



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication: **14.11.2001 Bulletin 2001/46** (51) Int Cl.7: **F25D 25/02, A47B 96/02**

(21) Application number: **01110956.8**

(22) Date of filing: **07.05.2001**

(84) Designated Contracting States:  
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU  
 MC NL PT SE TR**  
 Designated Extension States:  
**AL LT LV MK RO SI**

- **Ansaldo Andrea, c/o Whirlpool Europe S.r.l. 21025 Comerio (IT)**
- **Stroppari Massimo, c/o Whirlpool Europe S.r.l. 21025 Comerio (IT)**

(30) Priority: **10.05.2000 IT MI000287 U**

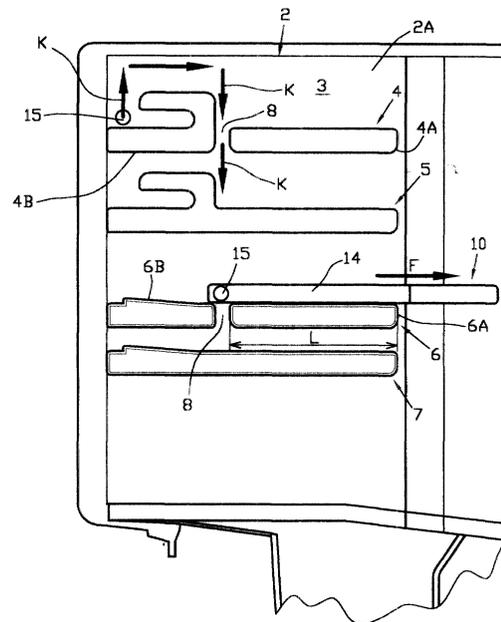
(74) Representative: **Guerci, Alessandro**  
**Whirlpool Europe S.r.l.**  
**Patent Department**  
**Viale G. Borghi 27**  
**21025 Comerio (VA) (IT)**

(71) Applicant: **WHIRLPOOL CORPORATION**  
**Benton Harbor Michigan 49022 (US)**

(72) Inventors:  
 • **Pelizzari, Armando, c/o Whirlpool Europe S.r.l. 21025 Comerio (IT)**

(54) **Refrigerator with movable shelves**

(57) A refrigerator with the cell defining the preservation compartment obtained by vacuum-forming and presenting co-formed projecting supports for shelves, presenting at least one pair of projecting supports (4; 6) which mutually cooperate to support a shelf (10, 11) and present an interruption (8) which divides each support (4; 6) into two parts (4a, 4b, 6a, 6b), the shelf (10; 11) presenting terminal appendices (15) arranged to pass through said interruption (8), and recesses (14, 14') arranged to bypass one (4a, 6a) of said parts without interference therewith (Figure 1).



**FIG. 1**

## Description

**[0001]** This invention relates to a refrigerator with the cell defining the preservation compartment obtained by vacuum-forming, and presenting co-formed projecting supports for shelves.

**[0002]** In order to move the shelves into different positions it is currently necessary to empty them of their contained products, extract them completely from the preservation compartment, re-insert them therein at the desired height (position) resting on the corresponding supports, then reload them with the previously removed products. Positioning a shelf differently (often necessary to enable relatively large products to be supported on it) is therefore a decidedly uncomfortable operation, for which the present invention proposes a solution enabling a shelf to be moved from one position to another without having to empty and completely extract it.

**[0003]** This result is achieved by a refrigerator in accordance with the teachings of the accompanying claims.

**[0004]** The invention will be more apparent from the ensuing detailed description provided by way of non-limiting example with reference to the accompanying drawing, in which:

Figure 1 is a schematic vertical section through the refrigerator; and

Figures 2 and 3 are plan views of two different types of shelf suitable for the purposes of the invention.

**[0005]** In the figures, the reference numeral 1 indicates the refrigerator overall (the example illustrates a refrigerator of the so-called undercounter type), and 2 indicates the relative cell defining the preservation compartment 3 and obtained by vacuum-forming. The cell presents, in one piece therewith (i.e. co-formed with it), projecting support means for shelves, these means being located on the two opposing side walls 2A of the cell.

**[0006]** Figure 1 shows four types of support means, indicated by 4, 5, 6 and 7 respectively. The support means 4 and 6 form an interruption. The interruptions are indicated by 8 and divide these support means into two portions indicated by 4a, 4b and 6a, 6b. The support means 5 and 7 are continuous and lie below the support means 4 and 6 respectively.

**[0007]** The length of the parts 4a, 6a (equal to each other) is indicated by L, their overhang (see Figure 2) being indicated by P.

**[0008]** The shelves 10, 11 which can be used are substantially of two types (shown in Figures 2 and 3). The shelf 10 comprises a glass sheet 12 surrounded by a co-moulded plastic frame 13. It presents, on each side on which it rests on the support means in the cell, a recess 14 of depth slightly greater than said dimension P and of longitudinal extension slightly greater than said dimension L. The recesses in question are located in the rear part of the shelf and are bounded (at their rear)

by guide appendices 15 forming an integral part of the frame 13. A shelf of this type is shown schematically in Figure 1, in which it has been positioned by the user (by moving it in the direction of the arrow F) in the position which enables it to be passed from the support means 6 to the underlying support means 7. From this position the shelf can be moved vertically, with the projections 15 passing through the interruptions 8 and the recesses 14 (which lie in a position coinciding with the parts 6a) bypassing said parts. When the projections 15 make contact with the underlying support means 7, the shelf 10 is moved in the opposite direction to the arrow F, to locate it in its new position for use.

**[0009]** To transfer a shelf from the support means 4 to the underlying means 5, the shelf is moved such that the projections 15 follow the trajectory indicated by the arrows K.

**[0010]** Instead of the shelf 10 the shelf 11 can be used, this being formed from metal rods and shown in Figure 3, in which parts equivalent and/or corresponding to those of Figure 2 carry the same reference numerals plus an apex.

## 25 Claims

1. A refrigerator with the cell defining the preservation compartment obtained by vacuum-forming and presenting co-formed projecting supports for shelves, **characterised by** presenting at least one pair of projecting supports (4; 6) which mutually cooperate to support a shelf (10, 11) and present an interruption (8) which divides each support (4; 6) into two parts (4a, 4b, 6a, 6b), the shelf (10; 11) presenting terminal appendices (15) arranged to pass through said interruption (8), and recesses (14, 14') arranged to bypass one (4a, 6a) of said parts without interference therewith.
2. A refrigerator as claimed in claim 1, wherein the shelf (10) comprises a glass sheet (12) surrounded by a plastic frame (13), the frame presenting recesses (14) bounded at their rear by appendices (15) (Figure 2).
3. A refrigerator as claimed in claim 1, wherein the shelf (11) is constructed of metal rod and presents recesses (14') bounded at their rear by appendices (15').
4. A refrigerator as claimed in at least one of the preceding claims, wherein continuous projecting supports (5; 7) are provided below the interrupted supports (4 and 6).

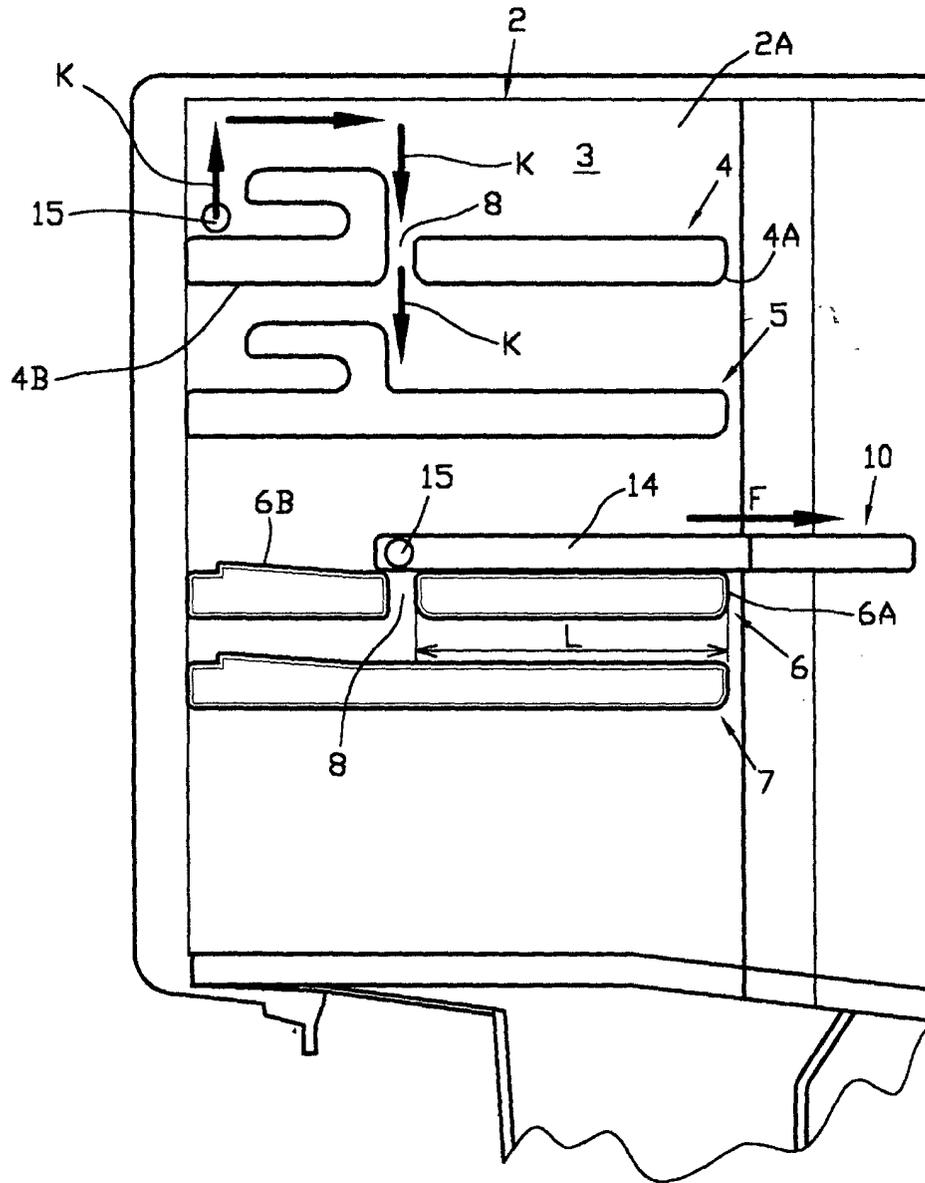
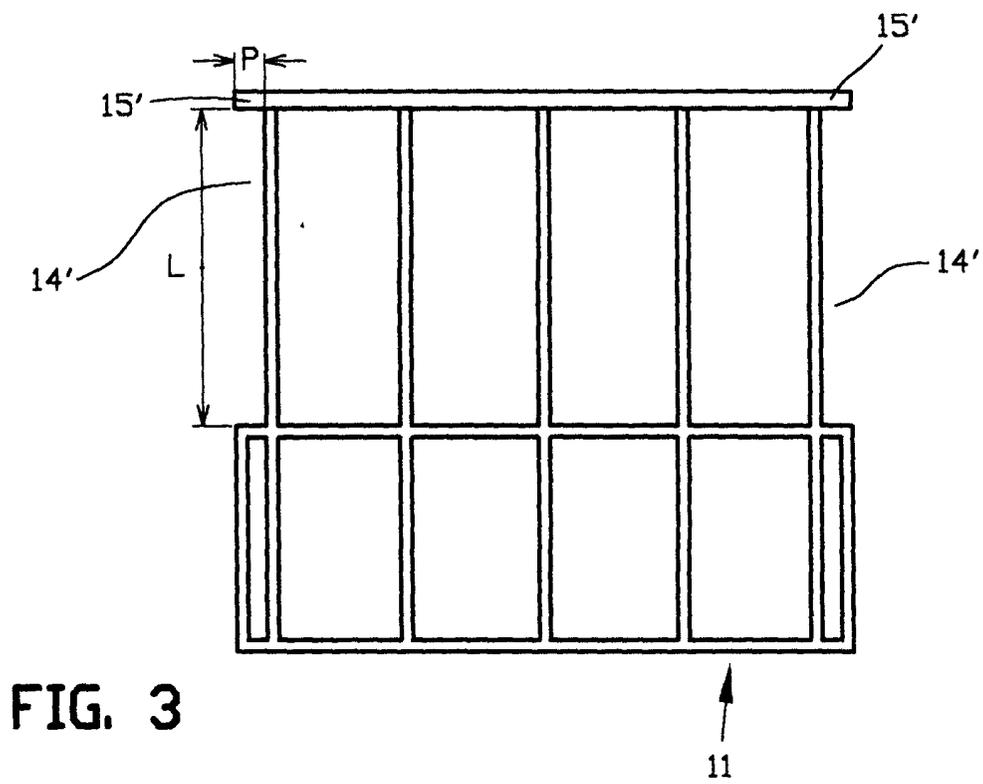
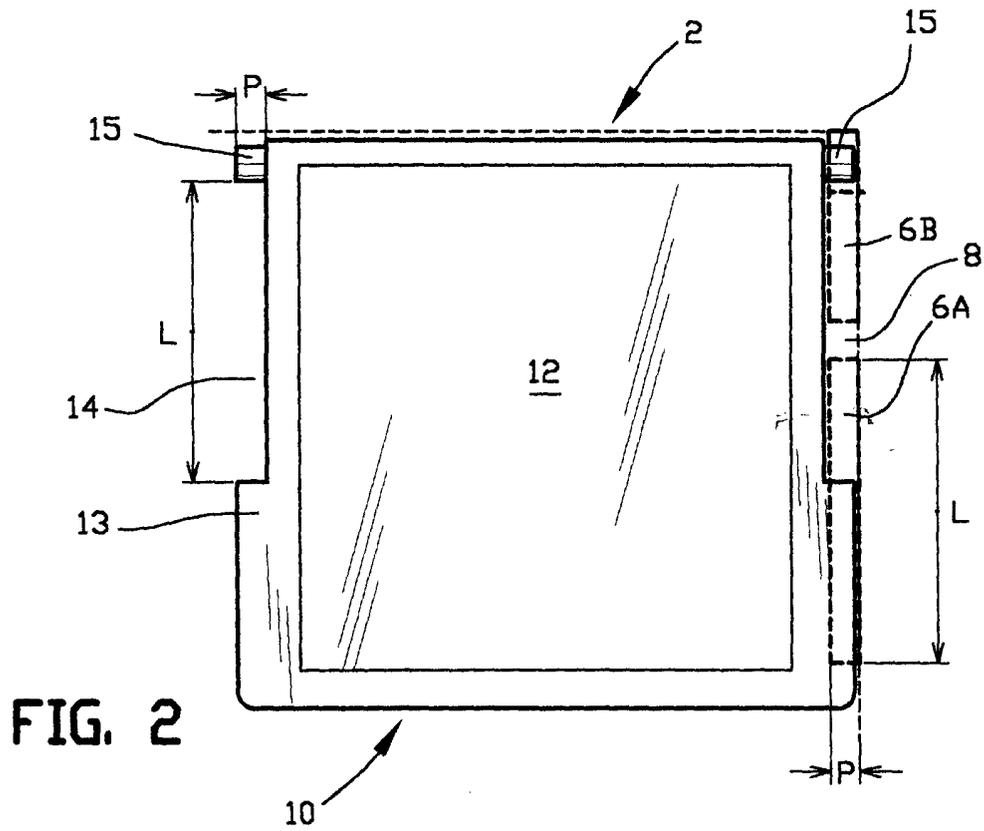


FIG. 1





European Patent Office

EUROPEAN SEARCH REPORT

Application Number  
EP 01 11 0956

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.7)
A	US 4 904 032 A (JENKINS THOMAS E) 27 February 1990 (1990-02-27) * column 2, line 65 - column 3, line 46; figures 1-6 *	1	F25D25/02 A47B96/02
A	US 5 642 924 A (WOHLRAB CHAD A ET AL) 1 July 1997 (1997-07-01) * column 2, line 33 - column 3, line 18; figures 1-4,10 *	1	
A	DE 298 13 644 U (LIEBHERR HAUSGERAETE) 7 January 1999 (1999-01-07) * page 4, last paragraph - page 6, last paragraph; figures 1,2 *	1,2	
A	US 3 516 369 A (BIDAK JOHN ET AL) 23 June 1970 (1970-06-23) * column 2, line 21 - column 4, line 53; figures 1-4 *	1,3,4	
A	FR 2 660 740 A (BOSCH SIEMENS HAUSGERAETE) 11 October 1991 (1991-10-11) * page 4, line 25 - line 35; figures 1-4 *	1,2	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A	FR 2 592 144 A (BOSCH SIEMENS HAUSGERAETE) 26 June 1987 (1987-06-26) * page 4, line 23 - line 34; figures 1-3 *	1,3	F25D A47B
A	DE 298 15 932 U (BOSCH SIEMENS HAUSGERAETE) 17 December 1998 (1998-12-17)		
The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>17 September 2001</b>	Examiner <b>Boets, A</b>
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

EPO FORM 1503 03/02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 11 0956

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

17-09-2001

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4904032	A	27-02-1990	NONE	
US 5642924	A	01-07-1997	NONE	
DE 29813644	U	07-01-1999	DE 29813644 U1 DE 19916621 A1 EP 0976995 A2	07-01-1999 10-02-2000 02-02-2000
US 3516369	A	23-06-1970	NONE	
FR 2660740	A	11-10-1991	DE 9004180 U1 ES 2029644 A6 FR 2660740 A1 IT 221834 Z2	08-08-1991 16-08-1992 11-10-1991 06-12-1994
FR 2592144	A	26-06-1987	DE 8535795 U1 AT 397147 B AT 308486 A CH 671283 A5 FR 2592144 A1 IT 1199750 B	06-02-1986 25-02-1994 15-06-1993 15-08-1989 26-06-1987 30-12-1988
DE 29815932	U	17-12-1998	DE 29815932 U1	17-12-1998

EPO FORM P0469

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82