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(54) **Title**: STEP DEVICE AND SYSTEM

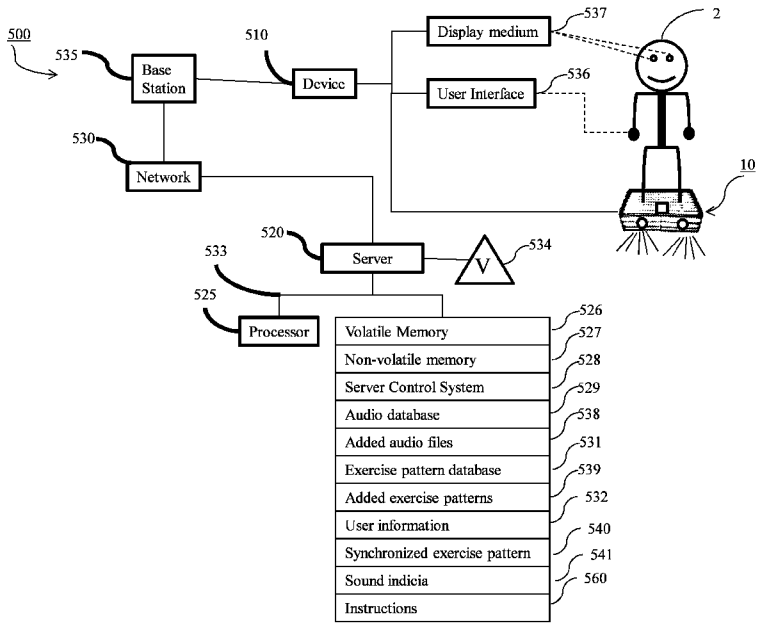

Figure 15

(57) **Abstract**: A step device for performing an exercise may comprise a stepping surface having at least one elevation, a system configured to sense input from and provide output to a user, and at least one handle attached thereto that is configured to move the step device. The exercise is performed by stepping onto and off of the stepping surface or moving the step device using the at least one handle. The at least one handle may be detachable and configured to emit a sound when it mechanically attaches to the step device. The step device may also comprise a cavity configured to receive a weight or sound emitting mechanism. The step device may form part of an interactive system for displaying a series of movements that follow an exercise pattern so that a synchronized pattern is displayed to a user defined by the series of movements that follow an exercise pattern.

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STEP DEVICE AND SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to United States provisional patent application no. 61/885,138 entitled "A system for displaying a series of movements that follow a synchronized pattern," filed October 1, 2013, United States provisional patent application no. 61/894,881 entitled "A step device for performing an aerobic exercise," filed October 23, 2013, and to United States provisional patent application no. 61/932,169 entitled "A step device for performing exercise," filed January 27, 2014. The contents of each of these United States provisional patent applications are incorporated herein by reference in their entirety as if set forth verbatim.

FIELD

[0002] The present device is in the field of exercise equipment. More particularly, it is in the field of step devices configured to facilitate performance of an aerobic exercise by a user.

BACKGROUND

[0003] Stepping platforms have been used in the performance of exercise routines for a number of years. They are useful for performance of exercises by individuals or in a group setting. In particular, they are now used in most health clubs offering individual, studio-type and group work-outs. They facilitate the aerobic efficiency of the exercise routine by the user by requiring the user to expend additional energy to step up to a raised platform as compared to step movements performed on a flat surface.

[0004] It should be noted that, as used herein, the step device of the present invention is "stationary", *e.g.* it does not have individually movable foot platforms, such as devices that mimic climbing stairs.

[0005] Stationary step devices are typically used in conjunction with stepping patterns or routines where the user steps on and off the device in or to a particular rhythm, such as the beat of accompanying music. In a group setting, an instructor typically performs the step routine while the user or users follow the instructor's movements. Commercially available stationary step devices typically include one or more sets of feet to adjust the height of the

platform for use by different user types. For example, a more experienced user may attach more than one set of feet to move the stepping platform to its maximum height above the surface on which it sets. Alternatively, a less ambulatory user may prefer to use a single platform with or without a single set of feet to make the stepping exercise routine less strenuous and to provide minimal impact on the leg joints. However, other than height adjustment mechanisms, users generally lack options that provide additional difficulty control and other customizable options to diversify the exercise experience with step devices.

[0006] When using the step device, a user's stepping motion causes the user to burn additional calories, because lifting the body weight up to the level of the step device engages muscles in both the upper body, which moves during the stepping motion for balance and lift, and the lower body, which performs the stepping motion.

[0007] Stationary step devices can be constructed from molded hollow plastic such as acrylonitrile butadiene styrene (ABS), which provides a stable platform to step upon. However, such devices are often heavy because the form of the device must support the weight of the user. Hence, they become difficult to transport and carry, because they can often weigh upwards of 15 lbs. The bulky shape of conventional step devices render them difficult to transport as well because they typically lack the means by which an average user can easily transport them between locations.

[0008] Accordingly, there is a need to provide a stationary step device that is designed to be convenient, safe to use, and easy to transport. Additionally, there is a need for a device that provides an enhanced, customizable user experience by providing exercise to a user's lower body muscles, core muscles and upper body muscles as well as providing user interaction as explained in more detail below.

[0009] Additionally, participating in aerobics or cardio-style group exercise classes to music has been popular around the world since the second half of the twentieth century. The benefit of both aerobic and cardio exercise has been widely recognized. A wide variety of aerobic and cardio exercise options and styles exist and this type of exercise (e.g. the type of exercise that does not use equipment such as treadmills, exercise bicycles, or other exercise devices) are usually performed to music. For example, in some exercise classes, music is played to provide rhythm that is perceived by the instructor and the class participants. The music with its rhythm guides the participant to move in step with the instructor.

[0010] Aerobic and cardio exercises are usually done by following a fitness instructor and/or participating in a group class. Alternatively, aerobic and cardio exercises may be done by

following classes on television, watching recorded media such as on a DVD or streamed from the internet. Within the aerobic and cardio exercise industry, there is also a growing trend toward installing large monitors in studios and health clubs for participants to follow classes, wherein the recorded classes are often played from DVD players, personal computers, or other media devices that play or stream video.

[0011] When following an aerobic and cardio exercise routine to music, the participant mimics the movements of the instructor on screen or in the classroom. When an instructor moves her feet and upper body, the participants try to move in the same direction, mimicking the movements of the instructor. However, such classes present the problem of intimidation for many would-be participants who may not be skilled dancers or who may lack rhythm. This manner of teaching also creates the problem of easily confusing participants who may struggle to follow the instructor's feet either on screen or in the classroom.

SUMMARY

[0012] The following simplified summary is provided in order to provide a basic understanding of some aspects of the claimed subject matter. This summary is not an extensive overview, and is not intended to identify key/critical elements or to delineate the scope of the claimed subject matter. Its purpose is to present some concepts in a simplified form as a prelude to the more detailed description that is presented later.

[0013] In one aspect of the disclosed embodiments, A step device for performing an exercise by a user is provided, wherein the step device comprises a stepping surface having at least one elevation, a sensory input system adapted to sense input from and provide output to a user, and at least one handle mechanically attached to the step device. The at least one handle is configured to move the step device. The exercise with the step device is performed by stepping onto and off of the stepping surface or by moving the step device using the at least one handle.

[0014] In some embodiments, the step device further comprises an outer surface defined between the stepping surface and a lower base surface, and wherein the at least one handle is disposed on the outer surface. In other embodiments, the step device further comprises an outer surface defined between the stepping surface and a lower base surface, wherein the at least one handle is disposed on the outer surface and at least one second handle is disposed on the lower base surface. In other embodiments, the at least one handle is disposed on the

lower base surface of the step device. In other embodiments, the at least one handle sits flush with a surface of the step device on which the at least one handle is attached.

[0015] In some embodiments, the at least one handle is integrally formed with the step device whereas in other embodiments, the at least one handle is configured to detachably connect to the step device. In this embodiment, the at least one handle may further comprise at least one fastening mechanism that produces a sound when the at least one handle is fastened to the step device. In other embodiments, the at least one fastening mechanism snaps onto the step device.

[0016] In some embodiments, the step device further comprises a cavity, wherein the cavity is configured to receive a weight. In other embodiments, the cavity is configured to receive a sound emitting mechanism. The cavity may be removable from the device whereas in other embodiments the cavity is integrally formed with the device and a sound emitting mechanism.

[0017] In another aspect of the disclosed embodiments, the step device is used in an interactive system for displaying a series of movements that follow an exercise pattern. The interactive system comprises the step device, a server, and a display device. In some embodiments, the interactive system operatively connects to a network. The server may comprise a processor and memory. The memory comprises an exercise pattern database, an audio database, a processor, and instructions for generating a series of movements that follow the exercise pattern.

[0018] The instructions may stored in a non-transitory computer readable storage medium, the instructions comprising analyzing an audio file that's selected by a user from the audio database (or elsewhere), detecting a speed of the audio file, and synchronizing the speed with an exercise pattern selected by the user from the exercise pattern database (or elsewhere) to generate the series of movements that follow a synchronized exercised pattern.

[0019] The processor may be configured to execute the instructions and communicate the synchronized exercised pattern it generates. At least one device may be operatively connected to the server with a display medium to display the synchronized exercised pattern and a user interface that is configured to communicate with the server. The exercise pattern database may be comprised of recognizable shapes such as letters, numbers, or any user created or selected image as the foundation of each step in the synchronized pattern. For example, a letter, series of letters, a number, a series of numbers, or some combination of each can be selected by a user.

[0020] An audio playback mechanism may be included and configured to reproduce and play the audio file while the series of movements that follows the synchronized pattern is displayed. In some embodiments, the audio playback mechanism may be disposed on the at least one device and in other embodiments, the system may further include a second device, wherein the audio playback mechanism is disposed on the second device.

[0021] The synchronized exercised pattern displayed on the display medium demonstrates to users where their feet should be positioned presently and in the future by tracing the steps over the selected pattern (e.g. letters, numbers, recognizable symbols, a happy face, etc.). Accordingly, the audio file may play while the displayed synchronized pattern is traced causing a user to be induced to move her feet to the beat of the music along the synchronized pattern. The concepts described herein provide a dynamic synchronization of the visual content of the exercise pattern with the audio file (e.g. song) to generate a customized exercise routine that is easily recognizable and easy to learn. Because immediately recognizable shapes are used, a participant more easily recognizes the user-defined pattern on the display medium and therefore more easily learns the expected series of steps to follow the pattern such that the steps and beat are immediately recognizable and understood by the user.

[0022] In another aspect of the disclosed embodiments, a method for displaying a method for displaying a series of movements that follow an exercise pattern comprises providing a step device and selecting an audio file and an exercise pattern. The step device analyzes the audio file to detect a speed. The speed is synchronized with the exercise pattern to generate the synchronized exercise pattern. The synchronized exercise pattern is then displayed as a series of movements on a step display medium that is disposed on the step device. The audio file is played on an audio playback mechanism disposed on or operatively connected to the step device.

[0023] To the accomplishment of the foregoing and related ends, certain illustrative aspects are described herein in connection with the following description and the annexed drawings. These aspects are indicative, however, of but a few of the various ways in which the principles of the claimed subject matter may be employed and the claimed subject matter is intended to include all such aspects and their equivalents. Other advantages and novel features may become apparent from the following detailed description when considered in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] FIG. 1 is a perspective view of one embodiment of a step device for performing an aerobic exercise.

[0025] FIG. 2 is a top plan view of the device of FIG. 1.

[0026] FIG. 3 is a bottom plan view of the device of FIG. 1 configured to use at least one fastening mechanism.

[0027] FIG. 4 is a side plan view of one embodiment of the device of FIG. 1.

[0028] FIGS. 5 and 6 are side plan views of specific embodiments of the step device for performing an aerobic exercise, wherein the step device is arranged in an opened state.

[0029] FIG. 7 is a perspective view of one embodiment of the device in FIG. 1 with a user stepping one foot onto the stepping surface.

[0030] FIG. 8 is a perspective view of one embodiment of the device in FIG. with a user stepping two feet onto the stepping surface.

[0031] FIG. 9 is a perspective view of one embodiment depicting a user stepping one foot onto the stepping surface, wherein a sensing mechanism is operatively connected to the stepping surface.

[0032] FIG. 10 depicts one embodiment of a step device that depicts at least one inflatable bladder.

[0033] FIG. 11 depicts an exemplary embodiment of a step device comprised of three inflatable bladders.

[0034] FIG. 12 depicts an exemplary embodiment of a step device comprised of three inflatable bladders, wherein each bladder inflates to different heights.

[0035] FIG. 13 depicts an exemplary embodiment of a step device comprised of three inflatable bladders, wherein sequential inflation of each bladder functions as a height adjustment mechanism for the step device.

[0036] FIG. 14 depicts an exemplary embodiment of a stepping surface that comprises a sensing mechanism.

[0037] FIG. 15 depicts a sensory input system for using the step devices of FIGS. 1-14, wherein the system displays a series of movements that follow an exercise pattern in accordance with one embodiment.

[0038] FIG. 16 depicts a preferred embodiment of mobile device for displaying a series of movements that follow an exercise pattern to be used with the step device.

[0039] FIG. 17 depicts one embodiment of an exemplary display of a synchronized pattern being displayed on a display medium.

[0040] FIG. 18 depicts one embodiment of a synchronized exercise pattern being displayed.

[0041] FIG. 19 depicts one embodiment of a pattern being used with the step device and displayed on a display medium.

[0042] FIG. 20 is a perspective view of another embodiment of a step device for performing an aerobic exercise.

[0043] FIG. 21 is a top plan view of the device of FIG. 20.

[0044] FIGS. 22A and 22B are sectional views taken along line A-A of FIG. 20.

[0045] FIG. 23 is a bottom plan view of the device of FIG. 20 configured to use at least one fastening mechanism.

[0046] FIG. 24 is a side plan view of one embodiment of the device of FIG. 20.

[0047] FIGS. 25 is a side plan view of the device of FIG. 20 arranged in an opened state.

[0048] FIG. 26 is a perspective view of one embodiment of the device in FIG. 20 with a user stepping one foot onto the stepping surface.

[0049] FIG. 27 is a perspective view of one embodiment of the device in FIG. 20 with a user holding the device from below the bottom side of the device.

[0050] FIG. 28 depicts another system for displaying a series of movements that follow an exercise pattern in accordance with one embodiment without the use of a step device.

[0051] FIG. 29 depicts a mobile device for displaying a series of movements that follow an exercise pattern without the use of a step device.

DETAILED DESCRIPTION

[0052] As used herein, "synchronized exercise pattern" refers to an exercise pattern (e.g. any indicia, such as a particular shape or shapes) that is synchronized with the speed (e.g. beats/min.), such as the rhythm of a song and thereby translated into a depiction of a series of movements that follow a pattern at the speed of the song.

[0053] "Mobile device" refers to a device that is portable with a battery that provides power to the device. The mobile device typically communicates with a server or other devices through cellular communication protocols. Current cellular communication protocols include 1G to 5G. However, concepts described herein may be used with any future generations of cellular communication protocols. Mobile devices may include personal digital assistants, pagers, cellular phones, tablets, and any equivalent.

[0054] "Planar" refers to a surface in the form of a plane. However, it may not necessarily refer to a surface being level, perfectly flat, and in fact may refer to a slightly curved surface.

[0055] "Non skid" refers to a surface that is configured to prevent or inhibit movement on a surface such as skidding or slipping.

[0056] "Stationary" refers to a device that may move slightly if, for example, a sensing mechanism were attached to the top or bottom of the device and would move slightly when sensing input. Stationary also refers to a device with a stepping surface that is deformable. Movement in both cases would not render the devices movable since movement would be slight and thus the device would still be considered stationary.

[0057] "Transportable" refers to a device that may able to be carried, transported, or moved between locations without inclusion of any additional support from other devices or tools or with the support of other devices or tools.

Device Design

[0058] The device of the present concept may be designed so that it essentially conforms to any known step device. The shape of the device can vary, such as a long, rectangular shape, square, round, oval, or any other regular or irregular shape.

[0059] In one embodiment, the device is a single platform that sits flat upon a surface so that it is planar to the surface on which it sits. Alternatively, one or more sets of "feet" can be incorporated into the device design, such that the device height can easily be adjusted by the user, so long as the feet are designed to stably support a solid stepping surface on which the user can step. The feet may be individual feet located in at least three different locations on the underside of the device. For example, individual feet could be located at the four corners of a device having a rectangular shape. In one embodiment, the feet are hingedly attached to the device body so that they can be collapsed onto the underside of the device. In some instances, the device body may further include one or more grooves inside which the feet can fit when collapsed. In another embodiment, the feet may actually extend from side to side, such as square feet that fit on either side of a rectangular shaped step device.

[0060] The device can have a single, upper stepping surface upon which the user can step, or it may also have more than one surface height, such that when the device is placed upon the floor, the user can step up to multiple heights on the stepping surface of the device. In other embodiments, the stepping surface may be further comprised of more than one independent surfaces so that one surface is at a different height than the other. It is also contemplated that

the stepping surface is further configured to absorb shock felt by the user during use. Accordingly, one surface may have different material properties that allows it to be displaced a certain amount whereas the second surface be displaceable more or less than that amount.

[0061] The dimensions of the device should be adequate to engage both of a user's feet and high enough off the surface on which it sits to enhance the aerobic experience of the user. In some instances, the device may have an elevation between 3 to 8 inches off the ground, such as 6 inches high, and this height may be adjustable if the device in such an embodiment included an adjustment mechanism such as removable feet. In some embodiments, the device has only one elevation and therefore is essentially planar. It is contemplated that the width of the device is sized according to the approximate shoulder width of the user to provide adequate basal stability to the step device. For example, if the user had a width of 35 inches between her shoulders, the device could be 36 inches wide.

[0062] The device may optionally be hingable, roughly through the middle from top to bottom (e.g., along the center line of the stepping surface or if the width of the stepping surface were 36", then the device could be hingable at 18" from either edge), so it may be folded for ease of transport and storage. Accordingly, where the device is configured with one fold, the device would be hingable into two portions, a first portion and a second portion, wherein the device could be folded in an opened stated and closed in a closed state in a clamshell manner. If more than one fold were desired, then one or more fold lines could be added according to design needs which would create an additional portion. Any manner for producing a hinge may be suitable, such as the incorporation of a deformable surface on the stepping surface. In this case, the first and second portions (and any additional portions if more folds were added) would be bonded to the flexible stepping surface and configured to mate along the center line of the stepping surface as described above.

[0063] Alternatively, one or more mechanical hinges are placed to provide the hinged, clamshell rotation between opened and closed states. The hinges are configured to recess into the portions on which they attach to provide the clamshell movement between closed and opened states. The hinges are constructed, for example, from metal, plastics, or composites in order to conserve weight and thus mobility.

[0064] The step device is constructed of any suitable, relatively solid material capable of stably supporting the weight and stepping forces of a user. Such materials may include, for example, wood, metal, plastics, rubbers, composite laminates, synthetic foams and the like. In one embodiment, the step device is constructed of a light weight foam core, such as those

used to construct surfboards, for example, polyurethane (PU), polystyrene (PS) or expanded polystyrene (PS). Other suitable foam materials include ethylene vinyl acetate (EVA) foam.

[0065] Construction of at least the stepping surface of the device, or alternatively of the device and optional feet, may be in the form of a solid material, a harder outside material with a lighter core material, or layers of differing types of foam or other composite laminates. If constructed with laminates, such as with layers of EVA foam, the layers can have different material properties such as density, compressive strength, tensile strength, elasticity, and flexural strength in order to optimize the stepping experience. In one respect, it may be somewhat beneficial to allow for some deformation of the surface of the step device to assist stability, provide more stiffness or to dissipate shock and therefore optimize the degree to which shock is absorbed. For example, if the surface of the device deforms even slightly because of the weight of the user and the pattern of their step, this configuration could prevent the user from a misstep caused by inadvertently losing their footing and thus avoid unnecessary injury.

[0066] By manufacturing the step device in the form of multiple layers of laminates such as foam or cloth (in other words, a composite matrix), the device can be configured to provide a higher degree of shock absorption than a device that is otherwise uniform in terms of its material such as a rigid, molded plastic step device or a wooden step device. In particular, using layers of different density, either foam, rubber or other compressible material, the incorporation of molded materials with greater densities can be avoided or limited as desired. Expandable foams in particular provide for a much lighter weight-to-volume ratio while still providing adequate structural support to a stepping surface. Such construction also facilitates the inclusion of cavities within the device to house electronic and/or mechanical components.

[0067] Although it is perhaps preferable that the upper surface of the device be essentially planar, it is also possible to add curvature to the surface to enhance the exercise experience. Alternatively, the device can be constructed essentially of two somewhat independently movable portions (e.g. halves), each with potentially varying material properties. For example, one portion could be comprised of more or fewer layers of the same foam or could use layers of foam with different density, compression strength, or other properties so that one side could be heaver, higher, stiffer, or compress more than the opposing side. Furthermore, the upper surface of the device, as well as the lower surface of the device can be covered in what is commercially known as “non-skid” material, such as may be found in the surfboard industry, the carpet industry, or the like.

[0068] FIGS. 1-5 illustrate one embodiment of the exercise step device 10. As shown in FIG. 1, the device 10 comprises a stepping surface 11 and a base surface 16 (i.e. the underside of the device 10) with internal support disposed therebetween. Device 10 is further depicted comprising first portion 12 and second portion 13, wherein center line 15 marks the line at which each portion meets. In some embodiments, internal support is comprised of a composite material matrix that comprises multiple layers 14 of varying materials such as foam, plastics, rubbers, cloth, elastomers and other composite material configured to withstand the force of a user stepping on any corner of the device 10. Accordingly, internal support is customized for different exercise routine environments such as being able to withstand more total weight of a user(s), more weight in at least one pre-determined location (e.g. making one location or portion stiffer or heavier than another), or being able to reduce the shock felt by a user during use.

[0069] FIG. 2 depicts a top plan view of the embodiment disclosed in FIG. 1. Accordingly, FIG. 2 illustrates the upper side of the stepping surface 11 which in some embodiments is textured, smooth, curved, planar, "non-skid" or any other type of surface, characteristic, or shape according to design needs. Stepping surface 11 is constructed from plastics, rubbers, polymers, elastomers, foam, cloth or any other suitable material. In all embodiments, the form of the device 10 is not necessarily rectangular as illustrated herein. Instead, it is circular, triangular, or any other regular or irregular shape that provides a stepping surface with adequate support.

[0070] Turning to FIG. 3, an embodiment is depicted of a step device for performing an aerobic exercise configured to use at least one fastening mechanism as viewed from the underside of the base surface 16. In this embodiment, portions 12 and 13 are depicted in a closed state such that the lower, underside surfaces of each mate to form base surface 16. Base surface 16 is comprised of any of the composite materials described herein and is not necessarily uniform or continuous in terms of material, meaning, surface 16 or other materials in device 10 include voids which may exist to conserve weight. In this embodiment, a first fastening point 17 is disposed on the lower, underside surface of first portion 12 and a second fastening point 18 is disposed on the lower, underside surface of second portion 13. A "fastening point" refers to a location on the device to which a fastener, a belt, a strap or any other type of fastening mechanism can securely attach.

[0071] Accordingly, the at least one fastening mechanism in this embodiment is configured to fasten portions 12 and 13 together in order to achieve the closed state by affixing a strap to

fastening points 17 and 18. Alternatively, the strap is replaced in some embodiments with a hook and loop fastener, rope, belt, chain, or any other fastening mechanism or fastener configured to secure fastening points 17 and 18 to each other in order to mate portions 12 and 13. In other embodiments where there are more than two portions, each additional portion comprises at least one associated fastening point wherein each fastening point is paired with an associated fastening mechanism or fastener as described above.

[0072] In other embodiments, along the mating surface of each portion (i.e. the surfaces that mate or rotate into each other when the device 10 moves between opened and closed states in the clamshell manner) are hook and loop fasteners (e.g. velcro). In this embodiment, the user fastens portions 12 and 13 to each other to move to a closed state by simply moving the mating surfaces of each portion towards each other so that they collide, fasten, and form base surface 16 and stepping surface 11. In other embodiments, fastening points are instead disposed on the outer side surfaces (i.e. the surfaces facing outwards and perpendicular to the stepping surface 11 and base surface 16) of each portion so that a user can easily access the fastening point and associated fastening mechanism while the device 10 is seated on the ground with the stepping surface 11 oriented upright.

[0073] In some embodiments, device 10 is configured to be able to withstand the stepping forces and weight caused by a user during use in such a way so that the device 10 remains firmly fixed to the ground (e.g. a user may step on one corner or one edge only and the device will remain in place instead of tipping or moving).

[0074] Turning to FIG. 4, an embodiment is depicted where the topside of the stepping surface 11 is oriented so that it is facing downwards. In this embodiment, portions 12 and 13 are depicted in the closed state with each portion folded into each other with outer side surfaces of each being visible.

[0075] FIG. 5 depicts the device 10 in an opened state. In this embodiment, it can be seen that portions 12 and 13 are hingedly connected in a clamshell manner along the center portion of stepping surface 11. Base surface 16 (not visible in this figure) is disposed on the underside of both portions 12 and 13 such that when portion 12 folds into portion 13 by contacting the corresponding mating surface, or vice versa, base surface 16 is formed by the undersides of portions 12 and 13.

[0076] In some embodiments, the stepping surface 11, base surface 16, and internal support are comprised of a first 12 and second 13 portion, wherein each portion is hingedly connected to the other so that first 12 and second 13 portion move between an opened state and a closed

state in a clamshell manner. In some embodiments, first 12 and second 13 portion are hingedly connected through an adjustable hinge disposed internal to the planar surface 11. In other embodiments, the first 12 and second 13 portions move in a clamshell manner by bonding to the planar surface along the center line 15 of the inner surface of the stepping surface 11 (see FIGS. 1 and 5). In other embodiments, there are more than one fold lines which increase the number of portions disposed between stepping surface 11 and base surface 16. FIG. 6 is an alternative embodiment depicting device 10 with more than two portions, wherein the portions hingably fold to form the stepping surface 11. While the embodiment depicted in FIG. 6 hingedly folds through a flexible surface 11, in other embodiments, mechanical hinges are used in place to achieve similar functionality.

User Interaction

[0077] An important feature of the step device of the present invention is that it provides for user interaction. The present concept is directed towards displaying a series of movements that follow an exercise pattern, the concept being particularly suited for cardio and/or aerobic exercise routines. Cardio and/or aerobic classes and general instruction of cardio, aerobic, and/or dance routines are commonly difficult for lay participants. This is because an average participant may struggle to maintain a rhythm in sync with a given routine or the participant may simply be unable to perceive the current step in a routine. If a participant struggles to place their feet in the proper present position or maintain a given rhythm associated with a song being played, the participant is likely to be unable recover where from their mistake which will result in frustrating the participant. This frustration will discourage the participant from engaging in future exercise routines.

[0078] This interaction can take the form of sensing input from the user and/or providing output to the user. For example, the input from the user in its simplest form may be the characteristics of the stepping pattern (to be discussed in more detail below) that is followed by the user. These characteristics are sensed by the stepping device and can include step speed, amount of pressure, step location, and number of completed steps. Conversely, the output to the user may be step-generated sound, a pattern of lights visible from the stepping surface, or immediate or delayed reporting information generated by the device for the user that may indicate some aspect of the routine performance including efficiency in terms of step location, speed, calories burned, or number of steps completed. Each of the above topics will be discussed separately below.

a. Input

[0079] In one embodiment, the step device of the present invention is used according to an aerobic exercise routine that can be predetermined or dynamically synchronized by the user (described below), the routine being displayed to the user by a virtual trainer or through a trainer in a studio setting, or played on any other form of display such as television, projector, computer, mobile device, tablet or any other suitable display medium. The routine can include instructions regarding where to step, when to step, how to step (e.g., with a flat foot or with the ball of the foot). Therefore, the characteristics of this physical input may include step speed, steps completed, stepping forces, calories burned stepping, efficiency, location or any other input characteristic that will be useful for later use in output. Accordingly, these characteristics of the step itself provide information that can be sensed by the step device, which may then be converted into an output to the user.

[0080] Other input from the user may come from a user's instructions through interaction with a mobile device or the step device such as song selections, pattern selections, song speed, whether to use a trainer, selections regarding comparisons between prior user performance, any sounds or commands communicated through sound by the user, or where or how the user steps on the device. Accordingly, input is also comprised of any communications carried out through a user interface either on the step device, display devices, or devices with which the user interacts in conjunction with the step device.

b. Output

[0081] The output from the device is anything sensed by the user, such as sound, lights, or other visible information such as text or animation. This output can be presented to the user by the step device (or a separate device with which the step device communicates) either before, during or after each step or after the entire step routine.

[0082] For example, in one embodiment, the step device includes at least one audio playback mechanism for emitting sound that can play a song, a rhythm of sounds, or any audibly detectable information to the user before, during and/or after the exercise routine is performed. Further, the sound can be generated mechanically from the step device if it incorporates features that allow it to be "beat" like a conventional drum when it is stepped upon, or to play music. For example, in an embodiment where the device 10 comprises portions 12 and 13, the user could step on portion 12 which could cause a sound emitting device such as drum stick to move and strike a first drum stored internally thereto to emit a first sound. Similarly, stepping on portion 13 would cause a second sound emitting device

such as a second drum stick to move and strike a second drum disposed internally thereto to emit a second sound. As such, stepping on portion 12 would effect a first sound and stepping on portion 13 would effect a second sound contributing to an interactive exercise experience where the user can generate unique drum beats to the tempo of their favorite music.

[0083] Alternatively, device 10 may comprise a speaker capable of playing any variety of noises. In another embodiment, device 10 may operatively connect with another sound emitting device, either wired or wirelessly, that is capable of producing sound.

[0084] While the sound may be presented to the user as a sort of "warm up", in one embodiment, the sound is generated as either a rhythmic pattern of output for the user to follow in performing the exercise routine, or the sound is generated in sync to the user's performance of the routine, i.e., the speed/location of the user's steps on the device 10.

[0085] Output may also involve using the device 10 (or another device with which the step device operatively communicates) to process input that is sensed, measure, record and report the contact between the user's feet and the stepping surface 11. Such sensing mechanisms may include a pressure plate that triggers a mechanical switch, an accelerometer, an electrical grid, an optical plate that senses heat or other means of identifying when and where the user places their feet on the stepping surface. Incorporating sensing technology allows the step device 10 to be connected to a variety of other devices to optimize user experience by processing input that is sensed and providing user feedback, such as a counter that registers the number of steps taken, an image portrayed on a digital display corresponding to the user's step routine, or any other form of audio or visual output medium configured to convey back to the user before, during or after performance of an exercise routine.

[0086] As mentioned above, the user output may be the display of at least one pattern of lights displayed on the stepping surface which is observable by the user. In one embodiment, the lights are displayed to the user before beginning the exercise routine to demonstrate to the user the stepping pattern to be performed. In another embodiment, the lights are displayed to the user during performance of the routine to indicate to the user where to step, how, or when to step. The lights can take any shape or color, so long as they are observable by the user.

[0087] FIG. 9 illustrates a perspective view of the device 10 demonstrating the user's foot 2 as it interacts with the device 10 when comprised of portions 12 and 13, wherein the device 10 further comprises a sensing mechanism as discussed above. In this embodiment, the sensing mechanism 110 is triggered when the user's foot 2 strikes the surface 11. In this

embodiment sensing mechanism is an accelerometer such that the user's 2 step causes the surface 11 to move ever so slightly to the extent the accelerometer records a completed step. In this embodiment, movement is also sensed by having the user's foot 2 intersect with a plurality of grid lines 20 which may be infrared LED lines or a simple electrical grid (described in detail below). The lines and/or the grid are each configured to sense movement on the stepping surface 11.

[0088] The device 10 in this embodiment further comprises an output display 21 disposed on stepping surface 11. In this embodiment, the display 21 is operatively connected to the sensing mechanism 110 such that input such as steps sensed by the sensing mechanism 110 is recorded by a recording mechanism and/or communicated to the display 21, and thus observable by the user 2. In some embodiments, the display 21 shows actual digits, letters, or images but in other embodiments the display 21 simply emits lights, sound, or other output to indicate to a user output such as progress, efficiency, or speed. As seen in FIG. 9, device 10 further comprises first audio playback mechanism 24 disposed on any outer surface of first portion 12 and second playback mechanism 22 disposed on any outer surface of second portion 13. In this embodiment, sounds such as music, drumbeats, or any other desired sound is emitted from each playback mechanism to provide an enriching exercise experience.

[0089] In some embodiments such as FIG. 9, disposed on the stepping surface 11 of the device 10 may be features that facilitate a user 2 giving input and/or receiving output before or during an exercise routine. For example, sensing mechanism 110 operatively connects to the stepping surface 11 and is disposed thereon in such a way that records each step by a user on the stepping surface 11. In other embodiments, steps are sensed, measured, recorded and/or reported through a pressure plate operatively connected to the planar surface 11 (described in FIG. 14). In this embodiment, when a user 2 steps on the surface 11, the force applied by the user 2 triggers a switch and when the switch is triggered, the sensing mechanism 110 senses this input thereby registering that one step has been completed for recording in recording mechanism and/or being displayed to the user.

[0090] In embodiments where sensing mechanism 110 is an accelerometer, it is configured to measure the rate of acceleration of the stepping surface 11 resulting from the user 2 applying forces thereto. For example, when the user 2 steps on the surface 11, the accelerometer will sense a rate of acceleration and when the rate of acceleration of the stepping surface 11 exceeds a pre-determined value, this will indicate to the recording mechanism that a step has

been completed and should be recorded for purposes of later or immediately reporting via output to the user 2.

[0091] In some embodiments, device 10 further comprises at least one audio playback mechanism operatively connected to the device directly thereto or wirelessly across a network or through some other means (e.g., 22 and 24). In certain embodiments, audio playback mechanism may be a speaker or multiple speakers configured to play sounds or music. In embodiments where the device 10 comprises speakers internally, the device 10 is constructed from a rectangular shape ideal for enhancing speaker acoustics.

[0092] Accordingly, each embodiment of the device 10 is comprised with a particular sensory input system operable to sense input from and/or provide output to the user using any or all of the sensing mechanisms, recording mechanisms, and/or other devices that generate output as described herein.

[0093] While the stepping device 10 can incorporate audio playback mechanisms 22 and 24 such as speakers or other music players such as DVD, CD, mp3 and electronic audio players, it can also incorporate other devices that operatively connect, wired or wirelessly, with other devices capable of playing sounds and music as described above. As an example, in addition to incorporating speakers into the stepping device 10, it may also incorporate sensing and recording devices (as described above), wherein input received through any one of these sensing mechanism and/or recorded through a recording mechanism activates sound and visual generating devices operatively connected, but external, to the device 10 itself. For instance, the stepping device 10 can produce one or more drumbeats as described above, but instead of it coming from the built in speakers in the step, it can come from audio playback devices that are part of a gaming console system or other media device (discussed below).

Device Options

a. Bladder

[0094] Since storage and mobility are of great importance in the exercise device industry, in some embodiments of the device 10, internal support between stepping surface 11 and base surface 16 is comprised of an inflatable bladder. The bladder can be inflated with any fluid, such as gas including nitrogen or it may be filled using liquids such as water. In some embodiments, the bladder is surrounded by a support structure such as collapsible feet, an assembly of collapsible support beams, or the like to provide the desired structural support to the inflatable bladder so that the device 10 is easily transportable and storable in small places.

[0095] FIG. 10 depicts one embodiment where at least one inflatable bladder 205 is disposed between stepping surface 11 and base surface 16. The bladder 205 may be constructed from an assortment of materials including PVC, neoprene, hypalon, polyurethane, urethane, nylon, polyester, and any other rubbers, plastics, cloth or any other desired material. The bladder 205 is formed from one material or a composite blend of materials woven, welded, or bonded together as required. In some embodiments, air pump 210 is disposed on stepping surface 11. Air pump 210 comprises a spring 215 mechanically attached to a switch, wherein the user releases the switch to engage the pump 210. Once engaged, the air pump 210 can be compressed to inflate the at least one bladder 205 to its design volume. As the bladder 205 expands (see FIGS. 10A-D), it can be seen that the elevation of the device 10 increases. Although depicted as being part of the device in FIG. 10, in other embodiments the air pump 210 is disposed inside the device 10 including internal to the at least one bladder 205. In alternative embodiments, the air pump 210 is entirely separate from the device 10 such that the device 10 is configured to receive fluids pumped from the entirely separate pump. The pump in some embodiments is battery powered and/or integrated into the bladder. In other embodiments the pump is detachable from the bladder and is operable with an external power supply.

[0096] In certain embodiments, the device 10 further comprises a plurality of collapsible support beams 225 and collapsible feet 265. Accordingly, as air or other fluids enter the at least one bladder 205, it can be seen that the collapsible support beams 225 previously disposed adjacent to stepping surface 11 and/or base surface 16 begin to both rise and spread out (See FIG. 10B-C). Each individual beam 225 may comprise an associated collapsible foot 265 configured to slide until it reaches a locked position in a groove along an outer edge of the base surface 16. FIG. 10D-D illustrates a closer look of the device 10 in this embodiment when the at least one inflatable bladder 205 is fully inflated such that collapsible feet 265 and collapsible beams 225 and are in a fully extended, locked position. Grooves 255 arranged on the outer edge of base surface 16 are configured to receive collapsible feet 265 so that once the bladder 205 expands to the extent that beams 225 slide its associated feet 265 into groove 255, the feet 255 lock the device 10 to a pre-determined device elevation. With the feet 265 having locked the beams 225 in place, the upper surface 11 is ready to receive stepping forces and/or weight of the user and distribute these forces through the device structure. In other embodiments, the feet 265 could be locked in more than one location through the use of multiple grooves, locking pins, or any other desired technique such as

magnets. In other embodiments, using grooves to lock the feet 265 in place are replaced with magnets such that magnetic forces lock the feet 265 in one or more pre-determined positions along base surface 16.

[0097] In other embodiments, the device 10 is constructed from an inflatable bladder surrounded by one or more layers that provide the stiffness and support necessary for the stepping experience. In this embodiment, additional mechanical and/or electrical components are disposed internal to the device 10 (e.g. mechanisms to operatively connect to a network, a user interface, a step recording mechanism, a display medium to display output to the user, audio speakers, etc). Storing these components inside the bladder provides the additional advantage of being able to provide a package in which all components necessary to operate the device or operate the device within a system would be easily storable and movable from one location to another.

[0098] FIG. 11 depicts an exemplary embodiment wherein device 10 is configured to comprise more than one inflatable bladder (228, 235, 245). In this embodiment, disposed between stepping surface 11 and base surface 16 are three inflatable bladders of equal height (228, 235, 245). Similar to FIG. 10, pump 210 is included with a spring loaded switch that does not require external power to function. A user can engage the pump by releasing the switch, compressing the pump manually to thereby inflate each of bladders 228, 235, and 245. In other embodiments, the pump 210 comprises a dial through which the user can select all bladders or an individual bladder she wishes to inflate. In other embodiments, pump 210 is configured to function off of external power such that the user is not required to manually compress the pump lever to operate the pump 210.

[0099] In certain situations, the user may desire an exercise surface that is not level. Accordingly, FIG. 12 depicts one embodiment where the device 10 comprises three inflatable bladders of different volumes, shapes, and/or height. In this embodiment, bladders 229, 236, and 246 are illustrated as having different volumes that result in a slanted stepping surface 11 on which the user will exercise. In some embodiments, each bladder is connected such that inflation causes the bladders to expand together. However, in other embodiments, the user may desire to inflate one or some of the bladders to a certain percent expansion (i.e. 75% capacity) while filling other bladders to a greater percent expansion (i.e. 98% capacity). This causes the non-level surface 11 do also have different characteristics such as stiffness or compression strength to differ and thus be customizable according to design needs or desire.

[00100] In other embodiments, the user can adjust the height of the device 10 with at least one inflatable bladder by sequential inflation. FIG. 13 depicts this embodiment using three inflatable bladders (207, 237 247). Accordingly, each of the three inflatable bladders (207, 237 247) in this embodiment are shown with gradually larger volumes. Starting from a collapsed state in FIG. 13A where bladders remain in an deflated state, device 10 is configured so that fluids inflate first bladder 207 first (FIG. 13B). Accordingly, as first bladder 207 expands, device 10 rises to a first elevation. The user could use the device 10 at this point. However, if the user wishes increase the elevation of the device 10, fluids would have to be supplied to second bladder 237. FIG. 13C more clearly shows device 10 after second bladder 237 has been inflated and thus device 10 has been elevated to a second elevation. If it is desired to increase the elevation of the device 10 even more, fluids are supplied to third bladder 247. Bladders are constructed from any material that is elastic enough to expand and retain fluids such as rubbers, plastics, elastomers, or any other material.

[00101] In all embodiments of the device 10 with inflatable bladders disposed therein, stepping surface 11 and base surface 16 may be mechanically attached through collapsible beams, resistance belts, straps, elastic membrane, or any other fastening mechanism that can be collapsed and easily stored between each surface.

[00102] Turning to FIG. 14 is a closer look at an exemplary embodiment of the of the stepping surface 11 when it is configured with sensing mechanism that comprises a pressure plate configured to measure the forces that are imparted onto the stepping surface 11. Disposed between an upper 305 and lower portion 315 of stepping surface 11 is a plurality of pressure sensory spring 325. Pressure sensory springs 325 are configured to displace such that when an individual sensory spring is displaced even slightly, that displacement is measured and can later be recorded in terms of force and location. This information can then be stored locally on a recording mechanism or communicated to other devices or mediums operatively connected thereto (described in detail below). FIG. 14B depicts a top pan view of stepping surface 11 wherein locations of sensory springs 325 are visible from above device 10. Accordingly, sensory springs 325 may be located at as many or as few locations on stepping surface 11 as required. In other embodiments, instead of sensory springs, disposed between upper 305 and lower portion 315 is a plurality of magnets such that pressure applied to the stepping surface 16 results in downward displacement of upper portion 305. This

downward displacement is measured and force used to displace the magnetically induced displacement forces is recorded.

a. Transportability and Diversified Exercise

[00103] FIGS. FIGS. 20-27 illustrate certain embodiments of the exercise step device 110 comprising at least one handle. As shown in FIG. 20, device 110 comprises a stepping surface 111 and a base surface 116 (i.e. the underside of device 110) with internal support disposed therebetween in addition to other features as discussed herein. Device 110 is depicted further comprising first portion 112, second portion 113, and center line 115, wherein center line 115 defines the plan at which each portion mates. In other embodiments, device 110 may be one entire portion and not split into a first 112 and second portion 113 whereas in other embodiments device 110 may comprise more than two portions.

[00104] In some embodiments, internal support is constructed of a composite material matrix comprised of multiple layers 114 of varying materials such as foam, plastic, rubber, cloth, elastomer and other composite material configured to withstand the force of a user 2 stepping on any corner of the device 110 or otherwise moving device 110. Internal support is optimized for different exercise routine environments such as being able to withstand more total weight of a user(s), more weight in at least one pre-determined location (e.g. making one location or portion stiffer or heavier than another or adding weight to a cavity inside device 110), or being able to reduce the shock felt by a user during use.

[00105] FIG. 20 further illustrates device 110 comprising a first side handle 142 disposed on the outer surface of first portion 112 and a second side handle 143 disposed on the outer surface of second portion 113. Each handle is configured to be easily grabbed, moved, lifted, transported or otherwise used with a user's hand so that a user 2 can move the device 110 using the handle to thereby work out core and/or upper body muscles in addition to lower body muscles during stepping. Each handle is configured ergonomically with sufficient strength to support the device 110 and transfer forces imparted by a user 2 when moving device 110 so that the user 2 can exploit the device 110 to achieve maximum exercise effect and ease of mobility.

[00106] In some embodiments, a handle may comprise a pull mechanism such as tubing or the like dimensioned to be grabbed by one hand, finger, or the like. In preferred embodiments, the tubing is plastic and hollow. In other embodiments, the pull mechanism

may be solid or be comprised of multiple materials such as a polymer, elastomer, fiber, metal, plastic, rubber, foam, or even wood.

[00107] Each handle is configured to mechanically attach to the device 110. In some embodiments, a handle is integrally formed with the device 110 whereas in other embodiments a handle is configured to be detachably mechanically attached to the device 110. In those embodiments where a handle is configured to be detachable, the handle is configured to be snapped onto the device 110 in a pre-determined location and produce a sound when mechanically attached. In other embodiments, the handle attaches and detaches by utilizing other fastening mechanisms such as at least one bolt, cable, clamp or similar coupling, hook and loop fastener, latch, lock, lug, pin or the like.

[00108] In some embodiments, a handle is configured to be attached so that it is seated flush with the outer surface on the portion of device 110 to which it is attached. In certain embodiments where the handle sits flush, the pull mechanism and associated features are recessed in the device 110. In other embodiments, the handle is configured so that certain features of the handle, such as the pull mechanism, extrude or extend away from the outer surface of the portion or device 110 such that handle is not seated flush with an outer surface or lower base surface of device 110.

[00109] FIG. 21 depicts a top plan view of the embodiment disclosed in FIG. 20. Accordingly, FIG. 21 illustrates the upper side of the stepping surface 111 which in some embodiments is textured, smooth, curved, planar, "non-skid" or any other type of surface, characteristic, or shape according to design needs. Stepping surface 111 is constructed from plastics, rubbers, polymers, elastomers, foam, cloth or any other suitable material. In some embodiments, the shape of the device 110 may not necessarily be rectangular as illustrated herein. Instead, it is circular, triangular, or any other regular or irregular shape that provides a stepping surface with adequate support.

[00110] Turning to FIG. 23, an embodiment is depicted of a step device for performing an exercise configured to use at least one fastening mechanism and at least one handle which in this embodiment is first lower handle 132, second lower handle 133, third lower handle 134, fourth lower handle 135, fifth lower handle 136, and sixth lower handle 137 as viewed from the underside of the base surface 116. In other embodiments, device 110 may comprise more or fewer handles than those depicted in FIG. 23 according to design needs.

[00111] Portions 112 and 113 are depicted in a closed state such that the lower, underside surfaces of each mate to form base surface 116 along center line 115. Base surface 116 is

comprised of any of the composite materials described herein and is not necessarily uniform or continuous in terms of material, meaning, base surface 116 or other materials in device 10 include voids or cavities in some embodiments which may exist to conserve weight. In other embodiments, the void or cavity is configured to receive weight added by a user 2 so that a user 2 can control the amount of weight and the location of the weight in the device 110. This provides a user 2 with the ability to regulate the difficulty of the exercise routine but still easily transport or move the device 110 after the exercise routine is finished since the weight can be added and removed at the user's discretion.

[00112] FIGS. 22A and 22B depict sectional views taken along line A-A of FIG. 20. In the embodiment disclosed in FIG. 22A, cross sections of handles 132, 133, 134, 135, 136, and 137 are depicted being situated along the outer surfaces of device 110 between stepping surface 111 and base surface 116. The embodiment disclosed in FIG. 22B further comprises cavity 140 disposed inside device 110 between surfaces 111 and 116. Cavity 140 is configured to be accessible by a user and to receive features such as weight or a sound emitting mechanism. Device 110 may comprise more than one cavity and the one or more cavities can be disposed anywhere in device 110. In certain embodiments, sound emitting mechanism disposed in cavity 140 produces sound mechanically through a drum and stick as previously described. In other embodiments, sound emitting mechanism operatively connects, wirelessly or directly, to audio playback mechanism 24 disposed therein or another audio playback or display device operatively connected thereto.

[00113] In the embodiment of FIG. 23, a first fastening point 117 is disposed on the lower, underside surface of first portion 112 and a second fastening point 118 is disposed on the lower, underside surface of second portion 113. A "fastening point" refers to a location on the device 110 to which a fastener, a belt, a strap or the like can securely attach. At least one fastening mechanism is configured to fasten portions 112 and 113 together in order to achieve a closed state by affixing a strap to fastening points 117 and 118. Alternatively, the strap is replaced in some embodiments with a hook and loop fastener, rope, belt, chain, or the like configured to secure fastening points 117 and 118 to each other in order to mate portions 112 and 113. In other embodiments where there are more than two portions, each additional portion comprises at least one associated fastening point wherein each fastening point is paired with an associated fastening mechanism or fastener as described above.

[00114] In some embodiments, device 110 is configured to be able to withstand the stepping forces and weight caused by a user 2 during use so that the device 110 remains firmly fixed to

the ground (e.g. a user may step on one corner or one edge only and the device will remain in place instead of tipping or moving).

[00115] Turning to FIG. 24, an embodiment of device 110 is depicted where the topside of stepping surface 111 is oriented so that it is facing downwards. Portions 112 and 113 are depicted in a closed state with each portion folded into each other with outer side surfaces of each being visible. Device 110 is depicted further comprising third side handle 144 disposed on the outer surface of first portion 112 and a fourth side handle 145 disposed on the outer surface of second portion 113. As previously described, each handle is configured to be easily grabbed, moved, lifted, transported or otherwise used with a user's hand or the like so that the device 110 is used during an exercise routine to work out lower body, core, and/or upper body muscles. In other embodiments, there are a fewer or greater number of handles arranged on the outer surfaces of portions 112 and 113 or device 110.

[00116] FIG. 25 depicts device 110 in an opened state. In this embodiment, it can be seen that portions 112 and 113 are hingedly connected in a clamshell manner along the center portion of stepping surface 111. Base surface 116 (not visible in this figure) is disposed on the underside of both portions 112 and 113 such that when portion 112 folds into portion 113 by contacting the corresponding mating surface, or vice versa, base surface 116 is formed by the undersides of portions 112 and 113.

[00117] FIG. 26 is a perspective view of one embodiment of device 110 with a user 2 stepping one foot onto the stepping surface 111. Device 110 in this embodiment comprises handles 143 and 142 disposed on outer surfaces of portions 113 and 112, respectively.

[00118] FIG. 27 is a perspective view of one embodiment of device 110 with a user 2 holding the device from below bottom surface 116. As shown, user 2 is grabbing handles 137 and 136 and moving the device 110 by lifting during an exercise routine. However, the user 2 may grab, move, lift, throw, or otherwise use device 110 by utilizing handles 144, 145, 135, 134, 133, and 132. It can be seen that device 110 in one moment can be seated firmly on the ground and in the next moment, a user 2 can lift the device 110 overhead or hold the device 110 in any other desirable position to exercise lower body, core, and/or upper body muscles. In some embodiments, when device 110 is lifted, shaken, or otherwise moved, sound emitting mechanism disposed therein or operatively connected thereto is configured to generate a pre-determined sound.

Exemplary Embodiment

[00119] In other embodiments, the exercise step device is configured to function within a system capable of allowing a user to define a series of movements using recognizable patterns, customizable music, and customizable instructions into the exercise routine in order to display the series of movements that follow an exercise pattern for an easy to learn, enriching, and interactive exercise routine experience with the step device. Recognizable patterns may include any written character from known languages such as Arabic, Syriac, Cyrillic, Greek, Hebrew, English, Hangeul, Bopomofo, Ogham, Latin, Mandarin, Cantonese, Japanese, or Glyph. Where appropriate, to enrich user experience the patterns may contain dynamically rendered fonts and/or other options that provide additional layers to the visual experience to be customized by the user. The patterns may also be images such as a happy face, a shape, or an animal.

[00120] In the following, preferred embodiments of the present system will be described in detail with reference to the accompanying drawings. FIG. 15 depicts a system 500 for using the step device 10 and displaying a series of movements that follow an exercise pattern in accordance with one embodiment. In this embodiment, the system 500 is configured to display an exercise pattern by communicating between display device 510 (e.g. a mobile device) and a server 520. In this embodiment, a user 2 uses the display device 510 to select an audio file (e.g. a song) and an exercise pattern. The audio file selected by a user 2 may be permanently stored in a sound database 529 on the server 520 or the audio file may be stored elsewhere (e.g. permanently stored locally on the display device 510, step device 10, or available for download through a network 530). The user 2 will also select an exercise pattern. The user's selections are received by a user interface 536 disposed on the display device 510 and these selections are then communicated through the network 530 to the server 520. Alternatively, the step device 10 may comprise a step user interface configured to receive and communicate user selections such as song choice, wherein the user may utilize the step user interface to communicate song selections.

[00121] In addition to display device 510 and the server 520, the system 500 comprises the network 530 through which information may be communicated between the display device 510, the server 520, or the step device 10. Information may be communicated between each of these components, wired or wirelessly, across the network 530. The network 530 may comprise one or more local or wireless networks, meaning, the device 510 and/or stepping device 10 may be operatively connected with the server 520 through a base station 535 connected to the at least one network 530 (meaning,. there could be more than one network)

for accessing the audio database 529 and/or exercise pattern database 531 to select and receive audio files stored therein. In other embodiments, the server 520 may operatively connect and/or synchronize with the one or more audio databases and/or exercise pattern databases external to network 530 so that a user 2 can access and select audio files and/or exercise pattern files from anywhere.

[00122] The server 520, with power provided to it by power supply 534, may comprise a processor 525, volatile memory 526, non-volatile memory 527, a server control system 528, one or more audio database 529, one or more exercise pattern database 531, user information 532, and a bus 533 to interconnect each one of the above-listed components. The audio file that will ultimately be selected for generating the synchronized pattern may be permanently stored in the audio database 529, it may be permanently stored locally on the display device 510 or step device 10, or it may be available for preview and download through the network 530. The display device 510 or step device 10 may further comprise an audio file recording mechanism through which the user 2 can create his/her own sound file which can then be selected. In some embodiments, the display device 510 or step device 10 may be configured to preview sound files and/or preview patterns before synchronizing them into a synchronized exercise pattern. Furthermore, the system 500 may include customer support modules wherein a user 2 will be able to transmit help requests from the display device 510 or step device 10 to resolve issues as they arise.

[00123] The server 520 may be controlled by a server control system 528. The server control system 528 may comprise an operating system and a database control system for regulating access to the data stored in the audio database 529 and/or the exercise pattern database 531. The server 520 comes equipped with additional features that intercommunicate between local components of the server 520 and components remote to the server 520 so that the system 500 is capable of communicating information across the network 530, locally or remotely. These additional features may include communication circuitry, network cards, and other features that can work together to provide connectivity to any other network, wired or wireless.

[00124] The user information 532 may comprise files selected by a user 2 from the sound 529 and exercise pattern databases 531 as well as any exercise pattern 540 that is generated by the user 2 or a pattern selected by the user 2 that is external to the exercise pattern database 531. The user information 532 may further comprise edited or modified content including song files from the sound database 529 whose beat per minute (hereinafter "BPM") (e.g. tempo)

may have been slowed down or sped up by a user 2. Edited or modified content may include audio files that have been modified by the user 2 from its original form by adjusting the song's speed, intonation, and/or length. Modified content may also include an exercise pattern (e.g. an image file such as a happy face or the letter "L" as in FIG. 18) that is modified by the user by adding more characters or changing the selected pattern. The patterns that are modified from exercise pattern files in the exercise pattern database or patterns are that are created by the user 2 through the pattern creation mechanism can all be used in the system 500 to generate the synchronized exercise pattern 540. A user 2 may also access and select song files stored locally on the display device 510, step device 10, and/or access audio files on the network 530 in order to access and select audio files external to the system 500 (e.g. via the internet or via servers that are external to the network 530) in order to add song files 538 to the sound database 529.

[00125] The user information 532 may also comprise lists of song files that the user 2 has selected from the sound database 529, lists of song files the user 2 has added to the song database 529, the user-generated or user-added songs and/or patterns communicated from the display device 510 or step device 10 by the user 2 using the user interface 36 or step user interface (e.g. patterns stored locally on the display device 510 or step device 10 or remotely on computer readable storage mediums external to the network 530) (described below).

[00126] Importantly, the server also comprises instructions 560 for generating a series of movements that follow the exercise pattern. The instructions comprise analyzing the audio file selected by the user, detecting a speed of the audio file (e.g. BPM), and synchronizing the speed with the selected exercise pattern to generate a synchronized exercised pattern 540. In some embodiments, the instructions are permanently stored in a non-transitory computer readable storage medium. In all embodiments of the system 500, the processor 525 is configured to execute the instructions 560 and communicate the synchronized exercise pattern 540 to components such as the display device 510 or step device 10. In some embodiments, the display device 510 may be a mobile device. The processor 525 is operatively coupled to the memory. The memory may comprise volatile memory 526 and/or non-volatile memory 527, meaning, memory may include random-access memory (RAM), high speed RAM, data, and/or software such as application programs such as information that is loaded from non-volatile memory 527. Memory may also include read-only memory and/or flash memory.

[00127] In those embodiments where the display device 510 is a mobile device, the cellular communication protocols used by the display device 510 can be utilized for provision of the network 530 and all components in the system 500 connected thereto. In other embodiments, a second display device (not depicted in FIG. 15) (e.g. a personal computer, another mobile device such as a tablet, etc.) may operatively connect with the server 520 through the network 530 (e.g. the internet that in turn communicates with the base station 535 that operatively connects to the display device 510).

[00128] In one embodiment, the user interface 536 of the display device 510 may comprise at least one user input mechanism such as a touch screen, a mouse, a keyboard, a stomp pad, a scroll wheel or any equivalent that is configured to receive selections from a user 2 and communicate the selections to the device 510. A display medium 537 functioning as an output medium on the device 510 may also be operatively connected thereto. The display medium 537 is configured to receive communications from the processor 525 disposed on the server 520 to project those communications on its display in such a manner that is perceptible by the user 2. Similarly, the step user interface of the step device 10 may comprise at least one user input mechanism such as a touch screen, a mouse, a keyboard, a stomp pad, a scroll wheel or any equivalent that is configured to receive selections from a user 2 and communicate the selections to the step device 10. A step display medium functioning as an output medium on the device 10 may also be operatively connected thereto. The step display medium is configured to receive communications from the processor 525 disposed on the server 520 to project those communications on the step display in such a manner that is perceptible by the user 2.

[00129] In practice in some embodiments, the display medium 537 or step display induces the user 2 to access the user interface 536 or step user display and select an audio file from the sound database 529 or elsewhere. The user 2 is further induced to select a pattern from the exercise pattern database 531 or elsewhere. The processor 525 then receives communications from the display device 510 or step device 10 regarding the user's selections and causing the processor 525 to execute the instructions 560 by analyzing the user-selected audio file. The processor 525 in turn determines the speed of the audio file and synchronizes the speed with the user-selected pattern in order to generate the synchronized exercised pattern 40 that is displayable on display medium 37 or step display medium to induce a desired user movement. Displaying synchronized exercised pattern 40 on display medium 37, step display medium, or any display medium connected thereto (e.g. computer or

projector) may be further accompanied by the audio file being played on an audio playback mechanism, the playback mechanism being capable of being disposed on the display device 510, the side walls of the step device 10, or operatively connected to the system 500.

[00130] Turning to FIG. 16, in other embodiments the concept may be a system comprised of display device 610 and a step device 10 for displaying a series of movements that follow an exercise pattern. The display device 610 comprises memory with internal and/or external power supply 634. Similar to the memory in system 500, the memory in the device 610 may include volatile memory 626 and/or non-volatile memory 627. The memory may comprise a local exercise pattern database 631 with a plurality of exercise patterns, a local audio database 629 with a plurality of audio files, and instructions 660. The instructions 660 are for generating a series of movements that follow the selected exercise pattern. The instructions 660 comprise (1) analyzing an audio file selected by a user 2 from the local audio database (or elsewhere) to detect a speed and (2) synchronizing the speed with an exercise pattern selected by the user from the exercise database (or elsewhere) to generate the synchronized exercised pattern 640. The device 610 further comprises a processor 625 that is operatively coupled to the memory, 626 and/or 627. The processor 625 is configured to execute the instructions 660 and communicate the synchronized exercise pattern 640 to a display medium 637 and/or any other component connected thereto configured to receive such data (e.g. a server, a second device with display medium, etc.).

[00131] The device 610 has a user interface 636 configured to receive and communicate user selections. The device 610 also has a display medium 637 that is configured to display the series of movements that follow the synchronized pattern. Device 610 may be a mobile device. The device may further include an audio playback mechanism configured to reproduce and play the audio file while the series of movements that follow the synchronized pattern is displayed.

[00132] In some embodiments of the device 610, device control system 628 controls the device 610 through local processor 625. It is contemplated that device control system 628 may be any operating system native to the device 610 including platforms such as Android, Asha, Blackberry, iOS, and/or any equivalents. Device control system 628 may be stored locally on device 610. In other embodiments, display device 610 may comprise a sound design module 619 for recording and/or modifying sound files. Display device 610 may also comprise pattern design module 618 for creating and/or modifying pattern design files.

[00133] In other embodiments, display device 610 or step device 10 may further comprise at least one message protocol such as e-mail, SMS, MMS and/or equivalent forms of electronic communication. A user may wish to utilize the at least one message protocol to communicate with customer support 615 and/or communicate with fellow users of the device 10 in order to share synchronized patterns. Device 610 may also comprise a native browser through which device 610 can operatively connect to antenna 650 to access network 530.

[00134] In some embodiments, the local sound database 629 or a sound database stored on device 10 may each comprise one or more songs or audio files. Through its connection to network 530, the device 610 or device 10 may also access songs or audio files or alternatively, store song files locally for later use in their respective storage mediums for later use during creation of a synchronized exercise pattern. In some embodiments, the sound design module 619 may be configured to record music or sound to then store locally on the display device 610. Once added to the local sound database 629 or sound database on device 10, a recorded sound file can then be integrated for utilization in a synchronized pattern.

[00135] Through the browser 617 native to the device 610, additional patterns (e.g. images) may be accessed and stored locally on the device 610 in the local pattern database 231 or pattern database stored locally on step device 10. Using the local pattern database 231 or local pattern database stored locally on step device 10, each sound database, sound design module 619, pattern design module 618, and/or any databases and/or modules operatively connected thereto, a user 2 can store information on the display device 610 or step device 10 in order to customize the synchronized exercise pattern to the extent possible.

[00136] In some embodiments, the device 610 or system 500 may comprise audio file indicia (e.g. BPM, genre, order of user-defined ranking, etc) stored locally in memory or in another non-statutory storage medium connected thereto via the network 530 (e.g. a server, a hard disk, a compact disk, etc.). Audio file indicia may include top-20 lists in a particular music genre such as hip-hop, R&B, pop, Latin, country, rap or any other music to which a user may wish to generate, customize, and perform cardio and/or aerobic routines. A user may also wish to sort and/or rank music based on song title, artist name, timestamp when the audio file was added and/or created by the user 2. In some embodiments, audio files and/or patterns may be available for downloading to a device through native browser 617 or other communication protocol.

[00137] In some embodiments of both the display device 610, step device 10, and the system 500, the user 2 may observe that a particular song is too fast or too slow for their taste or

exercise routine needs. As such, display device 610, step device 10 and/or system 500 may further comprise a speed adjustment mechanism operatively coupled to the associated processor. The speed adjustment mechanism provides the user with the ability to increase or decrease the speed of an audio file thereby allowing a user to speed up or slow down the exercise routine. The speed adjustment mechanism will also provide the user with the capability of speeding up or slowing down without affecting the song's intonation. This means that a user is able to select a song of their choosing from anywhere (or record a song) and then increase or decrease the speed of the entire song, part of the song, or some combination of increasing and decreasing speeds in certain parts of the song. For example, a user can create the synchronized pattern by selecting an audio file and increasing or decreasing the BPM of the audio file. This causes the series of movements that follow the exercise pattern selected by the user to speed up or slow down in accordance with how the user modified the speed.

[00138] This added layer of customization as to speeding or slowing songs will induce the user to easily move and position his feet in accordance with the song's adjusted tempo since the user already expects the next step based on the easy to remember exercise pattern and the user adjusted speed. This also means that a user 2 is more likely to challenge himself by increasing the speed since doing cardio and/or aerobics at a fast rate is no longer intimidating since the present and future steps in the series are easy to both predict and remember. In some embodiments, the display device 610, the step device 10, and/or system 500 may further comprise a sensory mechanism configured to measure and communicate a user's vital statistics (e.g. heart rate) to the memory so that speed adjustment mechanism automatically increases or decreases the BPM of a song if a user is approaching an unsafe health condition.

[00139] In some embodiments, the series of movements in the synchronized exercised pattern are displayable in video alone, in step animation alone, with the guide of virtual instruction (e.g. an instructor on the display), or some combination thereof. In some embodiments, the display device 610, step device 10, and/or system 500 may further comprise an audio creation mechanism that is configured to record and permanently store a recorded audio file to the server 520, the display device 610, the step device 10, or any computer readable storage medium operatively connected to a network connected, wired or wirelessly, thereto. In some embodiments, the display device 610, the step device 10, and/or system 500 may further comprise a pattern creation mechanism configured to allow a user via the user interface 636 and/or step user interface to create or modify patterns. For example, a

user 2 may wish to draw a happy face since this is a highly recognizable and easy to remember image. Accordingly, the user can either draw a happy face or select a happy face image from a local or non-local pattern database. With happy face pattern selected, the user may now generate the series of movements to follow the synchronized pattern.

[00140] In some embodiments, the foregoing information stored in memory (e.g. databases, user information, etc.) may be single data structures while in other embodiments some or all information may comprise at least one and sometimes a plurality of data structures that may be stored on server 520. For example, the audio file database 529, local audio file database 629, step device audio file database, exercise pattern database 531, local exercise pattern database 631, step device exercise pattern database, and/or any song files located elsewhere or created locally on the display device 610 or step device 10, may be permanently stored in memory on the server 520, the display device 610, or the step device 10. This information may also be accessible or in communication through network with other devices such as other servers or with the server 520 via the network, either locally or remotely.

[00141] In recent years, developments in the field of mobile devices have made it possible for applications (herein after, "apps") to be locally stored on mobile devices. This allows a user 2 to execute any processes (e.g. instructions 560/660) on a device when the user 2 may not be operatively connected to a network 530. However, mobile devices often suffer from being limited in their resources including small amounts of memory (volatile and non-volatile). These limitations reduce the available processing speeds, battery power, and/or network connectivity (including no connectivity). In order to overcome these limitations on mobile devices, apps have been created.

[00142] In some embodiments, an app may be stored on a device such as device 610 or 510 with all associated functionality of the system 500 and/or display device 610 as described herein. For example, the app may be configured to provide the user 2 with a platform to use the user interface 636 to select, play, and/or preview audio files, browse and/or or select patterns, and synchronize the selected audio files with the selected pattern files in order to create a synchronized exercised pattern. In certain embodiments, the app further comprises a menu through which a user can access any audio database including those disposed on the server 520, the local sound database, and/or a music store module.

[00143] In all embodiments of the app, the processor 625 of the device 610 is configured to analyze and detect the BPM of the user-selected audio file and then synchronize the speed at which the series of movements that follow the exercise pattern display. The resultant display

may be in video, step-animation, virtual instructor guide, or some combination of each. Further, the app may further comprise an audio playback mechanism that can play the selected audio file while the series of movements displays on the display medium. In other embodiments, the app provides a speed adjustment mechanism as described previously. This means that through the app, a user can select their favorite music from a database or record an audio file and then adjust the speed to generate an exercise routine that is highly interactive, easily customizable, easily recognizable, easy to learn, and importantly, one that is portable with a mobile device.

[00144] In certain embodiments, system 500, display device 610, or step device 10, the app may be operatively connected to a music store through network 530 to provide user 2 with the capability of searching for and purchasing audio files (e.g. songs or any sounds with tempo such as drum beats). The music store is capable of previewing a song prior to purchase and/or selection. Once selected, the user 2 using system 500, device 200, step device 10 and/or the app can permanently store the song selected from the music store, locally and/or remotely. One distinct advantage of this concept is that it provides for using a single license that allows the user to see different visual mixes synchronized to the same audio file. What this means is that instead of creating three different exercise routines and embedding each created exercise routine with an individual copy of the song, only one copy of the song is used to dynamically synchronized with the imagery within the display medium of the system 500, display device 610, step device 10, and/or the app. In some embodiments, this means that one copy of a song (e.g. downloaded or purchased), can be used to create a variety of different mixes of visual content based on the user's preference using only one copyright license.

[00145] FIGS. 17-18 are examples as to what can appear on the display medium of the device 610 or step device 10, the app, or any secondary device with a display medium operatively connected thereto. In FIG. 17, the user can select any song to pair with the selected letter "C" (i.e. the exercise pattern in this embodiment). The synchronized pattern in this embodiment would show the current step position and the subsequent positions overlayed on the selected pattern, the letter "C", all to the speed of the selected song. FIG. 18 show similar embodiments but with different selected exercise patterns. In each of FIGS. 17-18, the user may choose to view the synchronized pattern as a video, step-animation, with a virtual instructor guide, or some combination of each.

[00146] Turning to FIG. 19, is an example of how useful the concept described herein is as to effectively displaying, teaching, and creating an exercise routine. In this example, the user could select the song, "Happy Birthday" from the song database (or elsewhere). The user could then define a pattern using letters to form the words, "Happy Birthday." In this example, the processor 525 would analyze the user-selected song and then determine the "Happy Birthday" song's song-specific speed. The processor 525 would then synchronize the speed to the user-selected pattern, "Happy Birthday" to generate a synchronized exercise pattern 540. The processor 525 would then transmit the user-defined dance pattern to the display medium 537 and/or display medium disposed on the step device 10 wherein the synchronized exercise pattern 540 would display the words, "Happy Birthday", with foot positions be traced over the pattern at a speed defined by the song's speed and accompanied by the song, "Happy Birthday," playing in the background.

[00147] The present concept can be a program executable on a machine such as a personal computer and embedded in a non-transitory computer readable storage medium. Such an executable program could comprise the components of FIGS. 15 and/or 16 and be storable on a non-transitory computer readable storage medium such as a hard disk, magnetic disk, DVD, CD-ROM, ROM, a chip, integrated circuit and/or any equivalent computer readable storage medium product. Accordingly, in some embodiments it may be that the non-transitory storage medium is permanently stored on a server, access point, wireless bridge, mobile device, router, repeater, or equivalent, each of which being operatively connected to the device with the display medium through a network.

[00148] In some embodiments, this concept is used in an electronic game. Accordingly, as seen in system 500, device 10 is configured to operatively connect, wired or wirelessly to other devices such as a gaming console (e.g. a personal computer, tablet, or standalone console configured to operatively connect to a network). Recording mechanism disposed on stepping surface 11 of device 10 is therefore configured to sense input from the user and communicate that input to the gaming console allowing the user to utilize device 10 within an interactive fitness game, video, class, or remote broadcasted class in which user movement is measured, recorded, and/or communicated to device(s) operatively connected thereto.

[00149] System 1000 of FIG. 28 or system 1200 of FIG. 29 may be provided for use with a similar system to those previously described in FIGS. 15 and 16 with the exception that no step device is used with either of systems 1000 and 1200. Accordingly, either of systems 1000 and 1200 may be used with any of the previously described features or approaches.

Specifically, user interface 1036 of the at least one device 1010 of system 1000 may comprise at least one user input mechanism such as a touch screen, a mouse, a keyboard, a stomp pad, a scroll wheel or any equivalent that is configured to receive selections from a user 2 and communicate the selections to the device 1010. A display medium 1037 functioning as an output medium on the device 1010 may also be operatively connected thereto. The display medium 1037 is configured to receive communications from the processor 1025 disposed on the server 1020 to project those communications on its display in such a manner that is perceptible by the user 2.

[00150] In practice in some embodiments, the display medium 1037 induces the user 2 to access the user interface 1036 and select an audio file from the sound database 1029 or elsewhere. The user 2 is further induced to select a pattern from the exercise pattern database 1031 or elsewhere. The processor 1025 then receives communications from the at least one device 1010 regarding the user's selections and then the processor 1025 executes the instructions 1060 by analyzing the user-selected audio file. The processor 1025 in turn determines the speed of the audio file and synchronizes the speed with the user-selected pattern in order to generate synchronized exercised pattern 1040 that is displayable on display medium 1037 to induce a desired user movement. Displaying synchronized exercised pattern 40 on display medium 1037 may be further accompanied by the audio file being played on audio playback mechanism, the playback mechanism being capable of being disposed on the at least one device 1010 or elsewhere including a second device.

[00151] In the embodiments of FIG. 29, system 1200 may comprise device 1210 for displaying a series of movements that follow an exercise pattern. The device 1210 comprises memory with internal and/or external power supply 1234. Similar to the memory in system 1200, the memory in the device 1210 may include volatile memory 1226 and/or non-volatile memory 1227. Memory may comprise a local exercise pattern database 1231 with a plurality of exercise patterns, a local audio database 1229 with a plurality of audio files, and instructions 1260. The instructions 1260 are for generating a series of movements that follow the selected exercise pattern. The instructions 1260 comprise (1) analyzing an audio file selected by a user 2 from the local audio database (or elsewhere) to detect a speed and (2) synchronizing the speed with an exercise pattern selected by the user from the exercise database (or elsewhere) to generate the synchronized exercised pattern 1240. The device 1200 further comprises a processor 1225 that is operatively coupled to the memory, 1226 and/or 1227. The processor 1225 is configured to execute the instructions 1260 and

communicate the synchronized exercise pattern 1240 to a display medium 1237 and/or any other component connected thereto configured to receive such data (e.g. a server, a second device with display medium, etc.).

[00152] The device 1210 has a user interface 1236 configured to receive and communicate user selections. The device 1210 also has a display medium 1237 that is configured to display the series of movements that follow the synchronized pattern. Device 1210 may be a mobile device. The device 1210 may further include an audio playback mechanism configured to reproduce and play the audio file while the series of movements that follow the synchronized pattern is displayed.

[00153] The definitions of the words or elements of the following claims are, therefore, defined in this specification to not only include the combination of elements which are literally set forth. It is also contemplated that an equivalent substitution of two or more elements may be made for any one of the elements in the claims below or that a single element may be substituted for two or more elements in a claim. Although elements may be described above as acting in certain combinations and even initially claimed as such, it is to be expressly understood that one or more elements from a claimed combination can in some cases be excised from the combination and that the claimed combination may be directed to a subcombination or variation of a subcombination(s).

[00154] What has been described above includes examples of one or more embodiments. It is, of course, not possible to describe every conceivable combination of components or methodologies for purposes of describing the aforementioned embodiments, but one of ordinary skill in the art may recognize that many further combinations and permutations of various embodiments are possible. Accordingly, the described embodiments are intended to embrace all such alterations, modifications and variations that fall within the spirit and scope of the appended claims. Furthermore, to the extent that the term “includes” is used in either the detailed description or the claims, such term is intended to be inclusive in a manner similar to the term “comprising” as “comprising” is interpreted when employed as a transitional word in a claim. Finally, as used herein, “a” or “an” means “at least one” or “one or more” unless otherwise indicated.

CLAIMS

What is claimed is:

1. A step device for performing an exercise, the step device comprising:

a stepping surface having at least one elevation;

a sensory input system operable to sense input from or provide output to a user; and

wherein the exercise is performed by stepping onto and off of the stepping surface.

2. The device according to claim 1, further comprising at least one handle mechanically attached to the step device, wherein the exercise is also performed by moving the step device using at least one handle, and wherein the at least one handle is configured to be grasped by a user to move the step device.

3. The device according to Claim 1, wherein the step device further comprises an outer surface defined between the stepping surface and a lower base surface, and wherein the at least one handle is disposed on the outer surface.

4. The device according to Claim 2, wherein the step device further comprises an outer surface defined between the stepping surface and a lower base surface, and wherein the at least one handle is disposed on the outer surface and at least one second handle is disposed on the lower base surface.

5. The device according to Claim 2, wherein the at least one handle is disposed on a lower base surface of the step device.

6. The device according to Claim 2, wherein the at least one handle is flush with a surface on which the at least one handle is attached.

7. The device according to Claim 2, wherein the at least one handle is configured to detachably connect to the step device.

8. The device according to Claim 7, wherein when the at least one handle further comprises at least one fastening mechanism that produces a sound when the at least one handle is fastened to the step device.

9. The device according to Claim 8, wherein the at least one fastening mechanism snaps onto the step device.

10. The device according to Claim 2, wherein the at least one handle is integrally formed with the step device.

11. The device according to Claim 1, further comprising a cavity disposed therein.

12. The device according to Claim 11, wherein the cavity is configured to receive a weight.

13. The device according to Claim 11, wherein the cavity is configured to receive a sound emitting mechanism.

14. The device according to Claim 11, wherein the cavity is removable from the device.

15. The device according to Claim 11, wherein the cavity is integrally formed with the device and a sound emitting mechanism.

16. The device according to Claim 1, further comprising a sensing mechanism operable to sense input from a user operatively connected to the sensory input system.

17. The device according to Claim 16, wherein the sensing mechanism is an accelerometer, an electrical grid, an infrared LED grid, a pressure plate with a mechanical trigger, or a microphone.

18. The device according to Claim 17, wherein the sensing mechanism is disposed on the stepping surface.

19. The device according to Claim 16, further comprising a recording mechanism operatively connected to the sensory input system, wherein the recording mechanism is configured to record input sensed by the sensing mechanism.

20. The device according to Claim 17, wherein a display medium is operatively connected to the sensory input system, the display medium being configured to provide output to the user resulting from the input sensed by the sensing mechanism.

21. The device according to Claim 20, wherein the display medium is disposed on the stepping surface, and wherein the display medium is a digital display or a light grid.

22. The device according to Claim 21, wherein the light grid is configured to provide output to the user by emitting a pattern of lights.

23. The device according to Claim 19, wherein at least one audio playback mechanism is operatively connected to the sensory input system, wherein the system provides output to the user by emitting sound through the at least one audio playback mechanism.

24. The device according to Claim 23, the system further comprising a step user interface configured to communicate user selections.

25. The device according to Claim 23, wherein the at least one audio playback mechanism is disposed on at least one sidewall of the step device.

26. The device according to Claim 16, further comprising a base surface and a height adjustment mechanism mechanically connected to the base surface, wherein the height adjustment mechanism is configured to adjust at least one elevation.

27. The device according to Claim 16, wherein the stepping surface has only one elevation.

28. The device according to Claim 16, further comprising at least one inflatable bladder disposed between the stepping surface and a base surface, the inflatable bladder being configured to lift the stepping surface to at least one elevation.

29. The device according to Claim 28, further comprising a plurality of collapsible feet, wherein as the at least one inflatable bladder is inflated, the plurality of collapsible feet slide to a locked position.

30. An interactive system for displaying a series of movements that follow an exercise pattern, comprising:

a server comprising:

a memory, wherein the memory comprises:

an exercise pattern database with a plurality of exercise patterns and a series of movements that follow the exercise pattern;

an audio database with a plurality of audio files;

instructions for generating a series of movements that follow the exercise pattern, the instructions comprising:

analyzing an audio file selected by a user to detect a speed; and

synchronizing the speed with an exercise pattern selected by the user to generate a synchronized exercised pattern; and

a processor operatively connected to the memory, the processor configured to execute the instructions and communicate the synchronized exercise pattern;

a display device operatively connected to the server, the display device comprising:

a user interface configured to communicate with the server; and

a display medium configured to display the synchronized exercise pattern; and

a step device operatively connected to the server, the step device comprising:

at least one elevation,

a sensory input system operable to sense input from or provide output to a user,

a step user interface operable to receive and communicate user selections,

at least one audio playback mechanism operatively connected to the sensory input system, wherein the sensory input system provides output to the user by emitting sound through the at least one audio playback mechanism.

operatively connected to the server.

31. The interactive system according to Claim 30, wherein the step device is operatively connected to the server through a network.

32. The interactive system according to Claim 30, wherein the instructions are permanently stored in a non-transitory computer readable storage medium.

33. The interactive system according to Claim 30, wherein the display device is a cell phone, a personal digital assistant, a tablet, a screen, or a gaming console.

34. The interactive system according to Claim 30, a second audio playback mechanism is disposed on or operatively connected to the display device.

35. The interactive system according to Claim 30, further comprising an indirect or direct link to a music store or database over the network, wherein a user can select, preview, or purchase an audio file from the music store, wherein the audio file selected or purchased from the music store or database is permanently stored on a local sound database disposed on the display device or permanently stored in the sound database on the server, and wherein the purchased audio file only requires one license.

36. The interactive system according to Claim 30, wherein the display device further comprises a browser configured to locate audio files and pattern files on a network, wherein the located audio files may be permanently stored on the audio database, and wherein the located pattern files may be permanently stored on the exercise pattern database.

37. The interactive system according to Claim 30, wherein the step device further comprises a local audio database, and wherein audio files are selected by the user from the local audio database to introduce into the instructions for generating the series of movements that follow the synchronized pattern.

38. The interactive system according to Claim 37, wherein the memory further comprises at least one audio file indicia configured to sort the audio files permanently stored on the local audio database and the sound files permanently stored on the audio database, wherein sorting the at least one sound file indicia provides a user with information prior to selecting the audio file.

39. The interactive system according to Claim 30, further comprising a pattern creation mechanism configured to create a pattern file, and wherein a recorded pattern file is

permanently stored in the exercise pattern database or a local pattern database disposed on the display device or the step device.

40. The step system according to Claim 39, wherein the display device or the step device further comprise a local pattern database, and wherein the user selects pattern files from the local pattern database to introduce into the instructions for generating the series of movements that follow the synchronized exercise pattern.

41. The interactive system according to Claim 30, further comprising a speed adjustment mechanism disposed on the server, the display device, or the step device, wherein the speed of the selected audio file is increased or decreased by using either the server, the display device, or the step device.

42. A method for displaying a series of movements that follow an exercise pattern, the method comprising:

(a) providing a step device comprising:

at least one elevation, a sensory input system operable to sense input from or provide output to a user, a step user interface operable to receive and communicate user selections, and at least one audio playback mechanism operatively connected to the sensory input system, wherein the sensory input system provides output to the user by emitting sound through the at least one audio playback mechanism;

(b) selecting an audio file and an exercise pattern, wherein the step device analyzes the audio file to detect a speed, and wherein the speed is synchronized with the exercise pattern to generate a synchronized exercise pattern; and

(c) displaying the series of movements on a display medium operatively connected to the step device and playing the audio file on an playback mechanism operatively connected to the step device.

43. A method for displaying a series of movements that follow an exercise pattern, the method comprising:

(a) providing a system according to Claim 31;

(b) selecting an audio file and an exercise pattern, wherein the display device analyzes the audio file to detect a speed, and wherein the speed is synchronized with the exercise pattern to generate a synchronized exercise pattern; and

(c) displaying the series of movements on a display medium operatively connected to the step device and playing the audio file on an playback mechanism operatively connected to the step device.

44. A device for displaying a series of movements that follow an exercise pattern, the device comprising

a memory, wherein the memory comprises:

an exercise pattern database with a plurality of exercise patterns and a series of movements that follow the exercise pattern;

an audio database with a plurality of audio files;

instructions for generating a series of movements that follow the exercise pattern, the instructions comprising:

analyzing an audio file selected by a user to detect a speed; and

synchronizing the speed with an exercise pattern selected by the user to generate a synchronized exercised pattern; and

a processor operatively coupled to the memory, the processor configured to execute the instructions and communicate the synchronized exercise pattern;

a user interface configured to communicate user selections; and

a display medium configured receive communications from the user interface and processor to display the series of movements that follow the synchronized pattern.

45. The device according to Claim 44, further comprising an audio playback mechanism configured to play the selected audio file.

46. A system for displaying a series of movements that follow an exercise pattern, comprising:

a server comprising:

a memory, wherein the memory comprises:

an exercise pattern database with a plurality of exercise patterns and a series of movements that follow the exercise pattern;

an audio database with a plurality of audio files;

instructions for generating a series of movements that follow the exercise pattern, the instructions comprising:

analyzing an audio file selected by a user to detect a speed; and

synchronizing the speed with an exercise pattern selected by the user to generate a synchronized exercised pattern; and

a processor operatively coupled to the memory, the processor configured to execute the instructions and communicate the synchronized exercise pattern;

at least one device operatively connected to the server, the at least one device comprising:

a user interface configured to communicate with the server; and

a display medium configured to display the synchronized exercise pattern; and

an audio playback mechanism configured to play the audio file selected by the user.

47. The system according to Claim 46, wherein the at least one device operatively connects to the server through a network.

48. The system according to Claim 46, wherein the instructions are permanently stored on a non-transitory computer readable storage medium.

49. The system according to Claim 46, wherein the at least one device is a mobile device such as a cell phone, a personal digital assistant, and a tablet.

50. The system according to Claim 46, wherein the audio playback mechanism is disposed on the device.

51. The system according to Claim 46, further comprising a second device operatively connected to the server, wherein the audio playback mechanism is disposed on the second device.

52. The system according to Claim 47, further comprising an indirect or direct link to a music store or database over the network, wherein a user can select, preview, or purchase an audio file from the music store or database, wherein the audio file selected or purchased from the music store or database may be permanently stored on a local sound database disposed on the device or permanently stored in the sound database on the server, and wherein the selected or purchased audio file only requires one license.

53. The system according to Claim 46, further comprising an audio creation mechanism configured to record an audio file, and wherein a recorded audio file may be permanently stored in the audio database or a local audio database disposed on the at least one device.

54. The system according to Claim 46, wherein the at least one device further comprises a browser configured locate audio files and exercise pattern files on a network, wherein the

located audio files may be permanently stored on the audio database, and wherein the located exercise pattern files may be permanently stored on the exercise pattern database.

55. The system according to Claim 46, wherein the at least one device further comprises a local audio database, and wherein the user may select audio files from the local audio database to introduce into the instructions for generating the series of movements that follow the synchronized pattern.

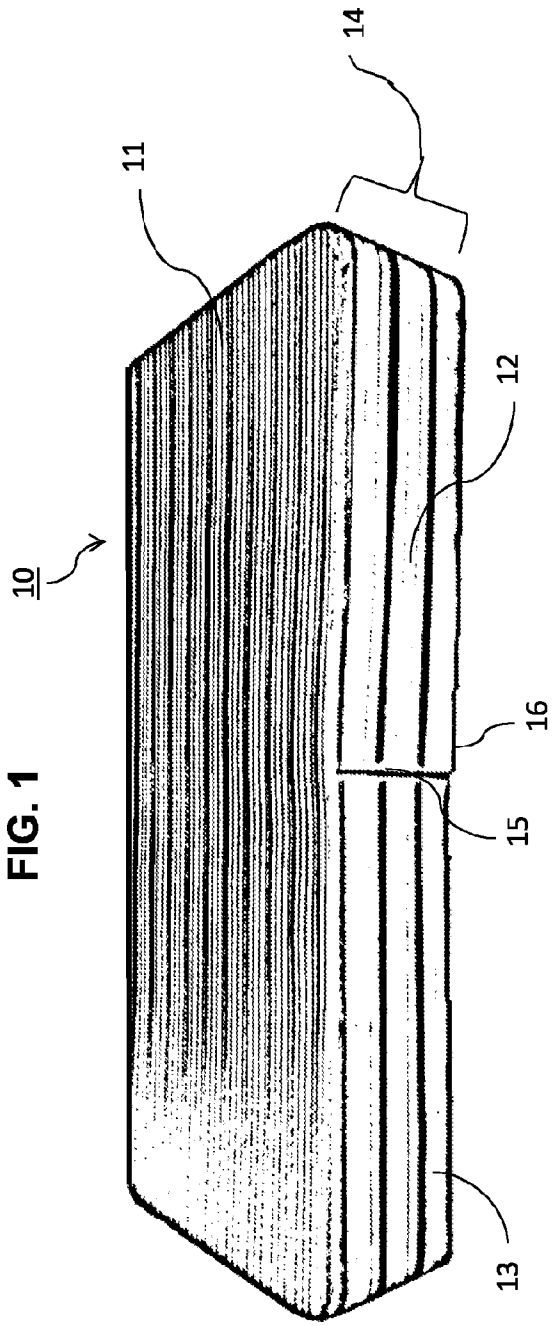

FIG. 1

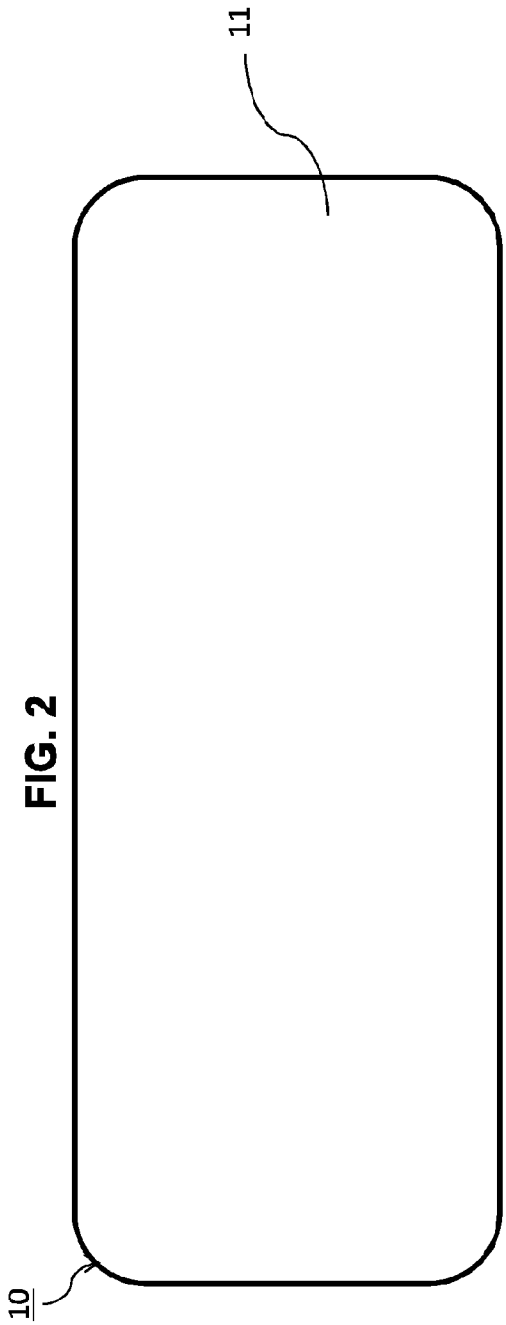

FIG. 2

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FIG. 3

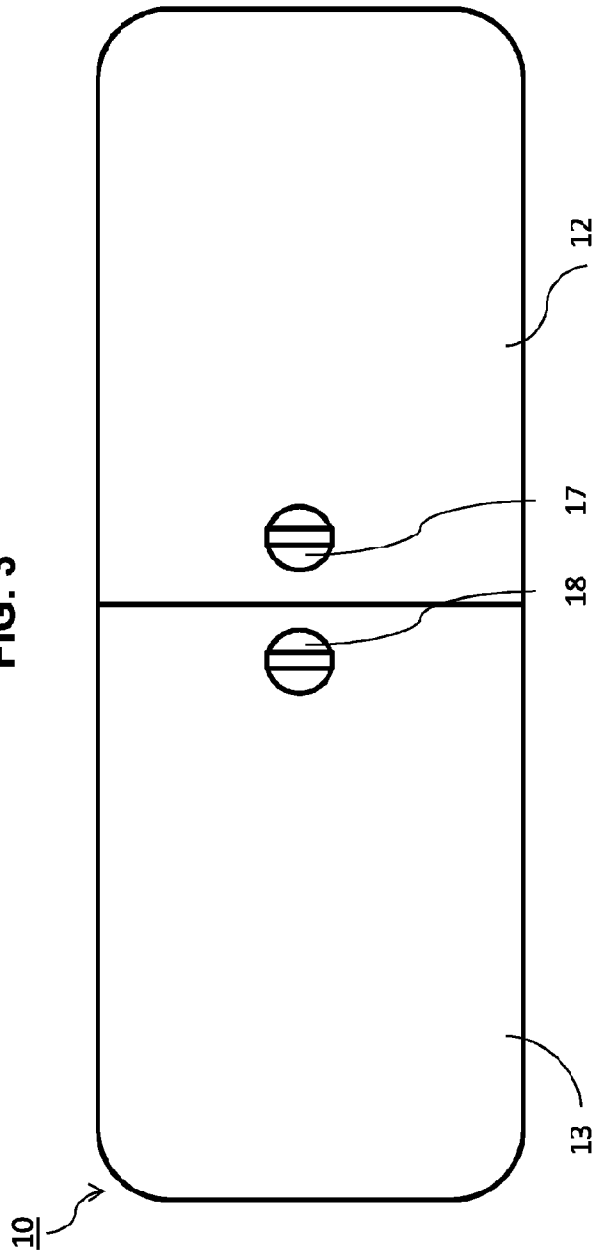

FIG. 4

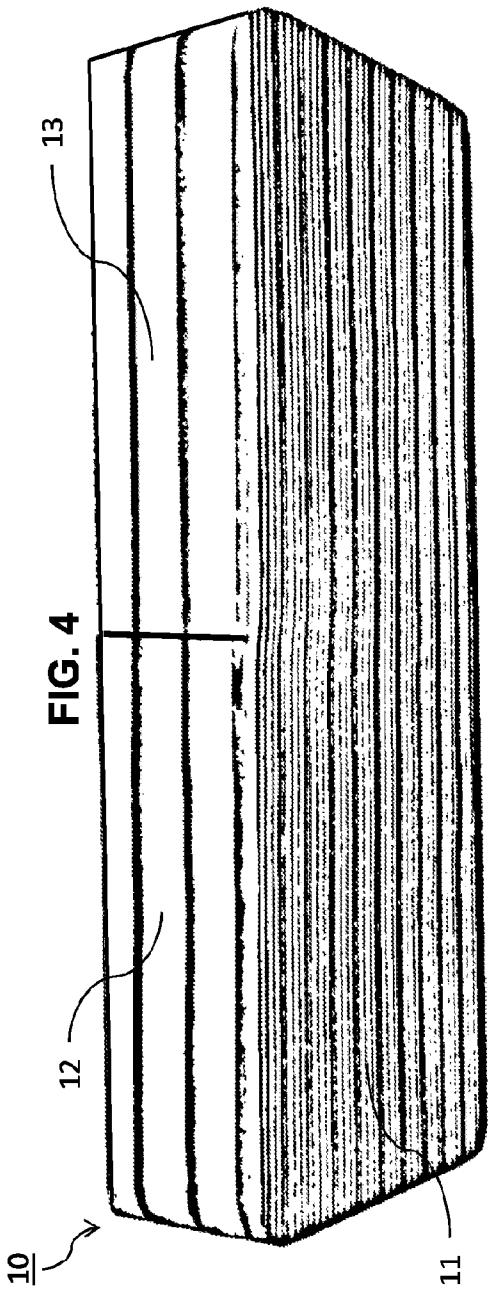

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FIG. 5

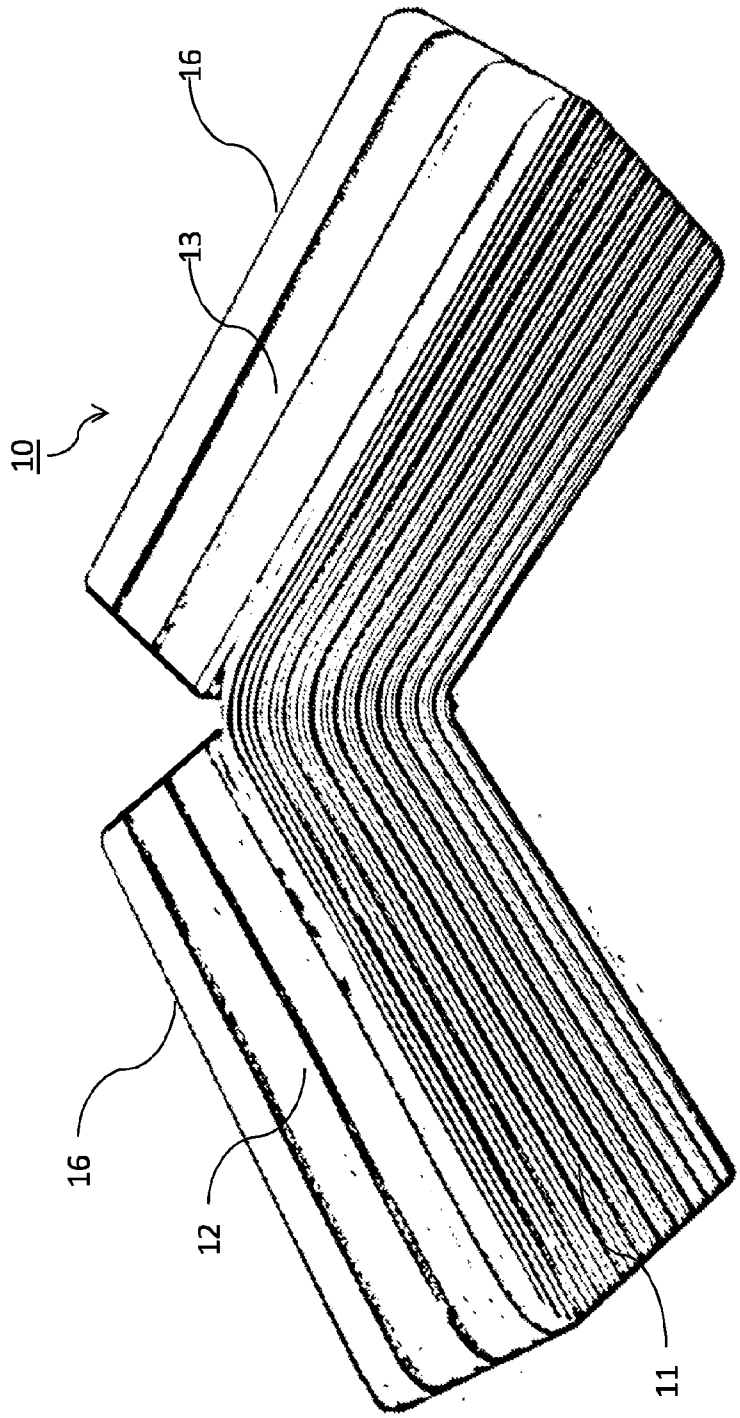

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FIG. 6

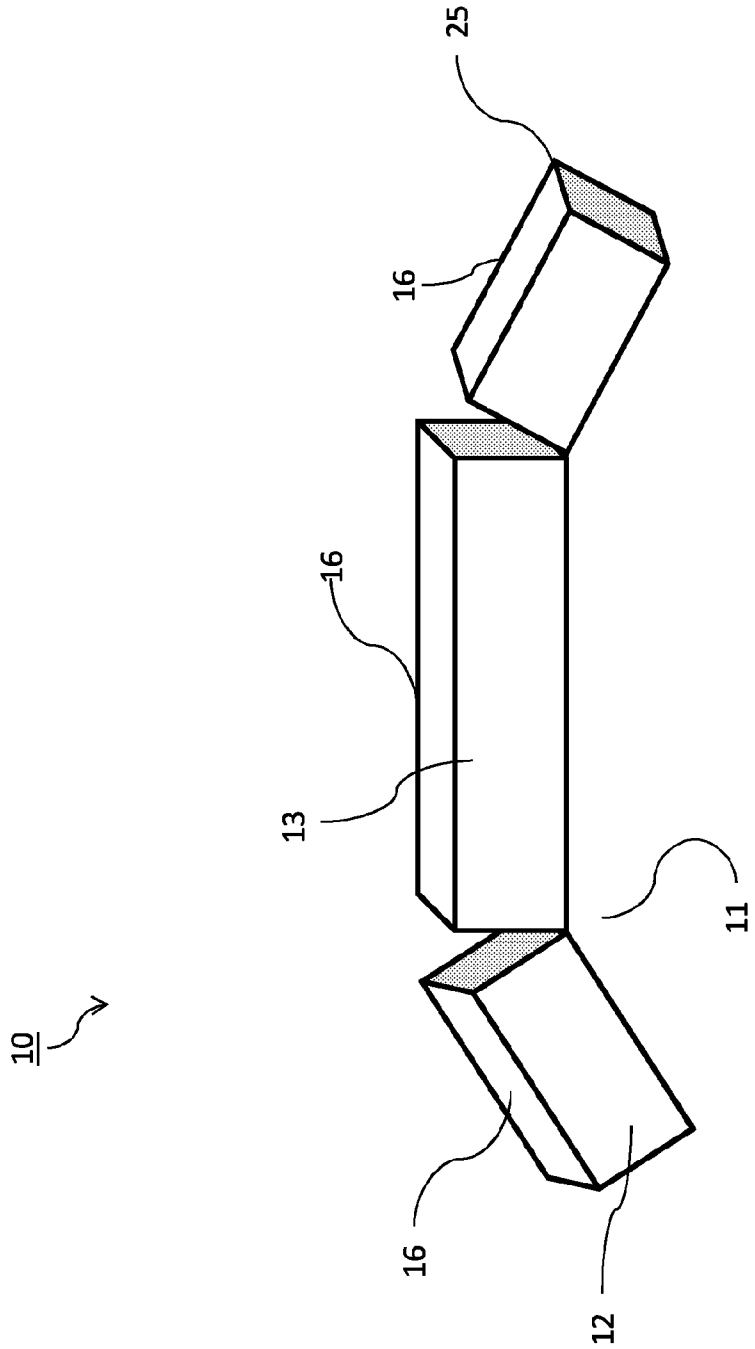

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FIG. 7

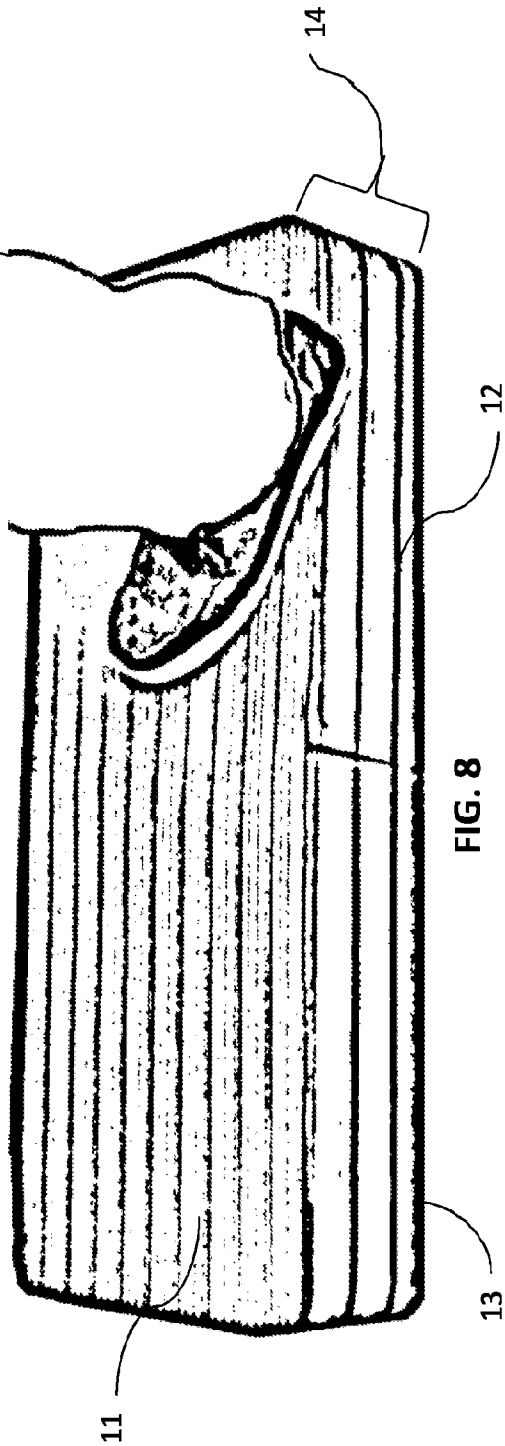


FIG. 8

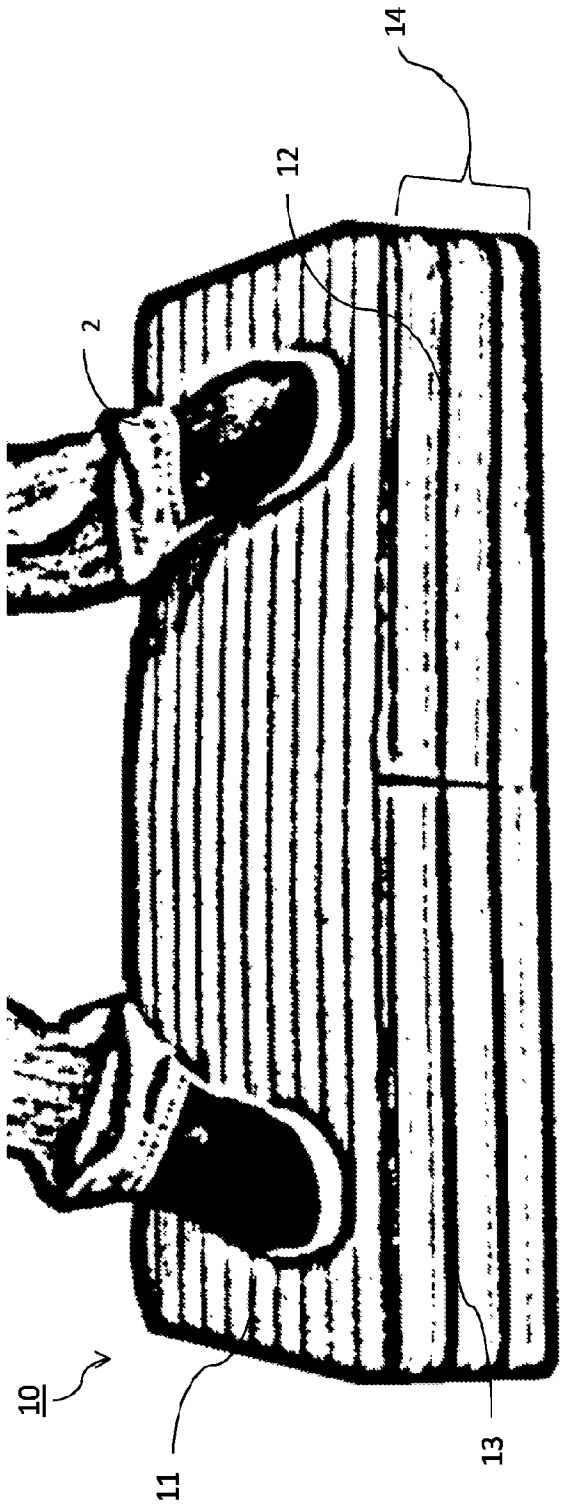
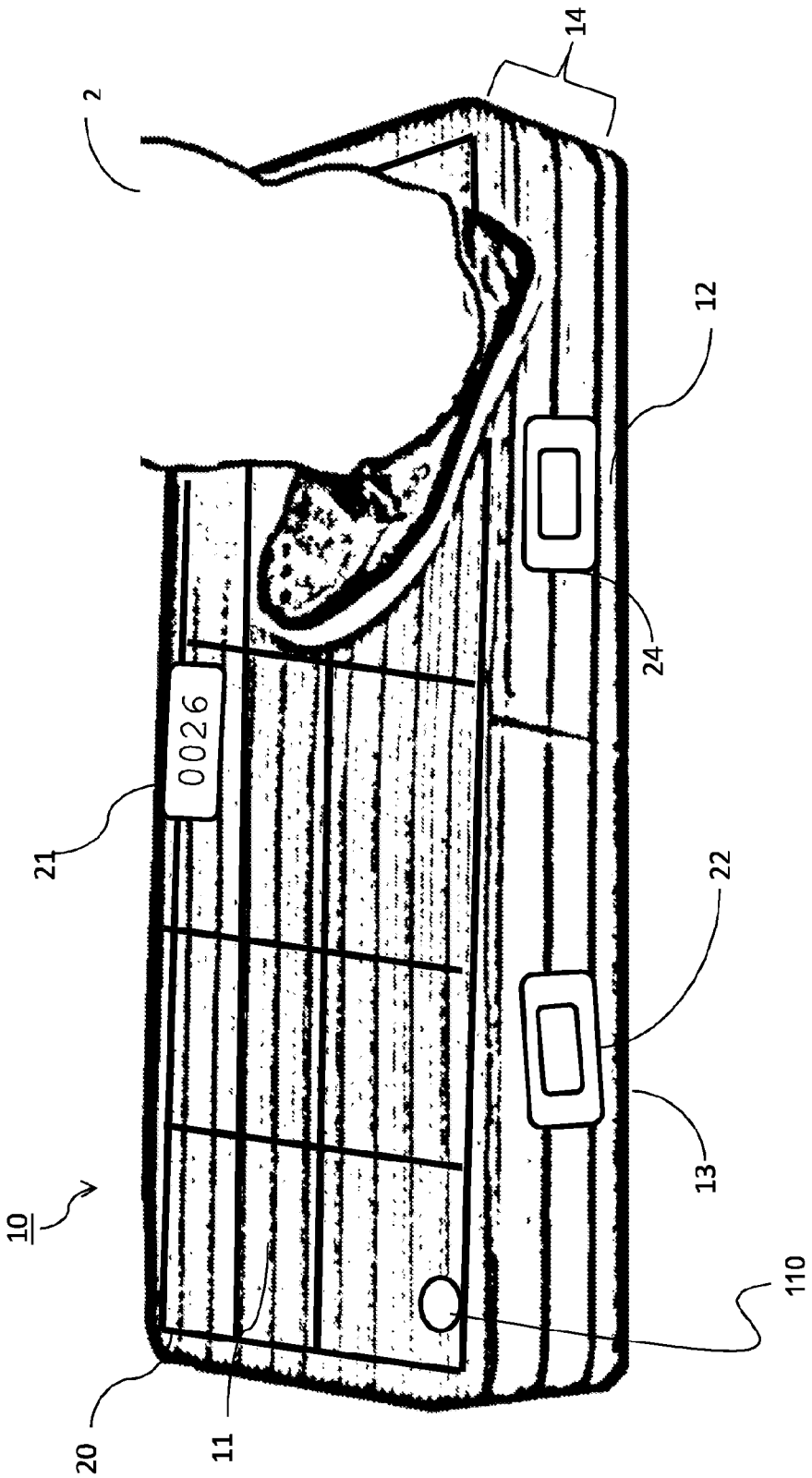


FIG. 9



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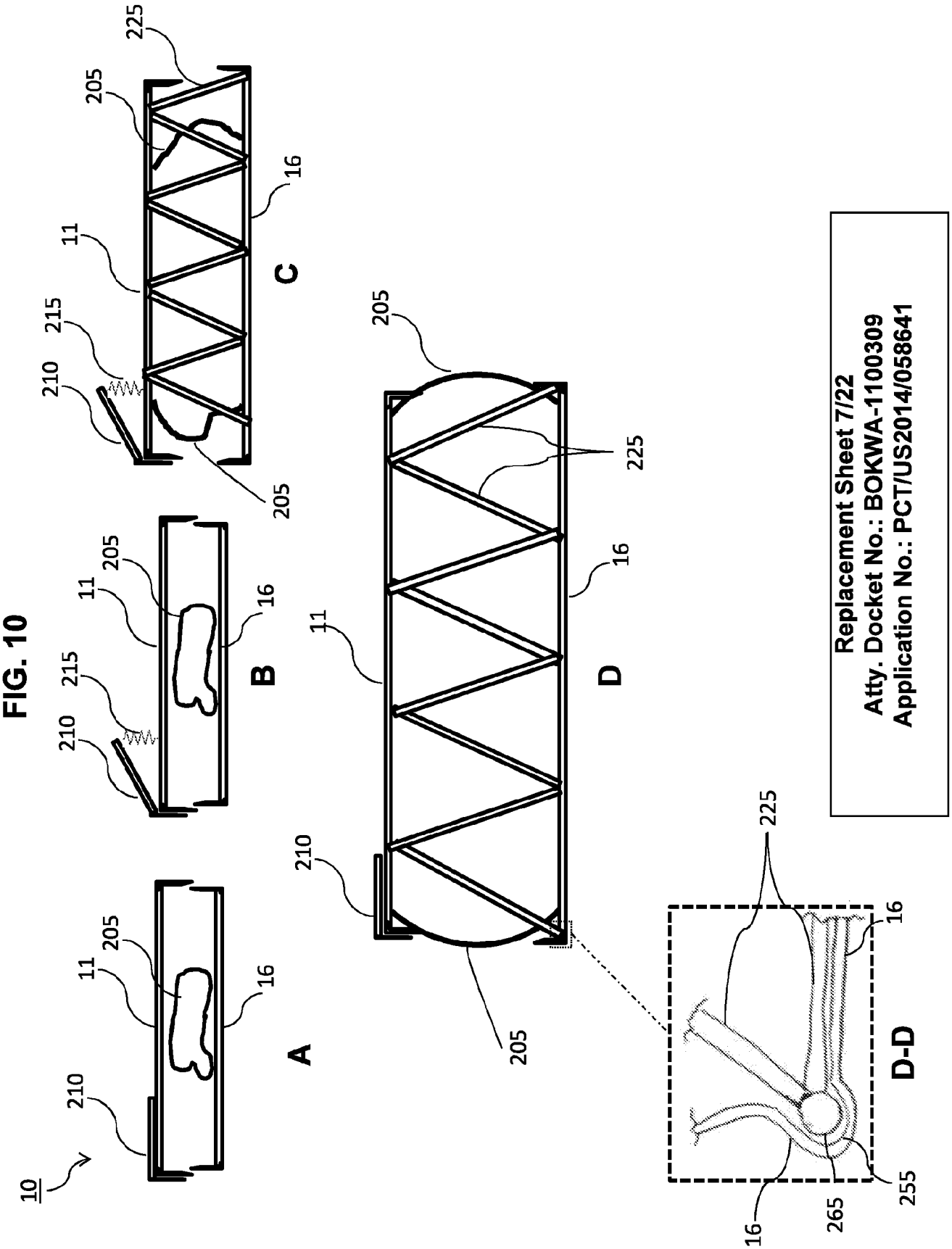
FIG. 10
10
A
B
C
D
D-D
11
16
205
210
215
225
255
265
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FIG. 11

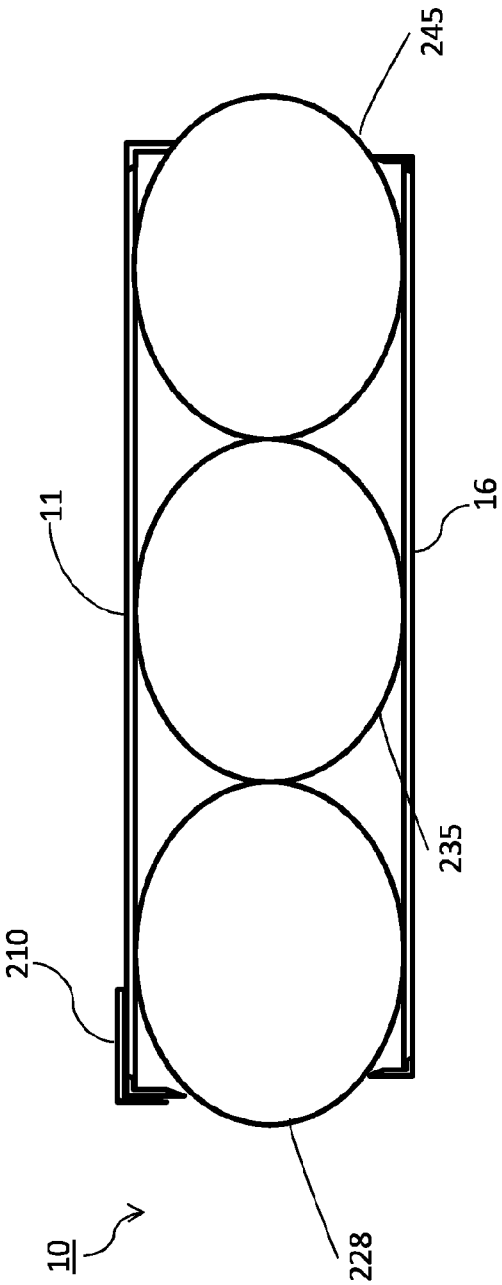

FIG. 12

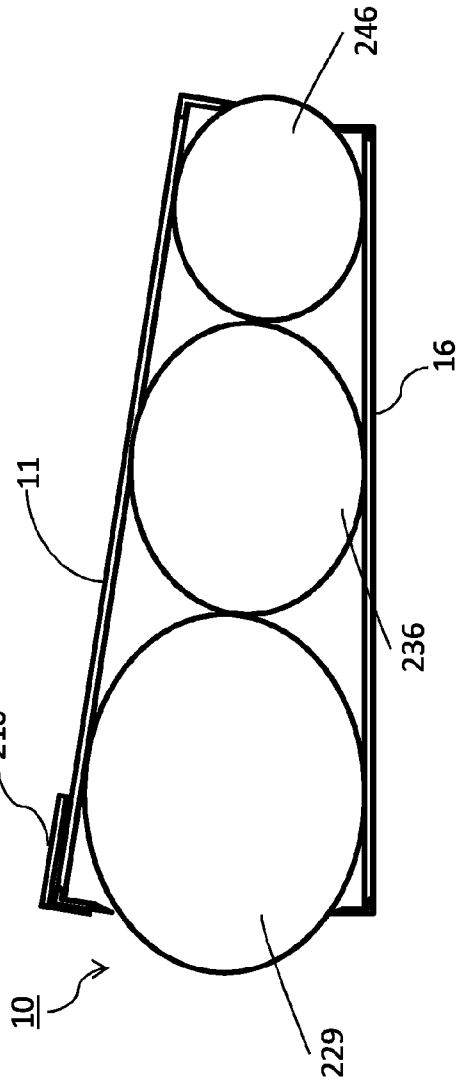

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FIG. 13

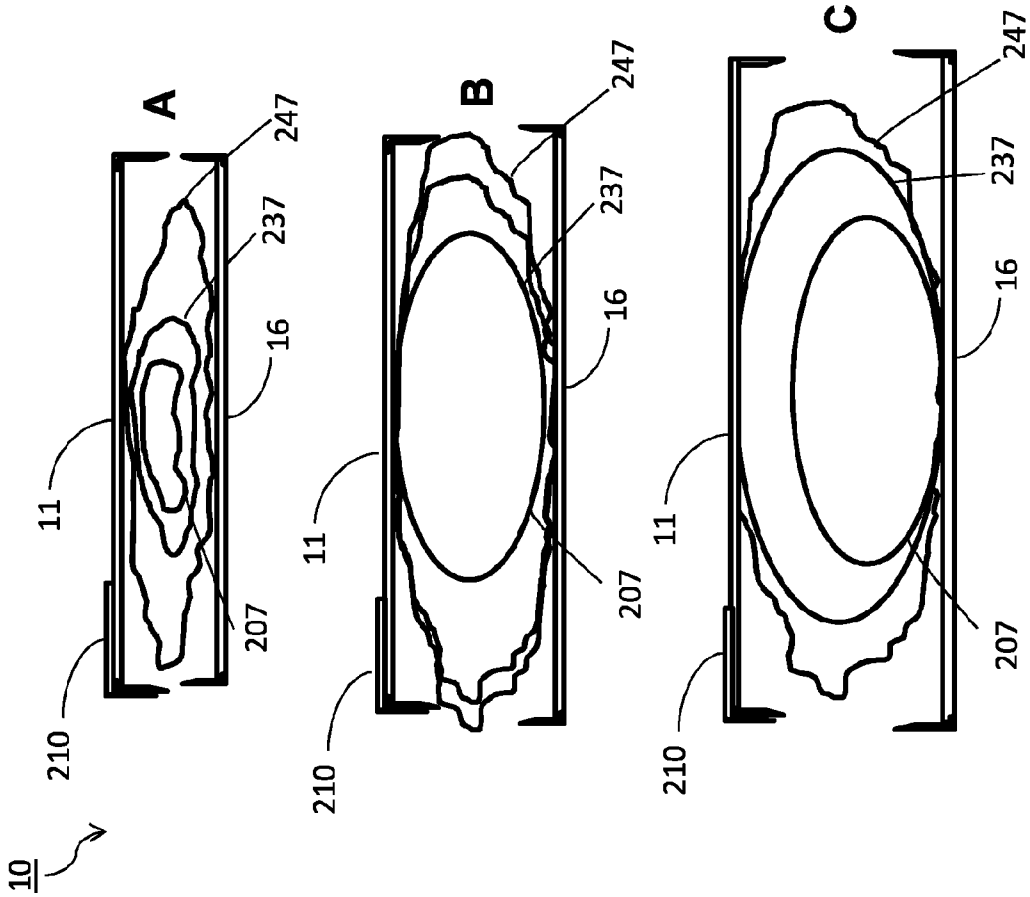

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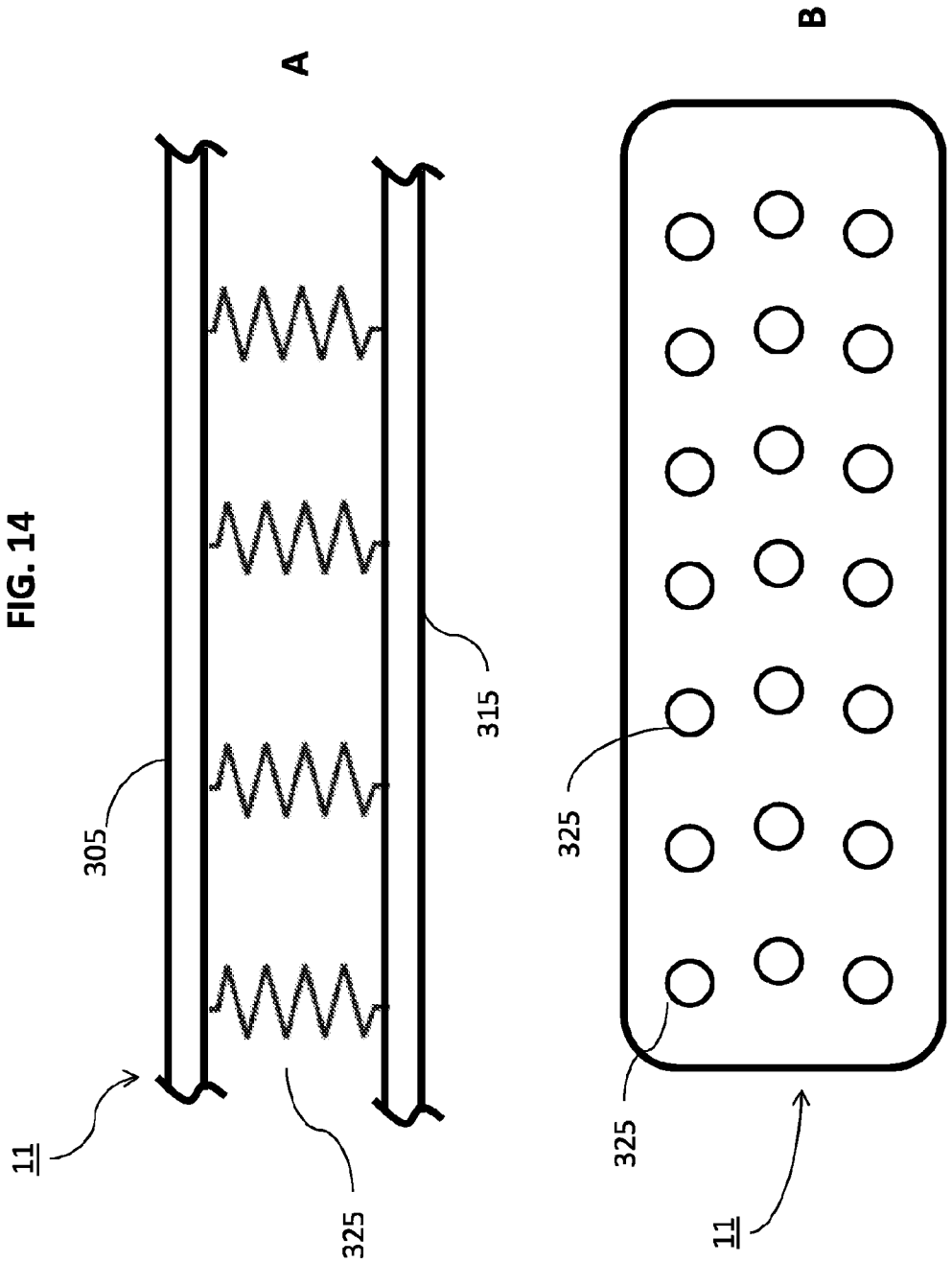
FIG. 14



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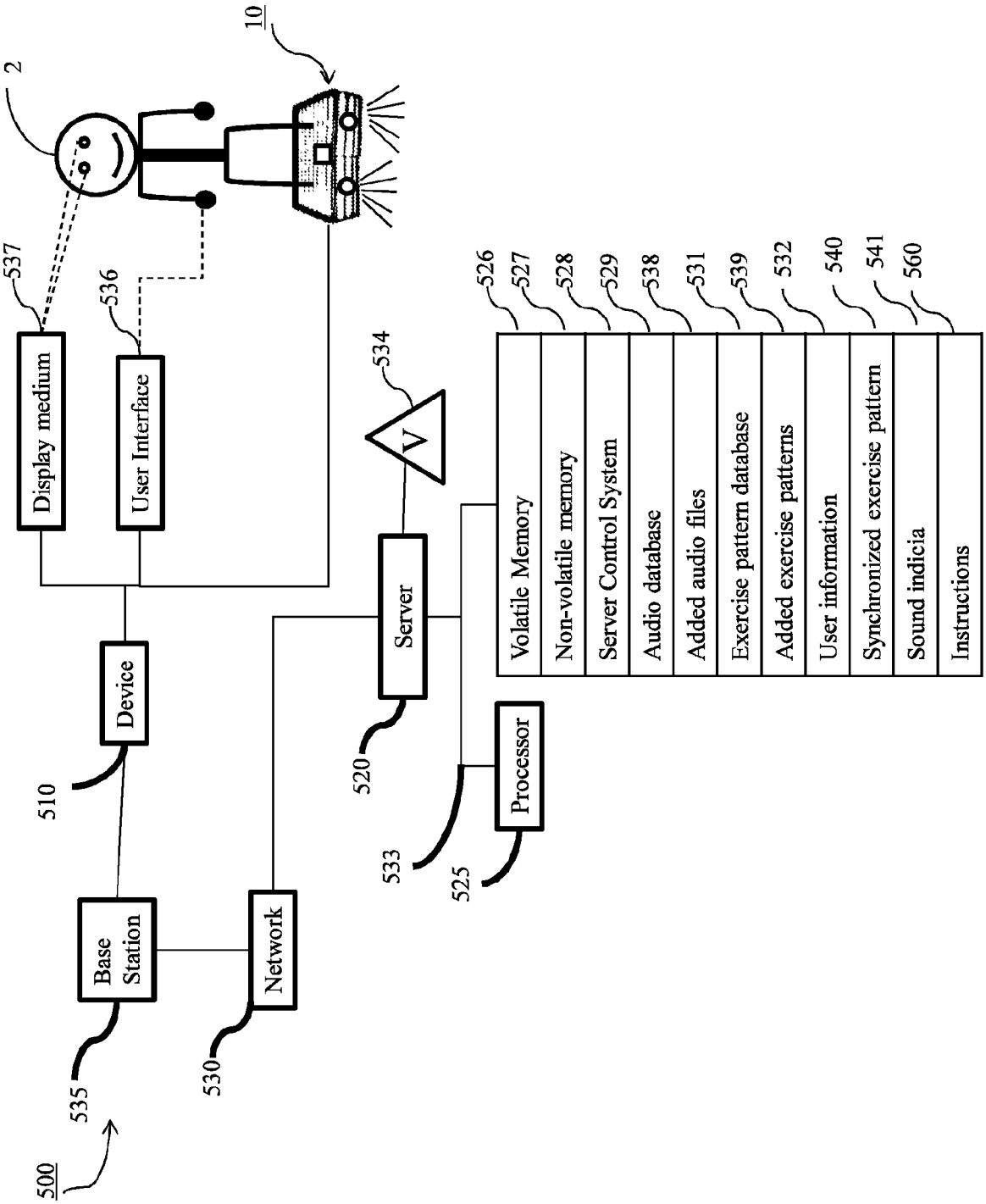

Figure 15

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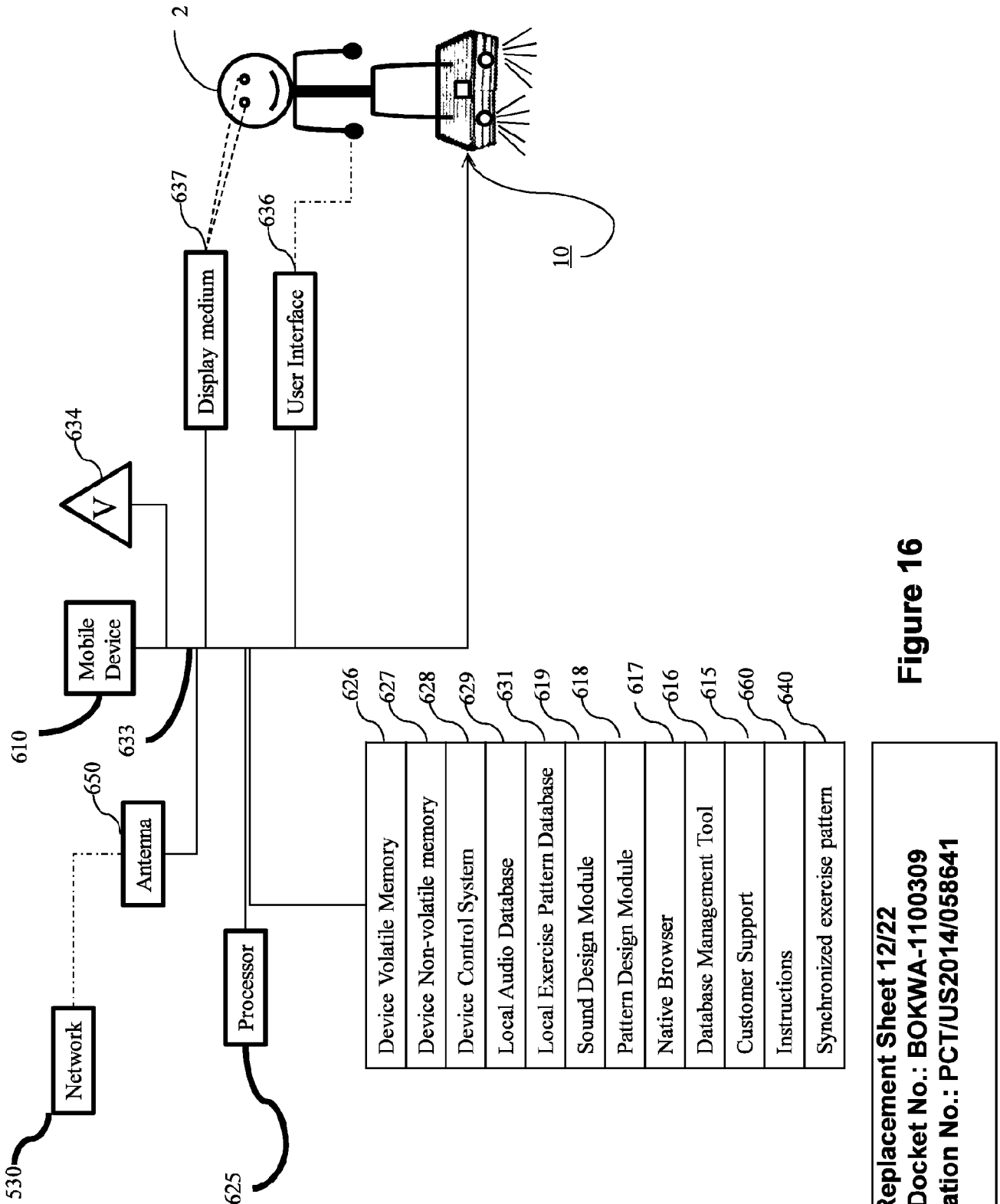

Figure 16

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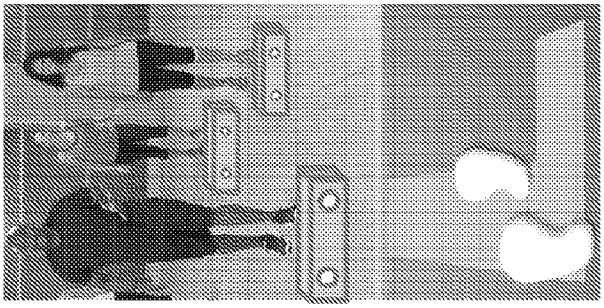

Figure 18

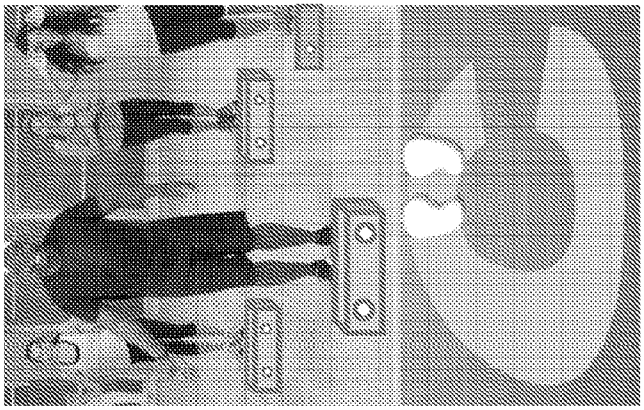

Figure 17

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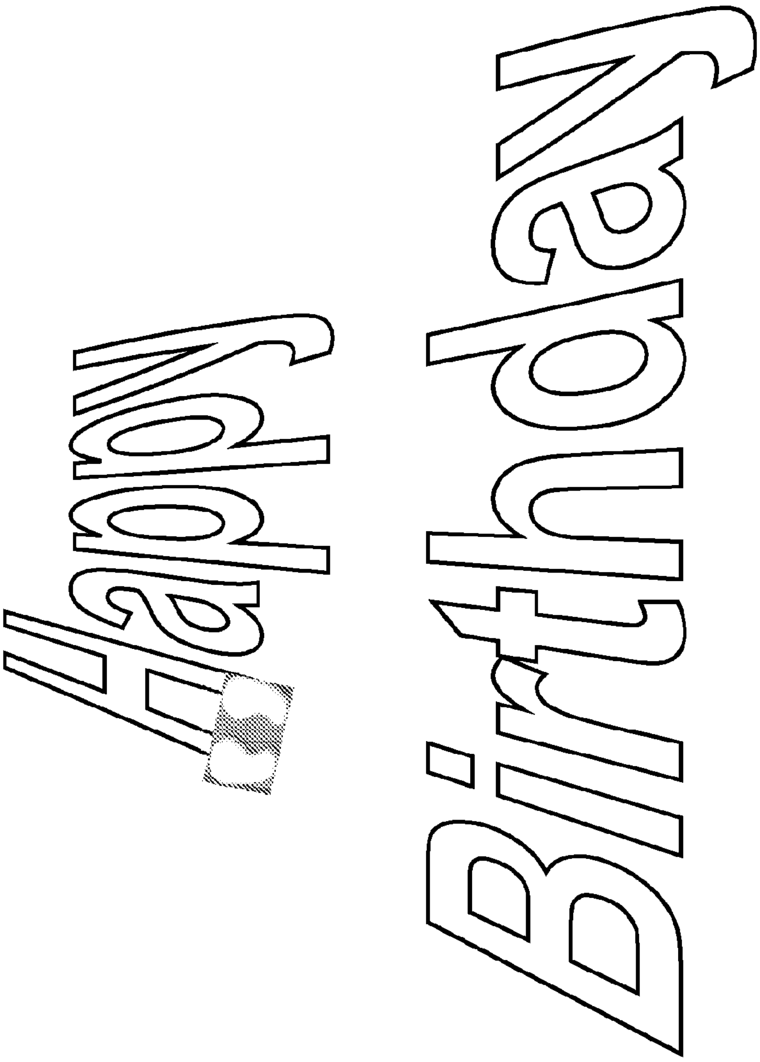

Figure 19

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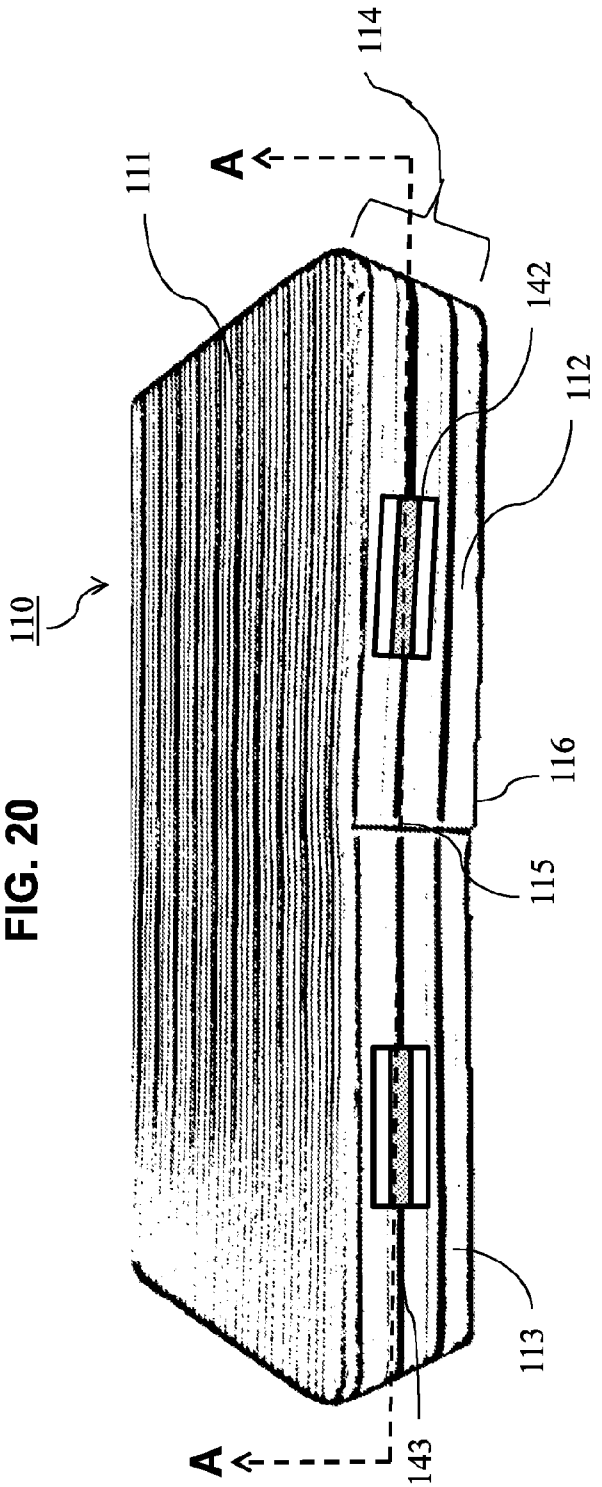

FIG. 20

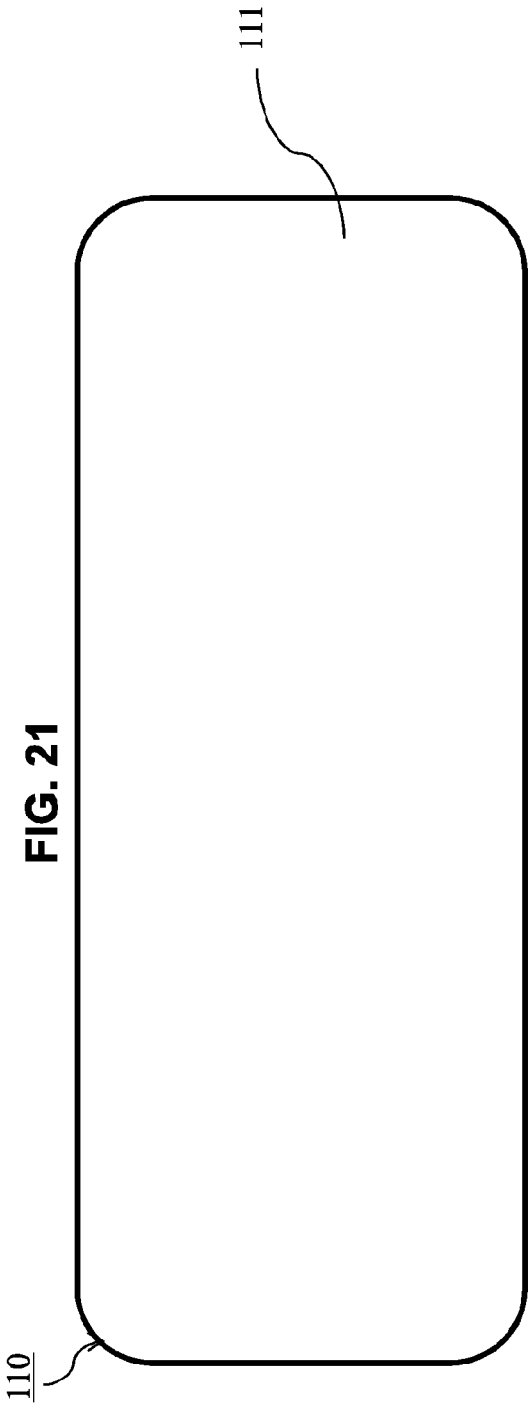

FIG. 21

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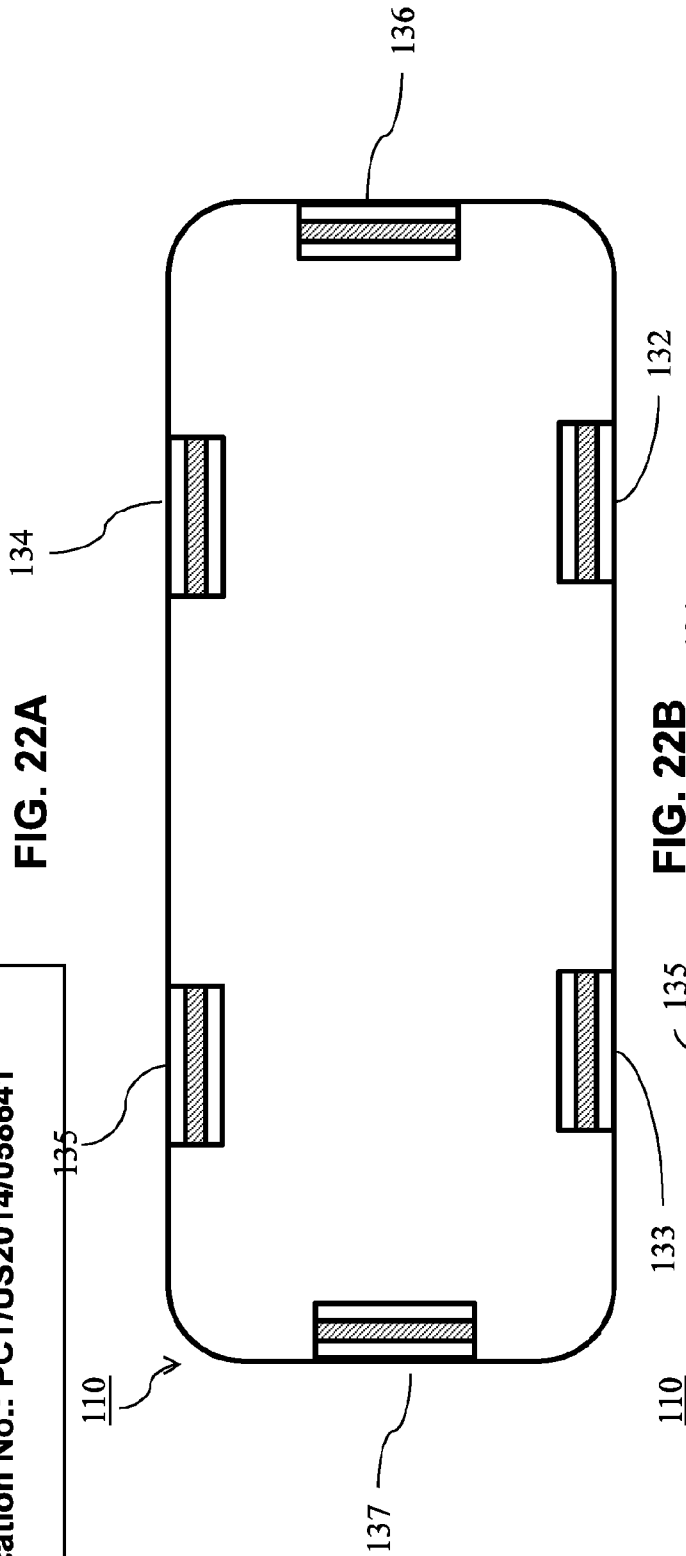

FIG. 22A

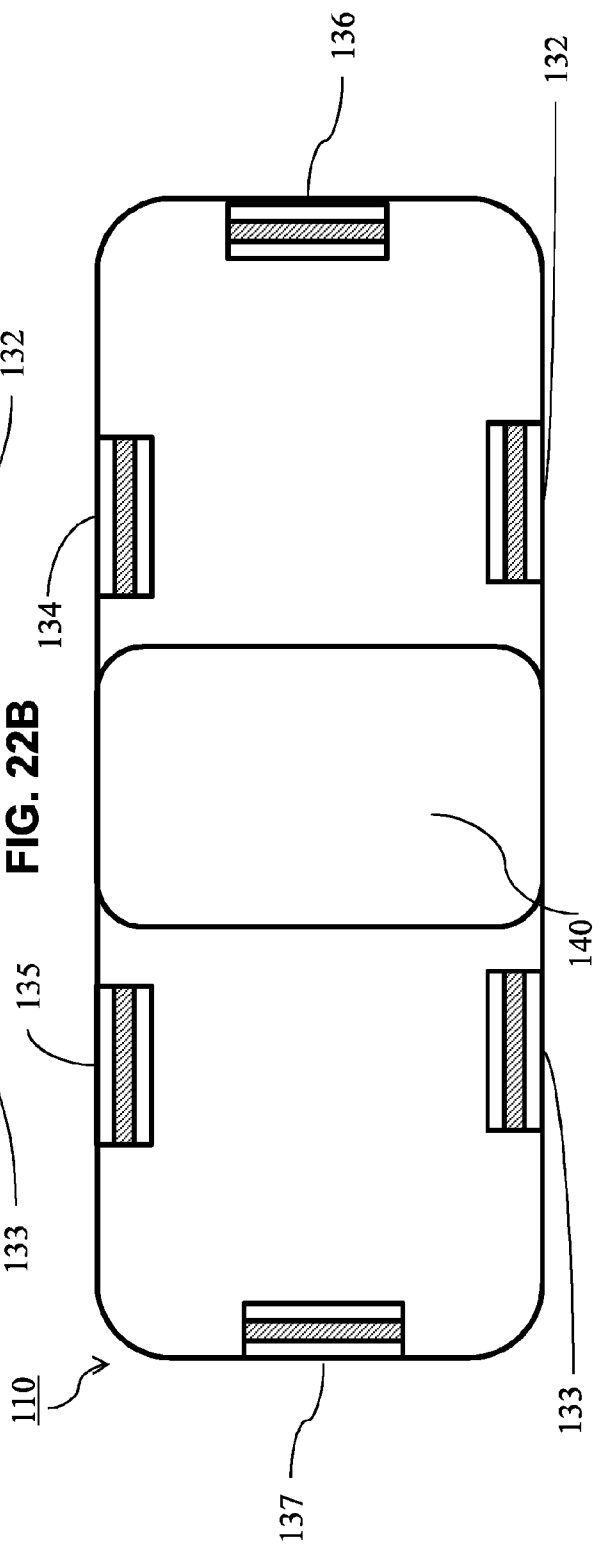

FIG. 22B

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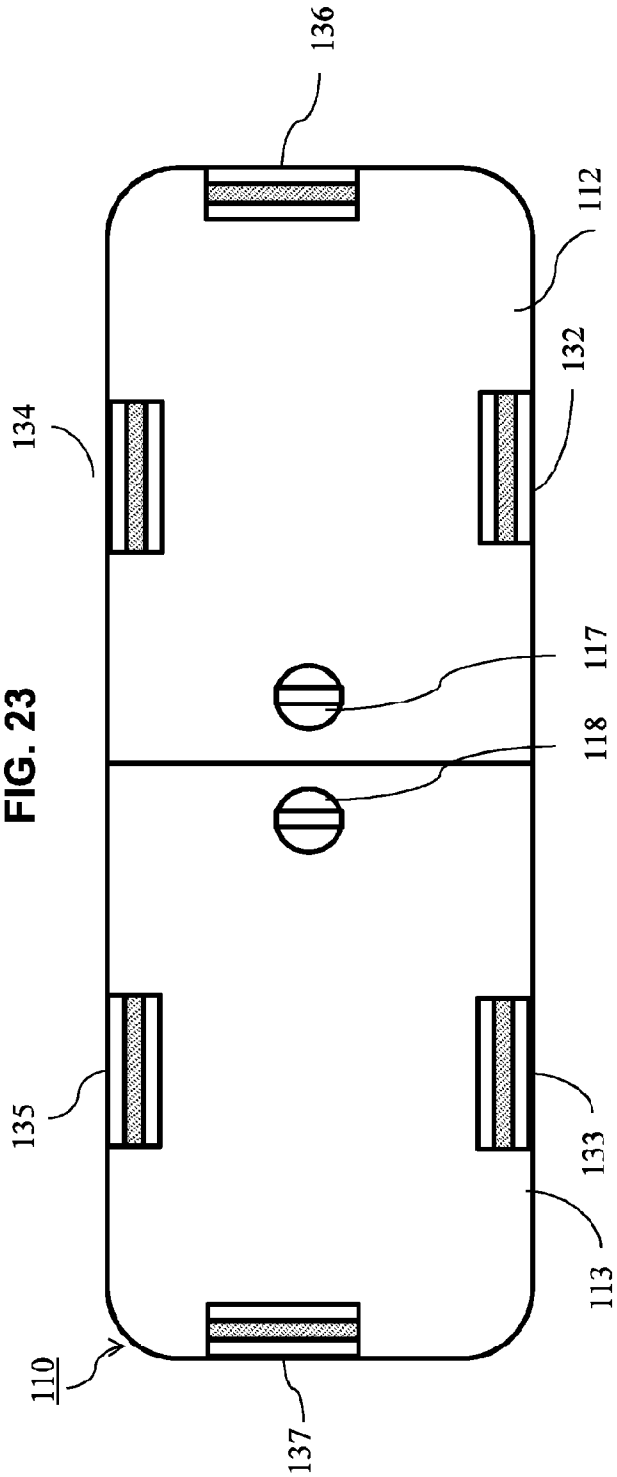

FIG. 23

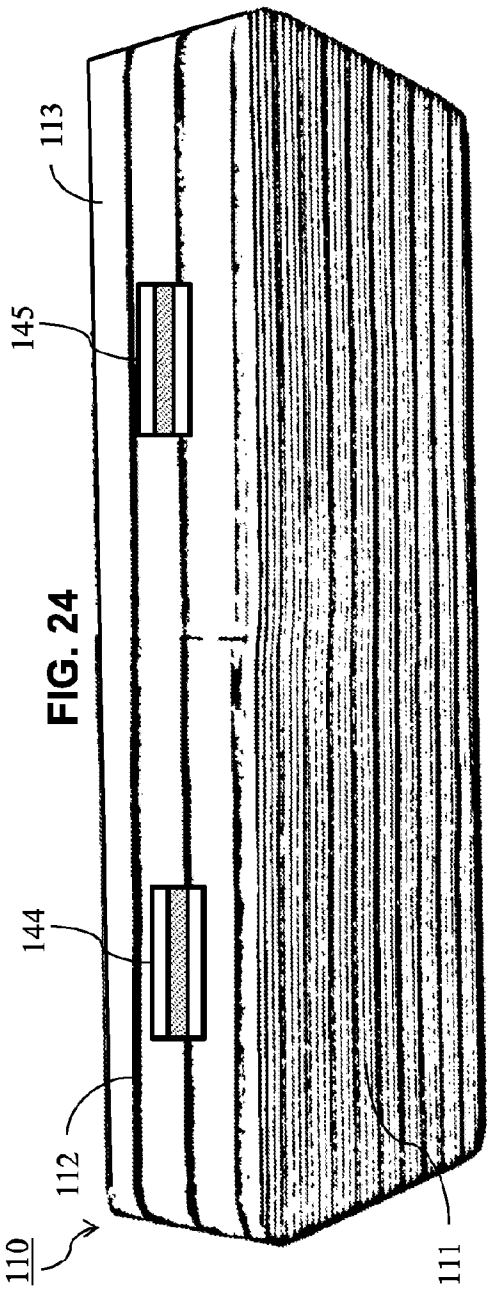

FIG. 24

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FIG. 25

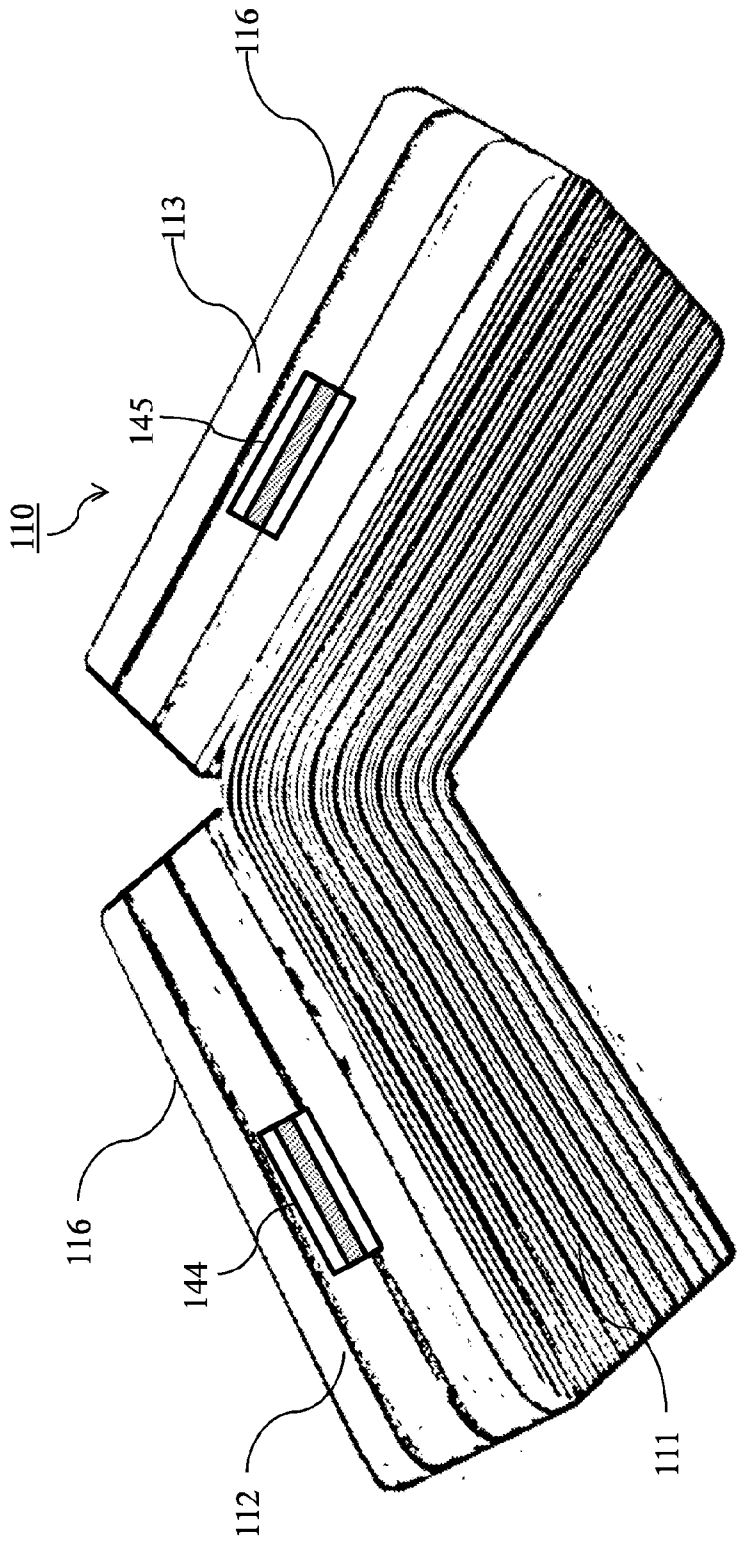

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FIG. 26

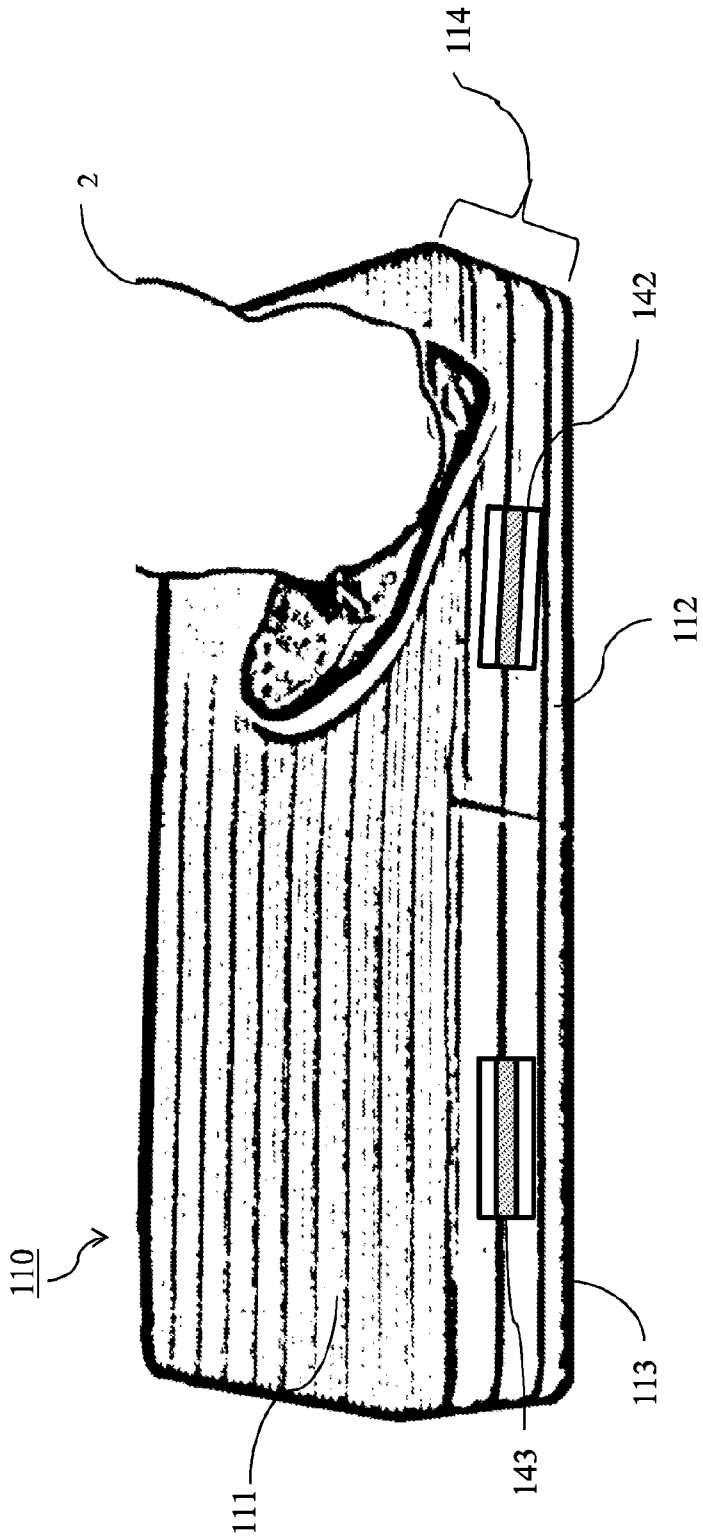

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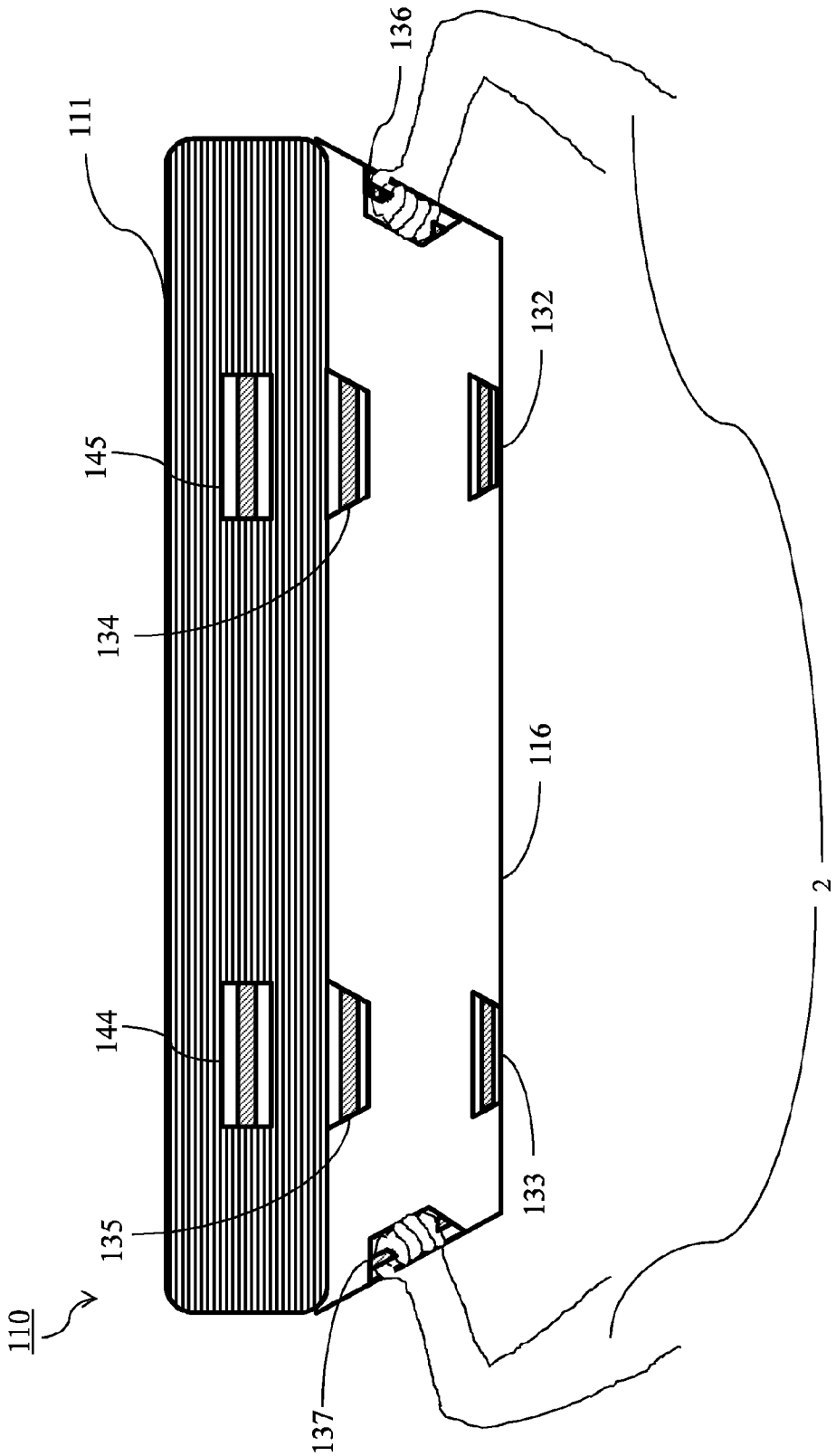
FIG. 27



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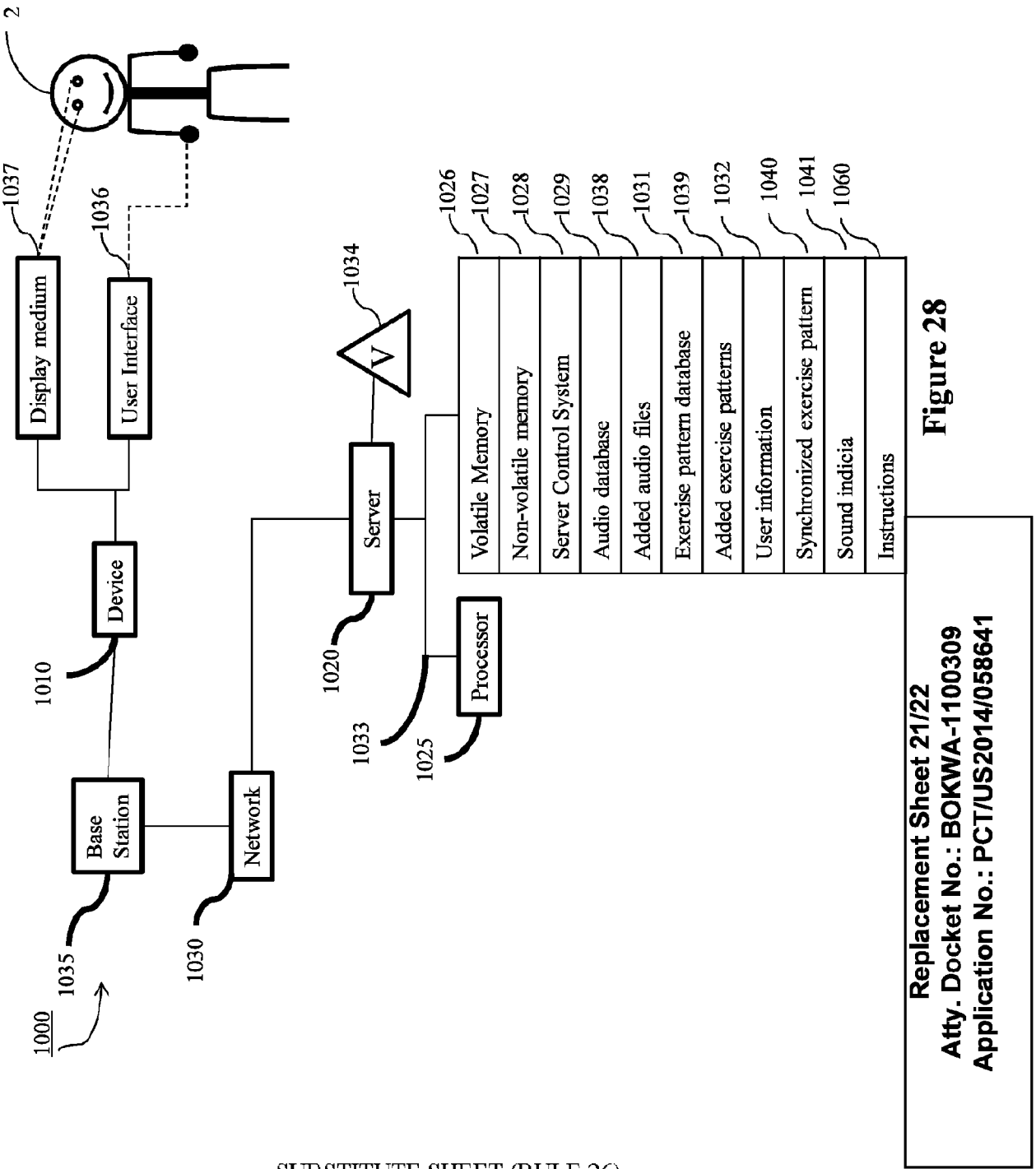
2
1037
1036
Display medium
User Interface
1034
1026
1027
1028
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1038
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1039
1032
1040
1041
1060
Volatile Memory
Non-volatile memory
Server Control System
Audio database
Added audio files
Exercise pattern database
Added exercise patterns
User information
Synchronized exercise pattern
Sound indicia
Instructions
Device
Server
1010
1020
1033
Processor
1025
Base Station
Network
1035
1030
1000
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Figure 28

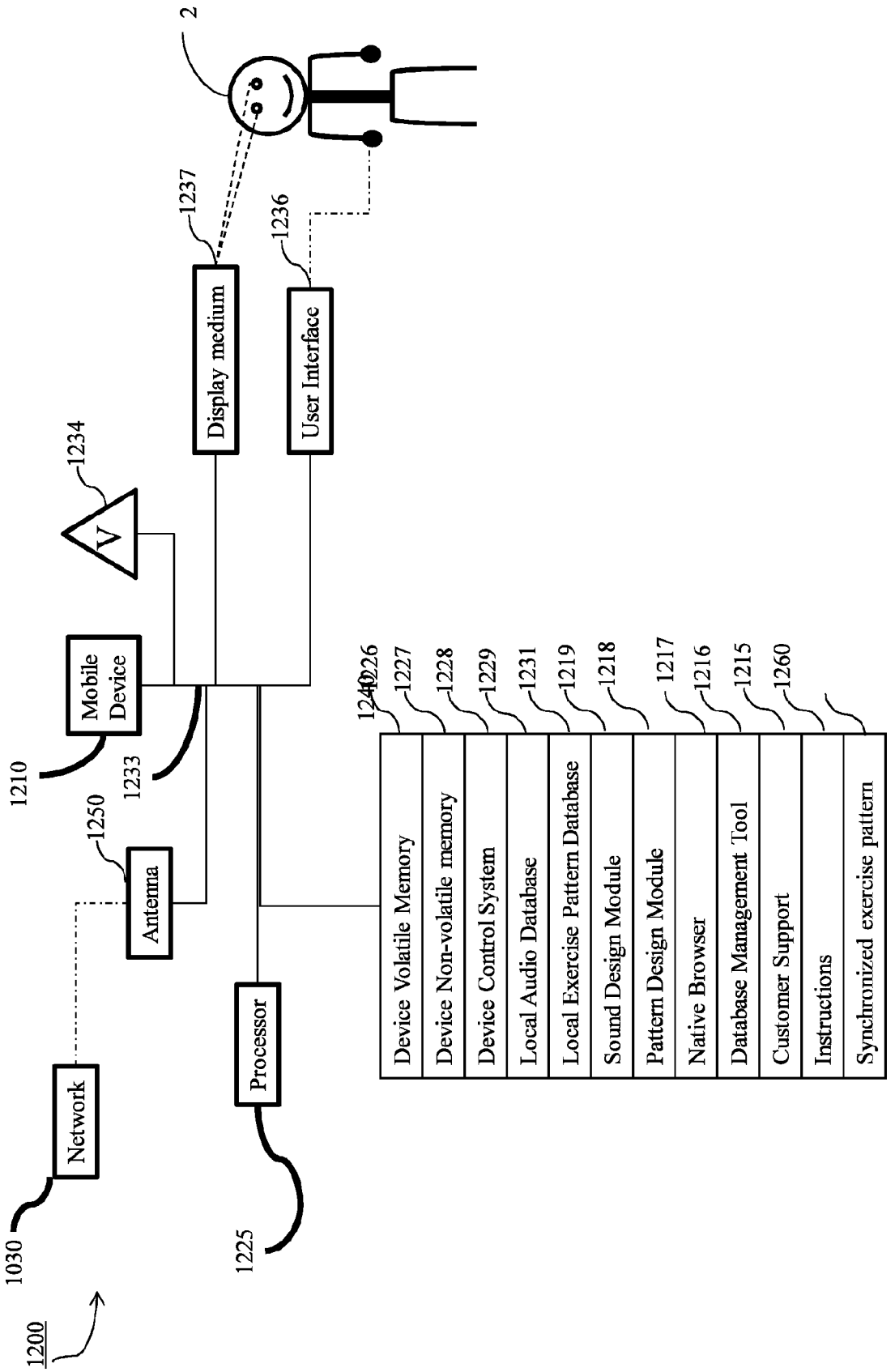

Figure 29

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