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(54) A method of manufacturing a lamp; and a lamp

(57) The invention relates to a method of manufacturing a lamp, wherein a rod-shaped light-source (120) is provided with a lampshade (401) made using a flexible sheet (101). According to the invention, the flexible sheet (101) is a blank (500) provided with a set of cuts (102) comprising a first cut (111) and a second cut (112), each of said first cut (111) and said second cut (112) comprising two ends so as to form two sheet areas (114) separated by a main sheet section (113), wherein said flexible sheet (101) is fixed to said rod-shaped light-source (120) by inserting the rod-shaped light-source (120) into said two cuts (102) so as to form the lampshade with the two sheet areas (114) and the main sheet section (113) forming loops (124) holding on to the rod-shaped light-source (120). The invention also relates to a set comprising a blank and a light-source.

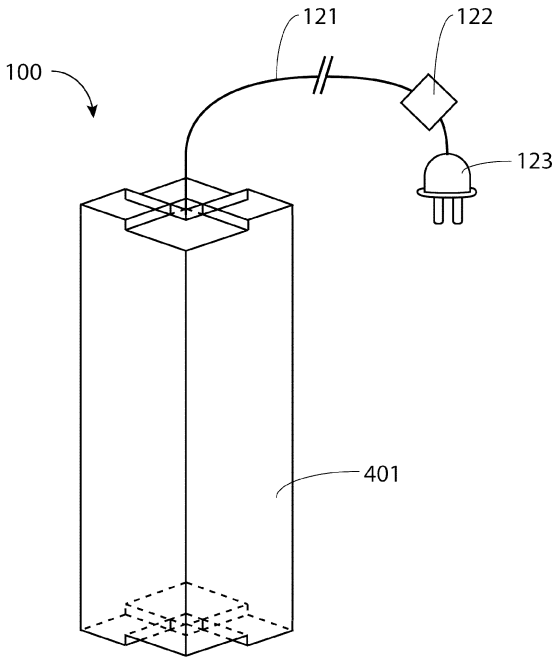

Fig. 4

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Description

[0001] The present invention relates to a method of manufacturing a lamp, wherein a rod-shaped light-source is provided with a lampshade made using a flexible sheet.

[0002] The flexible sheet is for example a sheet of plastic or a sheet of paper, including carton.

[0003] A problem with lamps is that they are sold pre-manufactured because they require a fair amount of skill to assemble. Also, they may be rather voluminous, making them hard to transport (for example if bought as a souvenir when traveling) or to send by mail (which increases the cost of shipping). The object of the present invention is to provide a method of manufacturing an alternative lamp in a simple manner from materials that can be mailed and/or transported easily first.

[0004] To this end, a method according to the preamble is **characterized in that** the flexible sheet is a blank provided with a cut, wherein said flexible sheet is fixed to said rod-shaped light-source by inserting the rod-shaped light-source into said cut so as to form the lampshade and the flexible sheet holding on to the rod-shaped light-source.

[0005] Thus the method allows for the manufacture of a lamp with a frame-less lampshade. Its light weight allows the flexible sheet to remain in place by friction alone. The rod-shaped light-source is for example a fluorescent tube. The blank, optionally with the rod-shaped light-source, may be easily transported in an envelope or rolled up in a shipping tube. A lamp manufactured in accordance with the method according to the invention can be easily disassembled for recycling. The flexible sheet is preferably capable of allowing light to pass, for example because

- of openings in the sheet, and/or
- it is over at least part of its surface area transparent and/or translucent.

[0006] The flexible sheet is for example paper, in particular carton, or plastic. It is preferably translucent. It is preferably provided with a picture such as a photograph. In the present application, the term "blank" includes a blank folded one or more times to a flat folded state.

[0007] According to a favourable embodiment, the blank comprises a set of cuts, said set of cuts comprising a first cut and a second cut, each of said first cut and said second cut comprising two ends so as to form two sheet areas separated by a main sheet section, wherein said flexible sheet is fixed to said rod-shaped light-source by inserting the rod-shaped light-source into said two cuts so as to form the lampshade, with the two sheet areas and the main sheet section forming loops holding on to the rod-shaped light-source.

[0008] In general, the two cuts will not be in line. The two cuts are preferably located such that the rod-shaped light-source inserted in said two cuts extends transverse to both said cuts. The resilient nature of the flexible sheet forces the sheet areas and the main sheet section against the rod-shaped light-source (including a supply wire thereof). The presence of more than two cuts through which the rod-shaped light-source is inserted is not excluded.

[0009] According to a favourable embodiment, the blank comprises a second set of cuts, the total length of the two first cuts is more than 50% of the largest length L of the flexible sheet in a direction transverse to the inserted rod-shaped light-source, and the total length of the two second cuts being more than 50% of L, wherein the rod-shaped light-source is held at a first side of the flexible sheet by loops formed by the first cuts and held at a second side of the flexible sheet opposite to the first side by loops formed by the second cuts.

[0010] This allows the rod-shaped light-source to be held by loops away from the main sections defined by the two sets of cuts.

[0011] According to a favourable embodiment, at least one of two loops of two different sets of cuts, said two loops holding the light-source, is provided with a secondary cut for engaging the other loop, said secondary cut ending in one of i) a cut of a set of cuts, and ii) an edge of the blank.

[0012] Such secondary cuts are useful for increasing the rigidity of the lamp.

[0013] According to a favourable embodiment, the flexible sheet comprises folds transverse to the cuts.

[0014] Thus a lamp having in cross-section a polygonal shape is provided. Because the blank can be mailed and/or transported in a state where it is folded at least once, the size of the package to be mailed or transported may be halved, facilitating mailing and/or transporting thereof.

[0015] According to a favourable embodiment, two opposite ends of the flexible sheet are connected, said two opposite ends being transverse to the two cuts of said set for receiving the rod-shaped light-source.

[0016] Thus a more traditionally looking, three-dimensional lampshade is provided which in its assembled state can not be mailed or transported as easily. The invention allows for easy disassembly, and the lamp can be transported/shipped easily again.

[0017] According to a favourable embodiment, the flexible sheet comprises at an end of the flexible sheet an adhesive layer.

[0018] This may be a gum-based adhesive layer that is activated using water, saliva etc. as known for envelopes. The adhesive will be present at an end that is transverse to the two cuts for receiving the rod-shaped light-source.

[0019] According to a favourable embodiment, the adhesive layer is provided with a release liner, and the release liner is removed to attach the end with the adhesive to the opposite end of the flexible sheet.

[0020] The adhesive will in general be a pressure sensitive adhesive (PSA). This allows for enhanced adhesive

properties, enhancing the durability of the lamp while still allowing the method to be performed without any supplementary material.

[0021] According to a favourable embodiment, the opposite ends are provided with male organs and female organs for connecting said opposite ends.

[0022] This allows the opposite ends to be connected without glue, tape etc. A locking organ may be provided.

[0023] According to a favourable embodiment, the flexible sheet is a rectangular flexible sheet.

[0024] The cuts will run substantially parallel to two opposite first sides and the two opposite second sides transverse to said opposite first sides will be connected to form the lamp shade.

[0025] According to a favourable embodiment, the rod-shaped light-source comprises a strip with Light Emitting Diodes.

[0026] These may be regular LEDs but also AMOLEDs etc. These are light (don't weigh much), so it is OK to let the lamp manufactured in accordance with the present method hang by the supply wires (power cable) of the strip. Also, LEDs don't get hot, so there is no fire-hazard at all. In general, the strip comprises a transparent housing for the LEDs.

[0027] According to a favourable embodiment, the flexible sheet is a light-transmitting flexible sheet.

[0028] This allows the lamp to spread light in more directions.

[0029] According to a favourable embodiment, the flexible sheet is provided with a picture.

[0030] The picture may be a photographic picture or a drawn picture. In particular with a flexible sheet of translucent material this results in a desirable lamp.

[0031] Finally, the present invention relates to a set comprising a light-source, wherein the set comprises a rod-shaped light-source and a blank in the form of a flexible sheet, said blank being a blank provided with a set of cuts comprising a first cut and a second cut, each of said first cut and said second cut comprising two ends so as to form two sheet areas separated by a main sheet section, wherein said flexible sheet can be fixed to said rod-shaped light-source by inserting the rod-shaped light-source into said two cuts so as to form the lampshade with the two sheet areas and the main sheet section forming loops holding on to the rod-shaped light-source.

[0032] Such a set is suitable for use in the method according to the invention. The blank may comprise secondary cuts, an adhesive strip, and/or a picture, or any other type in accordance with subclaims as discussed above for the method claims.

[0033] The present invention will now be illustrated with reference to the drawing where

Fig. 1 shows side view of a basic lamp comprising a light-source and a sheet;
Fig. 2 shows a bottom view on a lamp comprising a light source and two sheets;
Fig. 3 shows a cross-sectional view of two LED-strips known in the art;
Fig. 4 shows a perspective view of a lamp;
Fig. 5 shows a top view on a blank to be used as a flexible sheet in the lamp of Fig. 4;
Fig. 6 shows a bottom view of the lamp 100 of Fig. 4;
Fig. 7 is a bottom view of a lamp with a round cross-section;
Fig. 8 shows a blank for a foot;
Fig. 9 shows a top view on an alternative blank suitable for use as a flexible sheet in the lamp of Fig. 4; and
Fig. 10 shows a top view on an alternative blank suitable for use as a flexible sheet in the lamp of Fig. 7.

[0034] Fig. 1 shows a lamp 100, said lamp comprising a flexible sheet 101 of translucent material, e.g. Mondi Color Copy, 160 g/m^2. The flexible sheet is provided with a set 102 of first cut 111 and a second cut 112. As shown in Fig. 1, the first cut 111 and the second cut 112 do not have to run parallel. The two cuts of set 102 define a main section 113 between the first and the second cut and two sheet areas 114. A light-source 120 provided with a cable 121, and connected to a power supply 122 having a connector 123 is passed through the first cut 111 and the second cut 112. The resilient nature of the flexible sheet 101 allows the loop 124 formed by the main section 113 to hold on to the light-source 120 by friction alone. The lamp 100 of this embodiment is suitable for hanging close to a wall. This avoids rotation of the lamp 100 and prevents the light-source 120 from being predominantly visible.

[0035] Fig. 2 shows a bottom view of a lamp 100 that is basically the same as the lamp 100 of Fig. 1, but comprises two flexible sheets 101, 101' as described above. The loops 124, 124' formed by the main sections 113 of both flexible sheets 101 hold on to the light-source 120.

[0036] A picture may be present at either side of the lamp 100.

[0037] Fig. 3 shows a cross-sectional view of two LED-strips 301 as known in the art (Ledberg lighting strip, IKEA), with their backs mounted against each other. Each LED-strip 301 comprises a transparent plastic housing 302 and LEDs 303 mounted on a printed circuit board 304.

[0038] Fig. 4 shows a schematic perspective view of a lamp 100 comprising a lampshade 401 made by folding a flexible sheet 101 as will be explained in further detail below. Fig. 4 does not display the light-source 120.

[0039] Fig. 5 shows the flexible sheet 101 as a blank 500 that comprises two sets 102 of cuts, each of the sets 102 comprising a first cut 111 and a second cut 112. These define sheet areas 114 and 114' that will form loops 124. The loops 124 are provided with secondary cuts 511, 512 transverse to the cuts 111, 112 and corresponding oppositely directed secondary cuts 511', 512'. The secondary cuts 511, 512 engage the secondary cuts 511', 512' so that the loops 124 receive the loops 124'.

[0040] The blank 500 is folded back on itself at the side edges 501, 501' and connected, for example with glue, or, as shown here, using a patch 502 of pressure sensitive adhesive (PSA) parallel to a side edge 501'.

[0041] Folding lines 503 are indicated with dotted lines.

[0042] Fig. 6 shows a bottom view of the lamp 100 of Fig. 4 made using the blank 500 of Fig. 5. It can be seen that the LED-strips 301 are held centrally, away from the remainder of the flexible sheet. A more homogenous illumination is achieved this way than in the embodiment of Fig. 2.

[0043] Fig. 7 corresponds substantially to Fig. 6, except it shows a bottom view of a lamp 100 having a round cross-section because a blank 500 was used without folding lines 503.

[0044] Fig. 8 shows a blank for a foot 800. This foot 800 is useable for both lampshades 400 having a square cross-section and a circular cross-section. The sides 801, 801' are connected, e.g. using tape, and the lamp 100 of Fig. 4 (or Fig. 7) is inserted into the four slots 802. A cut-out 803 is provided to guide cable 121 through. Thus, the lamp 100 may be a standard lamp (with foot 800) or a hanging lamp (without foot 800) at the choice of the user.

[0045] Fig. 9 substantially corresponds to Fig. 5, except that in fig. 5 the loops 124 and 124' are at the same height, whereas a lamp assembled using the blank of Fig. 9 has the loops in an axially non-overlapping fashion.

[0046] To this end, the loops 124' are formed using two cuts 111', 112'. Secondary (transverse) cuts are not necessary.

[0047] Fig. 10 substantially corresponds to Fig. 9, except that in fig. 10 the adhesive patch 502 is replaced by cuts 1001', 1002' and lips 1011, 1012 that are provided at the side edges 501, 501', wherein the lips 1011, 1012 can be received by cuts 1001', 1002' so as to connect the side edges and retain the form of the lampshade 401. To avoid the lampshade 401 from spontaneously returning to an unbent shape, secondary lips 1021, 1022 are provided as catches. It is preferred that the lips 1011, 1012 enter the cuts 1001', 1002' from the surface of the blank that will form the outside of the lampshade 401. This achieves a better circular cross-sectional shape. The number of lips (and cuts) may vary from 1 to very many, such as 20 or more.

[0048] The invention also relates to a blank with any of the features as discussed in the subclaims for the method.

[0049] The invention can be easily varied within the scope of the appending claims. For example, a light source may be positioned out of the centre by using a combination of a short loop and a long loop. Also, there may be more than one light source.

Claims

1. A method of manufacturing a lamp (100), wherein a rod-shaped light-source (120) is provided with a lampshade (401) made using a flexible sheet (101), **characterized in that** the flexible sheet (101) is a blank (500) provided with a cut, wherein said flexible sheet (101) is fixed to said rod-shaped light-source (120) by inserting the rod-shaped light-source (120) into said cut so as to form the lampshade (401) and the flexible sheet (101) holding on to the rod-shaped light-source (120).

2. The method according to claim 1, wherein the blank comprises a set (102) of cuts, said set (102) of cuts comprising a first cut (111) and a second cut (112), each of said first cut (111) and said second cut (112) comprising two ends so as to form two sheet areas (114) separated by a main sheet section (113), wherein said flexible sheet (101) is fixed to said rod-shaped light-source (120) by inserting the rod-shaped light-source (120) into said two cuts (111, 112) so as to form the lampshade (401), with the two sheet areas (114) and the main sheet section (113) forming loops (124) holding on to the rod-shaped light-source (120).

3. The method according to claim 2, wherein the blank (500) comprises a second set (102) of cuts, the total length of the two first cuts is more than 50% of the largest length L of the flexible sheet (101) in a direction transverse to the inserted rod-shaped light-source (120), and the total length of the two second cuts being more than 50% of L, wherein the rod-shaped light-source (120) is held at a first side of the flexible sheet (101) by loops (124) formed by the first cuts and held at a second side of the flexible sheet (101) opposite to the first side by loops (124) formed by the second cuts.

4. The method according to claim 3, wherein at least one of two loops (124) of two different sets of cuts, said two loops (124) holding the light-source (120), is provided with a secondary cut (511) for engaging the other loop (124), said secondary cut (511) ending in one of i) a cut of a set (102) of cuts, and ii) an edge of the blank (500).

5. The method according to any of the claims 2 to 4, wherein the flexible sheet (101) comprises folds transverse to the cuts.

6. The method according to any of the preceding claims, wherein two opposite ends (501, 501') of the flexible sheet (101) are connected, said two opposite ends (501, 501') being transverse to the two cuts of said set (102) for receiving the rod-shaped light-source (120).

7. The method according to claim 6, wherein the flexible sheet (101) comprises at an end (501') of the flexible

sheet (101) an adhesive layer (502).

8. The method according to claim 7, wherein the adhesive layer (502) is provided with a release liner, and the release liner is removed to attach the end (501') with the adhesive to the opposite end (501) of the flexible sheet (101).

9. The method according to any of the claims 6 to 8, wherein the opposite ends (501, 501') are provided with male organs (1011, 1012) and female organs (1001', 1002') for connecting said opposite ends (501, 501').

10. The method according to any of the preceding claims, wherein the flexible sheet (101) is a rectangular flexible sheet (101).

11. The method according to any of the preceding claims, wherein the rod-shaped light-source (120) comprises a strip (301) with Light Emitting Diodes.

12. The method according to any of the preceding claims, wherein the flexible sheet (101) is a light-transmitting flexible sheet (101).

13. The method according to any of the preceding claims, wherein the flexible sheet is provided with a picture.

14. A set comprising a light-source (120), **characterized in that** the set comprises a rod-shaped light-source (120) and a blank (500) in the form of a flexible sheet (101), said blank (500) being a blank (500) provided with a set (102) of cuts comprising a first cut (111) and a second cut (112), each of said first cut (111) and said second cut (112) comprising two ends so as to form two sheet areas (114) separated by a main sheet section (113), wherein said flexible sheet (101) can be fixed to said rod-shaped light-source (120) by inserting the rod-shaped light-source (120) into said two cuts so as to form the lampshade (401) with the two sheet areas (114) and the main sheet section (113) forming loops (124) holding on to the rod-shaped light-source (120).

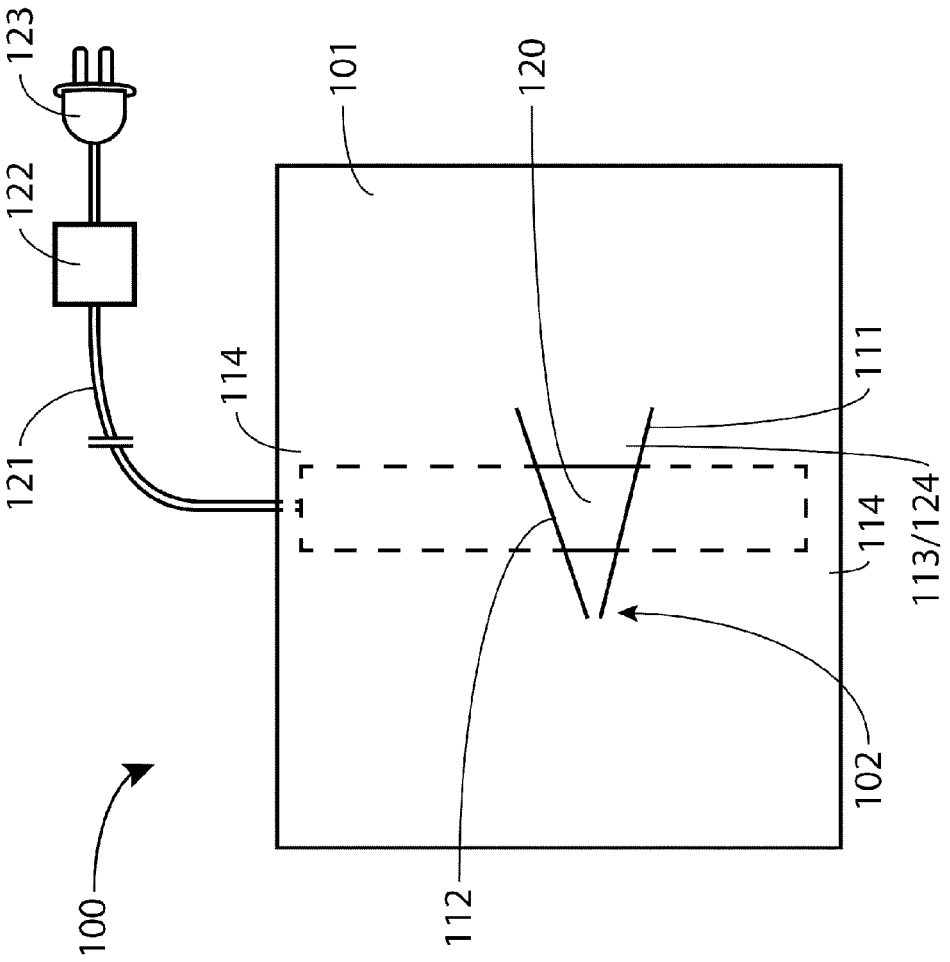

Fig. 1

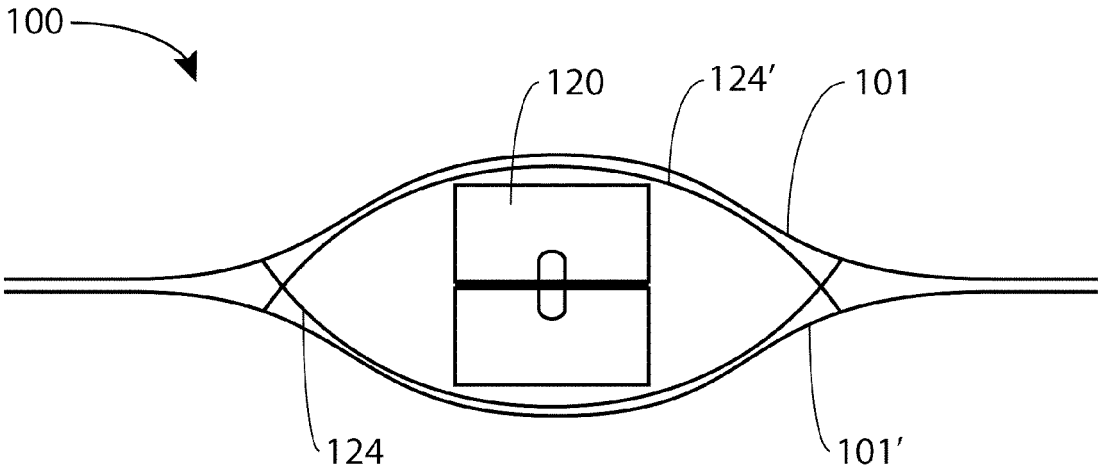

Fig. 2

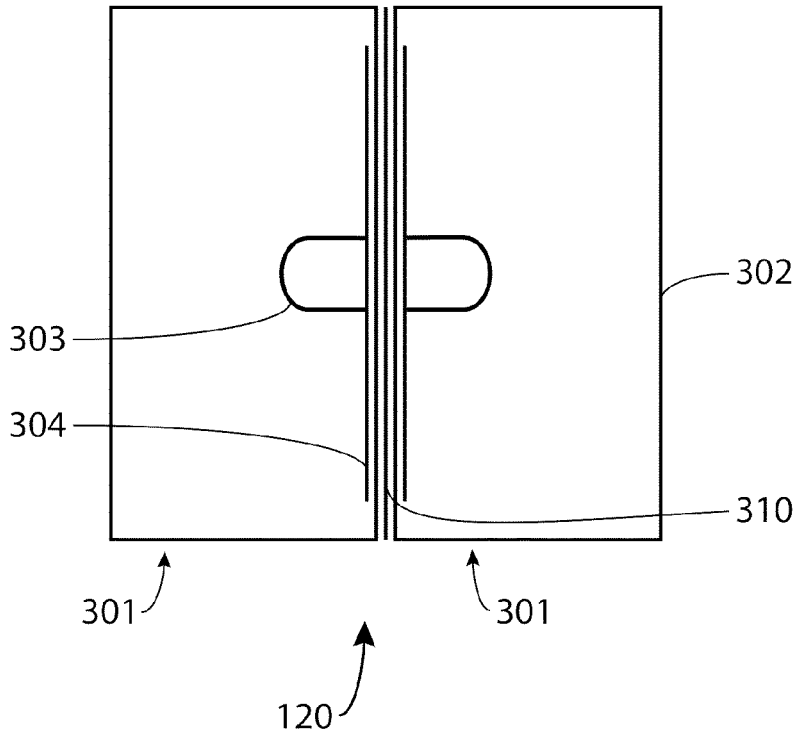

Fig. 3

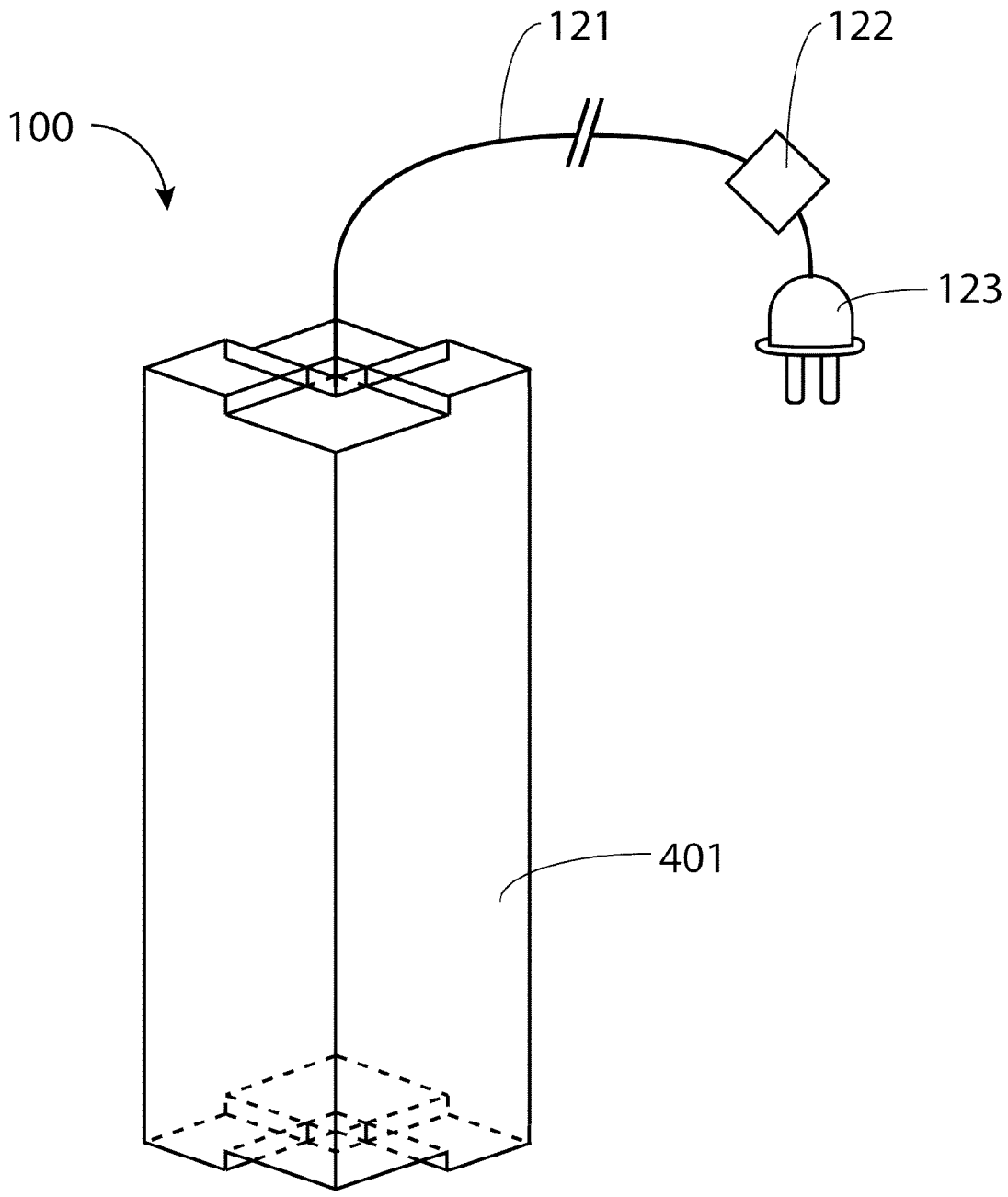

Fig. 4

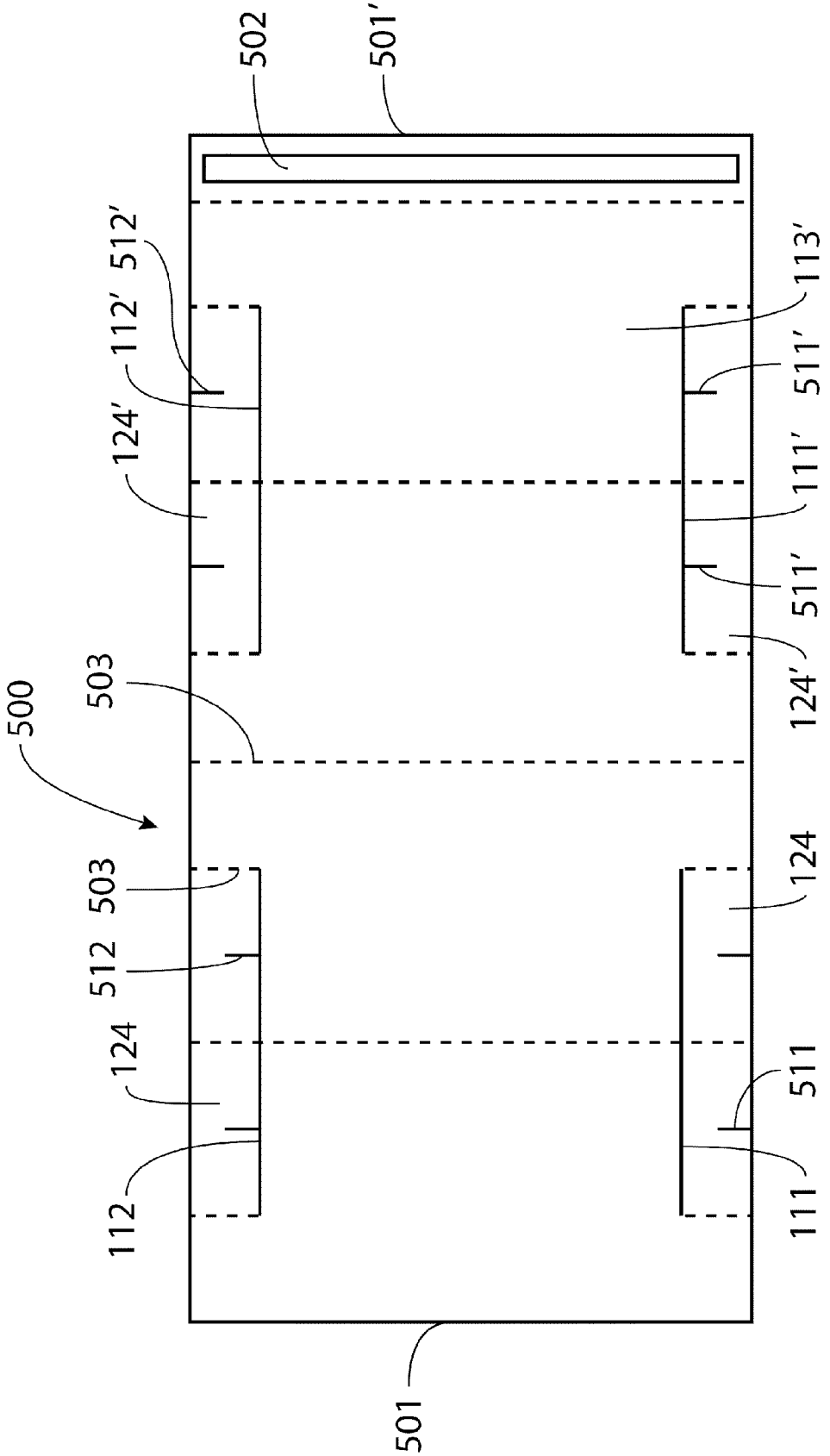
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Fig. 5

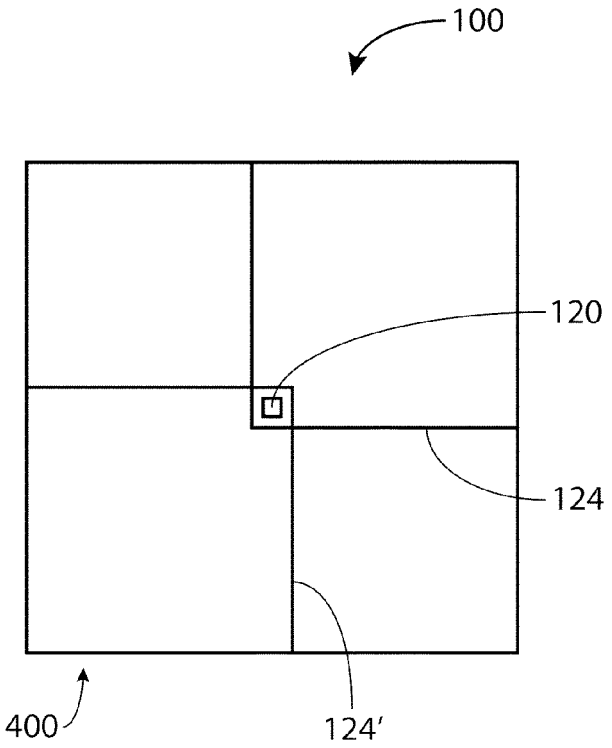

Fig. 6

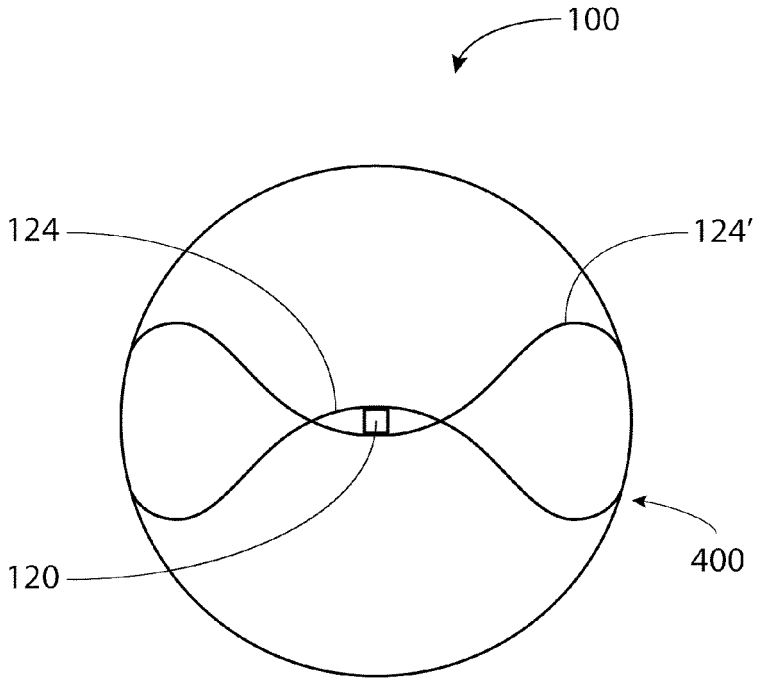

Fig. 7

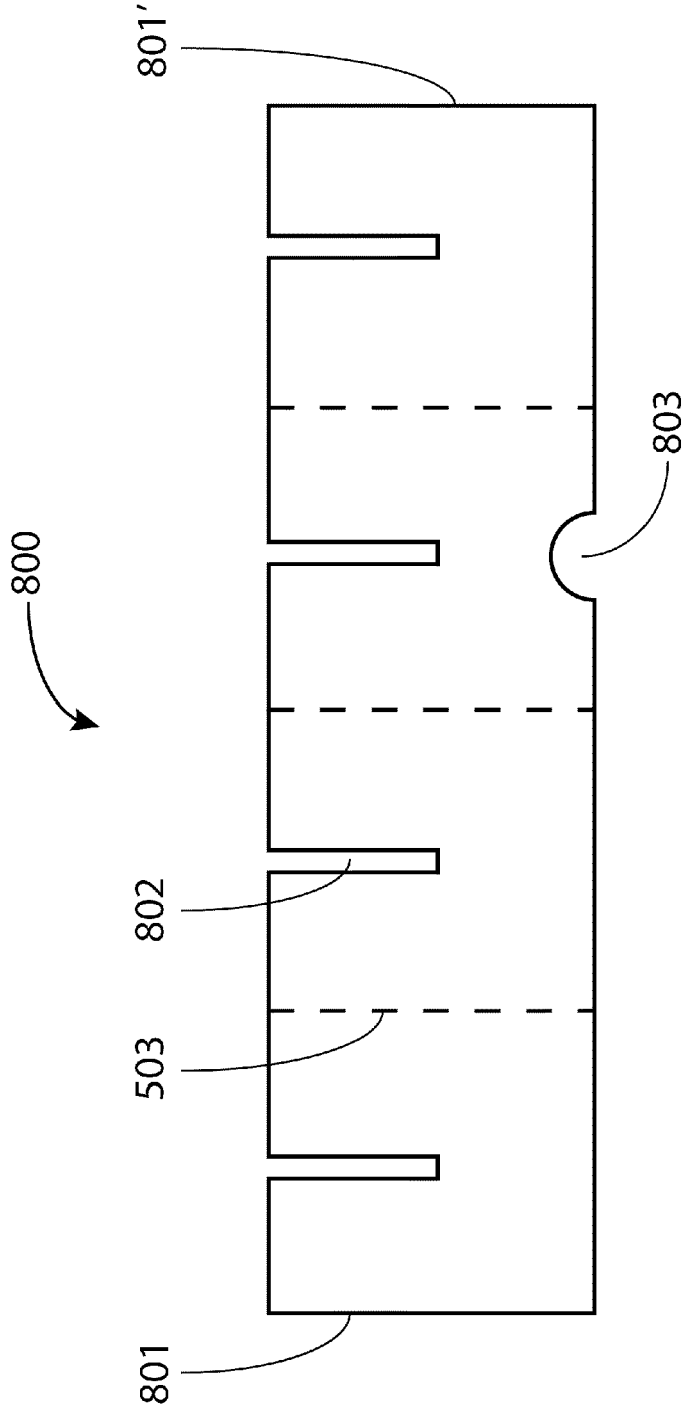

Fig. 8

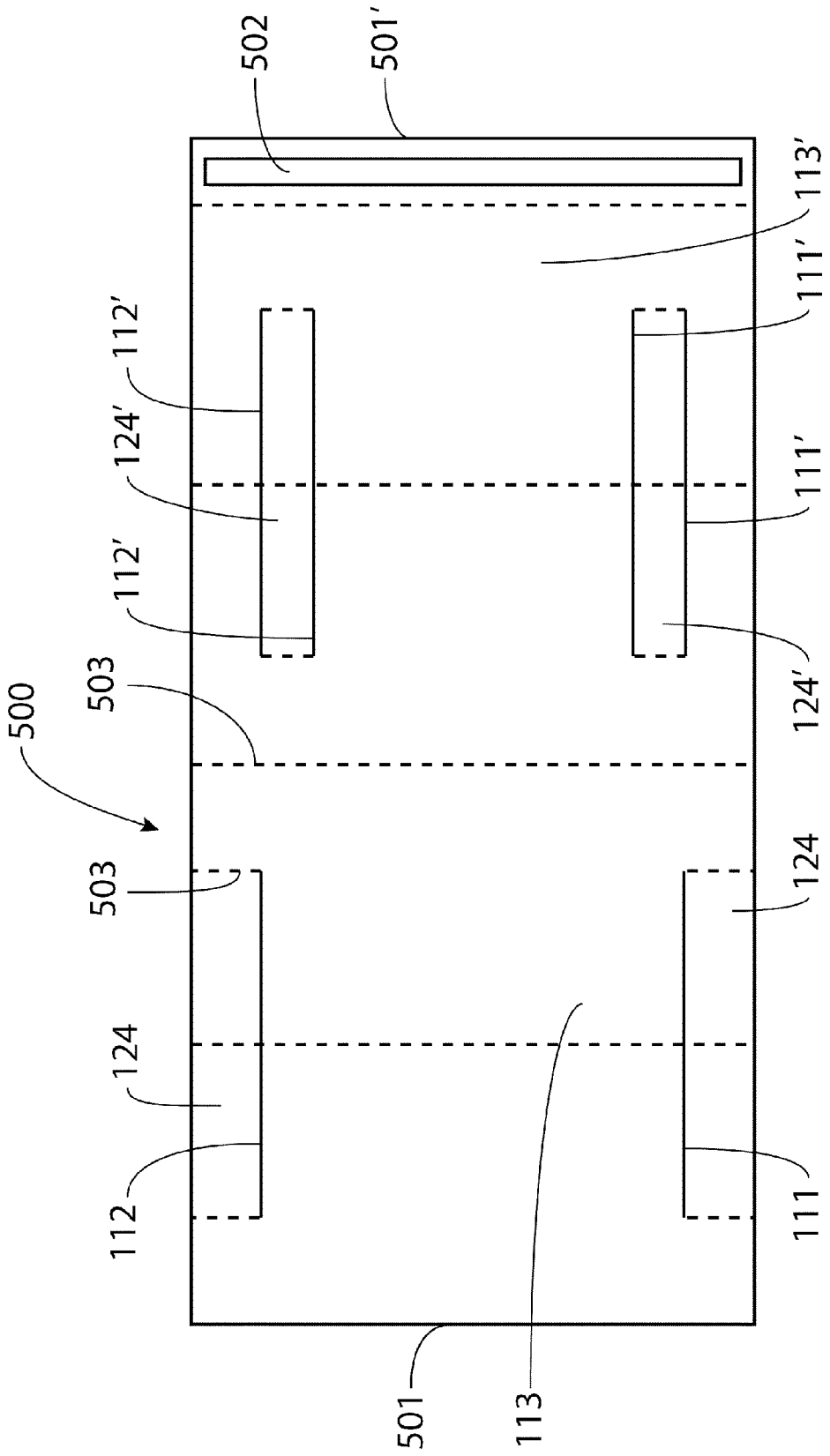
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Fig. 9

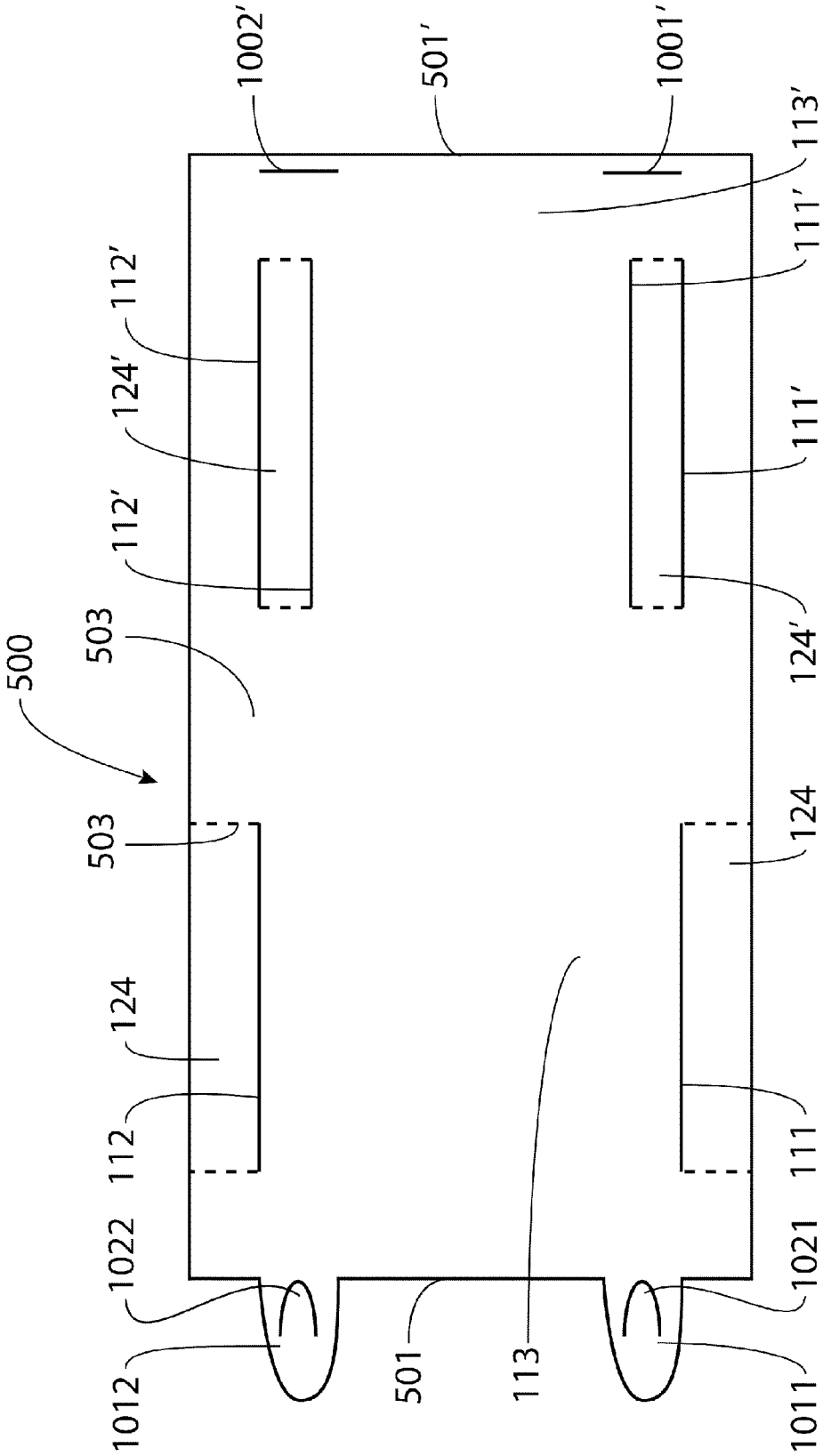
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Fig. 10

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EUROPEAN SEARCH REPORT

Application Number
EP 13 17 2664

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Y	US 2005/190565 A1 (JUANG MEI-JU [TW]) 1 September 2005 (2005-09-01) * figure 1 * * paragraphs [0015], [0018] *	6-8	
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	11 September 2013	Sacepe, Nicolas

CATEGORY OF CITED DOCUMENTS

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