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(54) **Road print**

(57) This invention relates to a method of adding road prints to a road surface e.g. road surfaces with asphalt. The road print is integrated in the road surface by the steps of adding a road print to said road surface by adding it to a curved road surface comprising a plurality of both inclining and declining sloped surfaces and dividing said road print in subparts along its vertical axis and adding a subpart to subsequent inclining sloped surfaces.

Thereby the road sign is positioned at the road surface and is easy to notice since drivers typically are focused on the road surface when driving. Further, by printing on a curved road surface, the car will vibrate when passing the curved distance and thereby significantly increase the chance that the driver notices the surface and thereby the road sign.

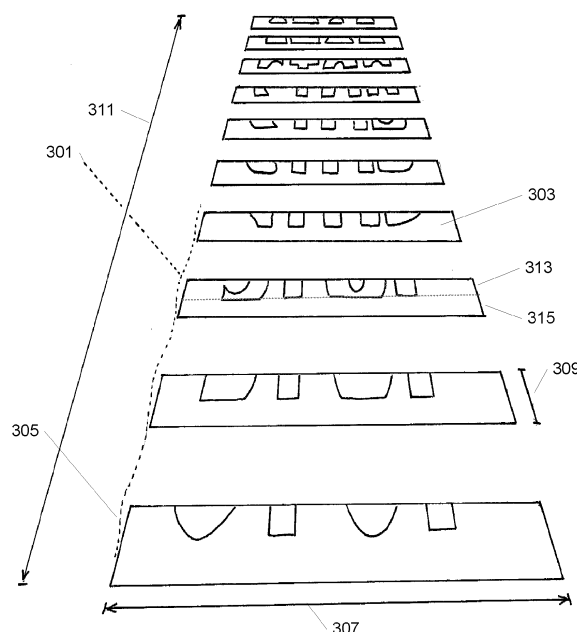


Fig. 3

Description

[0001] The present invention relates to a method of adding road prints to a road surface e.g. road surfaces with asphalt.

BACKGROUND OF THE INVENTION

[0002] Each year a lot of accidents happen in traffic and often these accidents cause the death of some of the involved parties. There are a lot of different reasons why such accidents occur depending on e.g. the road type, location, time of day and year.

[0003] One often seen reason for accident on particular high speed roads, such as highways, is the appearance of ghost drivers. A ghost driver is a person driving a car, who drives on the road in the wrong driving direction. Such a situation is often seen when the driver by accident uses a highway exit to enter the highway. If the driver believes that he/she is driving in the correct direction, he/she will drive at the high speeds normally used on the highway, thereby making the situation particularly dangerous and the potential accident very severe.

[0004] In order to prevent ghost drivers, a stop sign is typically positioned at the exit of the highway. This stop sign is readable from the ghost drivers driving direction, when he/she uses the exit as an entrance. However, if the driver overlooks this sign, he/she can easily access the highway as there is nothing else stopping the driver, whereby the dangerous ghost driver situation occurs.

[0005] The stop sign will also be readable upside down from the correct driving direction. This can be distracting for the driver as he/she will normally try to read the text and thereby not uphold his/hers full attention on driving.

OBJECT AND SUMMARY OF THE INVENTION

[0006] Disclosed herein is a method of adding road prints to a road surface, e.g. road surfaces with asphalt, characterized in that said road print is integrated in said road surface by the actions of 1) dividing said road print in subsequent subparts along its vertical axis; and 2) adding said subsequent subparts to subsequent inclining sloped surfaces on a curved road surface comprising a plurality of both inclining and declining sloped surfaces.

[0007] Thereby the road sign is positioned on the road surface as opposed to next to the road, where the drivers typically do not direct so much attention when driving. Further, by printing on the inclining surfaces of a curved road surface, the print will only be visible from one direction, thus when driving towards the inclining surfaces. The print will therefore not be a distraction for a driver driving in the opposite direction. Passing over the curved surface will induce vibrations in the car and thereby significantly increase the chance that the driver notices the surface and thereby the road sign.

[0008] It is a further advantage when the road surfaces already have segments with rumble lines as the road sign

can be added to this rumbled surface.

[0009] In an embodiment of the invention said road print is optimized to a viewpoint of a driver driving the car towards the road print on the road surface. It is thereby possible to optimize the viewpoint of the road print for the specific road it is added to. This is advantageous as the curvature of the road and the landscape surrounding it varies from road to road, thereby making what is the best viewpoint for one road an unsuitable one for another road.

[0010] In an embodiment of the invention the method further comprises the action of generating said curved road surface comprising a plurality of both inclining and declining sloped surfaces in a predefined area. It is thereby possible to create a curved road where e.g. the inclining sloped surfaces are steeper than the declining sloped surfaces. A ghost driver driving over a STOP sign put on the inclining sloped surfaces will therefore feel the rumbles much more than a driver driving in the opposite (and correct) direction, who will only feel the relatively flat rumbles when passing the road print from the declining road surfaces direction.

[0011] In an embodiment of the invention the method further comprises the actions of: 1) dividing a second road print in subsequent subparts along its vertical axis; and 2) adding said subsequent subparts to said subsequent declining sloped surfaces. A double sided road print is thereby created, which allows for completely different prints, e.g. a STOP print and a 'the highway is ending' print, to be added to the same area of the road. As these prints, displaying completely different messages, are only readable from one direction each, the driver will only be able to read the message on the print turned towards him/her and cannot be confused by the other print.

[0012] In an embodiment of the invention said road print is an inverse perspective transformation of an element when viewed towards said inclining surfaces. The road print thereby seems to be standing up on the road, which further demands the attention of the driver driving towards it.

[0013] In an embodiment of the invention said curved road surface is rumble lines integrated in said road surface. The driver will thereby for sure notice the road print as he/she drives over it.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] In the following, preferred embodiments of the invention will be described referring to the figures, where

figure 1 illustrates a car driving towards a road print added according to the method of the present invention,

figures 2a-f illustrate a perspective transformed road print according to the present invention,

figure 3 illustrates the curved road surface comprising a road print.

DESCRIPTION OF EMBODIMENTS

[0015] Figure 1a illustrates a car 103 with a driver 105 driving towards a road print added to a curved part 102 of a road surface 101. This curved part 102 could also function as rumble lines to get further attention of the driver. The distance from the eyes of the driver to the road print is indicated by 107 and the length of the curved part 102 with the print is indicated by 109. Further, the distance from the eyes of the driver to the road surface is indicated by 111.

[0016] As illustrated in the zoom view 113, the curved surface comprises a plurality of both inclining 115 and declining 117 sloped surfaces. The distance between two peak points is indicated by 121 and the distance between top and bottom of the curved surface is indicated by 123. The print 119 has been added to the inclined surfaces 115 as indicated.

[0017] When text is added to a straight road, it can be seen from every direction, though the driver might see the text upside down. This can be distracting for a driver as he/she might wonder what the text turned up-side-down reads and thereby loses his/her focus on driving. This is avoided with the print 119 of this invention as it is only added to the inclining surfaces 115 and can thereby only be seen by a person driving in the direction towards it.

[0018] An additional road print can be added to the declining surfaces 117, such that this second print is readable from the other driving direction. It is thereby possible to have a sign showing that the highway has ended when viewed from one direction and a text reading 'STOP' when viewed from the opposite direction, hence the direction of the ghost driver.

[0019] The inclining surfaces 115 can be steeper than the declining surfaces 117. This means that driving over the road print will feel different depending on which direction one is driving in; a driver driving in the correct direction might pass the road print without really noticing it, whereas a ghost driver will feel the road print as rumble lines and thereby become aware that he/she is trying to access the highway from the wrong direction.

[0020] Figure 2a illustrates a road print 201 according to the present invention before the print is divided in segments 203 marked by the dotted lines, and figure 2b illustrates the road print 201 after it has been divided up into the segments 203. The individual segments 203 are subsequently added to the inclining slopes 115 of the road surface shown in figure 1.

[0021] Depending on how close a viewer is to the curved road surface, the area of the inclining surfaces which is visible for the driver will change. This is illustrated in figure 2c, where three different view points 205, 207, 209 mark three different points that a car passes when approaching the curved road surface 102. When the car

is at point 205, the driver will be able to see a significantly smaller part 211 of the inclining surface 115 as compared to when he/she is at point 207, where an area of 213 is visible. At point 209, almost all 215 of the inclining surface 115 will be visible.

[0022] Before dividing the road print 201 into segments 203, the view point at which the print should be optimized for reading from is chosen. The length 217 of each segment 203 is chosen accordingly such that the segments 203 fill the area of the inclining surfaces 115 which is visible from that given view point.

[0023] If the length 217 of the segments 203 is optimized for the view point 207, each segment 203 fills the area 213. This means that when viewed from a point 205 further away from the road print than the optimized point 207, the driver will see a smaller area 211 of each inclining surface 115 and thereby not the entire length 217 of each segment 203. The road print seen from the view point 207 will thus be a small squashed version 219 as shown in figure 2d.

[0024] When the driver reaches the optimized view point 207, he/she will see each area 213 of each segment 203 and thereby its entire length 217. The road print 221 seen from view point 207 will therefore appear as shown in figure 2e. As the driver reaches the view point 209 close to the curved surface, he/she will in addition to seeing the entire length 217 of the segments 203 also see an extra part 223 of each of the inclining surfaces, together spanning the area 215. The road print 225 at this view point will therefore appear large and widespread as shown in figure 2f.

[0025] Figure 3 illustrates a curved road surface 301, where segments 303 of the prints have been added to inclining sloped surfaces 305. The curved road surface 301 has the length 311 and width 307, and is viewed from a view point closer to the print than the optimized view point. The segments 303 of the prints each have a length 309 and consist of an upper part 313 and a lower part 315. The upper part 313 is a segment of the road print itself as shown in figures 2a-b. The lower part 315 is self-colored in the same color as the background color behind the text in the upper part 313 and can optionally be left out.

[0026] The width 307 of the road print can be narrower than the distance between the two front/back wheels of a regular sized car, allowing an alert driver to pass over the road print without actually touching it with the car wheels. This can be advantageous for car drivers driving in the correct direction as the car's shock absorber is not affected by driving over the road print on the rumbled surface. On the other hand, for a driver to miss the regular stop sign and accidentally become a ghost driver, he/she needs to be somewhat distressed. The chances are therefore that he/she will drive over the road print with at least one wheel on the car and thereby be alarmed by the rumble effect. He/she might not even notice that it is a rumbled surface with print unless, of course, there is an additional print on the sloped surfaces pointing towards the driver.

[0027] The road print shown in figures 2a-f and figure 3 is a 'regular' road print, but could also be a perspective transformed road print, where the print is created such that it seems to be standing up on the road, thereby further catching the driver's attention. The perspective transformed road print can be created by using the 3-D projection optimized for a viewer having two viewpoints as described in EP1532606 or by a method optimized for a viewer having one viewpoint.

References

[0028]

101 road surface
102 curved part
103 a car
105 a driver
107 distance from the eyes of the driver to the road print is indicated by
109 length of the curved part with the print
111 distance from the eyes of the driver to the road surface
113 zoom view of the curved surface
115 inclining sloped surfaces
117 declining sloped surfaces
119 road print
121 distance between two peak points
123 distance between top and bottom of the curved surface
201 road print
203 segments of the road print
205 first view point
207 second view point
209 third view point
211 area of the inclining sloped surface visible from the first view point
213 area of the inclining sloped surface visible from the second view point

215 area of the inclining sloped surface visible from the third view point
217 length of the segments
5 219 road print seen from a first view point
221 road print seen from a second view point (the optimized view point)
10 223 extra part of the inclining surfaces visible from a third view point
225 road print seen from a third view point
15 301 curved road surface 301
303 segments of the road print
20 305 inclining sloped surface
307 width of the curved road surface
309 length of the segments
25 311 length of the curved road surface
313 upper part of the inclining surface seen from the view point
30 315 lower part of the inclining surface seen from the view point

35 Claims

1. A method of adding road prints to a road surface, e.g. road surfaces with asphalt **characterized in that** said road print is integrated in said road surface by the actions of:

- dividing said road print in subsequent subparts along its vertical axis; and
- adding said subsequent subparts to subsequent inclining sloped surfaces on a curved road surface comprising a plurality of both inclining and declining sloped surfaces.

2. A method according to claim 1, wherein said road print is optimized to a viewpoint of a driver driving the car towards the road print on the road surface.

3. A method according to claim 1 or 2, wherein the method further comprises the step of generating a curved road surface in a predefined area, said curved surface comprising a plurality of both inclining and declining sloped surfaces.

3. A method according to claim 1 or 2, wherein the method further comprises the action of generating said curved road surface comprising a plurality of both inclining and declining sloped surfaces in a pre-defined area.

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4. A method according to any of the claims 1-3, wherein the method further comprises the actions of:

- dividing a second road print in subsequent sub- 10 parts along its vertical axis; and
- adding said subsequent subparts to said subsequent declining sloped surfaces.

5. A method according to any of the claims 1-4, 15 wherein said road print is an inverse perspective transformation of an element when viewed towards said inclining surfaces.

6. A method according to any of the claims 1-5, 20 wherein said curved road surface is rumble lines integrated in said road surface.

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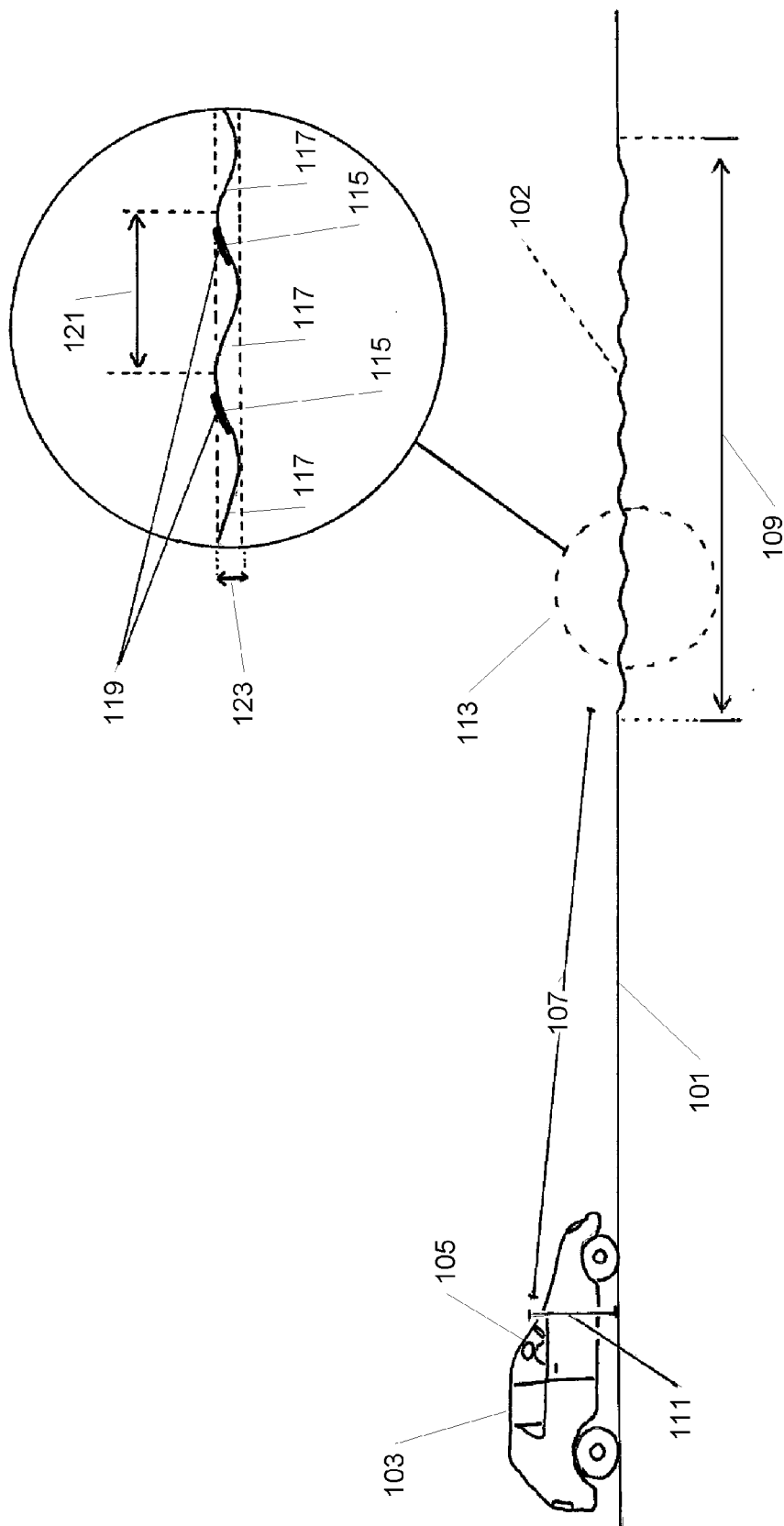


Fig. 1



Fig. 2a

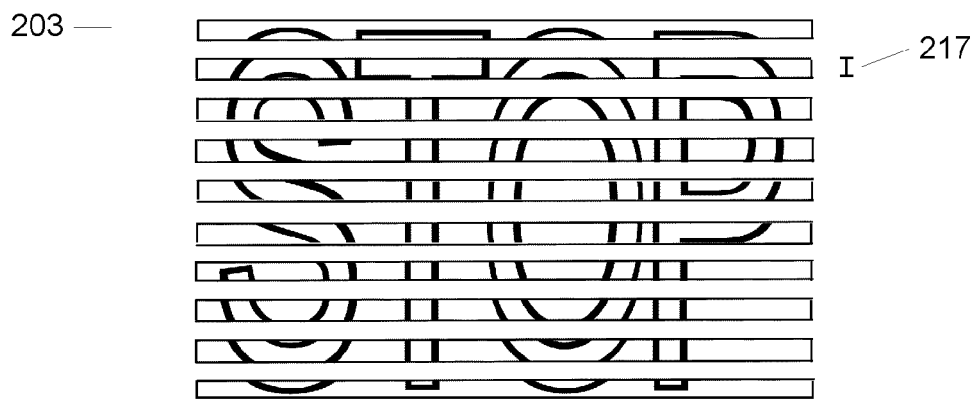


Fig. 2b

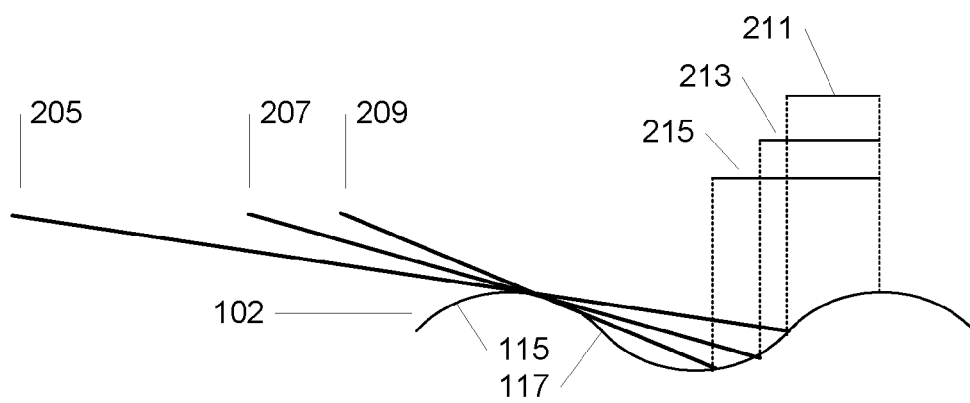


Fig. 2c

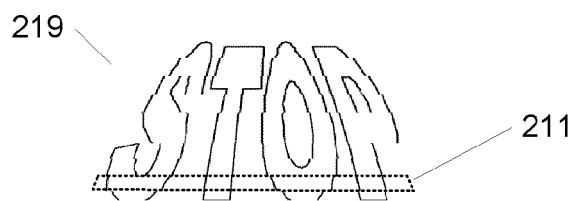


Fig. 2d

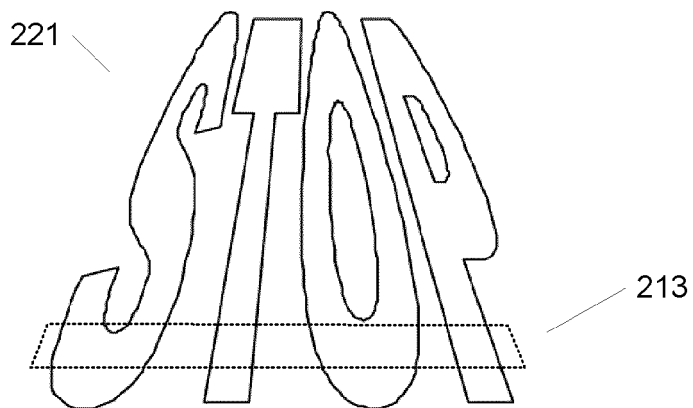


Fig. 2e

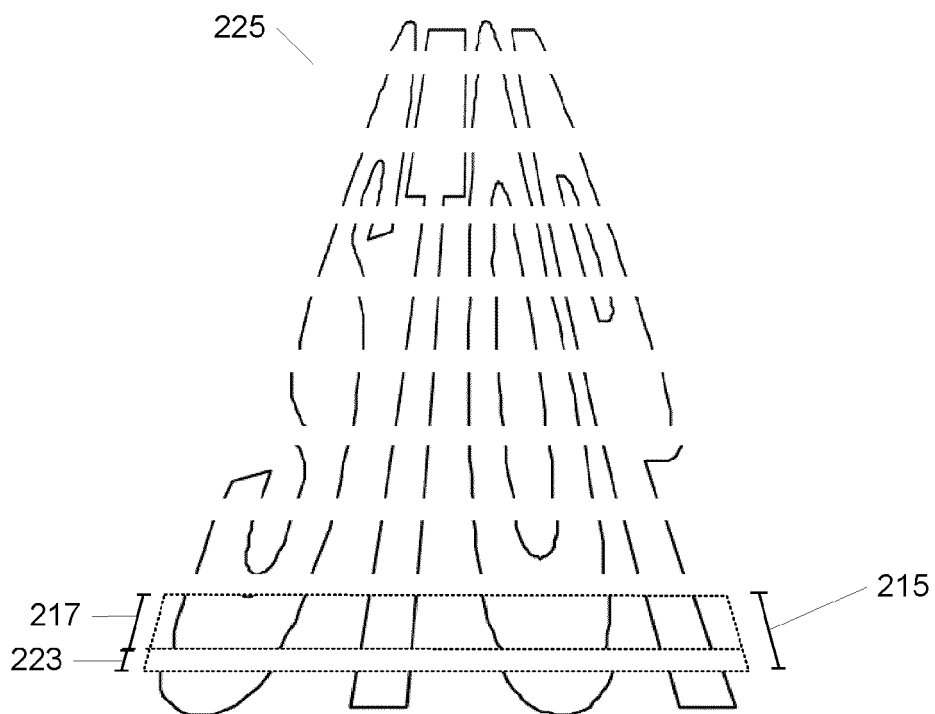


Fig. 2f

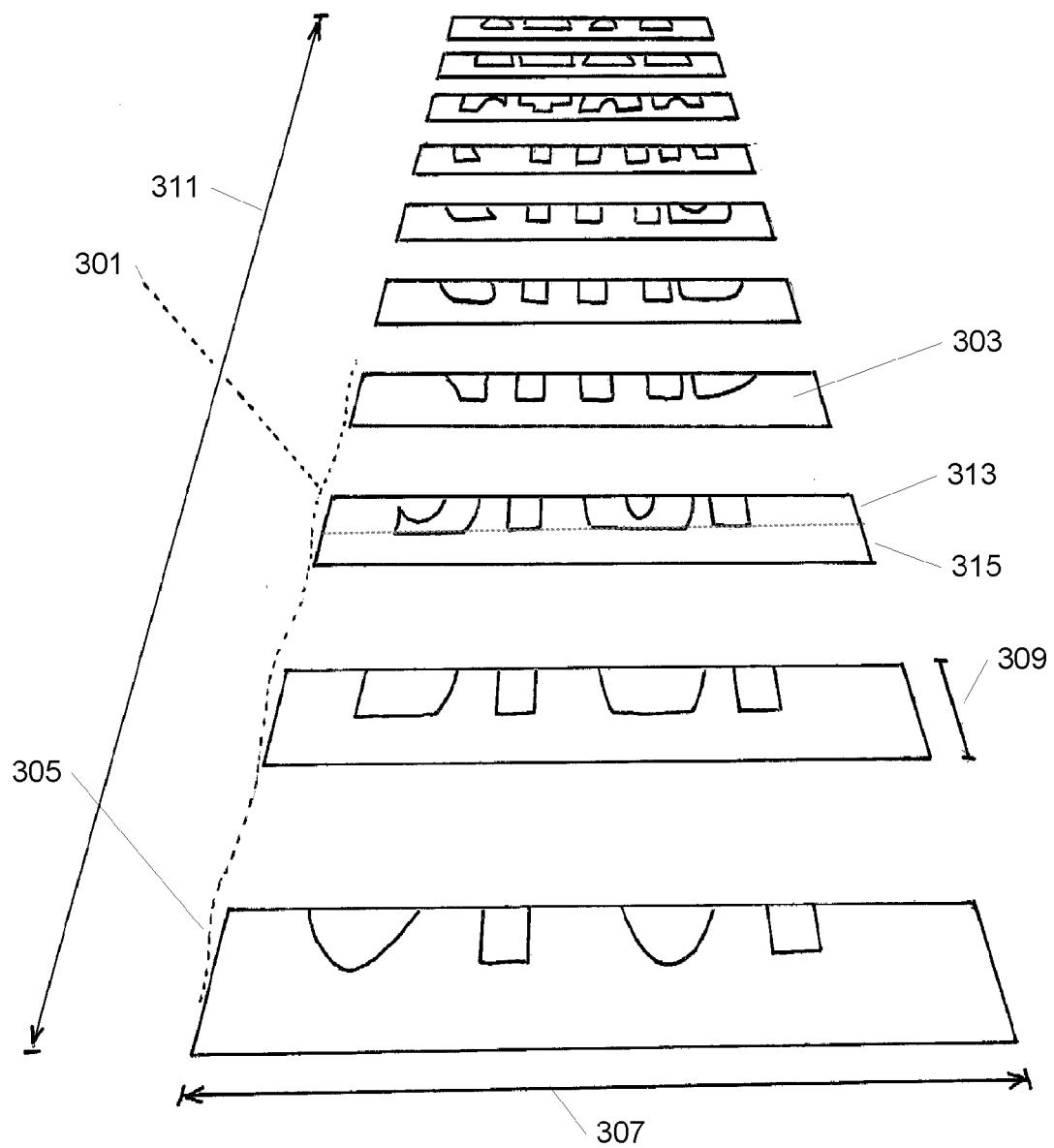


Fig. 3

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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