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(54) **Crockery support which can be positioned on the bottom of a dishwasher rack to create soft surfaces**

Geschirrablage, die auf dem Boden eines Geschirrkorbs auflegbar ist, um weiche Oberflächen zu schaffen

Elément de soutien de vaisselle qui peut être placé sur un panier dans une lave-vaisselle pour créer des surfaces souples

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## Description

**[0001]** The present invention relates to a crockery support which can be positioned inside a dishwasher rack.

**[0002]** As known, positioning a large number of pieces of crockery having non-standard dimensions, such as coffee cups/saucers, decorated serving dishes or the like, in a dishwasher rack may be a problem because the different dimensions of the objects do not allow proper interference with the rakes of the dishwasher rack, which are usually designed for standard-size crockery.

**[0003]** Moreover, the improper positioning of non-standard pieces of crockery in the rack, along with the fact that they are often made of delicate (and valuable) materials such as porcelain or the like, makes it likely that, during the wash cycle, a single moving or falling piece of crockery will cause one or more other pieces to break and/or chip, possibly also because a piece slides inside the rack.

**[0004]** Placing smaller rakes in the dishwasher rack would certainly provide a partial solution to the above-described problem, but loading flexibility would be reduced because it would be difficult or even impossible to position a large number of conventional pieces of crockery of bigger diameter, such as serving dishes or the like.

**[0005]** In patent JP 2007/313139 A to HITACHI APPLIANCES INC., this problem has been faced by adding a support (Fig. 5) which is raised from the tub bottom by means of a cage integral with the rack. This support can be used to support both small (Fig. 6) and large (Fig. 4) pieces of crockery; however, in this solution the larger pieces of crockery can only be housed in a semi-vertical position in contact with the rack (Fig. 5a). Furthermore, in this solution the pieces of crockery overlap (Fig. 2), leading to a probable decrease in washing efficiency, because the washing liquid may not be evenly sprayed onto the crockery.

**[0006]** In addition, this solution is not recommended for non-standard pieces of crockery made of valuable materials such as porcelain or the like; to ensure integrity of these pieces, it is known that they must be laid stably on the rack bottom, without being subject to possible movements generated by washing liquid sprayed at high speed and/or by vibrations generated by the washing means, such as pumps, motors or the like, and then transmitted to the rack.

**[0007]** The support described in the U.S. patent application US 2006/254992 A1 to LIM SUNG B reduces the washing efficiency, since it is shape (see Figures 6 and 7) decreases the flow of washing liquid coming into the rack from bottom side of said rack. In addition to that, it has a planar shape which is not designed for damping vibration coming from the rack.

**[0008]** The present invention aims at solving this and other problems by providing a crockery support which can be positioned on the bottom of a dishwasher rack.

**[0009]** The idea at the basis of the present invention is to provide a crockery support made of soft material, which is positioned on the bottom of the rack and which can filter at least a part of the vibrations.

**[0010]** To this end, the support has an elongated shape compatible with wires of the rack bottom; advantageously, for safely housing valuable pieces of crockery, said support is made of a soft material, preferably TPE rubber.

**[0011]** The advantageous features of the present invention will be set out in the appended claims. These features and the effects thereof will become more apparent from the following description of a preferred but non-limiting example of embodiment of the invention as shown in the annexed drawings, wherein:

Fig. 1 is a perspective side view from the top of a rack comprising two supports according to the invention, anchored to a bottom of the rack;
Fig. 2 is a perspective side view from the top of one of the supports of Fig. 1;
Fig. 3 is a side view of the support of Fig. 2;
Fig. 4 is a side view from the top of the support of Fig. 3.

**[0012]** With reference to Fig. 1, a rack 1 positioned inside a tub of a dishwasher (not shown in the drawings) comprises a bottom 2, side walls 3,4,5,6 and a crockery support 7.

**[0013]** The bottom 2 of the rack 1 and the side walls 3,4,5,6 are at least partly configured as a grid 20, preferably a metallic one; the wires of said grid may advantageously be coated with a layer of insulating material, such as Rilsan, in order to prevent the metal from contacting a washing liquid, thus avoiding any corrosion phenomena.

**[0014]** The bottom 2 of the rack comprises rises 21,22,23, which, in combination with the grid 20, act as rakes; in these rises one can position pieces of crockery vertically, so that they can be properly reached by the washing liquid.

**[0015]** The grid 20 is at least formed by horizontal wires 24 and vertical wires 25, preferably welded together at the crossing points.

**[0016]** Inside the rise 23,25, at least one support 7 according to the invention can be positioned; said support 7 is suitably shaped to exploit the space of said rise 23, for the purpose of ensuring increased loading flexibility of the dishwasher.

**[0017]** Also with reference to Figs. 2, 3, and 4, the support 7 is made of a soft material that can filter at least a part of the vibrations generated by washing means (such as pumps, motors or the like) comprised in the dishwasher.

**[0018]** Advantageously, the material of the support 7 (e.g. rubber, TPE or the like) is softer than that of the rack bottom and of the wires thereof.

**[0019]** The support 7 comprises small bars 71 and two crosspieces 72 having an elongated shape and preferably a rectangular cross-section, the length of the latter being approximately equal to or shorter than that of the

bottom 2 of the rack 1. These crosspieces 72 connect the small bars 71 to one another 71, and may both be made as one piece by moulding.

**[0020]** The crosspieces 72 are arranged parallel to each other, and may be approximately coplanar to the small bars 71; as an alternative, the small bars 71 protrude from the crosspieces 72, so as to create support lines for crockery and/or flatware.

**[0021]** Furthermore, the small bars 71 are preferably so oriented as to form an angle of approx. 90° relative to the crosspieces 72.

**[0022]** In the operating condition, the crosspieces 72 are perpendicular to the horizontal wires 24 of the bottom 2, whereas the small bars 71 are parallel to said wires 24 and preferably overlap them, so as to limit the presence of hard contact points. To this end, the small bars 71 may be spaced by a distance equal to an integer multiple of the distance that separates the horizontal wires 24 of the bottom 2.

**[0023]** Aiming at making the coupling between the support 7 and the bottom 2 of the rack 1 more stable, one or more small bars 71, preferably the two outermost ones, may comprise one or more hooking means adapted to constrain the support 7 to the rack 1; said hooking means may comprise snap-on hooks 74 positioned in the lower part of the small bars 71 and compatible with at least a portion of the horizontal wires 24 they overlap. The snap-on hooks 74 act upon the support 7 by elastically deforming it, so as to ensure adequate adherence of the support 7 itself to the bottom of the rack 1. This prevents the support 7 from being moved by the washing liquid which is sprayed at high speed during the wash cycle.

**[0024]** In addition, one or more small bars 71, preferably not the outermost ones, comprise an upward-projecting rectangular tooth 73, on which the most delicate objects to be washed can be laid.

**[0025]** As aforementioned, the support 7 is preferably made of TPE rubber. This material allows limiting the intensity of the vibrations that are transmitted to the objects being washed; such vibrations are often generated by the washing means, such as pumps, motors and the like, and then transferred to the tub, which in turn transmits them to the rack 1 and hence to the objects contained therein.

**[0026]** In order to further limit this phenomenon, the presence of the crosspieces 72 contributes to increasing the rigidity of the rack, thus advantageously damping the vibrations of the horizontal wires 24 and making any objects made of valuable materials placed on the support 7 unlikely to get damaged.

**[0027]** The support 7 makes it possible to use a crockery rake as a base for supporting objects that require a stable positioning on the bottom 2 of the rack 1.

**[0028]** Of course, the example described so far may be subject to many variations.

**[0029]** For example, by changing the length of the support 7 one can position it on just a portion of the length of the bottom 2, so that one can also place standard pieces of crockery in the rack.

**[0030]** Finally, it should be pointed out that the support according to the invention may not be applied directly to the bottom of the rack, but to flatware support elements.

**[0031]** This is the case of square-type supports or rakes for crockery and/or flatware, e.g. like those designed by the present Applicant, which are applied to the bottom of the rack and on which, in turn, the support 7 could be placed.

**[0032]** All possible variants which are apparent to those skilled in the art will still fall within the scope of the following claims.

## Claims

1. A dishwasher rack (1) comprising a bottom (2), a plurality of side walls (3,4,5,6) extending from the bottom (2), and a crockery and/or flatware support (7) which can be positioned on the bottom (2) of the rack (1), and comprises small bars (71) and two elongated crosspieces (72), wherein said small bars (71) and said crosspieces (72) are connected and coplanar to each other, and wherein the material of the support (7) is softer than that of the rack bottom and of the wires thereof, and can filter at least a part of the vibrations generated by washing means comprised in a dishwasher,
**characterized in that**
at least one of the small bars (71) comprises an upward-projecting rectangular tooth (73) on which objects to be washed can be laid.

2. A rack (1) according to claim 1, wherein the two crosspieces (72) are parallel to each other.

3. A rack (1) according to claim 2, wherein the small bars (71) and the crosspieces (72) are so oriented as to form an angle of approx. 90° between them.

4. A rack (1) according to claim 3, wherein the small bars (71) overlap horizontal wires (24) comprised in the bottom (2) of the rack (1).

5. A rack (1) according to claim 4, wherein the small bars (71) are spaced by a distance equal to an integer multiple of the distance that separates the horizontal wires (24) of the bottom (2).

6. A rack (1) according to claim 5, wherein the support (7) comprises coupling means adapted to constrain said support (7) to the rack (1).

7. A rack (1) according to claim 6, wherein said coupling means comprise at least one snap-on hook (74) positioned in the lower portion of one of the small bars (71), and said snap-on hook (74) is compatible with at least a portion of the horizontal wire (24) it over-

laps.

8. A rack (1) according to any one of claims 1 to 7, wherein the length of the crosspieces (72) is equal to or shorter than that of the bottom (2) of the rack (1).

9. A rack (1) according to any one of the preceding claims, wherein the support (7) is made of TPE rubber.

10. A washing machine **characterized by** comprising at least one rack (1) according to any one of claims 1 to 9.

**Patentansprüche**

1. Geschirrspülerspülkorb (1) umfassend einen Boden (2), mehrere Seitenwände (3, 4, 5, 6), die sich vom Boden (2) erstrecken, und eine Geschirr- und/oder Besteckhalterung (7), die auf dem Boden (2) des Spülkorbs (1) positioniert werden kann und schmale Stäbe (71) und zwei längliche Rahmenstücke (72) umfasst, wobei die schmalen Stäbe (71) und die Rahmenstücke (72) miteinander verbunden und koplanar zueinander sind und wobei das Material der Halterung (7) weicher als das Material des Spülkorbbodens und dessen Drähte ist, und zumindest einen Teil der Vibrationen, die durch die Mittel zum Waschen, die in einem Geschirrspüler enthalten sind, erzeugt werden, filtern kann,
**dadurch gekennzeichnet, dass**
zumindest einer der schmalen Stäbe (71) einen aufwärtsüberstehenden rechteckigen Zahn (73) umfasst, auf dem zu waschende Objekte abgelegt werden können.

2. Spülkorb (1) nach Anspruch 1, wobei die zwei Rahmenstücke (72) parallel zueinander sind.

3. Spülkorb (1) nach Anspruch 2, wobei die schmalen Stäbe (71) und die Rahmenstücke (72) so zueinander ausgerichtet sind, um einen Winkel von etwa 90° zwischen sich zu formen.

4. Spülkorb (1) nach Anspruch 3, wobei die schmalen Stäbe (71) horizontale Drähte (24), die im Boden (2) des Spülkorbs (1) angeordnet sind, überlappen.

5. Spülkorb (1) nach Anspruch 4, wobei die schmalen Stäbe (71) mit einem Abstand beabstandet sind, der gleich einem ganzzahligen Vielfachen des Abstandes ist, der die horizontalen Drähte (24) des Bodens (2) beabstandet.

6. Spülkorb (1) nach Anspruch 5, wobei die Halterung (7) Verbindungsmittel umfasst, die eingerichtet sind, um die Halterung (7) am Spülkorb (1) zu halten.

7. Spülkorb (1) nach Anspruch 6, wobei die Verbindungsmittel zumindest einen Einschnapphaken (74) umfassen, der im unteren Bereich der schmalen Stäbe (71) positioniert ist, und der Einschnapphaken (74) passend mit mindestens einem Bereich der horizontalen Drähte (24), die er überlappt, ist.

8. Spülkorb (1) nach einem der vorhergehenden Ansprüche 1 bis 7, wobei die Länge der Rahmenstücke (72) gleich oder kürzer als die des Bodens (2) des Spülkorbs (1) ist.

9. Spülkorb (1) nach einem der vorhergehenden Ansprüche, wobei die Halterung (7) aus TPE-Gummi hergestellt ist.

10. Geschirrspülmaschine **gekennzeichnet durch** das Umfassen mindestens eines Spülkorbs (1) nach einem der vorhergehenden Ansprüche 1 bis 9.

**Revendications**

1. Panier de lave-vaisselle (1) comportant une partie inférieure (2), une pluralité de parois latérales (3, 4, 5, 6) s'étendant à partir de la partie inférieure (2), et un élément de support pour la vaisselle et/ou les couverts (7), lequel peut être positionné sur la partie inférieure (2) du panier (1), et comprend des petites barres (71) et deux traverses de forme allongée (72), dans lequel lesdites petites barres (71) et lesdites traverses (72) sont raccordées et coplanaires les unes avec les autres et dans lequel le matériau de l'élément de support (7) est plus souple que celui de la partie inférieure du panier et que celui de ses fils métalliques, et qui peut filtrer au moins une partir des vibrations générées par les moyens de lavage incorporés dans un lave-vaisselle,
**caractérisé en ce que**
au moins l'une des petites barres (71) comprend une dent rectangulaire faisant saillie vers le haut (73) sur laquelle des objets à laver peuvent être posés.

2. Panier (1) selon la revendication 1, dans lequel les deux traverses (72) sont parallèles l'une à l'autre.

3. Panier (1) selon la revendication 2, dans lequel les petites barres (71) et les traverses (72) sont orientées de façon à former entre elles un angle de 90° environ.

4. Panier (1) selon la revendication 3, dans lequel les petites barres (71) se superposent à des fils métalliques horizontaux (24) inclus dans la partie inférieure (2) du panier (1).

5. Panier (1) selon la revendication 4, dans lequel les petites barres (71) sont espacées d'une distance

égale à un multiple entier de la distance qui sépare les fils métalliques horizontaux (24) de la partie inférieure (2).

**6.** Panier (1) selon la revendication 5, dans lequel l'élément de support (7) comprend des moyens de couplage conçus pour retenir ledit élément de support (7) au panier (1).

**7.** Panier (1) selon la revendication 6, dans lequel lesdits moyens de couplage comprennent au moins un crochet enclipsable (74) positionné dans la partie inférieure de l'une des petites barres (71), et dans lequel ledit crochet enclipsable (74) est compatible avec au moins une partie du fil métallique horizontal (24) qu'il recouvre.

**8.** Panier (1) selon l'une quelconque des revendications 1 à 7, dans lequel la longueur des traverses (72) est égale à, ou plus petite que, celle de la parie inférieure (2) du panier (1).

**9.** Panier (1) selon l'une quelconque des revendications précédentes, dans lequel l'élément de support (7) est constitué de caoutchouc TPE.

**10.** Machine à laver **caractérisée par** le fait de comporter au moins un panier (1) selon l'une quelconque des revendications 1 à 9.

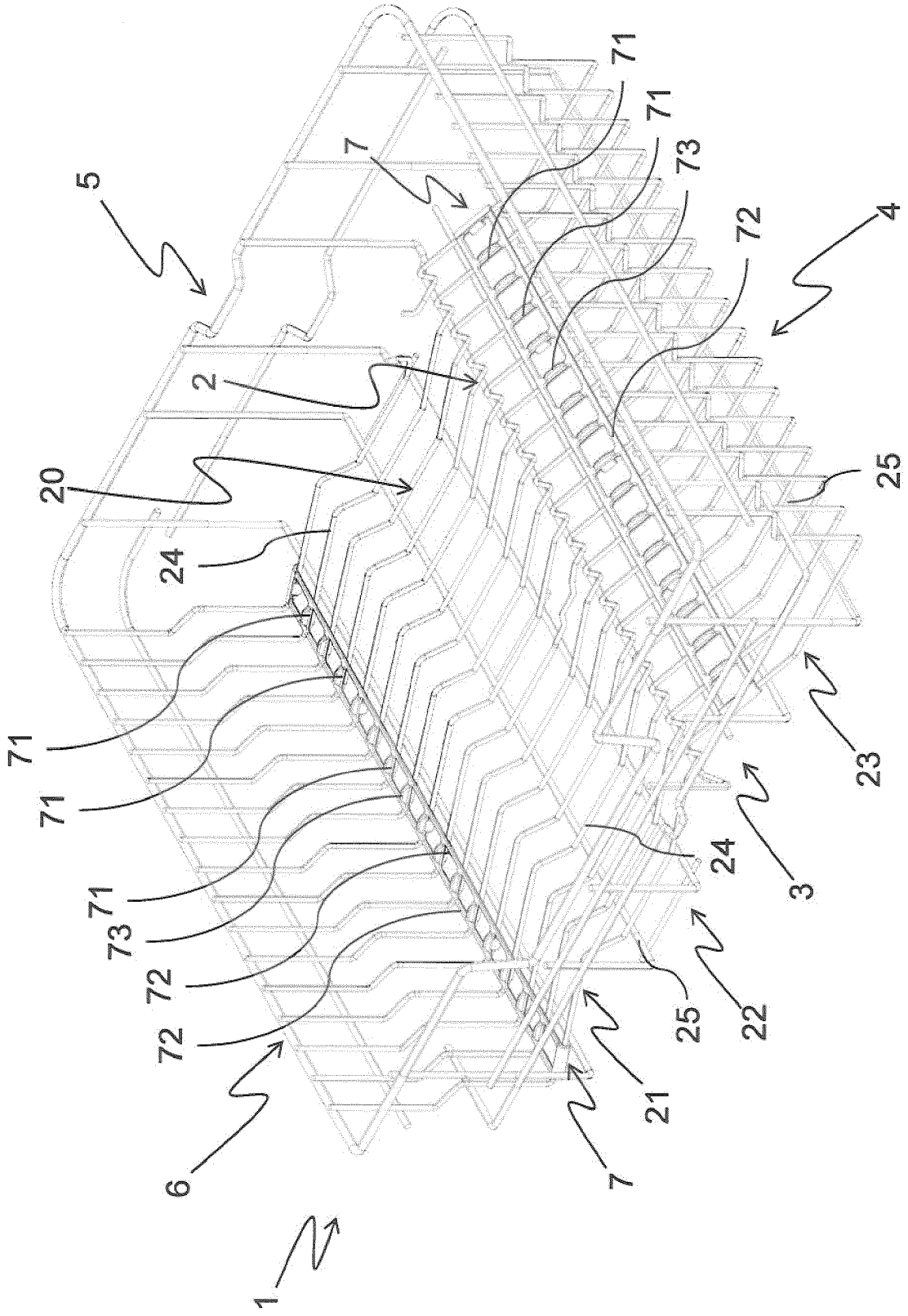



Fig. 1

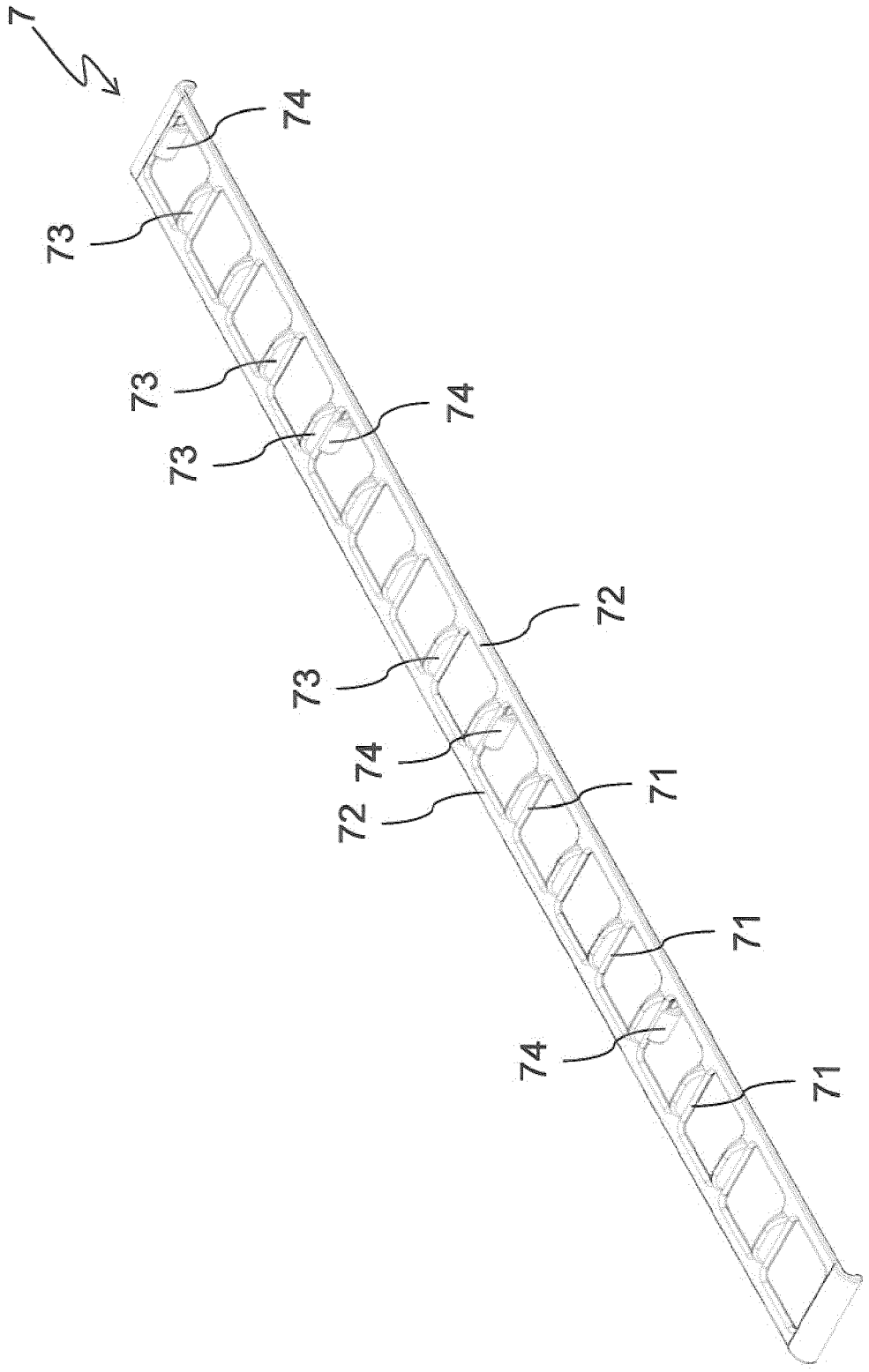



Fig. 2

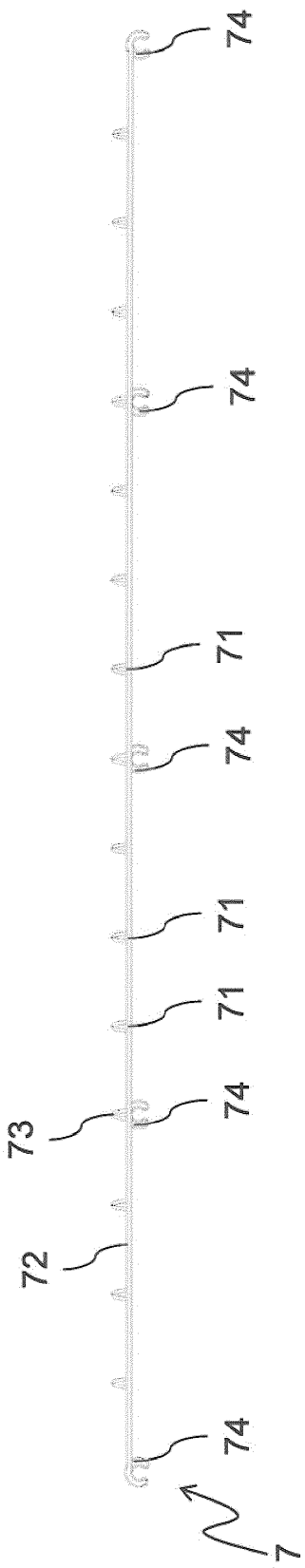

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Fig. 3

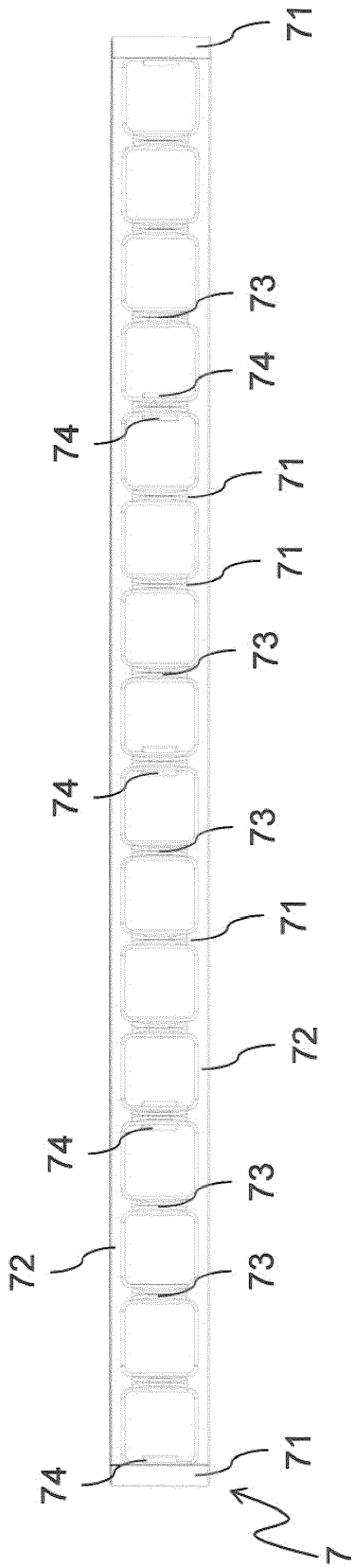

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Fig. 4

## REFERENCES CITED IN THE DESCRIPTION

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