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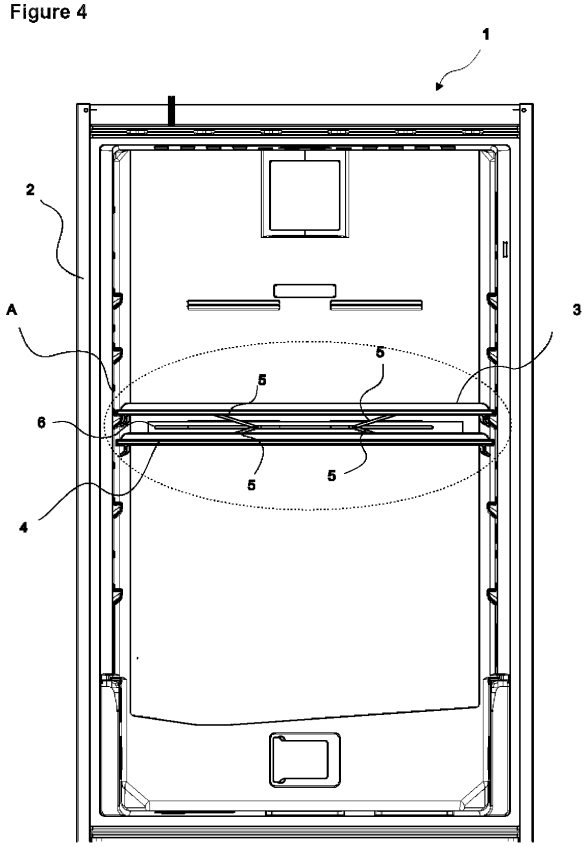
(54) **A REFRIGERATOR COMPRISING A MOVABLE SHELF**

(57) The present invention relates to a refrigerator (1) comprising a body (2), a first shelf (3) which is arranged in the body (2) and which is suitable for the placement of the foodstuffs, and a second shelf (4) which is arranged in the body (2) at a position just below the first shelf (3), wherein the distance (d) between said two shelves (3, 4) can be practically changed.

Figure 4



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Description

[0001] The present invention relates to a refrigerator comprising a shelf the height of which can be adjusted according to the user needs.

[0002] The refrigerators are provided with a plurality of shelves which define the partitions for the positioning of the foodstuffs to be placed into the body. Said shelves are positioned at certain intervals with respect to each other. Said shelves are not arranged at equal distances with respect to each other and a greater distance is left between some of the shelves so as to allow for easy placement of larger kitchen utensils such as cooking pots, etc. In this case, management of the space in the refrigerator body and the placement of the foodstuff by the user is limited by only the number and height of greater spaces between the shelves by the manufacturer. Only the space between the shelves predetermined by the producer is greater than other shelves, and when the user needs a larger number of partitions with greater heights, this need cannot be met.

[0003] Furthermore, the user may sometimes need the distance between two shelves to be greater than the distance predetermined by the producer. In such cases, the user cannot increase the space between the shelves according to his/her needs.

[0004] In order to solve the above-mentioned problems, movable shelves are provided in refrigerators.

[0005] In the state of the art United States Patent Application No. US2019075924, a refrigerator is disclosed, comprising an adjustable shelf assembly which is operated by means of a movable screw and a motor.

[0006] In the state of the art United States Patent Document No. US2019212054, a refrigerator comprising a movable shelf is disclosed, wherein the distance between two parallel shelves can be adjusted by means of a gear mechanism.

[0007] The aim of the present invention is the realization of a cooling device, especially a refrigerator, comprising a movable shelf unit the height of which can be adjusted.

[0008] Another aim of the present invention is the realization of the refrigerator comprising a shelf the height of which can be changed gradually.

[0009] The refrigerator of the present invention comprises a first shelf which is seated onto the side walls of the body to be fixed to the body, and a second shelf which is connected to the first shelf and which cannot be fixed to the side walls on the body in the region just under the first shelf.

[0010] The refrigerator of the present invention comprises a shaft which connects the first shelf and the second shelf, a bearing member having a channel in the form of a guide rail for moving the shaft, and a movement member which enables the shaft to moved in the bearing member.

[0011] In an embodiment of the present invention, the movement member is circular and connected to an end of the shaft.

[0012] The shaft is connected to the first shelf and/or the second shelf by means of a connection member. In an embodiment of the present invention, a profile is attached to the long edge of the first shelf and/or the second shelf which is close to the rear wall of the body and the shaft is fixed to said profile by means of a pin.

[0013] The movement member in the form of a wheel which is attached to the free end of the shaft moves on the horizontal plane in a bearing member and since the shaft is attached to at least the first shelf, the vertical distance between two shelves can be changed by means of the changing height of the shaft in the vertical plane.

[0014] In an embodiment of the present invention, the bearing member comprises at least one housing wherein the movement member can be placed. The circular movement member moves in the housings arranged side by side on the bearing member so as to be seated into said housings positioned at certain intervals and thus, two shelves can be positioned at different vertical levels.

[0015] In an embodiment of the present invention, the bearing member is attached to the edge of the second shelf which is parallel and close to the rear wall of the body. One end of at least one shaft is fixed to the first shelf by means of a profile and a pin. The free end of the shaft is attached to a movement member and moved in the bearing member.

[0016] In an embodiment of the present invention, at least one shaft is fixed at one end to the first shelf which is placed into the body in an immovable manner. In this embodiment, the free end of the shaft is placed by means of a movement member into the bearing member which is at the rear section of the second shelf which is not fixed to the body. Thereby, the second shelf which is not fixed to the body is connected to the first shelf and can be moved towards or away from the first shelf upwards/downwards in the vertical axis of the body by means of the bearing member and the movement member.

[0017] In another embodiment of the present invention, by means of the pin and the profile, at least one shaft is fixed onto the first shelf which is seated onto the side walls on the body in an immovable manner. In this embodiment, another shaft is fixed to the second shelf by means of a profile and a pin. The free ends of the shafts which are fixed to the shelves are connected by means of a movement member in a bearing member which is positioned between the first shelf and the second shelf without being fixed to the body. Thus, the bearing member and the second shelf enable the second shelf to be moved so as to be connected to the first shelf which is fixed to the body.

[0018] By means of the present invention, a refrigerator is realized, comprising a second shelf which is connected to a support shelf fixed to the body and which can be moved upwards and downwards along the vertical axis of the body without being fixed to the body. Consequently, a shelf can be used at various heights as a suspended

shelf without the need for using a channel or a groove on the side walls of the body.

[0019] The model embodiments related to the refrigerator realized in order to attain the aim of the present invention are shown in the attached figures, where:

Figure 1 - is the front view of the refrigerator of the present invention in an embodiment.

Figure 2 - is the exploded view of parts which constitute the movable shelf unit in the refrigerator in an embodiment of the present invention.

Figure 3 - is the exploded view of parts which constitute the movable shelf unit in the refrigerator in another embodiment of the present invention.

Figure 4 - is the front view in the refrigerator of the present invention in an embodiment wherein the vertical distance between the first shelf and the second shelf is decreased.

Figure 5 - is the detailed view of the A region in Figure 4.

Figure 6 - is the close-up perspective view of the bearing member in the refrigerator in an embodiment of the present invention.

[0020] The elements illustrated in the figures are numbered as follows:

1. Refrigerator
2. Body
3. First shelf
4. Second shelf
5. Shaft
6. Bearing member
7. Movement member
8. Housing
9. Profile
10. Connection member

d. distance between the first shelf and the second shelf

[0021] The refrigerator (1) comprises a body (2), a first shelf (3) which is arranged in the body (2) and which is suitable for the placement of the foodstuffs, and a second shelf (4) which is arranged in the body (2) at a position just below the first shelf (3).

[0022] The refrigerator (1) of the present invention comprises at least one shaft (5) which is connected to the first shelf (3) so as to be positioned between the first shelf (3) and the second shelf (4), a bearing member (6) in the form of a channel wherein the free end of the shaft (5) is moved, and a movement member (7) which is provided on the free end of the shaft (5) and which enable the distance (d) between the first shelf (3) and the second shelf (4) to be changed by moving the shaft (5) in the bearing member (6).

[0023] In the refrigerator (1) of the present invention, at least one shaft (5) is fixed to the first shelf (3). The other end of the shaft (5) which is free is placed into a bearing member (6). The bearing member (6) is connected to the second shelf (4) and by means of the movement of the movement member (7) which is movable in the bearing member (6) and which is positioned on the free end of the shaft (5), the second shelf (4) can be moved upwards and downwards in the vertical axis of the body (2) and the distance (d) between the first shelf (3) and the second shelf (4) can be increased or decreased as per user preference.

[0024] In an embodiment of the present invention, the refrigerator (1) comprises a bearing member (6) which is disposed on the second shelf (4). In this embodiment, the bearing member (6) is positioned at the rear long edge of the second shelf (2) at a region close to the rear wall of the body (2). Thus, as the shaft (5) moves in the bearing member (6), the bearing member (6) moves upwards or downwards together with the second shelf (4) just like a single piece.

[0025] In another embodiment of the present invention, the refrigerator (1) comprises two shafts (5) which are fixed to the first shelf (3) at one end and which have free ends movable in the bearing member (6) provided on the second shelf (4). Thus, the second shelf (4) and the bearing member (6) can be moved in a more balanced manner.

[0026] In an embodiment of the present invention, the refrigerator (1) comprises a bearing member (6) which is arranged between the first shelf (3) and the second shelf (4) and which can move freely in the vertical plane in the body (2). In this embodiment, the bearing member (6) is free in the body (2) so as to be connected to the shafts (5) between the first shelf (3) and the second shelf (4).

[0027] In an embodiment of the present invention, the refrigerator (1) comprises at least one shaft (5) which is fixed to the first shelf (3) at one end, at least one shaft (5) which is connected to the second shelf (4) at one end, and two movement members (7) which connect the free ends of the shaft (5) fixed to the first shelf (3) and the other shaft (5) fixed to the second shelf (4) in the bearing member (6) disposed between the two shelves (3, 4). Thus, by means of different shafts (5) which are fixed to the first shelf (3) and the second shelf (4), the height between the two shelves (3, 4) is further increased and two different shafts (5) can move synchronously between the first shelf (3) and the bearing member (6) and between the second shelf (4) and the bearing member (6) (Figure 3 and Figure 4).

[0028] In an embodiment of the present invention, the refrigerator (1) comprises a plurality of housings (8) which are arranged side by side on the bearing member (6) at intervals predetermined by the producer and which enable the second shelf (4) to be positioned at different levels as the movement member (7) is moved in the bearing member (6). By means of said housings (8), upwards or downwards movement amount of the second shelf (4) is adjusted. For example, if the shaft (5) and the movement member (7) move from a first housing (8) on the

bearing member (6) to another housing (8) which is to the right relative to the first housing (8), the length of the shaft (5) and thus, the distance (d) between the two shelves (3, 4) decrease. Otherwise, if the shaft (5) and the movement member (7) are moved from a housing (8) to another housing (8) which is to the left relative to said housing (8), the length of the shaft (5) increases and as the second shelf (4) moves downwards, the distance (d) between two shelves (3, 4) increases.

[0029] In an embodiment of the present invention, the refrigerator (1) comprises a circular movement member (7) which enables the shaft (5) to be moved on the bearing member (6) and which is mounted to the free end of the shaft (5). The circular form enables the movement member (7) to be moved quickly and easily in the housings (8) or in the body of the bearing member (6).

[0030] In another embodiment of the present invention, the refrigerator (1) comprises a profile (9) and a connection member (10) used for mounting the ends of the shaft (5) to be fixed to the first shelf (3) and the second shelf (4). Thus, the profile (9) is attached to an edge of the first shelf (3) and/or the second shelf (4), and the shaft (5) and the profile (9) are connected by means of a connection member (10) such as a pin or a screw.

[0031] By means of the present invention, a refrigerator (1) is realized, wherein the distance (d) between the two shelves (3, 4) can be adjusted as per user preference.

Claims

1. A refrigerator (1) comprising a body (2), a first shelf (3) which is arranged in the body (2) and which is suitable for the placement of the foodstuffs, and a second shelf (4) which is arranged in the body (2) at a position just below the first shelf (3), **characterized by** at least one shaft (5) which is connected to the first shelf (3) so as to be positioned between the first shelf (3) and the second shelf (4), a bearing member (6) in the form of a channel wherein the free end of the shaft (5) is moved, and a movement member (7) which is provided on the free end of the shaft (5) and which enable the distance (d) between the first shelf (3) and the second shelf (4) to be changed by moving the shaft (5) in the bearing member (6).

2. A refrigerator (1) as in Claim 1, **characterized by** a bearing member (6) which is disposed on the second shelf (4).

3. A refrigerator (1) as in Claim 2, **characterized by** two shafts (5) which are fixed to the first shelf (3) at one end and which have free ends movable in the bearing member (6) provided on the second shelf (4).

4. A refrigerator (1) as in Claim 1, **characterized by** a bearing member (6) which is arranged between the first shelf (3) and the second shelf (4) and which can move freely in the vertical plane in the body (2).

5. A refrigerator (1) as in Claim 4, **characterized by** at least one shaft (5) which is fixed to the first shelf (3) at one end, at least one shaft (5) which is connected to the second shelf (4) at one end, and two movement members (7) which connect the free ends of the shaft (5) fixed to the first shelf (3) and the other shaft (5) fixed to the second shelf (4) in the bearing member (6) disposed between the two shelves (3, 4).

6. A refrigerator (1) as in any one of the above claims, **characterized by** a plurality of housings (8) which are arranged side by side on the bearing member (6) at intervals predetermined by the producer and which enable the second shelf (4) to be positioned at different levels as the movement member (7) is moved in the bearing member (6).

7. A refrigerator (1) as in any one of the above claims, **characterized by** a circular movement member (7) which enables the shaft (5) to be moved on the bearing member (6) and which is mounted to the free end of the shaft (5).

8. A refrigerator (1) as in any one of the above claims, **characterized by** a profile (9) and a connection member (10) used for mounting the ends of the shaft (5) to be fixed to the first shelf (3) and the second shelf (4).

Figure 1

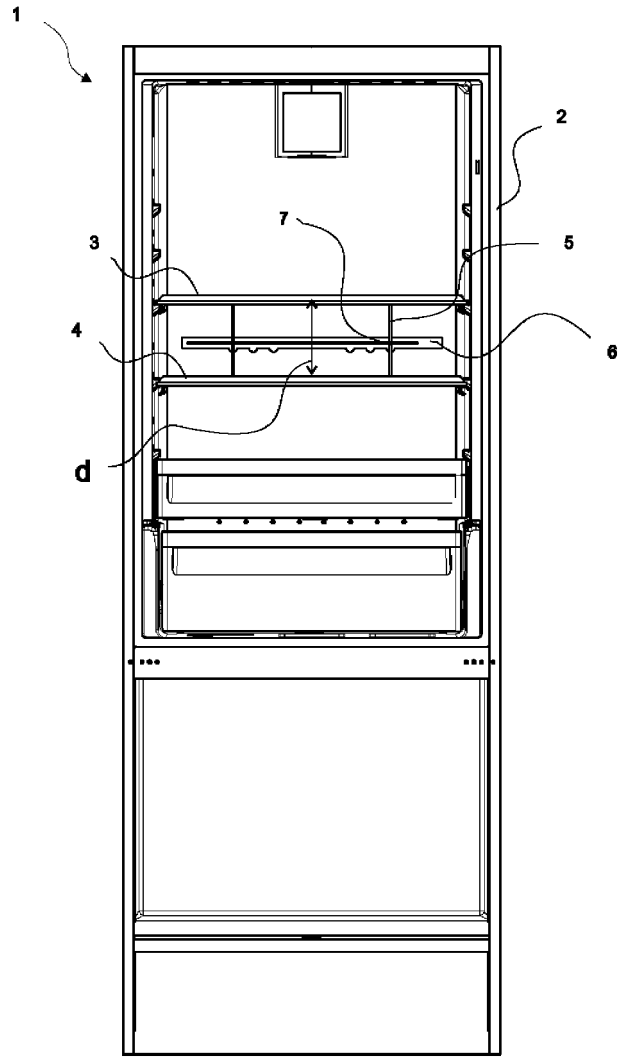


Figure 2

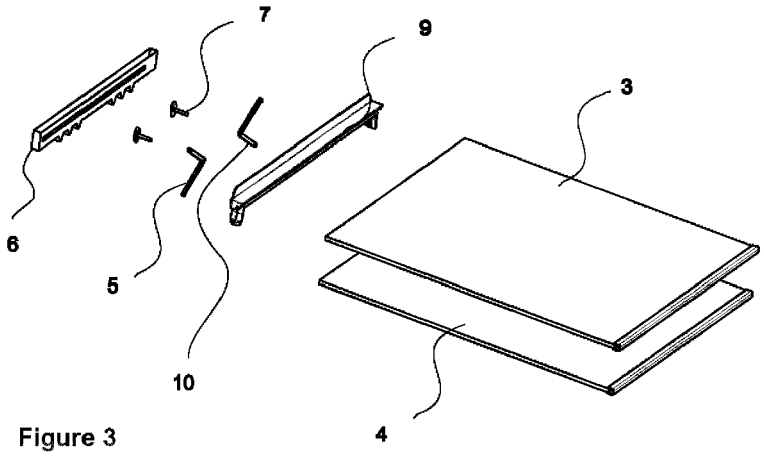


Figure 3

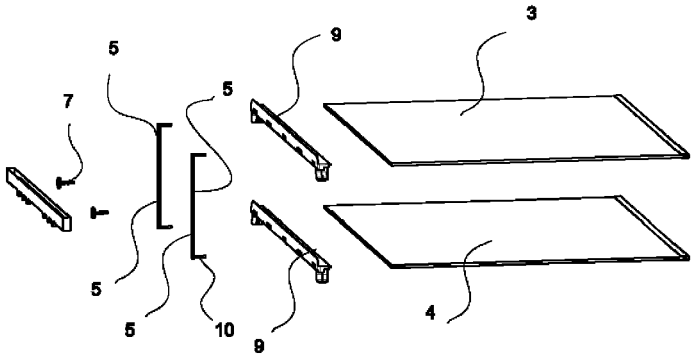


Figure 4

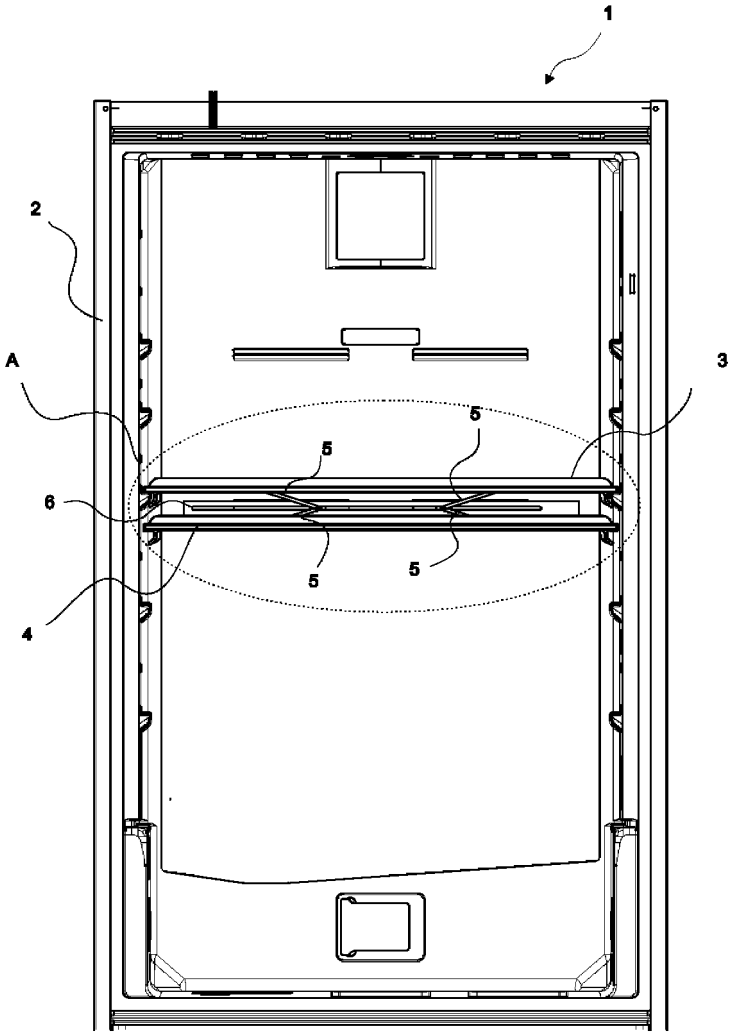


Figure 5

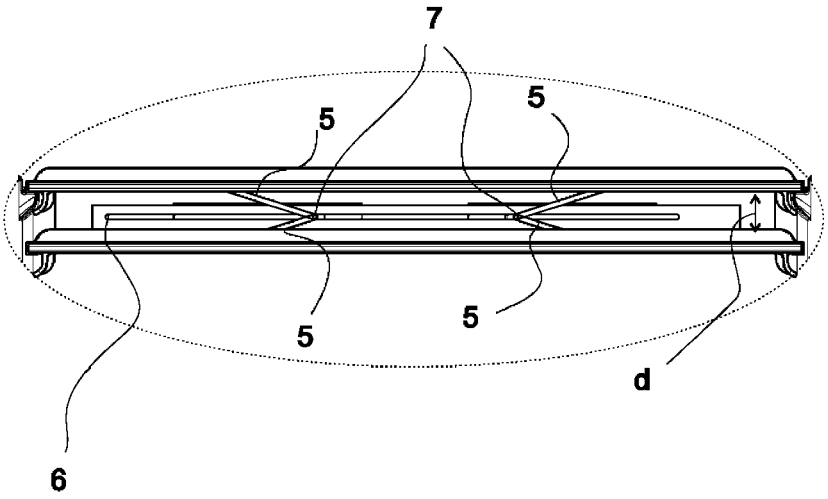
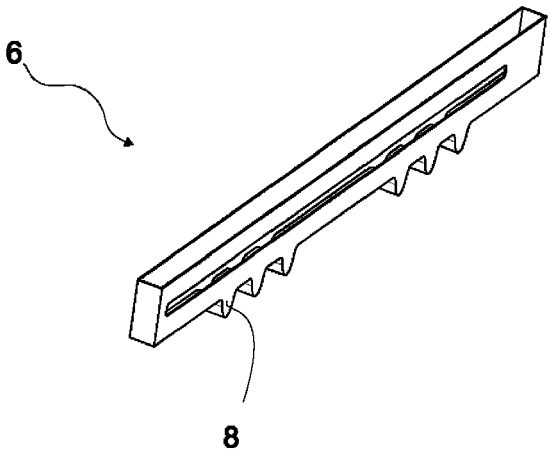


Figure 6



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EUROPEAN SEARCH REPORT

Application Number
EP 20 19 9392

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	KR 2001 0064432 A (SAMSUNG ELECTRONICS CO LTD [KR]) 9 July 2001 (2001-07-09) * figures *	1-3,6,8	INV. F25D25/02
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A	CN 1 648 581 A (LG ELECTRONICS TIANJIN [CN]) 3 August 2005 (2005-08-03) * figures *	1-8	
			TECHNICAL FIELDS SEARCHED (IPC) F25D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	23 February 2021	Vigilante, Marco

CATEGORY OF CITED DOCUMENTS

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23-02-2021

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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- US 2019212054 A **[0006]**