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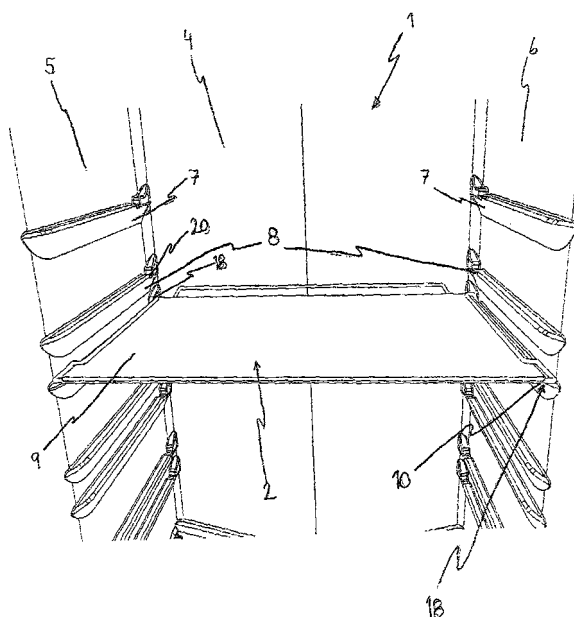
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(54) **Wire shelf**

(57) The present invention relates to a refrigerator comprising walls (4, 5, 6) defining a refrigerator compartment (1) and at least one shelf (2) for supporting foodstuff in the refrigerator compartment (1), said walls (4, 5, 6) including two opposing side walls (5, 6) comprising support members (7), a support member (7) of one of said side walls (5, 6) forms a pair (8) with a support member

(7) of the other of said side walls (6, 5), each of said pairs (8) being arranged to support one of said at least one shelf (2), each shelf (2) comprises a shelf panel (9) and a shelf frame (10) in the form of a wire structure, said shelf frame (10) having opposing rim portions (18) for engagement with one of said pairs (8) of said support members (7), wherein said shelf panel (9) is supported and slidably received by said shelf frame (10).

Fig 1



Description

Field of the Invention

[0001] The present invention relates to a refrigerator comprising walls defining a refrigerator compartment and at least one shelf for supporting foodstuff in the refrigerator compartment, said walls including two opposing side walls comprising support members, a support member of one of said side walls forms a pair with a support member of the other of said side walls, each of said pairs is arranged to support one of said at least one shelf.

Background Art

[0002] Within the field of refrigerators, in which the side walls of the refrigerator support shelves, a shelf normally being defined by a panel of glass or Plexiglas and by a rim made of plastic surrounding all or parts of the panel.

[0003] This types of panels is unhygienic in that dirt or parts of the foodstuff stored in the refrigerator may adhere to the joints between the panel and the plastic surrounding and bacteria may start to grow. The joints are difficult to clean and therefore it is common that the joints become unhygienic.

[0004] Within the field of refrigerators, in which shelves are supported by the back wall of the refrigerator, i.e. a standard different from that described above, the problem of unhygienic joints has been addressed. EP 1 426 716 discloses one technique within this standard that tries to solve the problem. However, additional problems arise as the refrigerator according to the latter standard involves shelves that are complicated and thus expensive to manufacture. Further, these shelves are not applicable to refrigerators of the standard in which the shelves is supported by the side walls.

Summary of the Invention

[0005] The present invention is new and inventive by providing a refrigerator comprising walls defining a refrigerator compartment and at least one shelf for supporting foodstuff in the refrigerator compartment, said walls including two opposing side walls comprising support members, a support member of one of said side walls forms a pair with a support member of the other of said side walls, each of said pairs being arranged to support one of said at least one shelf. The refrigerator is characterized in that each shelf comprises a shelf panel and a shelf frame in the form of a wire structure, said shelf frame having opposing rim portions for engagement with one of said pairs of said support members, wherein said shelf panel is supported and slidably received by said shelf frame.

[0006] An advantage of the inventive refrigerator is that the shelf panel is supported by the shelf frame in the form of a wire structure, which reduces the risk of dirt and foodstuff adhering to the shelf, and thereby reducing the

risk of bacterial growth in the refrigerator.

[0007] A second advantage of the inventive refrigerator is that the shelf panel is slidably received by the shelf frame, whereby the shelf panel may be easily removed and cleaned in case of dirt or foodstuff adhering to the shelf.

[0008] The shelf frame may comprise a front portion, two side portions and a rear portion, and said shelf frame may be arranged to receive said shelf panel such that movement of the shelf panel in a first direction is prevented by said front portion, movement of the shelf panel in said first and a second direction is prevented by said rear portion, and movement of the shelf panel in a third and fourth direction is prevented by said side portions.

[0009] The advantage of that the shelf panel is arranged in a stable and secure manner is hereby obtained.

[0010] A further advantage is that the shelf frame prevents movement of the shelf panel in unwanted directions. It should be understood that by the expression prevent is meant that the shelf panel is not able to be moved outside the shelf frame, i.e. tolerances and some degree of a gap is allowed.

[0011] The first direction may correspond to a downward direction, the second direction may correspond to a rearward direction, the third direction may correspond to a sideways direction, and the fourth direction may correspond to an upward direction. The advantages of that movement of the shelf panel in all directions, with exception for a forward direction, is hereby achieved.

[0012] The front portion may be connected to a first end of each of said two side portions and said rear portion may be connected to a second end of each of said two side portions. The advantages of an uncomplicated structure of the shelf frame are hereby obtained.

[0013] The shelf frame may be in the form of an endless wire structure. An endless wire structure has the advantage of being easy to manufacture and also of being easy to keep clean as dirt and foodstuff residue are less prone to adhere to such a structure. An endless wire structure may also easily be wiped clean.

[0014] The shelf frame may be formed by two connected wires. Also this wire structure has the advantages of being easy to clean and manufacture

[0015] The shelf frame may be formed by a single wire. A single wire structure also has the advantages of that it is easy to clean and manufacture.

[0016] The shelf frame may comprise locking means for releasable locking of said shelf in said pair of support members for avoiding unwanted movement of said shelf.

[0017] The shelf frame may restrict movement of the shelf panel in a forward direction. The advantage of a reduced risk of unwanted movement of the shelf panel is hereby obtained.

[0018] The restriction may be achieved by frictional engagement between the shelf frame and the shelf panel.

[0019] The front portion and rear portion of the shelf frame may be in contact with an underside of the shelf panel and the side portions of the shelf frame may be in

contact with an upper side of the shelf panel. This is an advantageous way to obtain frictional engagement between the shelf panel and shelf frame.

[0020] The shelf frame may make contact only with peripheral portions of said shelf panel- By reducing the contact area between the shelf panel and the shelf frame the possibility for dirt and foodstuff to adhere to the shelf is reduced as the contact area forms joints to which dirt are prone to adhere.

[0021] To obtain a strong, cleanable shelf and reduce the adhering of dirt and foodstuff, the shelf frame may be made of metal, such as steel or aluminium.

[0022] The refrigerator may further comprise a bottle rack, which is movable connected to said shelf frame. The advantage of that the bottle rack is movable allows for the bottle rack to be moved from a first position to a second position without removal of the bottle rack from the refrigerator compartment. In the first position the bottle rack may store bottles and in the second position it takes up only a small part of the storage area of the shelf panel.

[0023] One advantageous way to obtain the mobility of the bottle rack is that the bottle rack may be slidably connected to said side portions of the shelf frame.

[0024] A further advantageous way to obtain the mobility of the bottle rack is that the bottle rack may be hinged to the rear portion of said shelf frame.

[0025] To connect the bottle rack to the shelf frame in an easy and effective manner, the bottle rack may be magnetically connected to said shelf frame.

Brief Description of the Drawings

[0026] The invention and its many advantages will be described in more detail below with reference to the accompanying schematic drawings, which for the purpose of illustration show some non-limiting embodiments and in which:

Fig. 1 shows a schematic front view of a portion of a refrigerator compartment of a refrigerator according to the invention.

Fig. 2 shows a schematic perspective view of a shelf for a refrigerator according to the invention.

Fig. 3 shows a schematic perspective view of a shelf and a bottle rack for an inventive refrigerator, in which the bottle rack is positioned in a first position.

Fig. 4 shows a schematic perspective view of the shelf and the bottle rack shown in fig. 3, in which the bottle rack is positioned in a second position

Fig. 5 shows a schematic perspective view of a shelf and a bottle rack for an inventive refrigerator, in which the bottle rack is positioned in a first position.

Fig. 6 shows a schematic perspective view of the shelf and the bottle rack shown in fig. 5, in which the bottle rack is positioned in a second position

All the figures are highly schematic, not necessarily to scale, and they show only parts, which are nec-

essary in order to elucidate the invention, other parts being omitted or merely suggested.

Description of Preferred Embodiments

[0027] Fig. 1 shows a portion of a refrigerator compartment 1 and a shelf 2 of a refrigerator in accordance with the invention. The refrigerator compartment 1 is defined by a back wall 4, a top wall (not shown), bottom wall (not shown), two side walls 5, 6 and a front wall (not shown). The front wall is in the form of a door, through which the refrigerator compartment 1 is accessible for a user for placing foodstuff on the shelf 2.

[0028] The side walls 5, 6 comprise a number of support members 7 in the form of horizontal ribs 7. Each support member 7 on one of the side walls 5, 6 is positioned opposite a support member 7 on the other side wall 6, 5, such that two opposite support members 7 form a pair 8 of support members 7. It should be noted that the invention not is limited to support members in the form of ribs and that the support members could be configured in many different ways such as a groove, notch, protrusion or projection.

[0029] The shelf 2 is slidably supported by one pair 8 of support members 7. The shelf 2 may be arranged inside the refrigerator on any desired pair 8 of ribs 7. A shelf 2 may thus be slidably removed from one pair 8 of support members 7 and arranged on a second pair 8 of support members 7.

[0030] The shelf 2 comprises a shelf panel 9 and a shelf frame 10.

[0031] The shelf panel 9 could be made of glass, Plexiglas or any other suitable material and is in Fig. 2 to Fig. 6 constituted of a shelf panel 9 of a transparent material.

[0032] In the embodiment shown in Fig. 2 the shelf panel 9 has a thickness and a rectangular shape with a width and depth. Further, the shelf panel 9 has a perimeter section formed by a front section 11, a rear section 12 and two side sections 13.

[0033] The shelf frame 10 is formed by a wire structure and comprises a front portion 14, two side portions 15 and a rear portion 16.

[0034] The shelf frame 10 is made by a single wire 17. The wire 17 has an extension that essentially corresponds to the shape of the perimeter section of the shelf panel 9.

[0035] The front portion 14 of the wire 17 runs along the underside of the shelf panel 9 along its front section 11 and extends beyond the width of the shelf panel 9. On both sides of the shelf frame 10, outside the width of the shelf panel 9, the wire 17 is bent backwards and runs a distance in parallel with the respective side section 13 of the shelf panel 9. These parts of the wire 17 constitute parts of opposing rim portions 18 of the shelf frame 10. Thereafter the wire 17 on both sides is bent inwards and upwards towards a position above the respective side sections 13 of the shelf panel 9. The wire 17 is then again bent backwards and runs along the upper side of the

shelf panel 9 along the respective side section 13. When the wire 17 reaches the rear section 12 of the shelf panel 9 the wire 17 on each side is bent outwards and again extending beyond the width of the shelf panel 9. The wire 17 then extends downwards a distance that at least corresponds to the thickness of the shelf panel 9. Thereafter the wire 17 on both sides is bent towards the front section 11 of the shelf panel 9. These parts of the wire 17 constitute additional parts of the opposing rim portions 18 of the shelf frame 10. After a short distance the wire 17 on both sides is bent inwards and runs along the underside of the rear section 12 of the shelf panel 9. After a distance the wire is bent backwards and runs so that it extends beyond the depth of the shelf panel 9. Thereafter the wire 17 extends upwards on both sides a distance that is larger than the thickness of the shelf panel 9. Thereafter the wire 17 on both sides is bent inwards and converges such that its runs parallel with the rear section 12 of the shelf panel 10. The shelf frame 10 thus constitutes an endless wire structure that essentially encloses the shelf panel 9.

[0036] The shelf frame 10 in the form of a wire structure hereby supports the shelf panel 9 along the front section 11 and partially along the rear section 12 of the shelf panel 9. It also prevents the shelf panel 9 to be moved upwards, as the wire 17 runs along the upper side of the shelf panel 17 along its side sections. It prevents the shelf panel 9 to be moved sideways, as the wire 17 runs from the underside to the upper side of the shelf panel 17 outside the width of the shelf panel 9. It prevents the shelf panel 9 to be moved rearwards, as the wire 17 runs from the underside to the upper side of the shelf panel 9 outside the depth of the shelf panel 9 at its rear section 12.

[0037] It should be understood that by prevent is meant that the shelf panel 9 not is able to be moved outside the shelf frame 10 in the upward, sideway or rearward direction, i.e. tolerances and some degree of a gap is allowed.

[0038] As the wire 17 does not prevent the shelf panel 9 from being moved in a forward direction, the shelf panel 9 may be removed from the shelf frame 10 by sliding the shelf panel 9 forward in respect to the shelf frame 10. However, as the wire 17 runs along the shelf panel, it may make contact with the shelf panel 9, and thereby restrict the movement of the shelf panel 9 by frictional engagement between the wire 17 and the shelf panel 9. By adapting this frictional engagement, i.e. by adapting the material and the gripping force between the wire 17 and the shelf panel 9, unwanted movement of the shelf panel 9 may be avoided.

[0039] Reference is now once again made to Fig. 1. When the shelf 2 is arranged in the refrigerator compartment 1, the rim portions 18 of the shelf frame 10 engage the support members 7 which thus support the shelf 2. The rim portions 18 of the shelf frame 10 at the rear section 12 of the shelf frame 10 constitute locking means 19 in the shown embodiment. The locking means 19 of the shelf frame 10 are positioned in recesses 20 in the rib 7 when the shelf 2 is slidably arranged in the rib 7. The locking means 19 locks against the recesses 20 and pre-

vent movement of the shelf 2 in a forward direction. When a shelf 2 should be removed, the rear portion of the shelf frame 10 is first lifted upwards to unlock the locking means 19 and is thereafter slid forward.

[0040] Reference is now made to Figs- 3 and 4, in which a shelf 2 and a bottle rack 21 are disclosed. The shelf frame 10 corresponds to the shelf frame 10 disclosed in Figs. 1 and 2. The bottle rack 21 comprises a wave shaped bottle wire 22 connected in each end to connecting wires 23. Each connecting wire 23 has an essential U-shape in which the two legs converge in a tip pointing upward-forward. The bottle wire 22 connects to a leg of each connecting wire 23 at a distance from the tip. The bottle rack 21 is connected to the shelf frame 9 by placing the U-shaped connecting wires 23 on the wire 17 of the shelf frame 10 along its side portions 15. The wire 17 of the shelf frame 9 hereby supports the bottle rack 21. The bottle rack 21 is slidably movable along the side portions 15 of the shelf frame 9. When a bottle is stored in the refrigerator, the bottle rack 21 is moved to a first position as is shown in Fig. 3 such that a bottle may be placed on the bottle rack 21, whereby the wave shape of the bottle wire 22 ensures stable positioning of the bottle in the bottle rack 21. The first position is dependent upon the size, i.e. the length, of the bottle to be stored in the refrigerator. When the bottle is removed and the bottle rack 21 is empty, the bottle rack 21 may be moved to a second position as is shown in fig. 4. In the second position the bottle rack 21 is positioned at the rear portion 16 of the shelf frame 10. When the bottle rack 21 is arranged in said second position most of the storage area of the shelf panel 9 may be utilized without removing the bottle rack from the refrigerator 3.

[0041] Reference is now made to Figs. 5 and 6, in which a shelf 2 and a bottle rack 121 is disclosed. The shelf frame 10 corresponds to the shelf frame 10 disclosed in fig. 1 and 2. The bottle rack 121 comprises a bottle wire 122 with a wave shape and two connecting wires 123. Each connecting wire 123 is in one end connected to the bottle wire 122 and in the other end hinged to the wire 17 at the rear portion 16 of the shelf frame 10. The bottle rack 121 is thereby turnable from a first position, as shown in Fig. 5, to a second position, as shown in Fig. 6. When a bottle is stored in the refrigerator, the bottle rack 121 is moved to the first position and the bottle may be stored in the bottle rack 121. When the bottle is removed and the bottle rack 121 is empty, the bottle rack 121 may be turned to the second position. In the second position the bottle rack 121 is positioned at the rear portion 16 of the shelf frame 10. When the bottle rack 121 is arranged in said second position most of the storage area of the shelf panel 9 can be utilized without removing the bottle rack from the refrigerator.

[0042] Although the invention above has been described in connection with preferred embodiments of the invention, it will be evident for a person skilled in the art that several modifications are conceivable without de-

parting from the invention as defined by the following claims.

Claims

1. Refrigerator comprising walls (4, 5, 6) defining a refrigerator compartment (1) and at least one shelf (2) for supporting foodstuff in the refrigerator compartment (1),
said walls (4, 5, 6) including two opposing side walls (5, 6) comprising support members (7),
a support member (7) of one of said side walls (5, 6) forms a pair (8) with a support member (7) of the other of said side walls (6, 5), each of said pairs (8) being arranged to support one of said at least one shelf (2),
characterized in that
each shelf (2) comprises a shelf panel (9) and a shelf frame (10) in the form of a wire structure,
said shelf frame (10) having opposing rim portions (18) for engagement with one of said pairs (8) of said support members (7),
wherein said shelf panel (9) is supported and slidably received by said shelf frame (10).
2. Refrigerator according to claim 1, wherein said shelf frame (10) comprises a front portion (14), two side portions (15) and a rear portion (16), and wherein said shelf frame (10) is arranged to receive said shelf panel (9) such that movement of the shelf panel (9) in a first direction is prevented by said front portion (14), movement of the shelf panel (9) in said first and a second direction is prevented by said rear portion (16), and movement of the shelf panel (9) in a third and fourth direction is prevented by said side portions (15).
3. Refrigerator according to claim 2, wherein said first direction corresponds to a downward direction, said second direction corresponds to a rearward direction, said third direction corresponds to a sideways direction, and said fourth direction corresponds to an upward direction.
4. Refrigerator according to claim 2 or 3, wherein said front portion (14) is connected to a first end of each of said two side portions (15) and said rear portion (16) is connected to a second end of each of said two side portions (15).
5. Refrigerator according to any of the preceding claims, wherein said shelf frame (10) is in the form of an endless wire structure.

6. Refrigerator according to any of the preceding claims, wherein said shelf frame (10) is formed by two connected wires.
7. Refrigerator according to any of claims 1 to 5, wherein said shelf frame (10) is formed by a single wire.
8. Refrigerator according to any of the preceding claims, wherein said shelf frame (10) comprise locking means (19) for releasable locking of said shelf (2) in said pair (8) of support members (7) for avoiding unwanted movement of said shelf (2).
9. Refrigerator according to any of the preceding claims, wherein said shelf frame (10) restricts movement of the shelf panel (9) in a forward direction.
10. Refrigerator according to claim 6, wherein the restriction is achieved by frictional engagement between the shelf frame (10) and the shelf panel (9).
11. Refrigerator according to any of claims 2 to 10, wherein the front portion (14) and rear portion (16) of the shelf frame (10) are in contact with an underside of the shelf panel (9) and the side portions (15) of the shelf frame (10) are in contact with an upper side of the shelf panel (9).
12. Refrigerator according to any of the preceding claims, wherein said shelf frame (10) only makes contact with peripheral portions of said shelf panel (9).
13. Refrigerator according to any of the preceding claims, wherein said shelf frame (10) is made of metal.
14. Refrigerator according to any of the previous claims, wherein said shelf frame (10) is made of steel.
15. Refrigerator according to any of claims 1 to 13, wherein said shelf frame (10) is made of aluminium.
16. Refrigerator according to any of the previous claims, further comprising a bottle rack (21, 121), which is movable connected to said shelf frame (10).
17. Refrigerator according to claim 16, wherein said bottle rack (21) is slidably connected to said side portions (15) of the shelf frame (10).
18. Refrigerator according to claim 16, wherein said bottle rack (121) is hinged to the rear portion (16) of said shelf frame (10).
19. Refrigerator according any of claims 16 to 18, wherein said bottle rack (21, 121) is magnetically connected to said shelf frame (10).

Fig 1

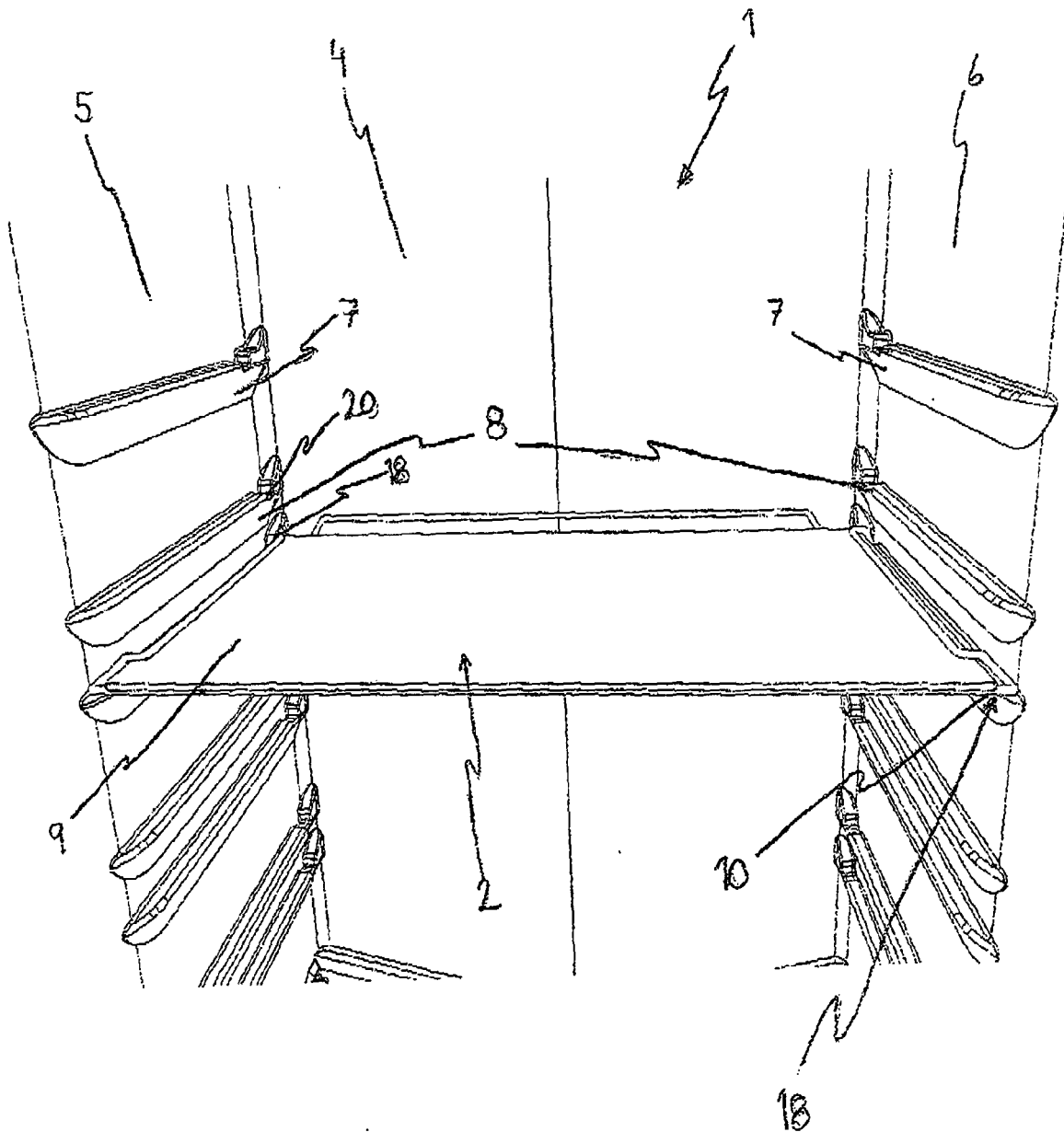


FIG 2

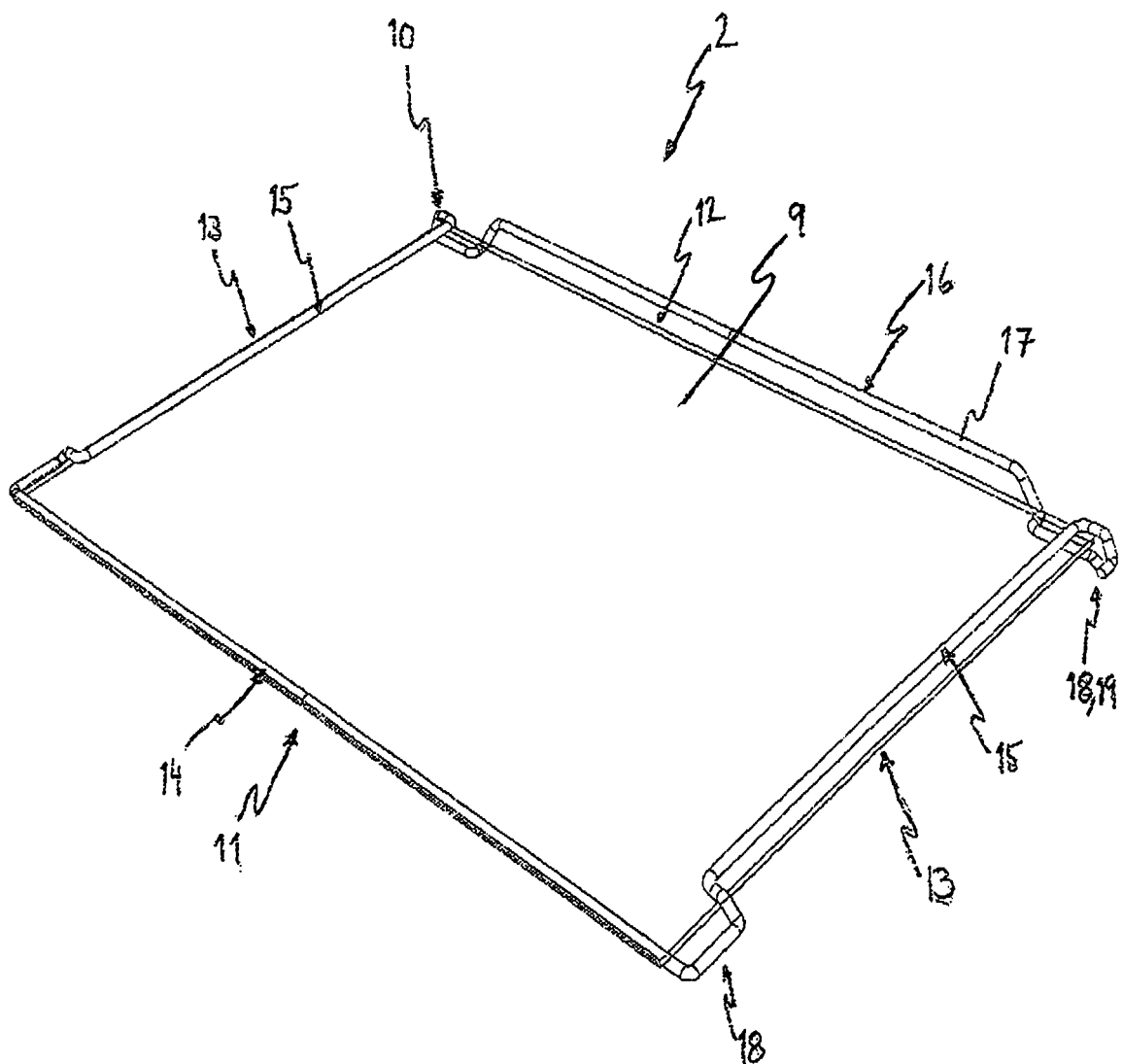


FIG. 3

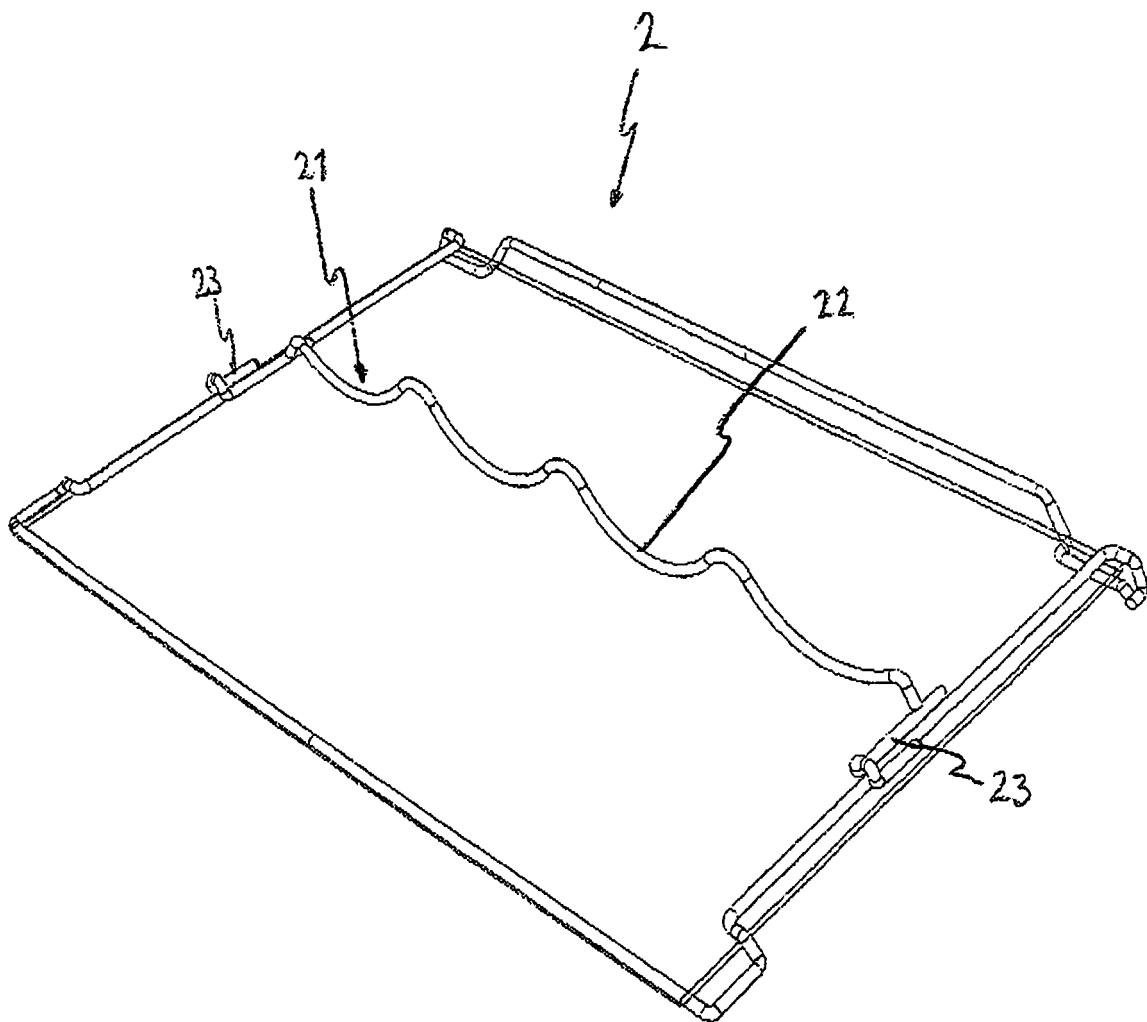


FIG 4

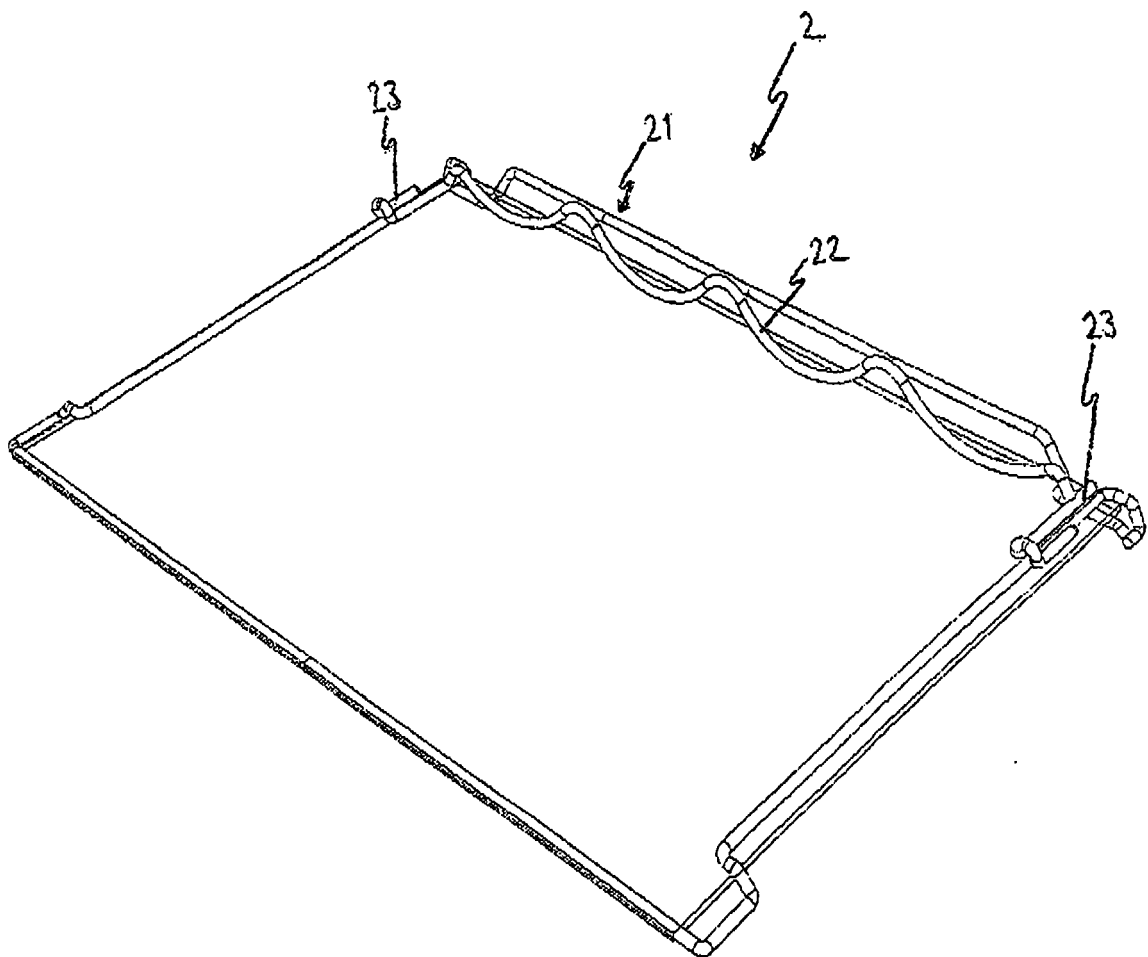


FIG 5

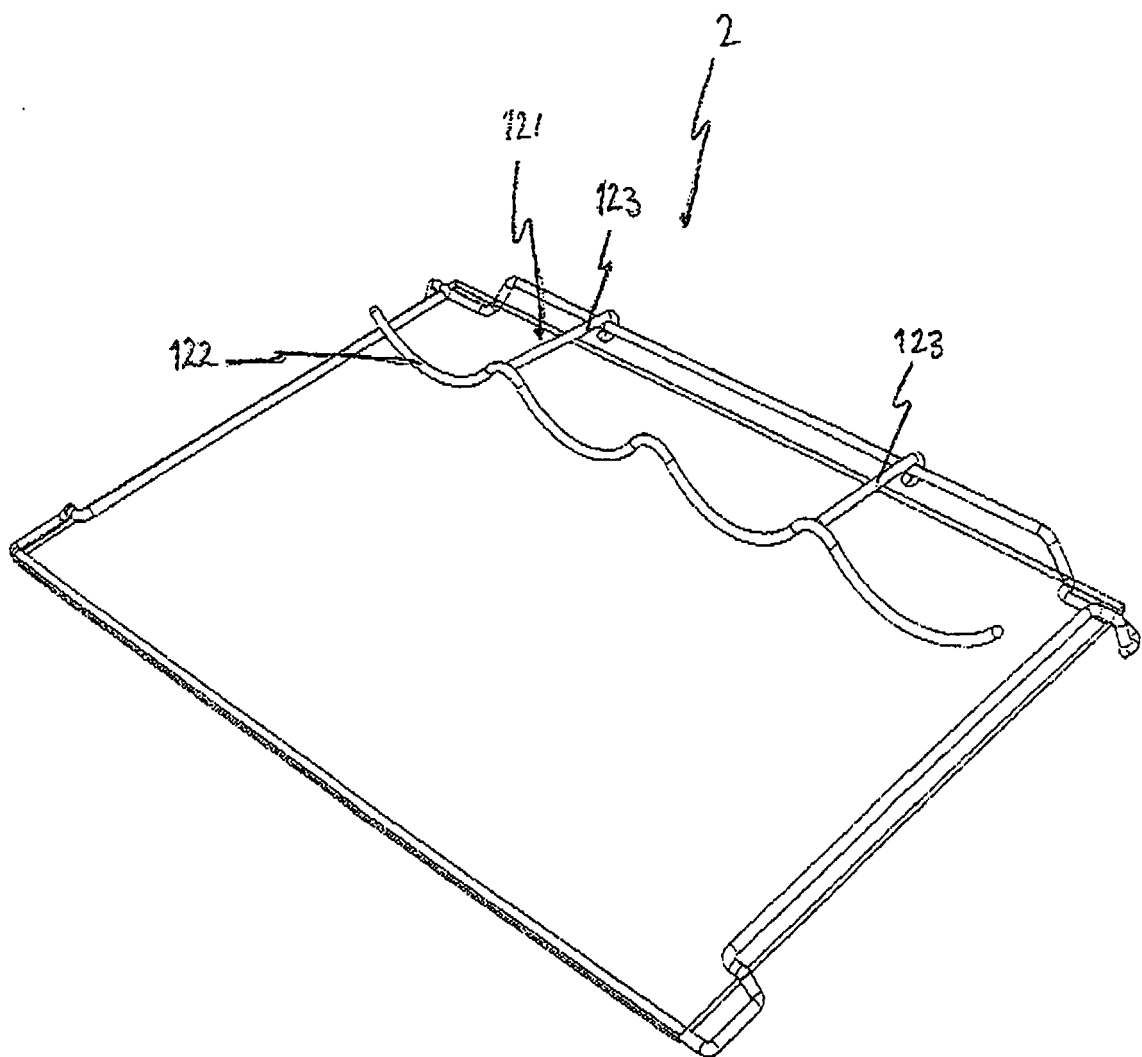
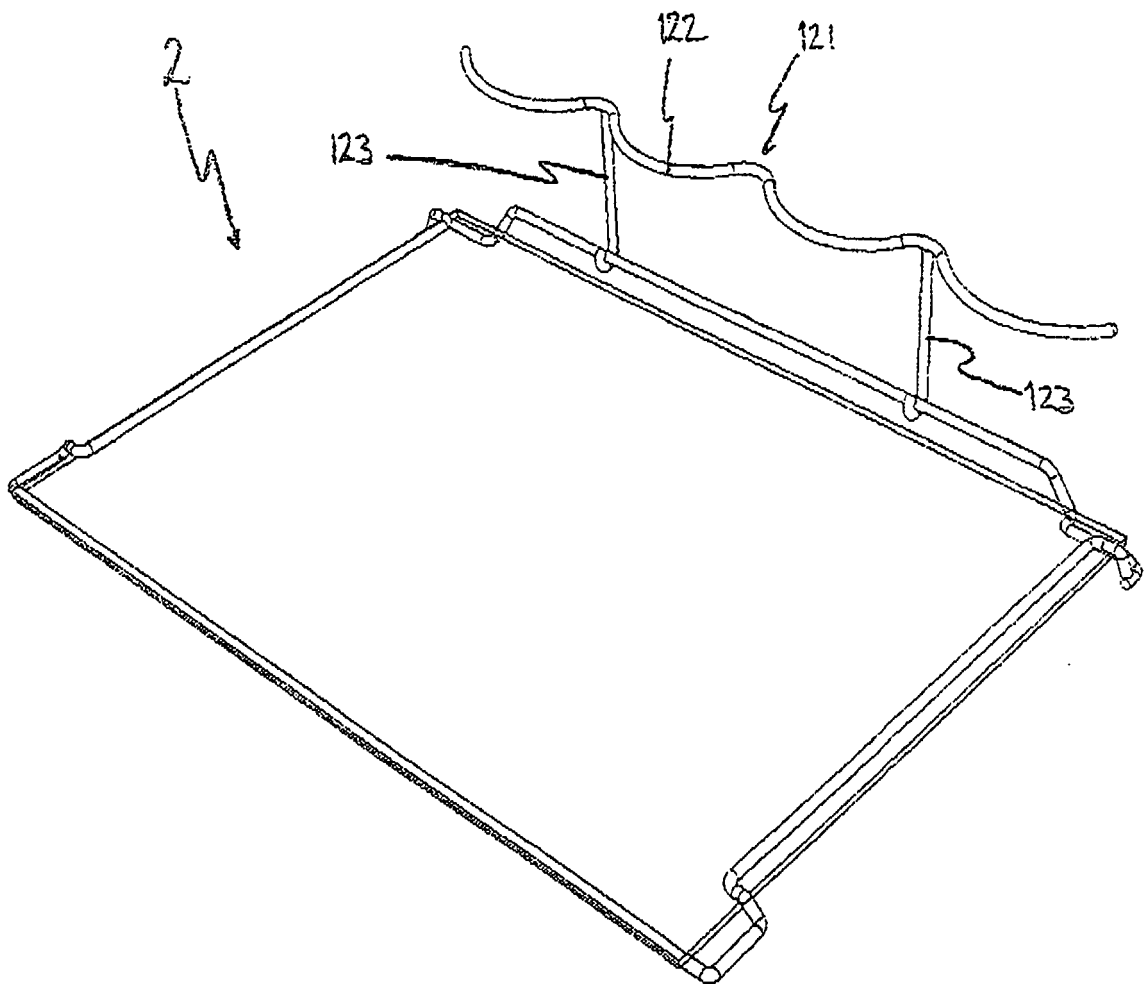


FIG 6



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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