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(54) **Device for hinging and connecting a door of a household electrical appliance built into a furniture item, to a door panel of this latter so as to achieve optimum utilization of the compartment housing the appliance**

Vorrichtung zur gelenkigen Verbindung und Kuppeln einer Tür eines zum Einbau in einen Möbelement bestimmten elektrischen Einbaugerätes an einem Türpaneel des Möbelementes, so dass der Raum des Möbelementes optimal benutzt wird

Dispositif pour articuler et connecter une porte d'un appareil domestique électrique encastré dans un élément de meuble, à un panneau de porte de ce dernier afin de réaliser une utilisation optimale du compartiment logeant l'appareil

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Description

This invention relates to a device for hinging and connecting a door of a built-in household electrical appliance, such as an upright refrigerator, to a door panel of a furniture item housing the door panel, the door panel being in a position corresponding with said door.

In the case of a built-in household electrical appliance it is desirable and necessary to achieve maximum utilization of the space in the furniture item housing the appliance.

There are various known methods of achieving this and allowing easy opening both of the door panel of the furniture item and of the door of the appliance (or of each door with which it is provided and each door panel relative to it).

For example a double-parallelogram hinge is known from EP-A-0565900, from which the preamble of claim 1 is known, such hinge on opening the door panel of the furniture item causes this panel to undergo an initial movement parallel to itself so as to separate it from the door of the appliance (for example an upright refrigerator), after which it allows both the door panel and the refrigerator door to rotate about relative hinging points.

Although this method achieves optimum utilization of the furniture item housing the refrigerator, it has various drawbacks including a high cost which negatively affects the cost of assembling the furniture item containing the appliance (for example a kitchen furniture unit); in addition the hinge is of considerable overall dimensions, involving obvious storage and installation problems, and is not easily adjustable.

It is also known to use two separate hinges for opening the refrigerator door and the door panel of the furniture item. This method does not however achieve optimum utilization of the space in the furniture item housing the appliance.

An object of the present invention is to provide a device of the aforesaid type which is of simple, low-cost construction and allows maximum utilization of the space housing the appliance.

This object is realised by the characterising features of claim 1.

This and further objects which will be apparent to the expert of the art are attained by a device in accordance with the accompanying claims.

The present invention will be more apparent from the accompanying drawing, which is provided by way of example and in which:

Figure 1 is a schematic perspective view of a household electrical appliance built into a furniture item, these latter comprising doors and door panels connected together by the device of the invention;

Figure 2 is an exploded partial perspective view of the device according to the invention;

Figures 3 to 5 are schematic sections on the line 3-3 of Figure 1 showing different stages in the use

of the device according to the invention.

Said figures show a built-in upright refrigerator positioned within a furniture item, for example a kitchen unit, and provided with doors 3 and 4 in positions corresponding with usual preservation compartments of the appliance. The furniture item 2 comprises three walls 5, 6 and 7 defining a compartment 3 housing the refrigerator 1; this compartment is closed on its free side by door panels 10 and 11 in positions corresponding with the appliance doors 3 and 4.

Each door panel is connected to the relative door by a hinging device 13 according to the invention.

This latter comprises a body 14 fixed, in known manner, on one side 14A to the wall 5 of the furniture item 2 and on another side 14B to the refrigerator cabinet 15 (alternatively the body 14 can be fixed to the furniture item or to the appliance). The body 14 comprises at least one projecting flange 17 (two superimposed in the figures); with that flange close to the refrigerator door there is associated a pin 18 arranged to cooperate with the appliance door 3 or 4 of the refrigerator 1, to form a hinge to enable said door to open and close.

The pin 18 extends perpendicularly from the lower face 20 (with reference to Figure 2) of the projecting flange 17.

With the body 14 there is associated a guide projection 21 projecting from a face 22 of its side 14A. This projection is arranged to cooperate, in order to guide its movement along the face 22, with a terminal element 23 of a hinging member 24 by means of a screw (not shown) enabling this member and said body to be associated with each other in an adjustable manner. For this purpose the screw is arranged to cooperate with a slot 28 provided in the element 23 and with a hole 29 provided in the guide projection 21.

The hinging member 24, which is a usual furniture hinge used in the furnishing field, comprises a known elastic return element 30 (comprising for example an elastic strip or an articulated quadrilateral of known construction and form) associated with a terminal member 31 fixed to the door panel 10 or 11. The return element 30 enables the door panel 10 or 11 to open and close automatically without the aid of the user, when the door panel exceeds a dead point during its movement (for example as shown in Figure 4).

Each door panel 10, 11 also comprises an outer face 22 (with respect to the compartment) on which there is preferably provided a handle, board or the like 34, and an inner face 35 facing the corresponding refrigerator door. The inner face 35 supports a substantially L-shaped guide 38 arranged to slidably cooperate with a slide (of complementary form) fixed to the refrigerator door. Finally, this latter supports usual seal elements 40 and an inner liner 41.

It will now be assumed that the refrigerator 1 is to be used by opening its door 3.

By pulling the handle 34 of the door panel 10, the

appliance door 3 is opened by rotating the door panel about the member 24 and specifically about usual hinging points (not shown but schematically indicated by 100 in Figures 4 and 5). This movement drags the appliance door 3 open by the cooperation between the guide 38 and the slide 36. The door rotates about the pin 18 shown in the figures (and about an analogous pin of a device 13, not shown, provided at the bottom of the door 3) to open and provide access to the preservation compartment closed by said door.

The appliance door 3 and the corresponding door panel are closed by operating in the opposite manner.

It should be noted that opening the door panel 10 causes it in known manner to initially separate from the wall 5 of the furniture item 2 (see Figure 4) to allow easy opening of the appliance door 3; in contrast when the door panel 10 is reclosed it becomes positioned in proximity to said wall (see Figure 3) to result in perfect sealing of the appliance door 3 against the refrigerator cabinet 15.

The device 13 is of simple construction and of considerably less cost than analogous known devices, this deriving in particular from the use of a hinging member 24 of wide commercial use in the furnishing field.

A particular embodiment of the invention has been described.

Other embodiments are however possible in the light of the foregoing description (such as providing the body 14 with only one projecting flange 17) without leaving the scope of the present document.

Claims

1. A device for hinging and connecting a door (3) of a built-in household electrical appliance (1), such as a refrigerator, to a door panel (10, 11) of a furniture item (2) containing the said appliance, and comprising hinge means having a body (14) provided with two sides (14A, 14B) respectively fixeable to a face of a furniture wall (5) and the built-in appliance (1), whereby the plane of the said furniture wall face is directed substantially perpendicular to the front face of the built in appliance (1), by which sides the body (14) is in use fixed to the furniture item (2) and/or to the appliance (1) whereby the said sides (14A, 14B) are connected together by at least one projecting flange (17), the hinge means further comprising a hinging member (24) constituted of a terminal member in use associated with the furniture item door panel (10, 11) and a parallelogram hinge link for providing a combined motion such that on opening the door panel (10, 11) the hinging member (24) causes the door panel (10, 11) to initially separate from the said wall (5) of the furniture item (2) to allow easy opening and rotation of the door panel (10, 11), the said body (14) supporting constraint means for the appliance door (3) about which this latter rotates to

open or close and whereby the said constraint means is constituted by a pin (18) supporting the appliance door (3) and projecting from that face (20) of the said at least one projecting flange (17) facing one of the opposite edges of the door (3) of the appliance (1), the device further comprising drag means (36, 38) to be associated with the door panel (10, 11) and the appliance door (3), e.g. a slide (36) and a guide (38) cooperating with each other, such that the appliance door (3) is dragged open when the door panel (10, 11) is pulled open, characterised in that said hinging member (24) is further constituted of a terminal element (23), whereby the said parallelogram hinge link links the terminal element (23) with the said terminal member, the hinging member (24) further comprising an elastic return means (30) for automatic closure or opening of the furniture item door panel (10, 11) when it exceeds a dead point during its movement, the terminal element (23) cooperating in an adjustable manner with a guide projection (21) projecting from that face (22) of the said body side (14A) to be fixed to the said furniture wall (5) which faces away from the furniture wall (5), the adjustment providing a guided movement along the said face (22) of the body side (14A) fixed to the said furniture wall (5).

2. A device as claimed in claim 1, characterised in that the projection is being arranged to cooperate, in order to guide its movement along the face (22), with the element (23) of the hinging member (24) by means of a screw enabling said member (24) and said body (14) to be associated with each other in an adjustable manner, said screw being arranged to cooperate with a slot (28) provided in the element (23) and with a hole (29) provided in the raised part (21).
3. A device as claimed in claim 1, characterised in that the drag means comprises a slide (36) associated with the appliance door to sliding cooperate with a guide element (38) associated with the door panel.

Patentansprüche

1. Vorrichtung zum Anlenken und Verbinden einer Tür eines elektrischen Haushaltseinbaugeräts (1), wie eines Standkühlschranks, an eine bzw. mit einer Türfrontplatte (10, 11) eines dieses Einbaugerät aufnehmenden Möbelstücks (2), wobei die Vorrichtung Gelenkmittel aus einem Körper (14) mit zwei Seitenwänden (14A, 14B) aufweist, mit denen der Körper (14) bei Gebrauch am Möbelstück (2) und/oder am Gerät (1) befestigt ist, wobei von diesen Seitenwänden (14A, 14B) die eine (14A) an einer Fläche einer Möbelwand (5) und die andere (14B) am Einbaugerät (1) befestigbar ist, die Ebene die-

ser Möbelwandfläche im wesentlichen senkrecht zur Frontfläche des Einbaugerätsgerichtet ist und diese Seitenwände (14A, 14B) durch mindestens einen hervorstehenden Schenkel (17) miteinander verbunden sind, wobei ferner die Gelenkmittel ein durch ein Endglied gebildetes Gelenkglied (24), das bei Gebrauch mit der Türfrontplatte (10, 11) des Möbelstücks verbunden ist, und ein Parallelogrammgelenkverbindungsmitglied umfaßt, das eine derartige Kombinationsbewegung vorsieht, daß beim Öffnen der Türfrontplatte (10, 11) das Gelenkglied (24) die Türfrontplatte (10, 11) veranlaßt, sich anfangs von der genannten Wand (5) des Möbelstücks (2) zu trennen, um ein leichtes Öffnen und Drehen der Türfrontplatte (10, 11) zu gestatten, wobei ferner der Körper (14) Klemmittel für die Gerätetür (3) trägt, die sich zum Öffnen und Schließen um diese Klemmittel dreht, und die Klemmittel durch einen Stift (18) gebildet sind, der die Gerätetür (3) stützt und aus der Fläche (20) des mindestens einen hervorstehenden Schenkels (17), der einer der gegenüberliegenden Kanten der Gerätetür (3) zugewandt ist, herausragt, wobei die Vorrichtung ferner Ziehmittel (36, 38) aufweist, die mit der Türfrontplatte (10, 11) und der Gerätetür (3) verbunden sind und beispielsweise ein Gleitstück (36) und ein Führungselement (38) umfassen, die beide miteinander derart zusammenwirken, daß die Gerätetür (3) aufgezogen wird, wenn die Türfrontplatte (10, 11) aufgemacht wird, **dadurch gekennzeichnet**, daß das Gelenkglied (24) ferner durch ein Endelement (23) gebildet ist, das durch das Parallelogrammgelenkverbindungsmitglied mit dem genannten Endglied verbunden ist, daß das Gelenkglied (24) ferner elastische Rückführmittel (30) umfaßt, die die Türfrontplatte (10, 11) automatisch schließen oder öffnen, wenn diese während ihrer Bewegung einen Totpunkt überschreitet, und daß das Endelement (23) mit einem Führungssteg (21) in einstellbarer Weise zusammenwirkt, der aus der Fläche (22) derjenigen Körperseitenwand (14A) hervorsteht, die an der genannten Möbelwand (5) zu befestigen ist, wobei diese Fläche (22) dieser Möbelwand (5) abgewandt ist und wobei die Einstellung eine geführte Bewegung längs dieser Fläche (22) derjenigen Körperseitenwand (14A) vorsieht, die an dieser Möbelwand (5) zu befestigen ist.

2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß der Führungssteg (21) so ausgebildet ist, daß er zur Führung des Endelements (23) längs der genannten Fläche (22) mit dem Endelement (23) des Gelenkgliedes (24) mittels einer Schraube zusammenwirkt, mit der das Gelenkglied (24) und der Körper (14) miteinander in einstellbarer Weise verbindbar sind und die so angeordnet ist, daß sie mit einem im Endelement (23) vorgesehenen Schlitz (28) und einem im Führungssteg (21) vor-

gesehenen Loch (29) zusammenwirkt.

3. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Ziehmittel ein mit der Gerätetür (3) verbundenes Gleitstück (36) aufweisen, das mit einem Führungselement (38) zusammenwirkt, das mit der Türfrontplatte (10) verbunden ist.

10 Revendications

1. Dispositif pour l'articulation et le raccordement d'une porte (3) d'un appareil électroménager intégré (1), tel qu'un réfrigérateur, sur un panneau de porte (10, 11) d'un meuble (2) contenant ledit appareil, et comportant des moyens d'articulation ayant un corps (14) pourvu de deux côtés (14A, 14B) pouvant être fixés de manière respective sur une face d'une paroi de meuble (5) et l'appareil intégré (1), de sorte que le plan de ladite face de paroi de meuble est dirigée sensiblement perpendiculairement à la face avant de l'appareil intégré (1), le corps (14) étant lors de l'utilisation fixé sur le meuble (2) et/ou l'appareil (1) grâce à ces côtés de sorte que lesdits côtés (14A, 14B) sont reliés ensemble par au moins un rebord saillant (17), les moyens d'articulation comportant en outre un élément d'articulation (24) constitué d'un élément terminal associé lors de l'utilisation au panneau de porte de meuble (10, 11) et une charnière à parallélogramme destinée à permettre un mouvement combiné tel que, lors de l'ouverture du panneau de porte (10, 11), l'élément d'articulation (24) amène le panneau de porte (10, 11) à se séparer initialement de ladite paroi (5) du meuble (2) afin de permettre une ouverture et une rotation faciles du panneau de porte (10, 11), ledit corps (14) supportant des moyens de retenue pour la porte d'appareil (3) autour desquels cette dernière tourne afin de s'ouvrir ou se fermer et lesdits moyens de retenue étant constitués par un axe (18) supportant la porte d'appareil (3) et dépassant de la face (20) dudit au moins un rebord saillant (17) face à l'un des bords opposés de la porte (3) de l'appareil (1), le dispositif comportant en outre des moyens d'entraînement (36, 38) devant être associés au panneau de porte (10, 11) et à la porte d'appareil (3), par exemple une glissière (36) et un guide (38) coopérant l'un avec l'autre, de telle sorte que la porte d'appareil (3) est entraînée en position ouverte lorsque le panneau de porte (10, 11) est tiré en position ouverte, caractérisé en ce que ledit élément d'articulation (24) est en outre constitué par un élément terminal (23), ladite charnière à parallélogramme reliant l'élément terminal (23) au dit élément terminal, l'élément d'articulation (24) comportant en outre des moyens de rappel élastique (30) pour la fermeture ou l'ouverture automatique du panneau de porte de meuble (10, 11) lorsqu'il dé-

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 passe un point mort pendant son mouvement, l'élé-
 ment terminal (23) coopérant d'une manière réglable avec une saillie de guidage (21) qui dépasse de la face (22) dudit côté de corps (14A) devant être fixé sur ladite paroi de meuble (5) qui est dirigée à l'écart de la paroi de meuble (5), le réglage permettant un mouvement guidé le long de ladite face (22) du côté de corps (14A) fixé sur ladite paroi de meuble (5).

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2. Dispositif selon la revendication 1, caractérisé en ce que la saillie est prévue pour coopérer, afin de guider son mouvement le long de la face (22), avec l'élément (23) de l'élément d'articulation (24) au moyen d'une vis permettant au dit élément (24) et au dit corps (14) d'être associés l'un à l'autre d'une manière réglable, ladite vis étant prévue pour coopérer avec une fente (28) prévue dans l'élément (23) et avec un trou (29) prévu dans la partie saillante (21).

3. Dispositif selon la revendication 1, caractérisé en ce que les moyens d'entraînement comportent une glissière (36) associée à la porte d'appareil afin de coopérer avec coulissement avec un élément de guidage (38) associé au panneau de porte.

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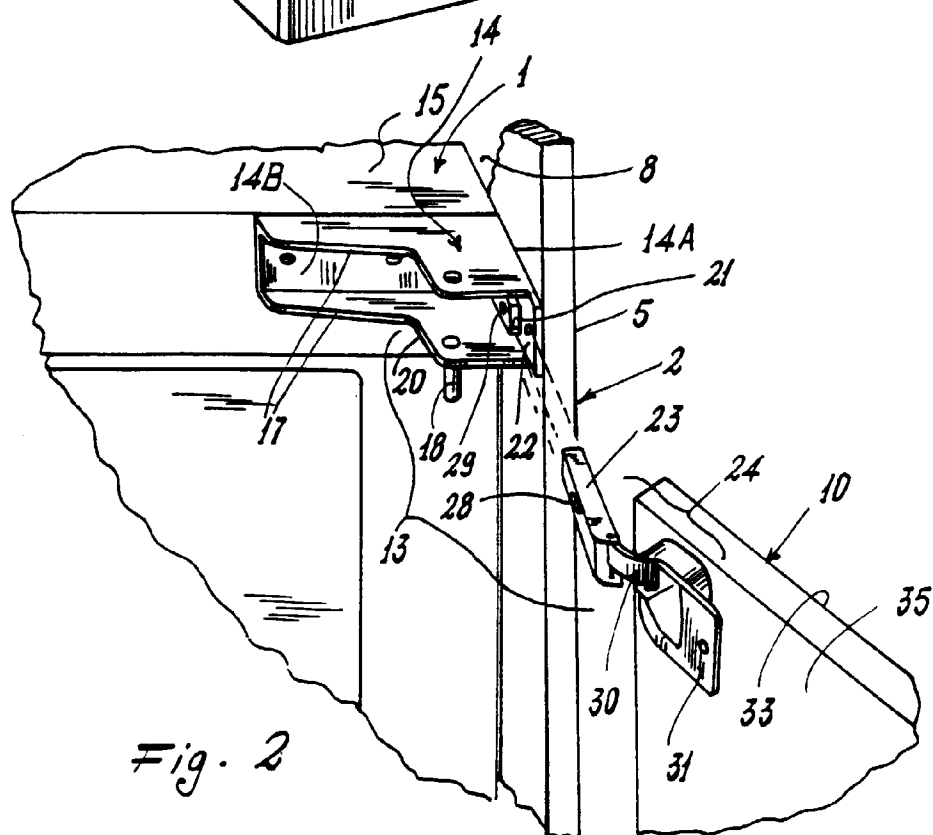
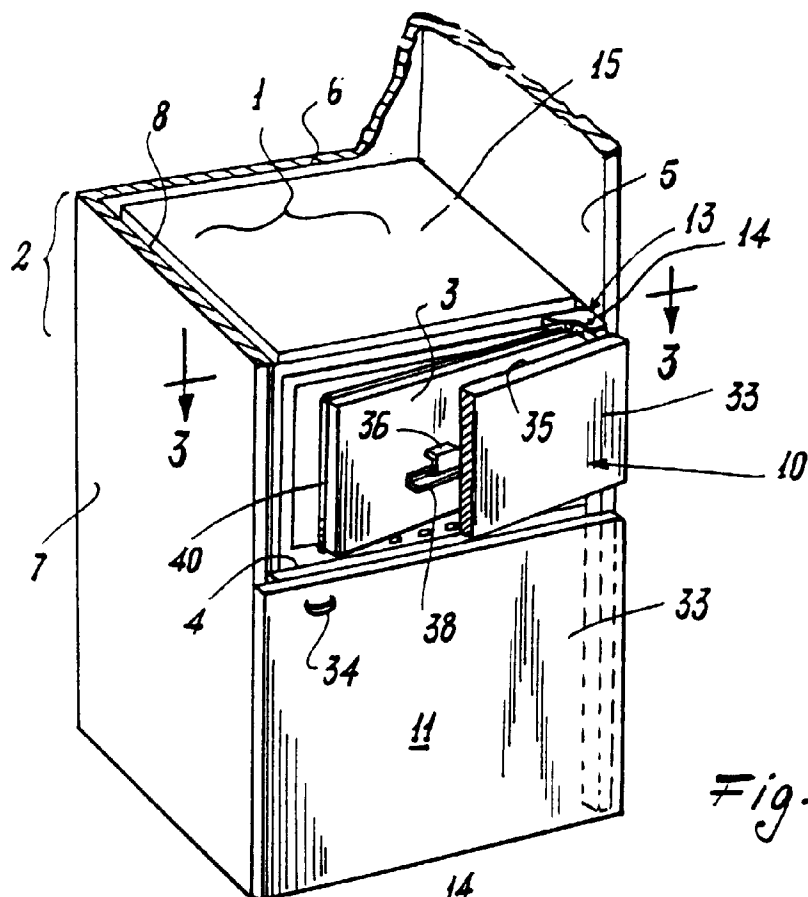
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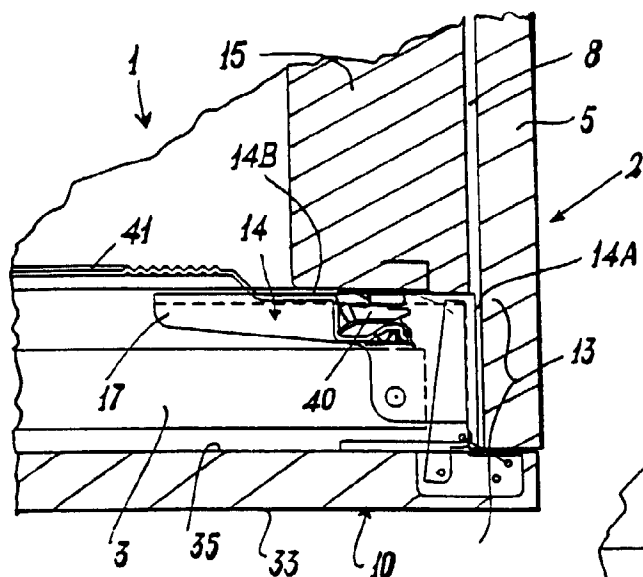


Fig. 3

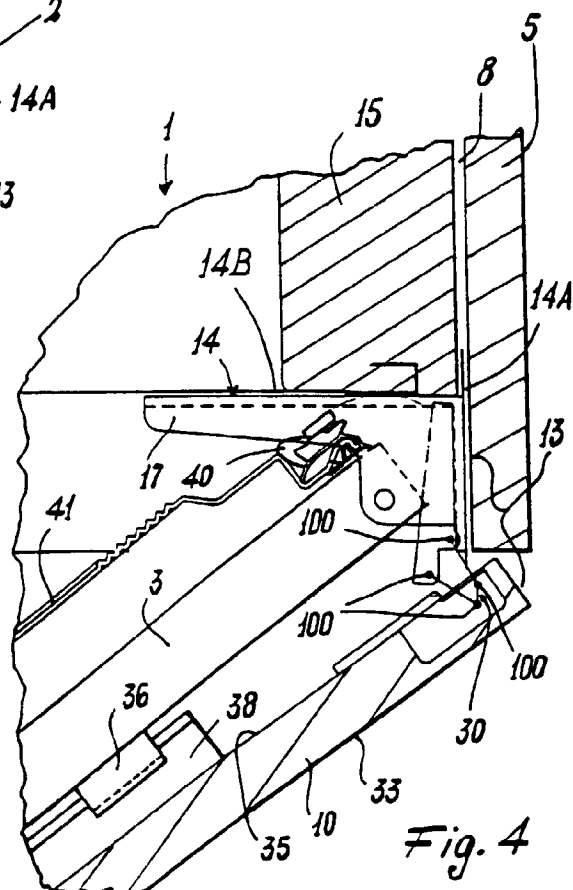


Fig. 4

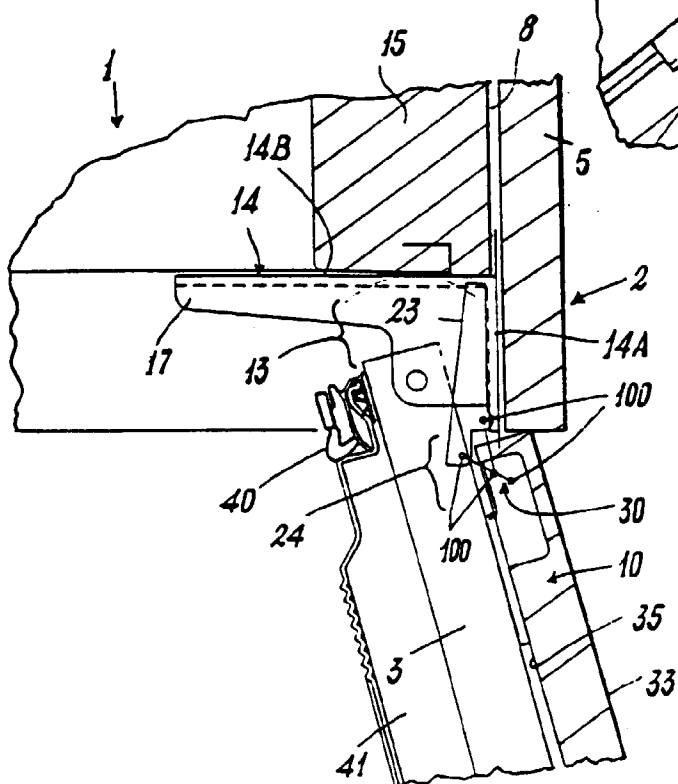


Fig. 5