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(54) **A SHELF SYSTEM**

REGALSYSTEM

SYSTÈME D'ÉTAGÈRE

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Description

Relevant Field of Art

[0001] The present invention relates to shelf systems that are especially suitable for use in white appliances such as refrigerators.

Background Art

[0002] Nowadays, various shelf systems are used in order to position an object at a desired area. Particularly, in white appliances such as refrigerators which are desired to have an effective inner volume, these shelf systems must be configured so as to satisfy the needs of the users optimally. The shelves in the conventional shelf systems are integral and are positioned in the white appliances such that they are engaged to and disengage from the white appliances. Generally, in white appliances, due to the fact a plurality of shelves provided in these shelf systems which are positioned one above another and/or one below another are integral, the user is prevented from using the inner volume of the white appliance in an effective manner. In other words, since the shelf systems are positioned at a certain distance one above another and between the shelves therein, the objects must be placed in the inner volume of the white appliance based on the distance between the two shelves of the shelf systems, and the user must create an alternative way in order to place an object having a height greater than the said distance. In this case, the user for example changes the position of a shelf provided in one of the two shelf systems, for which he must remove all other objects located on the shelf that is to be moved. Such alternatives created by the user cause a difficulty in use for the user and thus the needs of the user cannot be satisfied as necessary.

[0003] A shelf system designed to solve said problem is disclosed in US2465806A. In the embodiment disclosed in the said document, a shelf system with a multi-piece shelf in the form of a grate is disclosed, wherein a rear shelf section and a front shelf section are provided. Under the rear shelf section, there is a space in the form of a receptacle, in which the front shelf section is placed, when necessary. Thus, the dependency of the height of the object to be placed by the user into the inner volume of the white appliance on the distance of the two shelves is eliminated, and it is attempted to utilize the inner volume in an effective manner. However, in this embodiment, since a space is required under the rear shelf section in order to insert the front shelf section, said space may prevent effective use of the inner volume of the white appliance.

[0004] A shelf system designed to solve said problem is disclosed in patent document no. JPS593291U. In the embodiment given in the figures of this document, a shelf portion of a refrigerator is disclosed. As illustrated in figures and given in the description, the shelf portion com-

prises at least one shelf bracket; at least one front rack; at least one rear rack; at least two support shafts; at least one inclined guide rim and at least one slanted guide rim. The shelf portion provides two different positioning of the racks, one is folded position the other is flat position. In the flat position, the front rack and the rear rack are situated on the shelf bracket by means of support shafts side by side. When the racks required to be in the folded position, the front rack is moved towards the rear rack via support shafts and the inclined guide rim of the front rack moves the rear rack upwardly. While the front rack continues the movement on the bracket, the shafts under the rear rack enables the movement of the front rack under the rear rack (shown in figure 1). However, in this embodiment, since a space is required back of the rear rack in order to ensure the upward movement of the rear rack via the front rack, said space can prevent effective use of the inner volume of the refrigerator.

Brief Description of the Invention

[0005] The shelf system according to the present invention which is suitable to be positioned in the inner volume of a white appliance comprises the features of the independent claim. With the multi-piece shelf of the shelf system according to the present invention, the pieces are positioned one above another and the shelf is folded in a simple and practical manner, based on the needs of the user, and the inner volume of the white appliance is used effectively, so that the needs of the user can be satisfied optimally.

Object of the Invention

[0006] An object of the present invention is to provide a shelf system with a multi-piece shelf suitable for use in white appliances and which enables effective use of the inner volume of the white appliance.

[0007] Another object of the present invention is to provide a shelf system which enables effective use of the inner volume of the white appliance by positioning one of its shelf sections under the other.

[0008] Another object of the present invention is to provide a shelf system wherein an additional volume is not required in order to position one of its shelf sections under the other. Another object of the present invention is to provide a shelf system that can be removed from the white appliance, when necessary.

[0009] Still another object of the present invention is to provide a shelf system which is easy-to-use, practical, durable and reliable.

Description of the Drawings

[0010] The illustrative embodiments of the shelf system according to the present invention are illustrated in the enclosed drawings, in which:

Figure 1 is a perspective view of a flat position of the shelf system according to the present invention.

Figure 2 is a perspective view of a folded position of the shelf system according to the present invention.

Figure 3 is a side sectional view of a guide member of the shelf system according to the present invention.

Figure 4 is a side sectional view of a guiding element of the shelf system according to the present invention.

[0011] All the parts illustrated in the drawings are individually assigned a reference numeral and the corresponding terms of these numbers are listed as follows:

Shelf system	(S)
Shelf	(R)
Main shelf section	(1)
Movable shelf section	(2)
Guide member	(3)
Body	(3a)
Channel	(3b)
Recess	(3c)
Stopper element	(3d)
Guiding element	(4)
Curved surface	(4a)
Flat surface	(4b)
Holding member	(5)

Description of the Invention

[0012] In order to position an object in an inner volume of white appliances, shelf systems, which are able to be mounted to and removed from the inner volume of the white appliance, are mainly used. In particular, since the inner volume of the white appliances such as refrigerators should be suitable for effective use, said shelf systems may have various forms. However, such structures may sometimes be insufficient in order to utilize the inner volume in an effective manner. Therefore, with the present invention, a shelf system is provided which is suitable for use in white appliances and which ensures effective use of the inner volume.

[0013] In the shelf system (S) according to present invention, as illustrated in figures 1-2, comprises at least one shelf (R) comprising at least one main shelf section (1) and at least one movable shelf section (2), and having at least one flat position (figure 1) wherein the movable shelf section (2) is situated next to the main shelf section (1) such that at least an edge of the main shelf section (1) is adjacent to at least an edge of the movable shelf section (2), and at least one folded position (figure 2) wherein the movable shelf section (2) is situated in a lower region of the main shelf section (1) (by slidable movement of the movable shelf section (2) so as to get close to the main shelf section (1) in the flat position of

the shelf (R)), such that an upper surface of the movable shelf section (2) on which an object is placed is contacting a lower surface of the main shelf section (1). The shelf system (S) also comprises at least one guide member (3), as illustrated in figure 3, suitable for being fixed on at least one lateral wall of the white appliance, which guide member (3) in turn comprises at least one body (3a); at least one recess (3c) positioned on the body (3a), wherein at least one side of the main shelf section (1) is situated, and which permits upward and downward movement of the main shelf section (1) in a vertical direction (for example, so as to get close to or move away from the bottom of the white appliance) during the use of the shelf system (S) in a white appliance (said movement of the main shelf section (1) is performed such that the main shelf section (1) gets close to and away from the said body (3a)); at least one channel (3b) wherein at least one side of the movable shelf section (2) is positioned in the flat position of the shelf (R), at least an end of which is opened into the said recess (3c), and wherein said side of the movable shelf section (2) is able to be slidably moved so as to move the movable shelf section (2) close to or away from the main shelf section (1), and at least another end of which is preferably closed. The shelf system (S) also comprises at least one guiding element (4), as illustrated in figure 4, which orients the movable shelf section during its transition between the flat position of the shelf (R) and the folded position thereof. At least one side of the guiding element (4) is connected with a side of the main shelf section (1) that faces the movable shelf section (2) in the flat position of the shelf (R), and comprises at least one curved surface (4a) with a S-shape which contacts the said upper surface of the movable shelf section (2), wherein at least one portion of its side that is in contact with the movable shelf section (2) during the movement of the movable shelf section (2) is curved, and at least one flat surface (4b) forming a bridge between the main shelf section (1) and the movable shelf section (2).

[0014] In the invention, the shelf (R) of the shelf system (S) is located in the flat position, as shown in figure 1. In the flat position, at least one side of the main shelf section (1) is situated in the recess (3c) of the guide member (3) and at least one side of the movable shelf section (2) is situated in the said channel (3b). Thus, one side of the main shelf section (1) and the movable shelf section (2) is positioned side-by-side and the desired object can be positioned on upper surfaces of the main shelf section (1) and the movable shelf section (2). In other words, for example, while a shelf system (S) is used in a refrigerator, products desired to be cooled down can be placed on both shelf sections in the flat position of the shelf (R). During its transition from the flat position of the shelf (R) to the folded position thereof, the movable shelf section (2) is moved towards the main shelf section (1) and a side of the movable shelf section (2) that is in contact with the guiding element (4) and faces the main shelf section (1) exerts force on the main shelf section (1) by

means of the curved surface (4a) of the guiding element (4), and the main shelf section (1) is moved upward in the vertical direction so as to move away from the movable shelf section (2) by means of the thrust of the movable shelf section (2) on the main shelf section (1). In this manner, the movable shelf section (2) also seats into the region within the recess (3c), where the main shelf section (1) is situated in the flat position of the shelf (R), and the movable shelf section (2) is released from the channel (3b) and positioned on a lower region of the main shelf section (1), without requiring an additional space under the main shelf section (1), such that the inner volume of the white appliance is utilized in an effective manner and the needs of the user are met optimally. Moreover, thanks to the movement of the main shelf section (1) upward along with the movable shelf section (2), the main shelf section (1) can also be moved without the need to remove the objects that are already present on the main shelf section (1). During its transition from the folded position of the shelf (R) to the flat position thereof, the movable shelf section (2) is moved away from the main shelf section (1), and said side of the movable shelf section (2) is positioned adjacent to the main shelf section (1) by reinserting it into the channel (3b) through an end of the channel (3b) that is opened into the recess (3c) and slidably moving the movable shelf section. In this way, the user is able to bring the shelf into its flat and folded positions in an easy and practical manner, depending on the need, and without moving the objects that are already present on the main shelf section (1).

[0015] In the invention, the shelf system (S) comprises at least one stopper element (3d) that extends, within the said body (3a) and preferably at a region of the channel (3b) that is opened to the recess (3c), as a protrusion projecting outward from the said channel (3b), preferably in a vertical direction, and which prevents the main shelf section (1) situated in the recess (3c) from moving in the horizontal direction, in the folded position of the shelf (R), and uncontrolled dislocation of same. By means of the said stopper element (3d), the main shelf section (1) - whose movement in the horizontal direction in the flat position of the shelf (R) is prevented by the movable shelf section (2) - is prevented, in a practical manner, from being freed by its upward movement in the folded position of the shelf (R), and releasing from the recess (3c) where it is situated so as not to move on the movable shelf section (2), and thus a reliable shelf system (S) can be obtained.

[0016] In another alternative embodiment of the invention, on an upper side of the recess (3c) provided in the shelf system (S) (that side of the recess (3c) which is remote from the main shelf section (1) in the flat position of the shelf (R)), there exists at least one opening that allows detachment of the main shelf section (1) from the recess (3c) by moving it in the vertical direction. In this way, for example, if it is required to remove the shelf sections for various reasons such as changing the position of the shelf (R) and cleaning the shelf (R), at first the

main shelf section (1) is passed through said opening and released from the recess (3c) and then the movable shelf section (2) is passed through said opening and released from the recess (3c), so that a shelf system (S) can be obtained which is easy-to-use, practical and durable.

[0017] In another exemplary embodiment of the invention, the shelf system (S) comprises at least one holding member (5) which is suitable for being fixed to the white appliance and for receiving said guide member (3), which bears the guide member (3) and which prevents the guide member (3) from falling from the area where it is located in case of a detachment of the guide member (3) from the area where it is fixed, during the use. Thus, the shelf system (S) is made more reliable.

[0018] With the multi-piece shelf (R) of the shelf system (S) according to the present invention, the pieces are positioned one above another and the shelf (R) is folded to a single piece in a simple and practical manner, based on the needs of the user, and the inner volume of the white appliance is used effectively, so that the needs of the user can be satisfied optimally.

Claims

1. A shelf system (S) which is suitable to be positioned in an inner volume of a white appliance and comprises at least one shelf (R) comprising at least one main shelf section (1) and at least one movable shelf section (2), and having at least one flat position wherein the movable shelf section (2) is situated next to the main shelf section (1) such that at least an edge of the main shelf section (1) is adjacent to at least an edge of the movable shelf section (2), and at least one folded position wherein the movable shelf section (2) is situated in a lower region of the main shelf section (1) by slidably movement of the movable shelf section (2) so as to get close to the main shelf section (1) in the flat position of the shelf (R), such that an upper surface of the movable shelf section (2) on which an object is placed is facing a lower surface of the main shelf section (1); the shelf system comprising:

- at least one guide member (3) suitable to be fixed on at least one lateral wall of the said white appliance and comprising at least one body (3a); at least one recess (3c) positioned on the body (3a), wherein at least one side of the main shelf section (1) is situated, and which permits upward and downward movement of the main shelf section (1) in a vertical direction during the use of the shelf system (S) in the said white appliance, and which receives the main shelf section (1) when the movable shelf section (2) moves the main shelf section (1) upward in the folded position of the shelf (R); **characterized by com-**

prising at least one channel (3b) wherein at least one side of the movable shelf section (2) is positioned in the flat position of the shelf (R), and at least an end of which opens into the said recess (3c) and said side of the movable shelf section (2) is able to be slidably moved therein so as to move the movable shelf section (2) close to or away from the main shelf section (1);

- at least one guiding element (4) that orients the movable shelf section during its transition between the flat position of the shelf (R) and the folded position thereof, at least one side of which is connected with a side of the main shelf section (1) that faces the movable shelf section (2) in the flat position of the shelf (R), and having at least one curved surface (4a), being S-shaped, which contacts the said upper surface of the movable shelf section (2), wherein at least one portion of its side that is in contact with the movable shelf section (2) during the movement of the movable shelf section (2) is curved, and at least one flat surface (4b) forming a bridge between the main shelf section (1) and the movable shelf section (2) and

- at least one stopper element (3d) that extends, within the said body (3a), as a protrusion projecting outward from the said channel (3b), and which prevents the main shelf section (1) situated in the recess (3c) from moving in the horizontal direction, in the folded position of the shelf (R), and uncontrolled dislocation of the same;

wherein in the folded position of the shelf (R), the main shelf section (1) and the movable shelf section (2) are positioned in contact with each other.

2. A shelf system (S) according to claim 1, **characterized in that** at least another end of the said channel (3b) is closed.
3. A shelf system (S) according to claim 1, **characterized in that** the stopper element (3d) is positioned at a side of the channel (3b) that is opened to the recess (3c).
4. A shelf system (S) according to claim 1, **characterized in that** the stopper element (3d) is configured to extend in the vertical direction.
5. A shelf system (S) according to claim 1, **characterized by** comprising at least one opening on an upper side of the recess (3c), which allows detachment of the main shelf section (1) from the recess (3c) by moving it in the vertical direction.
6. A shelf system (S) according to claim 1, **characterized by** comprising at least one holding member (5) which is suitable for being fixed to the white appliance

and for receiving said guide member (3), which bears the guide member (3) and which prevents the guide member (3) from falling from the area where it is located in case of a detachment of the guide member (3) from the area where it is fixed, when it is in use.

Patentansprüche

1. Fachbodensystem (S), das geeignet ist, in einem inneren Volumen eines Haushaltsgerätes platziert zu werden, und das wenigstens einen Fachboden (R) aufweist, der wenigstens einen Hauptfachbodenabschnitt (1) und wenigstens einen beweglichen Fachbodenabschnitt (2) umfasst und der wenigstens eine flache Stellung hat, in der der bewegliche Fachbodenabschnitt (2) benachbart zu dem Hauptfachbodenabschnitt (1) liegt, so dass wenigstens eine Kante des Hauptfachbodenabschnitts (1) benachbart zu wenigstens einer Kante des beweglichen Fachbodenabschnitts (2) ist, und wenigstens eine zusammengelegte Stellung hat, in der der bewegliche Fachbodenabschnitt (2) in einer unteren Region des Hauptfachbodenabschnitts (1) durch gleitende Bewegung des beweglichen Fachbodenabschnitts (2), um so nahe an den Hauptfachbodenabschnitt (1) in der flachen Stellung des Fachbodens (R) zu kommen, liegt, so dass eine obere Oberfläche des beweglichen Fachbodenabschnitts (2), auf der ein Gegenstand platziert ist, einer unteren Oberfläche des Hauptfachbodenabschnitts (1) zugewandt ist, wobei das Fachbodensystem aufweist:

wenigstens ein Führungsteil (3), das zur Fixierung an wenigstens einer Seitenwand des Haushaltsgerätes geeignet ist und wenigstens einen Körper (3a) aufweist, wobei wenigstens eine Vertiefung (3c) auf dem Körper (3a) angeordnet ist, in der wenigstens eine Seite des Hauptfachbodenabschnitts (1) liegt und die die Aufwärts- und Abwärtsbewegung des Hauptfachbodenabschnitts (1) in einer vertikalen Richtung während der Verwendung des Fachbodensystems (S) in dem Haushaltsgerät erlaubt und die den Hauptfachbodenabschnitt (1) aufnimmt, wenn der bewegliche Fachbodenabschnitt (2) den Hauptfachbodenabschnitt (1) nach oben in die zusammengelegte Stellung des Fachbodens (R) bewegt, **gekennzeichnet durch** wenigstens einen Kanal (3b), in dem wenigstens eine Seite des beweglichen Fachbodenabschnitts (2) in der flachen Stellung des Fachbodens (R) angeordnet ist und von dem wenigstens ein Ende in die Vertiefung (3c) mündet und in dem die Seite des beweglichen Fachbodenabschnitts (2) gleitend bewegt werden kann, um so den beweglichen Fachbodenabschnitt (2) nahe an oder weg von dem Haupt-

- fachbodenabschnitt (1) zu bewegen, wenigstens ein Führungselement (4), das den beweglichen Fachbodenabschnitt während seines Übergangs zwischen der flachen Stellung des Fachbodens (R) und dessen zusammengelegter Stellung orientiert, wobei wenigstens eine Seite des Führungselements (4) mit der Seite des Hauptfachbodenabschnitts (1) verbunden ist, die in der flachen Stellung des Fachbodens dem beweglichen Fachbodenabschnitt (2) zugewandt ist, und wobei wenigstens eine gekrümmte Oberfläche (4a) daran vorhanden ist, die S-förmig ist und die die obere Oberfläche des beweglichen Fachbodenabschnitts (2) kontaktiert, wobei wenigstens ein Bereich seiner Seite, die in Kontakt mit dem beweglichen Fachbodenabschnitt (2) während der Bewegung des beweglichen Fachbodenabschnitts (2) kommt, gekrümmt ist, und wobei wenigstens eine flache Oberfläche (4b) eine Brücke zwischen dem Hauptfachbodenabschnitt (1) und dem beweglichen Fachbodenabschnitt (2) bildet, und wenigstens ein Stopperelement (3d) das innerhalb des Körpers (3a) als ein Vorsprung verläuft, der von dem Kanal (3b) nach außen vorsteht und der den in der Vertiefung (3c) liegenden Hauptfachbodenabschnitt (1) daran hindert, sich in horizontaler Richtung in die zusammengelegte Stellung des Fachbodens zu bewegen, und eine unkontrollierte Verschiebung desselben verhindert, wobei in der zusammengelegten Stellung des Fachbodens (R) der Hauptfachbodenabschnitt (1) und der bewegliche Fachbodenabschnitt (2) in Kontakt miteinander positioniert sind.
2. Fachbodensystem (S) nach Anspruch 1, **dadurch gekennzeichnet, dass** wenigstens ein anderes Ende des Kanals (3b) geschlossen ist.
 3. Fachbodensystem (S) nach Anspruch 1, **dadurch gekennzeichnet, dass** das Stopperelement (3d) an einer Seite des Kanals (3b) liegt, die zu der Vertiefung (3c) geöffnet ist.
 4. Fachbodensystem (S) nach Anspruch 1, **dadurch gekennzeichnet, dass** das Stopperelement (3d) dazu ausgestaltet ist, in vertikaler Richtung zu verlaufen.
 5. Fachbodensystem (S) nach Anspruch 1, **gekennzeichnet durch** wenigstens eine Öffnung an einer oberen Seite der Vertiefung (3c), die die Entnahme des Hauptfachbodenabschnitts (1) aus der Vertiefung (3c) ermöglicht, indem er in vertikaler Richtung bewegt wird.
 6. Fachbodensystem (S) nach Anspruch 1, **gekenn-**

zeichnet durch wenigstens ein Halteteil (5), das dazu geeignet ist, an dem Haushaltsgerät fixiert zu werden und das Führungsteil (3) aufzunehmen, das das Führungsteil (3) lagert und das das Führungsteil (3) daran hindert, im Fall einer Demontage des Führungsteils (3) von dem Gebiet, wo es fixiert ist, von dem Gebiet, wo es sich befindet, zu fallen, wenn es in Benutzung ist.

Revendications

1. Système d'étagères (S) conçu pour être positionné dans un volume intérieur d'un appareil blanc et comprenant au moins une étagère (R) comprenant au moins une section d'étagère principale (1) et au moins une section d'étagère mobile (2), et ayant au moins une position à plat dans laquelle la section d'étagère mobile (2) est située près de la section d'étagère principale (1) de sorte qu'au moins un bord de la section d'étagère principale (1) est adjacent à au moins un bord de la section d'étagère mobile (2), et au moins une position repliée dans laquelle la section d'étagère mobile (2) est située dans une région inférieure de la section d'étagère principale (1) par un déplacement coulissant de la section d'étagère mobile (2) de façon à se rapprocher de la section d'étagère principale (1) dans la position à plat de l'étagère (R), de sorte qu'une surface supérieure de la section d'étagère mobile (2) sur laquelle un objet est placé soit face à une surface inférieure de la section d'étagère principale (1) ; le système d'étagère comprenant :
 - au moins un élément de guidage (3) adapté pour être fixé sur au moins une paroi latérale dudit appareil blanc et comprenant au moins un corps (3a) ; au moins une cavité (3c) positionnée sur le corps (3a), dans laquelle au moins un côté de la section d'étagère principale (1) est situé, et qui permet un mouvement vers le haut et vers le bas de la section d'étagère principale (1) dans une direction verticale pendant l'utilisation du système d'étagère (S) dans ledit appareil blanc, et qui reçoit la section d'étagère principale (1) quand la section d'étagère mobile (2) déplace la section d'étagère principale (1) vers le haut dans la position repliée de l'étagère (R) ; **caractérisé en ce qu'il** comprend au moins un canal (3b) dans lequel au moins un côté de la section d'étagère mobile (2) est positionné dans la position à plat de l'étagère (R), et dont au moins une extrémité s'ouvre dans ladite cavité (3c) et ledit côté de la section d'étagère mobile (2) est capable d'être déplacé en coulissement à l'intérieur de façon à rapprocher ou à éloigner la section d'étagère mobile (2) de la section d'étagère principale (1) ;

- au moins un élément de guidage (4) qui oriente la section d'étagère mobile pendant sa transition entre la position à plat de l'étagère (R) et la position repliée de celle-ci, dont au moins un côté est connecté à un côté de la section d'étagère principale (1) qui fait face à la section d'étagère mobile (2) dans la position à plat de l'étagère (R), et ayant au moins une surface incurvée (4a), en forme de S, qui vient en contact avec ladite surface supérieure de la section d'étagère mobile (2) dans lequel au moins une partie de son côté qui est en contact avec la section d'étagère mobile (2) pendant le déplacement de la section d'étagère mobile (2) est incurvée, et au moins une surface plate (4b) formant un pont entre la section d'étagère principale (1) et la section d'étagère mobile (2) et

- au moins un élément de butée (3d) qui s'étend, dans ledit corps (3a), comme une saillie ressortant vers l'extérieur depuis ledit canal (3b), et qui empêche la section d'étagère principale (1) située dans la cavité (3c) de bouger dans la direction horizontale, dans la position repliée de l'étagère (R), ainsi qu'une dislocation incontrôlée de celle-ci ;

guidage (3) de la zone où il est fixé, lorsqu'il est utilisé.

dans lequel dans la position repliée de l'étagère (R), la section d'étagère principale (1) et la section d'étagère mobile (2) sont positionnées en contact l'une avec l'autre.

2. Système d'étagères (S) selon la revendication 1, **caractérisé en ce qu'**au moins une autre extrémité dudit canal (3b) est fermée.
3. Système d'étagères (S) selon la revendication 1, **caractérisé en ce que** l'élément de butée (3d) est positionné sur un côté du canal (3b) qui est ouvert vers la cavité (3c).
4. Système d'étagères (S) selon la revendication 1, **caractérisé en ce que** l'élément de butée (3d) est configuré pour s'étendre dans la direction verticale.
5. Système d'étagères (S) selon la revendication 1, **caractérisé en ce qu'**il comprend au moins une ouverture sur un côté supérieur de la cavité (3c), qui permet le détachement de la section d'étagère principale (1) à partir de la cavité (3c) en la déplaçant dans la direction verticale.
6. Système d'étagères (S) selon la revendication 1, **caractérisé en ce qu'**il comprend au moins un élément de maintien (5) qui est conçu pour être fixé à l'appareil blanc et pour recevoir ledit élément de guidage (3), qui porte l'élément de guidage (3) et qui empêche l'élément de guidage (3) de tomber de la zone où il est situé en cas de détachement de l'élément de

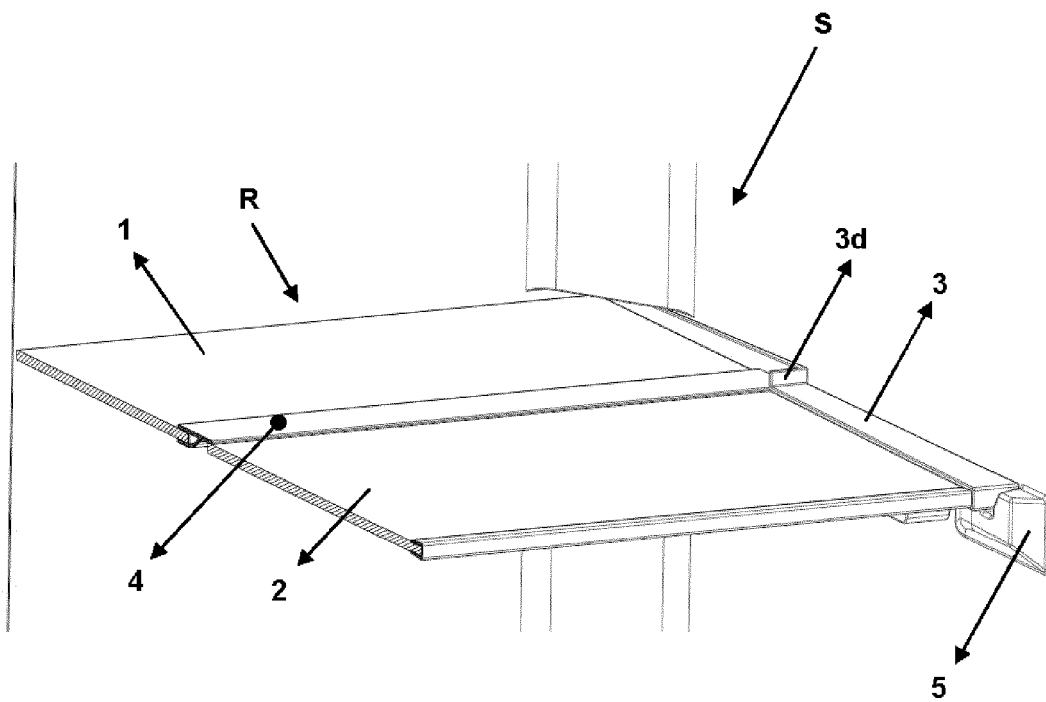


Figure 1

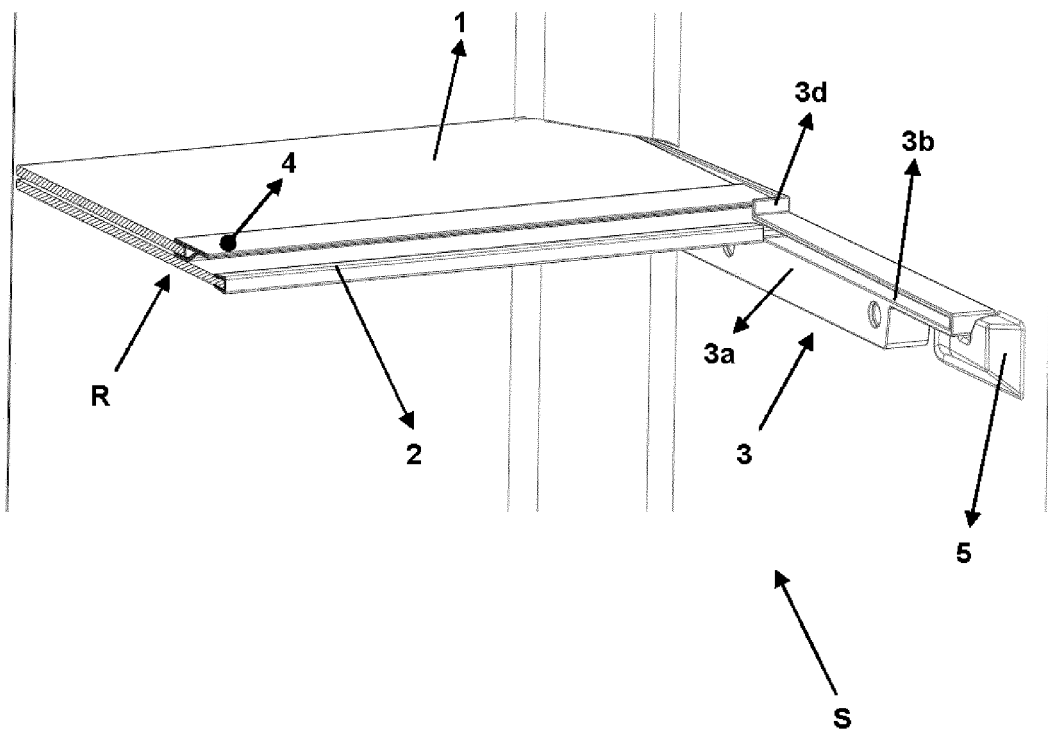


Figure 2

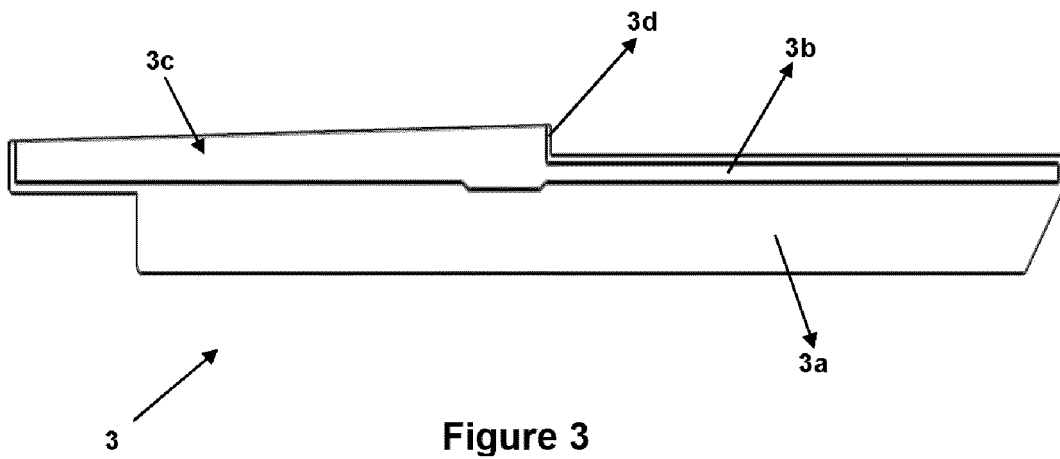


Figure 3

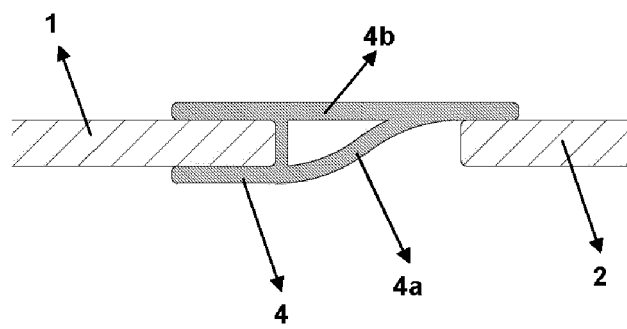


Figure 4

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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