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(54) MAGNETIC BUILDING TILES FOR CREATING TWO DIMENSIONAL AND THREE-DIMENSIONAL STRUCTURES AND FLAT MAGNETIC TILES FOR DECORATING THE BUILDING TILES

(57) The present invention comprises a set of tiles of any shape, including magnets placed in between a top and bottom portion allowing the tiles to be magnetically attached to each other, allowing a user to build 2D/3D structures. There are panel pieces, that have same shape and size as the tiles, and that have a ferrous base that allows for them to be attached flatly to the tiles. The panels have decorative portions placed on at least one side, which allows the user to decorate the tiles and/or the structure built out of the tiles in any way that captures their imagination. The decorative portions include the design, including but not limited to a road, a city/town, colors, patterns, or a writeable surface to allow for the ultimate level of customization.

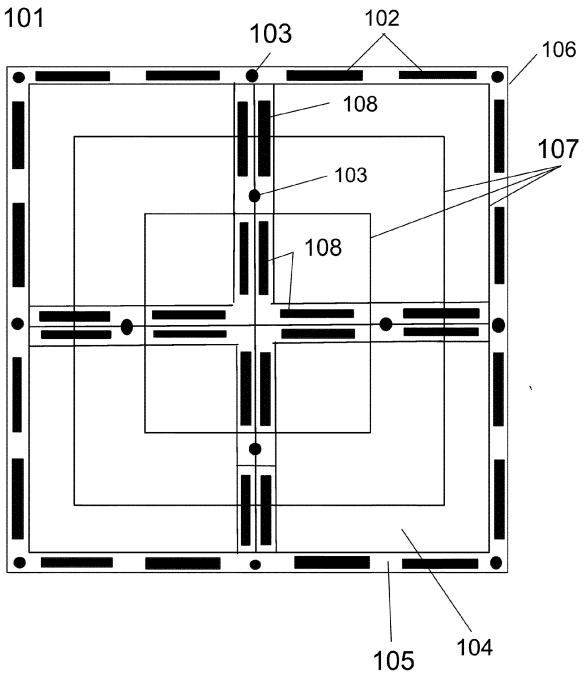

Figure 1

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Description

FIELD OF THE INVENTION

[0001] The present invention is centered around a toy building concept, with a particular emphasis on a panel designed for magnetic attachment to tiles. In addition, the panels in the present invention minimize the expenditure required for buying additional tiles to decorate with multiple graphics. The present invention facilitates a user to create both two-dimensional and three-dimensional decorative structures, offering an entertaining experience with multiple play options and simultaneously improving the user's skills.

BACKGROUND ART

[0002] Building toys are play items composed of multiple pieces or components that a user assembles to construct a structure. These toys stimulate creativity and imagination by actively engaging users in a hands-on construction process. As users figure out how to fit the components together, the assembly process cultivates problem-solving skills. Apart from immediate enjoyment, construction toys often provide educational benefits by encouraging the development of spatial awareness through the manipulation of three-dimensional structures. The educational experts underscore the significance of building toys in early childhood development, contributing to the refinement of fine motor skills through the manipulation and connection of pieces. Collaborative play with these toys enhances social skills as children communicate, share ideas, and collaborate on creating structures.

[0003] Magnetic tiles are employed to improve a user's skills, enabling the creation of two-dimensional or three-dimensional structures featuring diverse graphics printed on the tiles. Nevertheless, the cost of magnetic tiles is relatively high. Consequently, if the user desires to construct a design with different graphics, the user must acquire additional magnetic tiles, incurring additional expenses.

[0004] Building toys have been a staple for kids to play with for centuries, including wood blocks, Lego™, K'Nex™, MAGNA-TILESTM, and so on. The issue with these toys has been the ability to decorate the structures that kids build, limiting them to specialized decorated pieces that are hard to keep track of amongst the regular pieces. Further, acquiring magnetic tiles entails a substantial cost, and these tiles come with predefined graphic designs suited only for specific play scenarios such as castles, houses, or roads. This proves impractical as it demands a significant investment for limited adaptability across diverse play situations.

[0005] Furthermore, efforts have been made to enhance the playability of magnetic tiles by directly imprinting graphics onto them. However, this approach has a drawback: once graphics are printed, users cannot reprint the magnetic tiles. Consequently, the user or parents find themselves needing to purchase numerous sets to cater to various play scenarios. Notably, the manufacturing cost of magnetic tiles is considerably higher than that of panels.

PRIOR RELATED ART

[0006] US9713777B2 disclosed a magnetic construction toy that is similar to the one being proposed in this application. The main difference is how the tiles themselves are constructed, mainly that the panels are made of edge pieces and separate interior pieces, which makes them more complicated to make than the current invention. The other difference is that the design panels are incorporated into the tiles themselves, making them hard to differentiate from the non-design tiles. They also would take up more space in a toy chest or box and make it hard for a kid to change the design once the structure was built.

[0007] Therefore, there is a need in the art for developing a panel(s) that do not suffer from the aforementioned deficiencies

OBJECTS OF THE INVENTION

[0008] Some of the objects of the invention are as follows:

An object of the present invention is to design a panel that minimizes the expense associated with constructing a multi-graphics structure compared to using magnetic tiles.

[0009] An object of the present invention is to develop a panel that prevents a tile of a building toy play system from any potential damage during usage.

[0010] Another object of the present invention is to develop a panel that is non-scratchable.

[0011] Another object of the present invention is to design a panel featuring a range of graphics, aiming to offer numerous illusions to a user.

[0012] Another object of the present invention is to design a panel capable of absorbing vibrations generated during the usage of the play system.

[0013] Another object of the present invention is to develop a panel that enables the user to write/draw on the surface of the panel.

[0014] Another object of the present invention is to develop a panel that possesses erasable qualities.

[0015] Another object of the present invention is to design an affordable panel.

[0016] Yet another object of the present invention is to develop a panel that is reusable.

SUMMARY OF THE INVENTION

[0017] Magnetic tiles are a type of building or construction toy characterized by flat, geometric shapes with embedded magnets along their edges. These magnets facilitate easy attachment between tiles, allowing a user

to construct a diverse range of two-dimensional and three-dimensional structures. The magnetic feature enhances stability and versatility in the creations. Children commonly engage in creative play with magnetic tiles, constructing anything from simple shapes to intricate designs such as houses, castles, or other imaginative structures. The tiles are recognized for fostering spatial awareness, fine motor skills, and problem-solving capabilities in users.

[0018] In the present invention, a panel is disclosed that is magnetically attached to a tile. The panel comprises a top portion, allowing a user to change the appearance of the panel. The panel further comprises a core portion being a solid piece that gives the panel rigidity and also absorbs vibrations. Further, the panel includes a bottom portion being a flat ferrous magnetic sheet. The core portion is affixed with the top portion and the bottom portion via an adhesive agent.

[0019] In one embodiment of the invention, the top portion and the bottom portion of the panel are decorated with a graphics layer.

[0020] In one embodiment of the invention, the top portion and the bottom portion are erasable and non-scratchable.

[0021] In one embodiment of the invention, the top portion is made with a ferrous magnetic material.

[0022] In one embodiment of the invention, the graphics layer includes but is not limited to a straight road, curved road, Y-shaped road, straight train track, curved train track, river, lake, ocean, plants, vegetation, people, characters, colors, and patterns.

[0023] In one embodiment of the invention, the panel is a variety of shapes, incorporating, but not confined to, squares, rectangles, triangles, trapezoids, hexagons, and octagons.

[0024] In one embodiment of the invention, the material of the core portion absorbs vibrations and provides rigidity/strength to the top portion and the bottom portion.

[0025] In one embodiment of the invention, there is provided a tile play system with the panel. Multiple tiles with a length, width, and depth, the tiles having a solid top piece and a solid bottom piece while having a hollow space in between the solid top piece and the solid bottom piece that allows for a plurality of magnets to be placed within the tiles, and where the depth is smaller than the length and width of the tile. The plurality of magnets is placed around an inside edge of the tiles. The top and bottom pieces are attached together at the corners vertically with a fastener. Further, multiple panels, the same shape as the tiles, allow for the panels to be connected to the tiles magnetically so that the panels fit on the tiles. The panels comprise a magnetic ferrous sheet with a decorative portion printed on one side to allow for the panels to change the appearance of the tiles when the panels are placed on top of the tiles.

[0026] In one embodiment of the invention, the depth of the tile is smaller than the length and width of the tile.

[0027] In one embodiment of the invention, the tiles being able to connect up to each other via the plurality of magnets to allow for a user to create horizontal structures, vertical structures, and a combination of horizontal and vertical structures.

[0028] In one embodiment of the invention, at least two magnets per side around the inside edge, having alternate polarity every other magnet, continuing around the entire inside edge of the tiles.

[0029] In one embodiment of the invention, an even number of magnets are placed on each side of the tile.

[0030] In one embodiment of the invention, additional magnets are placed in the center along the length and width of the tile to enable one tile to be magnetically attached to another tile.

[0031] In one embodiment of the invention, additional magnets in a first tile enable a second tile to be magnetically attached to the middle of the first tile perpendicularly.

[0032] In one embodiment of the invention, an additional fastener is provided in the interior of the tile, where the points are found in the center of the length and width of the tile.

[0033] In one embodiment of the invention, the tiles are connected together horizontally or vertically via magnets to any other tile, as long as the sides of the tiles are of equal lengths or widths.

[0034] In one embodiment of the invention, the tiles with sides of different lengths or widths are connected to each other when the length or widths of the sides on the larger side of the tile is a multiple of the length or width of the smallest side of another tile.

[0035] In one embodiment of the invention, the panel and the tile are identical in shape and size.

[0036] In one embodiment of the invention, the panel is thinner than the tile to attach the panel to the tile and to rest against the tile.

[0037] In one embodiment of the invention, the panel and the tile are attached magnetically to enable the user to perform various amusement activities that include but are not limited to running a car, running a train, and drawing.

[0038] In one embodiment of the invention, a method of assembling a plurality of panels and a plurality of tiles to create a tile play structure, wherein the plurality of panels comprises a top portion, a core portion, and a bottom portion. The method step comprises, selecting a shape from a plurality of tiles. The method step further comprises, arranging each of the tiles in horizontally, or vertically, or at an angle, in order to prepare a base for the tile play structure. The method step further comprises, selecting a plurality of panels based on the shape of the plurality of tiles. The method step further comprises, selecting the plurality of panels based on a graphics affixed on the top portion. The method step further comprises, attaching magnetically the plurality of panels with the plurality of tiles. The method step further comprises, enabling the user to perform the amusement activity over the attached panels.

[0039] In one embodiment of the invention, a method for assembling a tile play system, comprising the steps, providing multiple tiles, each having a length, width, and depth, wherein the tiles include a solid top piece and a solid bottom piece, with a hollow space in between allowing for the placement of a plurality of magnets, the depth being smaller than the length and width of the tile. The next step includes, placing the plurality of magnets around an inside edge of the tiles. The next step includes attaching the top and bottom pieces of the tiles together using a fastener. The next step includes, providing multiple panels, each having the same shape as the tiles. Further, the next step includes, connecting the panels to the tiles magnetically, allowing the panels to fit on the tiles. The next step includes constructing the panels with a magnetic ferrous sheet and a decorative portion printed on one side, facilitating a change in the appearance of the tiles when the panels are placed on top of the tiles.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

[0040] The accompanying drawings illustrate the best mode for carrying out the invention as presently contemplated and set forth hereinafter. The present invention may be more clearly understood from a consideration of the following detailed description of the preferred embodiments taken in conjunction with the accompanying drawings wherein like reference letters and numerals indicate the corresponding parts in various figures in the accompanying drawings, and in which:

Fig. 1 illustrates a top view of a magnetic tile, in accordance with an embodiment of the present invention;

Fig. 2 illustrates the separated top and bottom parts of the tiles, in accordance with an embodiment of the present invention;

Fig. 3 illustrates two tiles attached to each other by magnetic attraction, in accordance with an embodiment of the present invention;

Fig. 4 illustrates the different shapes of the tiles, in accordance with an embodiment of the present invention;

Fig. 5 illustrates a plurality of horizontal tiles attached to a plurality of vertical tiles, in accordance with an embodiment of the present invention;

Fig. 6 illustrates a structure created using the square tiles, in accordance with an embodiment of the present invention;

Fig. 7 illustrates a structure created using diamond, triangle, and hexagon tiles, in accordance with an embodiment of the present invention;

Fig. 8 illustrates a top view of a panel, in accordance with an embodiment of the present invention;

Fig. 9 illustrates a bottom view of the panel, in accordance with an embodiment of the present invention;

Fig. 10 illustrates a side view of the panel, in accordance with an embodiment of the present invention;

Fig. 11 illustrates a perspective view of the panel, in accordance with an embodiment of the present invention;

Fig. 12 illustrates various shapes of the tiles, in accordance with an embodiment of the present invention;

Fig. 13 illustrates an exploded view of the assembly of the panel and the tile, in accordance with an embodiment of the present invention;

Fig. 14 illustrates an exploded view of the panel, in accordance with an embodiment of the present invention;

Fig. 15 illustrates a flow chart of a method of assembling a plurality of panels and a plurality of tiles to create a tile play structure, in accordance with an embodiment of the present invention; and

Fig. 16 illustrates a flow chart of a method for assembling a tile play system, in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION

[0041] Embodiments of the present invention disclosure will be described more fully hereinafter with reference to the accompanying drawings in which like numerals represent like elements throughout the figures, and in which example embodiments are shown.

[0042] The detailed description and the accompanying drawings illustrate the specific exemplary embodiments by which the disclosure may be practiced. These embodiments are described in detail to enable those skilled in the art to practice the invention illustrated in the disclosure. It is to be understood that other embodiments may be utilized, and other changes may be made, without departing from the spirit or scope of the present disclosure. The following detailed description is therefore not to be taken in a limiting sense, and the scope of the present invention disclosure is defined by the appended claims. Embodiments of the claims may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein.

[0043] The building toys described here are magnetic tiles that allow kids to build two-dimensional structures and three-dimensional structures by using magnets on the edges of each tile to allow for the tiles to stick together in any combination that the kid can think of. The tiles can be in any shape, such as square, rectangular, circular, triangular, octagon, etc., which will make it easier to create intricate and complex structures as well as simple ones.

[0044] The magnetic tiles comprise a top and bottom portions that are solid on the outside. Before the top and bottom portions are placed together and are fastened to each other using ultrasonic weld points at the corners, the magnets are placed around the outside edge recesses of the top and bottom portions. The two or more magnets are placed around each of the edges, dividing the recess space evenly among the magnets. The magnet poles are reversed with every additional magnet placed, so north/-south is followed by south/north. Ideally, there would be an even number of magnets around each edge. In between each of the magnets, there may be an additional ultrasonic weld point.

[0045] The building toys also include flat decorative panels that are made of a flat magnetic piece with a decal affixed on one side. These panels can have any decoration on them, such as roads, train tracks, rivers, grass, pictures, letters, colors, patterns, characters, and images from books, movies, and TV. The panels are the same width and length as any of the magnetic tiles described above and stick to the magnetic tiles using the back side of the panels. An advantage is that the panels would be the exact size and shape of the tiles to ensure that there is no overlap or underlap between the pieces, but the panels could be smaller or larger than the tiles. The decorative panels can be magnetically attached to the magnetic tiles. Another advantage is that the decorative panels would be easily differentiated from the tile pieces when the kids are building a structure. The panels could be attached to a predetermined shape created by the panels, so the panels are used in combination to create a pattern or single image, like the child completing a puzzle.

[0046] **Fig. 1** illustrates a top view of a tile **101,** in accordance with an embodiment of the present invention. In several embodiments of the present invention, a magnetic tile having a square shape is illustrated. Although, it is recognized by those skilled in the art that alternate configurations/shapes may be conceivable. The alternate shape may include but is not limited to rectangle, triangle, circle, rhombus, parallelogram, octagon, hexagon, heptagon, nonagon, and decagon.

[0047] In several embodiments of the present invention, the tile is made up of two identical pieces **104,** i.e., a solid top piece and a solid bottom piece, that make up the top and bottom of the tile. Further, a hollow portion is present between the solid top piece and the solid bottom piece. A plurality of circle portion **103** is a fastening portion that is used to connect the top and bottom pieces **104,** with a fastener. The fastener is preferably an ultrasonic rivet, but any type of fastener may be used for connecting the top and bottom pieces **104.** The pieces **104** are solid on the top and hollow in the middle. A solid edge **106** surrounds the tile on the outside, and internal dividing portions **107,** which are part of the top and bottom pieces **104,** are placed in the interior of the tiles for added support when the top and bottom pieces **104** are attached to each other.

[0048] In several embodiments of the present invention, a plurality of magnets **102** are placed around the outer edge of the inside portions **105** of the tiles. Preferably the magnets are placed at equidistant intervals, as shown in the **Fig. 1,** but any number of magnets or various placements could be used. The magnets **102** have opposite polarities, with the one on the left being north/south and the one of the right being south/north. This is just an example, and any combination of magnets could be used as long as they alternate polarities to enable the tiles to be attracted to each other when placed on top of each other or next to each other.

[0049] In several embodiments of the present invention, the interior magnets **108** are placed equidistant from each other on the interior of the tiles. While two magnets are shown along the cross portion, any equal number of magnets could be used as long as they mirror each other vertically and horizontally along the center axes of the tile. The polarity of the interior magnets should alternate polarities along the vertical and horizontal axes. Additional magnets could be placed anywhere in the interior, as long as they are equidistant and switch polarities along the vertical and horizontal axes.

[0050] **Fig. 2** illustrates the separated top and bottom parts of the tiles, in accordance with an embodiment of the present invention. In several embodiments of the present invention, the tile top **201** shows the flat top portion of the tile. The tiles could be an opaque solid color, a translucent solid color, clear, or any combination of colors and/or patterns. The ultrasonic welding points **103** are shown only on the edges for simplicity, but the preferred configuration would be the welding points shown in **Fig. 1.** The bottom portion **204** shows the rivet points **103** as well as magnets **202** and **203.**

[0051] In several embodiments of the present invention, a divider(s) **205** could be placed between neighboring magnets and between the rivet points and the magnets to keep the magnets in place. The outer and inner magnet borders **206** and **207** keep the magnets in a perpendicular direction to the dividers. The magnets could be affixed to the bottom piece via an adhesive, or the dividers and borders could keep the magnets in place. There could be inner dividers **107,** as shown in **Fig. 1,** but this figure omits them for simplicity. The magnet **202** and the magnet **203** would have different polarities as discussed above, so the magnet **202** could be north/-south and the magnet **203** could be south/north, but either configuration could be used, as long as the magnet closest to them had the opposite polarity. When the top portion **201** and the bottom portion **204** are placed on top

of each other and ultrasonically welded together at the rivet points, they would form tile **101.**

[0052] **Fig. 3** illustrates two tiles attached to each other by magnetic attraction, in accordance with an embodiment of the present invention. In several embodiments of the present invention, two square tiles **301** and **304** are temporarily held together by the magnets **302** and **303,** along with the other magnets that aren't labeled. The magnetic attraction will align the tiles so they line up with each other. The tiles or any shape can be combined to make any horizontal and/or vertical shapes and/or structures (*as shown in* **Fig. 5, Fig. 6,** and **Fig. 7).**

[0053] **Fig. 4** illustrates different shapes of the tiles, in accordance with an embodiment of the present invention. In several embodiments of the present invention, four different shapes from the square example are shown in **Fig. 1.** In **Fig. 4,** a triangle, a rectangle, a diamond, or parallelogram, and a hexagon shapes are shown. Preferably the sides, except for the long sides of the rectangle, would be the same size so that the sides could be attached to each other magnetically as shown in **Fig. 7.**

[0054] **Fig. 5** illustrates a plurality of horizontal tiles attached to a plurality of vertical tiles, in accordance with an embodiment of the present invention. In several embodiments of the present invention, a set of square tiles is magnetically attached to each other in a horizontal as well as vertical manner, allowing a user to create a two-dimensional structure.

[0055] **Fig. 6** illustrates a structure created using the square tiles, in accordance with an embodiment of the present invention. In several embodiments of the present invention, a set of square tiles is magnetically attached to each other horizontally, vertically, and at different angles to create a three-dimensional structure.

[0056] **Fig. 7** illustrates a structure created using diamond, triangle, and hexagon tiles, in accordance with an embodiment of the present invention. In several embodiments of the present invention, a set of tiles including, diamond, triangle, hexagon, and square shapes are magnetically attached to each other in a horizontal, vertical, and at different angles to create a two-dimensional and three-dimensional structure.

[0057] **Fig. 8** illustrates a top view of a panel, in accordance with an embodiment of the present invention. In several embodiments of the present invention, the magnetic panels, which are different from the tiles, have a design on one side or both sides, such as a road. Other designs could be, but are not limited to, dead-end roads, curved roads, Y intersections, U-turns, train tracks, rivers, lakes, grass areas, trees, letters, words, shapes, animals, people, or anything else that someone could use to decorate the tiles.

[0058] **Fig. 9** illustrates a bottom view of the panel, in accordance with an embodiment of the present invention. In several embodiments of the present invention, the bottom of the panel is composed of a ferrous material. The design could be on both sides of the panel, so the panel would be able to show multiple designs that could be flipped over and stuck on the tile. The multiple designs on a single panel could convey an action when the panel is flipped over, such as a character throwing a ball where the ball moves on the opposite side of the panel.

[0059] In another embodiment of the present invention, the top portion is made of a ferrous magnetic material. Since the graphic design covers both the top portion and the bottom portion, and the material for both the top portion and the bottom portion is ferrous, the user is allowed to affix any side with the magnetic tile based on the desired graphics presented on the top side.

[0060] **Fig. 10** illustrates a side view of the panel, in accordance with an embodiment of the present invention. In several embodiments of the present invention, the side views of the panels are identical, regardless of the perspective from which the panel is viewed. The panels are the same size as the tiles, ideally 75 mm x 75 mm, but any sized tiles and panels could be used, as long as they are of the same size. While only shown as square shaped, the panels could be the same size as the other shaped tiles. The panels are shown to be thinner than the tiles, and the corners being rounded, but any thickness and corner types could be used.

[0061] In several embodiments of the present invention, the panel comprises a top portion, a core portion, and a bottom portion. The top portion is decorated with different type of graphics. Further, the core portion, i.e., the center of panel **1002** is ideally made of wood, but it could be made of plastic, rubber, or a non-metallic metal to give the panel rigidity. The top portion **1001** is affixed to the center of the panel via glue, epoxy, tape, or any type of substance that can attach one object to another. Further, the bottom portion, i.e., base **1003,** is a ferrous sheet that covers the entire section of the panels, or around the parameter, that allows for the panels to attach to the tiles.

[0062] **Fig. 11** illustrates a perspective view of the panel, in accordance with an embodiment of the present invention. In several embodiments of the present invention, the top portion **1001** has the graphic, the core portion **1002** is preferably made of wood, and the bottom portion **1003** is the ferrous magnetic sheet. The finish over the graphic could be matte, semi-gloss, glossy, or any other type of finish. The glossy panels could be white, or any other light color, which would allow the panels to act as a whiteboard so the kid or the user could write on them with a dry erase marker and easily wipe it clean after playing.

[0063] **Fig. 12** illustrates various shapes of the tiles, in accordance with an embodiment of the present invention. In several embodiments of the present invention, **Fig. 12** shows the preferred shapes and sizes of the tiles disclosed above. The disclosed list of shapes and sizes is not meant to be exhaustive, and any combination of shapes and sizes could be used. Ideally, the shapes shown, if made in different sizes, would be multiples of the sizes listed in the figures.

[0064] **Fig. 13** illustrates an exploded view of the assembly of the panel and the tile, in accordance with an embodiment of the present invention. In several embodi-

ments of the present invention, the panel is magnetically attached to the tile. Similarly, the plurality of panels is attached to the plurality of the tiles. The panel is to be placed on the tile in a manner that the bottom portion of the panel will be magnetically attached to the tile.

[0065] **Fig. 14** illustrates an exploded view of the panel, in accordance with an embodiment of the present invention. In several embodiments of the present invention, the panel comprises the top portion, the core portion, and the bottom portion. The top portion enables the user to change the appearance of the panel. Further, the core portion is a solid piece that gives the panel rigidity. The material of the core portion also absorbs the vibrations that may be associated with playing a game running a vehicle, or a train on the track decorated over the top portion. The vibration-absorbing properties also enhance the life of the panels and the tiles. The core portion is flat and is made with a ferrous magnetic sheet. Further, the core portion is affixed between the top portion and the bottom portion by an adhesive agent.

[0066] **Fig. 15** illustrates a flow chart of method **1500** of assembling a plurality of panels and a plurality of tiles to create a tile play structure, in accordance with an embodiment of the present invention. The first method step **1501** includes selecting a shape from a plurality of tiles. The second method step **1502** includes arranging each of the tiles in horizontally, or vertically, or at an angle in order to prepare a base of the tile play structure. The third method step **1503** includes selecting a plurality of panels based on the shape of the plurality of tiles. Further, the fourth method step **1504** includes selecting the plurality of panels based on a graphics affixed on the top portion. Furthermore, the fifth method step **1505** includes attaching magnetically the plurality of panels with the plurality of tiles. The sixth method step **1506** includes enabling the user to perform the amusement activity over the attached panels.

[0067] **Fig. 16** illustrates a flow chart of method **1600** for assembling a tile play system, in accordance with an embodiment of the present invention. The first method step **1601** includes providing multiple tiles, each having a length, width, and depth, wherein the tiles include a solid top piece and a solid bottom piece, with a hollow space in between allowing for the placement of a plurality of magnets, the depth being smaller than the length and width of the tile. The second method step **1602** includes placing the plurality of magnets around an inside edge of the tiles. The third method step **1603** includes attaching the top and bottom pieces of the tiles together using a fastener which includes but not limited to ultrasonic welding, potentially and riveting. The fourth method step **1604** includes providing multiple panels, each having the same shape as the tiles. The fifth method step **1605** includes connecting the panels to the tiles magnetically, allowing the panels to fit on the tiles. The sixth method step **1606** includes constructing the panels with a magnetic ferrous sheet and a decorative portion printed on both sides, facilitating a change in the appearance of the tiles when the panels are placed on top of them.

[0068] The invention, as described above, offers several advantages. For instance, each of the panels is very simple in design and construction. Further, the panels use commonly available materials. The simplicity in design and construction and the use of commonly available materials allow the panels to be mass-produced with minimal capital expenditure and to be made available in the market at significantly lower prices. Also, the panels can be reused several times and are, therefore, cost-effective for the end user and minimize waste generation. Magnetic tiles are typically expensive, and incorporating ferrous panels is a means to reduce costs while offering additional play options, as compared to purchasing various magnetic tiles.

[0069] Various modifications to these embodiments are apparent to those skilled in the art, from the description and the accompanying drawings. The principles associated with the various embodiments described herein may be applied to other embodiments. Therefore, the description is not intended to be limited to the embodiments shown along with the accompanying drawings but is to provide the broadest scope consistent with the principles and the novel and inventive features disclosed or suggested herein. Accordingly, the invention is anticipated to hold on to all other such alternatives, modifications, and variations that fall within the scope of the present invention and appended claims.

Claims

1. A panel magnetically attached to a tile in a flat manner, wherein the panel comprises:

   a top portion allowing a user to change the appearance of the panel;
   a core portion being a solid piece that gives the panel rigidity; and
   a bottom portion being a flat ferrous magnetic sheet,
   wherein the core portion is affixed with the top portion and the bottom portion via an adhesive agent.

2. The panel claimed in claim 1, wherein the top portion and the bottom portion of the panel are decorated with a graphics layer.

3. The panel claimed in claim 1, wherein the top portion is made with a ferrous magnetic material.

4. The panel claimed in claim 1, wherein the top portion and the bottom portion are erasable and non-scratchable.

5. The graphics layer claimed in claim 2, wherein the graphic layer includes but is not limited to a straight

road, curved road, Y-shaped road, straight train track, curved train track, river, lake, ocean, plants, vegetation, people, characters, colors, and patterns.

6. The panel claimed in claim 1, wherein the panel is having a variety of shapes, incorporating, but not confined to, squares, rectangles, triangles, trapezoids, hexagons, and octagons.

7. A tile play system with a panel, comprises:

multiple tiles with a length, width, and depth, the tiles having a solid top piece and a solid bottom piece while having a hollow space in between the solid top piece and the solid bottom piece that allows for a plurality of magnets to be placed within the tiles, and where the depth is smaller than the length and width of the tile;

wherein the plurality of magnets is placed around an inside edge of the tiles, and wherein the top and bottom pieces are attached together with a fastener;

multiple panels, the same shape as the tiles, that allow for the panels to be connected to the tiles magnetically so that they fit flatly on the tiles, wherein the panels comprise of a magnetic ferrous magnetic sheet with a decorative portion printed on one side to allow for the panels to change the appearance of the tiles when the panels are placed on top of the tiles.

8. The tile claimed in claim 7, wherein the depth of the tile is smaller than the length and width of the tile.

9. The tile claimed in claim 7, wherein the tiles are able to connect to each other via the plurality of magnets, allowing a user to create horizontal structures, vertical structures, and a combination of horizontal and vertical structures.

10. The tile claimed in claim 7, wherein at least two magnets per side around the inside edge, having alternate polarity every other magnet, continuing around the entire inside edge of the tiles.

11. The tile claimed in claim 7, wherein an even number of magnets are placed on each side of the tile.

12. The tile claimed in claim 7, wherein additional magnets are placed in the center along the length and width of the tile to enable one tile to be magnetically attached to another tile.

13. The tile claimed in claim 7, wherein additional magnets in a first tile enable a second tile to be magnetically attached to the middle of the first tile perpendicularly.

14. The tile claimed in claim 7, wherein a plurality of additional fastener points is provided in the interior of the tile, where the points are found in the center of the length and width of the tile.

15. The tile claimed in claim 7, wherein the tiles are connected together horizontally or vertically via magnets to any other tile, as long as the sides of the tiles are of equal lengths or widths.

16. The tile claimed in claim 7, wherein tiles with sides of different lengths or widths are connected to each other when the length or widths of the sides on the larger side of the tile is a multiple of the length or width of the smallest side of another tile.

17. The panel and the tile claimed in claim 7, wherein the panel and the tile are identical in shape and size.

18. The panel and the tile claimed in claim 7, wherein the panel is thinner than the tile to attach the panel with the tile and to rest flatly against the tile.

19. The panel and the tile claimed in claim 7, wherein the panel and the tile are attached magnetically to enable the user to perform various amusement activities that include but are not limited to running a car, running a train, and drawing.

20. A method of assembling a plurality of panels and a plurality of tiles to create a tile play structure, wherein the plurality of panels comprises a top portion, a core portion, and a bottom portion, the method comprising:

a) selecting a shape from a plurality of tiles;
b) arranging each of the tiles in horizontal, or vertical, or at an angle in order to prepare a base of the tile play structure;
c) selecting a plurality of panels based on the shape of the plurality of tiles;
d) selecting the plurality of panels based on a graphics affixed on the top portion;
e) attaching magnetically the plurality of panels with the plurality of tiles; and
f) enabling the user to perform the amusement activity over the attached panels.

21. A method for assembling a tile play system, comprising the steps of:

Providing multiple tiles, each having a length, width, and depth, wherein the tiles include a solid top piece and a solid bottom piece, with a hollow space in between allowing for the placement of a plurality of magnets, the depth being

smaller than the length and width of the tile;
Placing the plurality of magnets around an inside edge of the tiles;
Attaching the top and bottom pieces of the tiles together at the corners vertically using a fastener;
Providing multiple panels, each having the same shape as the tiles;
Connecting the panels to the tiles magnetically, allowing the panels to fit flatly on the tiles; and
Constructing the panels with a magnetic ferrous sheet and a decorative portion printed on one side, facilitating a change in the appearance of the tiles when the panels are placed on top of the tiles.

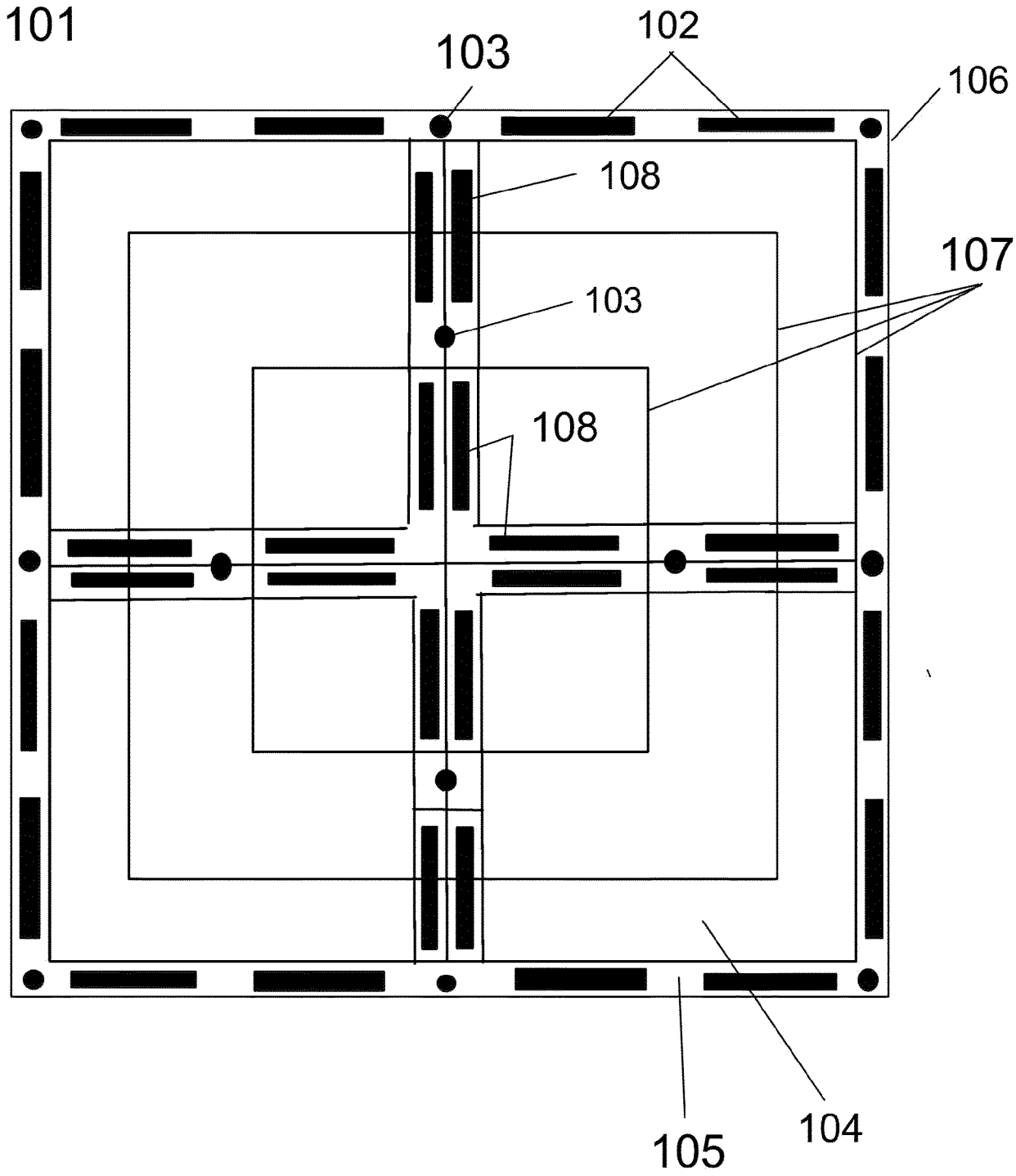
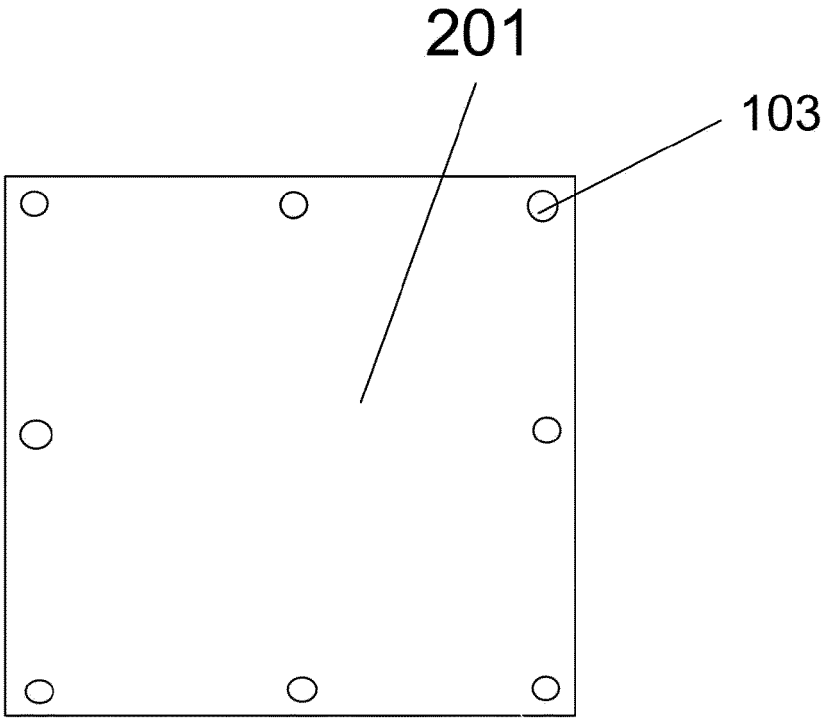


Figure 1



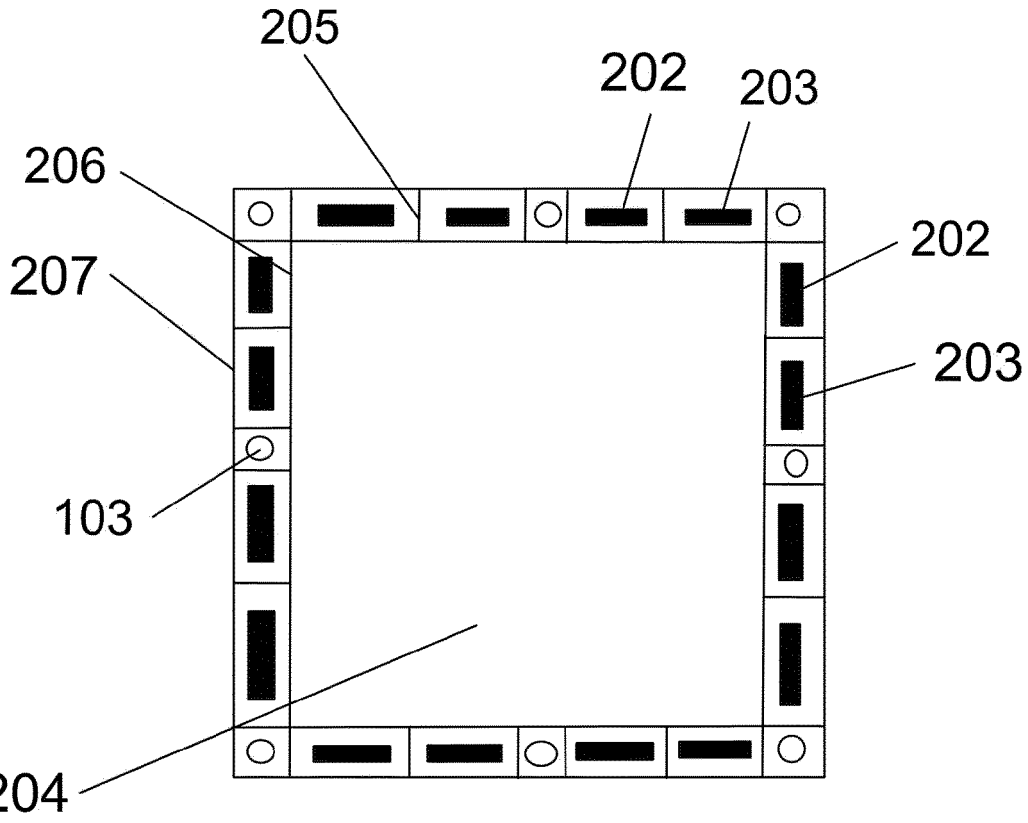


Figure 2

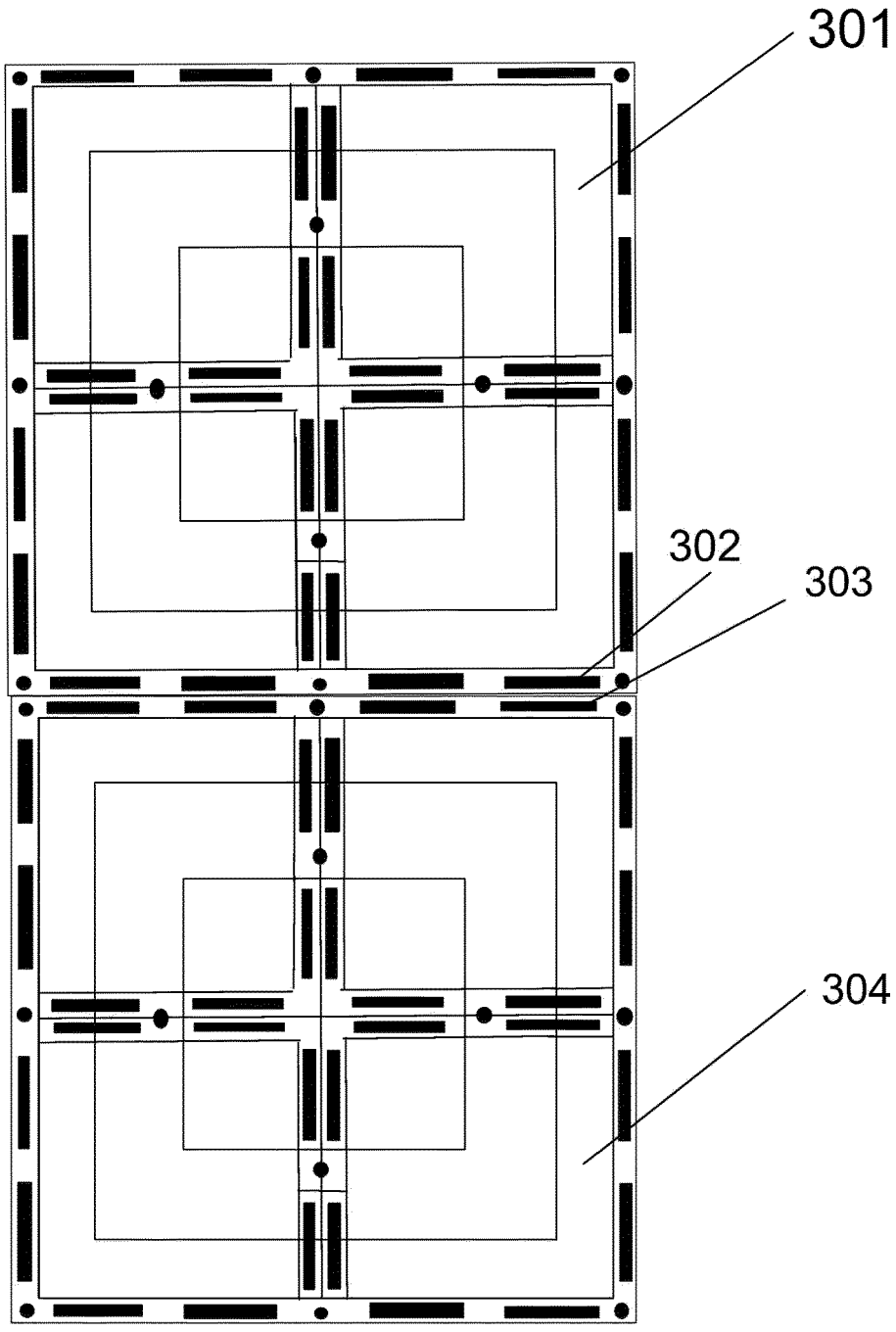


Figure 3

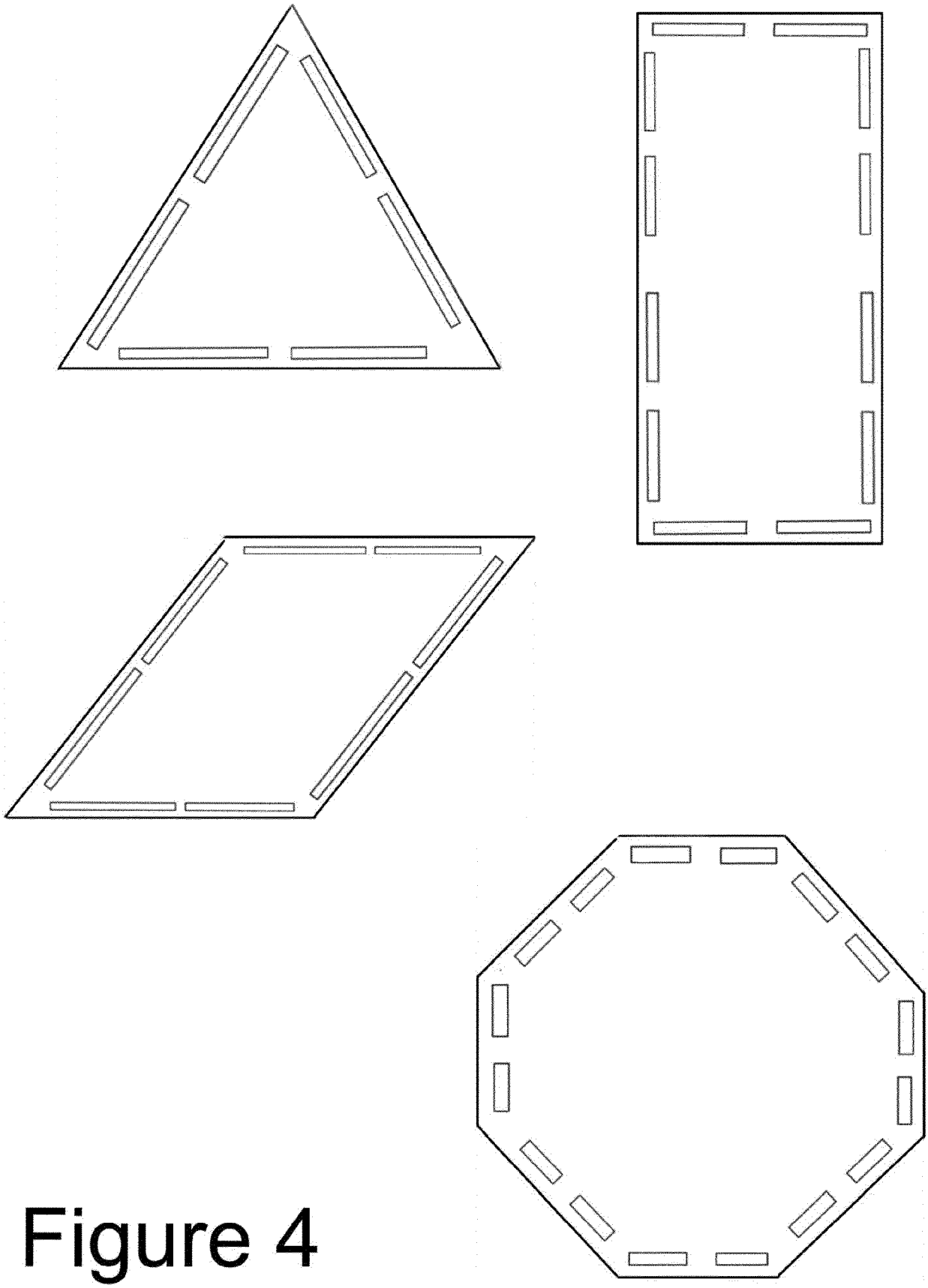


Figure 4

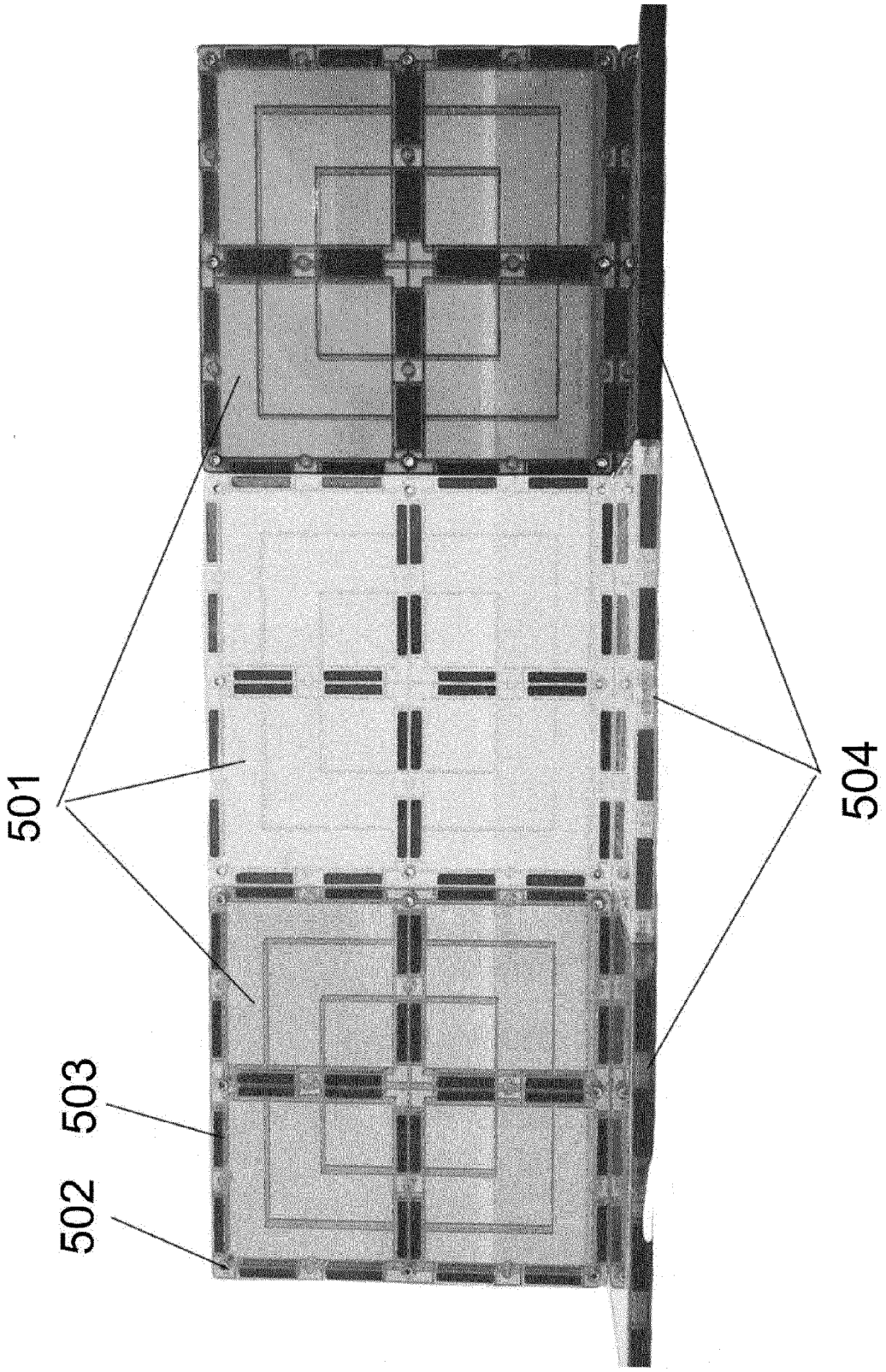


Figure 5

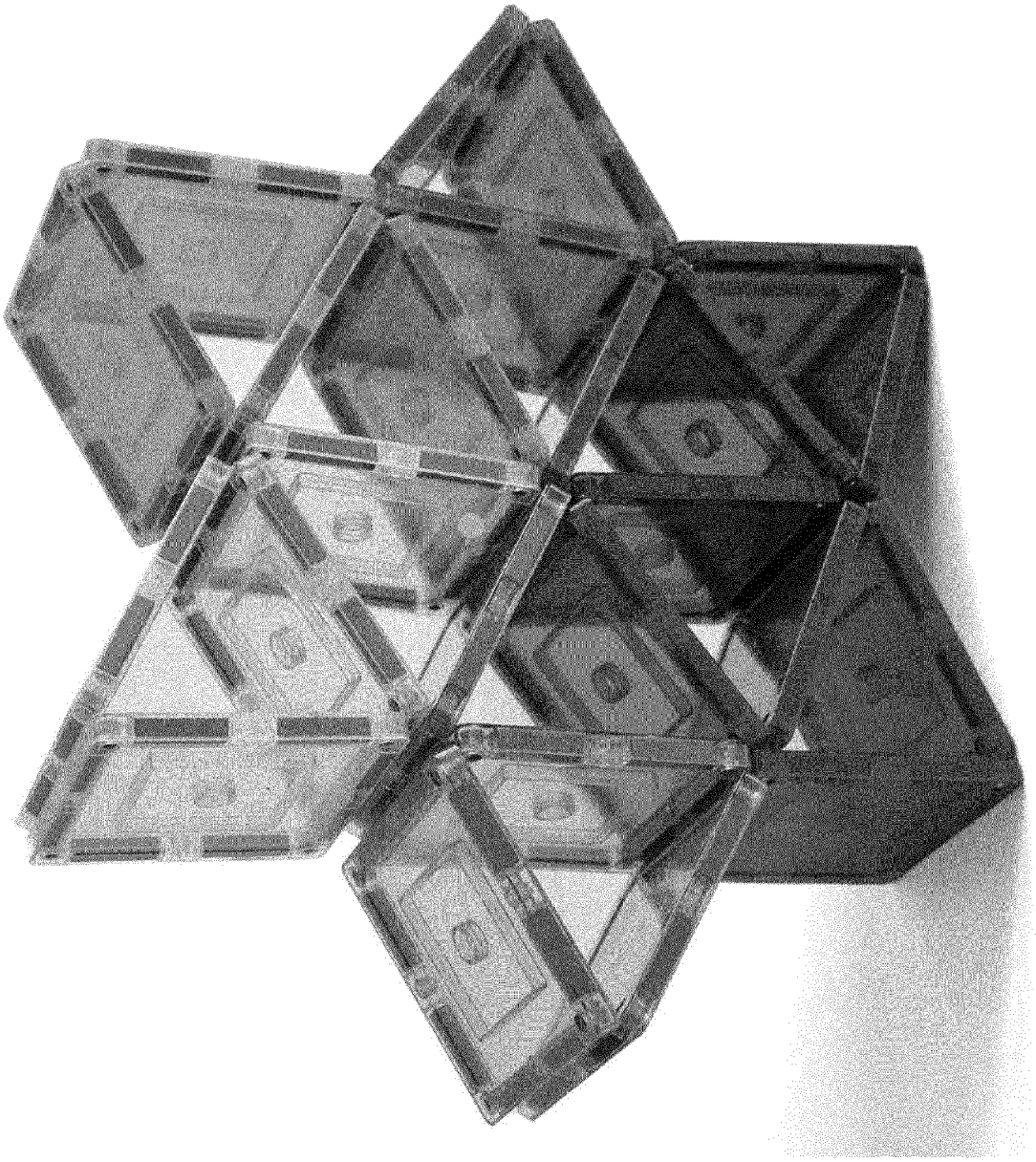


Figure 6

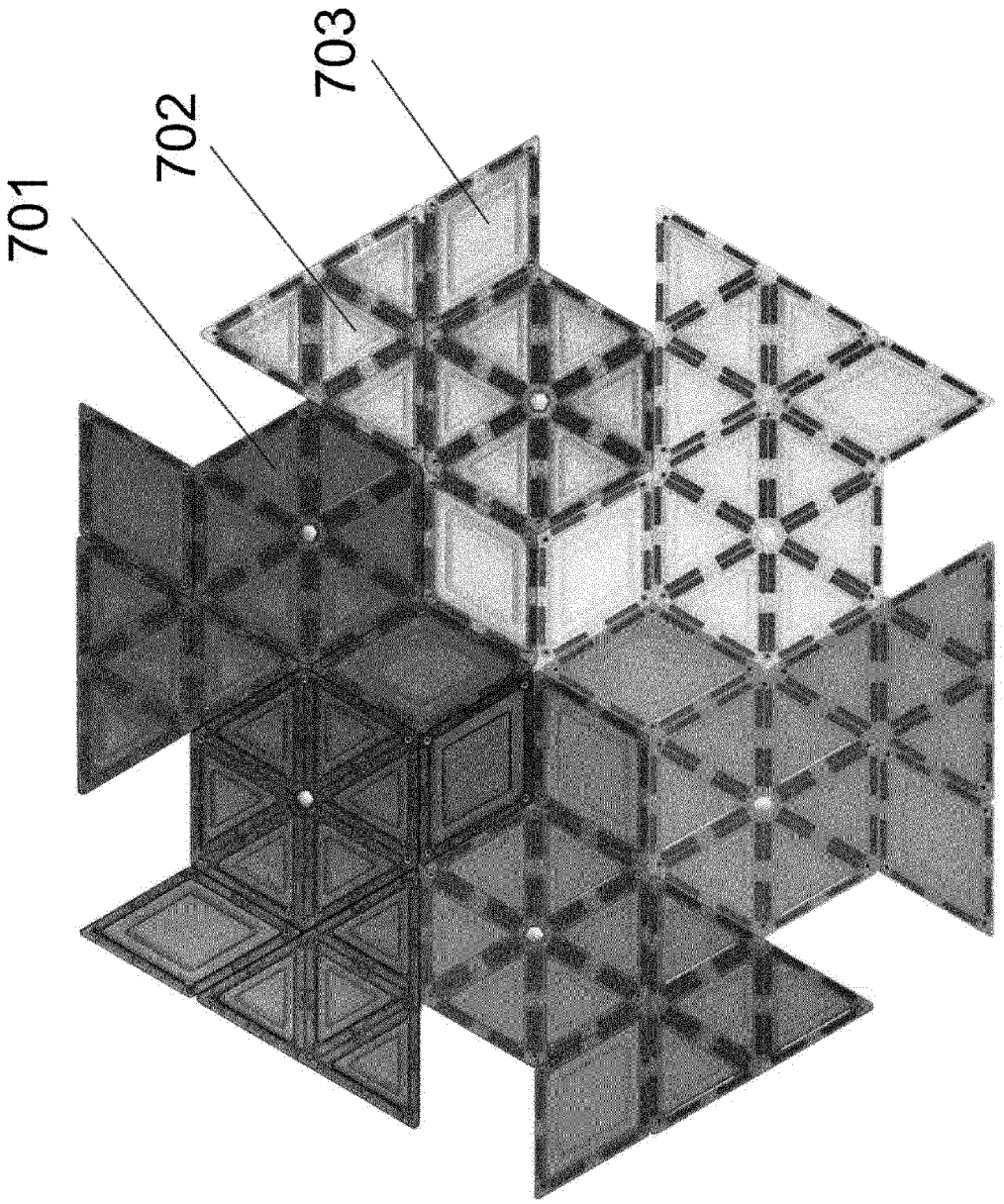


Figure 7

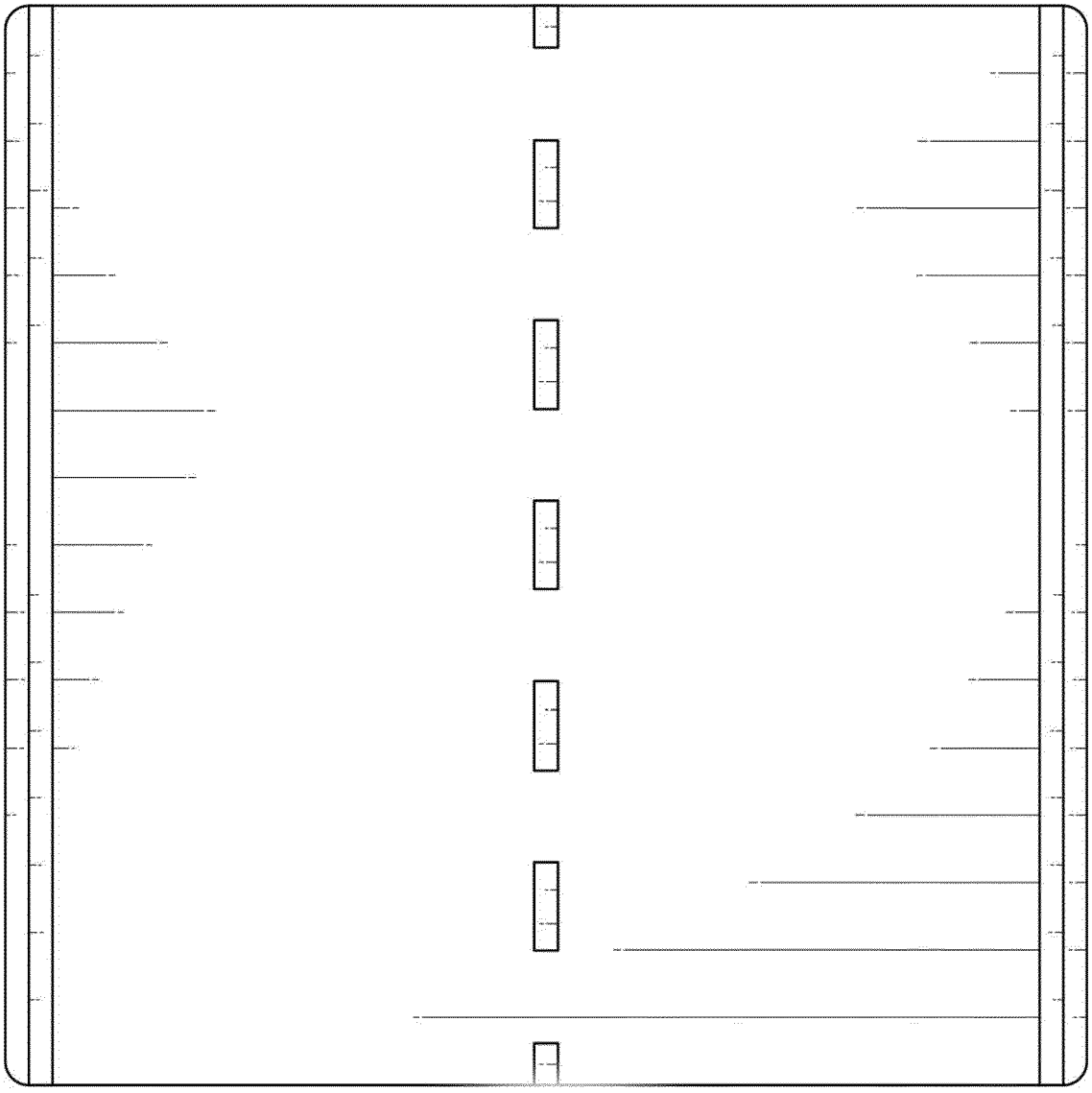


Figure 8

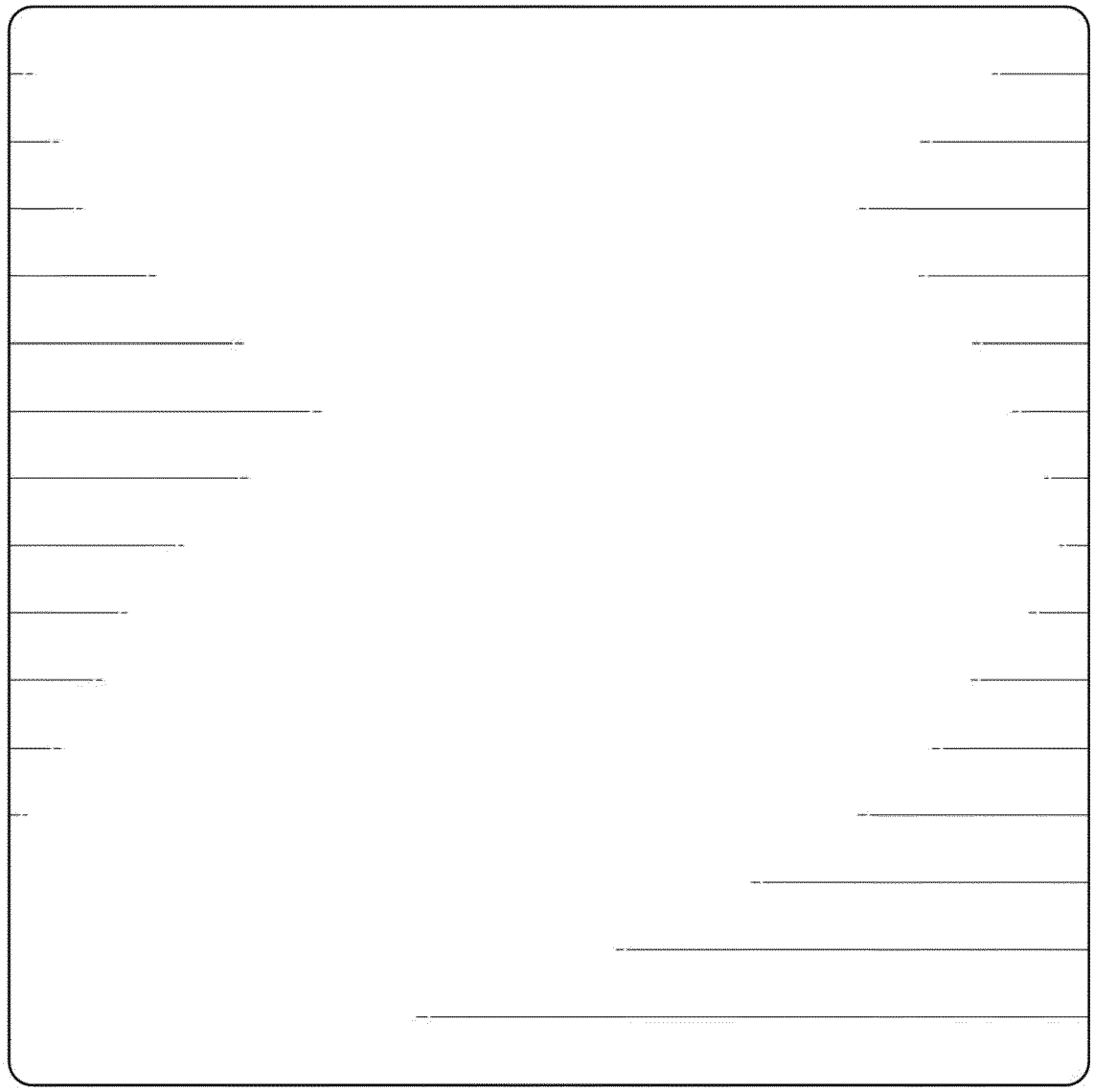


Figure 9

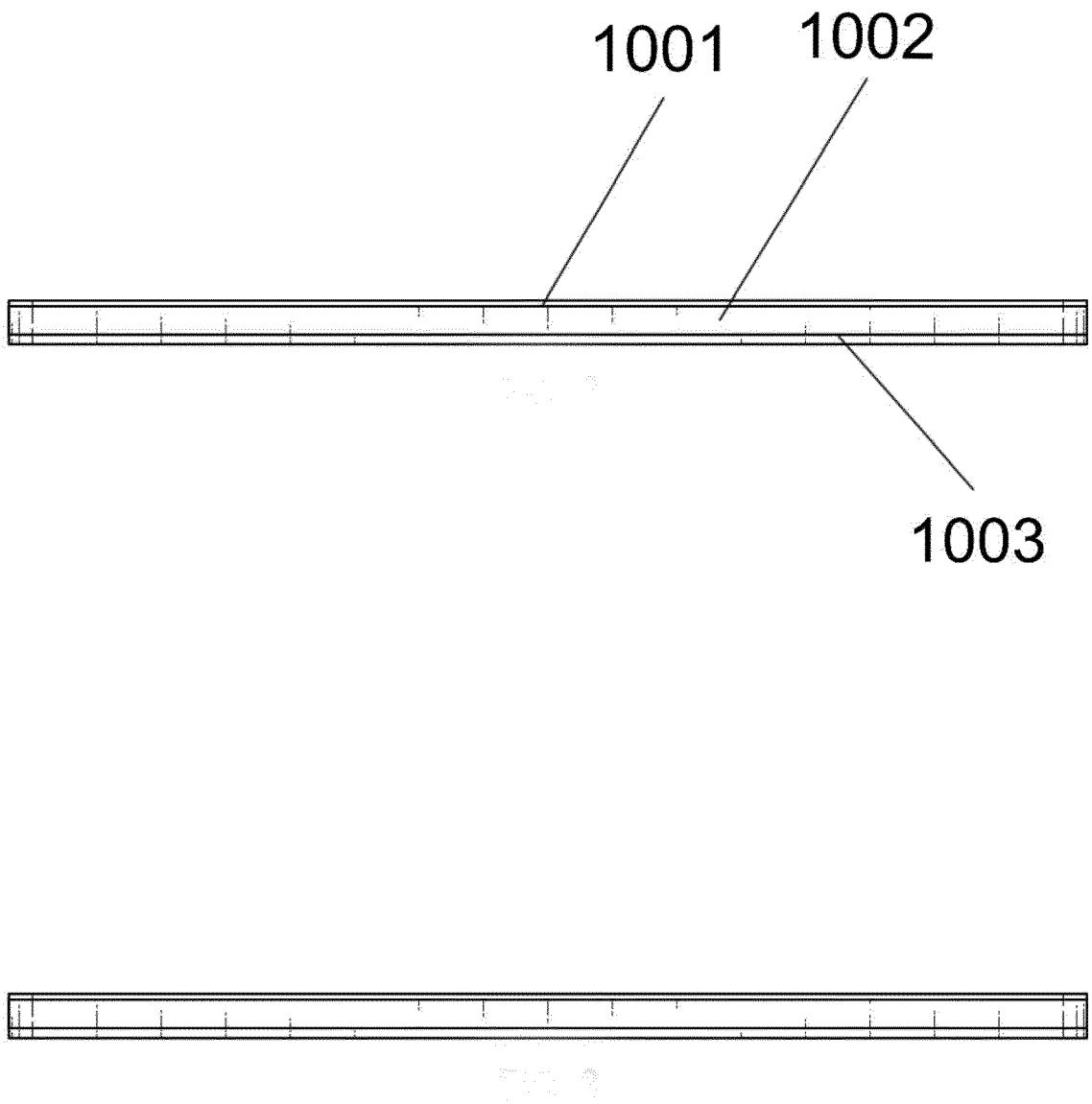


Figure 10

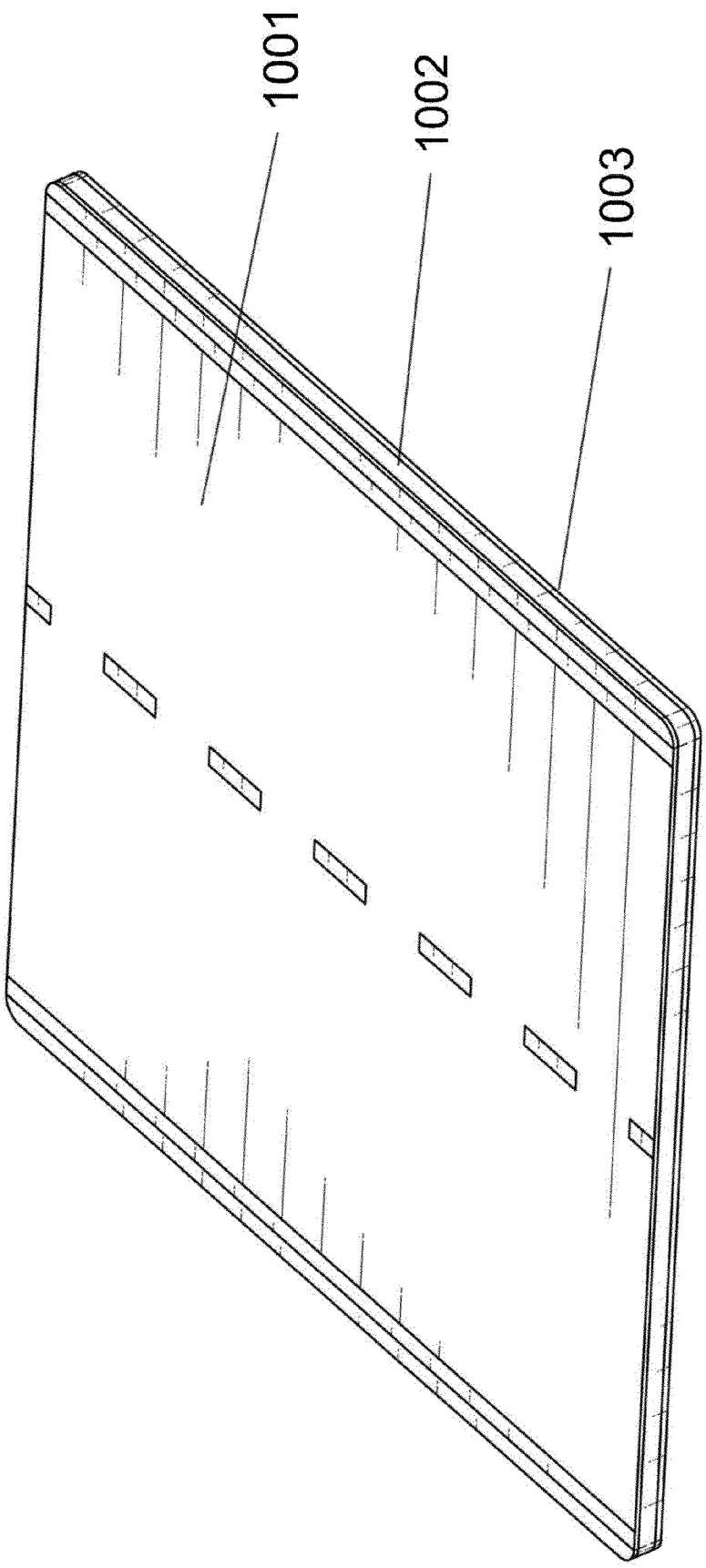


Figure 11

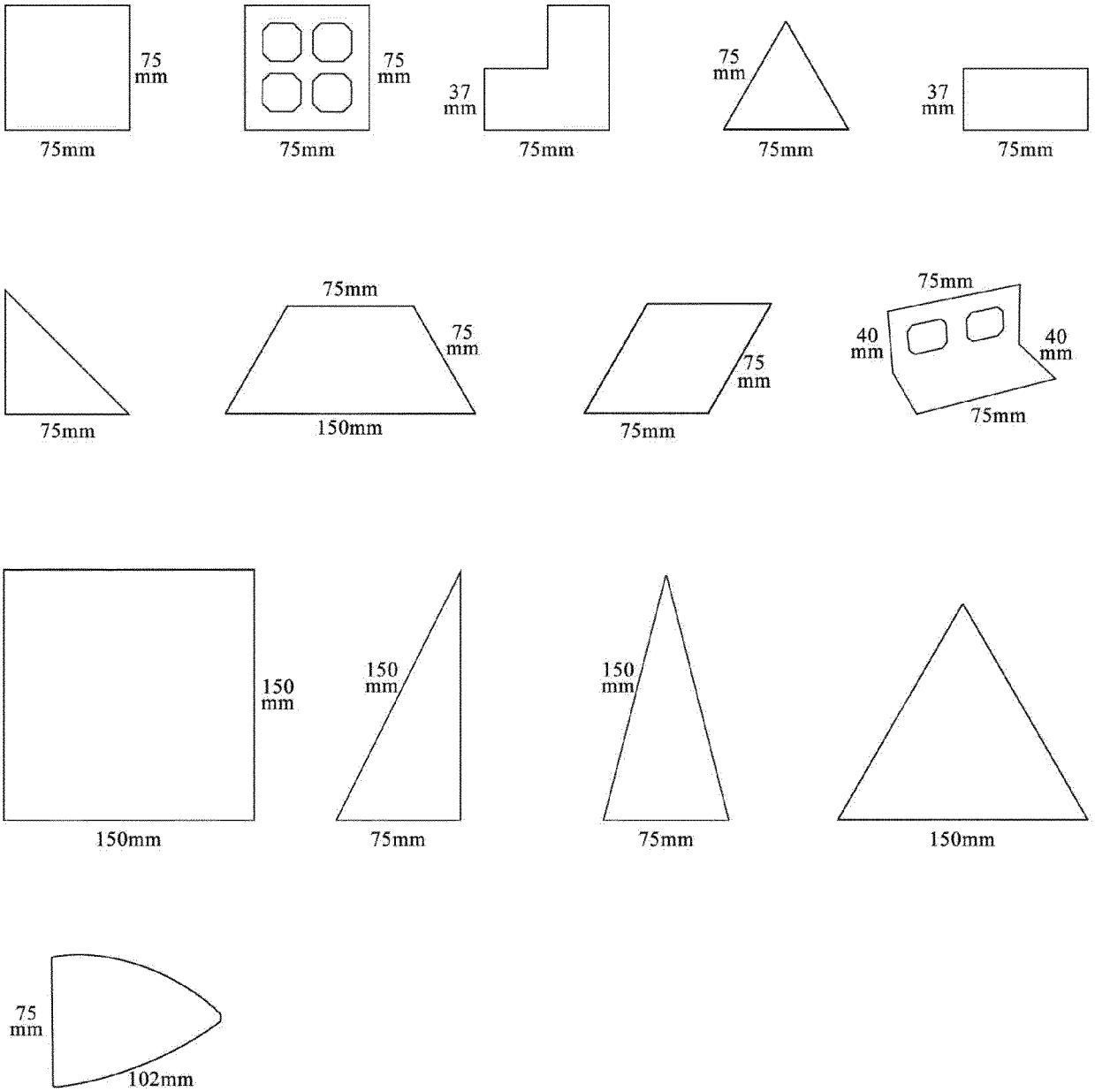

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Figure 12

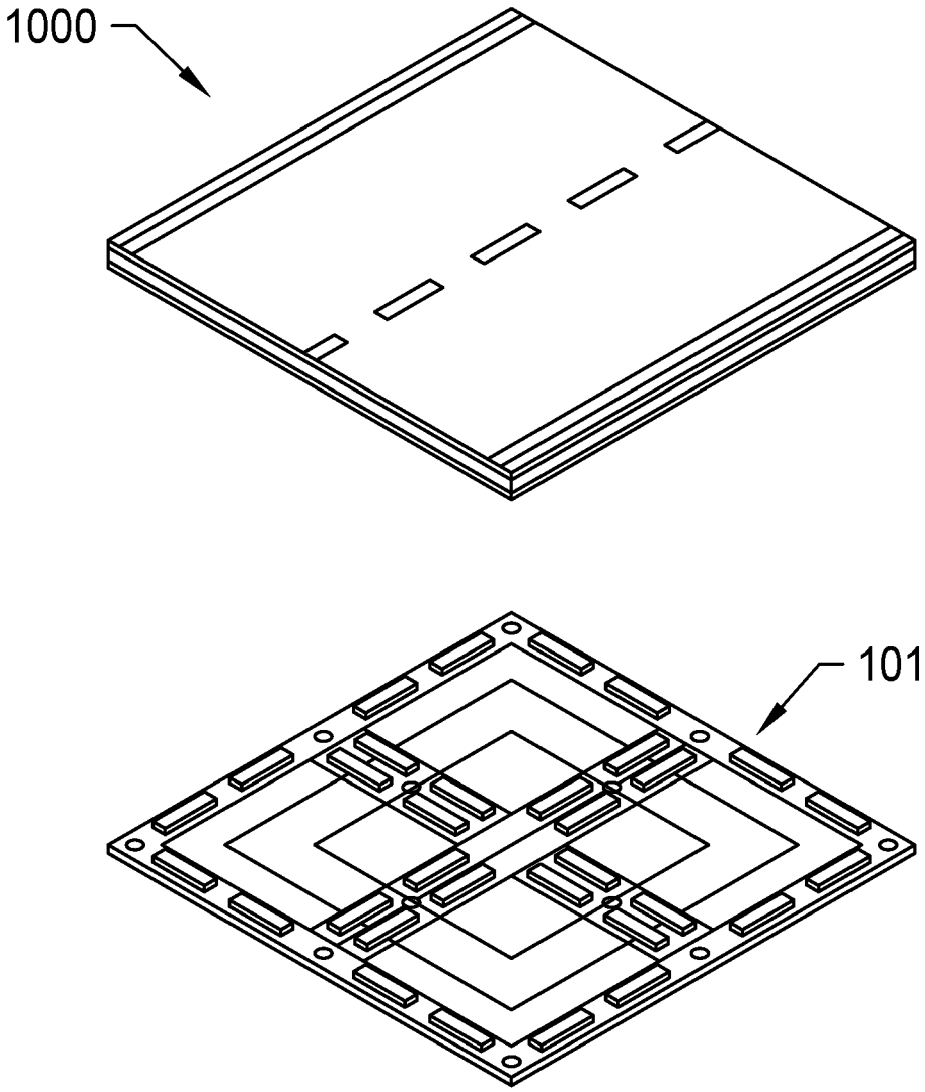

FIG. 13

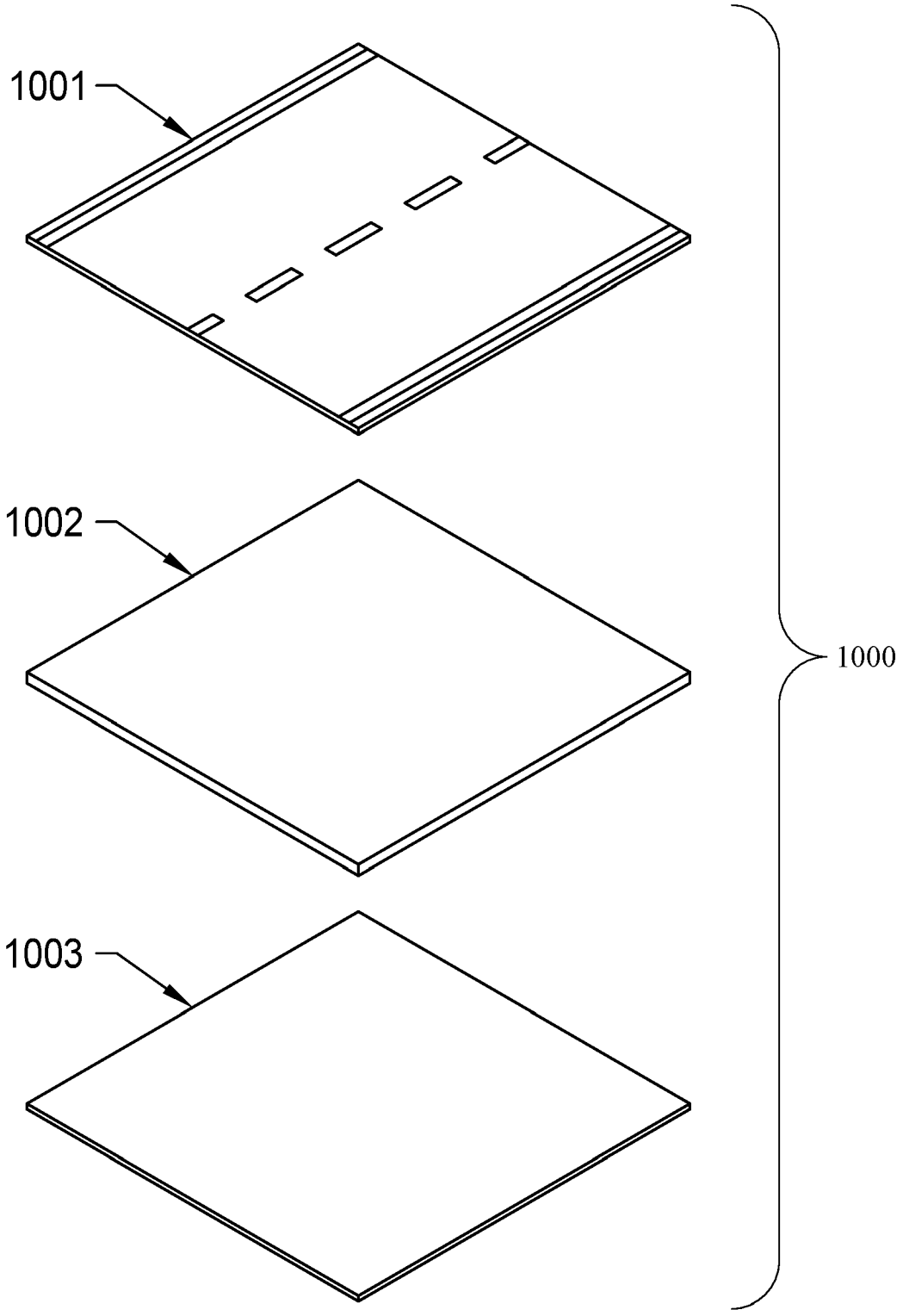

FIG. 14

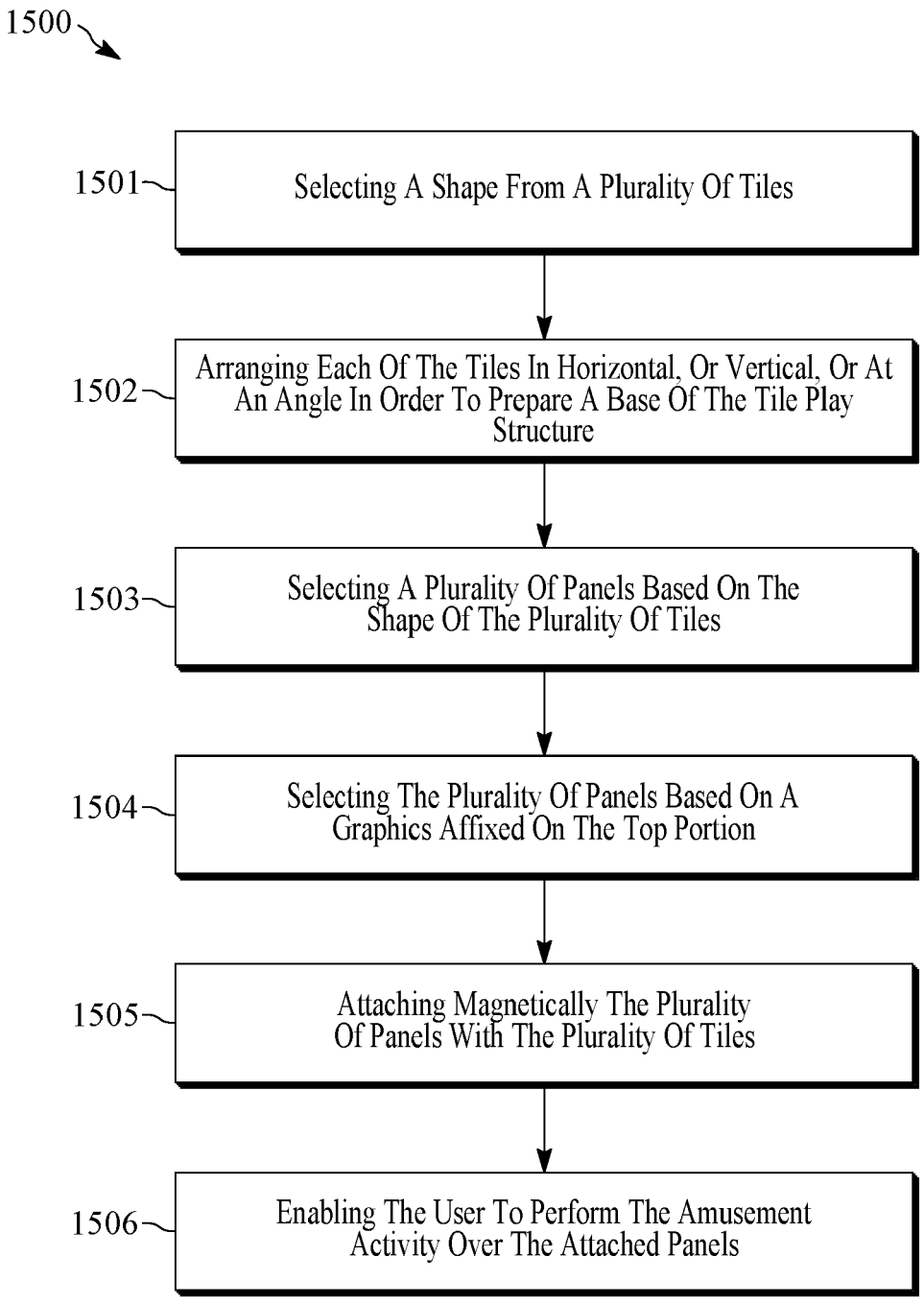
1500
1501
Selecting A Shape From A Plurality Of Tiles
1502
Arranging Each Of The Tiles In Horizontal, Or Vertical, Or At An Angle In Order To Prepare A Base Of The Tile Play Structure
1503
Selecting A Plurality Of Panels Based On The Shape Of The Plurality Of Tiles
1504
Selecting The Plurality Of Panels Based On A Graphics Affixed On The Top Portion
1505
Attaching Magnetically The Plurality Of Panels With The Plurality Of Tiles
1506
Enabling The User To Perform The Amusement Activity Over The Attached Panels

FIG. 15

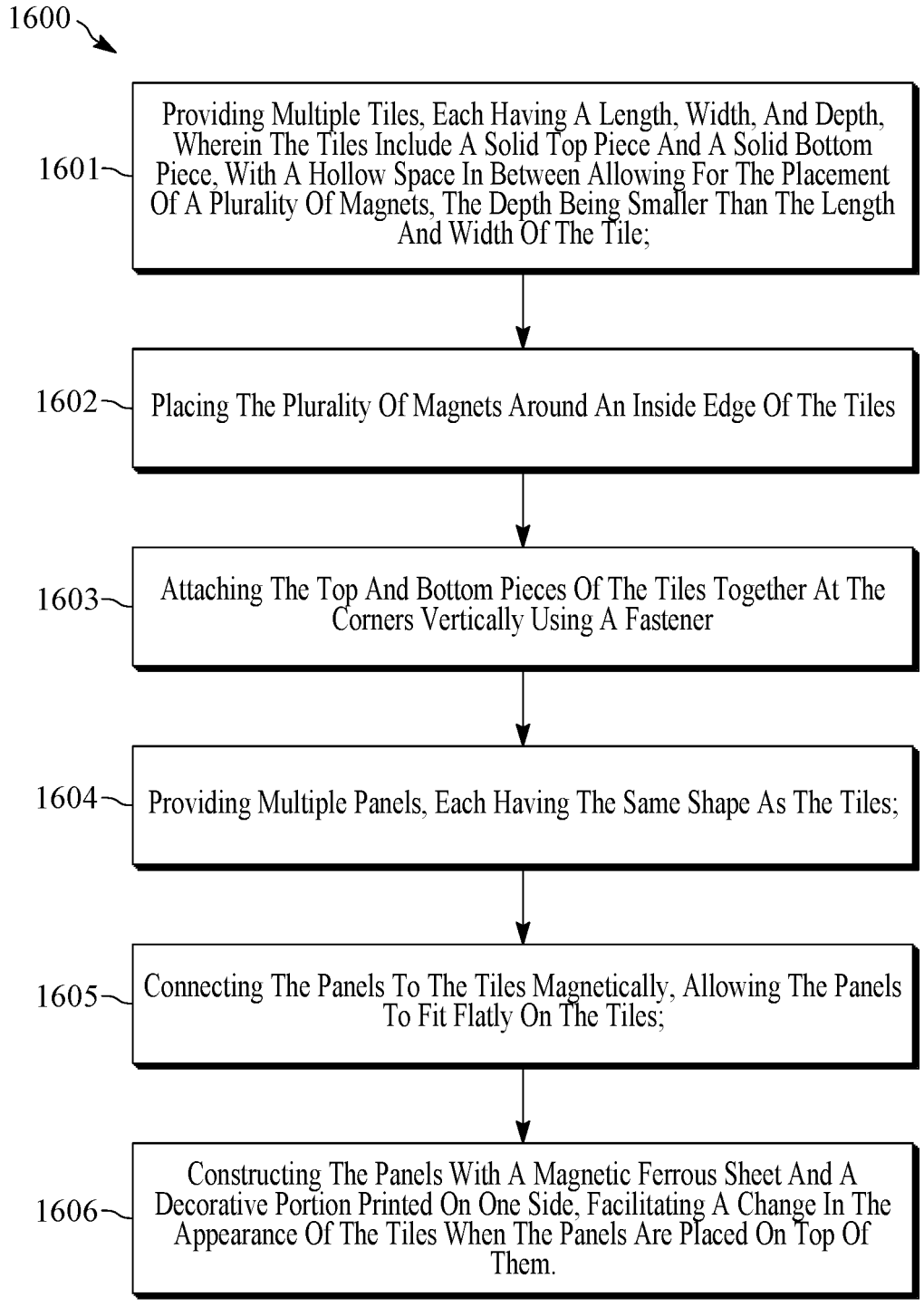
1600
1601
Providing Multiple Tiles, Each Having A Length, Width, And Depth, Wherein The Tiles Include A Solid Top Piece And A Solid Bottom Piece, With A Hollow Space In Between Allowing For The Placement Of A Plurality Of Magnets, The Depth Being Smaller Than The Length And Width Of The Tile;
1602
Placing The Plurality Of Magnets Around An Inside Edge Of The Tiles
1603
Attaching The Top And Bottom Pieces Of The Tiles Together At The Corners Vertically Using A Fastener
1604
Providing Multiple Panels, Each Having The Same Shape As The Tiles;
1605
Connecting The Panels To The Tiles Magnetically, Allowing The Panels To Fit Flatly On The Tiles;
1606
Constructing The Panels With A Magnetic Ferrous Sheet And A Decorative Portion Printed On One Side, Facilitating A Change In The Appearance Of The Tiles When The Panels Are Placed On Top Of Them.

FIG. 16

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PARTIAL EUROPEAN SEARCH REPORT

under Rule 62a and/or 63 of the European Patent Convention. This report shall be considered, for the purposes of subsequent proceedings, as the European search report

Application Number
EP 24 15 2934

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	US 2020/246715 A1 (BENSUSSAN BERNARD [US] ET AL) 6 August 2020 (2020-08-06) * paragraphs [0056], [0071]-[0072], [0080], [0103], [0109]-[0114], [0116], [0118], [0122]-[0125], [0127]-[0128], [0145]; figures 2, 3A, 3B, 4-6, 9, 10A, 10B, 11, 21 * -----	7-11, 14-19,21 12-14	INV. A63H33/04 ADD. A63H18/02 A63H19/30
Y	US 2020/353375 A1 (KOGURE MASAKO [JP]) 12 November 2020 (2020-11-12) * paragraphs [0018]-[0019], [0032]-[0034]; figures 2, 5 * -----	12,13	
Y	US D 831 129 S (WANG HOWARD [US]) 16 October 2018 (2018-10-16) * figures 1-2 * -----	14	
A	US 2020/360827 A1 (WANG HOWARD [US]) 19 November 2020 (2020-11-19) * the whole document * -----	7-19,21	
A	US 2022/013267 A1 (KUO YI-CHING [TW]) 13 January 2022 (2022-01-13) * the whole document * -----	7-19,21	TECHNICAL FIELDS SEARCHED (IPC) A63H

INCOMPLETE SEARCH

The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC so that only a partial search (R.62a, 63) has been carried out.

Claims searched completely :

Claims searched incompletely :

Claims not searched :

Reason for the limitation of the search:

see sheet C

Place of search	Date of completion of the search	Examiner
Munich	19 September 2024	Turmo, Robert

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
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T : theory or principle underlying the invention
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INCOMPLETE SEARCH
SHEET C

Application Number
EP 24 15 2934

Claim(s) completely searchable:
7-19, 21

Claim(s) not searched:
1-6, 20

Reason for the limitation of the search:

The search has been restricted to the subject-matter (claims 7 to 19 and 21) indicated by the applicant in his letter of 13.08.2024 filed in reply to the invitation pursuant to Rule 62a(1) EPC, and therefore, claims 1 to 6 and 20 have not been searched.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 24 15 2934

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19-09-2024

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