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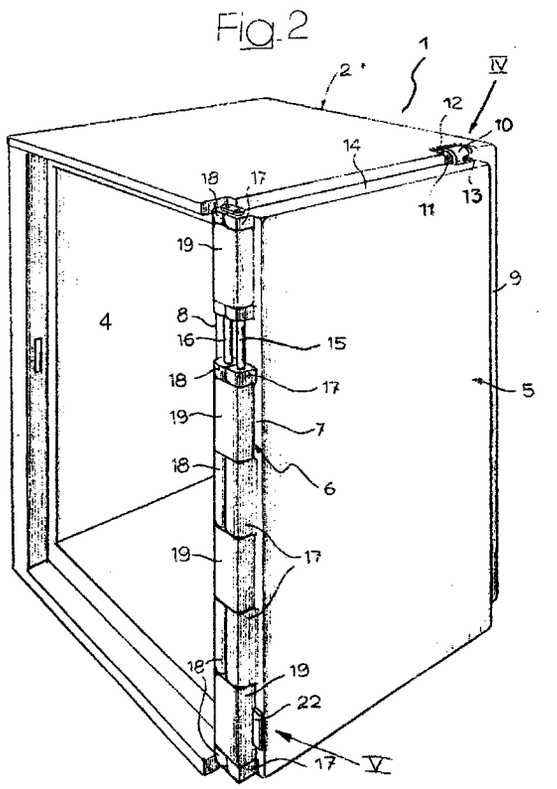
(54) Isothermal container having a double-hinged door

(57) Isothermal container (1) having a door (5) pivoted to the body (2) of the container through a double hinge (6) comprising a first and a second hinge pin (15,16) fitted across spaced-apart hinge lugs (17,18) respectively fixed to the door (5) and to the body (2) of the container. Intermediate link members (19) are interposed between the first and second hinge lugs (17,18), interconnecting the first and the second hinge pins (15,16). The two hinge pins (15,16) are rigidly connected to each other at the respective ends (15a, 15b, 16a, 16b).

Fig.2



EP 0 801 197 A1

Description

The present invention is related to isothermal containers, i.e. having a structure made of a thermally-insulating material, adapted for transportation of perishable foodstuffs for instance from the production or storage plants where the foodstuffs are preserved at low temperature, to the distribution locations.

More particularly, the invention refers to an isothermal container comprising a body having an aperture and a door having one side pivoted to a vertical edge of the aperture of the body through of a double hinge, wherein this double hinge comprises a first hinge pin fitted across first spaced-apart hinge lugs fixed to the door, a second hinge pin parallel to the first hinge pin and fitted across second spaced-apart hinge lugs fixed to the body, and intermediate link members formed as double sleeves interconnecting said first and second hinge pins between said first and said second hinge lugs.

An isothermal container of the above-referenced type is known, for instance, from French Patent FR-2.699.587, wherein the door is enabled to swing through 270º from the closed position, so as to be located against and parallelly to one side wall of the body.

The containers of this type involve a problem consisting of that, on one hand owing to clearance between the two hinge pins and the respective hinge lugs which are necessary so as to allow mutual pivoting thereof, and on the other hand due to deformations of the intermediate link members, during opening and closing rotations the door may be subject to downward yelding deriving from the double hinge being out of alignment with respect to a vertical line. As a consequence, the closing operation of the door may be difficult.

In order to avoid this problem, the already cited document FR-2.699.587 provides that the intermediate link members have a longer axial size and that the ends of the hinge pin carried by the door, projecting beyond the corresponding upper and lower hinge lugs, are guided by ramps formed at the ends of the vertical edge of the body aperture.

This arrangement has a relatively complicated construction and further may even become ineffective following repeated opening and closure strokes of the door, should the guide ramps of the ends of the door hinge pin be worn.

The object of the present invention is to give a solution to the above-referenced problem in a constructively more simple and functionally more reliable way.

According to the invention, this object is achieved essentially by virtue of the fact that the first and the second hinge pins are rigidly connected to each other.

By virtue of this idea of solution, the double hinge is provided with a relatively stiff structure with respect to twisting and bending strains, which ensures proper stability of the door during swinging thereof, thus avoiding any trouble during closing operation.

According to a particularly simple, and thus preferred embodiment, the invention provides a pair of end plates to which the upper and lower ends of the first and second hinge pins are rigidly secured.

According to another aspect of the invention, between the lowermost intermediate link member and the hinged side of the door a mutual abutment member is provided, which is operative during the closure phase of the door so as to ensure resetting of the correct position of the double hinge in the closed condition of the door.

This abutment member is advantageously constituted by a shim projecting from the hinged side of the door.

According to a further advantageous feature of the invention, the container further comprises an anchoring device between the body of the container and the door to lock the latter in its fully open condition. This anchoring device may be comprised of a hook member rotatably carried by a support bar arranged in correspondence of a lateral recess of the container body and adapted to engage a corresponding seat formed on the upper side of the door.

The invention will now be disclosed in detail with reference to the accompanying drawings, purely provided by way of non-limiting example, in which:

- figure 1 is a diagrammatic perspective view of an isothermal container according to the invention, with the door shown in the closed position,
- figure 2 is a view same as figure 1, with the container door shown in a fully open position,
- figure 3 is a perspective view showing in detail the double hinge pin of the container,
- figure 4 shows in an enlarged scale the detail indicated by arrow IV in figure 2,
- figure 5 shows in an enlarged scale the detail indicated by arrow V in figure 2,
- figure 6 is a diagrammatic, simplified and reduced view along line VI-VI of figure 1,
- figures 7,8,9 and 10 are diagrammatic views same as figure 6, showing successive phases during opening of the door, and
- figure 11 shows in an enlarged scale a portion of figure 8.

Referring initially to figure 1 and 2, reference numeral 1 generally designates an isothermal container according to the invention, formed by a body 2 having a generally parallelepipedal shape, equipped with castor wheels 3 and having a front aperture 4 to which a swinging door 5 is associated. The body 2 and the door 5 have both conveniently a moulded plastic material hollow structure filled with a thermally insulating material.

Swinging of the door 5 relative to the body 1 is performed by means of a double hinge, generally designated as 6, through which a vertical side 7 of the door 5 is pivoted to the corresponding vertical edge 8 of the aperture 4.

The double hinge 6 allows the door 5 to swing

between the closed position depicted in figure 1 and the fully open position shown in figure 2, through an angular extent of 270º. In the closed position, the door 5 is locked relative to the body 2 by means of a manually operable latching system, generally designated as 8, arranged on the side opposite to the double hinge 6. In the fully open position, the door 5 is positioned parallelly to a lateral wall 9 of the body 2, and is maintained thereagainst by means of a hook member 10, shown in better detail in figure 4. The hook member 10 is rotatably carried by a horizontal bar 11 arranged in correspondence of a lateral upper recess 12 of the body 2, between an inoperative raised position (shown with dotted lines in figure 4) and a raised position in which it is engaged into a corresponding seat 13 formed at the upper side 14 of the door 5. The hook member 10 can be positioned in an inoperative condition even in the raised position shown in figure 1. In any case, in the inoperative condition it does not generally projects beyond the outline of the container 1.

The double hinge 6 comprises a pair of adjacent vertical rods, shown in detail in figure 3, defining a first hinge pin 15 and a second hinge pin 16. The first hinge pin 15 is rotatably fitted across first spaced-apart hinge lugs 17 which are fixed to (and normally formed integrally with) the side 7 of the door 5, and the second hinge pin 16 is rotatably fitted across spaced-apart hinge lugs 18 which are fixed to (and normally formed integrally with) the edge 8 of the aperture 4. Between each pair of hinge lugs 17,18 an intermediate articulation link member 19 is arranged, which is formed as a double sleeve normally made of moulded plastic material, vertically passed across by the two hinge pins 15,16.

According to the fundamental feature of the invention, the two hinge pins 15,16 are rigidly connected to each other, normally by means of a pair of end transverse plates 20 to which the upper ends 15a, 16a, and the lower ends 15b, 16b of the hinge pins 15 and 16, respectively, are fixed. In the case of the shown example, this fixed connection is carried out by means of transverse pegs 21. As an alternative, rigid connection might be performed by bonding or any other equivalent system.

With this arrangement, the double hinge 6 is provided with a high twisting and bending rigidity which prevents, during swinging of the door 5 and particularly upon closing thereof, its tendency to lean downwardly. Thus, when the door 5 is being closed any possible difficulty is avoided.

According to another aspect of the invention, in the lower area of the side 7 of the door 5, in correspondence of the lowermost link member 19, a shim 22 is arranged which may also be formed integrally. The shim 22, shown in detail in figure 5, constitutes an abutment member whose function is to ensure proper positioning of the double hinge 6 when the door 5 is being closed. This effect will be explained in detail with reference to the diagrams of figure 6 through 10 and 11, showing in a simplified way the opening/closing sequence of the door 5. In detail, figure 6 shows the fully closed condition of the door 5, figure 7 depicts the beginning of the opening phase, figure 8 depicts opening at 90º, figure 9 shows opening at 180º and figure 10 shows full opening at 270º of the door 5. In the opposite direction, starting from the fully open condition of figure 10, the door 5 is angularly displaced towards the opened position at 180º of figure 9 through rotation thereof about the hinge pin 15. During this phase, the shim 22 performs no task.

Then, displacement from the open position at 180º of figure 9 to the open position at 90º of figure 8 is also carried out following swinging of the door 5 about the hinge pin 15. In the open position at 90º of figure 8, the shim 22 comes into contact with the lowermost link member 19, such as depicted in better detail in figure 11, whereby starting from this position the further closing rotation of the door 5 takes place also about the hinge pin 16. In the final closing phase, from the position of figure 7 to the position of figure 6, the door 5 is maintained in the correct position by combined rotations thereof about the hinge pins 15 and 16. In the closed condition of the door 5, the proper position of the double hinge 6 is reset by means of the shim 22.

Naturally, the details of construction and the embodiment may be widely varied with respect to what has been disclosed and illustrated, without thereby departing from the scope of the present invention, such as defined in the appended claims.

Claims

1. Isothermal container (1) comprising a body (2) having an aperture (4) and a door (5) having one side (7) pivoted to a vertical edge (8) of the aperture (4) of the body (2) through a double hinge (6), wherein the double hinge (6) comprises a first hinge pin (15) fitted across first spaced-apart hinge lugs (17) fixed to the door, a second hinge pin (16) parallel to said first hinge pin (15) and fitted across second spaced-apart hinge lugs (18) fixed to the body (2), and intermediate link members formed as double sleeves (19) interconnecting said first and second hinge pins (15,16) between said first and second hinge lugs (17,18), characterised in that said first and second hinge pins (15,16) are rigidly connected to each other.

2. Isothermal container according to claim 1, characterised in that it comprises a pair of end plates (20) to which the upper and lower ends (15a, 16a, 15b, 16b) of said first and second hinge pins (15,16) are rigidly secured.

3. Isothermal container according to claim 1, characterised in that a mutual abutment member (22) is provided between the lowermost intermediate link member (19) and said side (7) of the door (5), which is operative during the closing phase of the door (5)

so as to ensure resetting of the correct position of said double hinge (6) in the closed condition of the door (5).

4. Isothermal container according to claim 1, characterised in that said abutment member is formed by a shim (22) projecting from said side (7) of the door (5).

5. Isothermal container according to one or more of the preceding claims, characterised in that it further comprises an anchoring device (10) between the body (2) of the container (1) and the door (5) to lock said door (5) in its fully open condition.

6. Isothermal container according to claim 5, characterised in that said anchoring device is formed by a hook member (10) rotatably carried by a support bar (11) arranged in correspondence of a lateral recess (12) of the body (2) of the container (1) and adapted to engage a corresponding seat (13) formed on the upper side (14) of the door (5).

Fig. 1

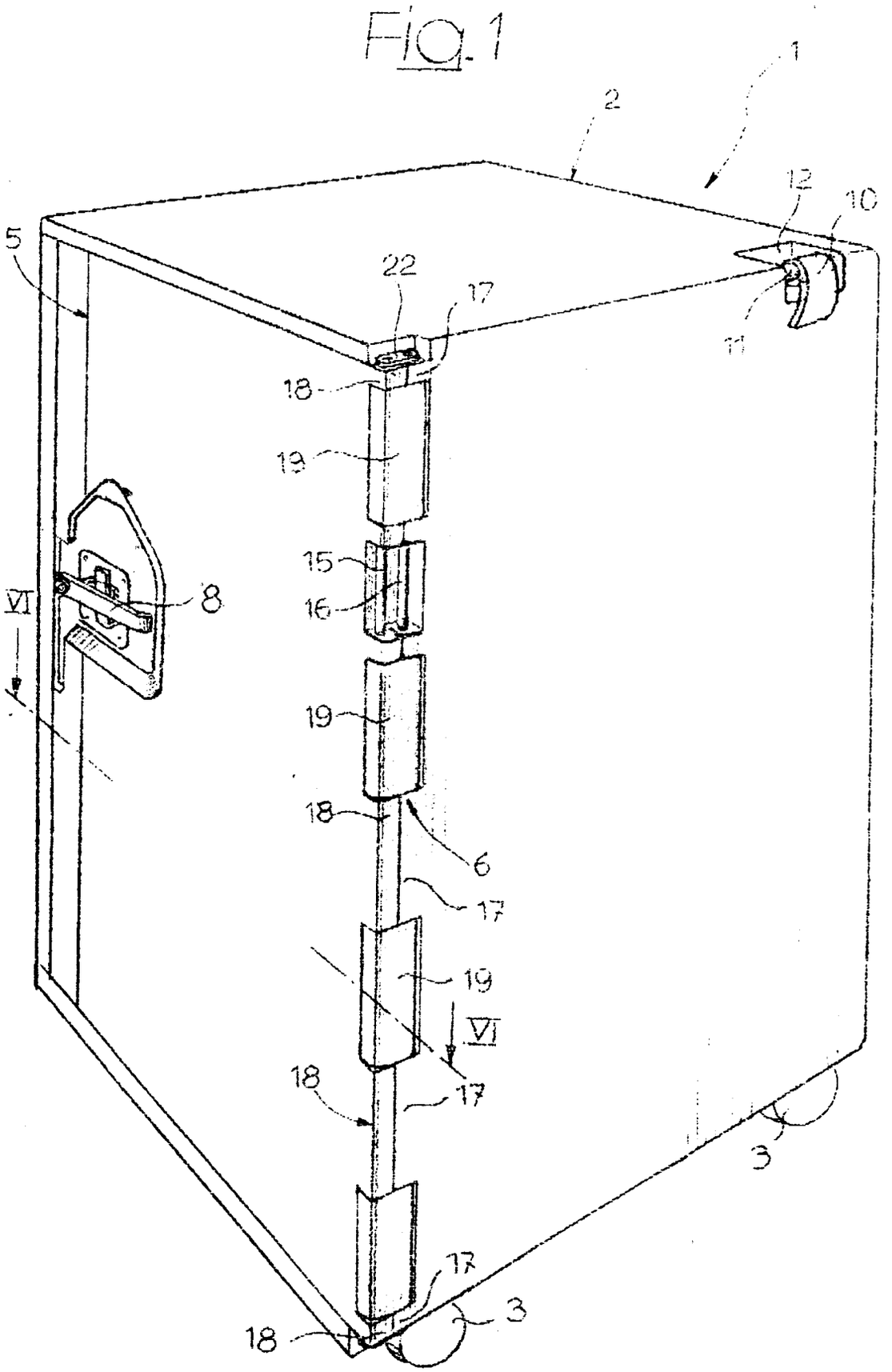


Fig.2

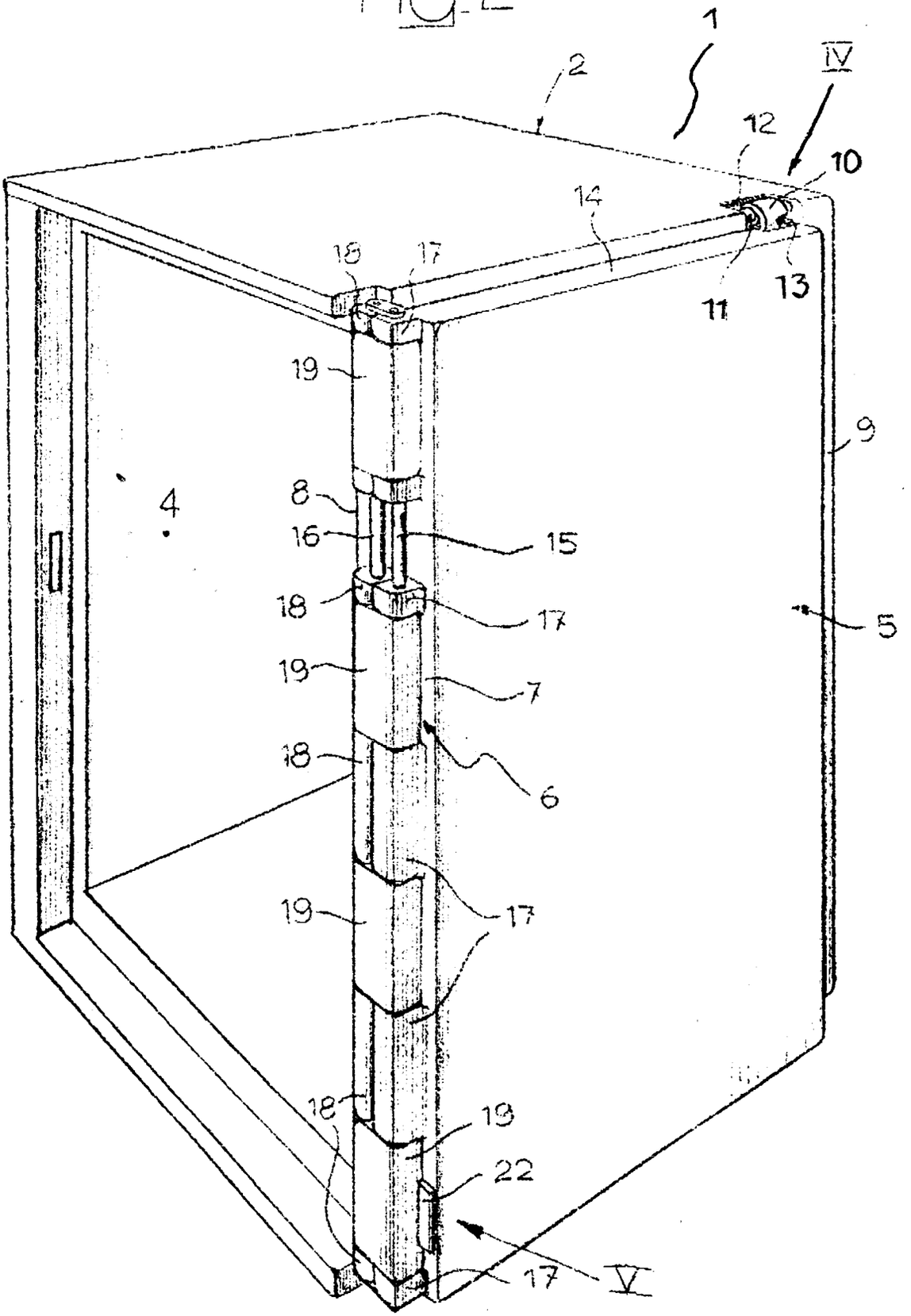

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Fig. 3

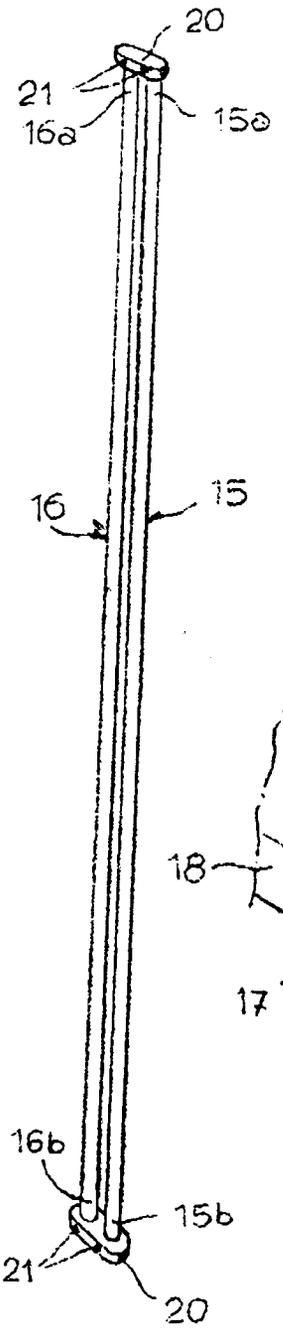
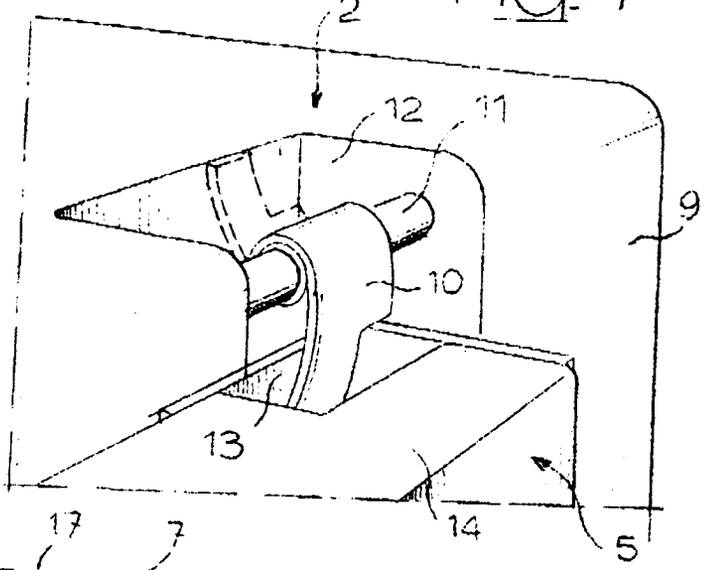


Fig. 4



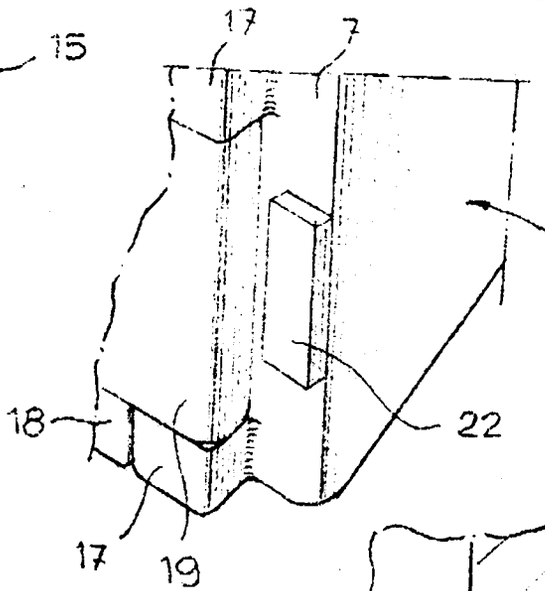


Fig. 5

Fig. 11

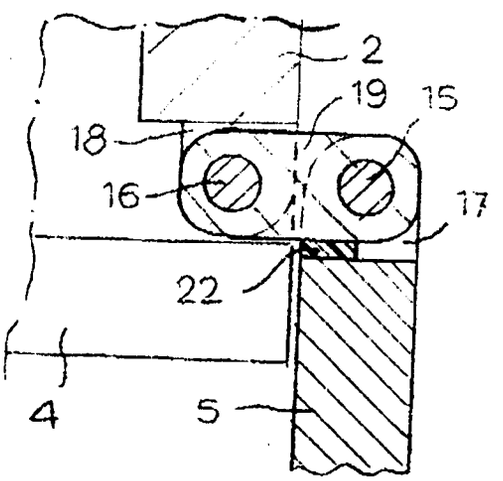


Fig. 6

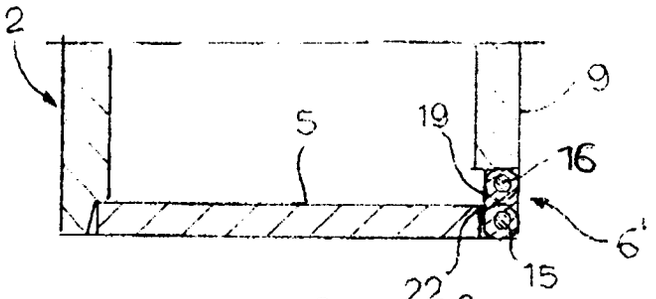


Fig. 7

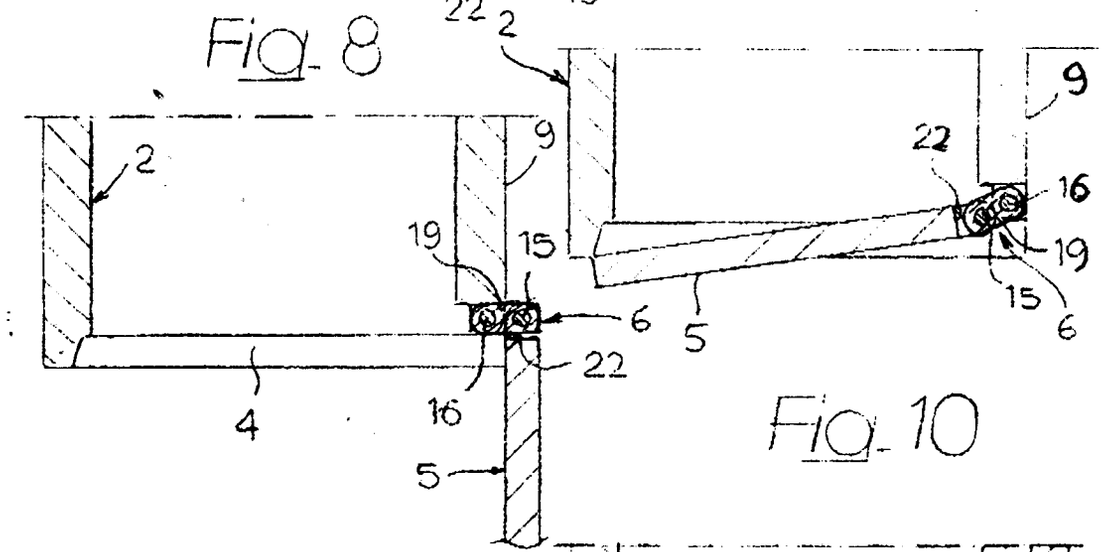


Fig. 8

Fig. 10

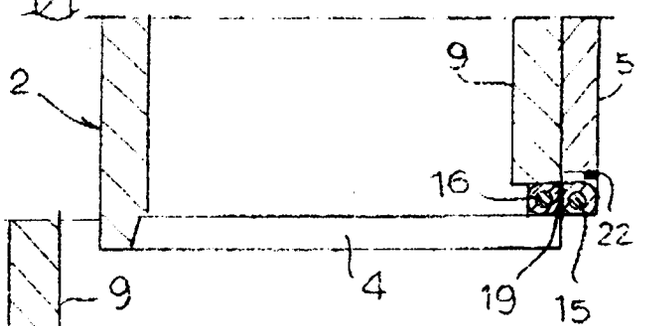
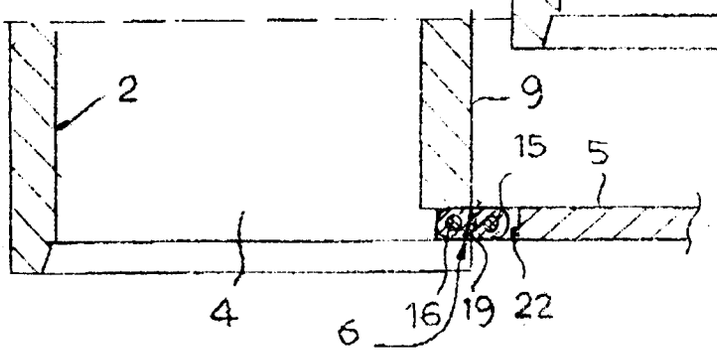


Fig. 9



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EUROPEAN SEARCH REPORT

Application Number
EP 96 83 0198

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.6)
D,Y	FR-A-2 699 587 (OLIVO) * the whole document * ---	1,2	E05D3/06 A47B31/06
Y A	DE-B-10 23 990 (APPRICH ET AL) * the whole document * ---	1,2 3	
Y	EP-A-0 330 056 (ROMAY AG) * the whole document * ---	1,3	
Y	FR-A-2 649 438 (PINET S.A.) * page 2, line 15 - page 3, line 8 * * page 4, line 1 - line 7; figures 1-5 * -----	1,3	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)
E05D A47B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	27 August 1996	Van Kessel, J

CATEGORY OF CITED DOCUMENTS

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