

(19)



Europäisches Patentamt  
European Patent Office  
Office européen des brevets

(11) Publication number:

**0 091 666  
B1**

(12)

## EUROPEAN PATENT SPECIFICATION

(45) Date of publication of patent specification: **01.10.86**

(51) Int. Cl.<sup>4</sup>: **F 24 C 15/16**

(21) Application number: **83103410.3**

(22) Date of filing: **07.04.83**

(54) **Support for extractable grid shelves.**

(30) Priority: **13.04.82 IT 3401382 u**

(43) Date of publication of application:  
**19.10.83 Bulletin 83/42**

(45) Publication of the grant of the patent:  
**01.10.86 Bulletin 86/40**

(84) Designated Contracting States:  
**AT BE CH DE FR GB IT LI LU NL SE**

(50) References cited:  
**CH-A- 228 614  
DE-U-7 209 590  
DE-U-7 507 245  
FR-A-1 136 577  
US-A-2 011 189**

(73) Proprietor: **INDUSTRIE ZANUSSI S.p.A.**  
**Via Giardini Cattaneo 3**  
**I-33170 Pordenone (IT)**

(72) Inventor: **Van Onck, Andries**  
**Via Cavour 26**  
**I-21026 Gavirate (Varese) (IT)**

(74) Representative: **Patentanwälte Grünecker, Dr.**  
**Kinkeldey, Dr. Stockmair, Dr. Schumann, Jakob,**  
**Dr. Bezold, Meister, Hilgers, Dr. Meyer-Plath**  
**Maximilianstrasse 58**  
**D-8000 München 22 (DE)**

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European patent convention).

Courier Press, Leamington Spa, England.

**EP 0 091 666 B1**

## Description

The present invention relates to a support for extractable grid shelves in domestic cooking ovens provided with pairs of guide elements disposed one above the other and fixedly attached to the side walls of the oven cavity.

As generally known, the oven cavity of domestic cooking ranges or hearths is suitably designed to slidably receive therein at least one grid shelf acting as a support for foods to be cooked therein. This object is achieved by a great number of known constructions, the presently preferred one of which provides for the employ of frame structures usually formed of metal rods and fixedly attached to the side walls of the oven cavity as by means of a screw-threaded system. Fixedly attached to each frame are a number of horizontally projecting guide elements disposed at predetermined levels of the oven cavity opposite one another so as to slidably receive therein, with a certain clearance, the lateral support rim portions of a grid shelf.

This known embodiment suffers from the disadvantage, however, that it renders the operation of extracting the grid shelf to a cantilevered position forward of the oven cavity such as for monitoring the cooking process rather cumbersome and even dangerous.

This is because the supporting frame structures are immovably affixed to the walls of the oven cavity in the cooking position, so that they are unable to follow the grid shelf as it is being extracted.

In addition, the play existing in the mechanical coupling between the guides of the oven cavity and the rim portions of the grid shelf is increased by the flexibility of the guides which are normally affixed to the frame structures only with their end portions. The effects produced by these factors result in that the portion of the grid shelf which may be extracted to a cantilevered position without endangering the stability of the pots or the like carried thereby is rather limited and in many cases insufficient for visually examining all of the foods carried by the shelf.

If the grid shelf is extracted beyond this safe support position, in which it is retained substantially horizontal, its own weight as well as that of the foods carried thereon results in the formation of a fulcrum at the forward end of the lower guides so as to act on the upper guides, whereby the latter are bent upwards and the plane of the grid shelf assumes a forwardly inclined attitude, so that the pots supported thereon may start to slip. If the extraction of the grid shelf occurs too rapidly or if the guides and/or the supporting rims of the grid shelf are overly slippery due to the presence thereon of cooking oils or fats, there is the danger that the grid shelf is completely withdrawn from the guides, so that it drops down outside of the oven cavity.

For these reasons, the user is nearly always constrained to not extract the grid shelf beyond its safe horizontal end position and to take care

that the grid shelf is not completely withdrawn from the guides while supporting it in a substantially horizontal position.

A support, as stated in the first paragraph of this description and which shows the aforementioned deficiencies, is disclosed in the US—PS 2,011,189. With this known support, it is not possible to extract the grid shelf totally because the guides do not move together with the grid shelf. The grid shelf may only be extracted to such a position in which a certain part still lies within the oven cavity to be kept therein in the guides.

It is evident that these working conditions do not readily permit the user to busy himself with the foods contained in a number of pots at the same time without performing a number of operations rendered difficult and even dangerous by the high cooking temperatures.

According to other known solutions, the oven is provided with a door and a carriage connected thereto for displacement along horizontal guides within the oven cavity. In another known embodiment, a movable structure provided with table-shaped supports for the grid shelves is slidably installed within the oven cavity so as to be extracted therefrom as the door of the oven cavity is being opened.

Another known solution provides that telescope supports of the type employed for the drawers of metal furniture are mounted at various levels within the oven cavity. In this case, however, the material employed for the telescope supports is required to be particularly resistant to high temperatures and the expansion caused thereby.

Although the described alternative solutions permit the grid shelf to be extracted to its full length, they are disadvantageous in that they require considerable modifications in the traditional construction of the oven and are excessively costly due to the quantities of the material employed and the characteristics required thereof.

In addition, the described alternative solutions do not provide for the extraction of any single shelf of a plurality of shelves disposed in the oven, it being inevitable to extract all of the shelves simultaneously in any case.

Finally it is unavoidable that these systems employing a carriage or telescopic supports are difficult to disassemble, rendering maintenance and cleaning of the oven undesirably complicated.

It is therefore an object of the present invention to create a domestic cooking range provided with an extractable grid shelf and an associated support system presenting the structural simplicity and uncomplicated operability of the traditional solution while permitting the grid shelf to be fully extracted to a horizontally cantilevered position outside of the oven cavity.

A further object of the invention to create an oven of the type described, which is provided with retaining means adapted to prevent the grid

shelf from being inadvertently withdrawn completely from the guide elements within the oven cavity.

Finally it is an object of the invention to create an oven of the type described provided with a grid shelf which may, if need be, be readily and quickly withdrawn from the oven cavity so as to simplify the cleaning and maintenance thereof, and in which any grid shelf may be extracted singly and independently of any further grid shelves contained in the oven cavity.

These objects are attained by a support for extractable grid shelf as mentioned above which is characterized in that it is formed by a profile member having an L-shape cross-section with a horizontal upper portion, directed towards the associated side wall and a vertical lower portion, whereby the free end portion of the vertical portion is bent towards the associated sidewall and upwards for slidably engaging the lower of said pair of guide elements and whereby the free end portion of the horizontal portion is bent upwards and towards the interior of the oven cavity for slidably receiving therein the rim portion of a grid shelf, said profile member being also provided with coupling means for coupling of the shelf with the member for sliding them together along the guides and with stop means for controlling the extraction of said grid shelf.

Further preferred embodiments are disclosed in the subclaims.

Further characteristics and advantages of the invention will become evident from the following description of an exemplary embodiment with reference to the accompanying drawings, wherein:

Fig. 1 shows a diagrammatic perspective view of a grid shelf and the associated supporting system in an oven according to the invention,

Fig. 2 shows a detail of fig. 1 on an enlarged scale, and

Fig. 3 shows a partial side view of the detail shown in fig. 2.

The cooking range according to the invention comprises an oven cavity to the side walls of which pairs of horizontal guide elements 5 are fixedly attached as by means of a thread system (not shown) so as to project inwardly of the oven cavity opposite each other and to form sliding seats for each lateral support rim portion 9 of a conventional metal grid shelf 4 (fig. 1).

Slidably guided on each pair of vertically spaced horizontal guide elements 5 is a support member preferably made of metal sheet in the form of a profile member 6 having an L-shaped cross section with a vertical portion 7 and a horizontal portion 8 (fig. 2). Vertical portion 7 is in sliding engagement with the pair of horizontal guide elements 5, while horizontal portion 8 slidably receives therein one of the support rim portions 9 of grid shelf 4.

The free end sections of portions 7 and 8 of profile member 6 are rearwardly or inwardly bent so as to grippingly engage the lower one of the pair of guide elements 5 and the support rim portion 9

of the frame surrounding grid shelf 4, respectively, both of which are preferably formed of metal rods.

Horizontal portion 8 is formed with a plate-shaped extension 10, the free end of which is provided with a vertical lug 12 extending only over part of the width of horizontal portion 8 and being of sufficient height for constituting a stop for the extraction movement of grid shelf 4 so as to prevent the latter from being completely withdrawn from the guide elements 5 of the oven cavity.

Adjacent vertical lug 12, the inwardly bent end portion of horizontal leg 8 is formed with an interruption of sufficient length to provide a passage 13 for the introduction and extraction of the rim portion of grid shelf 4 by lifting it over vertical lug 12 (fig. 3).

Adjacent the forward end of vertical portion 7, the inwardly bent end portion of horizontal portion 8 is formed with a flexible, downwards bent lug 11 having a forward flank 14 and a rearward flank 15 of different inclination.

In the embodiment described, sliding support 6 is first brought into engagement with the lower guide element 5 and subsequently pivoted to the position shown in fig. 2. In this position, sliding support 6 is able to slide along horizontal guide elements 5 between positions defined by the engagement of the forward or rearward end of its vertical section 7 with the bent end portions of lower guide element 5.

After the two sliding supports 6 have been so positioned, the support rim portions 9 of grid shelf 4 are inserted into passage 13 and subsequently introduced into the inwardly bent end portions of horizontal portion 8 until they come into resilient engagement with flank 14 of lug 11, whereupon the sliding support 6 is dragged along by grid shelf 4 until it is stopped by the engagement of the end of vertical section 7 with the bent end portion of horizontal guide element 5. At this point, the continued thrust exerted on grid shelf 4 causes the latter to slip with respect to flank 14 of lug 11 until the grid shelf has been completely pushed into the oven cavity.

On being extracted, grid shelf 4 slides on its sliding supports 6 until its rear rim portion comes into engagement with the rear flank 15 of lug 11, whereafter the sliding supports 6 are dragged along by the grid shelf 4 until they come into engagement with the bent forward ends of lower guide elements 5.

In this instance, grid shelf 4 is completely extracted to a cantilevered horizontal position outside of the oven cavity.

If the user intends to withdraw grid shelf 4 from the oven, he has to overcome the resilient resistance offered by flank 15 of lug 11, whereupon the rearward rim of grid shelf 4 slides along plate-shaped extension 10 until it comes in to engagement with vertical lug 12, from which position it can be lifted off through passage 13.

In the described manner the grid shelf 4 can be safely extracted from the oven cavity to a cantilevered horizontal position.

After the grid shelf 4 has been completely withdrawn, the sliding supports 6 may be readily dismounted by pivoting them about lower guide elements 5 and disengaging them therefrom.

In addition to these advantages, the described embodiments safeguards the user against accidental withdrawal of the grid shelf from the oven cavity and in a simple manner offers the possibility to individually extract any of the grid shelves contained in the oven cavity.

It is finally to be noted that the support according to the invention offers the quoted advantages without requiring any definite modification of the traditional construction of the oven, thanks to its being designed as an accessory.

### Claims

1. A support for extractable grid shelves, in domestic cooking ovens provided with pairs of guide elements disposed one above the other and fixedly attached to the side walls of the oven cavity, characterized in that it is formed by a profile member (6) having an L-shape cross-section with a horizontal upper portion (8) directed to the associated side wall and a vertical lower portion (7), whereby the free end portion of the vertical portion (7) is bent towards the associated sidewall and upwards for slidably engaging the lower of said pair of guide elements (5) and whereby the free end portion of the horizontal portion (8) is bent upwards and towards the interior of the oven cavity for slidably receiving therein the rim portion (9) of a grid shelf (4), said profile member (6) being also provided with coupling means (11) for coupling of the shelf with the member (6) for sliding them together along the guides (5) and with stop means (12) for controlling the extraction of said grid shelf (4).

2. A support for extractable grid shelves according to claim 1, characterized in that the horizontal upper portion (8) of said profile member (6) is formed with a forwardly projecting plate-shaped extension (10) the forward end portion of which is formed with a lug (12) and an opening (13) adapted respectively to permit said grid shelf (4) to be arrested with respect to said profile member (6) and subsequently disengaged therefrom.

3. A support for extractable grid shelves according to claim 1, characterized in that the edge of said horizontal upper portion (8), directed towards the interior of the oven cavity, is formed with downwardly bent cam means (11) having two flanks (14, 15) of different inclination adapted respectively to permit said profile member (6) to be dragged along said guide elements (5) and to arrest said grid shelf (4) in a cantilevered extracted position.

### Revendications

1. Support pour grilles formant tablettes amovibles dans des fours de cuisson ménagers, équipés de paires d'éléments de guidage placés l'un au-dessus de l'autre et attachés fixes aux

parois latérales du volume utile ou cavité du four, caractérisé en ce qu'il est formé d'une pièce profilée (6) ayant une section droite en L, constituée d'une aile supérieure horizontale (8) dirigée vers la paroi latérale coordonnée et d'une aile inférieure verticale (7), l'extrémité libre de l'aile verticale (7) étant recourbée vers la paroi latérale coordonnée et vers le haut pour pouvoir glisser sur l'élément de guidage (5) inférieur de la paire d'éléments de guidage et l'extrémité libre de l'aile horizontale (8) étant courbée vers le haut et vers l'intérieur de la cavité du four pour la réception et le coulissement du bord (9) d'une grille formant tablette (4), la pièce de profilée (6) étant pourvue, en outre, d'un dispositif d'accouplement (11) pour accoupler la grille à la pièce (6) afin qu'ils puissent glisser ensemble le long des guides (5), ainsi que d'un dispositif de butée pour limiter l'extraction de la grille (4).

2. Support selon la revendication 1, caractérisé en ce que l'aile supérieure horizontale (8) de la pièce profilée (6) comporte un prolongement plat (10) faisant saillie vers l'avant et présentant une patte (12) et une ouverture (13) agencées pour arrêter le mouvement de la grille (4) par rapport à la pièce profilée (6) et permettre ensuite de dégager la grille de la pièce profilée.

3. Support selon la revendication 1, caractérisé en ce que le bord de l'aile supérieure horizontale (8), dirigé vers l'intérieur de la cavité du four, porte un élément d'arrêt (11) courbé vers le bas et présentant deux flancs (14, 15) d'inclinaisons différentes, agencés l'un pour l'entraînement de la pièce profilée (6) le long des éléments de guidage (5) et l'autre pour arrêter la grille (4) dans une position d'extraction où elle est en porte à faux.

### Patentansprüche

1. Halterung für herausziehbare Rosteinschübe in häuslichen Backöfen, mit einem Paar Führungselemente, die übereinanderliegend angeordnet und fest mit den Seitenwänden des Ofenhohlraums verbunden sind, dadurch gekennzeichnet, daß sie von einem Profilelement (6) gebildet wird, welches einen L-förmigen Querschnitt hat, mit einem horizontalen oberen Abschnitt (8), der auf die zugeordnete Seitenwand gerichtet ist und mit einem vertikalen unteren Abschnitt (7), wobei das freie Ende des vertikalen Abschnitts (7) in Richtung auf die zugeordnete Seitenwand und nach oben umgebogen ist, und in gleitendem Eingriff mit dem unteren der Führungselemente (5) steht und wobei der freie Endabschnitt des horizontalen Abschnitts (8) nach oben und in Richtung zum Inneren des Ofenhohlraums umgebogen ist, und in sich einen Rahmenteil (9) eines Rosteinschubes (4) aufnimmt, und wobei das Profilelement (6) auch mit einer Kuppel einrichtung (11) verbunden ist, die den Rost an das Element (6) ankoppelt, so daß diese zusammen entlang den Führungen (5) gleiten können und mit einer Anschlag einrichtung (12), um die Ausziehbewegung des Rosteinschubs (4) zu kontrollieren.

2. Halterung für ausziehbare Rosteinschübe nach Anspruch 1, dadurch gekennzeichnet, daß der horizontale obere Abschnitt (8) des Profilelementes (6) mit einer nach vorne vorstehenden plattenförmigen Verlängerung (10) versehen ist, deren vorderer Endbereich mit einer Lasche und einer Öffnung (13) versehen ist, die jeweils so ausgestaltet sind, daß der Rosteinschub bezüglich des Profilelementes (6) angehalten und nachfolgend außer Eingriff damit gebracht werden kann.

3. Halterung für ausziehbare Rosteinschübe

nach Anspruch 1, dadurch gekennzeichnet, daß die Kante des horizontalen oberen Abschnitts (8) in Richtung auf das Innere des Ofenhohlraumes umgebogen ist und mit einer nach unten umgebogenen Nockeneinrichtung (11) versehen ist, die zwei Flanken (14, 15) verschiedener Neigungswinkel aufweist, welche so ausgestaltet sind, daß das Profilelement (6) entlang der Führungselemente (5) gezogen werden kann bzw. daß der Rosteinschub (4) in einer freitragenden ausgezogenen Stellung arretiert wird.

5

10

15

20

25

30

35

40

45

50

55

60

65

5

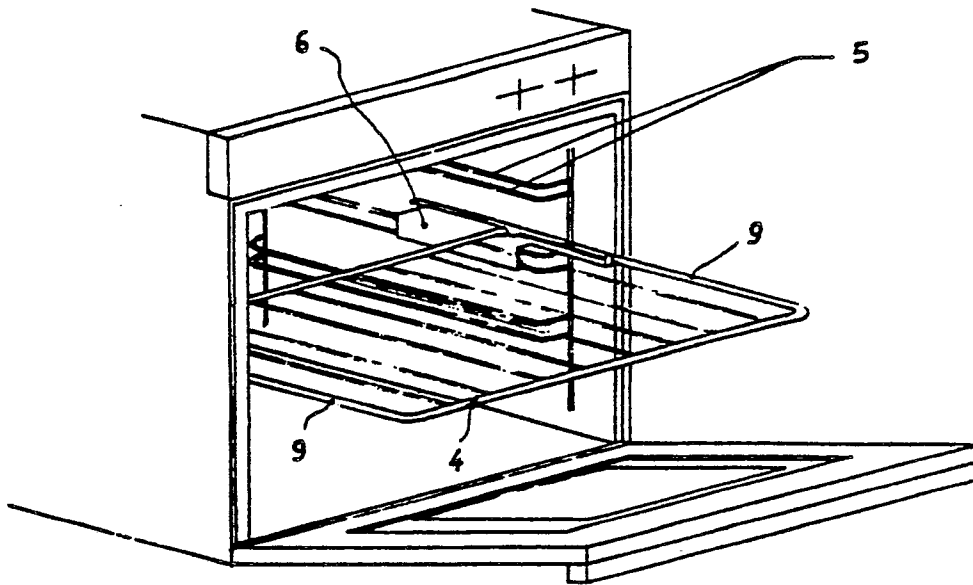


Fig. 1

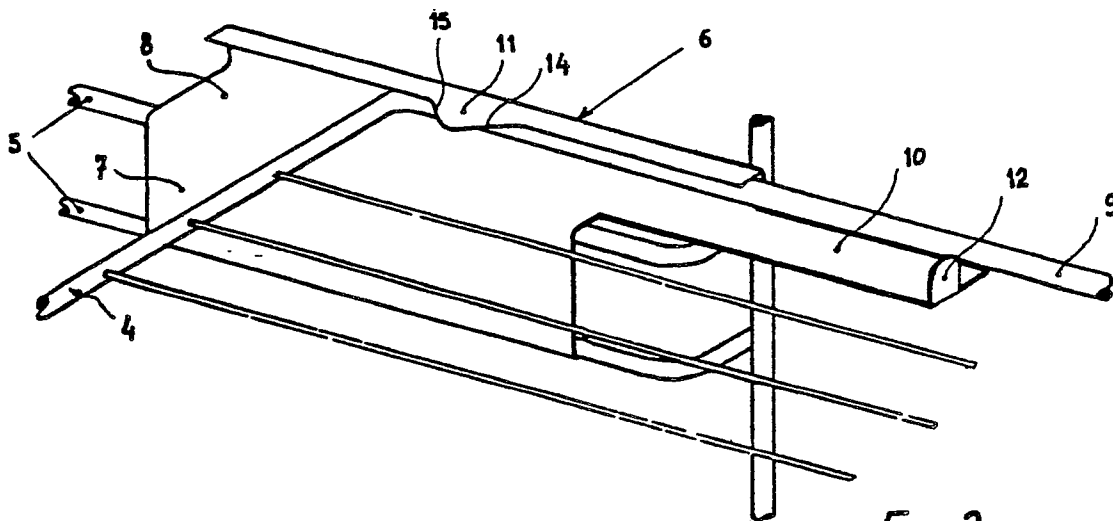


Fig. 2

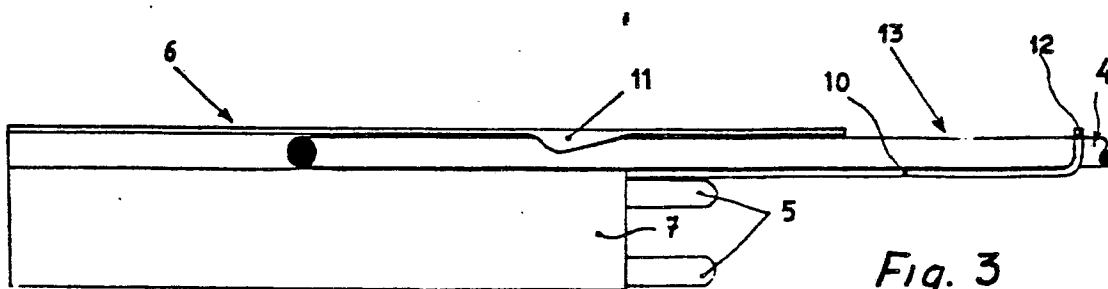


Fig. 3