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(54) **A home appliance door connection**

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Connexion de porte pour appareil ménager

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Description

Technical Field

[0001] The present invention is related to the connection of the doors located in home appliances such as dishwasher to the home appliance.

Prior Art

[0002] Home appliances of the state of the art such as dishwasher, cooker, etc. comprise at least one door which is suitable for closing at least one chamber comprised by the home appliance. Said door can make rotational movement around a horizontal axis preferably and thus the door is able to come to an open and a close state for reaching to the inner chamber. However, in the event that these doors are not moved in a careful and controlled manner, the door or the home appliance can be damaged since the doors move in horizontal axis. In order to prevent said problem, said doors are assembled to the body of the home appliance by using hinge and spring. However, during the movement of the door, the spring can give damage due to the force it exerts on the body of the home appliance and on the door.

[0003] The embodiment used commonly in the state of the art for solving said problem is connecting the spring to the body and to the door via interconnection elements. Such a home appliance is known from EP 2362044 and discloses the features of the preamble of claim 1. The published patent documents no EP1431671B1, EP1602883A2 and WO2007088141A1 are included in the state of the art. In the embodiments described in said documents, the spring is used for assembling the doors located in home appliances such as dishwasher and/or cooker to the body of the home appliance; and this spring is engaged to the body of the home appliance and/or to the door via interconnection elements. However, using interconnection elements both increases the cost of the home appliance and causes the assembly to take long time by making the assembly of the door difficult.

Brief Description of the Invention

[0004] A home appliance of the present invention comprises at least one door; at least one lower panel, which comprises at least one channel, and at least one back wall extending upwards from a side of the channel away from the door; for opening and closing of the door, at least one spring which is placed in said channel, which has at least one hook provided in at least one end, whose end having the hook is engaged to said back wall, whose other end is connected with said door; at least one groove which is located in the back wall for engaging the spring to the back wall, and through which the hook comprised by the spring is passed by moving away from the channel when the spring is placed in the channel; at least one hole which is located in the back wall for engaging the

spring to the back wall, and after the hook is passed inside said groove, through which a hook end comprised by the hook is passed such that the hook end is moved towards the channel; at least one side wall which extends from the back side of the back wall to the outside along the back wall; at least one support element whose one edge is positioned at the back side of the back wall and whose other edge is positioned at a side of the side wall facing the back wall close to the groove; at least one horizontal support rib which extends from the upper portion of said groove to the outside at the back side of the back wall so as to support the groove; at least two vertical support ribs which extend at the back side of the back wall to the outside being parallel to the side wall so as to be at least one in both sides of said hole and by which a channel structure, in which said hole remains, is formed.

[0005] With the home appliance of the present invention, it is able to be ensured that a door of the home appliance which is suitable for closing an internal chamber of the home appliance is assembled to the body of the home appliance in an easy and reliable way. A robust, reliable and durable home appliance is obtained against the force to be exerted by the spring to the lower panel to which the spring used during the assembly of the door is engaged, and against the damage to be given by the hook provided in the spring during the engagement of the spring by contacting with the lower panel.

Objectives of the Invention

[0006] An aim of the invention is to develop a home appliance in which a spring connecting a door therein to the body of the home appliance is engaged to the body without using an interconnection element.

[0007] The other aim of the invention is to develop a home appliance in which said spring is assembled to the body of the home appliance in an easy, quick and reliable manner.

[0008] Another aim of the invention is to develop a home appliance in which the damage to be given to the body via the spring by the movement of the door is minimized.

Description of the Drawings

[0009] Exemplary embodiments of the home appliance of the invention are shown in attached drawings wherein;

Figure 1 is a perspective view of a lower panel comprised by the body of the home appliance.

Figure 2 is a perspective view of a spring used for the connection of a door comprised by the home appliance to the body.

Figure 3 is a view of detail "D" shown in figure 1.

Figure 4 is a perspective view of the spring engaged to the body.

Figure 5 is a perspective view of detail "E" shown in figure 3.

Figure 6 is a back perspective view of detail "F" shown in figure 5.

Figure 7 is a back perspective view of detail "G" shown in figure 4.

[0010] The parts in figures are individually enumerated and the corresponding terms of reference numbers are given as follows:

Lower panel	(A)
Channel	(K)
Back wall	(K1)
Side wall	(K2)
Spring	(Y)
Hook	(Y1)
Hook end	(Y2)
Groove	(1)
Hole	(2)
Support element	(3)
Horizontal support rib	(4)
Vertical support rib	(5)
Front support rib	(6)

Description of the Invention

[0011] Home appliances such as dishwasher comprise at least one door which can be opened and closed for reaching to the internal chamber of the home appliance. Said doors are opened and closed preferably by making rotational movement in a horizontal axis. Therefore, these doors are engaged to the home appliance via at least one spring whose one end is connected to the body of the home appliance and whose other end is connected to the door. The spring, whose both ends are preferably in the form of hooks, is engaged to the body preferably by an interconnection element; and therefore the assembly of the door becomes difficult and the cost of the home appliance is increased. Thanks to the home appliance of the present invention, engagement of the door to the home appliance in an easy and reliable way is ensured without requiring said interconnection element.

[0012] The home appliance (not shown in figures) of the present invention comprises at least one lower panel (A), an exemplary view of which is shown in figure 1, which comprises at least one channel (K), and at least one back wall (K1) extending upwards from a side of the channel (K) away from at least one door (not shown in the figure) comprised by the home appliance; and, for opening and closing the door, at least one spring (Y) an exemplary view of which is shown in figure 2, which is placed in said channel (K), which has at least one hook (Y1) in at least one end, whose end having the hook (Y1) is engaged to said back wall (K1), whose other end is connected to said door. As shown in figures 3 to 5, the home appliance comprises at least one groove (1) and at least one hole (2) which are located in the back wall

(K1) for engaging the spring (Y) to the back wall (K1). When the spring (Y) is placed in the channel (K), the hook (Y1) comprised by the spring (Y) is passed through said groove (1) preferably in horizontal position, and therefore the hook (Y1) remains at the backside of the back wall (K1) (at the side of the back wall (K1) which does not face the channel (K)). Then, the hook (Y1) is preferably brought to vertical position, and the hook (Y1) is passed through the hole (2) provided in the back wall (K1) such that a hook end (Y2) comprised by the hook (Y1) is moved towards the channel (K). Therefore, the portion of the back wall (K1) remaining between the groove (1) and the hole (2) remains in the hook (Y1), and it is ensured that the hook (Y1) is engaged to the back wall (K1).

[0013] In order to ensure the engagement of the spring (Y) to the back wall (K1) in a reliable way and minimize the damage to be given by the spring (Y) to the back wall (K1) especially during opening and closing of the door said home appliance, as shown in figure 6 and figure 7, comprises at least one side wall (K2) which extends from the back side of the back wall (K1) to the outside along the back wall (K1); at least one support element (3), preferably in a triangular form, positioned close to the groove (1) such that one edge of which is positioned at the back side of the back wall (K1) and the other edge of which is positioned at a side of the side wall (K2) facing the back wall (K1); at least one horizontal support rib (4) which extends from the upper portion of said groove (1) to the outside at the back side of the back wall (K1) so as to support the groove (1); at least two vertical support ribs (5) which extend at the back side of the back wall (K1) being parallel to the side wall (K2) to the outside so as to be at least one in both sides of said hole (2). During opening and closing of the door, the back wall is supported against the force, which is exerted by the spring (Y) on the back wall (K1), by said support element (3). The hook (Y1) at the end of the spring (Y) is ensured to be passed through the groove (1) properly without sticking to the back wall (K1) by said horizontal support rib (4). Besides, a channel structure, in which said hole (1) remains, is formed by the vertical support ribs (5) positioned in the back wall (K1), and it is ensured that the hook (Y1) passed through the groove (1) is aligned properly and the hook end (Y2) is passed through said hole (2) without damaging by being sticking to the back wall (K1). Therefore the support element (3), the horizontal support rib (4) and the vertical support ribs (5) strengthen the back wall (K1) against the force to be exerted by the spring (Y) together and it is able to be ensured that the hook (Y1) comprised by the spring (Y) is engaged to the back wall (K1) without damaging the back wall (K1) by being aligned properly. Thus, a home appliance in which said spring (Y) is assembled to the body (exemplified as the lower panel (A) in the invention) of the home appliance in an easy, quick and reliable manner without requiring using an interconnection element is obtained.

[0014] In a preferred embodiment of the invention, the home appliance as shown in figure 3 and figure 5 com-

prises at least two front support ribs (6) which are positioned at a side of the back wall (K1) facing the channel (K) so as to be extending towards the channel (K) and to be at least one at both sides of said hole (2). The front support ribs (6), preferably contacting with the base of the channel (K), form a channel structure for the spring (Y) and the hook (Y1) and support the spring (Y) and the hook (Y1) when the hook (Y1) is engaged to the back wall (K1). Therefore it is ensured that the spring (Y) is settled in the channel (K) in a reliable way, and in the event that the end of the spring (Y) connected to the door is released due to any reason, the damages to be given to the home appliance by the spring (Y) settled in the channel (K) is able to be prevented by restraining the spring (Y) becoming free.

[0015] In another exemplary embodiment of the invention, shown in figures, the home appliance comprises at least one another support element (3) which is positioned close to said hole (2) so as to contact with the back wall (K1) and the side wall (K2) and which is preferably in a triangular form. Therefore both the groove (1) and the hole (2) are supported at the same time, and a home appliance which is more durable against the force to be exerted by the spring (Y) is able to be obtained.

[0016] In another embodiment of the invention, the hook end (Y2) of the spring, (Y) which passes through the groove (1) and the hole (2), is in a structure curved towards the spring (Y). Therefore, when the hook end (Y2), which has been passed through the groove (1), is passed through the hole (2), in the event that the hook end (Y2) contacts with the back wall (K1), the back wall (K1) is prevented from being damaged by the hook end (Y2). Moreover, thanks to this curved hook end (Y2) easy and quick assembly of the spring (Y) to the lower panel (A) is ensured by centering the hook (Y1) passed through the groove (1) via vertical support ribs (5),.

[0017] With the home appliance of the present invention, it is able to be ensured that a door of the home appliance which is suitable for closing an internal chamber of the home appliance is assembled to the body of the home appliance in an easy and reliable way. A robust, reliable and durable home appliance is obtained against the force to be exerted by the spring (Y) to the lower panel (A) to which the spring used during the assembly of the door is engaged, and against the damage to be given by the hook (Y1) provided in the spring (Y) during the engagement of the spring (Y) by contacting to the lower panel (A).

Claims

1. A home appliance comprising at least one door which is suitable for closing at least one chamber of the home appliance; at least one lower panel (A), which comprises at least one channel (K), and at least one back wall (K1) extending upwards from a side of the channel (K) away from the door; and for

opening and closing of the door, at least one spring (Y) which is placed in said channel (K), which has at least one hook (Y1) provided in at least one end, whose end having the hook (Y1) is engaged to said back wall (K1), whose other end is connected with said door further comprising;

- at least one groove (1) which is located on the back wall (K1) for engaging the spring (Y) to the back wall (K1), and through which the hook (Y1) comprised by the spring (Y) is passed by moving away from the channel (K) when the spring (Y) is placed in the channel (K);

- at least one hole (2) which is located on the back wall (K1) for engaging the spring (Y) to the back wall (K1), and through which a hook end (Y2) comprised by the hook (Y1) is passed such that the hook end (Y2) is moved towards the channel (K) after the hook (Y1) is passed inside said groove (1);

characterized by the home appliance comprising;

- at least one side wall (K2) which extends from the back side of the back wall (K1) to the outside along the back wall (K1);

- at least one support element (3) which is positioned close to the groove (1) such that whose one edge is positioned at the back side of the back wall (K1) and whose other edge is positioned at a side of the side wall (K2) facing the back wall (K1);

- at least one horizontal support rib (4) which extends from the upper portion of said groove (1) to the outside at the back side of the back wall (K1) so as to support the groove (1);

- at least two vertical support ribs (5) which extend at the back side of the back wall (K1) being parallel to the side wall (K2) to the outside so as to be at least one in both sides of said hole (2) and by which a channel structure, in which said hole (2) remains, is formed.

2. A home appliance according to claim 1 **characterized by** comprising at least two front support ribs (6) which are positioned at a side of the back wall (K1) facing the channel (K) so as to be extending towards the channel (K) and to be at least one at both sides of said hole (2), and which form a channel structure for the spring (Y) and the hook (Y1), and which support the spring (Y) and the hook (Y1) when the hook (Y1) is engaged to the back wall (K1).

3. A home appliance according to claim 2 **characterized in that** said front support ribs (6) are positioned so as to contact with the base of the channel (K).

4. A home appliance according to claim 1 **characterized by** comprising at least one another support el-

ement (3) which is positioned close to said hole (2) so as to contact with the back wall (K1) and the side wall (K2).

5. A home appliance according to claim 1 or 4 **characterized in that** said support element (3) is in a triangular form. 5
6. A home appliance according to one of the preceding claims **characterized in that** the hook end (Y2) of the spring (Y) which passes through the groove (1) and the hole (2) is in a structure curved towards the spring (Y). 10

Patentansprüche

1. Haushaltsgert mit zumindest einer Tdr, die geeignet ist, zumindest eine Kammer des Haushaltsgerts zu schlieen; zumindest einer unteren Platte (A), die zumindest einen Kanal (K) aufweist und zumindest einer Rckwand (K1), die sich von einer von der Tdr entfernten Seite des Kanals (K) aufwrts erstreckt; und zum dffnen und Schlieen der Tdr mit zumindest einer Feder (Y), die in dem Kanal (K) angeordnet ist, die zumindest einen Haken (Y1) an zumindest einem Ende aufweist, wobei das Ende mit dem Haken (Y1) in die Rckwand (K1) greift, und das andere Ende mit der Tdr verbunden ist; weiterhin umfassend: 20
 - zumindest eine Nut (1), die sich an der Rckwand (K1) befindet, zum Eingreifen der Feder (Y) in die Rckwand (K1), und durch die der Haken (Y1), umfasst von der Feder (Y), durch ein Wegbewegen von dem Kanal (K) eingefhrt wird, wenn die Feder (Y) in den Kanal (K) angeordnet wird; 25
 - zumindest ein Loch (2), das sich in der Rckwand (K1) befindet, zum Eingreifen der Feder (Y) in die Rckwand (K1), und durch das ein Hakenende (Y2), umfasst von dem Haken (Y1), so eingefhrt wird, dass es in Richtung des Kanals (K) bewegt wird, nachdem der Haken (Y1) in die Nut (1) eingefhrt wird; 30

dadurch gekennzeichnet, dass das Haushaltsgert umfasst:

- zumindest eine Seitenwand (K2), die sich von der Rckseite der Rckwand (K1) zu der Auenseite entlang der Rckwand (K1) erstreckt; 50
- zumindest ein Sttzelement (3), das nahe der Nut (1) angeordnet ist, so dass dessen eine Kante an der Rckseite der Rckwand (K1) angeordnet ist und dessen andere Kante an einer Seite der Seitenwand (K2), gegenber der Rckwand (K1), angeordnet ist; 55

- zumindest eine horizontale Sttzippe (4), die sich vom oberen Teil der Nut (1) zu der Auenseite der Rckseite der Rckwand (K1) erstreckt, um die Nut (1) zu sttzen;
- zumindest zwei vertikale Sttzippen (5), die sich an der Rckseite der Rckwand (K1) erstrecken, parallel zu der Seitenwand (K2), zu der Auenseite, so dass zumindest Eine auf beiden Seiten des Lochs (2) ist und wodurch eine Kanalstruktur, in der das Loch (2) liegt, gebildet wird.

2. Haushaltsgert nach Anspruch 1, **dadurch gekennzeichnet, dass** es umfasst:

zumindest zwei vordere Sttzippen (6), die auf einer Seite der Rckwand (K1), gegenber des Kanals (K), angeordnet sind, so dass sich diese in Richtung des Kanals (K) erstrecken und dass zumindest Eine auf beiden Seiten des Lochs (2) ist, und die eine Kanalstruktur fr die Feder (Y) und den Haken (Y1) bilden, und die die Feder (Y) und den Haken (Y1) sttzen, wenn der Haken (Y1) in die Rckwand (K1) greift.

3. Haushaltsgert nach Anspruch 2, **dadurch gekennzeichnet, dass** die vorderen Sttzippen (6) so angeordnet sind, dass sie die Basis des Kanals (K) berhren.

4. Haushaltsgert nach Anspruch 1, **dadurch gekennzeichnet, dass** es umfasst:

zumindest ein weiteres Sttzelement (3), das nahe dem Loch (2) angeordnet ist, so dass es die Rckwand (K1) und die Seitenwand (K2) berhrt.

5. Haushaltsgert nach einem der Ansprche 1 oder 4, **dadurch gekennzeichnet, dass** das Sttzelement (3) eine dreieckige Form aufweist.

6. Haushaltsgert nach einem der vorstehenden Ansprche, **dadurch gekennzeichnet, dass** das Hakenende (Y2) der Feder (Y), das in die Nut (1) und das Loch (2) eingefhrt ist oder durch das Loch greift, eine in Richtung der Feder (Y) gekrmmte Form aufweist.

Revendications

1. Appareil mnger comprenant au moins une porte qui est approprie pour fermer au moins une chambre de l'appareil mnger ; au moins un panneau infrieur (A), qui comprend au moins une gorge (K), et au moins une paroi arrire (K1) s'tendant vers le haut à partir d'un cte de la gorge (K) en s'loignant

de la porte ; et pour l'ouverture et la fermeture de la porte, au moins un ressort (Y) qui est placé dans ladite gorge (K), qui comporte au moins un crochet (Y1) prévu dans au moins une extrémité, dont l'extrémité possédant le crochet (Y1) est en prise avec ladite paroi arrière (K1), dont l'autre extrémité est raccordée à ladite porte, comprenant en outre :

- au moins une rainure (1) qui est située sur la paroi arrière (K1) pour mettre le ressort (Y) en prise avec la paroi arrière (K1), et à travers laquelle le crochet (Y1) compris par le ressort (Y) passe en s'éloignant de la gorge (K) lorsque le ressort (Y) est placé dans la gorge (K) ;
- au moins un trou (2) qui est situé sur la paroi arrière (K1) pour mettre le ressort (Y) en prise avec la paroi arrière (K1), et à travers lequel une extrémité de crochet (Y2) comprise par le crochet (Y1) passe de sorte que l'extrémité de crochet (Y2) soit rapprochée de la gorge (K) après que le crochet (Y1) passe à l'intérieur de ladite rainure (1) ;

caractérisé en ce que l'appareil ménager comprend :

- au moins une paroi latérale (K2) qui s'étend à partir du côté arrière de la paroi arrière (K1) vers l'extérieur le long de la paroi arrière (K1) ;
- au moins un élément de support (3) qui est positionné à proximité de la rainure (1) de sorte que son premier bord soit positionné sur le côté arrière de la paroi arrière (K1) et son autre bord soit positionné sur un côté de la paroi latérale (K2) faisant face à la paroi arrière (K1) ;
- au moins une nervure de support horizontale (4) qui s'étend à partir de la partie supérieure de ladite rainure (1) vers l'extérieur sur le côté arrière de la paroi arrière (K1) afin de supporter la rainure (1) ;
- au moins deux nervures de support verticales (5) qui s'étendent sur le côté arrière de la paroi arrière (K1) parallèlement à la paroi latérale (K2) vers l'extérieur afin d'être au moins une dans les deux côtés dudit trou (2) et par lesquelles une structure de gorge, dans laquelle ledit trou (2) reste, est formée.

2. Appareil ménager selon la revendication 1, **caractérisé en ce qu'il** comprend au moins deux nervures de support avant (6) qui sont positionnées sur un côté de la paroi arrière (K1) faisant face à la gorge (K) afin de s'étendre vers la gorge (K) et d'être au moins une sur les deux côtés dudit trou (2), et qui forment une structure de gorge pour le ressort (Y) et le crochet (Y1), et qui supportent le ressort (Y) et le crochet (Y1) lorsque le crochet (Y1) est en prise avec la paroi arrière (K1).

3. Appareil ménager selon la revendication 2, **caractérisé en ce que** lesdites nervures de support avant (6) sont positionnées afin d'entrer en contact avec la base de la gorge (K).

4. Appareil ménager selon la revendication 1, **caractérisé en ce qu'il** comprend au moins un autre élément de support (3) qui est positionné à proximité dudit trou (2) afin d'entrer en contact avec la paroi arrière (K1) et la paroi latérale (K2).

5. Appareil ménager selon la revendication 1 ou 4, **caractérisé en ce que** ledit élément de support (3) présente une forme triangulaire.

6. Appareil ménager selon une des revendications précédentes, **caractérisé en ce que** l'extrémité de crochet (Y2) du ressort (Y) qui passe à travers la rainure (1) et le trou (2) est dans une structure incurvée vers le ressort (Y).

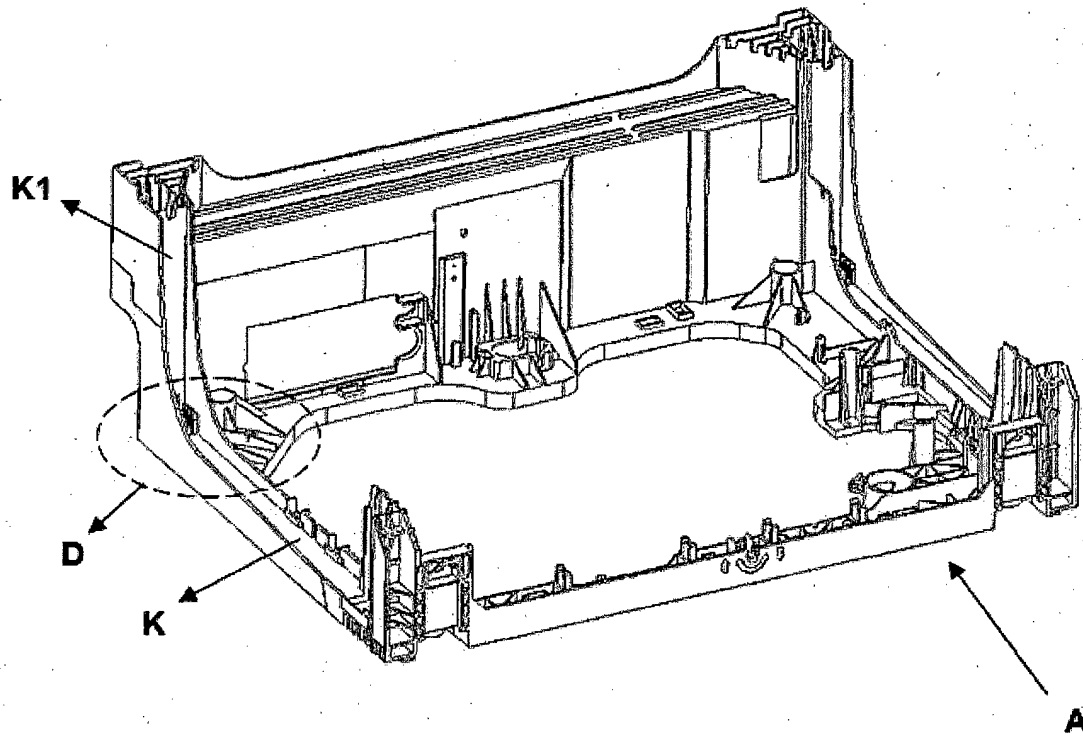


Figure 1

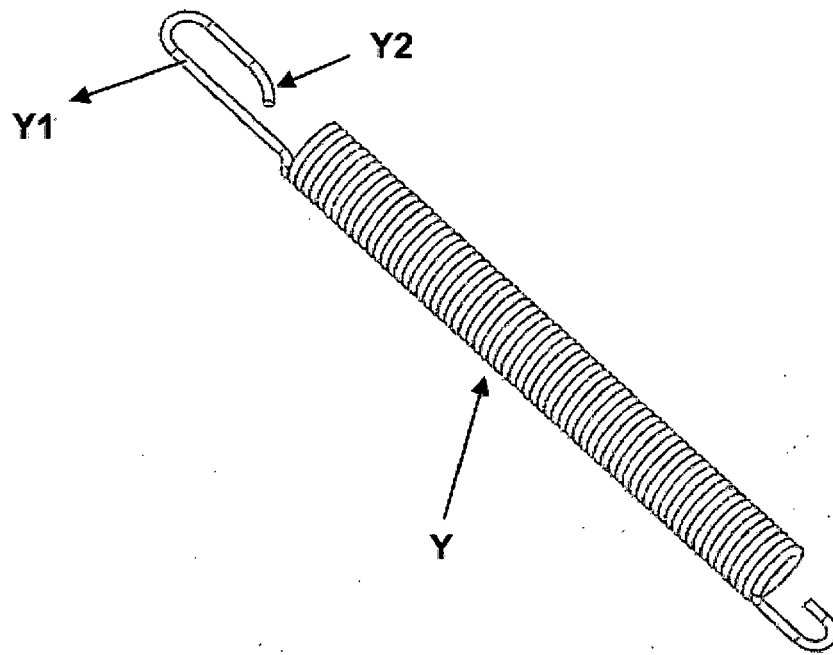


Figure 2

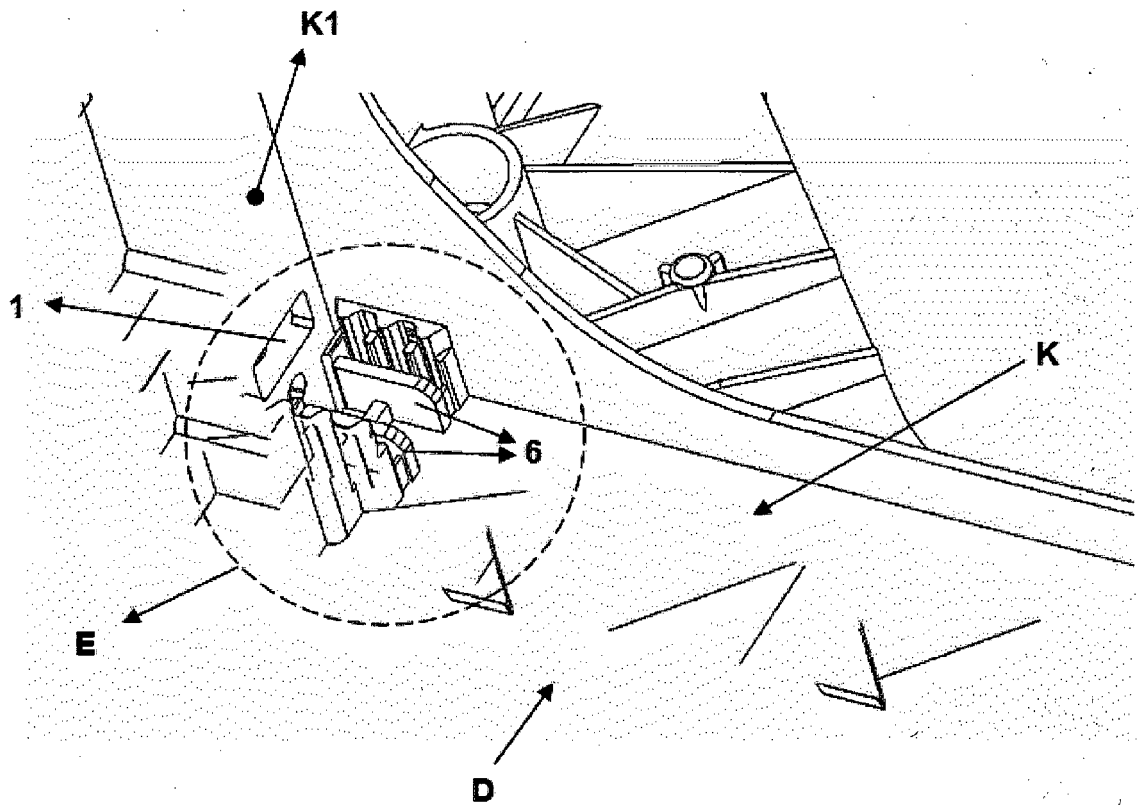


Figure 3

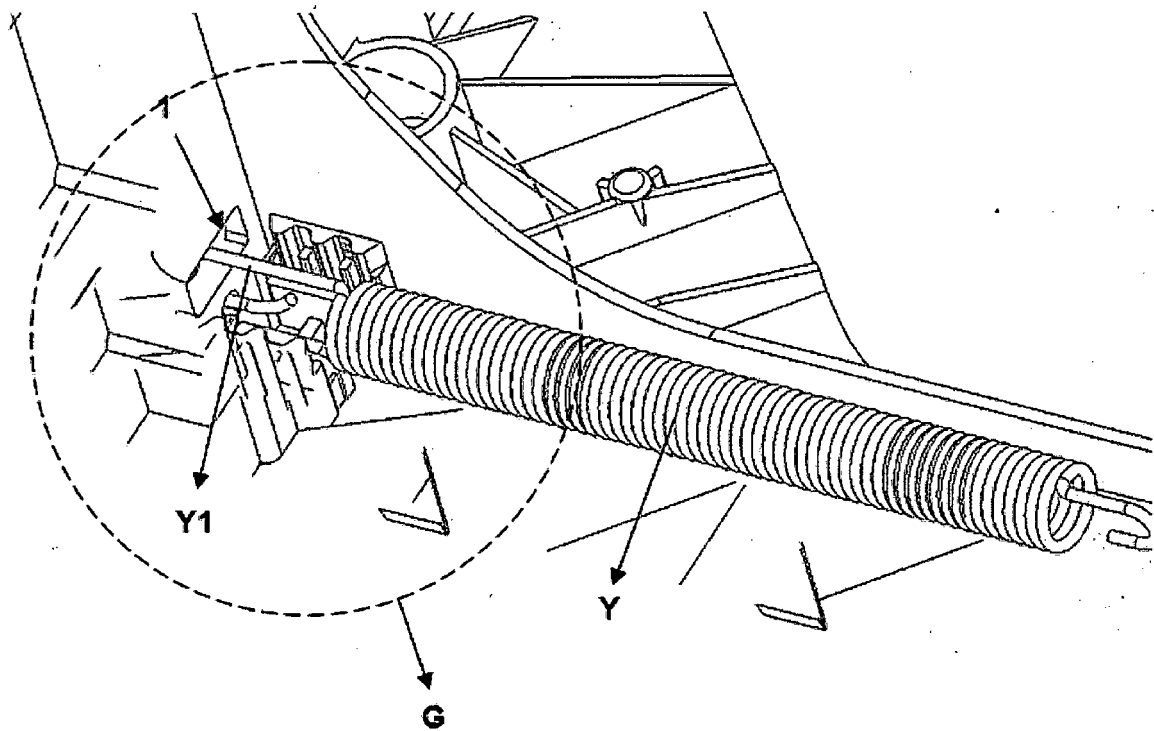


Figure 4

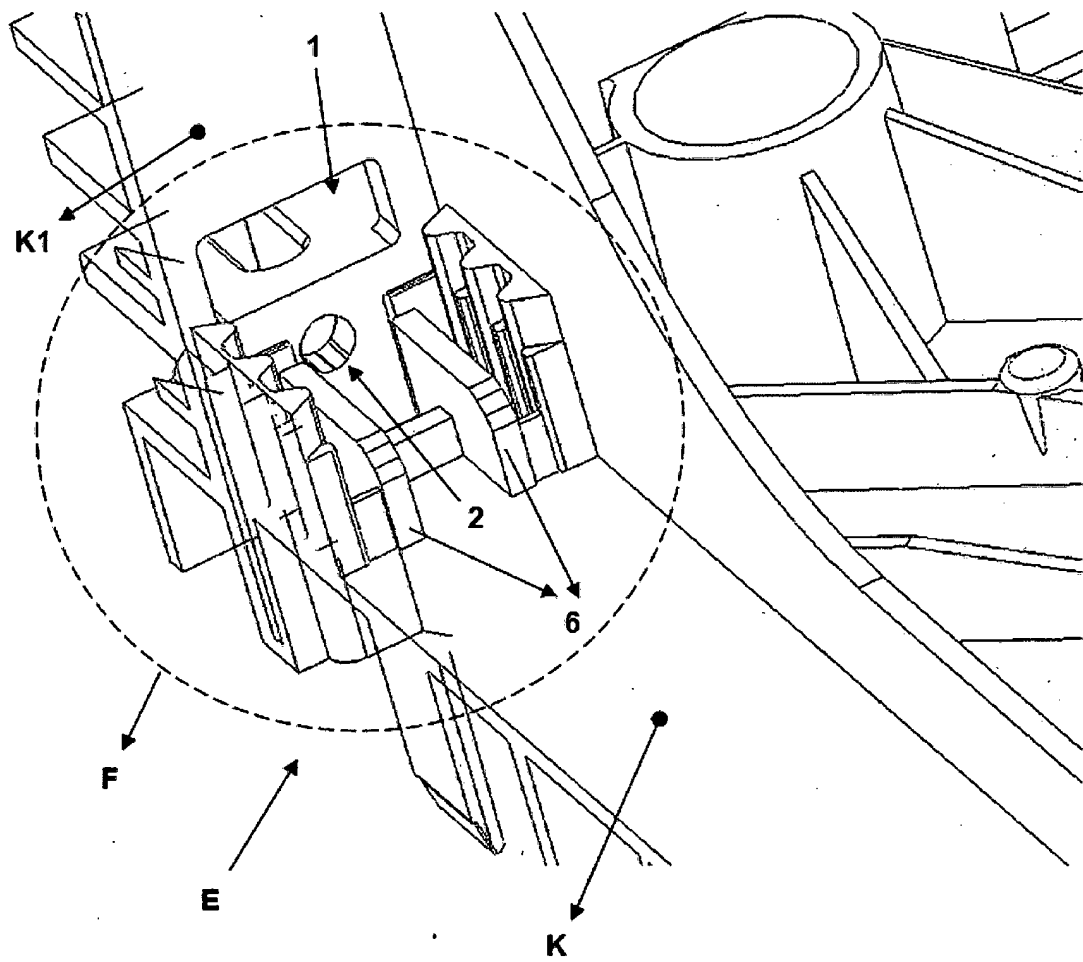


Figure 5

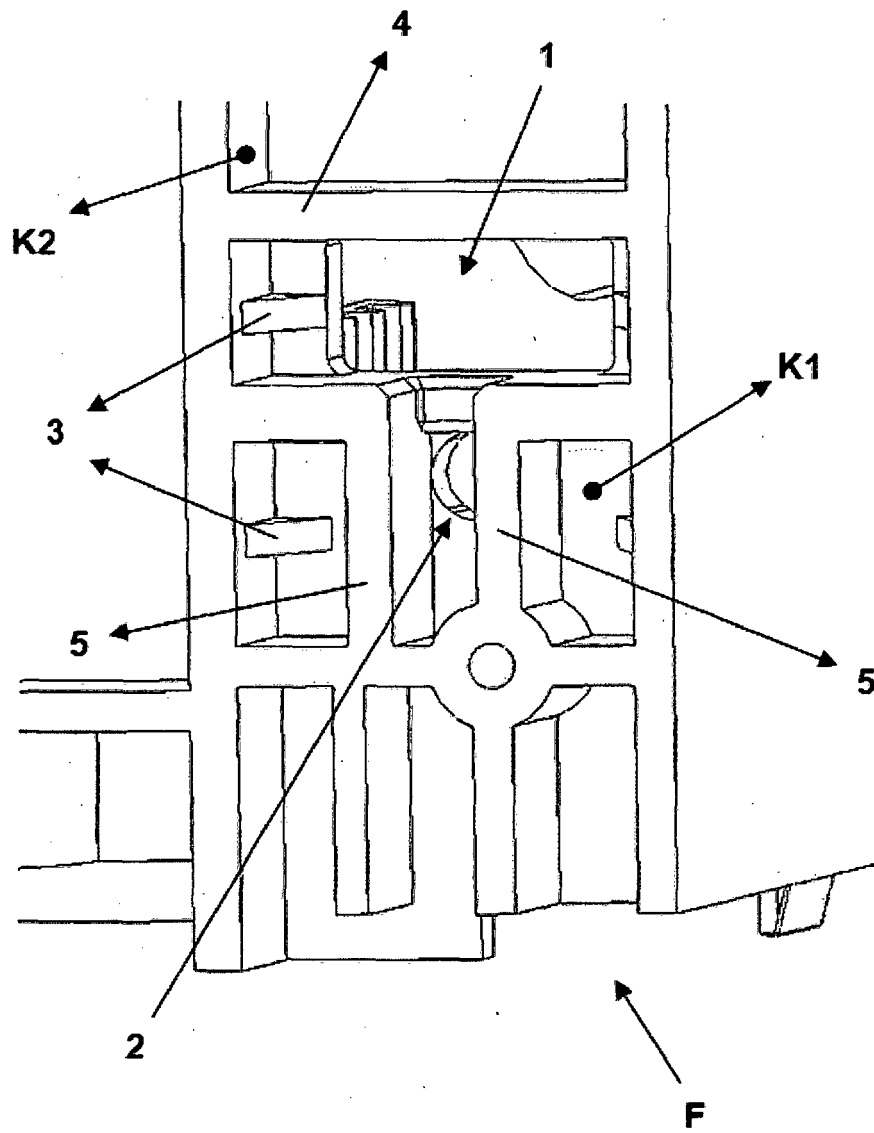


Figure 6

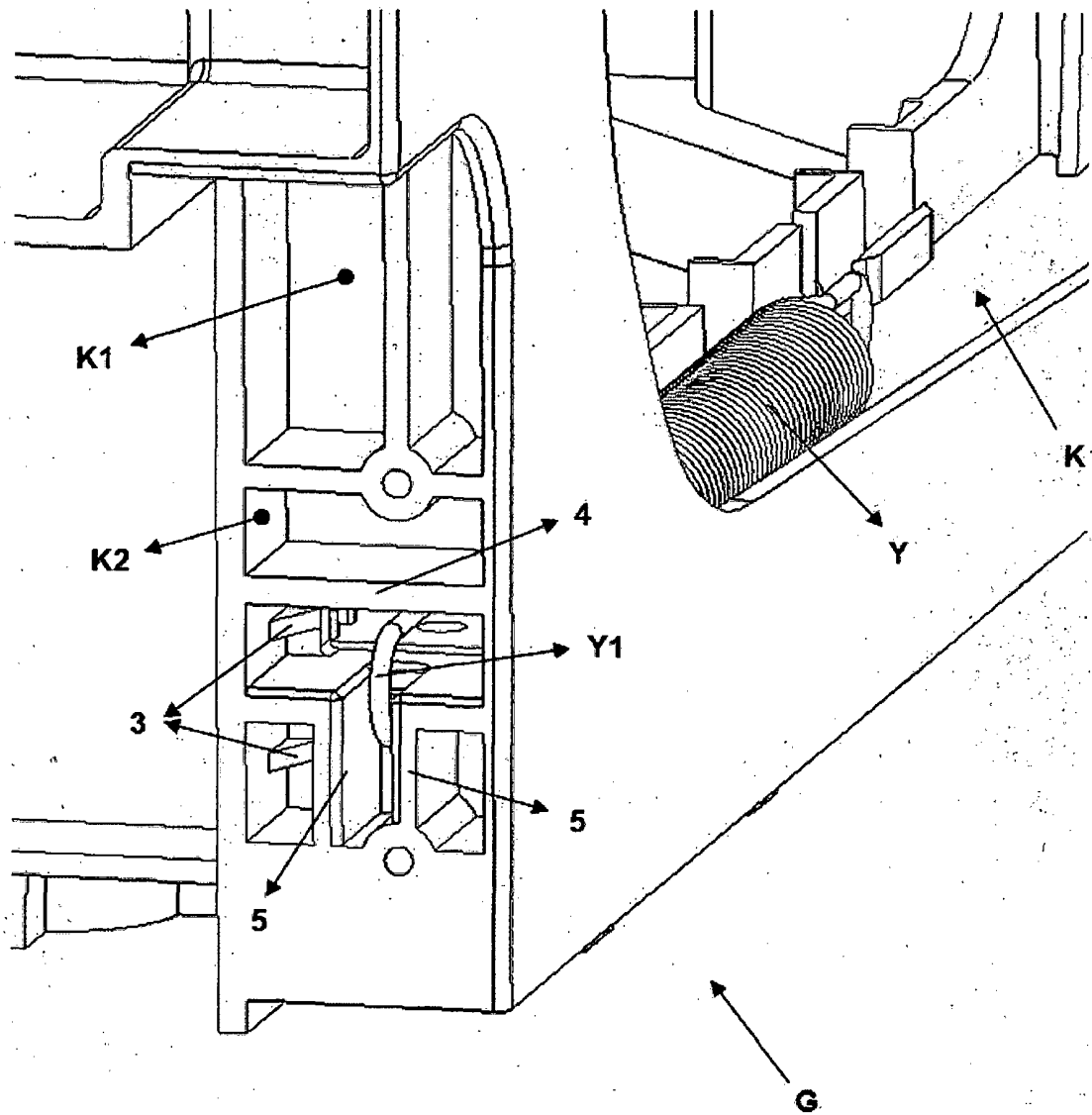


Figure 7

REFERENCES CITED IN THE DESCRIPTION

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