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(54) Title: CONFIGURABLE SHOE SOLE ARRANGEMENT

(57) Abstract: The disclosed subject matter illustrates an arrangement for a footwear (100) for selectively configuring at least a portion of a footwear sole (102). The arrangement includes at least one opening (104) in the footwear sole (102) defining a compartment, such that each compartment have a sole hub (106). The sole hub (106) have a plurality of sole faces (108) and each sole hub (106) being operable to selectively arrange one sole face on the footwear sole (102), wherein the arrangement being such that at least a part of the footwear sole (102) face is selectively configured by operating the sole hub (106).

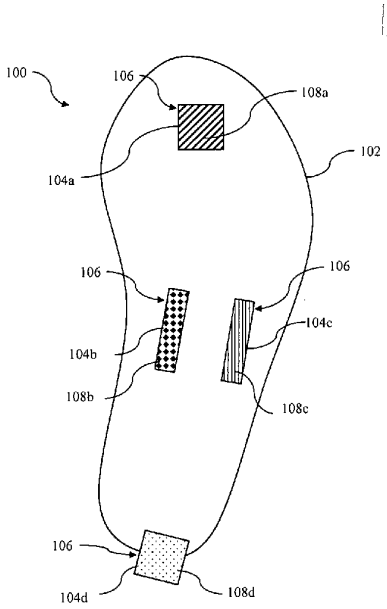
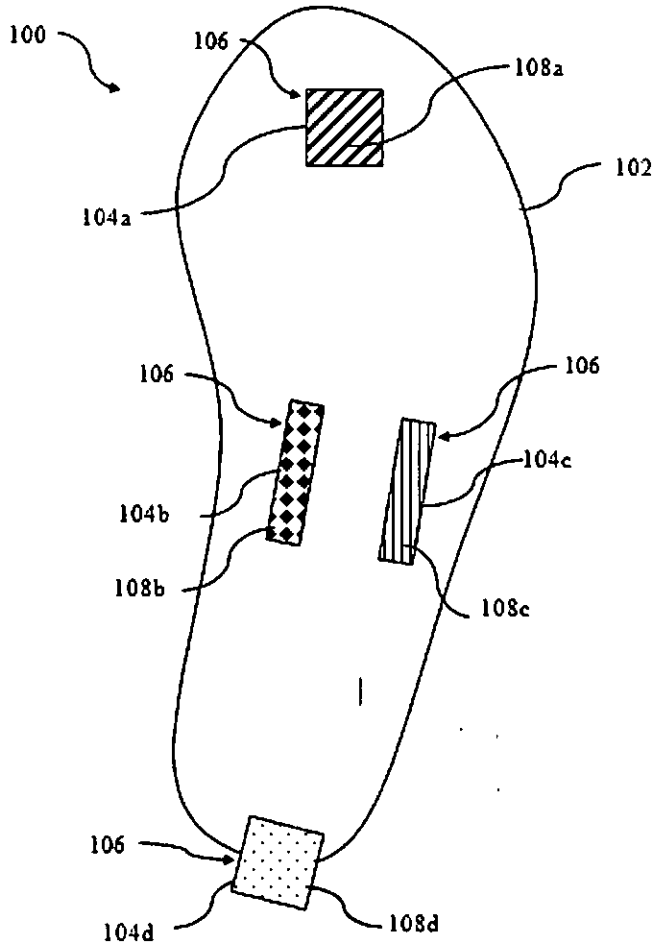


Figure 1

ABSTRACT

CONFIGURABLE SHOE SOLE ARRANGEMENT

The disclosed subject matter illustrates an arrangement for a footwear (100) for selectively configuring at least a portion of a footwear sole (102). The arrangement includes at least one opening (104) in the footwear sole (102) defining a compartment, such that each compartment have a sole hub (106). The sole hub (106) have a plurality of sole faces (108) and each sole hub (106) being operable to selectively arrange one sole face on the footwear sole (102), wherein the arrangement being such that at least a part of the footwear sole (102) face is selectively configured by operating the sole hub (106).



We claim:

1. An arrangement for a footwear (100) for selectively configuring at least a portion of a footwear sole (102), the arrangement comprising:

at least one opening (104) in the footwear sole (102) defining a compartment, such that each compartment have a sole hub (106);

the sole hub (106) have a plurality of sole faces (108) and each sole hub (106) being operable to selectively arrange one sole face on the footwear sole (102),

wherein the arrangement being such that at least a part of the footwear sole (102) face is selectively configured by operating the sole hub (106).

2. The arrangement as claimed in claim 1, further comprising a control system for operating the sole-hub (106) such that only one sole face (108) is moved at a time through the at least one opening (104) in the footwear's sole (102).

3. The arrangement as claimed in claim 1, wherein each of the plurality of sole faces (108) comprises: ridges, spikes, studs, lugs, deep-pattern, less-pattern, or a combination thereof.

4. The arrangement as claimed in claim 2, wherein the control system is mechanical switch.

5. The arrangement as claimed in claim 2, wherein the control system is electronic arragement.

6. The arrangement as claimed in claim 2, wherein the control system is a electro-machanical arrangement.

7. The arrangement as claimed in claim 1, wherein the sole hub (106) is a polygonal-block having a plurality of planar-surfaces acting as the plurality of sole-faces (108), each of said planar surface defining a unique sole-face (108).

8. The arrangement as claimed in claim 1, wherein the sole hub (106) is an elongated planar surface supporting the plurality of sole-faces (108) along longitudinal-axis.

Dated this 30th day of March 2017,

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TECHNICAL FIELD

[0001] The disclosed subject matter relates to footwear and in particular, relates to a mechanism in a footwear assembly.

BACKGROUND

[0002] Footwear such as shoes are known to exist in various forms and shapes for fulfilling daily-life purposes like running, walking, trekking, playing, dancing etc. In addition, it is quite usual to find multiple traits in a same human-being, e.g. fitness-freak, sportsman, dancer, white-collar professional etc. Accordingly, it is quite usual to see a person buying different types of footwear for undertaking different tasks such as professional-duties or pursuing different hobbies.

[0003] Typically, a different type of footwear such as shoes differs from one another mainly in respect of the type of sole or more specifically the patterns described within the sole. In an example, 'trekking-shoes' are known to have "rubber-sole" with deep lugs/indentations to give a secure footing upon rocky terrain. 'Soccer' shoes are known to a hard-sole with spikes/studs to provide increased traction upon grass-fields. Jogging/Walking shoes have a rubber sole with flat or minimal depth-patterns. As a part of formal-wear, formal-shoes have a hard-sole with minimal depth-patterns. As may be evident, not only a person is compelled to buy different sets for shoes for pursuing different interests, but also happens to incur incidental expenses, since housing different sets of shoes at home requires an even larger wardrobe. In addition, in case a particular interest/activity is not followed frequently, one or more type of footwear ends up 'unused' for a long time and accordingly leads to under-utilization of resources.

[0004] Moreover, even if it means pursuing a single hobby such as trekking or playing through a single type of footwear, one encounters all sorts of different types of ground-surfaces contacting the footwear. As may be well understood, single footwear may not be suited for

contacting all sorts of ground-surfaces and often ends up either getting damaged. In other scenario, a lack of grip between the footwear and the ground surface may also cause injury to the wearer.

[0005] Hence, there lies a need for an improved multi-purpose footwear.

SUMMARY

[0006] This summary is provided to introduce a selection of concepts in a simplified format that is further described in the detailed description of the present disclosure. This summary is neither intended to identify key or essential inventive concepts of the disclosure, nor is it intended for determining the scope of the invention or disclosure.

[0007] In an embodiment, the disclosed subject matter illustrates an arrangement in a footwear for selectively adapting at least a portion of footwear's sole.. The arrangement includes at least one opening (104) in the footwear sole (102) defining a compartment, such that each compartment have a sole hub (106). The sole hub (106) have a plurality of sole faces (108) and each sole hub (106) being operable to selectively arrange one sole face on the footwear sole (102), wherein the arrangement being such that at least a part of the footwear sole (102) face is selectively configured by operating the sole hub (106).

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] These and other features, aspects, and advantages of the present disclosure will become better understood when the following detailed description is read with reference to the accompanying drawings in which like characters represent like parts throughout the drawings, wherein:

[0009] **FIG. 1** illustrates a schematic illustration of a footwear provided with an apparatus in accordance with an embodiment of the disclosed subject-matter;

[0010] **FIG. 2** illustrates an exemplary sole-hub forming a part of the apparatus within the footwear of Fig. 1, in accordance with an embodiment of the disclosed subject matter;

[0011] **FIG. 3** illustrates an orientation of the exemplary sole-hub connected to an exemplary control system, in accordance with an embodiment of the disclosed subject matter;

[0012] **FIG. 4** illustrates an exemplary change in position of the sole-hub, in accordance with an embodiment of the disclosed subject matter;

[0013] **FIG. 5** illustrates another type of orientation of an exemplary sole-hub, in accordance with an embodiment of the disclosed subject matter;

[0014] **FIG. 6** illustrates yet another exemplary sole-hub, in accordance with an embodiment of the disclosed subject matter; and

[0015] **FIG. 7** illustrates another exemplary control-system forming a part of the apparatus in the footwear of Fig. 1, in accordance with an embodiment of the present subject matter.

[0016] The elements in the drawings are illustrated for simplicity and may not have been necessarily been drawn to scale. Furthermore, in terms of the construction of the device, one or more components of the device may have been represented in the drawings by conventional symbols, and the drawings may show only those specific details that are pertinent to understanding the embodiments of the present disclosure so as not to obscure the drawings with details that will be readily apparent to those of ordinary skill in the art having benefit of the description herein.

DETAILED DESCRIPTION

[0017] For the purpose of promoting an understanding of the principles of the present disclosure, reference will now be made to the embodiment illustrated in the drawings and specific language will be used to describe the same. It will nevertheless be understood that no limitation of the scope of the present disclosure is thereby intended, such alterations and further modifications in the illustrated system, and such further applications of the principles of the

present disclosure as illustrated therein being contemplated as would normally occur to one skilled in the art to which the present disclosure relates.

[0018] The foregoing general description and the following detailed description are explanatory of the present disclosure and are not intended to be restrictive thereof.

[0019] Reference throughout this specification to "an aspect", "another aspect" or similar language means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the present disclosure. Thus, appearances of the phrase "in an embodiment", "in another embodiment" and similar language throughout this specification may, but do not necessarily, all refer to the same embodiment.

[0020] **FIG. 1** illustrates a schematic diagram of a footwear 100 provided with an apparatus in accordance with an exemplary embodiment of the invention. Specifically, the figure 1 depicts a bottom or sole 102 of the footwear 100, which in turn may be a shoe, slipper, sandal etc. According to an implementation, the sole 102 may be a plain-sole. According to another implementation, the sole 102 may be a sole with a pattern. According to yet another implementation, the sole 102 may be a combination of plain and patterned sole.

[0021] In order to facilitate an operation of the apparatus in the footwear 100, the sole 102 comprises one or more compartments 104 a, 104b, 104c, 104d. According to an embodiment, the compartment 104 may be openings or cavities carved out within the sole 102. According to exemplary embodiment, the cavities may extend through the thickness of the sole 102 and thereby act as perforations within the sole 102.

[0022] The compartments 104 may be provided on any part of the sole 102. The compartments may be provided at the front part, central part or rear part of the sole 102. According to an implementation, the shape of one or more compartments 104 may be similar to each other. According to another implementation, the shape of one or more compartments 104 may be different than each other. The shape of the compartments 104 may be shapes such as but

not limited to a square, rectangle, triangle, pentagon, hexagon etc. According to an embodiment, the size of one or more compartments 104 may be similar to each other. According to another embodiment, the size of one or more compartments 104 may be different than each other.

[0023] Further, each of the compartment 104(a, 104b, 104c, 104d acts as an enclosure for a sole-hub 106, which is a set of sole-faces 108 a, 108b, 108c, 108d. As shown in the figure 1, such sole-faces 108 stand exposed through the compartments 104 within the sole 102. Each sole hub (106) may be operable to selectively arrange one sole face on the footwear sole (102). The arrangement being such that at least a part of the footwear sole (102) face is selectively configured by operating the sole hub (106).

[0024] FIG. 2 illustrates the exemplary sole-hub 106 forming a part of the apparatus in the footwear 100, in accordance with an embodiment of the disclosed subject matter. The sole-hub 106 may be a polygonal block (rectangular block as shown in Fig. 2a, tetrahedron of Fig. 2b or octahedron of Fig. 2c etc.) having a plurality of planar-surfaces supporting the number of sole-faces 108. Each of said planar surface of the sole-hub 106 defines a unique sole-face 108. In other implementation, the sole hub 106 may be an elongated strip or thin-sheet as shown in Fig. 2d, such that the different sole-faces 108 are aligned longitudinally along the length of sheet.

[0025] According to an embodiment, the sole-faces 108 may include common sole-patterns such as spikes, studs, deep patterns, less patterns etc. or a combination thereof. Alternatively, each of the plurality of sole faces 108 is defined by one or more of the constructional features: material, depth, pattern, and size. The plurality of sole faces 108 enable an adequate-grip of the footwear 100 upon the ground-surface based on different terrain and applications.

[0026] FIG. 3 illustrates an orientation of the exemplary sole-hub 106 along with an exemplary control-system 202, in accordance with an embodiment of the disclosed subject matter. The position or orientation of the sole-hub 106 corresponds to an initial-state, wherein the sole-hub 106 may be rotatable so as to enable one of the sole-faces 108 to face the

compartment 104. According to an exemplary embodiment the control-system 202 may be a mechanical arrangement or a electronic arrangement or a electro-mechanical arrangement. According to an embodiment, the control arrangement may be provided at the exterior of the footwear 100 for user-access. A shaft 204 may be provided for enabling a motion-transmitting means between the control system 202 and the sole hub 106. In other example, a push-button may be provided as the control system 202 to replace the sole-face 108. According to an embodiment, the sole-face 108 may be relaced in the compartment 104 with actuation of the push-button switch by the user.

[0027] FIG. 4 illustrates an exemplary arrangement for changing the position of the exemplary sole-hub 106, in accordance with an embodiment of the disclosed subject matter. As illustrated, the sole-hub 106 having a desired sole-face in the compartment 104 may undergoes a translation-motion or a downward linear-motion to protrude through the compartment 104 and accordingly aligns as a part of the sole 102. According to an examoplary embodiment, all the openings may have same type of sole-face 108 protruding through the opening 104 at a particular-instant. According to another examoplary embodiment, the openings may have diffrent type of sole-face 108 protruding through the opening 104 at a particular-instant.

[0028] FIG. 5 illustrates another type of orientation of the exemplary sole-hub 106 along with the exemplary control system 202, in accordance with an embodiment of the disclosed subject matter. As may be seen, the sole-hub 106 may remain oriented at the same vertical level as that of the compartment 104 and rotatable therein to change the sole-faces 108. Accordingly, the translation or downward motion as otherwise illustrated in Fig. 4 may not be needed and only the rotary motion is required to select the sole-face 108 and simultaneously align the selected sole-face 108 with sole 102.

[0029] FIG. 6 illustrates yet another exemplary sole-hub 106, in accordance with an embodiment of the disclosed subject matter. As illustrated, the sole-hub 106 may be an

elongated or linear-strip 106 having a plurality of sole-faces 108 extending longitudinally. Accordingly, the linear-strip 106 may be moved linearly such that a selected sole-face 108 faces the compartment 104. Once required sole-face 108 is selected, the sole-hub 106 may be lowered to align the selected sole-face 108 with the compartment 104. In another scenario, the sole-hub 106 may be aligned at the same vertical level as that of the compartment 104 and accordingly need not require any lowering. As may be understood, the control system in the form of selector-switch 202 may be actuated (rotated or pushed) to trigger the mechanical-actuator (e.g. a pulley arrangement) to eventually result in the linear motion for the elongated strip based sole hub 106.

[0030] Further, while the description of the preceding figures 3 till 6 illustrates a single sole-hub 106 getting aligned with the compartment 104, such description may be extended to cover presence of multiple sole-hubs 106 with respect to the plurality of compartments 104 within the sole 102. In such a scenario, actuation of a single control-system or selector switch 202 causes alignment of a unique sole-face 108 with each compartment 104. In other example, actuation of the selector-switch 202 results in alignment of the same sole-face 108 with each compartment 104.

[0031] According to another another exemplary embodiment the control-system may be an electronic control system that automatically actuates the sole-hub 106 and changes the sole-face 108, thereby enabling the footwear 100 to automatically adapt itself against various circumstances, e.g. current-terrain conditions, environmental-conditions, physiological parameters, etc. According to exemplary embodiment of the disclosure, the actuator connected to the control system may be an electric actuator such as a motor to generate rotary and/or linear motions for moving (e.g. rotating and/or linearly moving) the sole hub 106 to select the sole face 108 and, optionally, position the selected sole-face 108 in the respective-compartment 104.

[0032] At-least by virtue of aforesaid, the present subject matter provides a smart-footwear that has an adaptive sole-configuration. The adaptive-sole is configured to change dynamically

based on surface/terrain conditions and provide consumers with different soles for a particular type/design of footwear. In other scenario, the user-command may be provided to change the sole-configuration. In a nutshell, the present subject matter leads to single footwear usable for many scenarios, whereby the footwear facilitates an increased comfort and safety for the wearer across diverse applications.

[0033] At-least by virtue of aforesaid description of figures, the disclosed subject matter provides a smart-footwear that has an adaptive sole-configuration configured to change dynamically based on either the user-command or surface/terrain conditions. Such smart-footwear provides wearers with different soles for a particular type/design of footwear. Overall the disclosed subject matter facilitates multi-faceted footwear usable for many scenarios, wherein the footwear also facilitates safety for the wearer across diverse applications, without compromising upon the safety of the user.

[0034] While specific language has been used to describe the disclosure, any limitations arising on account of the same are not intended. As would be apparent to a person in the art, various working modifications may be made to the method in order to implement the inventive concept as taught herein.

[0035] It is understood that the above description is intended to be illustrative, and not restrictive. It is intended to cover all alternatives, modifications and equivalents as may be included within the spirit and scope of the invention as defined in the appended claims. Many other embodiments will be apparent to those of skill in the art upon reviewing the above description. The scope of the invention should, therefore, be determined with reference to the appended claims, along with the full scope of equivalents to which such claims are entitled. In the appended claims, the terms "including" and "in which" are used as the plain-English equivalents of the respective terms "comprising" and "wherein," respectively.

[0036] The drawings and the foregoing description give examples of embodiments. Those skilled in the art will appreciate that one or more of the described elements may well be combined into a single functional element. Alternatively, certain elements may be split into multiple functional elements. Elements from one embodiment may be added to another embodiment. For example, orders of processes described herein may be changed and are not limited to the manner described herein.

[0037] Moreover, the actions of any flow diagram need not be implemented in the order shown; nor do all of the acts necessarily need to be performed. Also, those acts that are not dependent on other acts may be performed in parallel with the other acts. The scope of embodiments is by no means limited by these specific examples. Numerous variations, whether explicitly given in the specification or not, such as differences in structure, dimension, and use of material, are possible. The scope of embodiments is at least as broad as given by the following claims.

[0038] Benefits, other advantages, and solutions to problems have been described above with regard to specific embodiments. However, the benefits, advantages, solutions to problems, and any component(s) that may cause any benefit, advantage, or solution to occur or become more pronounced are not to be construed as a critical, required, or essential feature or component of any or all the claims.

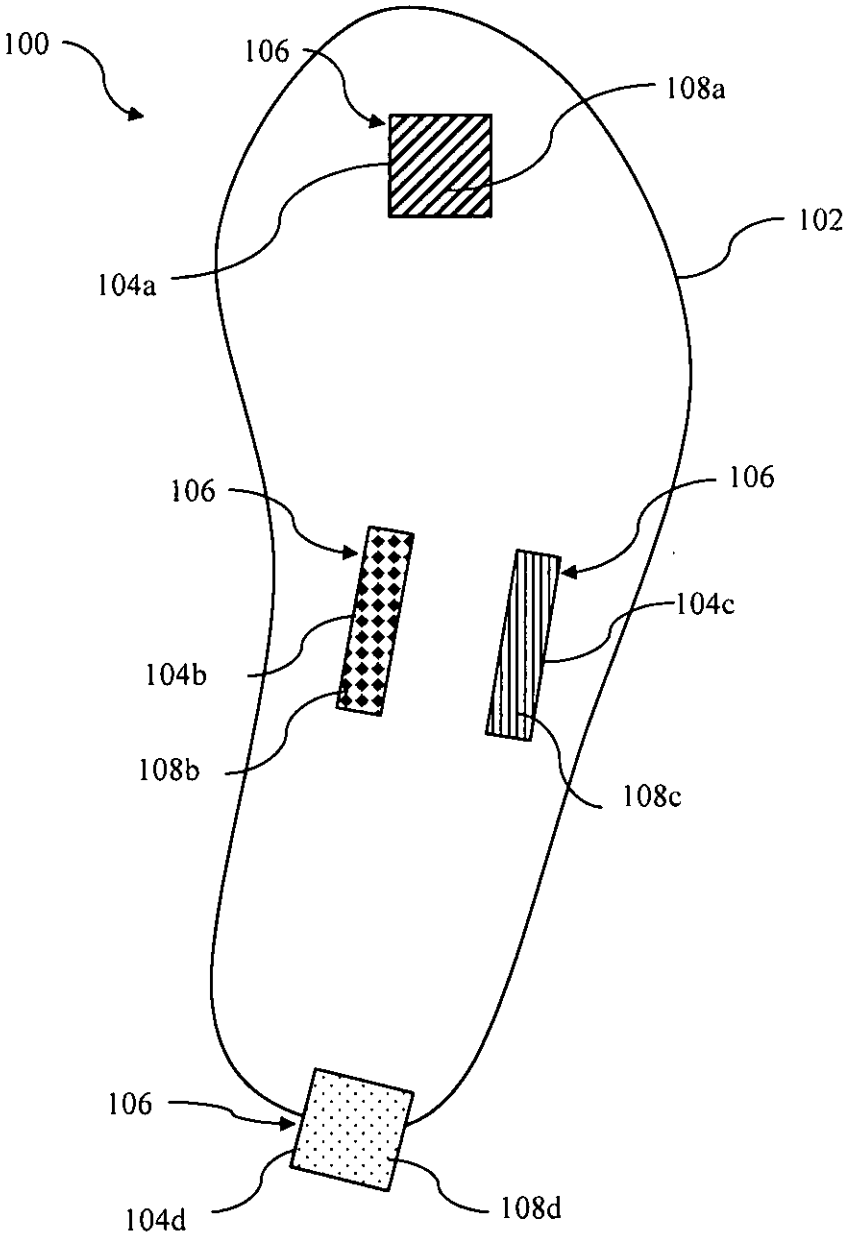

Figure 1

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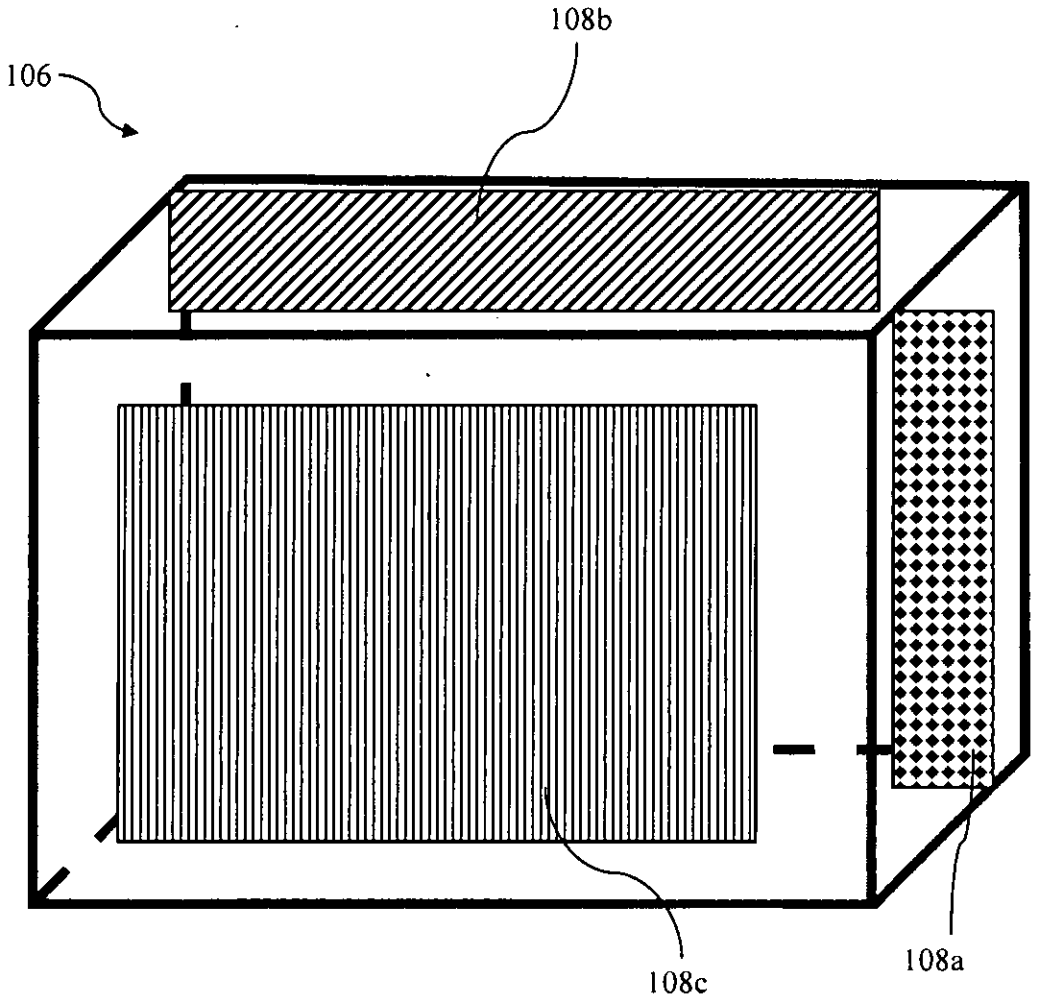

Figure 2a

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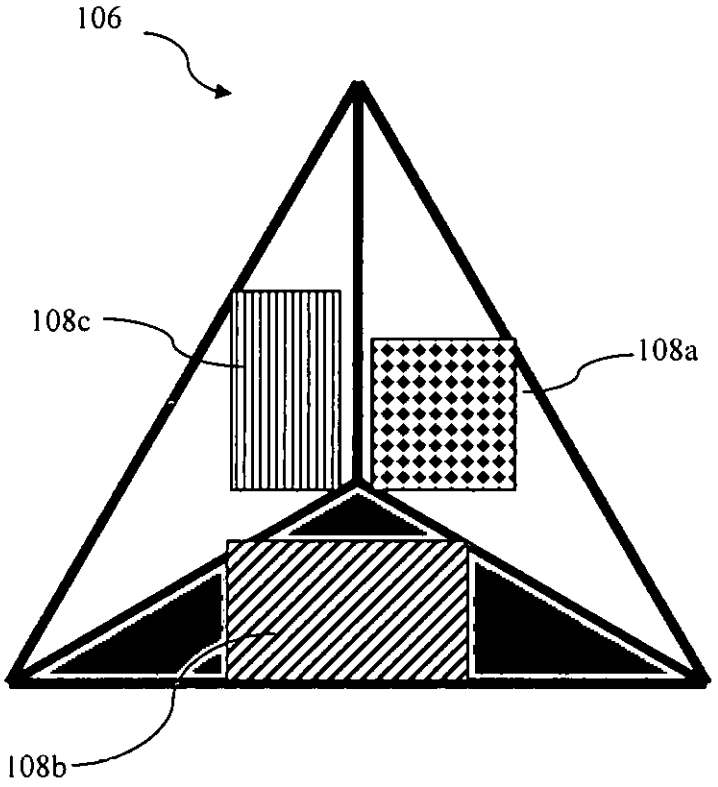

Figure 2b

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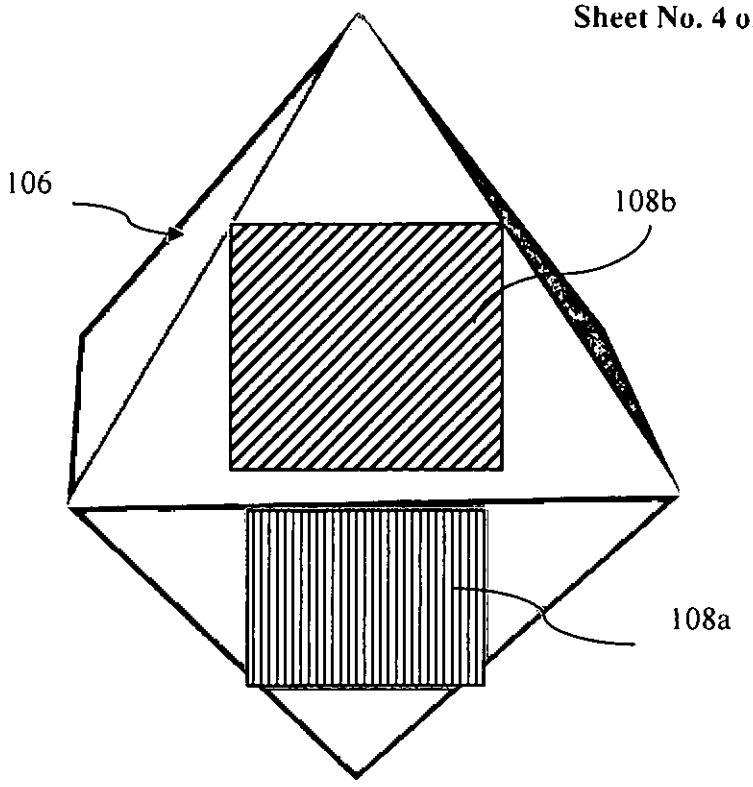

Figure 2c

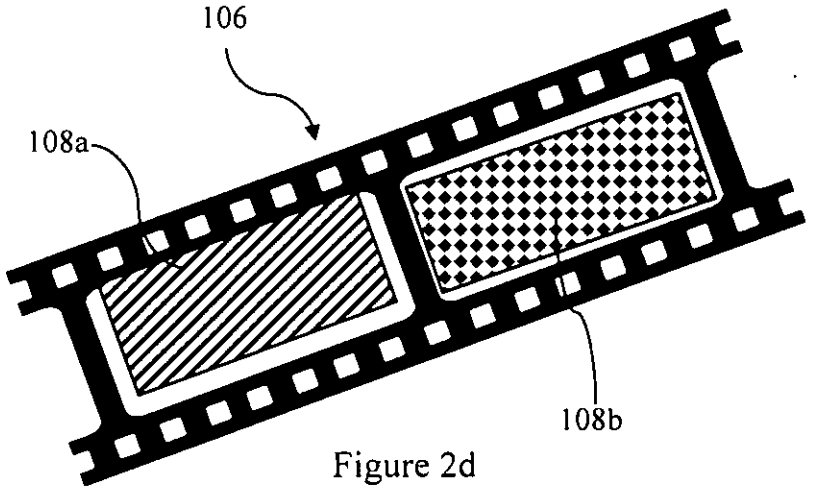

Figure 2d

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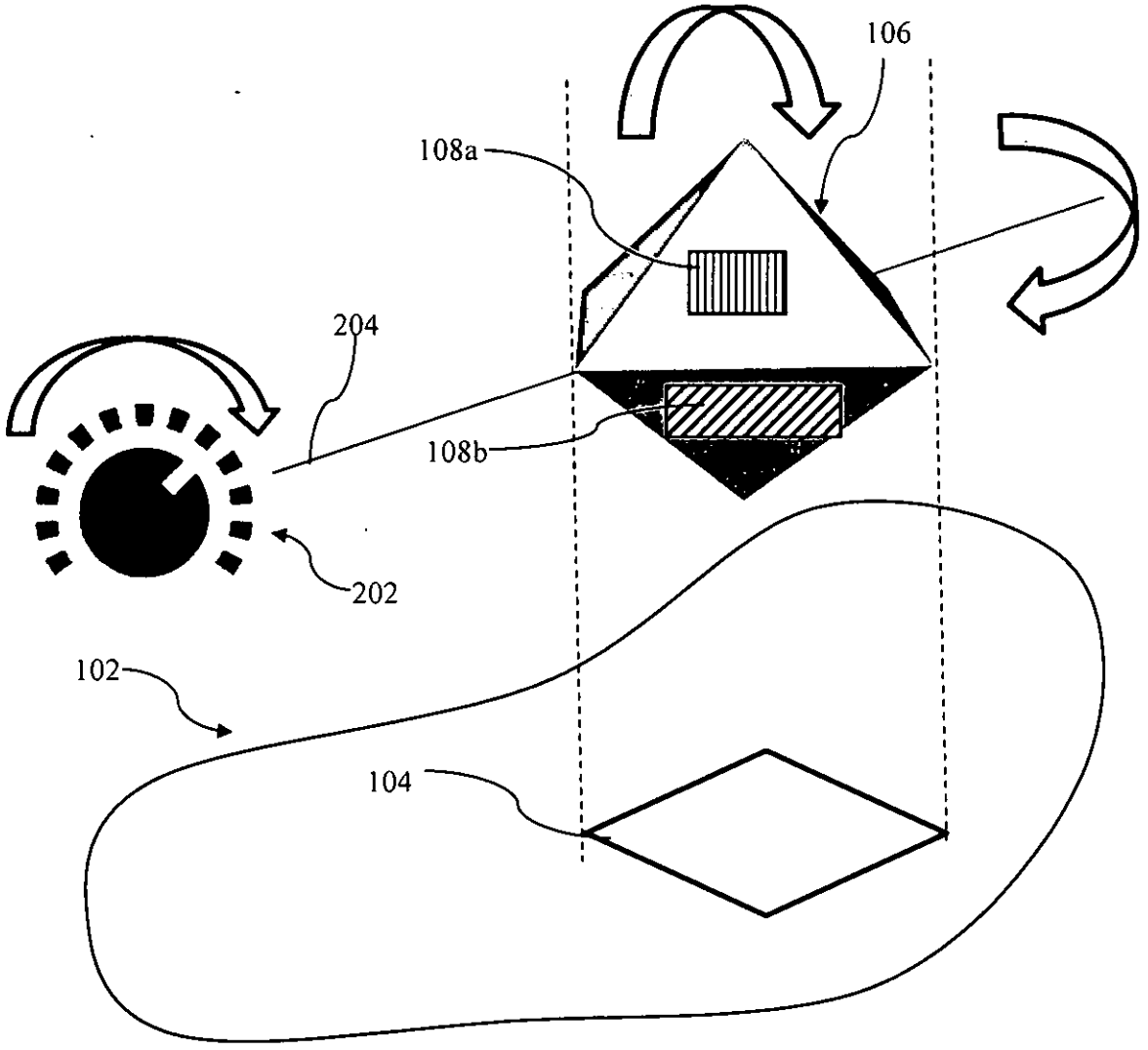

Figure 3

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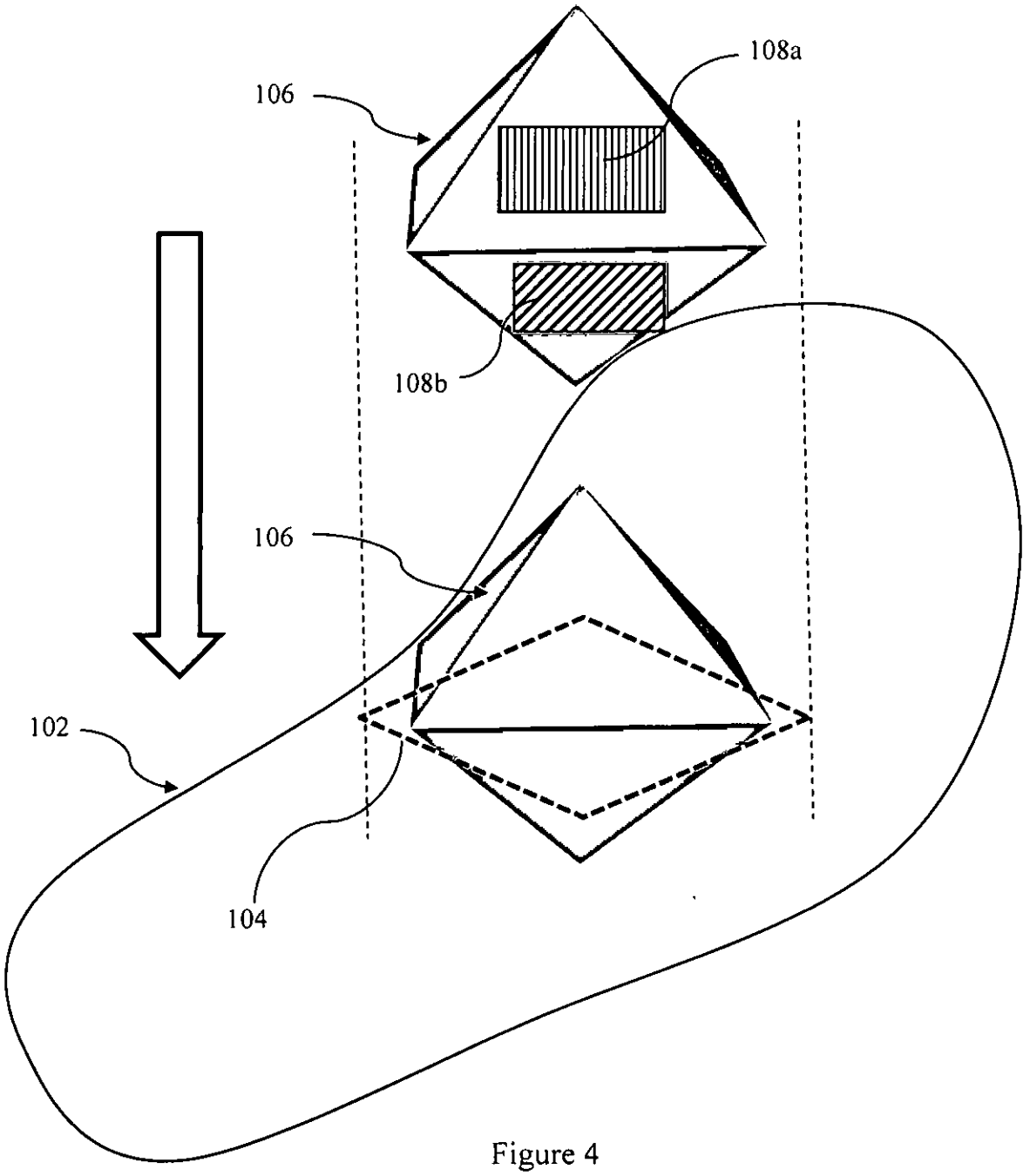

Figure 4

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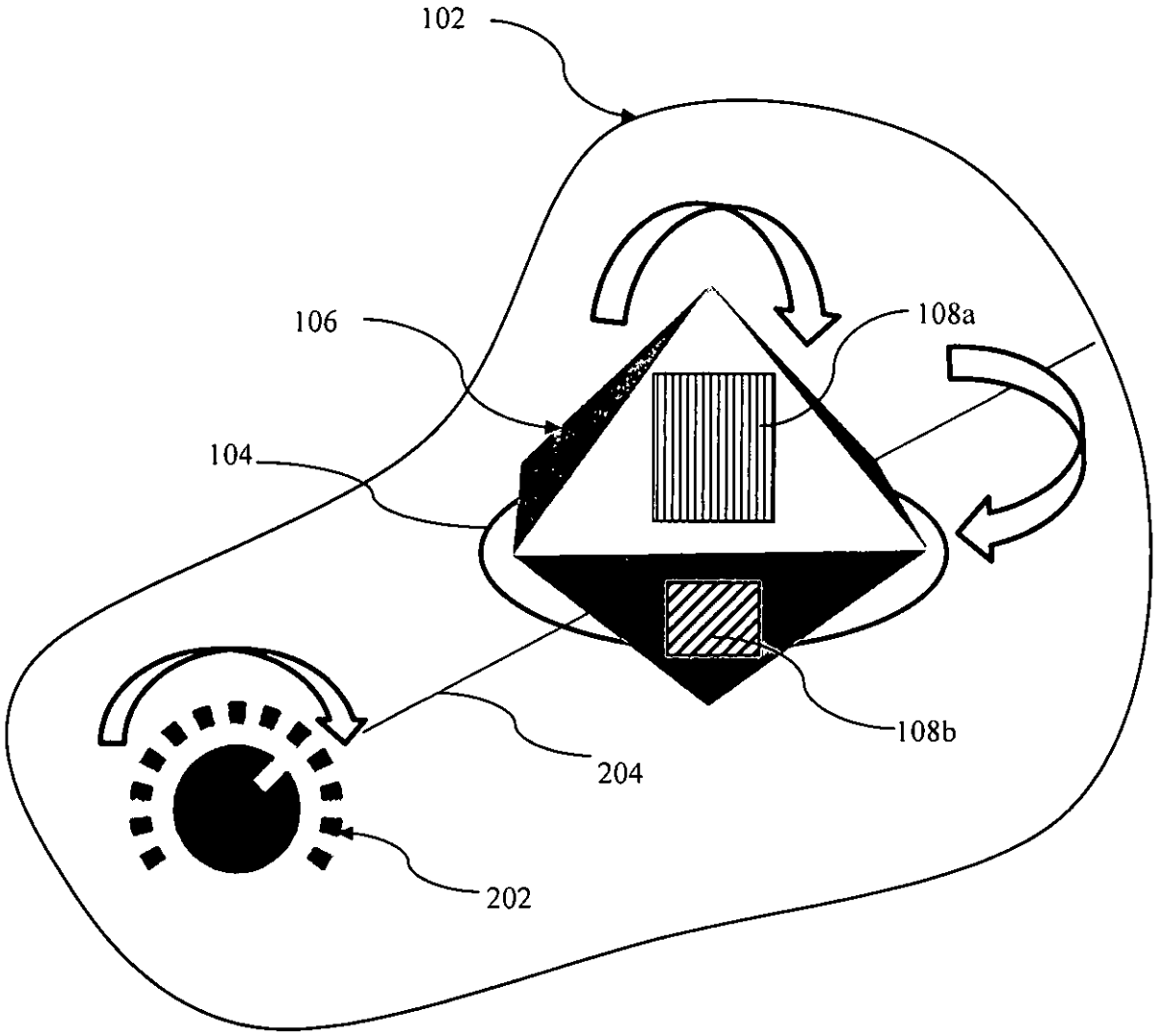

Figure 5

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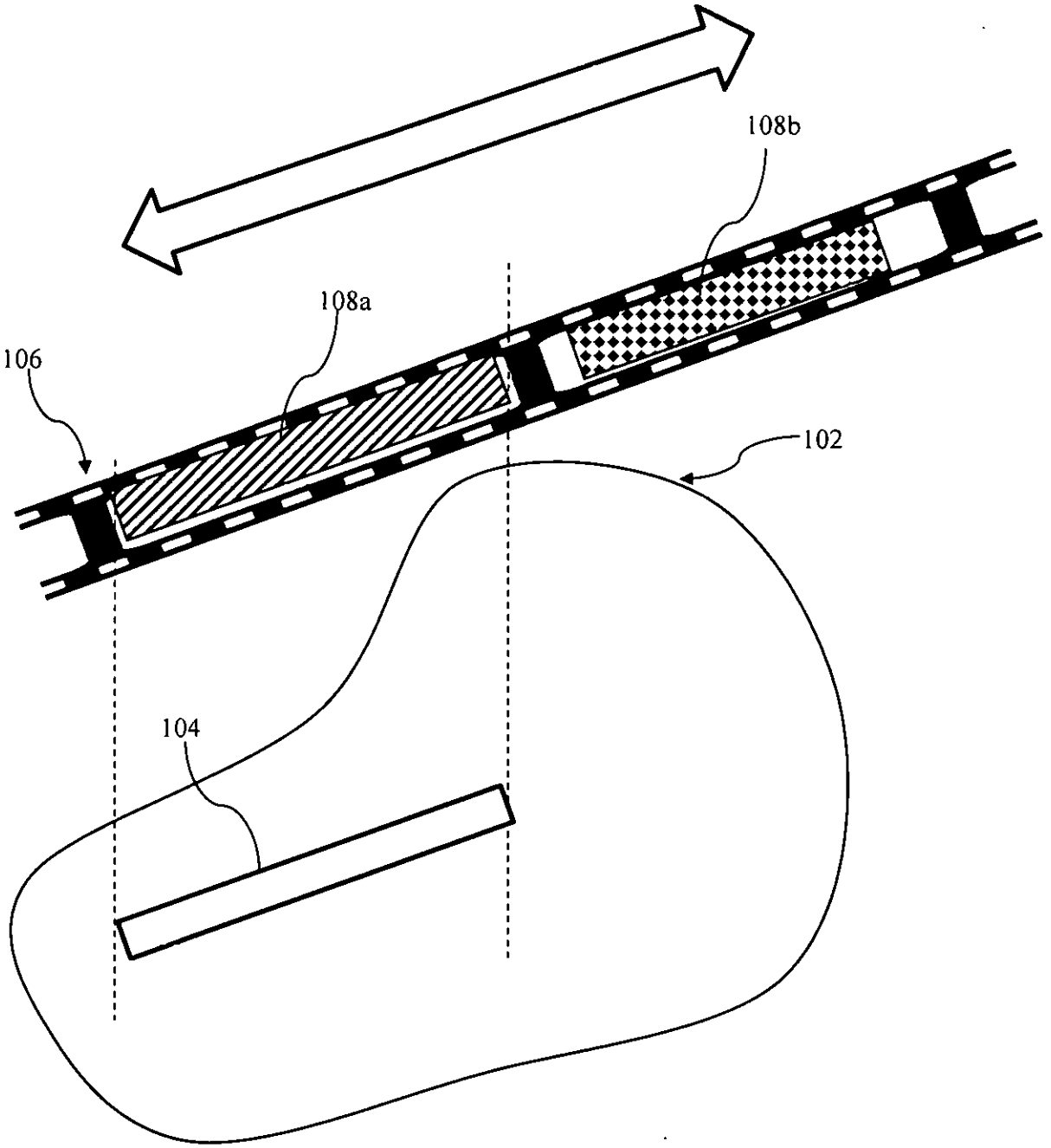

Figure 6

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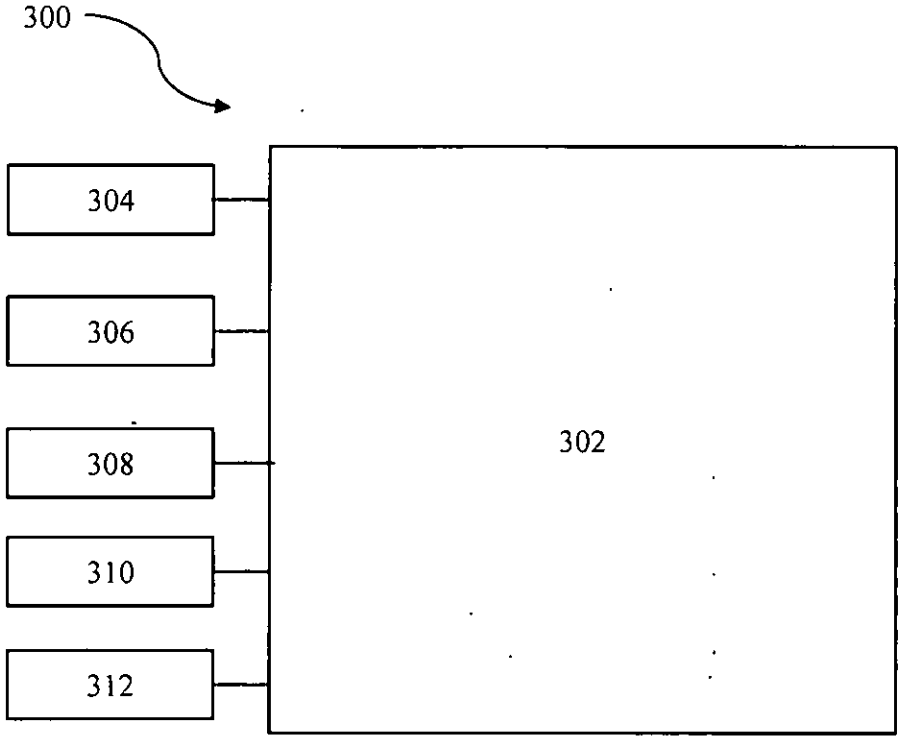

Figure 7

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