



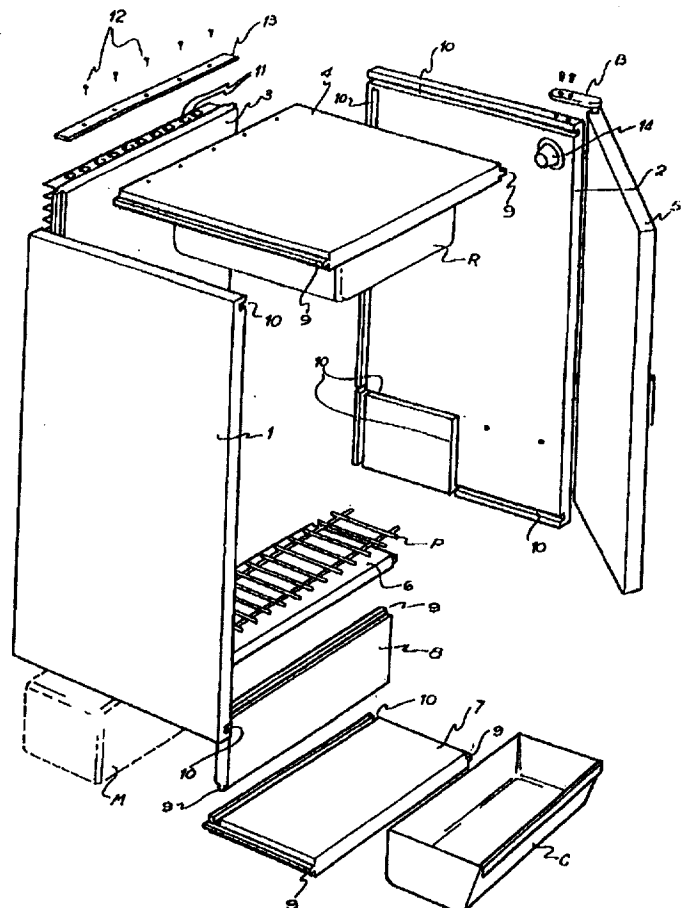
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: PCT/US97/13204</p> <p>(22) International Filing Date: 25 July 1997 (25.07.97)</p> <p>(30) Priority Data: 24.295                      25 July 1996 (25.07.96)                      UY</p> <p>(71)(72) Applicants and Inventors: GOLUBOFF, Miguel, Eduardo, Kuhn [US/US]; Apartment 409, Borton Way, Los Angeles, CA 90048 (US). KAPLAN, Ricardo, Gabriel [UY/UY]; Solano Antuna 2726, Piso 4, Dto. 401, Montevideo (UY).</p> <p>(74) Agents: LUDWIG, S., Peter et al.; Darby &amp; Darby P.C., 805 Third Avenue, New York, NY 10022 (US).</p>		<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p><b>Published</b> <i>With international search report.</i></p>

(54) Title: CABINET KIT FOR REFRIGERATOR AND/OR FREEZER

(57) Abstract

A refrigerator having insulated side (1, 2), back (3) and top (4) walls, a door (5) and an insulated multilevel floor (6-8), the walls (1-4) and floor (6-8) being attached together via assembled joints (9, 10).



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## CABINET KIT FOR REFRIGERATOR AND/OR FREEZER

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The patent covered by this application for registration relates to a **cabinet kit for refrigerator and/or freezer**, having a special means whereby its component panels can be assembled and the cabinet can be knocked down for transportation and storage, with the added benefit that it can be enlarged, and worn-out parts can be replaced on-

10 site.

Household appliances of the type described above are difficult to handle during shipping, given their size, and the amount of space they take up in cargo vehicles reduces the capacity of such vehicles, thus increasing shipping costs.

15

Likewise, factories and retailers have to set aside a great deal of space for inventory storage, and repairs involving worn-out cabinets must be carried out in locations properly equipped to replace the entire cabinet, which must therefore be shipped.

20

When these products are exported, manufacturers normally choose to ship refrigerators and freezers with their cabinets assembled and the cooling elements broken down for assembly, for the reasons set forth above and to reduce the cost of tariffs often imposed on finished products by the countries of destination to protect

25 their domestic industries, sometimes introducing low ceilings on imports or even banning them altogether.

As a result of these foreign trade requirements, manufacturers seeking to export to a number of markets must set up assembly plants in the various countries. Given the

30 current state of the art, such plants are complicated facilities where a large percentage of the total product must be manufactured, resulting in a more expensive final product.

shipability of the household appliances under consideration, with the added benefit of doing away with the costly and oversized cabinet framework by means of a modular joint whereby the cabinet can be assembled, resulting in an efficient final product that can be modified using easily interchangeable parts.

5

In a preferred embodiment of the invention, the cabinet is made up of flat modular panels that can be utilized in more than one model, consisting of inner and outer sheet metal or plastic walls or combinations thereof, injected with an insulating material, such as polyurethane, and folded at the edges to couple with sets of  
10 interlocking elements with male or female cross-sections, depending on their position, which slide axially and fit tightly together to prevent cold from escaping, to form corner or coplanar joints as required for assembly.

The design of such interlocking elements can involve transversely clamping  
15 socket joints or, simply, sliding channels fastened in place using screws, rivets or a suitable adhesive.

Panels incorporating such design can be classified into two groups: simple wall components and containers for pre-incorporated functional elements, such as control  
20 mechanisms, control knobs, exhaust lines or cable conduits, condensation tubes, latches and so on.

These cabinets can accommodate all the internal add-ons like trays, containers, shelves, door shelves and so on, held in place using conventional means. Doors are  
25 attached using hinges fastened to the edges of the compartment opening, the top of the compartment, or, ideally, to a better-reinforced transverse bar supporting frame on the front of the compartment.

The benefits outlined above can be illustrated, and the structural and functional  
30 features of the **cabinet kit for refrigerator and/or freezer** covered by this patent can be better understood, by means of the following description of a preferred and alternative embodiments of the invention, in which the panels that are fitted together are not shown to any specific scale, and which are presented for illustrative purposes only.

Figure 1 is a perspective view of a basic refrigerator cabinet.

Figure 2 is an exploded perspective view of the cabinet shown in Figure 1.

5        Figure 3 shows a cross-section of the cabinet along plane A, as shown in Figure 1.

Figure 4 is a cross-sectional detail of a corner joint.

10       Figure 5 is the same view as in Figure 4, but of a coplanar joint.

Figure 6 shows the same joint as shown in Figure 4, but with a different cross-section.

15       Figure 7 shows a coplanar joint with the same cross-section as shown in Figure 6.

Figure 8 is the same view as in Figures 4 and 6, but showing a rectangular cross-section.

20       Figure 9 shows a joint with a lengthwise wedge-shaped cross-section.

Figure 10 illustrates a basic cabinet expanded vertically.

25       Figure 11 illustrates a basic cabinet expanded horizontally.

The same references are used in the different figures to designate the same or equivalent parts or structural elements of the unit chosen as an example for this description.

30       Figure 1 shows a finished version of a basic cabinet in the shape of a parallelepiped, of which Figure 2 provides an exploded view, showing its side walls 1 and 2, back 3, top 4, door 5 and multi-level floor consisting of two horizontal sections

6 and 7, and one vertical section 8, for housing the motor-driven compressor M on the lower level. A metal shelf P, a container C and the freezer R are also shown.

The assembly joints of the panels shown have male 9 and female 10 cross-  
5 sections, which slide together axially, tightly enough to prevent cold from escaping.

The Figure also shows how the back 3 of the compartment, which is provided with condensation tubes 11 on the outside, locks together with the top 4 of the compartment with the aid of screws 12 and is sealed using the seam 13, since this  
10 cannot be a sliding joint.

The side wall 2 in this embodiment, like the back of the compartment described above, is representative of the type of panel that contains pre-incorporated functional elements: in this case the control mechanism with its visible control knob 14.  
15

Finally, Figure 2 shows an option for a hinge B attached to the upper edge of the door 5, on which it pivots.

Once the panels have been joined together along their interlocking edges and  
20 the latch assembly has been attached, the cabinet stands is as shown in the cross-section in Figure 3, taken along plane A in Figure 1.

Figure 3 shows the joints of the multi-level floor, which are formed transversely along the secant plane, with the components in place and identified by  
25 their references.

The cross-sectional detail in Figure 4 shows a corner joint of two panels made up of insulating material 15 injected between the walls 16, with dovetail tenon joint cross-sections forming a single piece with the edges of such walls. The male 9 and  
30 female 10 elements of the joint fit tightly together.

The joint shown in Figure 5, which in this case is coplanar, is made in the same way and used to extend panels for the purpose of enlarging the cabinets.

Figures 6 and 7 show joint shapes equivalent to the ones shown in Figures 4 and 5, respectively, with triangular cross-sectional joint elements, selected from among many other possible cross-sections.

5 Figure 8, by contrast, illustrates double rectangular cross-sections that can be withdrawn transversely, for which reason they must be fastened in place using a screw 17 for assembly.

Options include, but are not limited to, giving the joint cross-sections a  
10 lengthwise wedge shape to increase tightness as the piece moves axially, as shown in Figure 9.

Finally, Figure 10 illustrates a cabinet 18 that has been expanded upward by section 18'; while Figure 11 illustrates expansion to the side.

15

Various alterations and combinations can be introduced in the embodiment of the cabinet kit for refrigerators described and illustrated herein. All such alterations and combinations must be considered alternative embodiments falling within the scope of this patent, the core of which is given by the following claims.

20

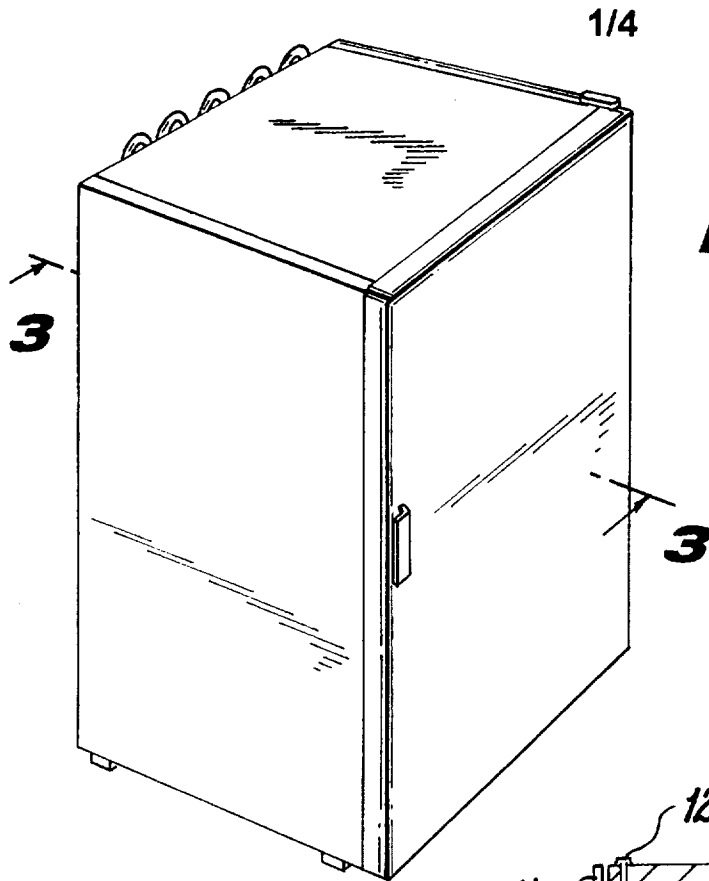
## C L A I M S

1. A cabinet kit for refrigerator and/or freezer, wherein the walls of such cabinet are panels consisting of thermal insulating material injected between two rigid  
5 plates, the edges of which are sealed by interlocking elements, and such interlocking elements form male-female joints on either edge of two panels assembled at an angle; and the door of such cabinet consists of a panel attached using any hinge means.

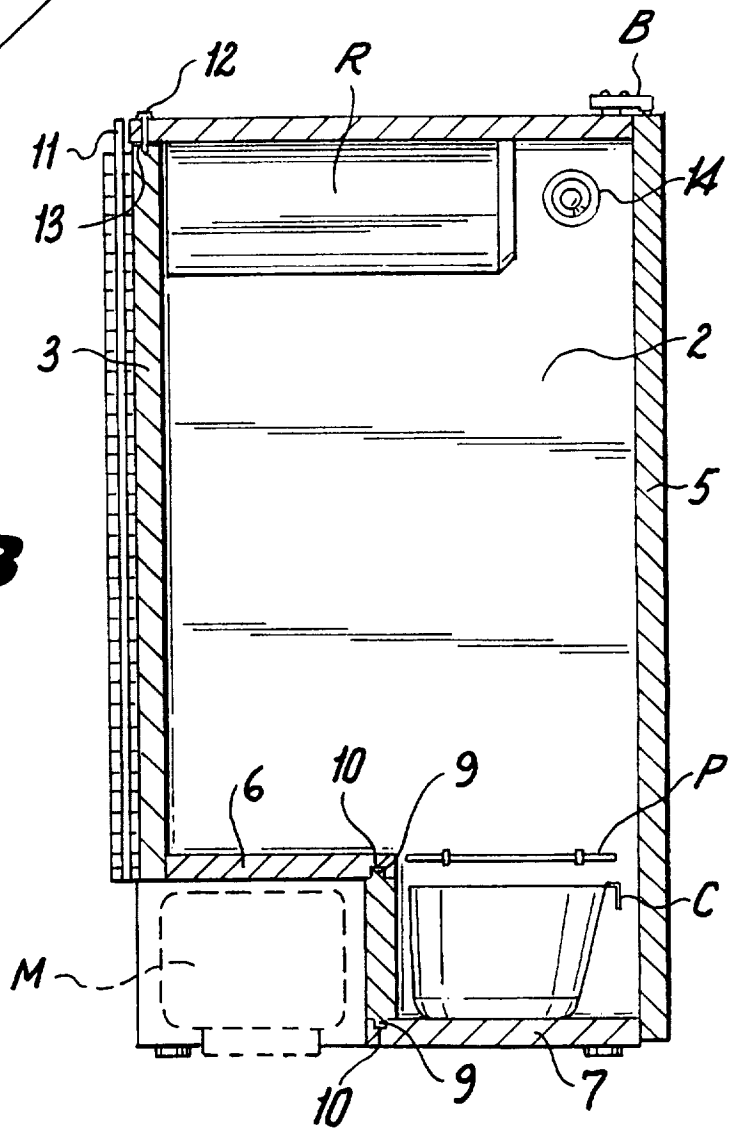
2. A cabinet kit for refrigerator and/or freezer as claimed in claim 1, having  
10 male-female interlocking elements along the edge of two panels assembled in the same plane.

3. A cabinet kit for refrigerator and/or freezer as claimed in claims 1 and 2, having mechanical and/or electrical devices inside its walls.

15 4. A cabinet kit for refrigerator and/or freezer as claimed in any of the foregoing claims, wherein both interlocking elements (male and female) have a matching lengthwise wedge shape.

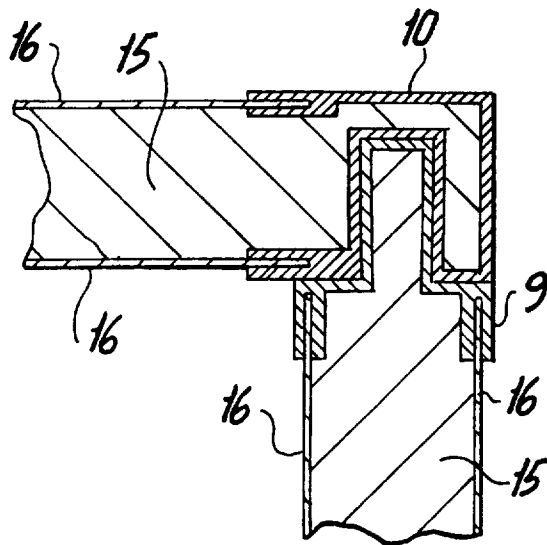


**Fig. 1**

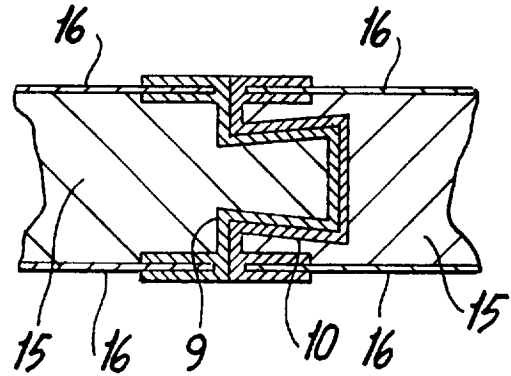


**Fig. 3**

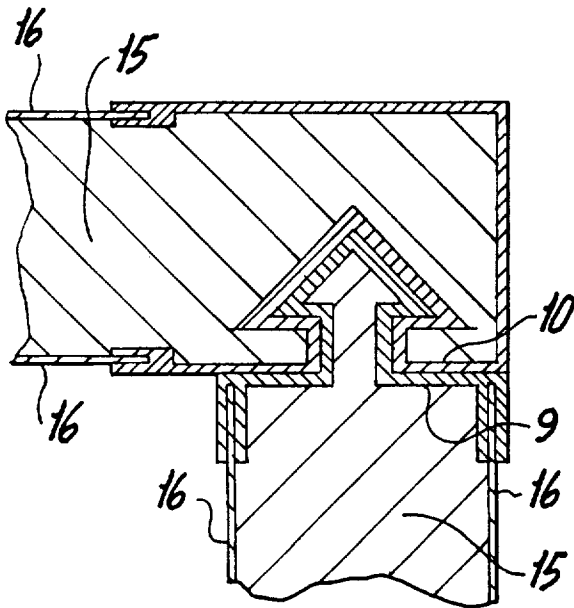




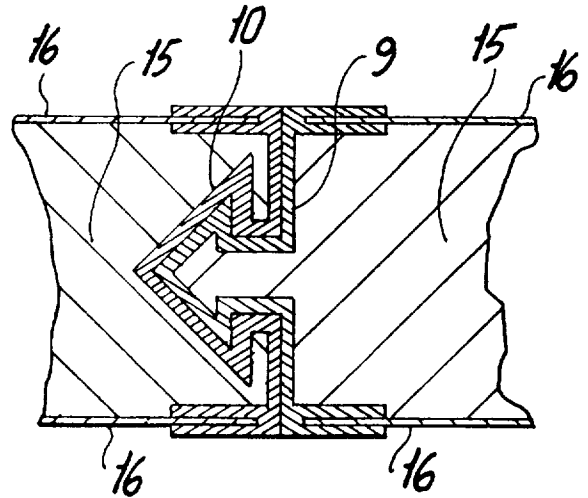
**Fig. 4**



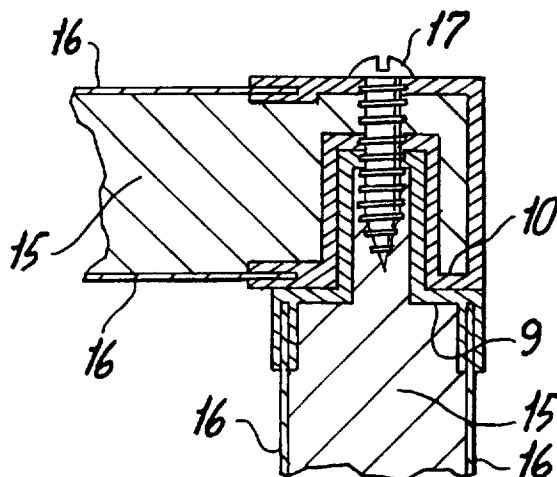
**Fig. 5**



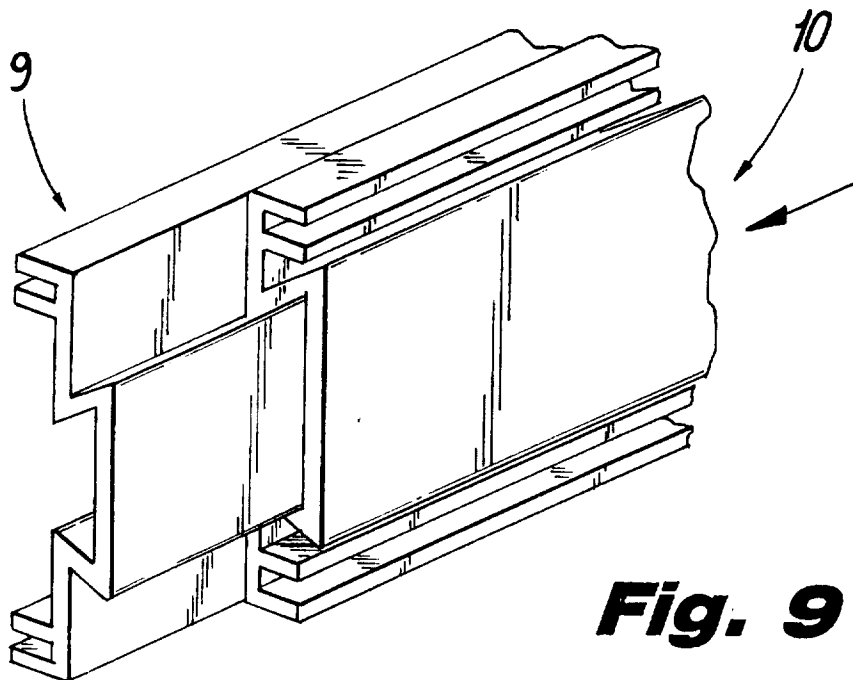
**Fig. 6**



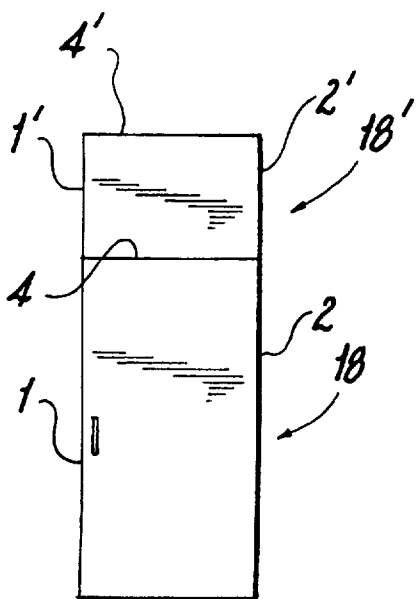
**Fig. 7**



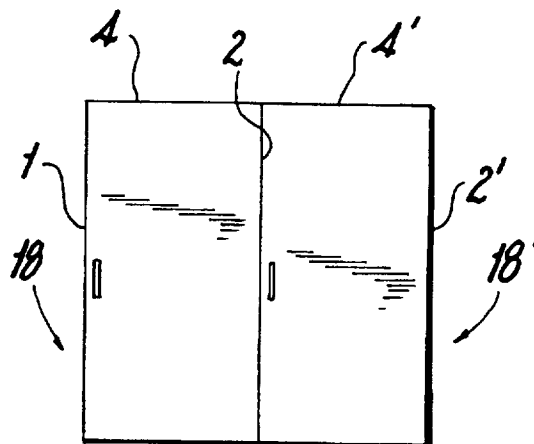
**Fig. 8**



**Fig. 9**



**Fig. 10**



**Fig. 11**

INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US97/13204

**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC(6) :F25D 11/00  
 US CL :312/263, 401, 406.2; 403/231, 381; 220/467  
 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)  
 U.S. : 312/263, 265.5, 401, 405, 406, 406.2; 403/231, 381, 382, 401; 220/420, 421, 467

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

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X ----- Y	US 2,535,682 A (JONES) 26 December 1950 (26/12/50), entire document.	1, 3 ----- 2, 4
Y	US 3,547,472 A (EHRMAN) 15 December 1970 (15/12/70), entire document.	4
Y	US 5,247,773 A (WEIR) 28 September 1993 (28/12/93), entire document.	2
A	US 4,125,301 A (QUY PHAN) 14 November 1978 (14/11/78), entire document.	2
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Further documents are listed in the continuation of Box C.  See patent family annex.

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