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(54) **User-configuration floor mat**

(57) The invention provides a user-configurable floor mat wherein a user may removably attach one or more tiles, each tile of which may contain one or more segments. Each tile may be connected to adjoining tiles via

removably attachable connectors. The removably attachable connectors may have at least one terminal end. Removably attachable connectors having at least two ends may be used to connect two or more adjoining tiles.

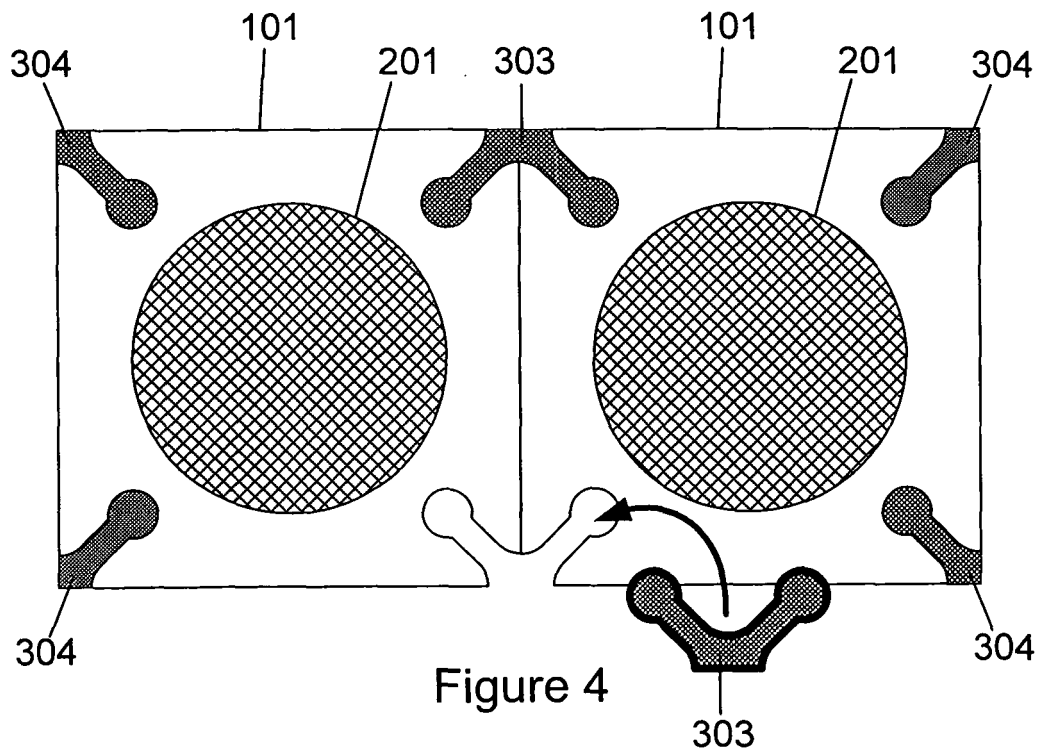


**Figure 4**

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## Description

### TECHNICAL FIELD

[0001] This invention relates in general to floor mats designed to provide a cushioned surface for a child to play or rest upon.

### BACKGROUND OF THE INVENTION

[0002] This invention relates in general to floor mats designed to provide a cushioned surface for a child to play or rest upon.

[0003] Generic floor mats are well known in the art. In general, a floor mat acts as a cushion or barrier between one object and a floor. With respect to their use with children and infants, play mats generally are padded to provide a soft, cushioned surface for the child or infant to play or lie upon. Preferably the play mats are colorfully decorated to provide a pleasing appearance to the child.

[0004] Floor mats for use by infants and children fall into two fairly broad categories: fixed-size mats, and variable-size mats. Of these two, the later is currently composed of two types: mats in which at least one edge has male and/or female slotted components, and mats in which at least one edge has male and female mating components (e.g., Velcro™, snaps, domes). In both types, the edges of a particular tile are not "fixed" per se, as the edge must include the mechanisms used to connect one tile to another. Thus, the line of contact between mating edges will be continuous, but the edges of the various tiles making up the circumference of the variable-size mat will be broken by un-mated connecting components, resulting in a tripping hazard.

[0005] The present invention overcomes a number of drawbacks of the prior art, unitary play mats.

[0006] The present invention uses removably attachable connectors to connect adjoining tiles eliminating hazards associated with unconnected edges. Further, the present invention allows greater freedom for the end user in fashioning a user-configured size and shape, even if that shape is irregular, since the circumference, even of an irregular shape, will be fully continuous and have no extraneous components, or open or unfinished edges.

### SUMMARY OF THE INVENTION

[0007] The invention comprises several general aspects. Each of those can if desired be combined with additional features, including features disclosed and/or not disclosed herein, the resultant combinations representing more detailed optional embodiments of these aspects.

[0008] A first aspect of the invention is an apparatus useful as a play or rest area for an infant or child, comprising at least two tiles, each of which shares at least a portion of one edge with at least one other adjacent tile,

wherein the tiles are connected via at least one removably attachable connector, and wherein the placement and positioning of the tiles is determined solely by the end-user. Said tiles may be of the same shape, or may be of different shapes. Further, said tiles may be of regular or irregular shapes, and may comprise repeating and/or non-repeating edges (e.g., saw tooth pattern).

[0009] In various embodiments of this aspect the completed mat may additionally comprise at least one null connector.

[0010] In other embodiments, at least one of said tiles may comprise at least one removably attachable segment internal to said tile. Said segment may comprise a geometric shape, a symbol, an alphanumeric character, a sign, a roadway, a railway, or a river/river bank. In certain forms of these embodiments, at least one additional segment may be nested within another segment.

[0011] In certain embodiments, the terminal end of said connector(s) may be configured such that it will not disengage from connected tiles when confronted with a force coplanar to the plane formed by the tile(s) and the connector(s). In certain related embodiments, the terminal end of the connector may be configured such that it will operably engage/disengage from connected tiles when confronted with a force perpendicular to the plane formed by the tile(s) and the connector(s).

[0012] In yet other embodiments, the material comprising at least one of said tiles, connectors and/or segments may consist, at least in part, of polymer, including, but not limited to EVA or PVC, or of rubber. In various related embodiments the materials comprising at least one of said tiles and at least one of said connectors, at least one of said tiles and at least one of said segments, and/or at least one of said connectors and at least one of said segments, may be the same, or may be different.

[0013] In certain embodiments, at least one surface of said tile(s), connector(s) and/or segment(s) may be smooth, that is, without a manufactured texture or pattern. In other embodiments, at least one surface of said at least one tile, at least one segment, and/or at least one connector may be plain or may comprise at least one picture and/or pattern. In still other embodiments, said at least one tile, at least one segment, and/or at least one connector may be covered with a decal. In various forms of this embodiment, the decals may be permanent, or may be removably attachable.

### ADVANTAGES OF THE INVENTION

[0014] The following discussion of advantages is not intended to limit the scope of the invention, nor to suggest that every form of the invention will have all of the following advantages. As will be seen from the remainder of this disclosure, the present invention provides a variety of features. These can be used in different combinations. The different combinations are referred to as embodiments. Most embodiments will not include all of the disclosed features. Some simple embodiments can include

a very limited selection of these features. Those embodiments may have only one or a few of the advantages described below. Other preferred embodiments will combine more of these features, and will reflect more of the following advantages. Particularly preferred embodiments, that incorporate many of these features, will have most if not all of these advantages. Moreover, additional advantages, not disclosed herein, that are inherent in certain embodiments of the invention, will become apparent to those who practice or carefully consider the invention.

**[0015]** The foregoing and other objects of the invention are achieved by the apparatus described herein which overcome problems inherent in traditional floor mats and associated devices. Those problems the inability to configure the mat into a user desired shape due to limitations in the connection mechanisms associated with individual tiles making up the mat, or tripping hazards inherent in non-mated sides of traditional mats which expose their connection mechanisms.

**[0016]** Thus, when compared to other floor mats the user-configurable floor mat offers several new and important advantages. The advantages offered by the various embodiments of this invention include:

- Continuous edges - no more safety hazards presented by unmated edge connectors;
- Arbitrary tile sizes and/or shapes - no more need to have uniform tiles since the connection mechanism is independent of the tile;
- User-defined tile layouts(no longer restricted to simple grids) ;
- The ability to incorporate multiple, different internal segments, allowing for user-defined patterns, arrays, and appearance; and
- The ability to incorporate a wide assortment of decals, which enable the creation of user-defined scenes and/or themes, e.g., underwater, farms, construction site.

## DESCRIPTION OF THE DRAWINGS

**[0017]** The drawings included herein are viewed top-down, with only figure 10 showing an edge-on view. The tiles, segments and connectors can be of arbitrary thickness, but the tiles, segments and connectors used in a particular mat are most likely to be of the same thickness to provide a uniform surface when assembled.

**[0018]** Figure 1 through 5 illustrates one of the more typical basic tile shapes 101 usable with the present invention, and in successive drawings, details the components of said tile and how multiple tiles may be joined.

**[0019]** Figure 1 shows a basic tile shape 101, in this case, a "square", which contains at least one internal

segment in the form of a geometric shape 201, in this instance, a circle. It should be noted that several other combinations and/or variations of basic tile shapes and internal segment(s) will be obvious to those skilled in the art.

**[0020]** Figure 2 shows four different removably attachable connectors, 301, 302, 303, and 304, the first three of which can connect at least two adjoining tiles, and the last being a "null" connector, used to provide a continuous edge to the user-configurable floor mat.

**[0021]** Figure 3 details a basic assembly for a single tile, comprising the tile 101, an internal segment 201, and four "null" connectors 304.

**[0022]** Figure 4 repeats this assembly of tiles 101, segments 201 and connectors 304, 303, herein detailing two adjoining tiles joined by two multi-head connectors 303.

**[0023]** Figure 5 further repeats this assembly, herein showing six tiles 101, each with at least one internal segment 201, connected in a 2 x 3 grid. In this configuration, there are four null connectors 304, six two-headed connectors 303, and two four-headed connectors 301.

**[0024]** Figure 6 details the ability of the present invention to combine tiles of different shapes and dimensions, in this instance, a square tile 101 and a rectangular tile 102. Figure 6 further details different types of internal segments which can be used without regard to the shape of the tile, specifically, geometric shapes 201 (circles, ovals, and triangles), symbols 202 (sun, airplane), alphanumeric characters 203 (the letter "A"), and signs 204, along with decals in the form of a roadway pattern 401.

**[0025]** As is obvious from the "hollows" shown at the adjoining edges, these tiles would be connected using connectors 301, 302, 303 and 304.

**[0026]** Figure 7 details another type of basic tile, a hexagonal tile 103. Figure 7 further details different types of internal segments which can be used without regard to the type of tile, specifically, geometric shapes 201 (circles, triangles, and a set of nested squares), symbols 202 (star, wave), and alphanumeric characters 203 (the letter "B"). It is further shown that tiles can exist without any internal segment.

**[0027]** As is obvious from the "hollows" shown at the adjoining edges, these tiles would be connected using connectors 305, 306 and 307.

**[0028]** Figure 8 details yet another type of basic tile, a triangular tile 104. Figure 8 further details different types of internal segments which can be used without regard to the type of tile, specifically, symbols 202 (automobile, house, and sun & clouds), and alphanumeric characters 203 (the letter "Z", and the numerals 1 and 2). It is further shown that tiles can exist without any internal segment.

**[0029]** As is obvious from the "hollows" shown at the adjoining edges, these tiles would be connected using connectors 308 and 309.

**[0030]** Figure 9 details some of the other potential terminal ends available within the present invention as compared to the previously identified rounded head terminal end, an example of which is shown in the null connector

309. Each of the designs shown would enable the connector to be securely lodged into the tile. The terminal ends shown include, but are not limited to, arrow heads, hooks, diamonds, triangles, and "hammer" heads.

**[0031]** Figure 10 details the direction of the forces capable of being resisted by the terminal end of the invention's removably attachable connectors.

**[0032]** A basic tile 101, in this case a square, is shown both in top view, and edge-on. In normal use, adjacent tiles would experience the majority of any unsupported forces within the X-Y plane (as would be documented through a simple free body diagram of, for example, someone stepping off of one tile). While the floor beneath the tile would counteract the downward force on the tile, only friction with the floor and the adjoining tiles would counteract any lateral forces imparted. Thus, the terminal end of the connector 300, regardless of the terminal ends' shape or configuration, is required to be securely lodged into a tile such that it can not be removed regardless of the direction of the lateral force(s) imparted. However, the connector, in order to be removably attachable, offers little resistance to forces perpendicular to the X-Y plane. Thus, the connector offers both a secure attachment mechanism for adjacent tiles, and is easily removably attachable.

#### Claims

1. A user-configurable floor mat comprising at least two tiles and at least one removably attachable connector wherein at least two adjacent tiles are positioned in a configuration selected by the end-user, and wherein said adjacent tiles are connected by said removably attachable connector.
2. A floor mat as in claim 1 wherein said mat further comprises at least one null connector.
3. A floor mat as in claim 1 wherein at least one of said tiles further comprises at least one removably attachable internal segment.
4. A floor mat as in claim 1 wherein the terminal end of said connector is configured such that it will not disengage from connected tiles when confronted with a force coplanar to the plane formed by the tile(s) and the connector(s).
5. A floor mat as in claim 1 wherein the terminal end of the connector is configured such that it will operably engage/disengage from connected tiles when confronted with a force perpendicular to the plane formed by the tile(s) and the connector(s).
6. A floor mat as in claim 1 wherein the material comprising at least one of said tiles consists, at least in part, of a polymer.
7. A floor mat as in claim 6 wherein said polymer further comprises polyvinyl chloride (PVC).
8. A floor mat as in claim 6 wherein said polymer further comprises ethylene-vinyl acetate (EVA).
9. A floor mat as in claim 1 wherein the material comprising at least one of said tiles consists, at least in part, of rubber.
10. A floor mat as in claim 1 wherein the material comprising at least one of said tiles and the material comprising at least one of said connectors are the same.
11. A floor mat as in claim 1 wherein the material comprising at least one of said tiles and the material comprising at least one of said connectors are different.
12. A floor mat as in claim 3 wherein the material comprising at least one of said tiles and the material comprising at least one of said segments are the same.
13. A floor mat as in claim 3 wherein the material comprising at least one of said tiles and the material comprising at least one of said segments are different.
14. A floor mat as in claim 3 wherein the material comprising at least one of said connectors and the material comprising at least one of said segments are the same.
15. A floor mat as in claim 3 wherein the material comprising at least one of said connectors and the material comprising at least one of said segments are different.
16. A floor mat as in claim 1 wherein at least the upper surface of at least one of said tiles is smooth.
17. A floor mat as in claim 1 wherein at least the upper surface of at least one of said segments is smooth.
18. A floor mat as in claim 1 wherein at least the upper surface of at least one of said connectors is smooth.
19. A floor mat as in claim 1 wherein at least one of said tiles is covered with at least one removably attachable decal.
20. A floor mat as in claim 3 wherein at least one of said segments is covered with at least one removably attachable decal.
21. A floor mat as in claim 1 wherein at least one of said connectors is covered with at least one removably attachable decal.

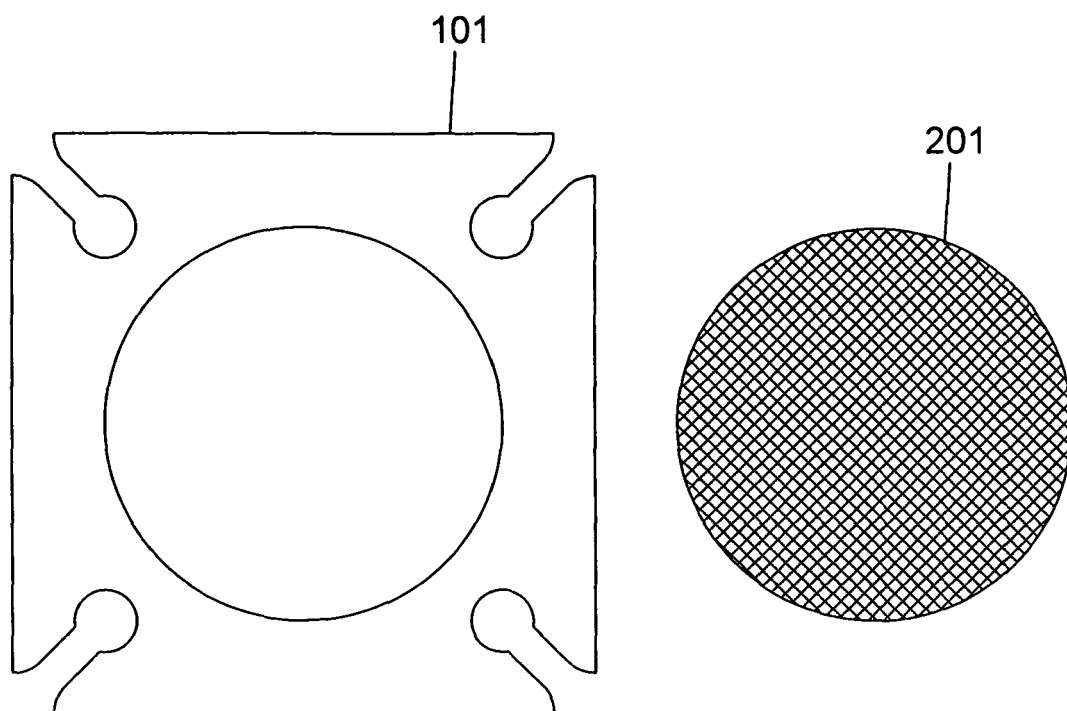


Figure 1

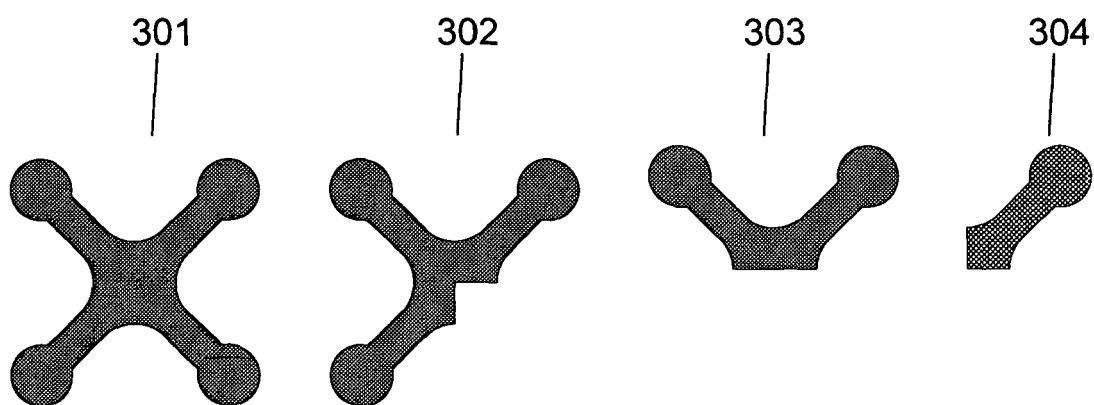


Figure 2

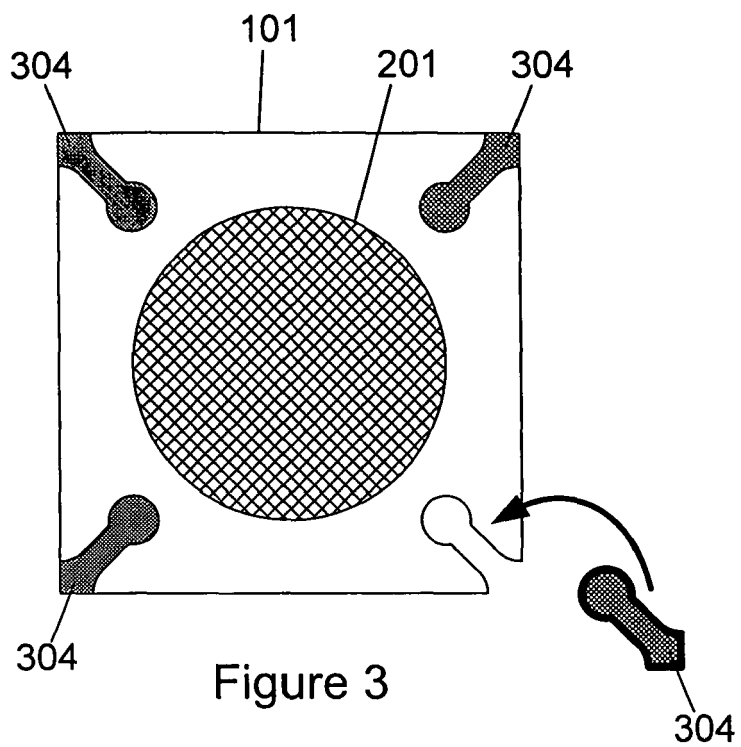


Figure 3

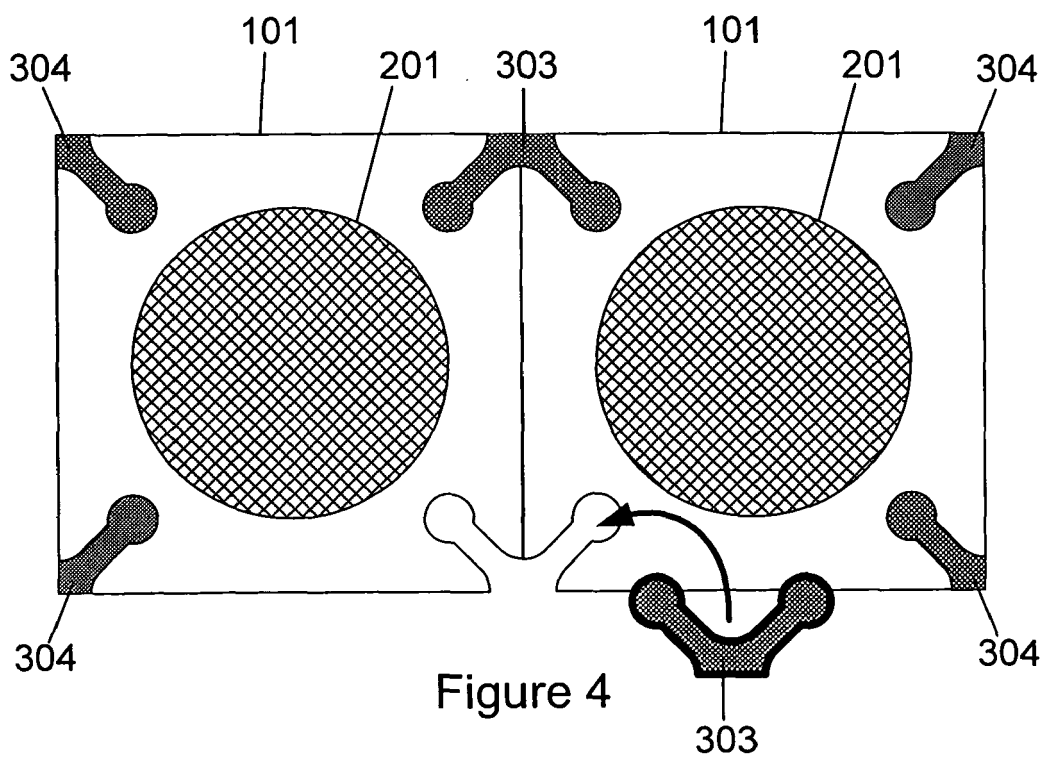


Figure 4

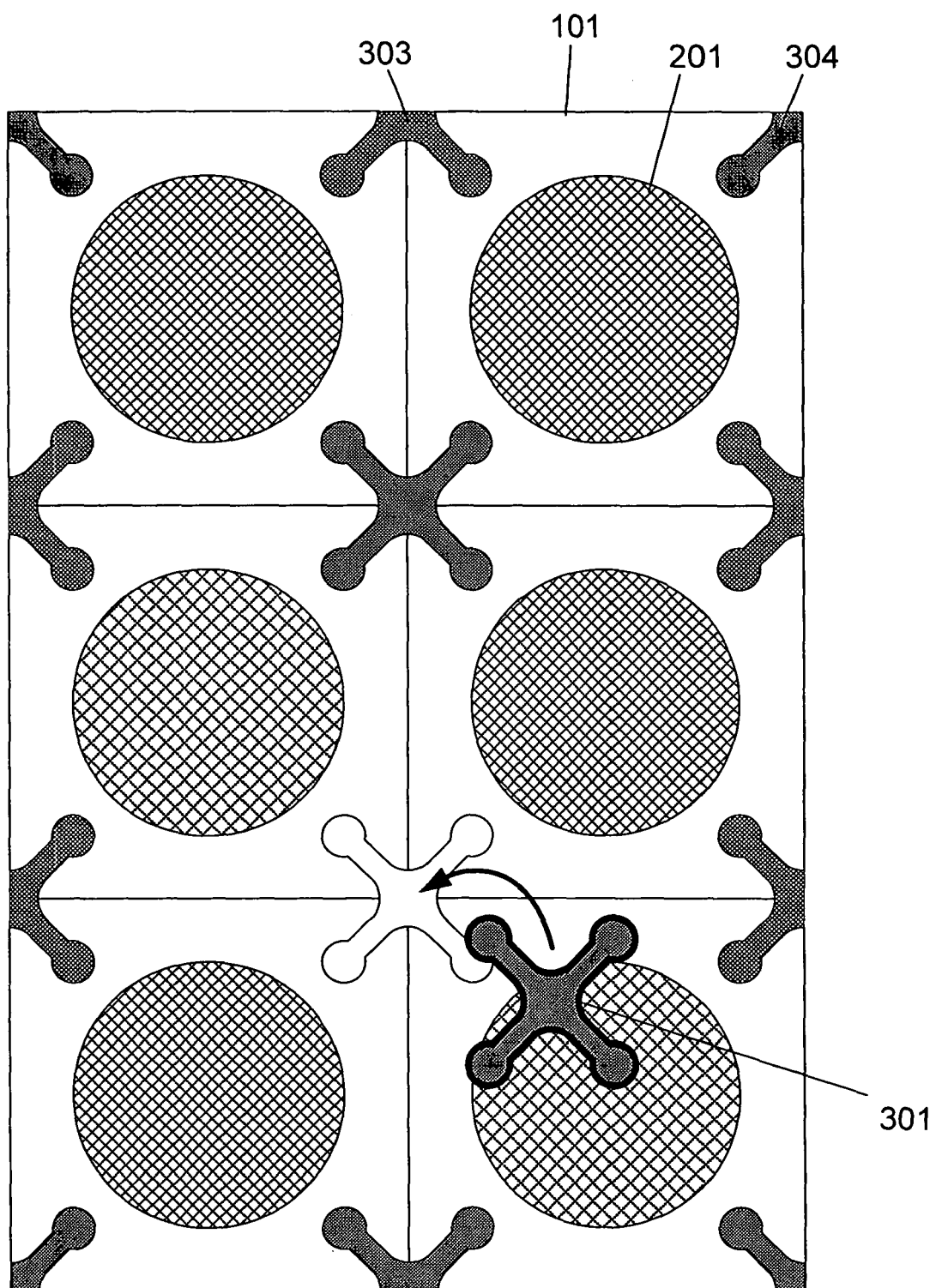


Figure 5

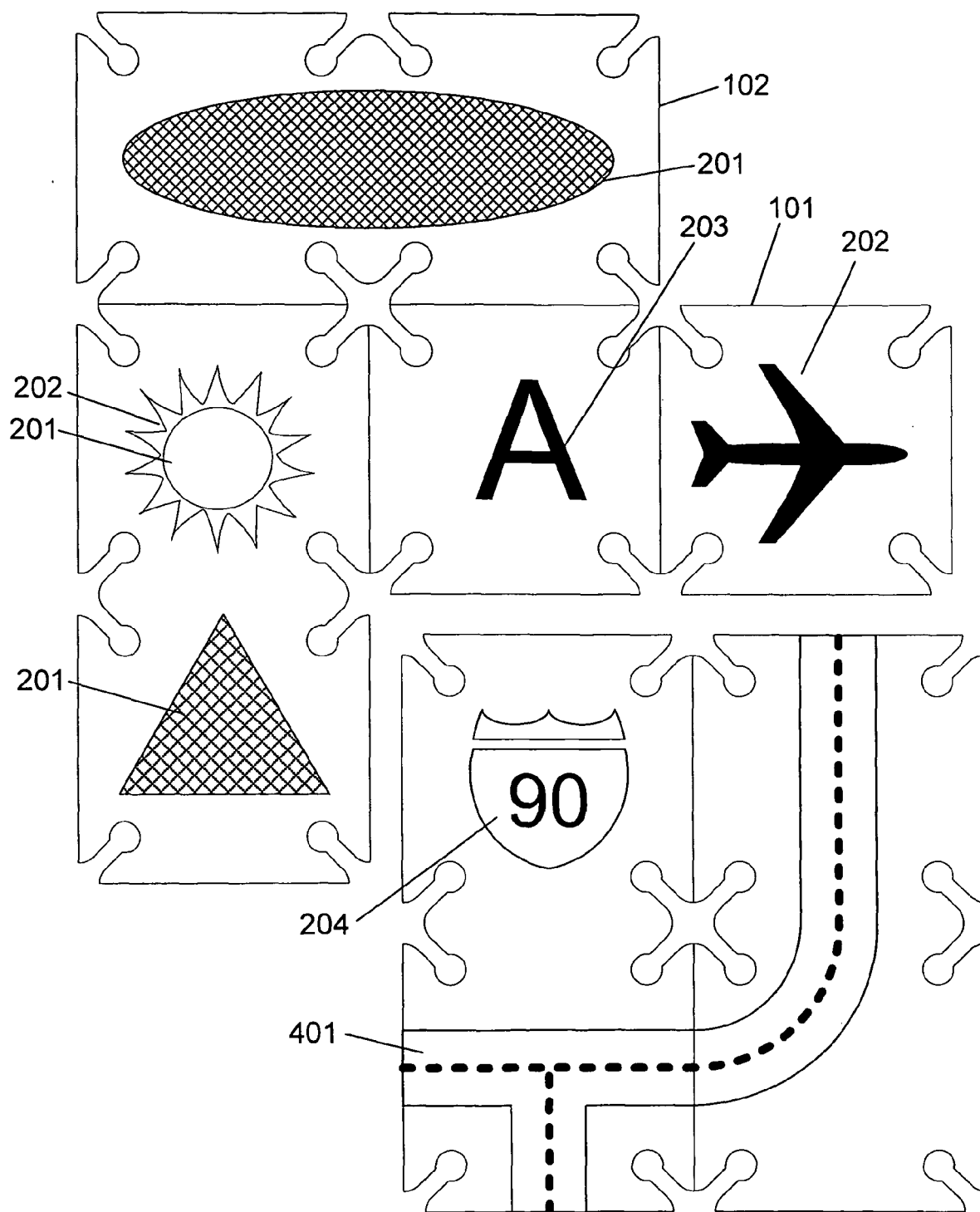


Figure 6

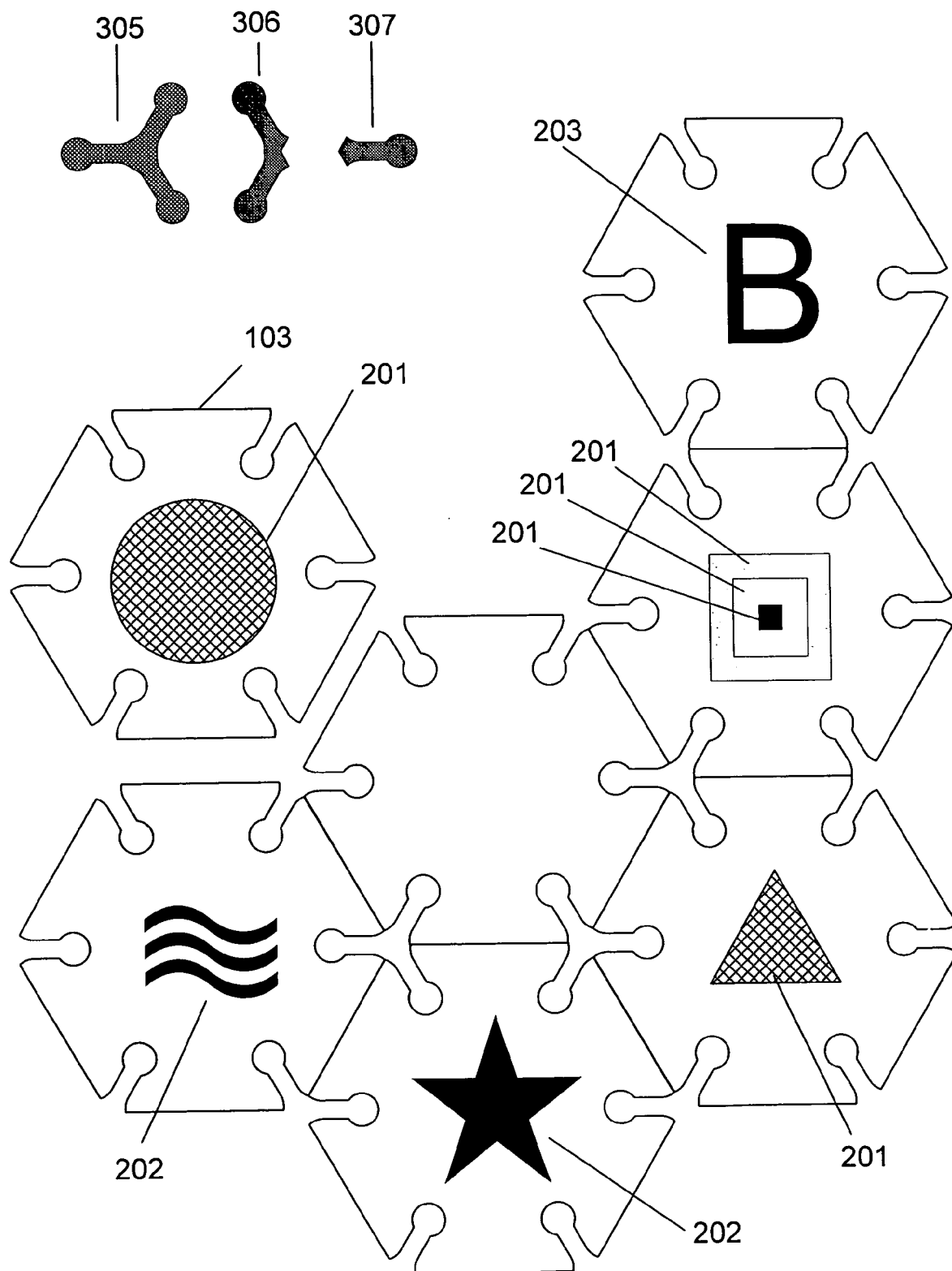


Figure 7

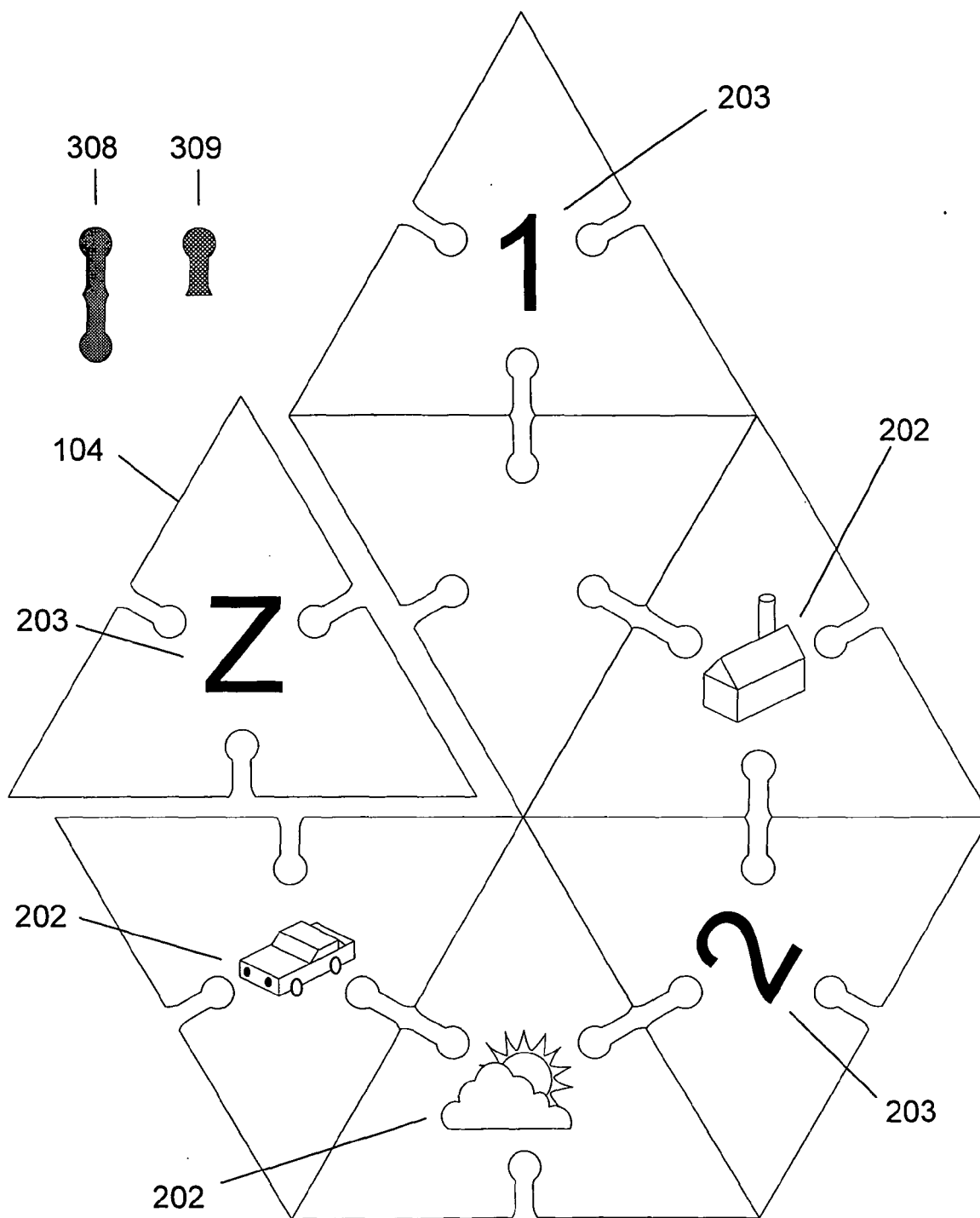


Figure 8

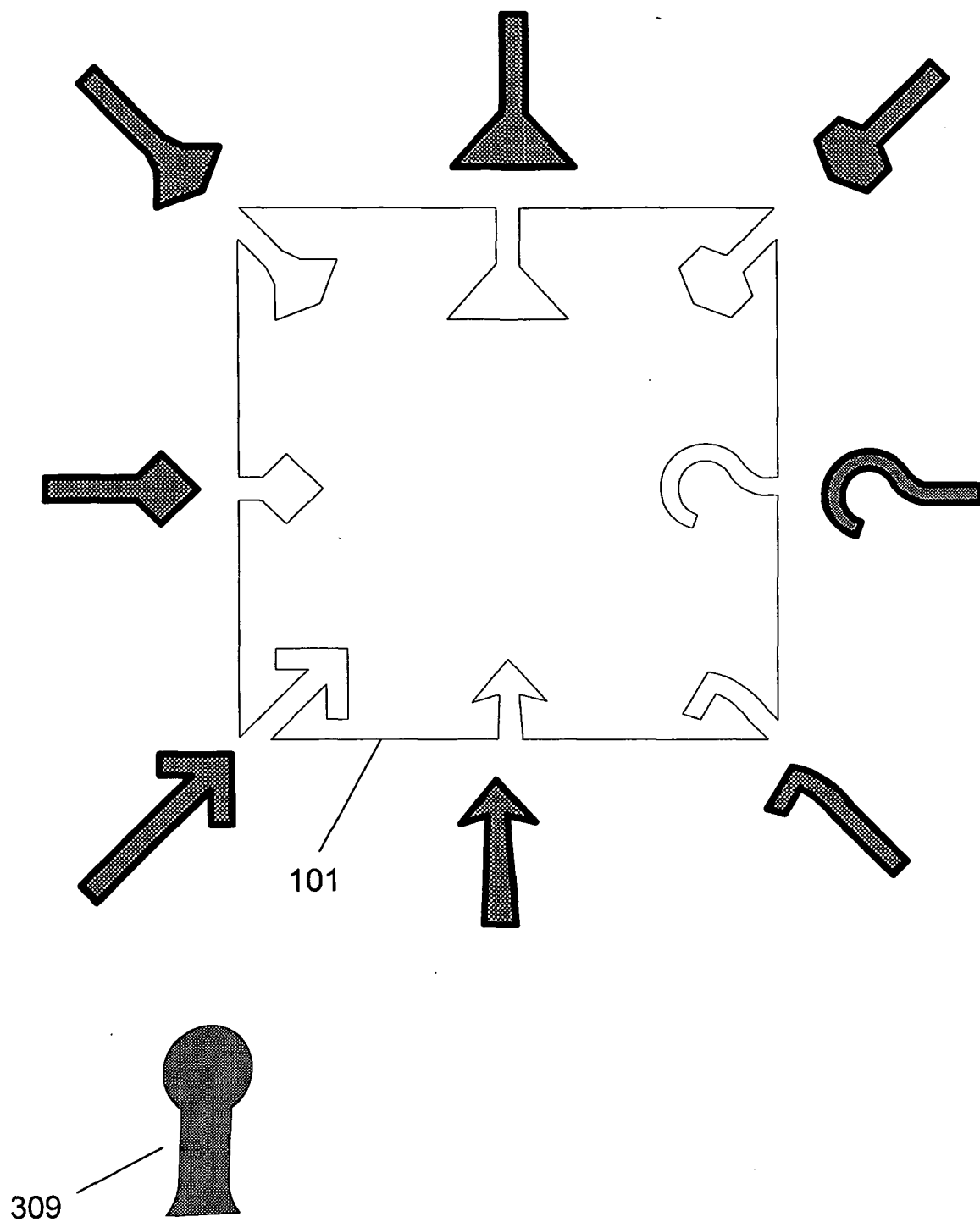


Figure 9

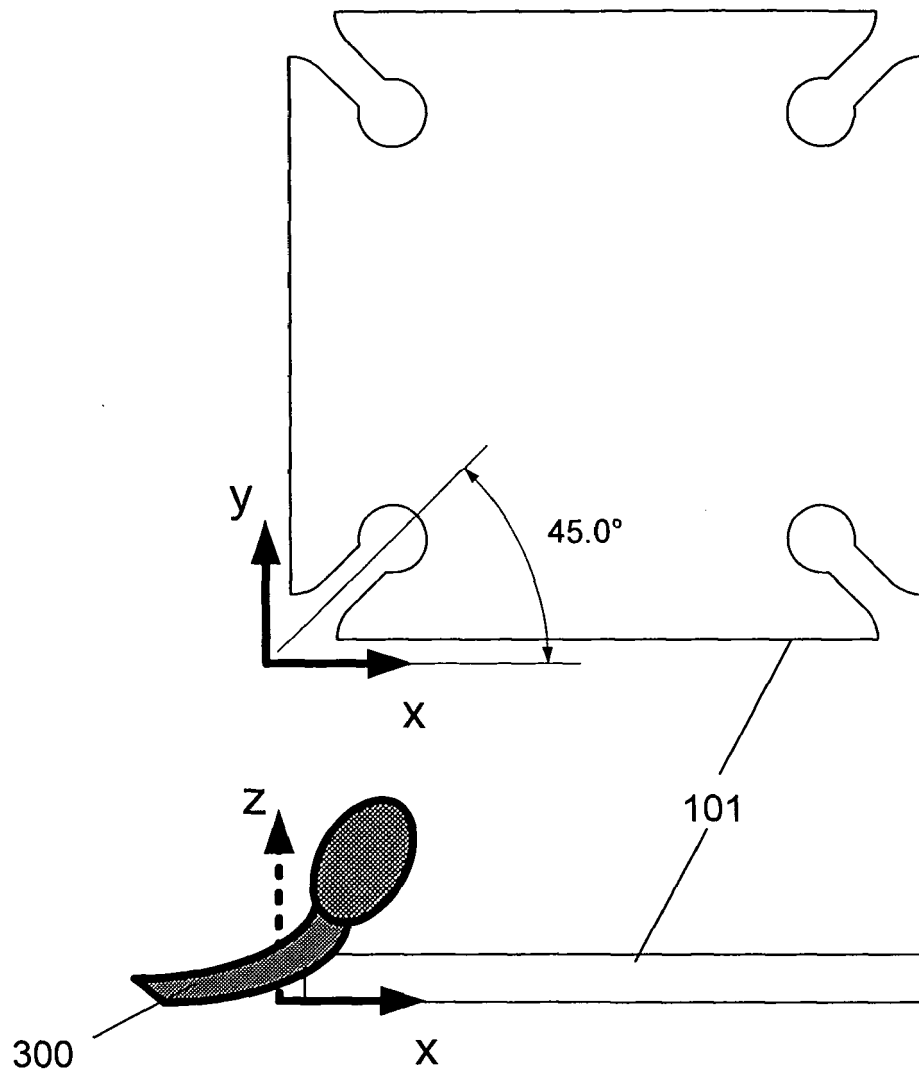


Figure 10



European Patent  
Office

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Application Number  
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| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                              |                                                 |                                         |
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| Place of search<br>Munich                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                              | Date of completion of the search<br>15 May 2008 | Examiner<br>Reichhardt, Otto            |
| <p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone<br/>Y : particularly relevant if combined with another document of the same category<br/>A : technological background<br/>O : non-written disclosure<br/>P : intermediate document</p> <p>T : theory or principle underlying the invention<br/>E : earlier patent document, but published on, or after the filing date<br/>D : document cited in the application<br/>L : document cited for other reasons<br/>&amp; : member of the same patent family, corresponding document</p> |                                                                                                              |                                                 |                                         |

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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