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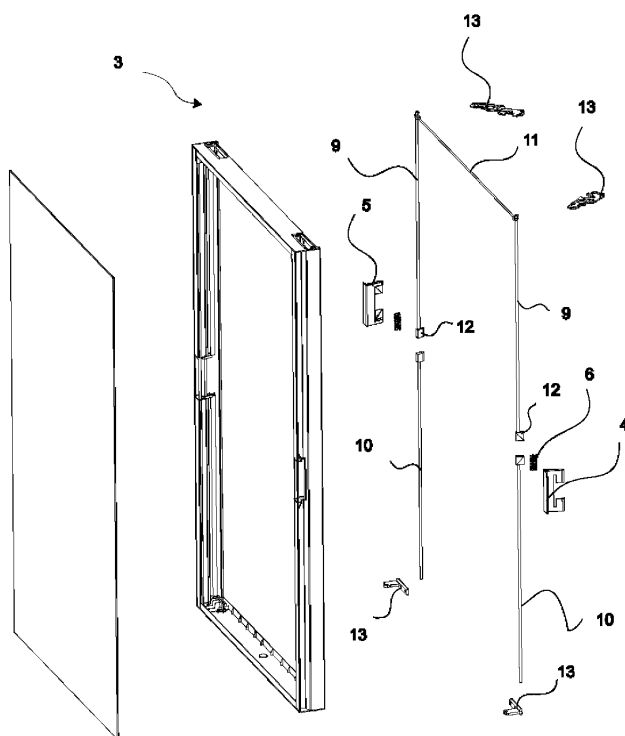
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(54) **A REFRIGERATOR COMPRISING A DOOR WITH ADJUSTABLE OPENING DIRECTION**

(57) The present invention relates to a refrigerator (1) comprising a body (2); a door (3) providing access into the body (2); a hinge (13) which enables the door (3) to be connected to the body (2); a first handle (4) which actuates a first position where the door (3) opens by piv-

oting around the vertical axis of the body (2); and a second handle (5) which actuates a second position where the door (3) opens in another direction by pivoting around the vertical axis of the body (2).

Figure 2



Description

[0001] The present invention relates to a refrigerator comprising a door with adjustable opening direction as per user needs.

[0002] Doors of refrigerators are mounted by the service personnel so as to open to right or left in the vertical axis of the body depending on the suitability of the installation area of the refrigerator. When the user wants to change the opening direction of the door according to his/her needs, a service personnel is called to mount a different hinge. Therefore, the user cannot change the opening direction of the door without the help of service personnel in a practical and safe manner.

[0003] In the state of the art European Patent Document No. EP0807740, devices such as refrigerator are disclosed, comprising a door having an additional mechanism which can shift between two positions so as to open to right or left.

[0004] In the state of the art United States Patent Document No. US3889419, a refrigerator is disclosed, comprising a door which has two handles and which can be opened both to right and left by means of the movement of the upper hinges.

[0005] The aim of the present invention is the realization of a refrigerator comprising a safe door wherein the opening direction thereof can be changed in a practical manner without the need for a service personnel and the door is prevented from being completely separated from the body while changing the opening direction.

[0006] The refrigerator of the present invention comprises two handles which are provided on the door.

[0007] The refrigerator of the present invention comprises a first movement mechanism, a second movement mechanism and a transfer shaft which is disposed between the two movement mechanisms.

[0008] When the first handle and the second handle are separately actuated, the first and second movement mechanisms move in opposite directions and form a rotational axis and a free axis. For example, when the first handle is pushed, the first movement mechanism becomes the free axis and the hinges are released from the housings thereof. Moreover, by means of the first movement mechanism actuating the transfer shaft, the second movement mechanism moves in the opposite direction with respect to the first movement mechanism and forms the rotational axis such that the hinge is released from the housings thereof.

[0009] In an embodiment of the present invention, the movements of the first movement mechanism and the second movement mechanism both comprising an upper shaft and a lower shaft are provided by a gear system.

[0010] In another embodiment of the present invention, the first and second movement mechanisms comprise pipes which can telescopically move one within the other. Said telescopic structures start to move upon the actuation of the first handle and the second handle.

[0011] In an embodiment of the present invention,

when the first handle and the second handle are pushed at the same time, the transfer shaft pushes the first movement mechanism and the second mechanism at the same time so as to prevent movement, and thus the door is prevented from being completely released from the hinges.

[0012] By means of the present invention, a refrigerator is realized, comprising a door having movement mechanisms which can open to both sides.

[0013] 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 perspective view of the refrigerator in an embodiment of the present invention.

Figure 2 - is the exploded view of the door, the first and second movement mechanisms and the transfer shaft of the refrigerator in an embodiment of the present invention.

Figure 3 - is the exploded view of the first movement mechanism, the second movement mechanism and the transfer shaft of the refrigerator in an embodiment of the present invention.

Figure 4 - is the perspective view of the operation of the first movement mechanism and the second movement mechanism when the first handle is actuated in the refrigerator in an embodiment of the present invention.

Figure 5 - the detailed view of regions A, B and C in Figure 4.

[0014] The elements illustrated in the figures are numbered as follows:

1. Refrigerator
2. Body
3. Door
4. First handle
5. Second handle
6. Spring
7. First movement mechanism
8. Second movement mechanism
9. Upper shaft
10. Lower shaft
11. Transfer shaft
12. Connection end
13. Hinge
14. Protrusion
15. Pushing member

[0015] The refrigerator (1) comprises a body (2); a door (3) providing access into the body (2); a hinge (13) which enables the door (3) to be connected to the body (2); a first handle (4) which actuates a first position where the door (3) opens by pivoting around the vertical axis of the body (2); and a second handle (5) which actuates a second position where the door (3) opens in another direction by pivoting around the vertical axis of the body (2).

[0016] The refrigerator (1) of the present invention comprises

- a first movement mechanism (7) which becomes free for opening the door (3) upon the actuation of the first handle (4),
- a second movement mechanism (8) which becomes free for opening the door (3) in another direction upon the actuation of the second handle (5), and
- a transfer shaft (11) which is disposed between the first movement mechanism (7) and the second movement mechanism (8) and which transfers the movements of the first movement mechanism (7) and the second movement mechanism (8) to each other.

[0017] In the refrigerator (1) of the present invention, at first, the first movement mechanism (7) and the second movement mechanism (8) are locked in the hinge (13) housings. When the first handle (4) is pressed, the first movement mechanism (7) is separated and released from the upper and lower hinge (13) housings. While becoming free, the first movement mechanism (7) pushes the transfer shaft (11) towards the second movement mechanism (8). Said movement of the transfer shaft (11) towards the second movement mechanism (8) provides that the second movement mechanism (8) moves out of the hinge (13) housings and thus, forms a rotation axis in the upper and lower hinge (13) housings where the second movement mechanism (8) is placed in an immovable manner at first. When the second handle (5) is pressed to open the door (3) in the second position, the second movement mechanism (8) moves inwards so as to be released from the upper and lower hinge (13) housings. With said movement of the second movement mechanism (8), the transfer shaft (11) is pushed towards the first movement mechanism (7). The transfer shaft (11) contacts the first movement mechanism (7) and provides that the first movement mechanism (7) moves out of the hinge (13) housings and thus, forms a rotation axis in the upper and lower hinge (13) housings where the first movement mechanism (7) is placed in an immovable manner at first, and thus the door (3) is opened in the second position. When the user presses the first handle (4) and the second handle (5) at the same time, the transfer shaft (11) is pushed by both the first movement mechanism (7) and the second movement mechanism (8) at the same time. Thus, the first movement mechanism (7) and the second movement mechanism (8) remain locked in the hinge (13) housings, and the door (3) is prevented from being separated from the body (2).

[0018] In an embodiment of the present invention, the refrigerator (1) comprises the first movement mechanism (7) which is separated from the hinges (13) where the same is disposed and becomes free in the first position the door (3) opens when the first handle (4) is pressed and the second movement mechanism (8) which moves so as to form a rotational axis in the hinges (13) where

the same is disposed in an immovable manner at first, and the second movement mechanism (8) which is separated from the hinges (13) where the same is disposed and becomes free in the second position the door (3) opens when the second handle (5) is pressed and the first movement mechanism (7) which moves so as to form a rotational axis in the hinges (13) where the same is disposed in an immovable manner at first. Thus, the first movement mechanism (7) and the second movement mechanism (8) operate in an opposite manner, and the door (3) can be safely opened/closed in two directions.

[0019] In an embodiment of the present invention, the refrigerator (1) comprises the first movement mechanism (7) and the second movement mechanism (8) each having an upper shaft (9), a lower shaft (10) and a spring (6) connecting the upper shaft (9) and the lower shaft (10) to each other and transferring the movement of the first handle (4) and the second handle (5) to the upper shaft (9) and the lower shaft (10). Thus, the upper shaft (9) and the lower shaft (10) can move towards each other or in opposite directions in the first position and the second position.

[0020] In an embodiment of the present invention, the refrigerator (1) comprises the first movement mechanism (7) and the second movement mechanism (8) each having a pushing member (15) which is disposed at the end of the upper shaft (9) in contact with the transfer shaft (11) and which transfers the movement of the first movement mechanism (7) or the second movement mechanism (8) to the transfer shaft (11). The pushing member (15) actuates the transfer shaft (11) in both positions, and provides the reversible movement between the first movement mechanism (7) and the second movement mechanism (8).

[0021] In an embodiment of the present invention, the refrigerator (1) comprises a protrusion (14) which is provided at both ends of the transfer shaft (11) and which contacts the pushing member (15) so as to provide the movement of the transfer shaft (11) in the horizontal axis of the door (3). By means of said protrusion (14), the transfer shaft (11) moves with the force of the first movement mechanism (7) and the second movement mechanism (8).

[0022] In an embodiment of the present invention, the refrigerator (1) comprises the protrusion (14) which is provided at both ends of the transfer shaft (11) in an angled form so as to be vertically symmetrical to each other with respect to the center of the transfer shaft (11). By means of said symmetrical structure, the first movement mechanism (7) and the second movement mechanism (8) move in opposite directions, and when both handles (4, 5) are pressed at the same time, the first movement mechanism (7) and the second movement mechanism (8) are locked.

[0023] In an embodiment of the present invention, the refrigerator (1) comprises the first movement mechanism (7) and the second movement mechanism (8) each having a disc-shaped pushing member (15) which can move

in an angled manner by squeezing the protrusion (14) on the transfer shaft (11).

[0024] In an embodiment of the present invention, the refrigerator (1) comprises a connection end (12) which has an inclined surface, which is provided at the parts of the upper shaft (9) and the lower shaft (10) in contact with the spring (6) and which enables the spring (6) to be easily compressed. By means of the inclined structure on the connection end (12), especially the movement of the lower shaft (10) in the downwards direction is facilitated.

[0025] By means of the present invention, a refrigerator (1) is realized, comprising a door (3) which can be safely opened in both directions without being separated from the body (2) and without the need for service personnel.

Claims

1. A refrigerator (1) **comprising** a body (2); a door (3) providing access into the body (2); a hinge (13) which enables the door (3) to be connected to the body (2); a first handle (4) which actuates a first position where the door (3) opens by pivoting around the vertical axis of the body (2); and a second handle (5) which actuates a second position where the door (3) opens in another direction by pivoting around the vertical axis of the body (2), **characterized by**
 - a first movement mechanism (7) which becomes free for opening the door (3) upon the actuation of the first handle (4),
 - a second movement mechanism (8) which becomes free for opening the door (3) in another direction upon the actuation of the second handle (5), and
 - a transfer shaft (11) which is disposed between the first movement mechanism (7) and the second movement mechanism (8) and which transfers the movements of the first movement mechanism (7) and the second movement mechanism (8) to each other.
2. A refrigerator (1) as in Claim 1, **characterized by** the first movement mechanism (7) which is separated from the hinges (13) where the same is disposed and becomes free in the first position the door (3) opens when the first handle (4) is pressed and the second movement mechanism (8) which moves so as to form a rotational axis in the hinges (13) where the same is disposed in an immovable manner at first, and the second movement mechanism (8) which is separated from the hinges (13) where the same is disposed and becomes free in the second position the door (3) opens when the second handle (5) is pressed and the first movement mechanism (7) which moves so as to form a rotational axis in the hinges (13) where the same is disposed in an im-
- movable manner at first.
3. A refrigerator (1) as in Claim 1 or 2, **characterized by** the first movement mechanism (7) and the second movement mechanism (8) each having an upper shaft (9), a lower shaft (10) and a spring (6) connecting the upper shaft (9) and the lower shaft (10) to each other and transferring the movement of the first handle (4) and the second handle (5) to the upper shaft (9) and the lower shaft (10).
4. A refrigerator (1) as in any one of the above claims, **characterized by** the first movement mechanism (7) and the second movement mechanism (8) each having a pushing member (15) which is disposed at the end of the upper shaft (9) in contact with the transfer shaft (11) and which transfers the movement of the first movement mechanism (7) or the second movement mechanism (8) to the transfer shaft (11).
5. A refrigerator (1) as in any one of the above claims, **characterized by** a protrusion (14) which is provided at both ends of the transfer shaft (11) and which contacts the pushing member (15) so as to provide the movement of the transfer shaft (11) in the horizontal axis of the door (3).
6. A refrigerator (1) as in Claim 5, **characterized by** the protrusion (14) which is provided at both ends of the transfer shaft (11) in an angled form so as to be vertically symmetrical to each other with respect to the center of the transfer shaft (11).
7. A refrigerator (1) as in any one of the Claims 4 to 6, **characterized by** the first movement mechanism (7) and the second movement mechanism (8) each having a disc-shaped pushing member (15) which can move in an angled manner by squeezing the protrusion (14) on the transfer shaft (11).
8. A refrigerator (1) as in any one of the Claims 3 to 7, **characterized by** a connection end (12) which has an inclined surface, which is provided at the parts of the upper shaft (9) and the lower shaft (10) in contact with the spring (6) and which enables the spring (6) to be easily compressed.

Figure 1

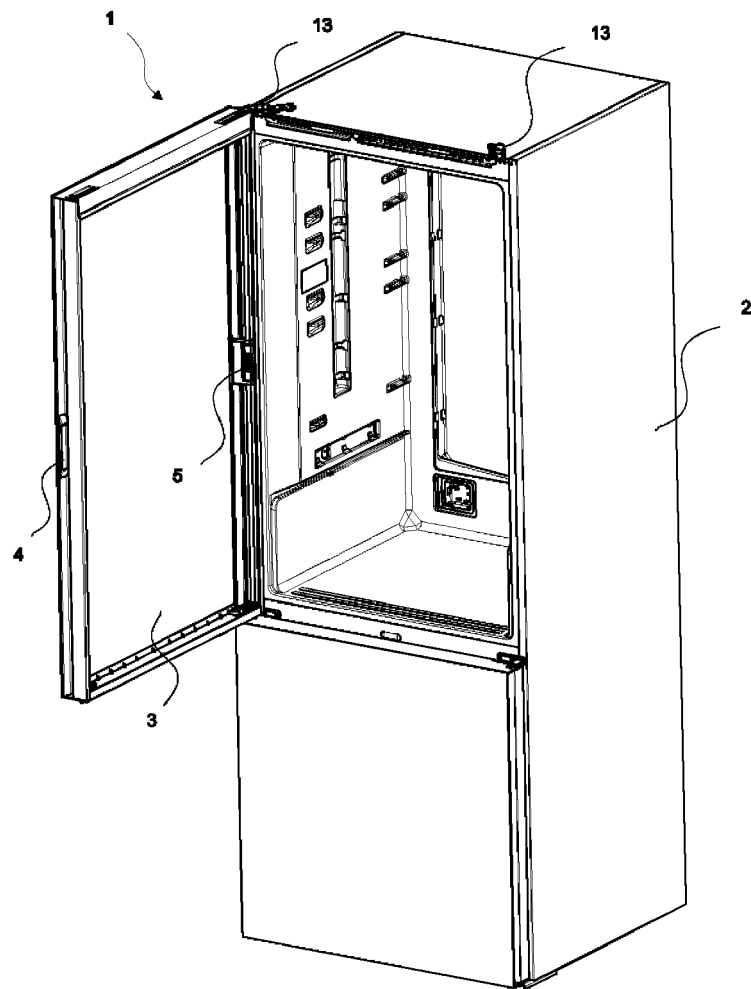


Figure 2

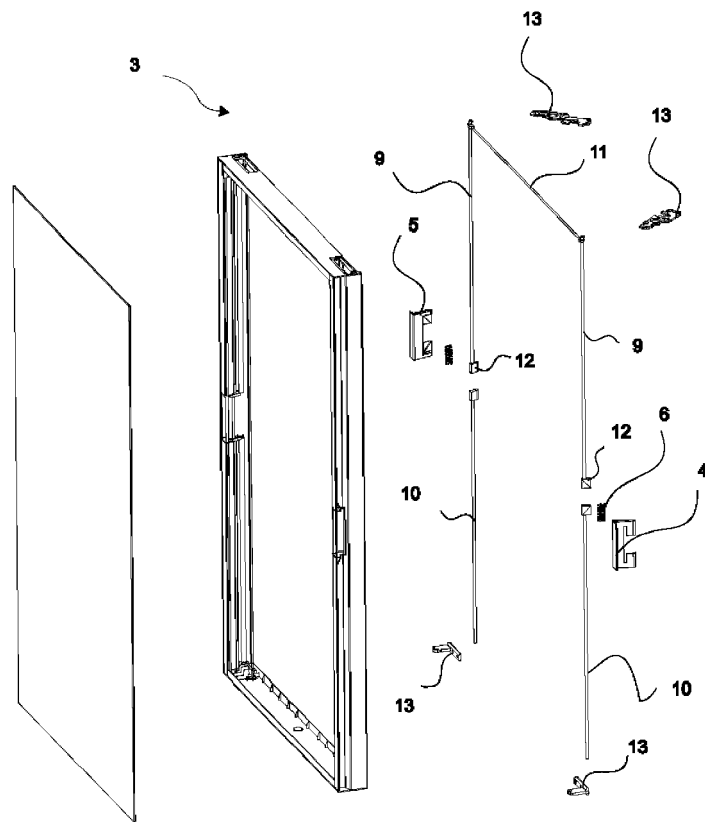


Figure 3

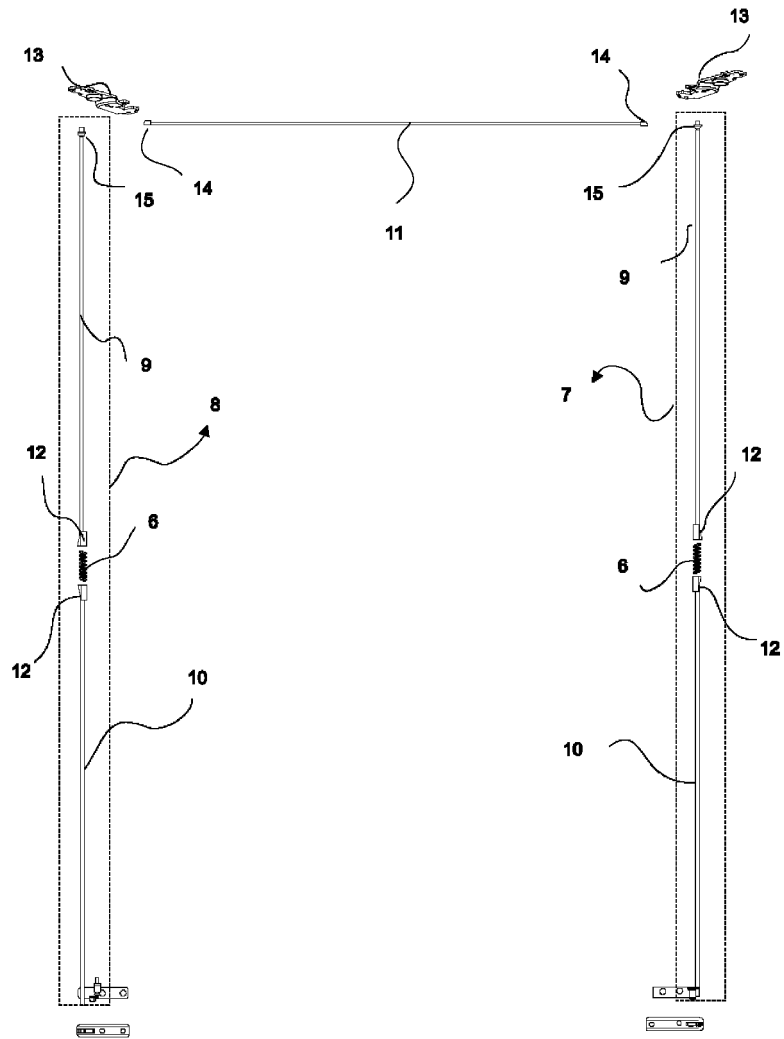


Figure 4

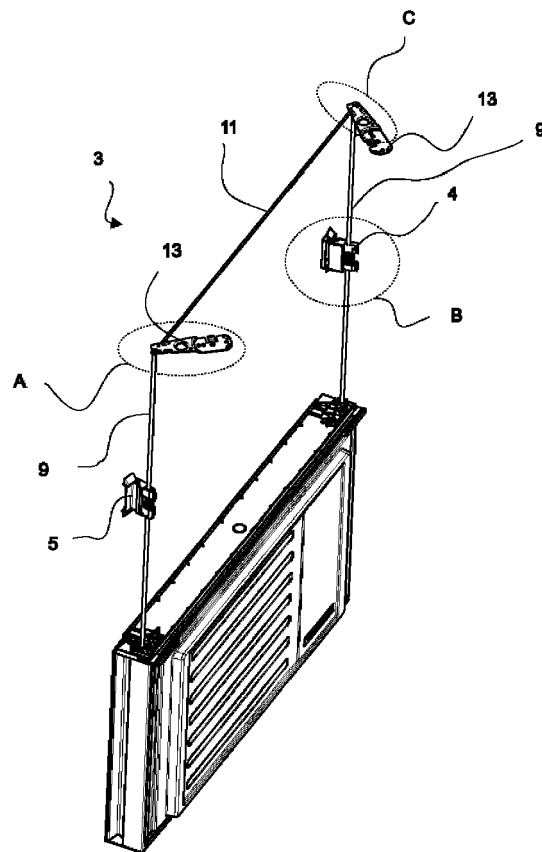
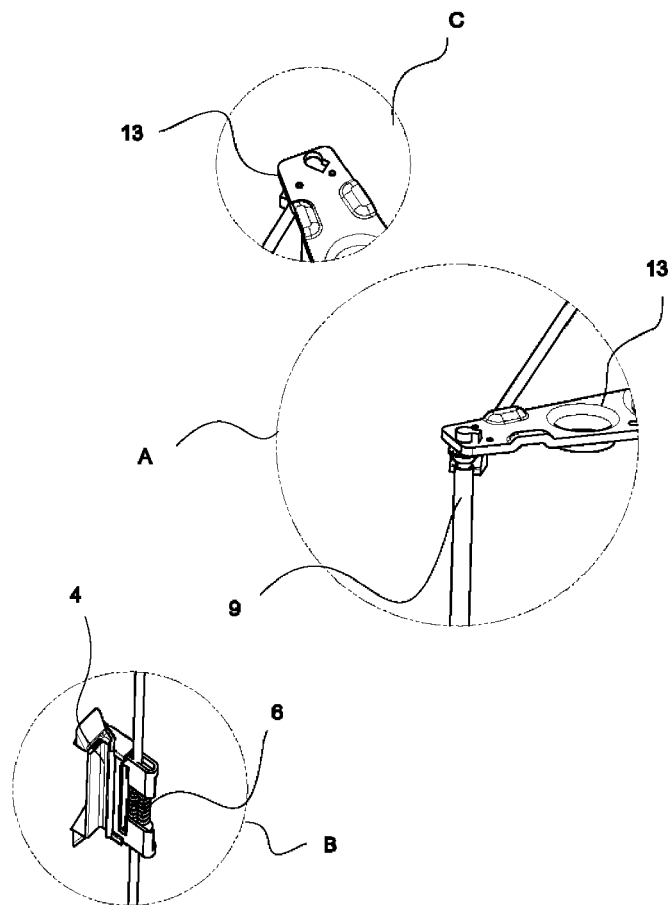


Figure 5





EUROPEAN SEARCH REPORT

 Application Number
 EP 20 20 3795

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			TECHNICAL FIELDS SEARCHED (IPC)
			F25D E05D E05G
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 22 March 2021	Examiner Yousufi, Stefanie
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 20 20 3795

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22-03-2021

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US 4811518	A	14-03-1989	NONE
US 1550205	A	18-08-1925	NONE
US 3048899	A	14-08-1962	NONE

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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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