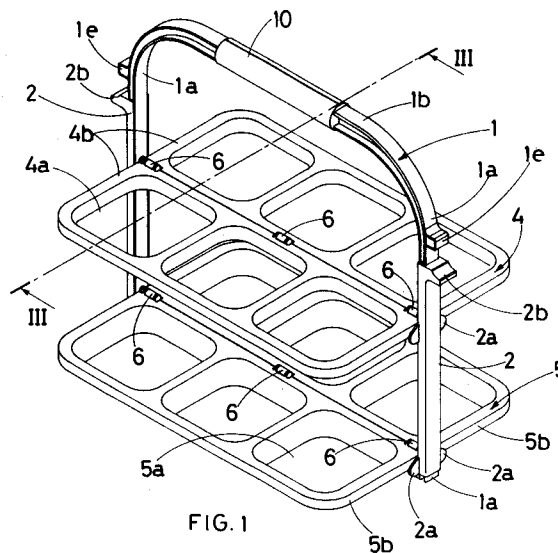
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I-60035 Jesi (Ancona) (IT)(54) **Foldable plastic crate for carrying and storing bottles in a tidy manner.**

(57) The instant invention concerns a collapsible plastic crate (bottle carrier) for carrying and storing bottles which has two horizontal inserts (4,5), a lower (5) insert with cavities for containing the bottom of the bottles and an upper insert (4) with through holes, aligned with the circular cavities underneath, in order to contain the body of the bottles in a vertical position; it being provided that said inserts, fixed within a portal (1) supporting structure, are each made up of a pair of identical half wings, able to open and close simultaneously like a book.

**EP 0 610 159 A1**

The instant patent application for an industrial invention concerns a foldable crate, made from moulding in plastic material, intended to carry and store bottles in a tidy manner.

The article in question is placed in a field where such articles already exist; more particularly, up to the present time, bottles have been carried - normally six at a time - in an erect position in crates with internal divided sectors or in baskets with handles, made of plastic or metal.

The structure of said crates is composed essentially of a base plate with several circular or square horizontal cavities, and of a second plate, parallel to the first one but in a higher position, with through holes perfectly aligned with the aforementioned circular cavities positioned on the base plate.

As is known these crates are used by lowering the bottles through the holes on the plate in the higher position, until the bottom of the bottles is perfectly nested and contained inside the cavities of the base plate; while the upper plate serves the purpose of containing the body of the bottles, in order to avoid any deviation from the vertical position.

It should, however, be mentioned that in spite of the fact that said crates of the conventional type, have proved to be quite adequate, they do nevertheless present certain problems.

The main problem must surely be the considerable physical size of these crates: it can be said, in fact, that each of these traditional crates, while being practically hollow inside, is the same size as a large box, able to contain in height, length and width, six bottles in an erect position.

If this considerable physical size could be considered normal or rather inevitable, when the crates are full of bottles, then the same cannot be said of the times when, vice-versa, the crates are empty.

On these occasions, it would appear to be less convenient (both from the practical and economical point of view), to have to waste so much space when storing and transporting articles which weigh so little.

This difficulty emerges both in the case of retailers and manufacturers, who have to keep large quantities of said crates, as well as in the case of private individuals, for whom even the size of just one of these articles can create considerable problems, particularly in view of the small amount of space normally available in modern homes.

It is on the basis of these considerations that the foldable crate in question was designed; apart from serving the same useful purpose as existing articles as far as containing bottles is concerned, this crate has the important added advantage of being able to be completely folded away after use.

More particularly, the physical size of the article when folded away, is practically insignificant, no bigger, for example than a picture frame.

Bearing this in mind, it is easy to comprehend how storage and transportation of this new article becomes much more practical than in the case of the aforementioned traditional articles.

In actual fact, the crate according to the invention, also has two horizontal inserts, one lower insert with the traditional cavities to contain the bottom of the bottles and one higher insert with through holes, aligned with the circular cavities underneath, to contain the body of the bottles in a vertical position.

These two inserts are fixed at the centre of a thin but robust, portal supporting structure, made up of two opposite uprights - on the inside of which the two said inserts are directly supported - connected by chamfered corners to a top crosspiece which in practice acts as a handle, for gripping and lifting the whole article; it being provided, moreover, that the two said uprights be connected by means of two more crosspieces, one about halfway up and the other at the base, which apart from reinforcing said supporting structure, also lend support to the inserts.

The most important feature of said article is the special structure of the two horizontal inserts: in effect, each of the inserts is made up of two perfectly symmetrical half-wings, one positioned on the right of the portal supporting structure, the other positioned on the left; it being provided that the two halves of each insert be hinged to each other very closely, at their respective internal longitudinal edges.

Because of their innovatory composite structure, the two inserts of the article, can be simultaneously closed like a book when the article in question is not in use; in practice, each of the four half-wings of the crate in question is able to rotate upwards and inwards to get from the horizontal in use position to the vertical resting position, at the same time as the other three.

More particularly, the simultaneous tilting of the four half-wings is effected at the same time as the sliding upwards of two strips (actually maneuvering sliders), inserted along the uprights of the portal structure and duly coupled with the base of the four tilting components.

In any case, on completion of their counter-rotation, the two halves of each insert come to rest one against the other, remaining partially contained within the portal bearing structure in this vertical position; in other words, this means that on completion of this closing operation, the two inserts have reached the position of being one below the other inside the portal structure.

It is obvious that the distance between the lower insert and the upper insert must be such as to guarantee that the components of the lower insert can complete their tilting action towards the vertical position without interfering with the base of the two components of the insert above.

At this point it is easier to point out once more that when closed, the physical size of the article is truly insignificant: in height and in length, this size is limited to the size of the portal supporting structure only, while in width it slightly exceeds the thickness of this structure.

Should the crate according to the invention need to be used once again to carry or contain bottles, then it will be sufficient to bring about the opening of the four half-wings downwards and outwards, and therefore set up the two horizontal inserts of the crate again, by means of the aforementioned maneuvering sliders.

For further clarity of explanation, the description of the invention continues with reference to the attached drawings, reproduced for illustrative and not limitative purposes, wherein:

- Figure 1 is an axonometric representation of the article according to the invention in its in use position;
- Figure 2A shows the article in its in use position, seen from the side ;
- Figure 2B shows the article in its closed position, seen from the side ;
- Figure 3 shows the article seen from the side, but sectioned along the transversal III-III plane of Figure 1 ;
- Figure 4 shows, in an enlarged side view, the base area of one of the maneuvering sliders, able to slide vertically along the uprights of the portal structure;
- Figure 5 is the section of Figure 4 along the V-V plane.

With reference to the attached drawings, the crate in question, the components of which are all made from moulding in plastic material, has a portal bearing structure (1), which has a double "T" transversal section and is made up of two opposite uprights (1a), connected at the top by means of a crosspiece (1b), to which they are united by means of chamfered corners and of two more crosspieces, one (1c) about halfway up the uprights (1a) and the other (1d) at the base of the uprights.

These two crosspieces (1c) and (1d) also have a double "T" transversal section, and more particularly have a lower wing which is wider than the upper wing.

Along the external face of the two aforementioned uprights (1a), two boxed sliders (2) are applied which are of slightly lower height than the uprights (1a) and which are able to effect alternate vertical strokes.

Each of said sliders (2) has two identical pairs of lugs (2a) at the side, the first pair about halfway up and the second at the base, in positions which correspond exactly to the positions of the reinforcing crosspieces (1c) and (1d) of the portal structure (1); at the top of each slider (2), there is a gripping nib (2b) on the outside, immediately above which there is a fixed counter-nib (1e), made in moulding on the outside of the uprights (1a).

From figure 4 it is possible to observe that the lugs (2a) of each pair are positioned one on the right and one on the left of the slider (2), and therefore in symmetrically opposite positions; all these lugs (2a) have pins inside on the horizontal axis (2c) inserted within corresponding slots (3) on the transversal edges of the inserts (4) and (5) of the article.

As concerns the manner in which each maneuvering slider (2) is coupled with the respective upright (1a), it should be mentioned - with reference to figure 5 - that each slider (2) has a "C" transversal section which enables it to precisely embrace from the outside the double "T" section which makes up the upright (1a); more particularly, the slider (2) is blocked firmly on the respective double "T" upright (1a), due to the fact that there are provided several cuneiform teeth (2d) on the internal face of its opposite edges, able to get blocked within the vertical grooves of the double "T" upright (1a).

Two inserts are fixed between the uprights (1a) of the portal structure (1), one upper insert (4) at the level of the crosspiece (1c) and one lower insert (5) at the level of the base crosspiece (1d).

The lower insert (5) has a series of cavities (5a) to receive and contain the bottom of the bottles, while the upper insert (4) has through holes (4a), to surround the body of the bottles, said holes being perfectly aligned vertically with the cavities (5a) of the insert below (5):

It is underlined that the holes (4a) have a flared internal edge; in the same way the cavities (5a) have flared perimetral edges.

As anticipated, these inserts (4) and (5) are out of the ordinary in that they are made up of two pairs of rectangular half-wings (4b) and (5b); these four half-wings being provided with a vertical stiffening edge (4c) and (5c), at the three sides, the two transversal sides and the external longitudinal side.

The two pairs of half-wings (4b) and (5b) are fixed by means of three hinges (6) distributed along the symmetry axis of the two inserts (4) and (5): two near the ends and one in an intermediate position (see Figure 1).

With reference to figure 5, one of the two half-wings of each pair has three forks (7) to receive the same number of "U" bolts (8), in corresponding

positions on the other half-wing of the same pair; it being provided that the stable introduction of the three bolts (8) within the respective forks (7), determines in practice, the formation of the three aforementioned hinges (6) which, on the one hand guarantee structural continuity to the entire insert and on the other, allow the two halves of each insert to counter-rotate upwards and vice-versa.

Each fork (7) is formed by a pair of fins which have a semi-circular upper section and at their internal face, are provided with pins on a horizontal axis (7a), positioned at the same height; the corresponding "U" bolt (8) has a semi-cylindrical upper section and has a through hole on the horizontal axis (8a).

The "U" bolt (8) is inserted with a slight forcing action into the corresponding fork (7), until the pins (7a) of the latter are nested in the opposite ends of the hole (8a) of the bolt (8); the dimensions of these two components are such that when the bolt (8) is inserted, this brings about the elastic opening of the fins of the fork (7), gradually as the pins (7a) come into contact with the lateral walls of the bolt (8).

Attention is brought to the fact that the end section of said pins (7a) is shaped like the-mouth of a flute; in fact it is this shape which favours the gradual opening, by elastic deflection, of the forks (7).

It is in any case, obvious that the fins of the fork (7) recover their natural position as soon as the pins are inserted within the hole (8a) of the bolt (8). As concerns the fixing of the said insert to the portal supporting structure (1) it should be specified - again with reference to the aforementioned figure 5 - that the half-wing on which there are provided the forks (7), at the two ends of its internal longitudinal edge, has the same number of lugs (9), structurally identical to the fins of the forks (7), but with small pins on the horizontal axis (9a) at their external face.

In this light, it is evident that said pair of pins (9a), also provided with a tip shaped like the mouth of a flute, end up by being the means for fixing an entire insert formed as described above, to the portal structure (1); in practice there are provided on the internal walls of the uprights (1a) of said structure (1), two pairs of holes opposite each other and horizontally aligned (1f), one in a position barely above the intermediate crosspiece (1c), the other barely above the base crosspiece (1d).

The pair of holes (1f) near the intermediate crosspiece (1c) must be used to house the pins (9a) of the upper insert (4), while the pair of holes (1f) near the base crosspiece (1d) must be used to house the pins (9a) provided at the ends of the lower insert (5).

In conclusion, there follows a description of the functioning of the crate according to the invention starting from the opening phase, as illustrated in figures 1, 2A, and 3 and namely, when the inserts are in their horizontal in use position.

With reference to figure 3 it can be observed how the bottom of the lower insert (5) touches the ground and therefore also provides a supporting surface for the entire structure.

Moreover, it should also be observed that in this phase the flared edges of the holes (4a) of the upper insert (4) and the flared edges of the cavities (5a) of the lower insert (5) rest precisely on the sides of the crosspieces (1c) and (1d), which, as anticipated, possess for this very purpose lower wings which are wider than the upper wings; in this case, the sides of said crosspieces (1c) and (1d) act as guides for the various half-wings, ensuring that they come to rest in a perfect horizontal position.

Also to be noted, this time with reference to figure 4, is the way in which in this same phase the slots (3), provided on the transversal edges of the half-wings (4a) and (5a), come into contact with the respective pins (2c) at their upper ends.

It is underlined that the tilting of the inserts (4) and (5) in the opening and closing phases is determined by the sliding downwards or upwards of the maneuvering sliders (2), in consideration of the fact that the pins (2c) protruding from the lugs (2a) of the latter are matched with the oblique slots (3) of the inserts themselves.

The special "S" shape of the slots (3) prevents the accidental re-opening of the article, once it has been put in the closed position.

Also in order to prevent the accidental re-opening of the inserts (4) and (5), as an alternative or in combination with the slots (3), it is provided that the cuneiform teeth (2d) of the sliders (2) glide on a knurled surface on the inside of the vertical grooves of the double "T" uprights (1a).

In figures 1 and 3, the number 10 indicates a handle made up of two semi-cylindrical shells applied along the upper crosspiece (1b) of the portal structure (1).

From these same figures just mentioned, it is also possible to observe that the semi-cylindrical shells which make up said handle (10), have, at their internal face, several projections (10a) destined to be lodged within slots provided on the vertical wing of the double "T" section of the crosspiece (1b); said projections (10a) being provided to avoid the risk of sliding or rotation of the entire handle (10) with respect to the horizontal crosspiece (1b).

Claims

1. Foldable plastic crate for carrying and storing bottles in a tidy manner, of the type comprising two inserts one above the other (4) and (5) sustained within a portal bearing structure (1), of which the upper insert (4) is provided with a series of holes (4a) vertically aligned with a corresponding series of cavities (5a) present on the lower insert (5) -
 - crate characterised :
 - by the fact that the inserts (4) and (5) are made up of two pairs of rectangular half-wings (4b) and (5b) fixed to each other by means of three hinges (6), distributed along the symmetry axis of the two inserts (4) and (5) and which allow each pair of half-wings to open and close like a book;
 - by the fact that the portal structure (1) is stiffened by two crosspieces (1c) and (1d), one (1c) provided about halfway up the uprights (1a) of the portal structure (1), the other at the base;
 - by the fact that one of the half-wings of each pair has at the two ends of its internal longitudinal edge, fixing pins (9a), with the tip shaped like the mouth of a flute, lodged within corresponding holes (1f) on the internal faces of the uprights (1a) of the portal structure immediately above the stiffening crosspieces (1c) and (1d);
 - by the fact that along the external face of the two uprights (1a) of the portal structure (1) there are applied two boxed sliders (2), each of which has two identical pairs of lugs (2a) at the side with respective pins (2c) inside, inserted within corresponding "S" shaped slots (3) positioned on the transversal edges of the half-wings (4b) and (5b) of the inserts (4) and (5).
2. Foldable plastic crate for carrying and storing bottles in a tidy manner, according to the previous claim, characterised by the fact that the portal structure (1) and the stiffening crosspieces (1c) and (1d) have a double "T" transversal section; it being provided that these crosspieces (1c) and (1d) have a lower horizontal wing which is wider than the upper horizontal wing.
3. Foldable plastic crate for carrying and storing bottles in a tidy manner, according to the previous claim, characterised by the fact that the aforementioned hinges (6) for the fixing of each pair of half-wings (4b) and (5b) are made up of three forks (7), provided on the internal longitudinal edge of one half-wing, in cooperation with the same number of bolts (8) in a corresponding position on the internal longitudinal edge of the other half-wing; it being provided that each fork (7) be made up of a pair of fins with a semi-circular upper section, which are provided on their internal face, with respective pins on the horizontal axis (7a), with the tip shaped like the mouth of a flute, inserted within the holes (8a) of the corresponding "U" bolt (8), which is also provided with a semi-cylindrical upper section.
4. Foldable plastic crate for carrying and storing bottles in a tidy manner, according to claim 1, characterised by the fact that the pins (9a) for the fixing of the inserts (4) and (5) to the uprights (1a) of the portal structure (1) protrude from the external face of the lugs (9), elastically flexible, at the two ends of the internal longitudinal edge of the half-wings provided with the aforementioned forks (7).
5. Foldable plastic crate for carrying and storing bottles in a tidy manner, according to claim 1), characterised by the fact that the maneuvering sliders (2) have a "C" transversal section which allows them to precisely embrace from the outside the double "T" section of the uprights (1a); said sliders (2) are firmly blocked due to the fact that there are provided cuneiform holes (2d) on the internal face of their opposite edges, which are blocked within the vertical grooves of the uprights (1a).
6. Foldable plastic crate for carrying and storing bottles in a tidy manner, according to claim 1), characterised by the fact that the sliders (2) have a gripping nib (2b) at the top, below a counter-nib (1e) made in moulding on the external side of the uprights (1a) of the portal structure (1).
7. Foldable plastic crate for carrying and storing bottles in a tidy manner, according to claim 1, characterised by the fact that the internal edge of the holes (4a) of the upper insert (4) and the edges of the cavities (5a) of the insert (5) are flared.
8. Foldable plastic crate for carrying and storing bottles in a tidy manner, according to claim 1), characterised by the fact that along the crosspiece (1b) of the portal structure (1) there is applied a handle (10), made up of two semi-cylindrical shells with internal projections (10a)

destined to be lodged within slots provided on the vertical wing of the double "T" section of the crosspiece (1b).

9. Foldable plastic crate for carrying and storing bottles in a tidy manner, according to claim 1), characterised by the fact that the cuneiform teeth (2d) of the sliders (2) glide on a knurled surface inside the vertical grooves of the up-rights (1a) of the portal structure (1).

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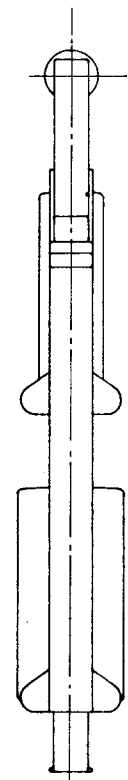
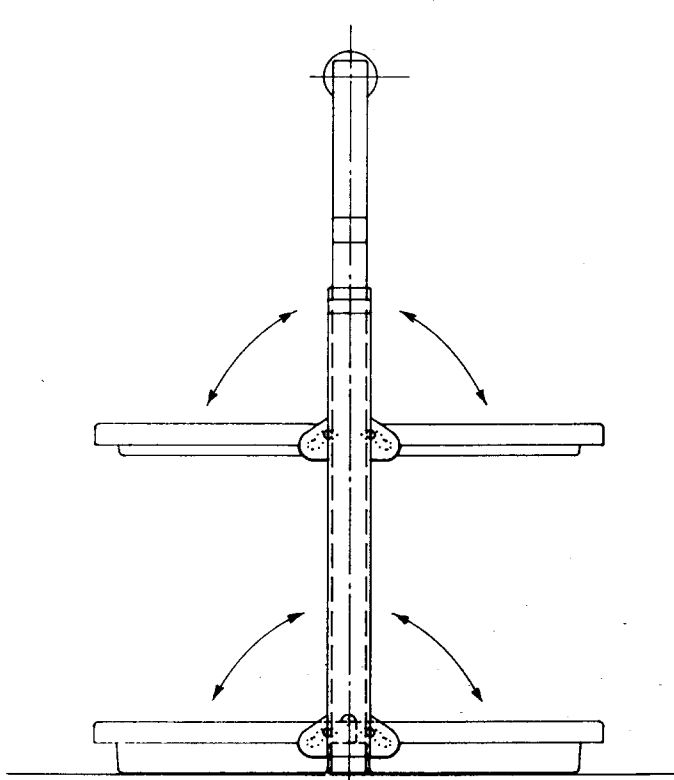
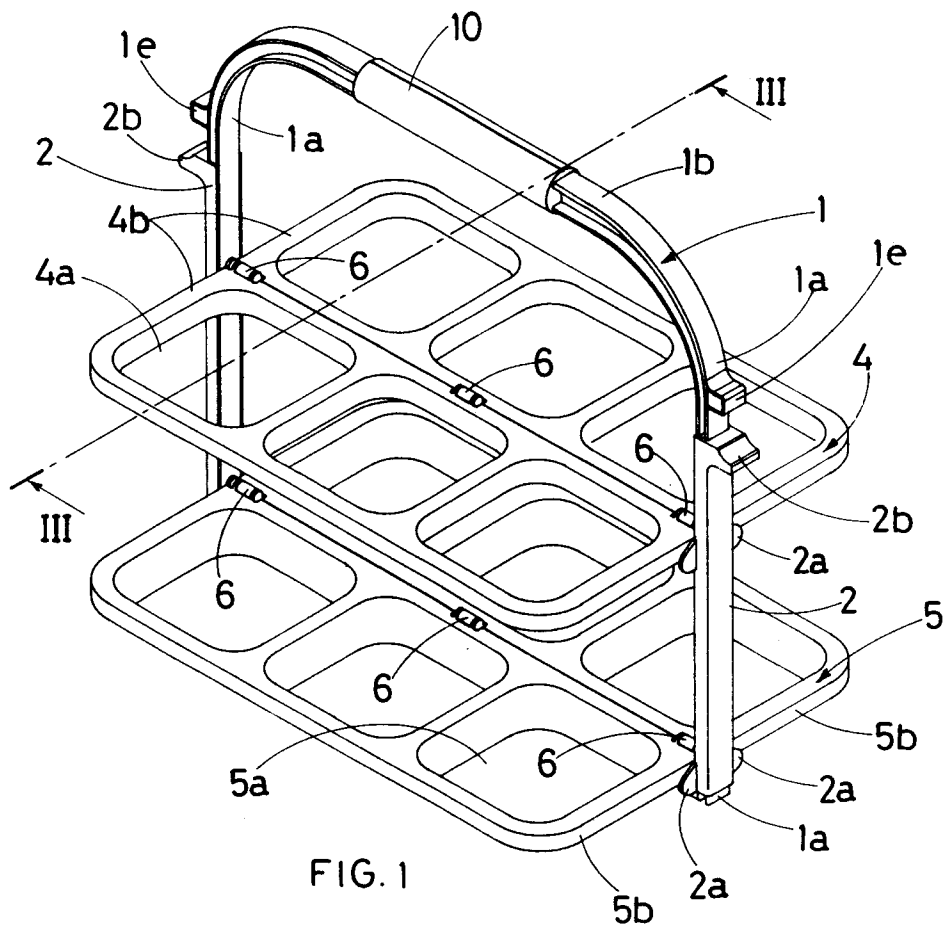
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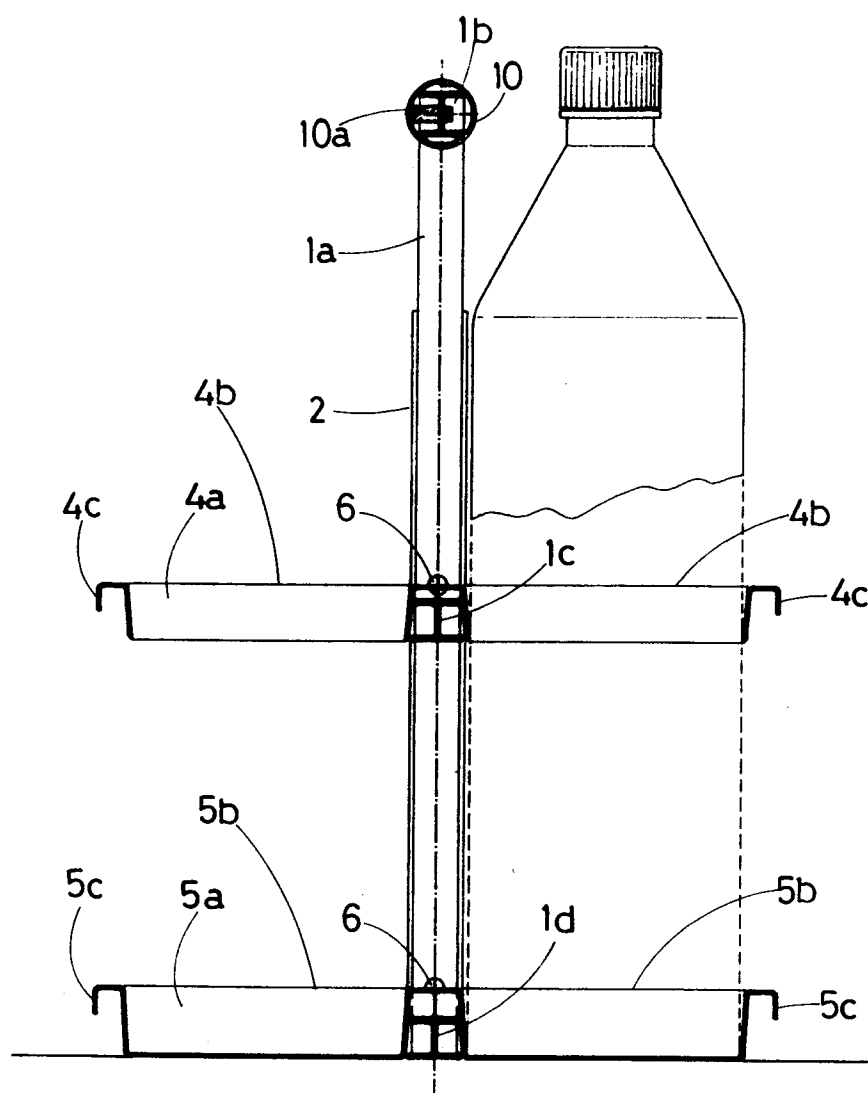


FIG. 3

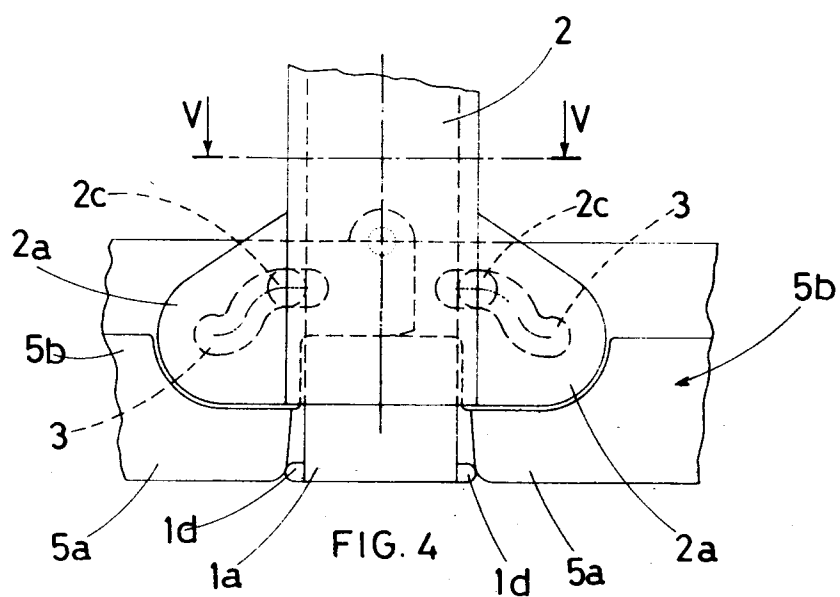


FIG. 4

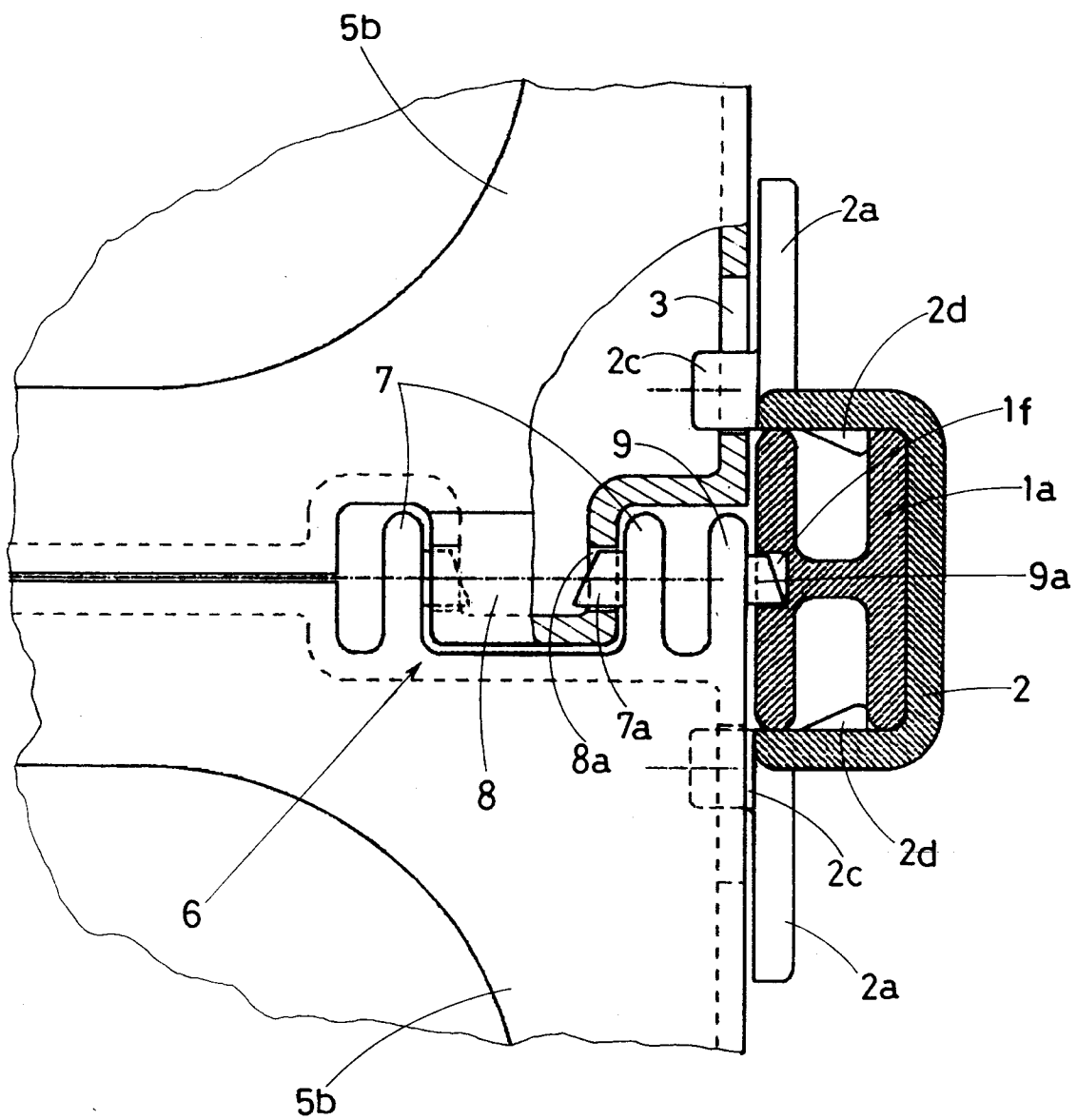


FIG. 5



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EUROPEAN SEARCH REPORT

Application Number
EP 94 83 0009

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
A	FR-A-2 481 232 (M.EVENO) * the whole document * ---	1	B65D71/00
A	US-A-2 510 591 (A.F.LISTMAN) * the whole document * -----	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			B65D A47G
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 17 May 1994	Examiner Zanghi, A
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