

(19)



(11)

EP 2 554 099 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

06.02.2013 Bulletin 2013/06

(51) Int Cl.:

A47L 15/50 (2006.01)

(21) Application number: **12179177.6**

(22) Date of filing: **03.08.2012**

(84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

Designated Extension States:

BA ME

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(30) Priority: **05.08.2011 IT TO20110746**

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(54) **A crockery support which can be positioned inside a rack of a dishwasher**

(57) The invention relates to a dishwasher rack (1) and a crockery support (7) which can be positioned inside said rack (1), wherein the rack (1) comprises a bottom (2) and wherein the support (7) can be positioned in the rack (1) in at least two operating conditions, so that at least a portion of the bottom (2) of the rack (1) can take respective different configurations, the support (7) has an elongated shape and comprises two portions (71,72,

71',72', 71'',72'', 71''',72''', 71''',72''') joined together along a central junction line (75), and wherein at least one of the portions (71,72) comprises a grid (76) that comprises small bars (77) to allow a washing liquid to flow, and wherein the portion (71) comprises a crosspiece (78) perpendicular to the small bars (77), where said crosspiece (78) comprises coupling means for coupling to the bottom (2) of the rack (1).

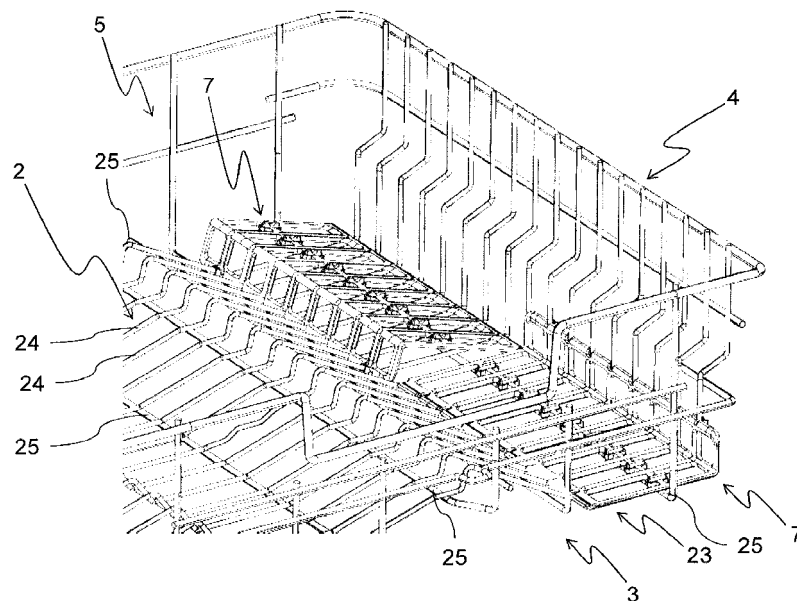


Fig. 3

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Description

[0001] The present invention relates to a crockery support that can be positioned inside a dishwasher rack and to a dishwasher rack comprising said support.

[0002] As it is known, the positioning of a high number of small crockery, such as coffee cups/saucers, inside dishwasher racks can be difficult, since the small dimensions of the objects do not allow them to properly interfere with the rack elements which usually are conceived for larger crockery.

[0003] Moreover, the wrong positioning of small crockery inside the rack, together with the fact that often they are made of delicate (and also precious) materials such as porcelain or the like, makes it likely that during the washing, the movement or fall of an individual crockery piece causes one or more crockery pieces to be broken and/or chipped, possibly also due to a crockery piece slipping from the rack.

[0004] The arrangement of smaller rack elements in the rack would surely allow the above mentioned problem to be solved, but it would reduce the loading flexibility, since the positioning of a high number of crockery with a larger diameter, such as serving dishes or the like, would be difficult if not impossible.

[0005] In the patent JP 2007/313139 to HITACHI APPLIANCES INC, the problem has been dealt with by adding a support (fig. 5) raised with respect to the bottom of the tub by a cage integral with the rack. This support acts for supporting both crockery with a smaller diameter (fig. 6) and those having a higher diameter (fig. 4); however this solution allows a limited number of large diameter crockery to be housed (fig. 5a) mainly due to the provision of the cage that, with its overall dimensions, considerably reduces the loading flexibility. Moreover, this solution provides also crockery to be put on one another (fig. 2), thus leading to a probable worsening of the washing efficiency, since the washing liquid could not be uniformly sprayed on crockery.

[0006] The present invention provides to solve these and other problems by providing a crockery support that can be positioned inside a dishwasher rack.

[0007] The idea at the base of the present invention is to provide a crockery support, which comprises one or more rack elements, and can be positioned inside the rack in at least two operating conditions: the first one for allowing small diameter crockery to be housed, and the second one for housing crockery with higher diameter.

[0008] To this end, the support has an elongated shape with preferably a L shaped section such that at least a portion of the rack bottom can take different configurations; advantageously, in order to allow crockery made of precious material to be safely housed, this support is made of a rigid material, preferably polypropylene or POM (polyoxymethylene), and a cutlery tray can be advantageously applied thereon which can be formed as one piece with the support or it can be a piece separated therefrom; the cutlery tray is described in the European

patent application N. 12179200.6 filed contemporaneously with the present one and to the same applicant .

[0009] The advantageous characteristics of the present invention are set forth in the annexed claims.

[0010] The characteristics and the effects deriving therefrom will be more clear from the description of a preferred and non-exclusive embodiment of the invention, shown in the annexed drawings wherein:

Fig. 1 shows a perspective view of a dishwasher rack comprising two crockery supports according to the invention, arranged in a first operating condition;

Fig. 2 shows a perspective view of the rack of Fig. 1, with the crockery supports arranged in the second operating position;

Fig. 3 shows a perspective view of the rack of Fig. 2, with the two crockery supports arranged in positions different one from the other;

Figs. 4a, 4b, 4c, 4d show a perspective view of possible variants of different shapes of the support of Fig. 1 or 3;

Fig. 5 shows a perspective view of the support of Fig. 2, arranged in the first operating condition;

Fig. 6 shows a perspective view of the support of Fig. 5, arranged in the second operating condition.

[0011] With reference to Fig. 1, a rack 1 of a dishwasher (not shown in the figures) comprises a bottom 2, side walls 3,4,5,6, and a crockery support 7.

[0012] The bottom 2 of the rack 1 and the side walls 3,4,5,6 are configured, at least partially, as a grid 20, preferably a metal one; the wires of this grid can be advantageously covered with a layer of insulating material, such as Rilsan, preventing the metal from contacting a washing liquid, thus avoiding corrosion phenomena.

[0013] The bottom 2 of the rack comprises hollows 21,22,23 that, in combination with the grid 20, act as rack elements; in these hollows is therefore possible to vertically position crockery such to be optimally reached by the washing liquid.

[0014] The grid 20 is made of at least horizontal wires 24 and vertical wires 25, preferably welded together in junction points.

[0015] Inside the hollow 23 at least one support 7, preferably two, can be positioned, according to the invention; the support 7 is suitably shaped for exploiting the space of said hollow 23, such to guarantee an increase in the loading flexibility of the dishwasher.

[0016] In addition, the support 7 can be advantageously laid on the bottom 2 of the rack 1, without using coupling means that lock it in an operating condition.

[0017] The hollow 23 has horizontal wires 25 inclined according to two different angles: horizontal near the edge and angled away therefrom, such that they can support table crockery such as plates, serving trays or the like.

[0018] The support 7 has an elongated shape with preferably an L shaped section, and it comprises two sub-

stantially flat portions 71,72 arranged transversely one another and preferably substantially perpendicularly to each other, and joined along a central junction line 75.

[0019] In addition, said portions 71,72 are arranged transversely one another, preferably perpendicularly to each other; they further have a preferably equal length and a different width, with two peripheral edges 73,74 arranged along the longitudinal extension of the vertices of the L section and a central junction line 75, preferably a straight one, along which the portions 71, 72 are joined.

[0020] The support 7 is preferably made of polypropylene or POM.

[0021] In fig. 1 the supports 7 are in a first operating condition, in which the portion 71 rests on the bottom 2 of the rack 1, and the portion 72 abuts against the side wall 4 thereof. With reference to this first operating condition, changes, which are obvious to the person skilled in the art, are possible, such to better satisfy the positioning requirements of said support 7 inside the rack 1.

[0022] In fig.2 the supports 7 are positioned in a second operating position, with the edges 73,74 resting on the bottom 2 of the rack 1, that is on horizontal wires 24 of the hollow 23.

[0023] In fig. 2 the support 7, which has right-angled triangle profile, is shown in the condition resting on its hypotenuse and the minor cathetus is faced to the inside of the rack; however, depending on the loading needs of the user, this condition can be modified by orienting the support 7 with the minor cathetus of its profile faced towards the side wall 4 of the rack 1 (with reference to figure 2).

[0024] The length of the hypotenuse of the profile of the support 7 is preferably smaller or equal to the width of the hollow 23.

[0025] At least one of the portions 71,72 comprises a grid 76 comprising some small bars 77, such to allow the washing liquid to flow; and where such small bars 77 are advantageously spaced each other by the same distance or a distance equal to an integer multiple of the distance between the horizontal wires 24 of the grid 20, such that the small bars 77 can be coupled to said horizontal wires 24 by coupling means.

[0026] To this end, with reference also to figures 5 and 6, the portion 71 comprises a crosspiece 78 perpendicular to the small bars 77 that in turn comprises the coupling means; these coupling means comprise bearing elements 79 that, being suitably shaped and spaced, can be coupled with the horizontal wires 24 of the bottom 2 when the support 7 is in the first operating condition.

[0027] On the contrary, when the support 7 is in the second operating condition, its configuration is made stable by bevels 73a,74a comprised in the peripheral edges 73, 74 respectively and by snap-on hooks 74b comprised in the edge 74, which engage by coupling with the rack wires; the bevels 73a,74a are suitably shaped and spaced to be coupled with the bottom 2, such to prevent the support 7 from moving.

[0028] The parts of the bearing elements 79 protruding

from opposite faces, which can be seen in figures 5 and 6 respectively, are preferably made of soft material such as TPE plastic or the like; advantageously this material can be co-molded with the support 7.

[0029] The soft material in the face opposite to the bearing elements 79 acts as a supporting point for cutlery or crockery to be washed.

[0030] It has to be noted how the provision of the support 7 in the second operating condition allows two portions with different angles to be obtained, and how from a single hollow 23 it is possible to obtain two hollows smaller than the previous one, only exploiting the configuration of the bottom 2.

[0031] Thus, it is possible to contemporaneously wash coffee saucers and cups, without them coming in contact, and by locking the cups by the handle using the grid 76 of the portion 72.

[0032] Moreover, as shown in fig. 3, the two supports can advantageously be laid in positions different one another, improving the loading flexibility of the dishwasher.

[0033] Obviously it is possible, for the person skilled in the art, to reduce the length of the supports 7 by increasing their number.

[0034] Obviously several variants of the example described up to now are possible.

[0035] Some variants are shown in figs. 4a-4d; for brevity reasons in the following description only the parts that differentiate these variants from the main embodiment described above will be pointed out; for the same reason, when possible, the same numerical references with one or more prime symbols will be used for denoting structurally and functionally equivalent elements.

[0036] As an alternative to flat portions 71,72 it is possible to use portions 71',71'',71''',71''', 72',72'',72''',72''' having a different shape but the same function, thus making the section of the support 7 different than a L. By way of example in figs. 4a-4d possible variants of portions 71, 72 are shown. Moreover, the central junction line 75 can be not only a straight one, but it can be like a broken line, a curve or several curves joined together. However, it is possible for the person skilled in the art to use further variants and/or combinations of portions having different shape, without departing from the teaching of the present patent application.

[0037] All the possible variants clear for the person skilled in the art however fall within the scope of the following claims.

Claims

1. A crockery support (7) which can be positioned inside a rack (1) of a dishwasher, wherein the rack (1) comprises a bottom (2) ,
characterized in that
the support (7) can be positioned in the rack (1) in at least two operating conditions, so that at least a portion of the bottom (2) of the rack (1) can take

respective different configurations, wherein said support (7) has an elongated shape and comprises two portions (71,72, 71',72', 71'',72'', 71''',72''', 71''''',72''''') joined together along a central junction line (75), and wherein at least one of the portions (71,72) comprises a grid (76) that comprises small bars (77) to allow a washing liquid to flow, and wherein the portion (71) comprises a crosspiece (78) perpendicular to the small bars (77), and said crosspiece (78) comprises coupling means for coupling to the bottom (2).

ceding claims 1 to 12.

2. A support (7) according to claim 1, **characterized in that** the support (7) is meant to be laid onto the bottom of the rack without using any coupling means.
3. A support (7) according to claim 1 or 2, wherein said portions (71,72) are substantially flat.
4. A support (7) according to claim 3, wherein said portions (71,72) have the same length.
5. A support (7) according to any one of claims 3 to 4, wherein said portions (71,72) have different widths.
6. A support (7) according to any one of claims 3 to 5, wherein said portions (71,72) are substantially orthogonal to each other.
7. A support (7) according to any one of claims 3 to 6, wherein, when said support (7) is positioned in a first operating condition, one of the two portions (71,72) rests on the bottom (2) of the rack (1).
8. A support (7) according to any one of claims 3 to 7, wherein said portions (71,72) respectively comprise two peripheral edges (73,74) arranged along the longitudinal extension of the portions (71,72).
9. A support (7) according to claim 8, wherein the peripheral edges (73,74) respectively comprise bevels (73a,74a) that can be coupled to the bottom (2).
10. A support (7) according to any one of claims 8 to 9, wherein, when said support (7) is positioned in a second operating condition, the edges (73,74) rest on the bottom (2).
11. A support (7) according to any one of claims 1 to 10, wherein the coupling means comprise bearing elements (79).
12. A support (7) according to any one of the preceding claims, **characterized in that** it is positioned in a hollow (23) comprised in said bottom (2).
13. A dishwasher rack (1) **characterized by** comprising at least one support (7) according to one of the pre-

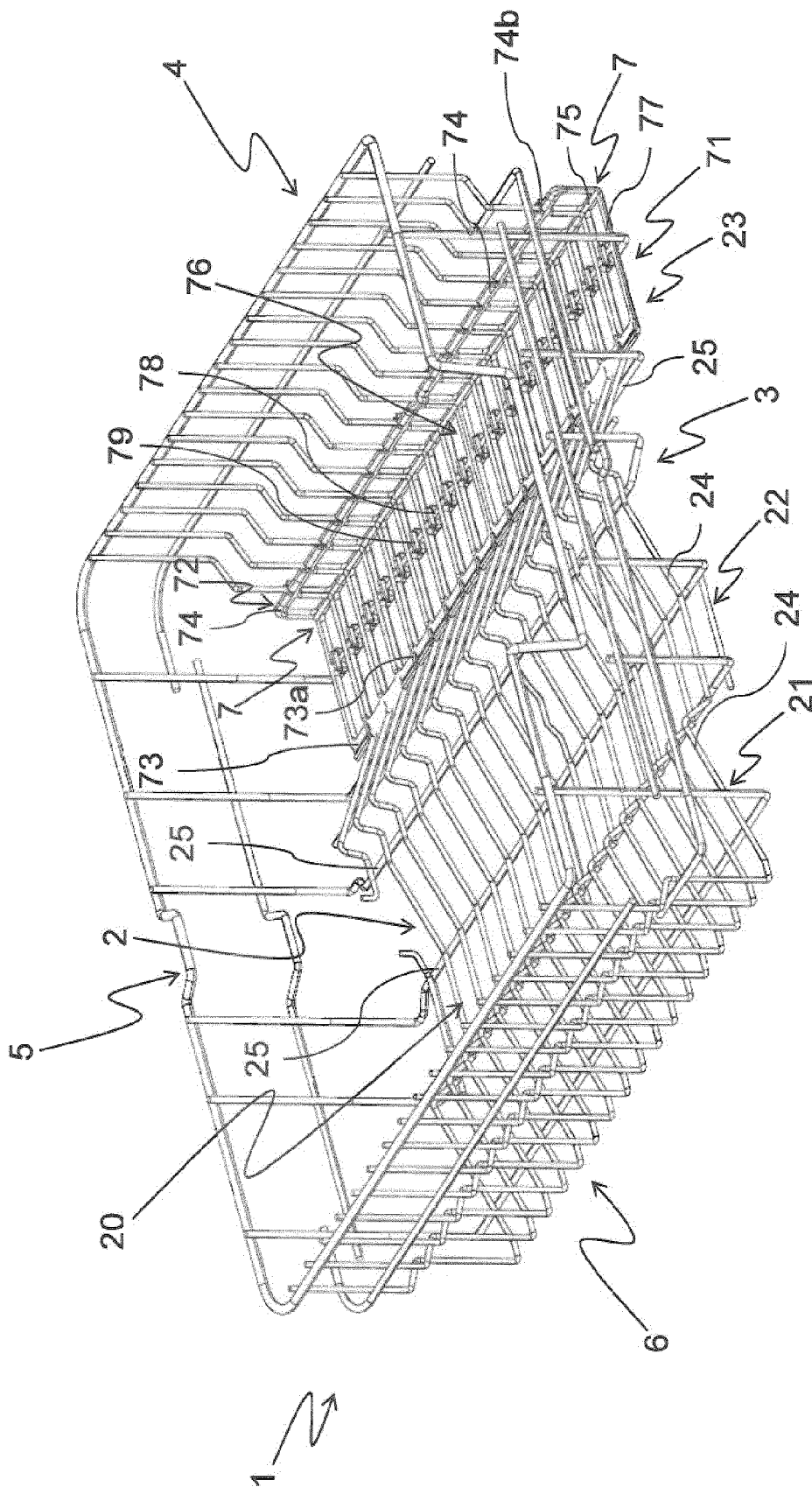


Fig. 1

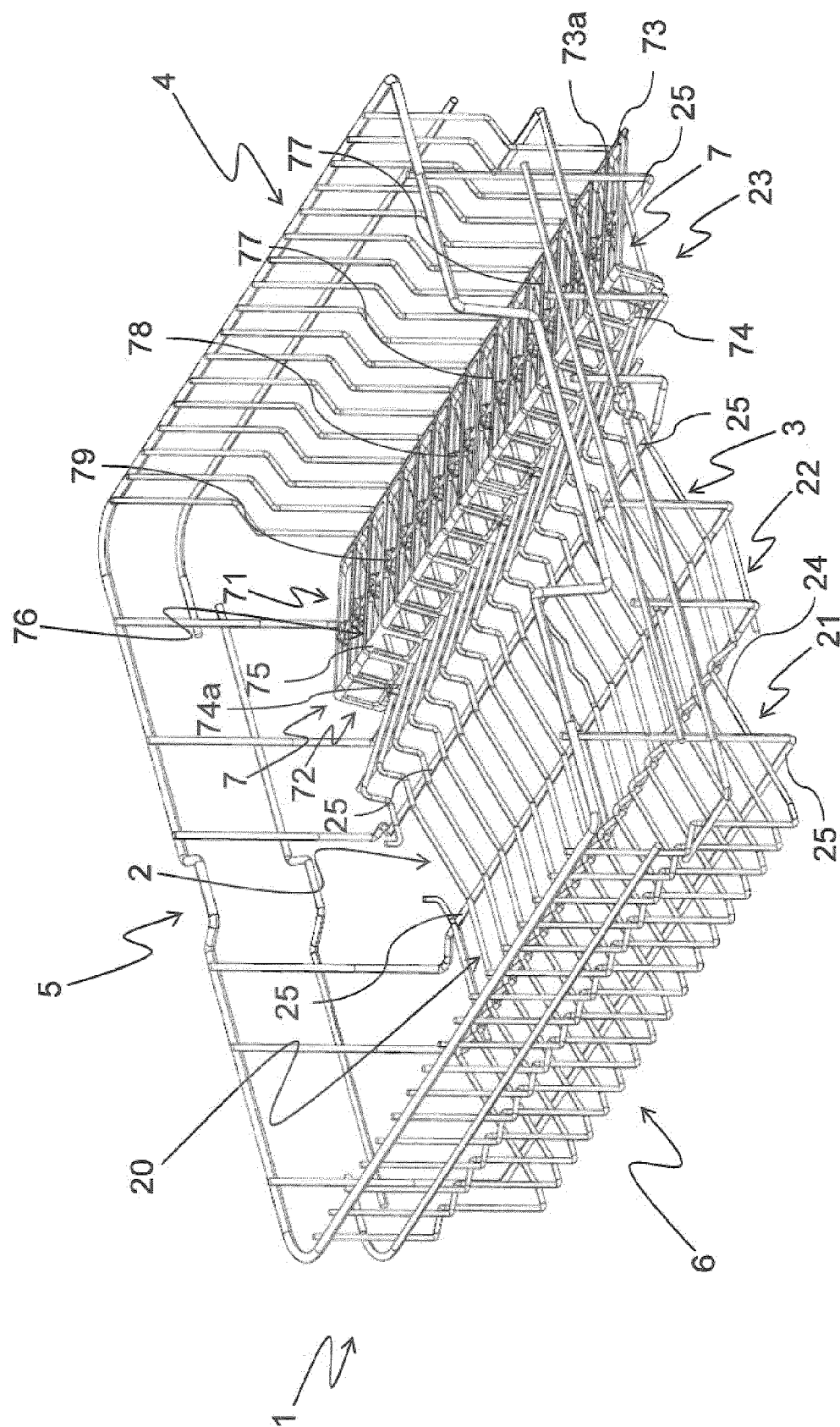


Fig. 2

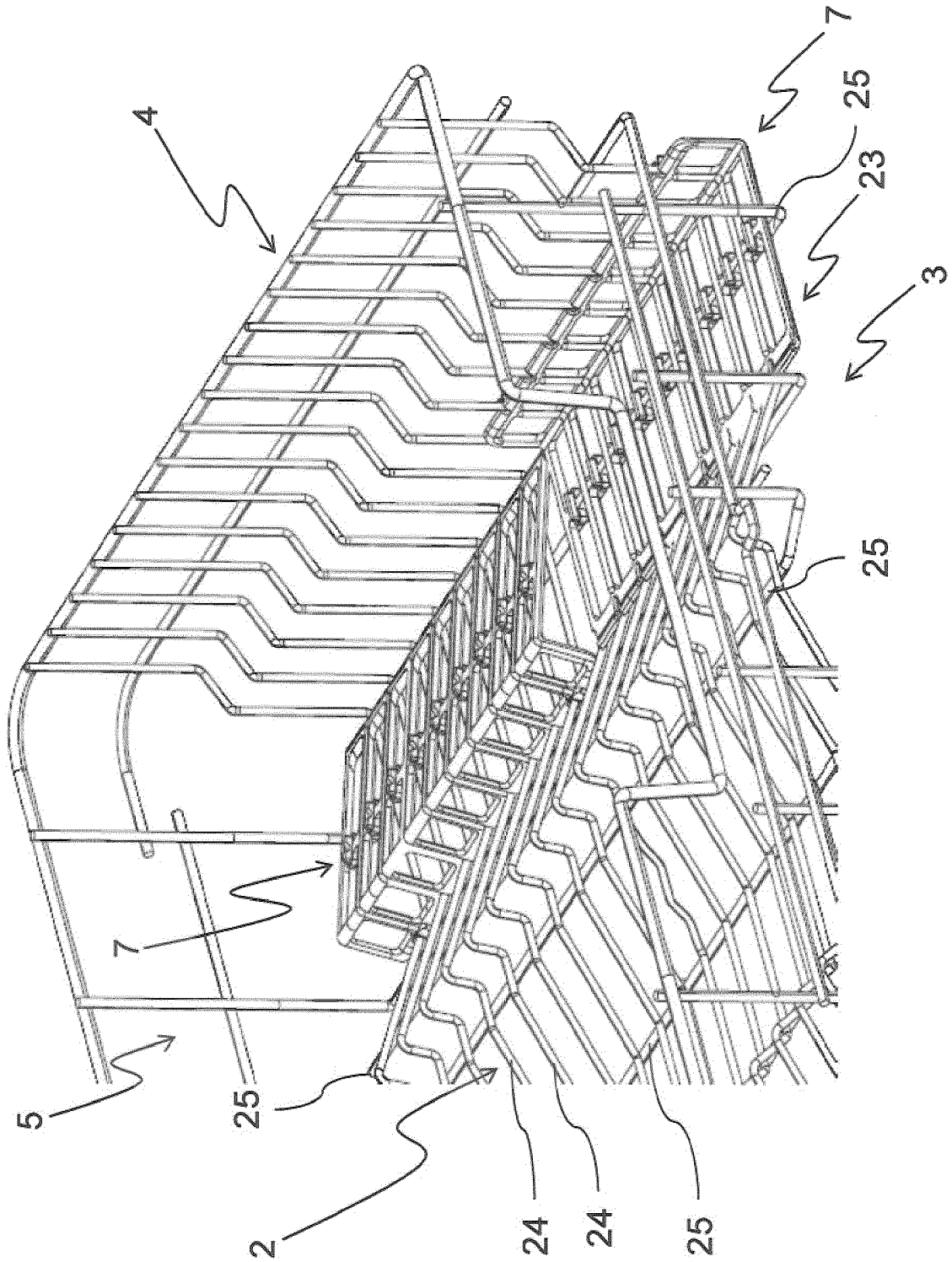


Fig. 3

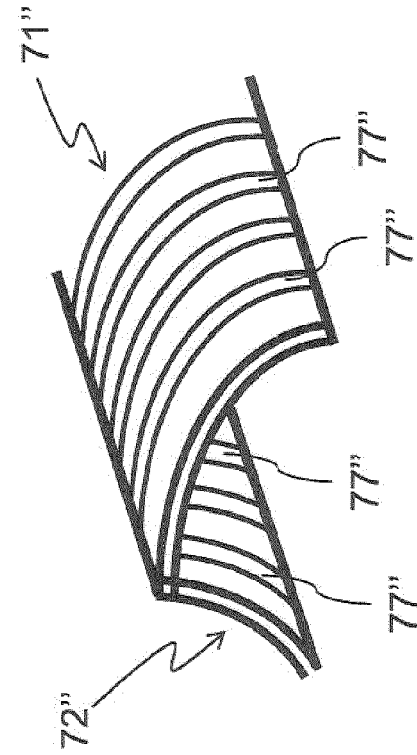


Fig. 4b

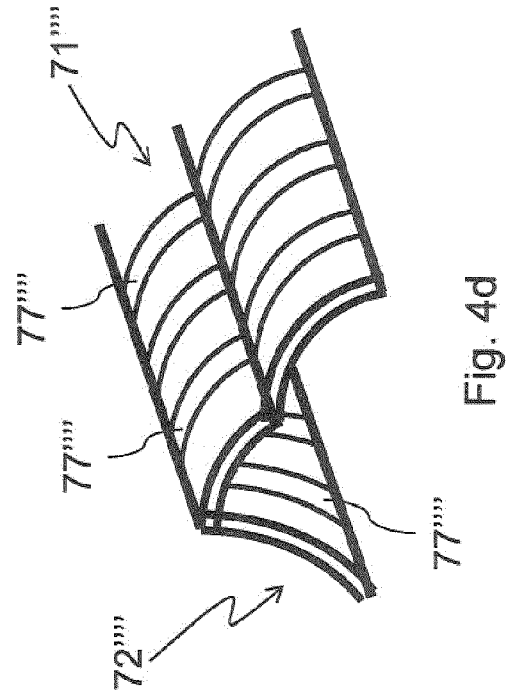


Fig. 4d

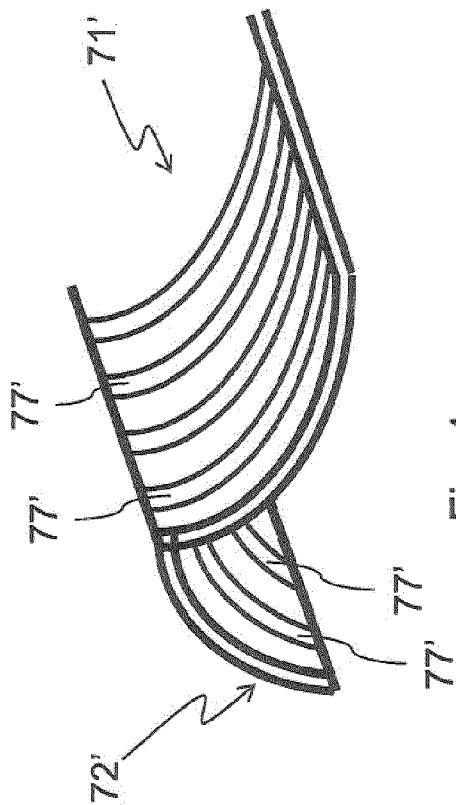


Fig. 4a

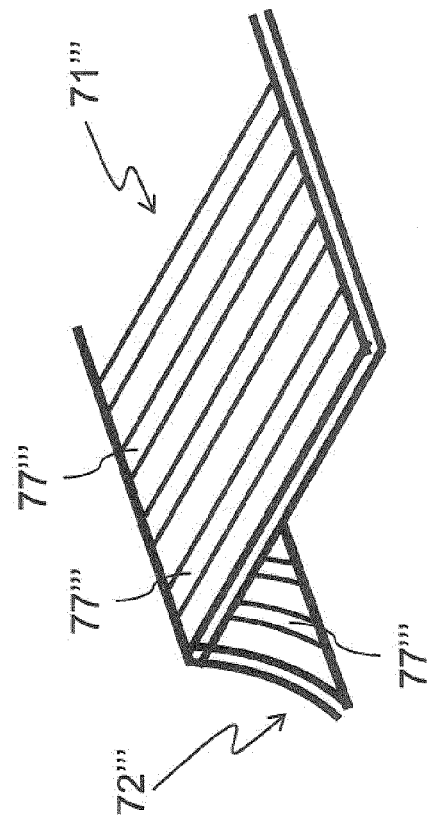


Fig. 4c

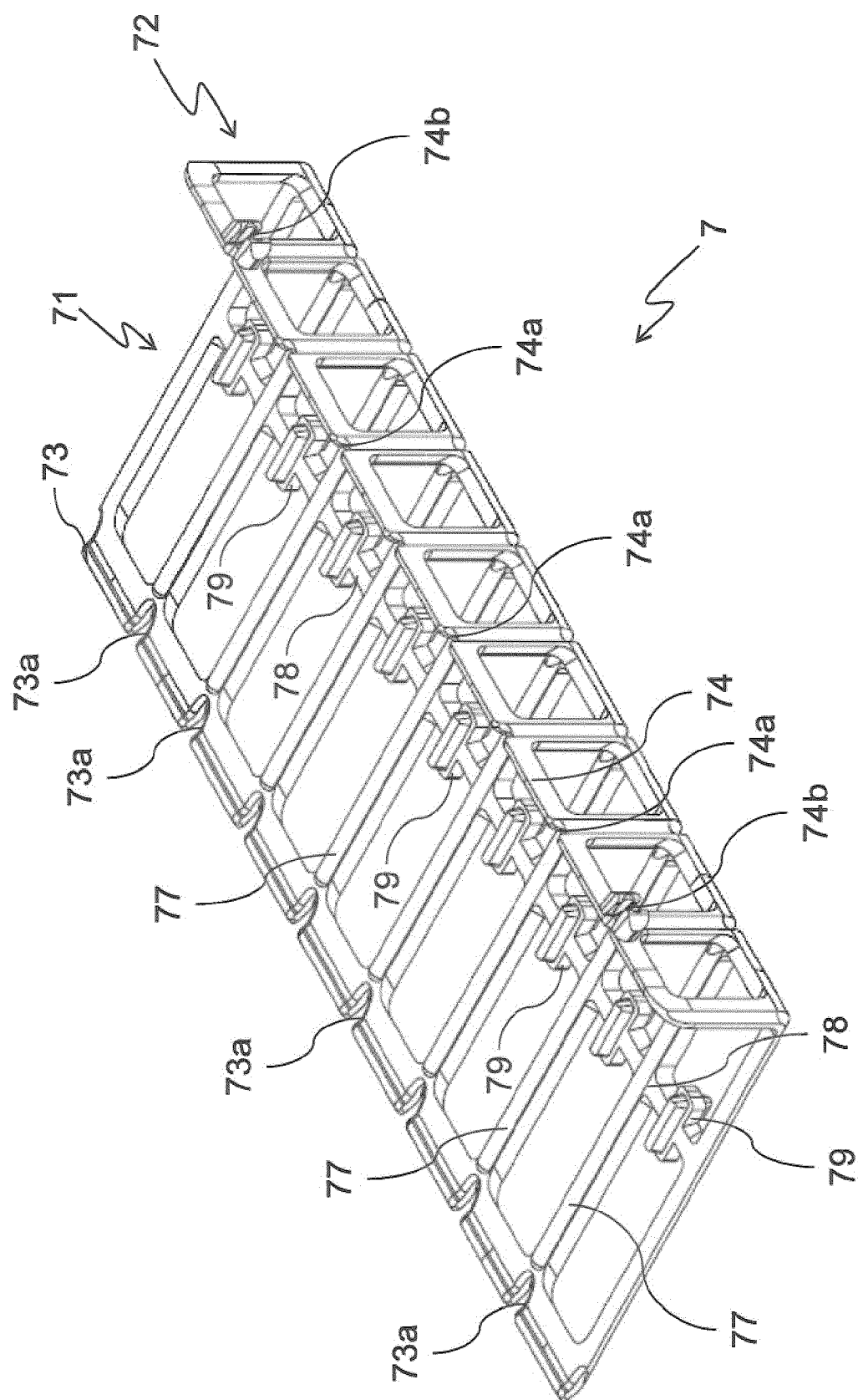


Fig. 5

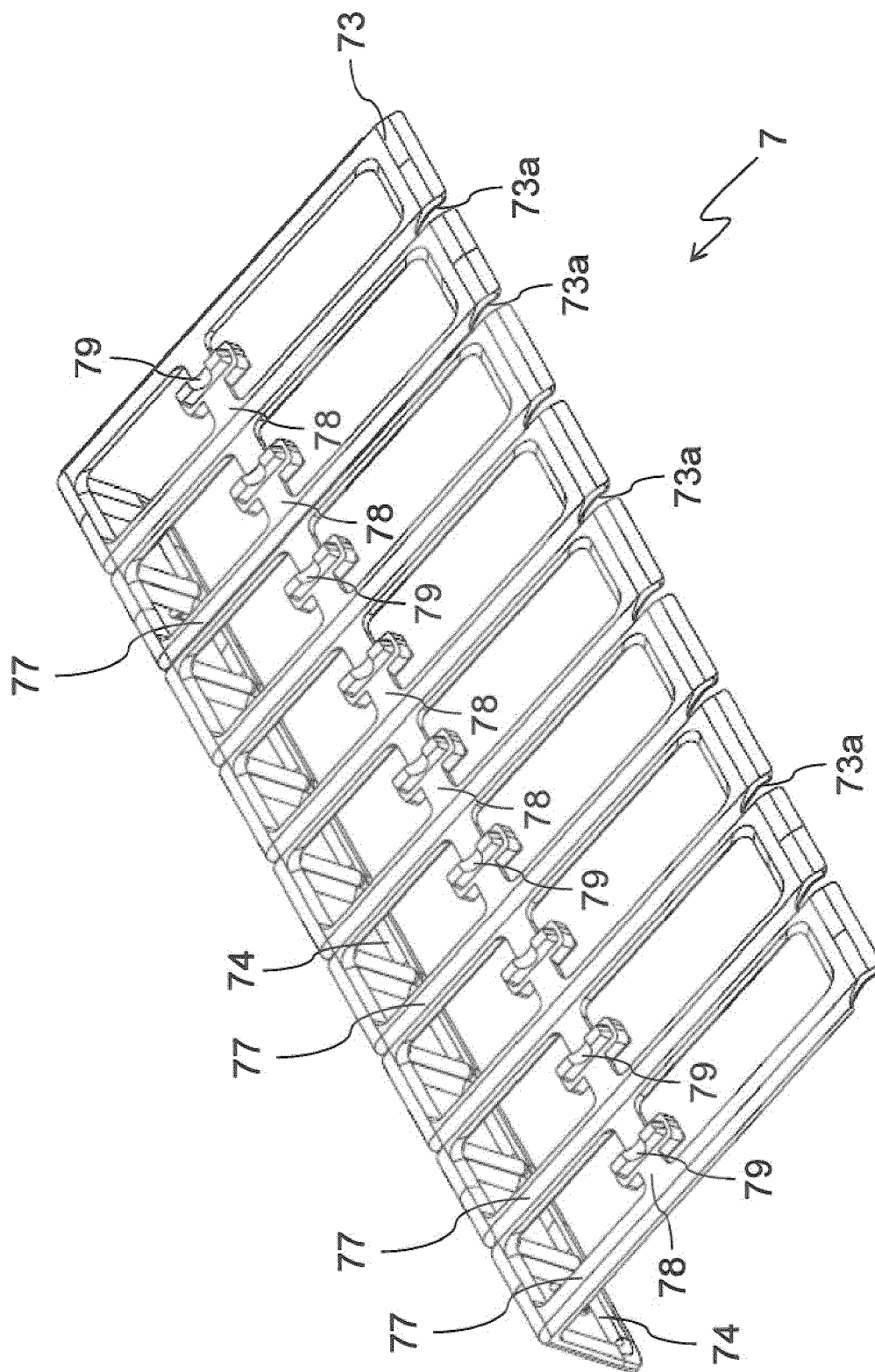


Fig. 6

REFERENCES CITED IN THE DESCRIPTION

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