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(54) Refrigerator door hinge with a reduced number of components

Scharnier für Kühlschranktür mit reduzierter Anzahl von Bauteilen

Charnière pour porte de réfrigérateur avec un nombre réduit de composants

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Description

[0001] This invention relates to a refrigerator according to the preamble of claim 1. Such a refrigerator is disclosed in DE 1 276 666 B.

[0002] Every refrigerator door is hinged to the cabinet usually by two hinges positioned at different heights on said cabinet. This door comprises a usual door liner associated with an outer shell with which there are also associated known abutment plates positioned at the top and bottom of the door liner and fixed to it. Usual insulating material is placed between the shell and door liner.

[0003] Each hinge comprises at least one arm projecting from an element by which the hinge is fixed to the cabinet. This arm is then usually connected to the door, normally at the corresponding abutment plate, the door rotating about the end of the arm. In known solutions, each abutment plate comprises a seat for coupling to the corresponding hinge arm. This coupling is achieved by a pin which engages in a threaded hole provided in a free end of the hinge arm and with a bush rigid with the abutment plate to form the hinge.

[0004] This solution, which is excellent from the operational aspect, comprises however a relatively large number of components, which influences the cost of each hinge and the time required for mounting it on the door while on the production line (with consequent influence on the refrigerator cost). Moreover, the door has to be arranged to receive the hinge bushes, and the hinge seats have to be suitably shaped and sealed against the foamed insulating material which is injected into the door after said seats have been made.

[0005] The main object of the invention is therefore to provide a refrigerator door hinge, for example for an upright refrigerator, which is not only easily mounted on the door but also enables this latter and its hinge receiving parts to be of simple construction.

[0006] A further object of the invention is to provide a hinge comprising a reduced number of component parts and hence of much lower cost than known hinges.

[0007] These and other objects which will be apparent to the expert of the art are attained by a hinge in accordance with the accompanying claims.

[0008] The invention will be more apparent from the accompanying drawing, which is provided by way of non-limiting example, and on which:

Figure 1 is a perspective view of a hinge of the invention during its fitting to the refrigerator door;

Figure 2 is a front view of the hinge of Figure 1; and

Figure 3 is a section on the line 3-3 of Figure 1 with the hinge fitted to the door.

[0009] With reference to said figures, a refrigerator, for example an upright refrigerator, comprises a usual cabinet 1 provided with food preservation compartments (not shown), and a usual door 2 provided with an outer shell (not shown), a door liner 3 and abutment

plates 4 (of which only one is shown in the figures). Usual insulation 5 is present between the shell and door liner. The cabinet and door are shown only schematically. The door moves relative to the cabinet 1 on hinges 6 (at least two), of which only one is shown in the figures, and which enable the door to be closed onto the cabinet 1 or be opened away from it.

[0010] Each hinge 6 comprises an arm 10 having a first end 11 fixed to an element (plate) 12 to be secured to the refrigerator cabinet 1 by screws or similar fixing means (not shown). The arm 10 has a second end 13 provided with a through hole 14 to be mounted on one of two pins 15 facing it inside the cavity 16 of a box element 17 open on one side 17A. This element is inserted into a seat 19 in the corresponding abutment plate 4 and fixed in it by opposing lugs or teeth 21 which snap into holes 22 provided in the wall 19A of the seat 19. The element 17 comprises a raised edge 20 which after insertion into the seat 19 rests against the abutment plate 4.

[0011] The pins 15 are defined by parallel projections 23 extending from opposing walls 24 of the cavity 16. These projections can be elastically forced apart and together to enable the end 13 of the hinge arm 10 to be mounted on them such that they cooperate by friction with the hole 14 in said arm, to allow correct movement of the door (slightly braked).

[0012] The hinge is assembled after the door has been constructed, this construction being totally independent thereof. The arm 10 is insertion-fitted to the box element 17 by inserting one of the two pins 15 into the hole 14 in the arm 10, depending on the hinge position (right or left, top or bottom) on the door. Preferably a ring 14A of self-lubricating material (for example nylon) is positioned in the hole 14 of the arm 10 to define a sort of bearing for the rotation of the arm relative to the pin 15.

[0013] After this assembly, the element 12 is fixed to the cabinet 1 and the element 17 is inserted into the door seat 19 until it snaps into secure connection to it.

[0014] The invention enables the door to be assembled in a simple manner without the hinge, which is fixed to the door only subsequently. The hinge also comprises a smaller number of components than known hinges.

Claims

1. A refrigerator, such as an upright refrigerator, having a cabinet (1), a door (2) and a hinge for the door (2) of the refrigerator the door comprising an outer shell, end abutment plates (4) and a door liner (3), usual insulation (5) being provided between the shell and door liner (3), said hinge comprising an arm (10) projecting from an element (12) for its fixing to said cabinet (1) and having a free end (13) provided with a through hole (14), said hinge further comprising a box member (17) to be inserted into a cavity (19) in a corresponding abutment plate (4) on

the door, engagement means (15) being provided within the cavity (16) of this box member (17) to engage the free end (13) of the hinge arm (10) and connect this latter to said member (17) and hence to the door (2), but such as to enable it to rotate relative to said means (15), the box member (17) being open on one side (17A), through which the hinge arm (10) is inserted for coupling to the engagement means (15), **characterised in that** the engagement means (15) comprise two superposed spaced-apart connection elements projecting from opposing walls (24) of the cavity (16) of the box member (17), only one of said elements (15) being inserted into the hole (14) in the hinge arm (10), and cooperating with said arm (10) after its connection to said member (17).

2. A refrigerator as claimed in claim 1, **characterised in that** each connection element (15) comprises two opposing parallel projections (23) extending from the corresponding wall (24) of the cavity (16) of the box member (17).
3. A refrigerator as claimed in claim 1, **characterised in that** the box member (17) comprises fixing elements (21) which fix it into the seat (19) in the abutment plate (4) on the door (2).
4. A refrigerator as claimed in claim 3, **characterised in that** the fixing elements (21) are teeth or lugs projecting from the box member (17) to cooperate with holes (22) provided in the wall (19A) of said seat.
5. A refrigerator as claimed in claim 1, **characterised in that** the box member (17) comprises a raised edge (20) arranged to rest on the abutment plate (4) when said member (17) is in its seat (19).
6. A refrigerator as claimed in claim 1, **characterised in that** an annular element (14A) of material of low friction coefficient is positioned in the hole (14) in the free end of the hinge arm (10) to become interposed between this arm (10) and the engagement means.

Patentansprüche

1. Kühlschrank so wie ein aufrecht stehender Kühlschrank mit einem Gehäuse (1), einer Tür (2) sowie einem Scharnier für die Tür (2) des Kühlschranks, wobei die Tür eine äußere Hülle, End-Abstützplatten (4) und einen Tür-Einsatz (3) umfasst, wobei eine übliche Isolierung (5) zwischen der Hülle und dem Tür-Einsatz (3) vorgesehen ist, das Scharnier einen Arm (10) umfasst, der von einem Element (12) für dessen Fixierung an dem Gehäuse (1) hervorsteht und ein freies Ende (13) mit einem Durch-

gangsloch (14) aufweist, wobei das Scharnier des weiteren ein Behälterelement (17) aufweist, welches in einen Hohlraum (19) in einer korrespondierenden Abstützplatte (4) an den Tür-Eingriffsmitteln (15), welche innerhalb des Hohlraums (16) dieses Behälterelementes (17) vorgesehen sind, um das freie Ende (13) des Scharnierarms (10) zu ergreifen und das letztere mit dem Element (17) und somit an der Tür (2) zu verbinden, eingeführt zu werden, jedoch derart, dass ihm möglich ist, relativ zu den Mitteln (15) zu rotieren, wobei das Gehäuseelement (17) an einer Seite (17A) durch die der Scharnierarm (10) zum Koppeln an den Eingriffsmitteln (15) eingeführt ist offen ist, **dadurch gekennzeichnet, dass** das Eingriffsmittel (15) zwei überlagernde und einander beabstandete Verbindungselemente umfasst, die von gegenüberliegenden Wänden (24) des Hohlraums (16) des Behälterelementes (17) hervorstehen, wobei nur eins dieser Elemente (15) in das Loch (14) in dem Scharnierarm (10) eingeführt ist und mit dem Arm (10) nach dessen Verbindung mit dem Element (17) zusammenwirkt.

2. Kühlschrank wie in Anspruch 1 beansprucht, **dadurch gekennzeichnet, dass** jedes der Verbindungselemente (15) zwei gegenüberliegende parallele Vorsprünge (23) umfasst, welche sich von der korrespondierenden Wand (24) des Hohlraums (16) des Behälterelementes (17) erstrecken.
3. Kühlschrank wie in Anspruch 1 beansprucht, **dadurch gekennzeichnet, dass** das Behälterelement (17) Fixierungselemente (21) umfasst, welche es in einen Sitz (19) in der Abstützplatte (4) an der Tür (2) fixieren.
4. Kühlschrank wie in Anspruch 3 beansprucht, **dadurch gekennzeichnet, dass** die Fixierungselemente (21) Zähne oder Ansätze sind, die von dem Behälterelement (17) hervorstehen, um mit Löchern (22), die in der Wand (19A) des Sitzes vorgesehen sind, zusammenzuwirken.
5. Kühlschrank wie in Anspruch 1 beansprucht, **dadurch gekennzeichnet, dass** das Behälterelement (17) eine erhabene Kante (20) umfasst, welche so angeordnet ist, dass sie an der Abstützplatte (4) abgestützt ist, wenn das Element (17) in seinem Sitz (19) sitzt.
6. Kühlschrank wie in Anspruch 1 beansprucht, **dadurch gekennzeichnet, dass** ein ringförmiges Element (14A) aus einem Material mit geringem Reibkoeffizienten innerhalb des Lochs (14) in dem freien Ende des Scharnierarms (10) positioniert ist, um zwischen diesem Arm (10) und dem Eingriffsmittel angeordnet zu werden.

Revendications

1. Réfrigérateur, tel qu'un réfrigérateur vertical, ayant un corps (1), une porte (2) et une charnière pour la porte (2) du réfrigérateur, la porte comportant une enveloppe extérieure, des plaques de butée d'extrémité (4) et une garniture de porte (3), une isolation habituelle (5) étant prévue entre l'enveloppe et la garniture de porte (3), ladite charnière comportant un bras (10) qui dépasse d'un élément (12) pour sa fixation sur ledit corps (1) et ayant une extrémité libre (13) pourvue d'un trou débouchant (14), ladite charnière comportant en outre un élément en forme de boîte (17) devant être inséré dans une cavité (19) dans une plaque de butée correspondante (4) sur la porte, des moyens d'engagement (15) étant prévus à l'intérieur de la cavité (16) de cet élément en forme de boîte (17) afin d'engager l'extrémité libre (13) du bras de charnière (10) et raccorder ce dernier audit élément (17) et donc à la porte (2), mais de façon à lui permettre de tourner par rapport aux dits moyens (15), l'élément en forme de boîte (17) étant ouvert sur un côté (17A), à travers lequel le bras de charnière (10) est inséré pour raccordement aux moyens d'engagement (15), **caractérisé en ce que** les moyens d'engagement (15) comportent deux éléments de raccordement espacés superposés qui dépassent des parois opposées (24) de la cavité (16) de l'élément en forme de boîte (17), un seul desdits éléments (15) étant inséré dans le trou (14) dans le bras de charnière (10), et coopérant avec ledit bras (10) après son raccordement audit élément (17).

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2. Réfrigérateur selon la revendication 1, **caractérisé en ce que** chaque élément de raccordement (15) comprend deux saillies parallèles opposées (23) s'étendant depuis la paroi correspondante (24) de la cavité (16) de l'élément en forme de boîte (17).

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3. Réfrigérateur selon la revendication 1, **caractérisé en ce que** l'élément en forme de boîte (17) comprend des éléments de fixation (21) qui le fixent dans le siège (19) dans la plaque de butée (4) sur la porte (2).

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4. Réfrigérateur selon la revendication 3, **caractérisé en ce que** les éléments de fixation (21) sont des dents ou des pattes qui dépassent de l'élément en forme de boîte (17) afin de coopérer avec des trous (22) prévus dans la paroi (19A) dudit siège.

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5. Réfrigérateur selon la revendication 1, **caractérisé en ce que** l'élément en forme de boîte (17) comprend un bord relevé (20) prévu pour reposer sur la plaque de butée (4) lorsque ledit élément (17) est dans son siège (19).

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6. Réfrigérateur selon la revendication 1, **caractérisé en ce qu'un** élément annulaire (14A) en matière à faible coefficient de friction est positionné dans le trou (14) dans l'extrémité libre du bras de charnière (10) afin d'être interposé entre ce bras (10) et les moyens d'engagement.

