



US 20070194187A1

(19) **United States**(12) **Patent Application Publication****Amron**(10) **Pub. No.: US 2007/0194187 A1**(43) **Pub. Date: Aug. 23, 2007**(54) **REFRIGERATOR MAGNET WITH CLIPPING ACTION****Publication Classification**(76) Inventor: **Scott L. Amron**, Westbury, NY (US)

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(57)

ABSTRACT(21) Appl. No.: **11/636,343**(22) Filed: **Dec. 8, 2006****Related U.S. Application Data**

(60) Provisional application No. 60/748,918, filed on Dec. 8, 2005.

A magnetic device is provided for holding paper memos, documents, notices, notes, photos and similar non-magnetic thin sheet materials against a flat or rounded, usually vertically oriented, magnetically attractive surface such as a refrigerator door. It comprises two neodymium disc magnets attached to a steel plate. The entire assembly is encapsulated in silicone rubber. The steel plate serves as a rigid structural splint. The steel plate also serves to focus the magnetic fields of the two magnets, thereby increasing the device's magnetic strength without increasing the size of the magnets.

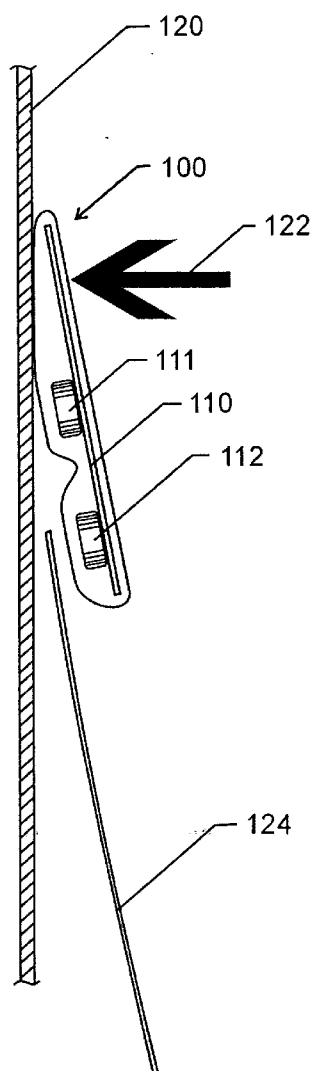
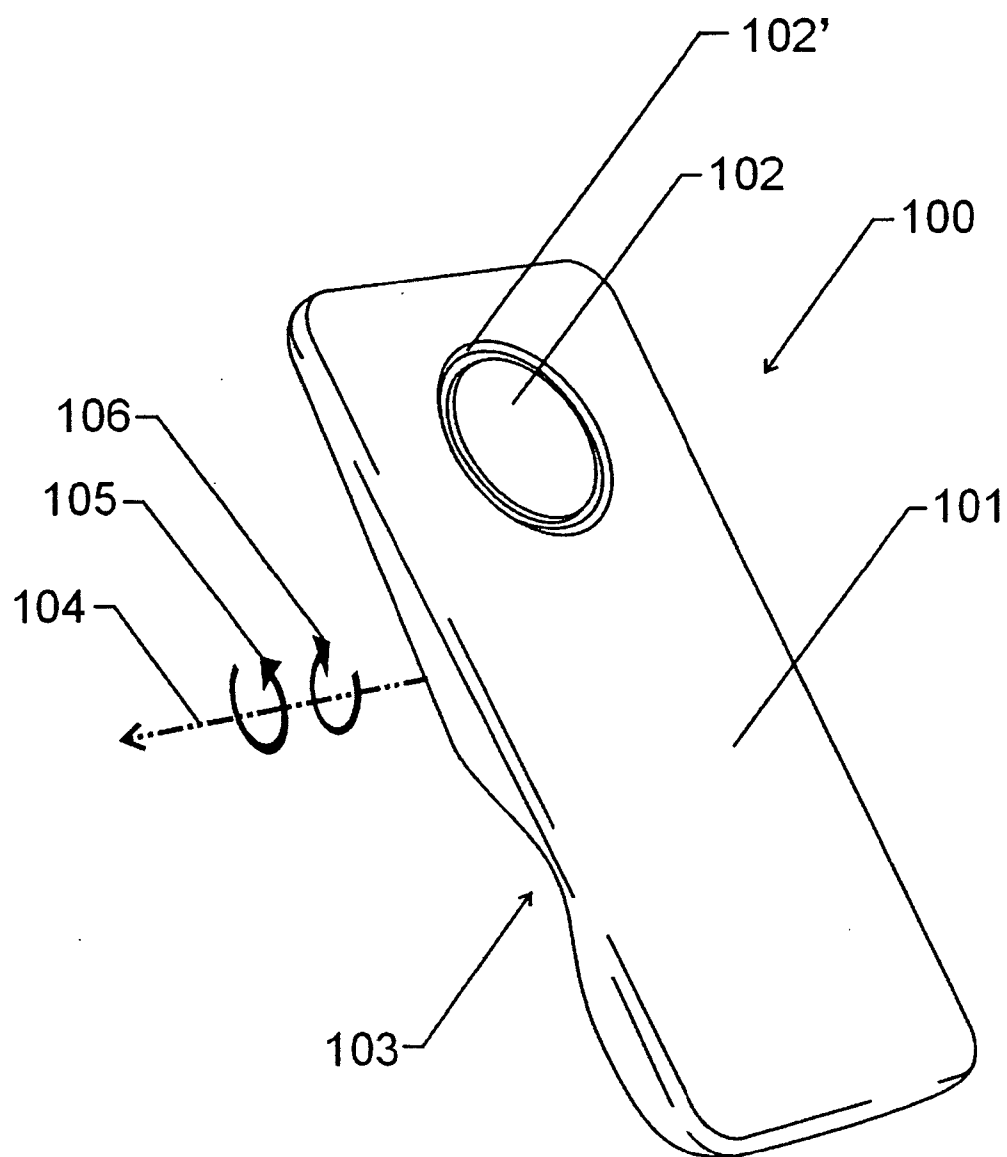


FIG. 1



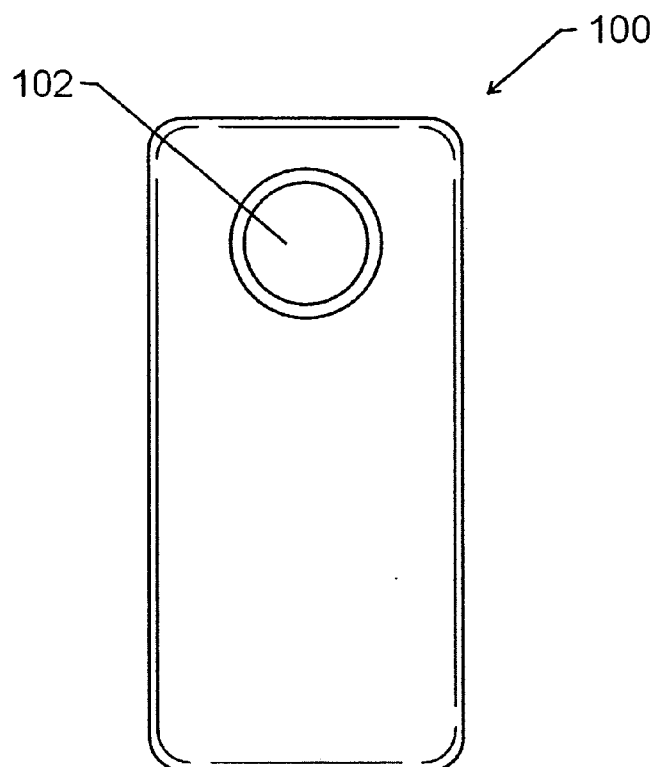


FIG. 2a

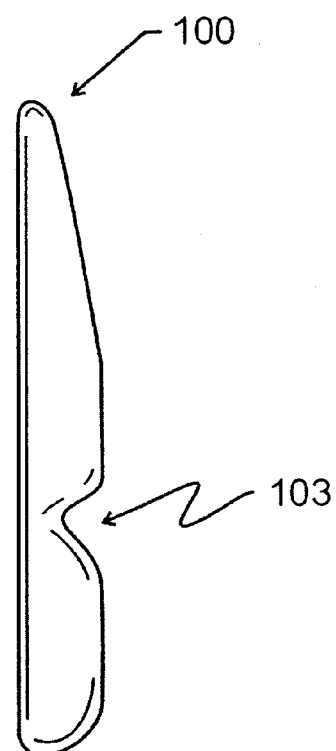


FIG. 2d

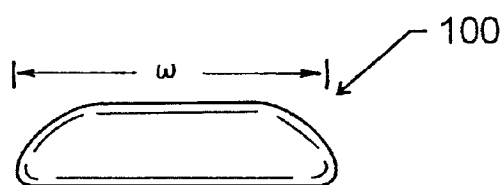
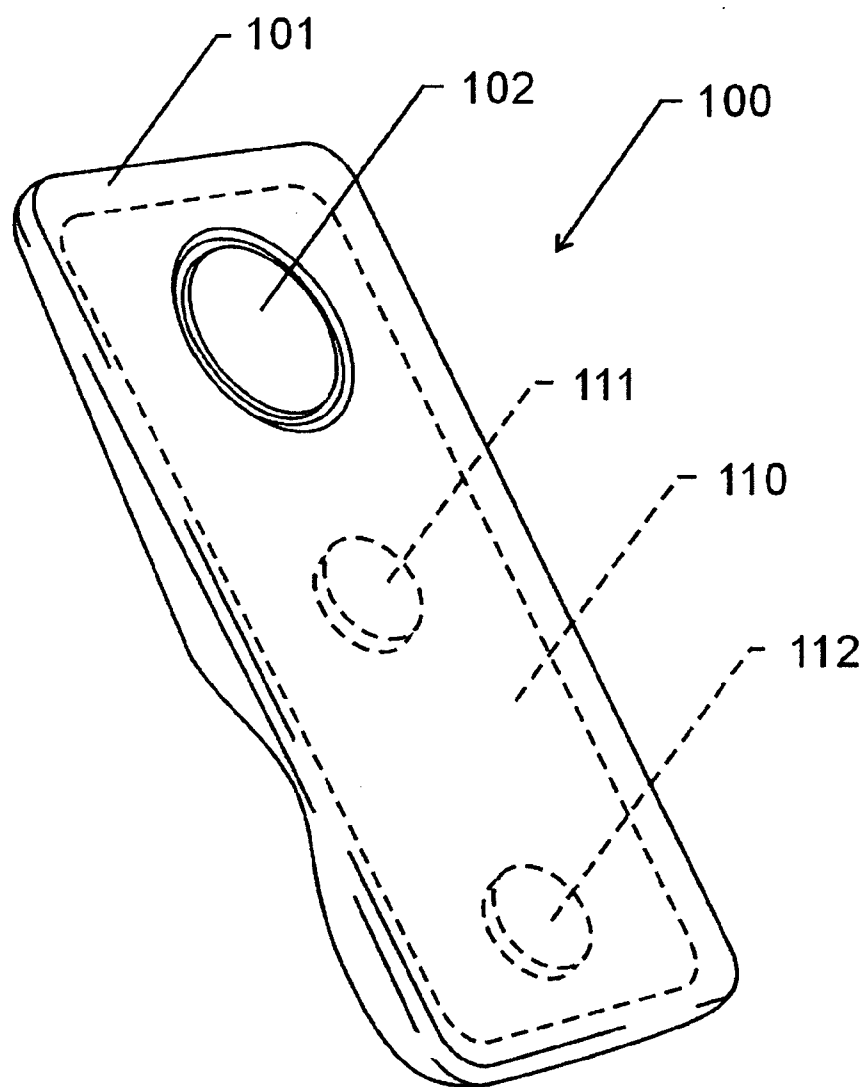


FIG. 2b



FIG. 2c

FIG.3



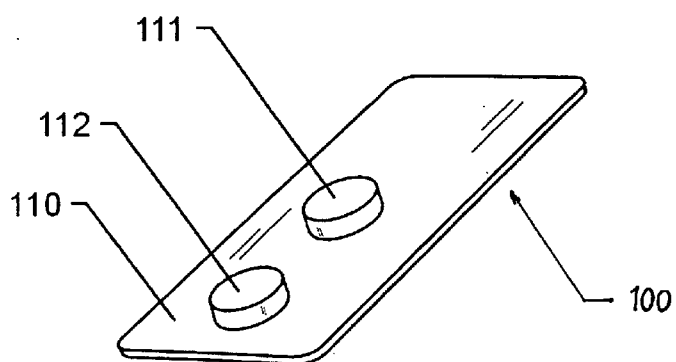


FIG. 4a

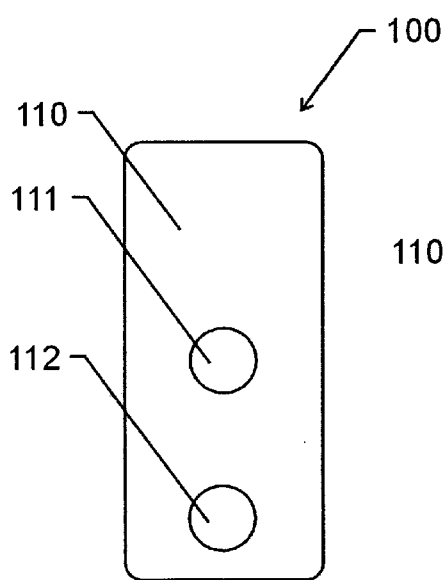


FIG. 4b

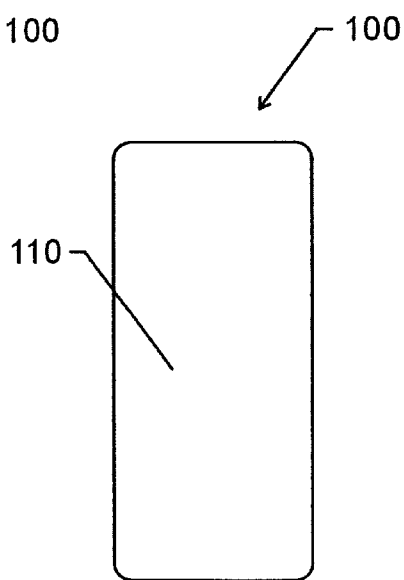


FIG. 4c

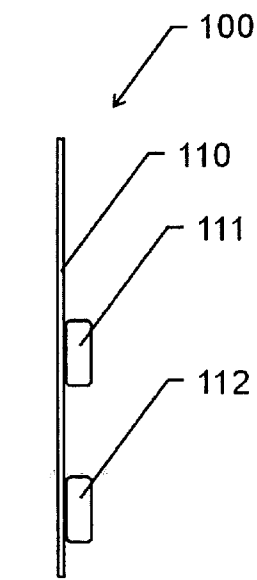


FIG. 4d

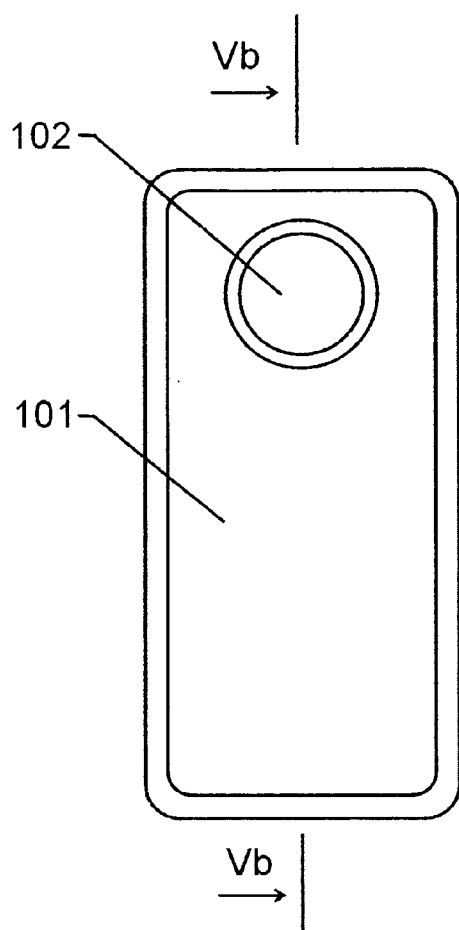


FIG. 5a

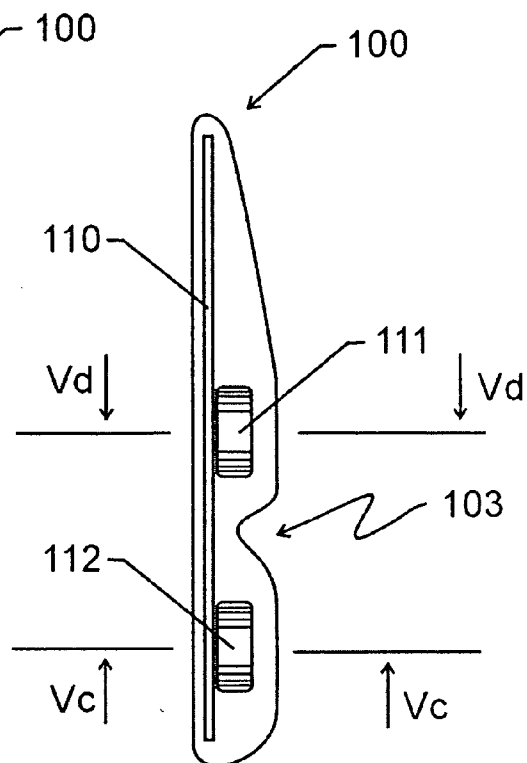


FIG. 5b

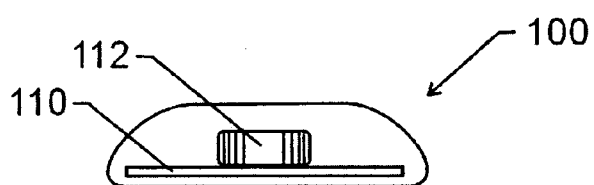


FIG. 5c

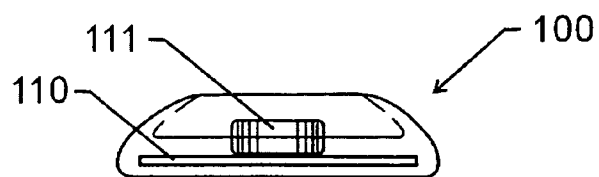


FIG. 5d

FIG. 6A

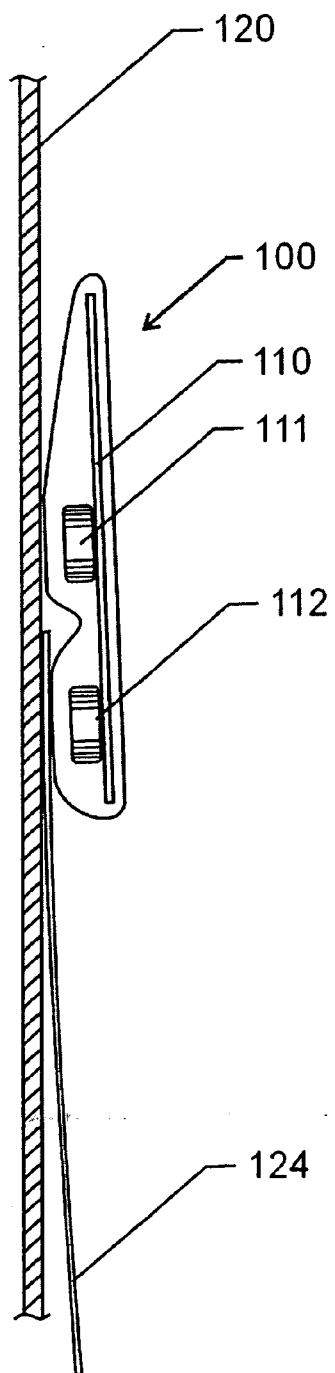
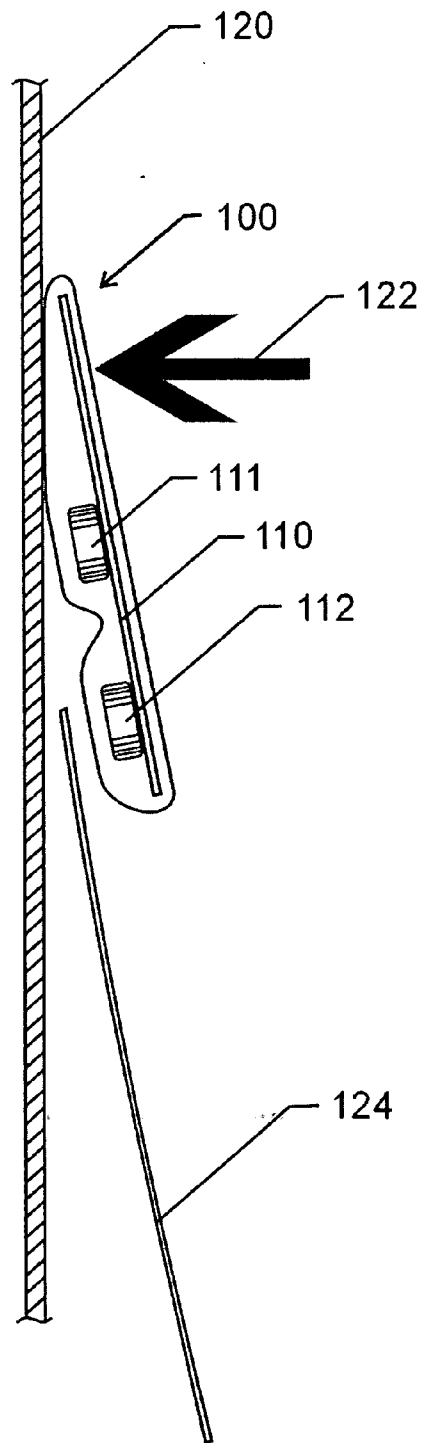


FIG. 6B



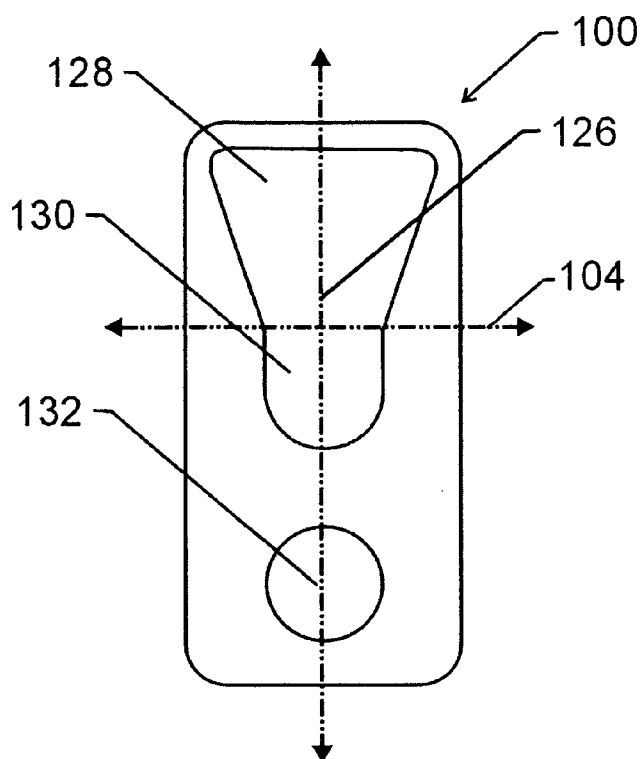


FIG. 7a

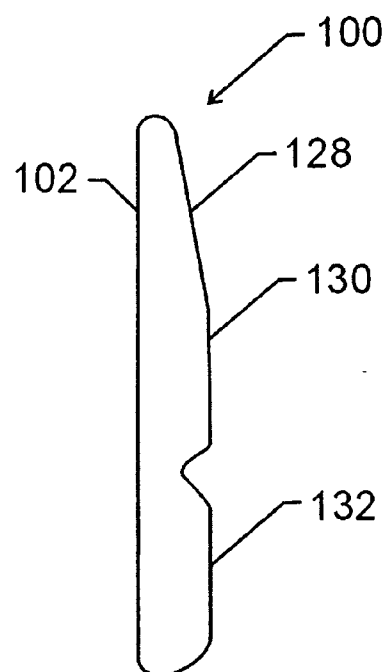


FIG. 7b

FIG. 8

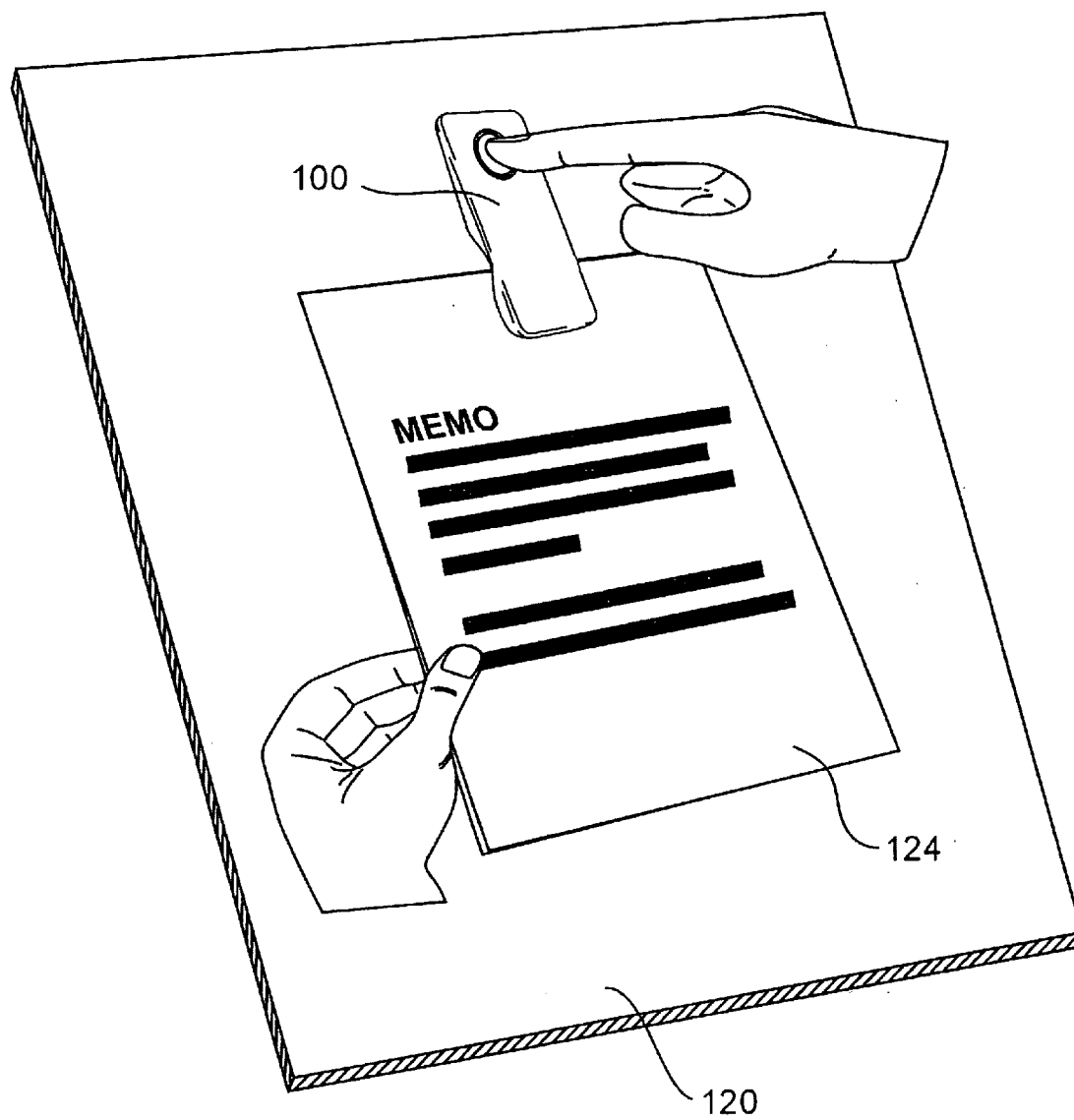


FIG.9

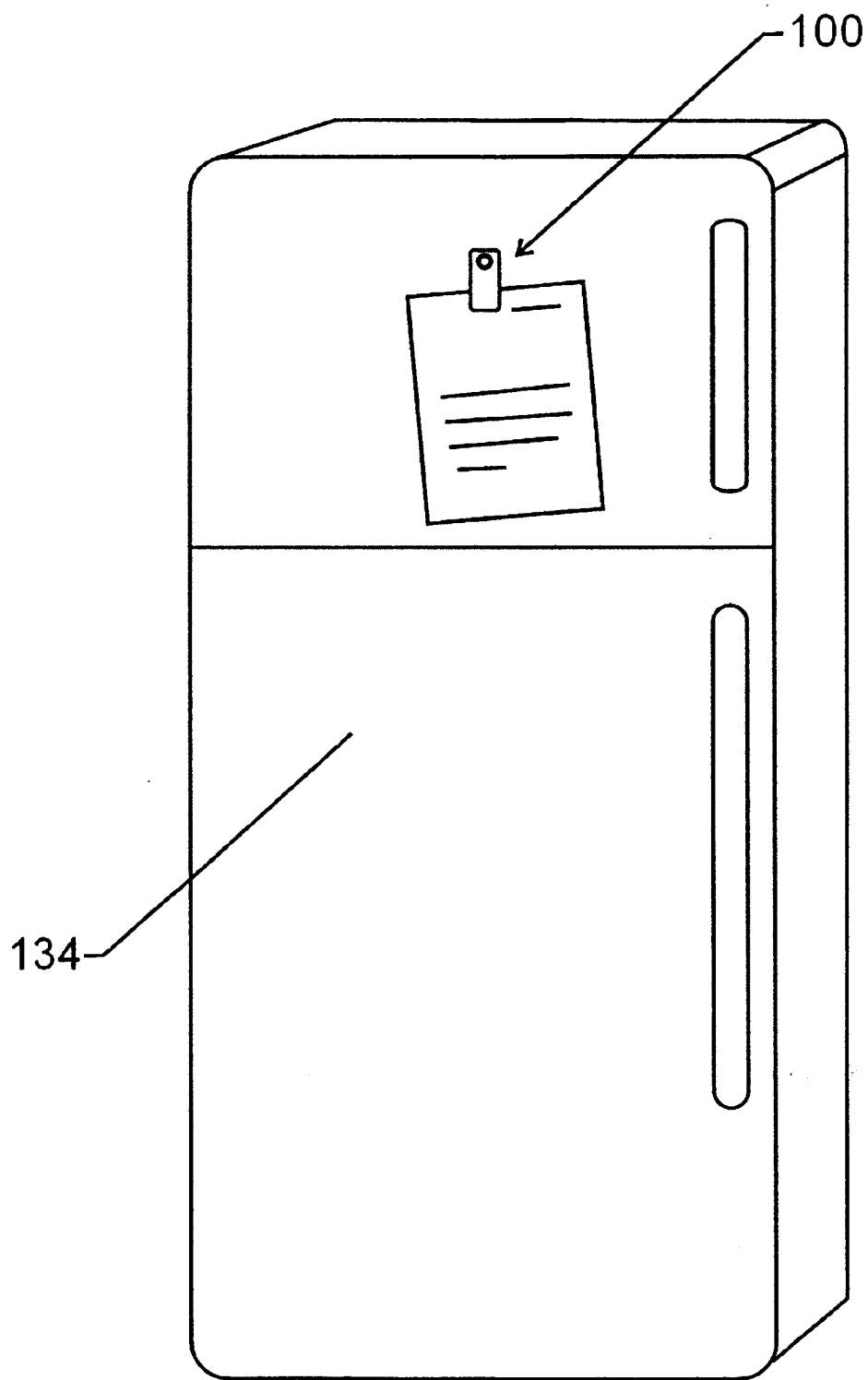


FIG.10

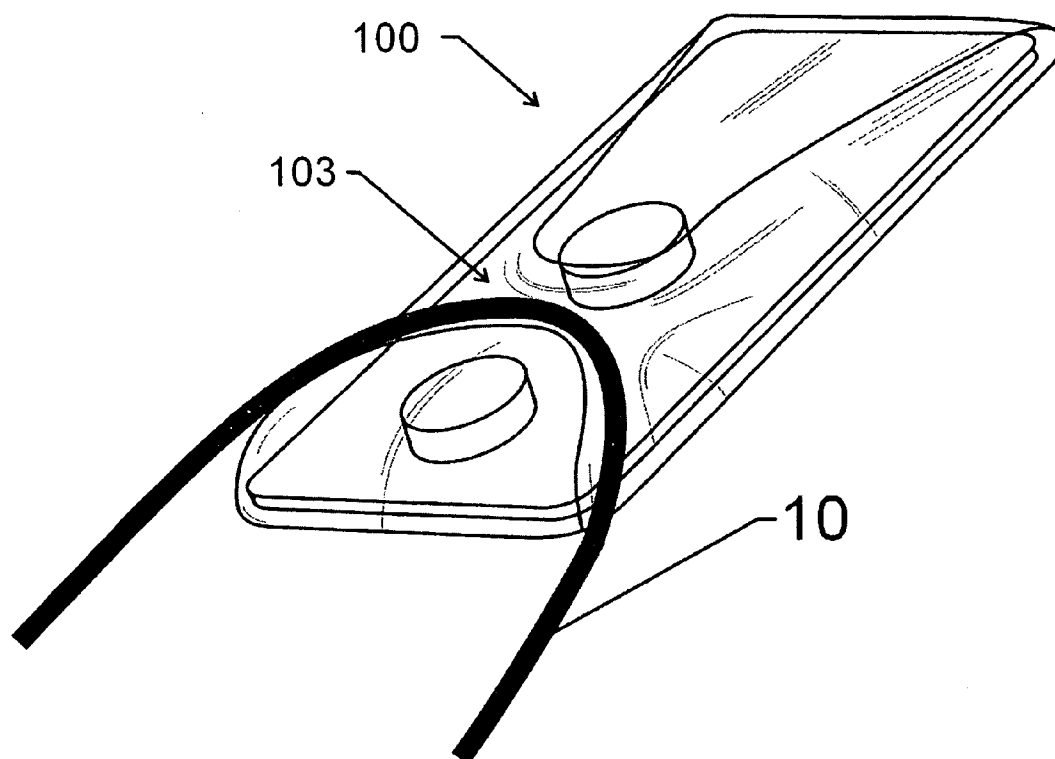
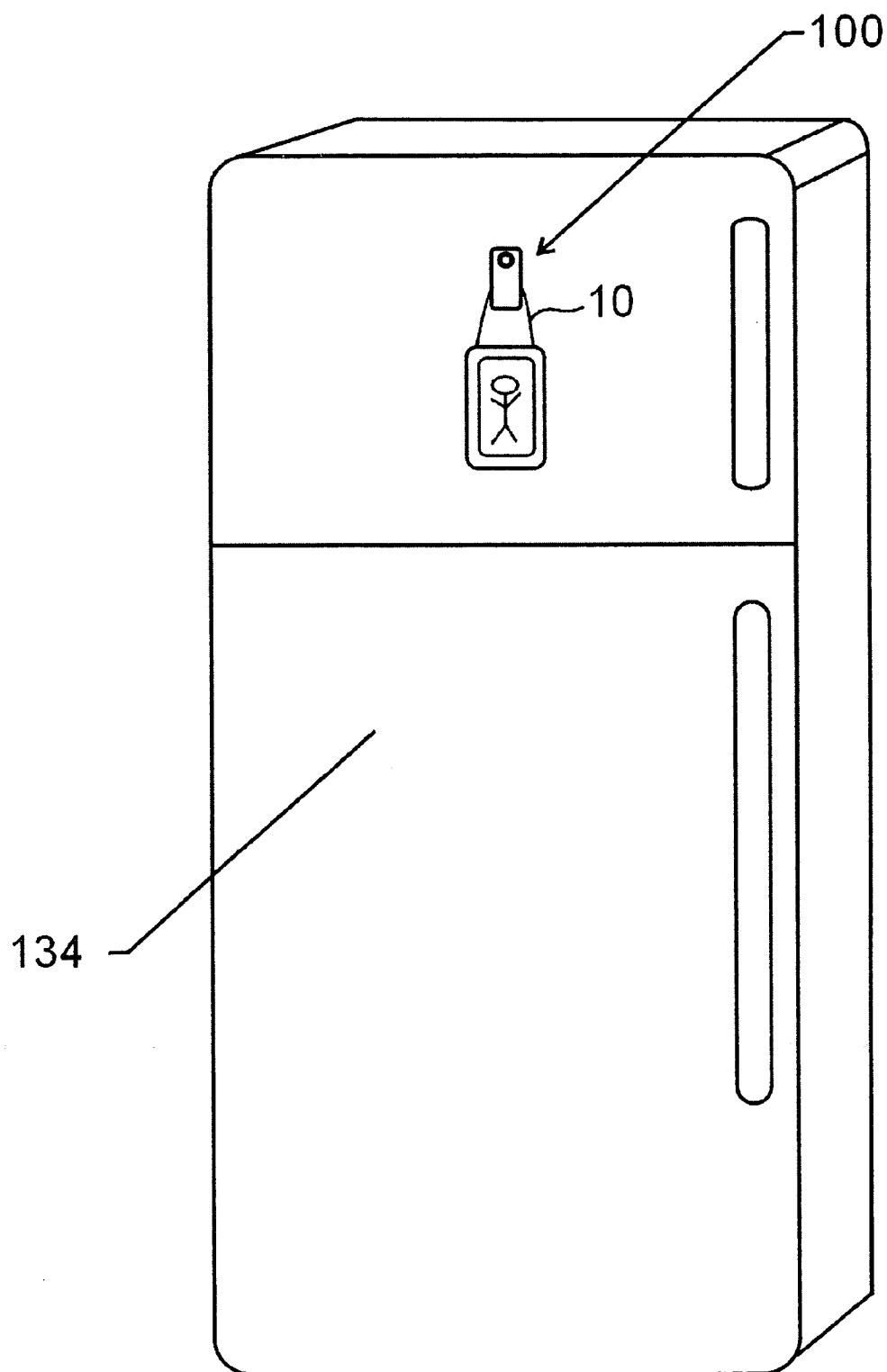


FIG.11



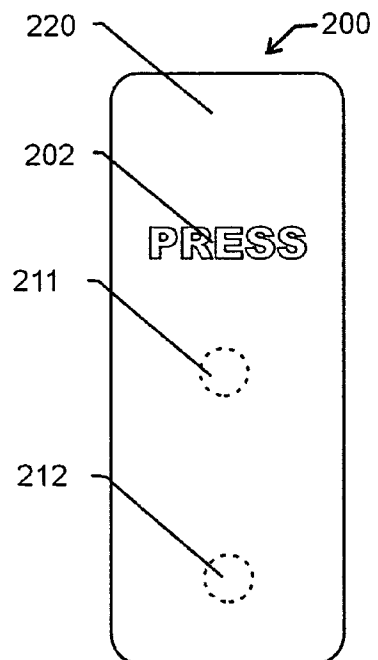


FIG. 12a

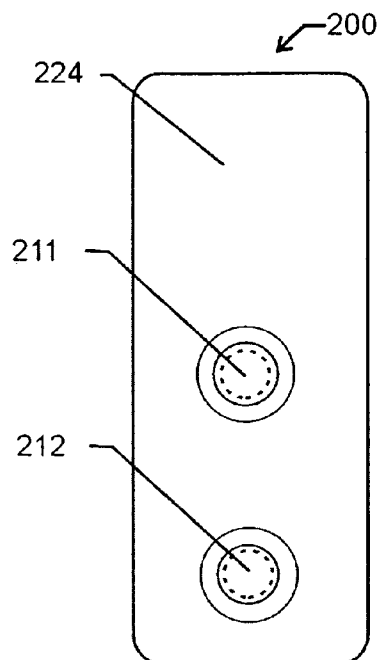


FIG. 12b

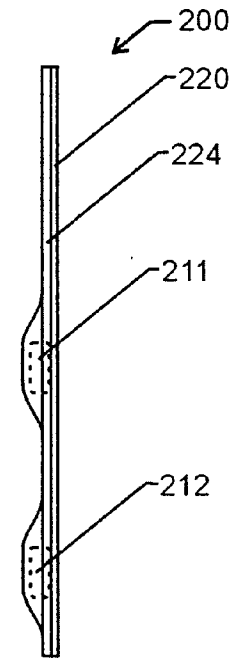


FIG. 12c

FIG.13A

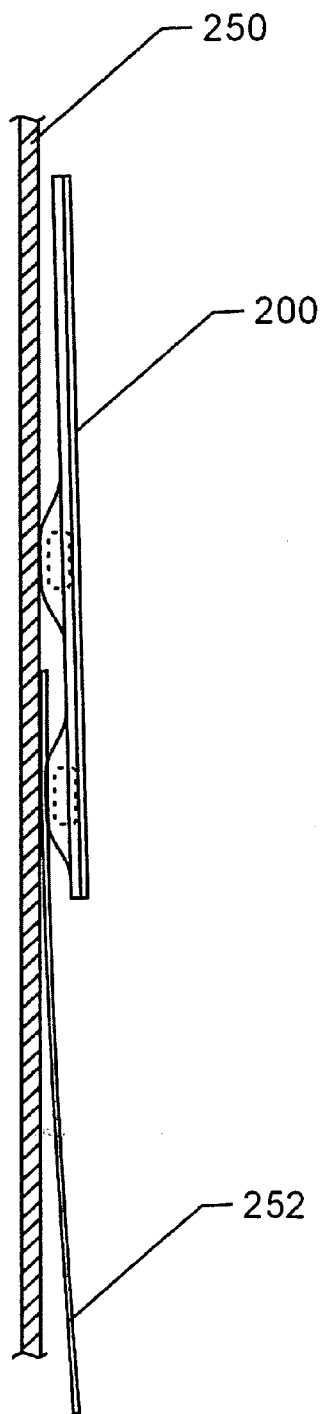
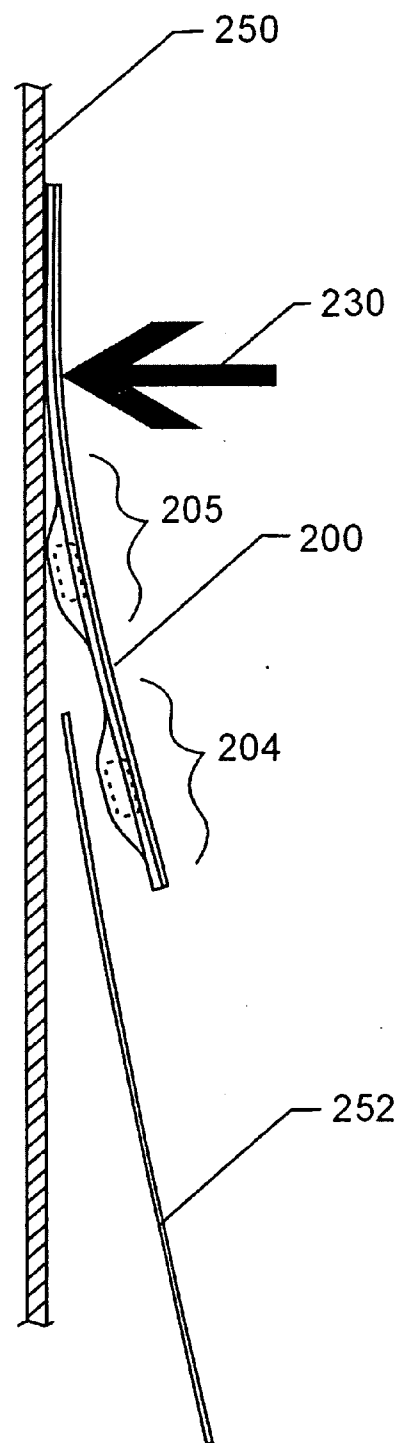


FIG.13B



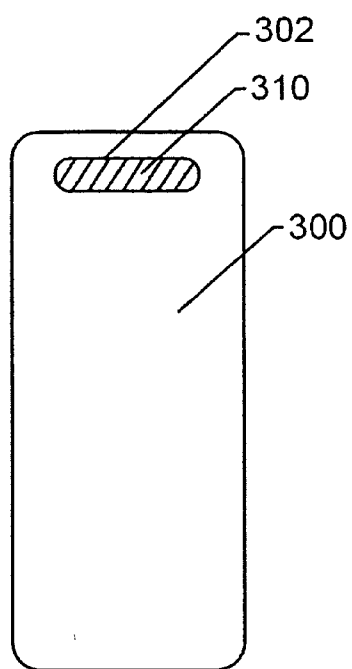


FIG. 14a

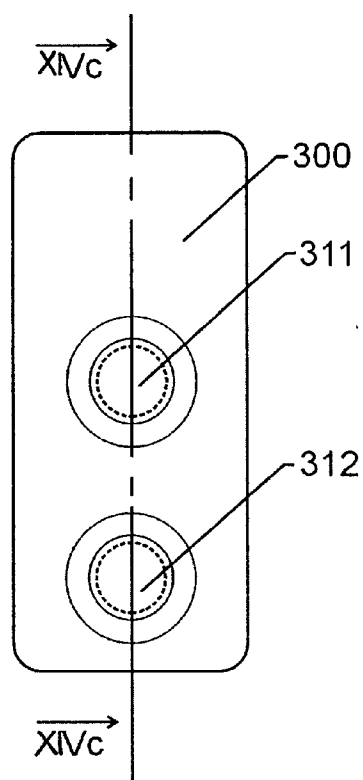


FIG. 14b

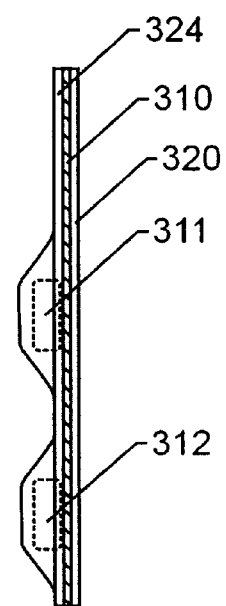
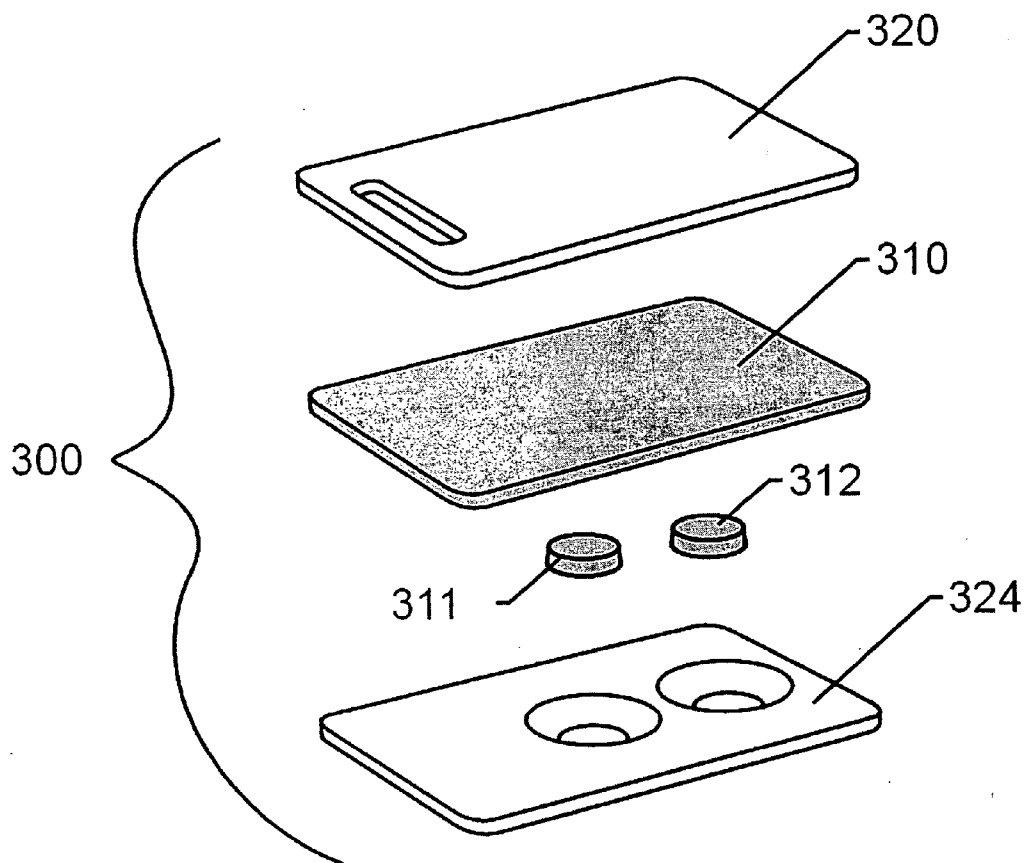


FIG. 14c

FIG.15



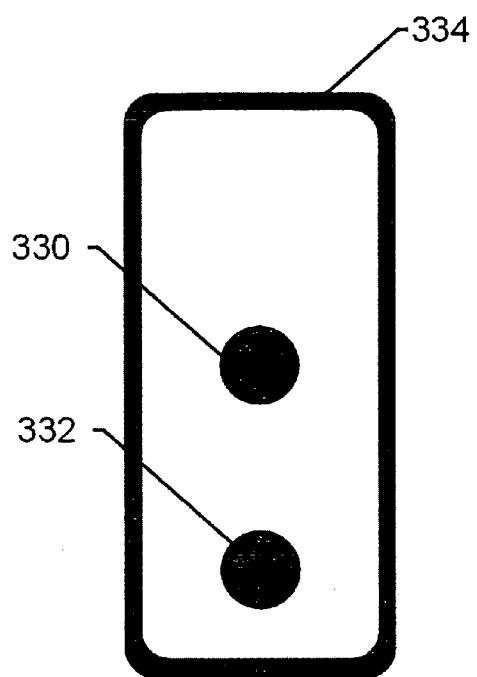


FIG. 16A

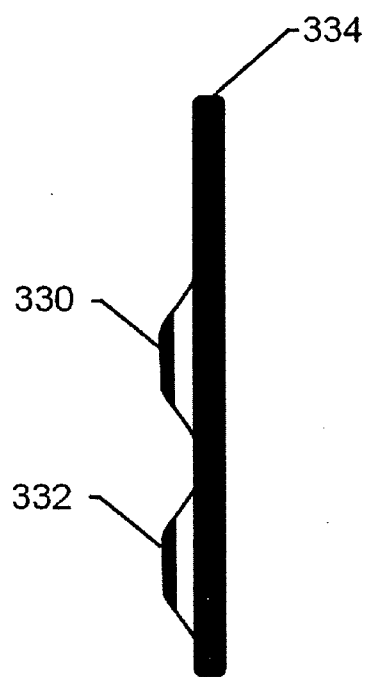


FIG. 16B

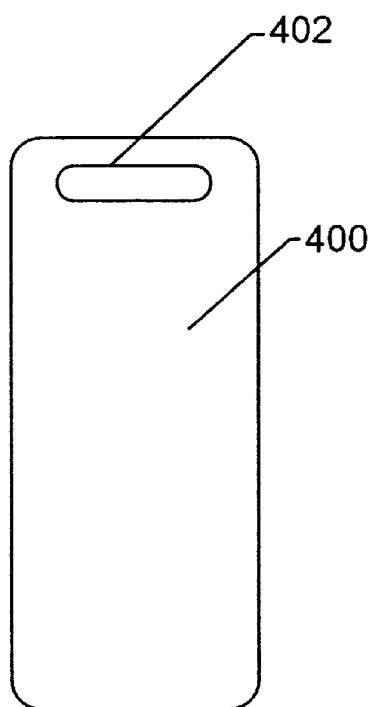


FIG. 17a

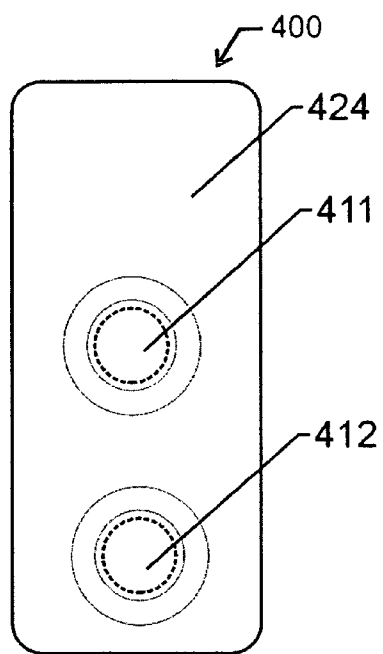


FIG. 17b

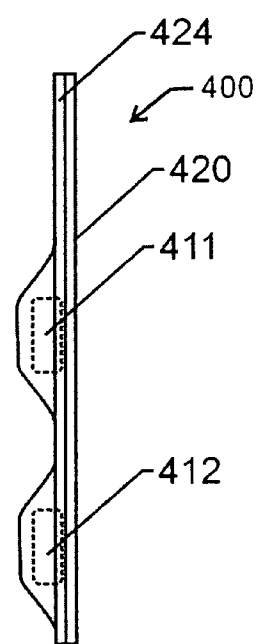
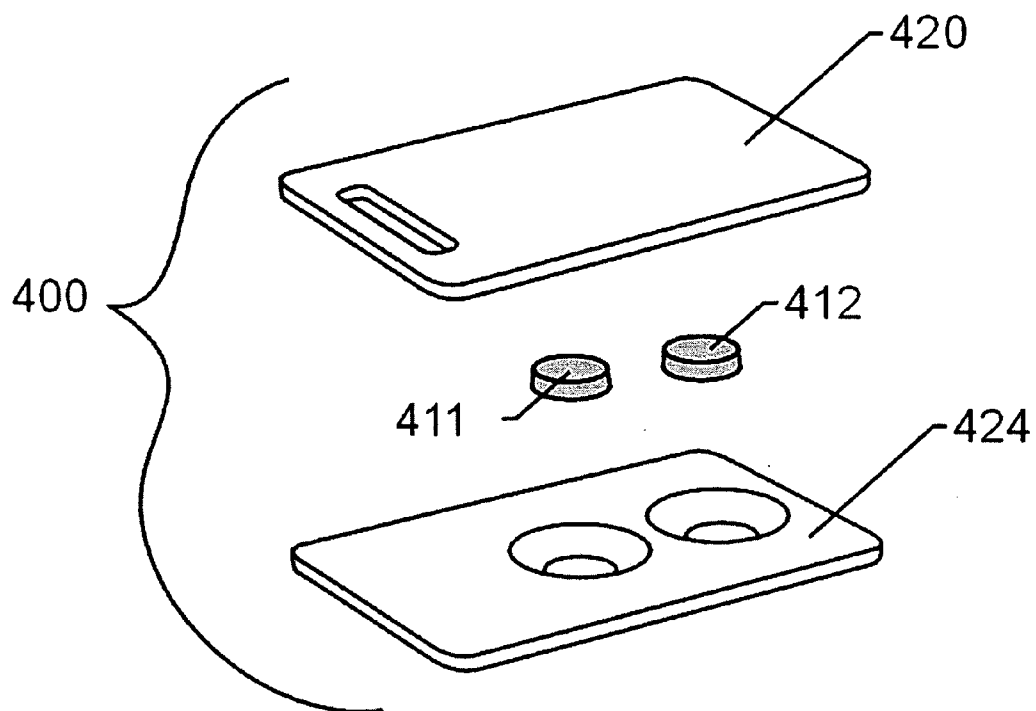


FIG. 17c

FIG.18



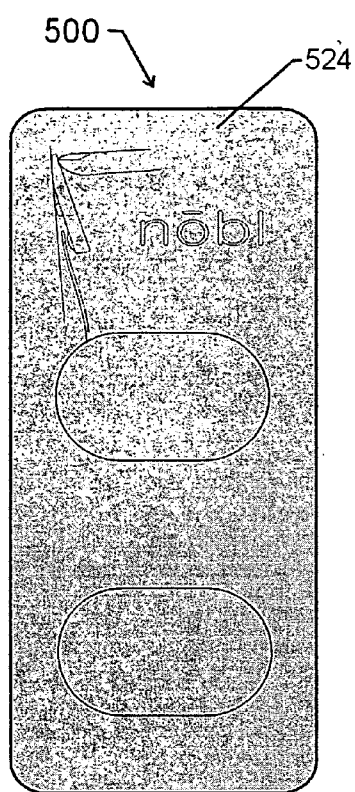


FIG. 19a

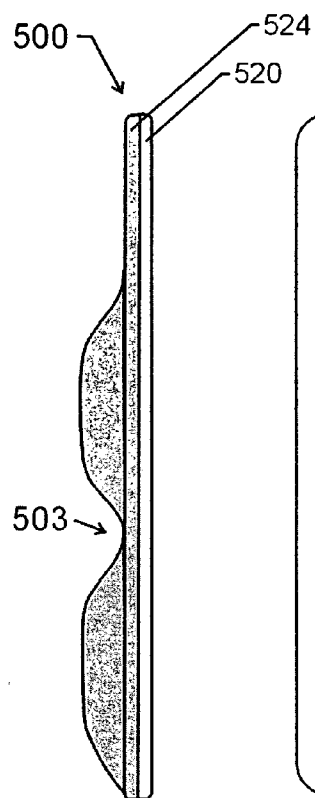


FIG. 19b

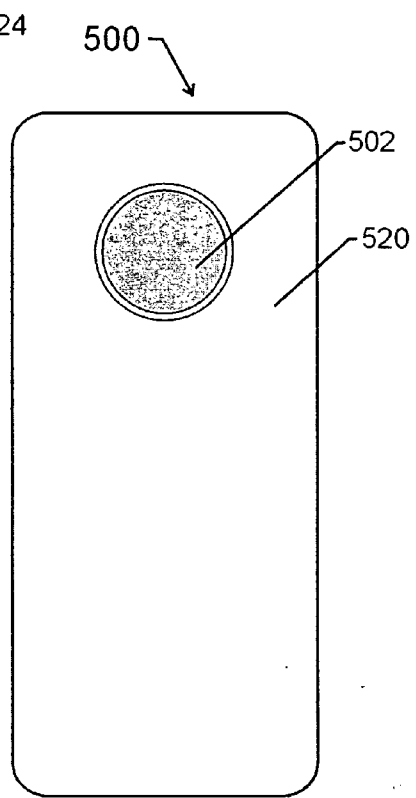
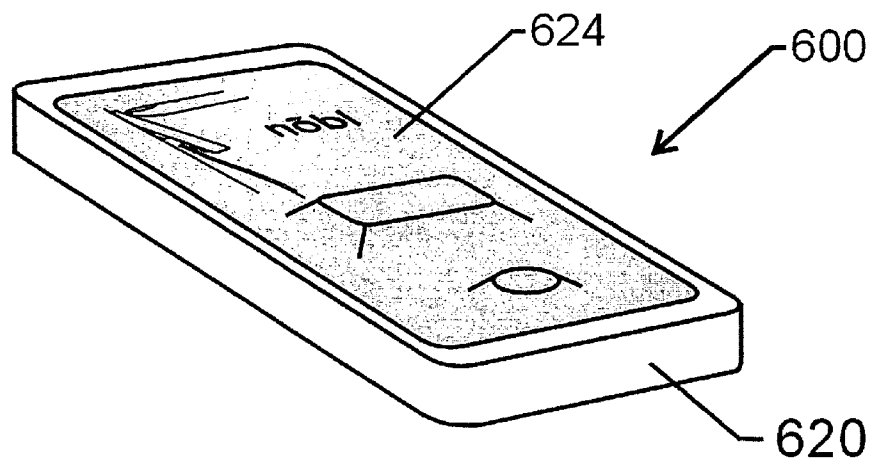


FIG. 19c

FIG.20



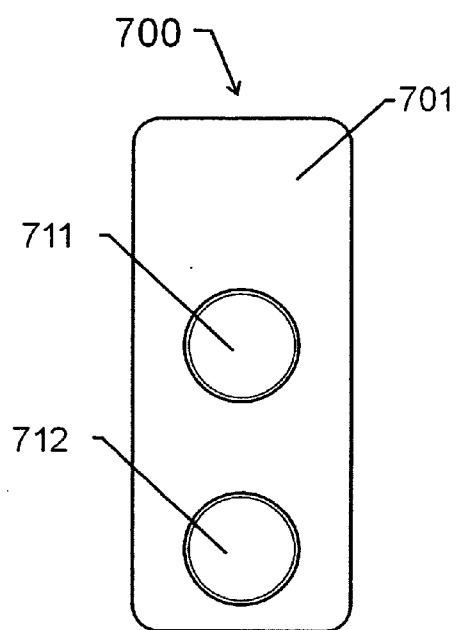


FIG. 21a

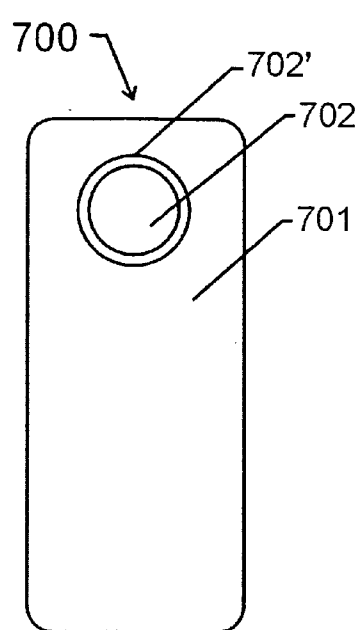


FIG. 21b

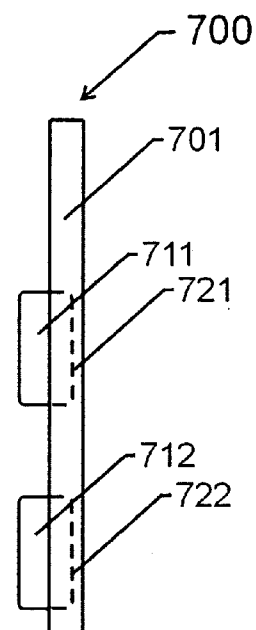


FIG. 21c

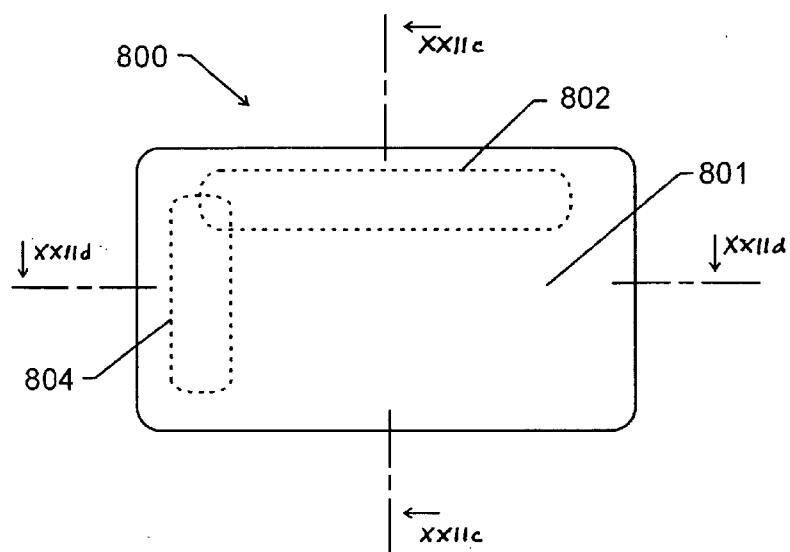


FIG. 22A

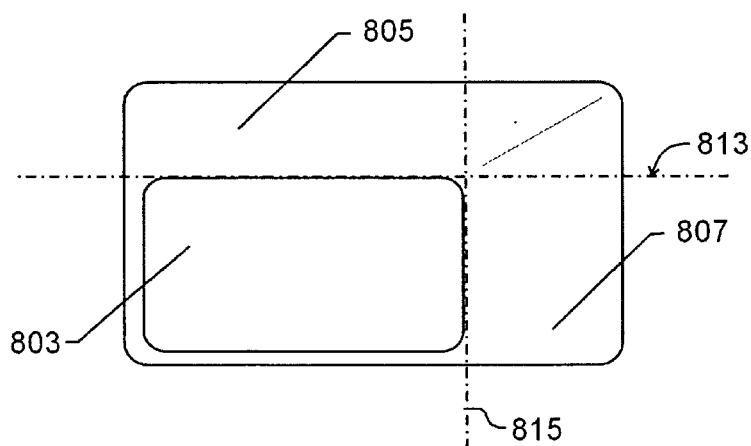


FIG. 22B

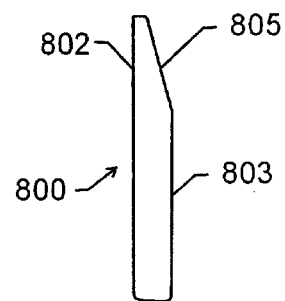


FIG. 22C

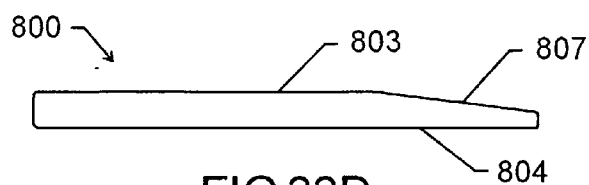
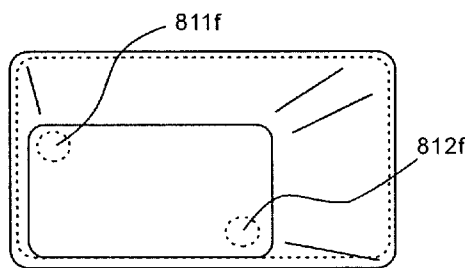
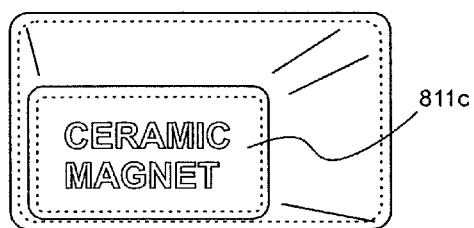
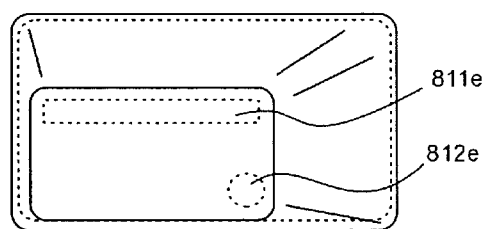
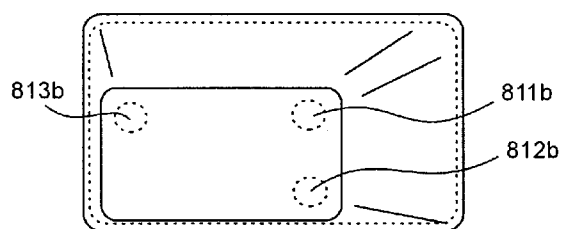
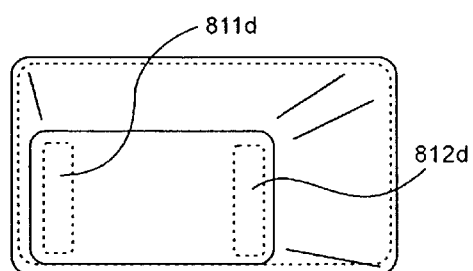
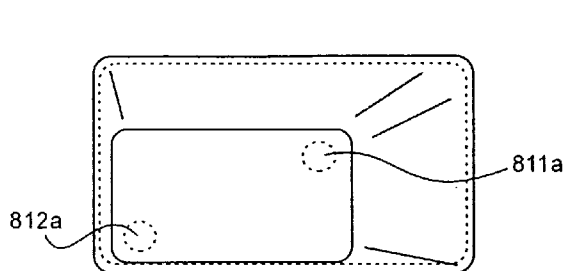


FIG. 22D



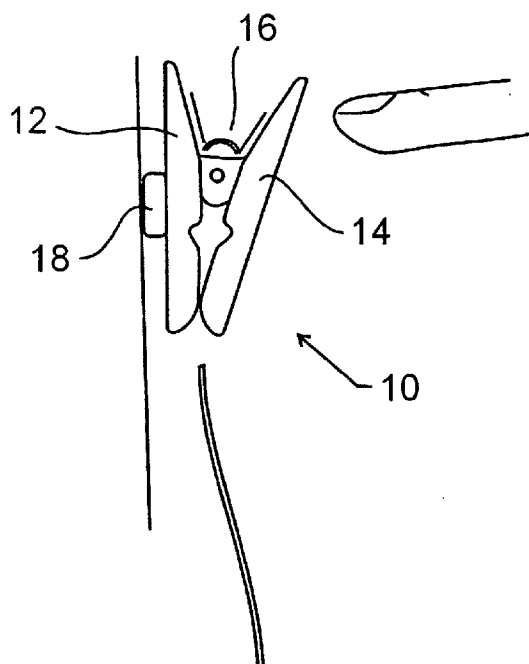


FIG. 24a

Prior Art

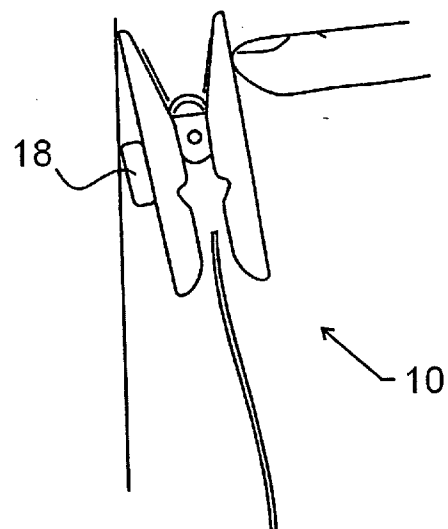


FIG. 24b

Prior Art

REFRIGERATOR MAGNET WITH CLIPPING ACTION

RELATED APPLICATIONS

[0001] This application claims priority from U.S. Provisional Patent Application Ser. No. 60/748,918 which was filed on Dec. 8, 2005.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to a magnetic device, commonly referred to as a refrigerator magnet, which is used to hold paper memos, documents, notices, notes, photos, exams, letters, postcards, recipes, poetry, pamphlets, greeting cards and similar non-magnetic thin sheet materials against flat or rounded, usually vertically oriented, magnetically attractive surfaces such as those found on refrigerators, stoves, file cabinets, metal lamps, memo boards, magnetic dry-erase message boards, magnetic bulletin boards, automotive bodies, submarine walls, steel structures, metal window frames, metal doors, and vending machines.

[0004] 2. Description of the Related Art

[0005] A refrigerator magnet is typically made of a single unit that is held onto a magnetically attractive surface. To secure thin sheets between the magnet and the magnetically attractive surface, the refrigerator magnet must first be wholly removed from the magnetically attractive surface and then placed back on the magnetically attractive surface. Subsequently, the refrigerator magnet must again be wholly removed from the magnetically attractive surface in order to release the thin sheet materials. Furthermore, typical refrigerator magnets comprise one or more exposed magnetic components that can scratch, smudge and damage photographs and the magnetically attractive surfaces to which they are attached. Flat, and often flexible, refrigerator magnets that reduce the risk of scratching are weak and difficult to remove as they generally possess low profiles that offer little in the way of leverage or grip. Refrigerator magnets lack the ability to secure string or wire from which to hang thick and/or relatively heavy objects such as picture frames, headphones and MP3 players. Refrigerator magnets generally cannot support more than approximately ten sheets of paper before sliding down the side of a refrigerator door.

[0006] FIGS. 24A and 24B show a prior art magnetic clip 10 with a clipping mechanism according to the prior art. The clipping mechanism of the typical magnetic clip 10 has two distinct rigid halves 12, 13 held together by a loaded spring or coil 16 which together to provide for a normally closed clipping function. A ceramic magnet 18 is usually attached to one of the device's rigid halves 12 for attachment to a magnetically attractive surface. These exposed magnets can scratch, smudge and damage photographs and the surfaces to which they are attached. Magnetic clips must first be wholly removed from rest in order to squeeze the two rigid halves together to cause the jaws of the magnetic clip to open for loading thin sheet materials. The jaws, i.e., rigid halves 12, 13 of the magnetic clip 10, are awkward to manipulate and thus difficult to separate when the device is attached to a magnetically attractive surface (see FIG. 24B).

SUMMARY OF THE INVENTION

[0007] An object of the present invention is provide a magnetic device that may be used as a magnetic clip and a refrigerator magnet.

[0008] Another object of the present invention is to provide a magnetic device that overcomes the problems associated with the prior art.

[0009] Another object of the present invention is to provide a magnetic clip having a one-piece unitary construction.

[0010] A further object of the present invention is to provide a magnetic clip that does not contain a coil or a spring component.

[0011] Yet another object of the present invention is to provide a magnetic clip with no internal moving parts.

[0012] A still further object of the present invention is to provide a refrigerator magnet that can be used to load and release thin sheet materials and/or string with ease.

[0013] A further object of the present invention is to provide a refrigerator magnet that can support a relatively large load.

[0014] Yet another object of the present invention is to provide a magnetic clip with a user interface that rests parallel with respect to the attachment surface.

[0015] The aforementioned deficiencies of the prior art are addressed, and an advance is made in the art, by a magnetic device configured for use as both a refrigerator magnet and a magnetic clip.

[0016] In accordance with a first embodiment of the present invention, the magnetic device is dimensioned and arranged to be used as a solid one-piece magnetic clip with no internal moving parts. The magnetic device includes two neodymium disc magnets attached to a steel plate. The magnets and steel plate are housed within a silicone rubber over-molding. The magnetic device appears as though it is a one-sided magnetic clip with no coil or visible hinge mechanism. It performs a spring-like clipping action without a single coil or spring component. The device can be wholly attached to, and detached from, a magnetically attractive surface with ease as the back of the device curves inward to provide the user with an elevated edge or lip for easy removal from a flat surface. The aesthetic beauty of the device is enhanced by the visual effect created by the seemingly floating flat shape. Its soft durable silicone housing will not damage photos or attachment surfaces. The device can be made durable enough to be dishwasher safe, making it ideal for securing art projects and workshop blueprints. Housing the internal magnetic components also provides for a more fluid transition from the closed state to the open state. The device is heat and stain resistant with a maximum operating temperature of 212 degrees Fahrenheit and a curie temperature of 572 degrees Fahrenheit.

[0017] The device according to the preferred embodiment supports a two pound load on a string or 20 sheets of paper. An indentation located on the underside of the device serves as a paper stop. It also allows for the threading/securing of wire or string with which to hang thick objects, taking full advantage of the devices magnetic strength and non-slip non-sticky silicone rubber grip. The device can also be used to string lights against a magnetically attractive surface.

[0018] Other objects and features of the present invention will become apparent from the following detailed description considered in conjunction with the accompanying draw-

ings. It is to be understood, however, that the drawings are designed solely for purposes of illustration and not as a definition of the limits of the invention, for which reference should be made to the appended claims. It should be further understood that the drawings are not necessarily drawn to scale and that, unless otherwise indicated, they are merely intended to conceptually illustrate the structures and procedures described herein.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] In the drawings, wherein like reference characters denote similar elements throughout the several views:

[0020] FIG. 1 is a perspective view of a magnetic device constructed in accordance with an embodiment of the present invention;

[0021] FIGS. 2A, 2B, 2C, and 2D are front, bottom, top and side views of the magnetic device of FIG. 1;

[0022] FIG. 3 is a perspective view of the magnetic device of FIG. 1 showing internal components of the device;

[0023] FIGS. 4A, 4B, 4C, and 4D are perspective, front, back and side views of the internal components of a magnetic device of FIG. 1;

[0024] FIGS. 5A, 5B, 5C, and 5D are front, side, bottom, and top views of the magnetic device as in FIG. 3;

[0025] FIGS. 6A and 6B are side views of the magnetic device of FIG. 1 arranged on a magnetically attractive surface in the closed and open states respectively;

[0026] FIGS. 7A and 7B are rear and side views of the magnetic device of FIG. 1 showing the surface shapes of the rear side of the device;

[0027] FIG. 8 is a perspective view of the magnetic device of FIG. 1 demonstrating the operation of the magnetic device;

[0028] FIG. 9 is a perspective view demonstrates the use of the magnetic device of FIG. 1 for holding a paper on a refrigerator;

[0029] FIG. 10 is a perspective view of the rear side of the magnetic device of FIG. 1 demonstrating the support of a load on a string or wire;

[0030] FIG. 11 is a perspective view of the device of FIG. 10 arranged on a refrigerator;

[0031] FIGS. 12A, 12B, and 12C are front, back and side views of a magnetic device constructed in accordance with another embodiment of the present invention;

[0032] FIGS. 13A and 13B are side views of the magnetic device of FIG. 12A arranged on a magnetically attractive surface in a closed and open state respectively;

[0033] FIGS. 14A, 14B, and 14C are front, back and side views of a magnetic device constructed in accordance with a further embodiment of the present invention;

[0034] FIG. 15 is an exploded view of the magnetic device of FIG. 14A showing the construction thereof;

[0035] FIGS. 16A and 16B are back and side views of a magnetic device constructed in accordance with yet another embodiment of the present invention;

[0036] FIGS. 17A, 17B, and 17C are front, back and side views of a magnetic device constructed in accordance with yet a further embodiment of the present invention;

[0037] FIG. 18 is an exploded perspective view of the components and assembly of a magnetic device of FIG. 17A;

[0038] FIGS. 19A, 19B, and 19C are back, side, and front views of a magnetic device constructed in accordance with a further embodiment of the present invention;

[0039] FIG. 20 is a perspective view of a magnetic device according to yet another embodiment of the present invention;

[0040] FIGS. 21A, 21B, and 21C are back, front, and side views of a magnetic device constructed in accordance with yet another embodiment of the present invention;

[0041] FIGS. 22A, 22B, 22C, and 22D are front, rear, and sectional views of yet another embodiment of a magnetic device; and

[0042] FIGS. 23A, 23B, 23C, 23D, 23E, and 23F are rear views showing internal location of magnets in the magnetic device of FIG. 22A; and

[0043] FIGS. 24A and 24B are sides views showing a prior art magnetic clip in the closed and open states respectively.

DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS

[0044] FIG. 1 illustrates a magnetic device 100 constructed according to a first preferred embodiment of the present invention. FIGS. 2A, 2B, 2C, and 2D show the front, top end, bottom end, and side views of the magnetic device 100. A silicone rubber over-molded housing 101 provides the device with non-slip durability. A circular etching 102' defines a user press point 102 which serves as an integrated finger pad. The magnetic device 100 is made to pivot about axis 104 in the direction of arrow 105 (FIG. 1) when the magnetic device is arranged on a magnetically attractive surface (not shown in FIG. 1) and a manual force is applied to the press point 102. The magnetic device pivots about axis 104 in the direction of arrow 106 (FIG. 1) when manual force is removed from the finger pad 102 and the magnetic device is arranged on the magnetically attractive surface. An indentation 103 is located on the underside of the magnetic device 100. As will be explained in more detail below, the indentation 103 acts as a stop to prevent a paper inserted between the magnetic device and the magnetically attractive surface from being inserted too far. As will also be explained below, the indentation 103 additionally allows for the threading and securing of wire or string from which to hang thick objects, taking full advantage of the devices magnetic strength and non-slip grip.

[0045] FIG. 3 and FIGS. 4A, 4B, 4C, and 4D illustrate the internal components of the magnetic device 100. The magnetic device 100 comprises two disc magnets 111 and 112 and a steel plate 110. Although the illustrated embodiments use disc magnets, the magnets may comprise any shape which achieves the same results. A housing 101 made of silicone rubber is molded over the steel plate 110 and disc magnets 111 and 112. The steel plate 110 is employed to cap and focus the magnet fields of the two disc magnets 111 and 112, thereby increasing the magnetic field strength in the

direction of attachment without increasing magnet volume. The steel plate **110** also provides the device with a rigid inner frame. The two disc magnets **111** and **112** may, for example, comprise neodymium and each measures approximately 8 mm in diameter and 3 mm in thickness. Neodymium (Nd—Fe—B) magnets are chosen for their high magnetic strength to volume ratio. FIGS. **5A**, **5B**, **5C** and **5D** show the position of the steel plate **110** and disc magnets **111** and **112** in the housing **101**.

[0046] FIGS. **6A** and **6B** illustrate the utility of the magnetic device **100**. In FIG. **6A**, the device **100** is shown attached to a magnetically attractive surface **120**. A sheet of paper **124** is shown held against the magnetically attractive surface **120** by the bottom portion of the device **100**. The magnet **112** is attracted to the magnetically attractive surface **120** and provides the force required to hold the sheet of paper **124** against the magnetically attractive surface **120**. The magnet **111** is also attracted to the magnetically attractive surface **120** and thus provides the force necessary to maintain the attachment of the magnetic device **100** to the magnetically attractive surface **120** during the clipping action as illustrated in FIG. **6B**. In FIG. **6B** a manual force **122** is applied, i.e., digitally applied, to the device pressure point **102**, causing the device **100** to pivot counterclockwise so that magnet **112** is lifted away from the magnetically attractive surface **120**. The magnet **111** is operative to maintain the attachment of the magnetic device **100** to the magnetically attractive surface **120** in the position shown in FIG. **6B**. A sheet of paper **124** is shown in its released state, free to either be loaded or released by the user in FIG. **6B**. The steel plate **110** provides the device **100** with rigidity. The steel plate **110** also serves to focus and thereby strengthen the magnetic fields of the magnets **111** and **112** in the direction of attachment (toward the magnetically attractive surface **120**). Upon the removal of a manual force **122** the magnetic device **100** will automatically return to the position shown in FIG. **6A** due to the attractive force of magnet **112**. The magnet **112** and the magnetically attractive surface **120** form two jaws of a clip which may be pivoted between a closed state (FIG. **6A**) and an open state (FIG. **6B**) by the above described manual force **122**.

[0047] FIGS. **7A** and **7B** illustrate the location of substantially planar surfaces on the magnetic device **100** positioned and sized for best operation. Planar surfaces **130** and **132** comprise two separated parts of a first planar surface and prevent the magnetic device **100** from rocking about its central axis **126** when the device **100** is attached to a magnetically attractive surface in the closed position in FIG. **6A**. These planar surfaces **130**, **132** are thus coplanar and are separated by the indentation **103**. In addition, the planar surfaces **130**, **132** are substantially parallel with the surface on the front side of the device **100** so that the front surface of the device **100** is substantially parallel with the underlying magnetically attractive surface in the closed state shown in FIG. **6B**. Furthermore, these planar surfaces **130**, **132** have a smaller width than the overall width *w* of the device **100** (see FIG. **2B**). Accordingly, the sides taper inward from the front surface to the rear surface of the device. As depicted in FIGS. **7A** and **7B**, a second flat surface **128** is arranged at an angle relative to the planar surfaces **130**, **132**. The first and second flat surfaces meet at a fulcrum or pivoting axis **104**. When the manual force **122** (see FIG. **6B**) is applied to the pressure point **102**, the magnetic device **100** pivots about the axis **104** until the second flat surface **128**

rests on the magnetically attractive surface. The second flat surface **128** becomes wider from an end of the second surface adjacent the axis **104** toward the opposing end of the second surface facing away from the axis **104**. This provides stability to the device **100** when manual or digital force is applied to pivot the device to the second position.

[0048] FIGS. **8** and **9** further demonstrate the operation and use of the magnetic device **100**. FIG. **8** shows one hand pressing the finger pad of the device **100** and the other hand either loading or removing a paper memo. When the finger pad is pressed the device **100** is in the “open” state. When the finger pad is not being pressed the device **100** is in the “closed” state. The device **100** is shown attached to a section of a magnetically attractive surface such as a refrigerator door. FIG. **9** shows the device **100** attached to the front of the freezer door of a common household refrigerator **134**. A memo is shown held against the freezer door by the lower portion of the magnetic device.

[0049] FIG. **10** illustrates a further utility of the indentation **103** located on the back of the magnetic device **100**. A wire or string **10** is shown placed in or threaded through the indentation **103**. When the magnetic device **100** is arranged on the magnetically attractive surface **120**, the wire or string may be drawn through the space defined between by the indentation **103** and the magnetically attractive surface **120**. FIG. **11** shows that a picture frame may hang from the string **10** held against the freezer door by the device **100**.

[0050] FIGS. **12A**, **12B**, and **12C** illustrate the front, back and side of a magnetic device **200** constructed according to a second embodiment of the present invention. The device **200** comprises two discrete neodymium disc magnets **211**, **212** housed in a semi rigid body. This second embodiment of the present invention does not contain a steel plate. Instead, the device is a semi-rigid body employed for improving mouth opening height without adding device standing height. Accordingly, the device of this embodiment is both thin and capable of opening wider than a low profile rigid body. Two neodymium disc magnets **211** and **212** are sandwiched between one flat sheet of styrene **220** and a one thermoformed sheet of styrene **224**. The two sheets of styrene **220**, **224** are connected together, e.g., by gluing, to house the two magnets **211**, **212**. The magnets **211**, **212** sit in two protruding bulges in the thermoformed sheet **224** of styrene. The top flat sheet of styrene **220** is thinner than the bottom thermoformed sheet of styrene **224**. During operation, a manual force is applied to the press point **202** of the magnetic device **200** to cause the bottom portion to bend away from the attachment surface (i.e., to open the clip).

[0051] FIGS. **13A** and **13B** illustrate the utility of the magnetic device **200**. In FIG. **13A**, the magnetic device **200** is shown attached to a magnetically attractive surface **250**. A sheet of paper **252** is shown held against the magnetically attractive surface **250** by the portion of the magnetic device **200** that contains the magnet **212** (not shown in FIGS. **13A**) because the magnet **212** is attracted to the magnetically attractive surface **250**. Magnet **212** thus provides the force required to hold the sheet of paper **252** against the magnetically attractive surface **250**. The other magnet **211** is also attracted to the magnetically attracted surface **250** and provides the force necessary to maintain the attachment of the device **200** to the magnetically attractive surface **250**. In FIG. **13B** a manual force **230** is applied to the press point

202, causing the device 200 to bend, forcing the magnet 212 in the lower portion 204 of the device 200 to be released from the magnetically attractive surface 250. The flexibility of the body allows the magnet in the lower portion 204 to be lifted away from the magnetically attractive surface by a distance greater than if the body was rigid. The magnet 211 proximate the center portion of the device 200 is operative to maintain the attachment of the device 200 to the magnetically attractive surface 250 during this clipping action. The sheet of paper 252 is shown in its released state in FIG. 13B, free to either be loaded or released by the user. Upon the removal of a manual force 230 the device 200 will automatically return to the normal position as shown in FIG. 13A due to the attractive force of magnet 212 and the memory of the semi-rigid body.

[0052] The two sheets of styrene 220, 224 are glued together to house the two magnets 211, 212 therebetween. The thickness and length of the styrene sheets 220, 224 are very important to achieving the best bend and pop, i.e., release, effect. The device 200 must be pressed slightly above its center portion 205 to cause the bottom portion 204 to bend away from the attachment surface and to pop open. This embodiment of the present invention is inexpensive to manufacture. Since this embodiment has no steel reinforcement and the two sheets of styrene have a combined thickness of 1 mm, this embodiment is ideal for securing one or two sheets of paper. By replacing the bottom thermoformed sheet of styrene with an injection molded rubber piece and slightly increasing the thickness of the top sheet of plastic, one could improve the device's ability to hold larger loads (more sheets of paper before sliding). The rubber bottom provides the device with a non-slip surface. However, increasing the magnetic strength of the bottom magnet is not practical in this embodiment as the semi-rigid body will not bend away if the magnetic force is too great. Increasing the magnetic strength of the top magnet will prevent the device from sliding, but will not prevent the sheets of paper from sliding loose.

[0053] FIGS. 14A, 14B, and 14C illustrate the front, back and side of a magnetic device 300 constructed according to a third embodiment of the present invention which comprises two discrete neodymium disc magnets 311 and 312 attached to a steel plate 310 and sandwiched between one thermoformed sheet of styrene 324 and one flat sheet of styrene 320. The flat sheet of styrene 320 possesses a cut-out user press point reference 302 which exposes the layer of steel 310 within. The magnets 311 and 312 sit in protruding bulges of the thermoformed sheet of styrene 224. FIG. 15 illustrates the assembly of the device 300. This embodiment of the present invention operates similarly to the device 100 described above.

[0054] FIGS. 16A and 16B illustrate the back and side views of the magnetic device 300 and further includes rubberized (i.e., TPS over-mold) contact points 330, 332 for improved non-slip grip. A rubber ring 334 is additionally wrapped around the perimeter of the magnetic device 300 to prevent the top edge from sliding when pressed during the clipping operation.

[0055] FIGS. 17A, 17B, 17C illustrate the back, side, and front views of a magnetic device 400 constructed according to a fourth embodiment of the present invention, which comprises two discrete neodymium disc magnets 411 and

412 sandwiched between one thermoformed sheet of styrene 424 and one flat sheet of styrene 420. The flat sheet of styrene 420 possesses a cut-out user press point reference 402. The magnets 411 and 412 sit in protruding bulges of the thermoformed sheet of styrene 424. FIG. 18 illustrates the assembly of the device 400. This, the third preferred embodiment of the present invention also operates similarly to the magnetic device 100 described above.

[0056] FIGS. 19A, 19B, 19C illustrate the back, side, and front views of a device 500 similar to the device 400, except that a bottom thermoformed sheet of styrene 424 is replaced by an injection molded piece of rubber 524. The top flat sheet of styrene 520 is made approximately 2 mm thick for purposes of rigidity. A cut-out in the flat top sheet of styrene 520 reveals the rubber bottom, providing a user press point reference 502. Instead of circular bulges, the embodiment of FIGS. 19A, 19B, and 19C has oblong bulges.

[0057] FIG. 20 shows another embodiment in which a rubber piece 624 is embedded in the top flat piece of styrene 620. The styrene material may be replaced with an alternative material such as, for example, ABS plastic or aluminum.

[0058] FIGS. 21A, 21B, and 21C illustrate the front, back and side of a magnetic device 700 constructed according to a further embodiment of the present invention, which comprises two discrete silicone rubber encapsulated ceramic disc magnets 711, 712 such as the Size: Dia 18.5×6.5 mm (Round in shape) offered by MAGNA CO., LTD, located at New State Manor 103, 2-23-1 Yoyogi Shibuya-ku, Tokyo 151-0053 JAPAN and a 6 mm thick sheet of acrylic 701. The magnets 711 and 712 are inserted and held in cavities 721, 722 defined in the sheet 701, e.g., by gluing. A circular etching 702' provides a user press point reference 702.

[0059] FIGS. 22A-22D show yet another embodiment of a magnetic device 800 which has a top surface 801 and three bottoms surfaces 803, 805, 807. The top surface 801 and bottom surface 803 are substantially parallel. FIG. 23A shows that magnets 811a and 811b are arranged in the device 800 in the area of the bottom surface 803. Surface 805 is arranged so that when a user exerts force at press point 802, the device 800 pivots about pivot axis 813 until surface 805 abuts the underlying surface. In this position the surface 803 is lifted from the underlying surface. Once the force is removed from the press point 802a, the magnets 811a and 812a compel the device to return. Similarly, surface 807 is arranged so that when a user exerts a force at press point 804, the device 800 pivots about a second pivot axis 815. Accordingly, device 800 exhibits dual edge independent clip actions. That is, the device 800 is independently pivotable about two separate edges of the surface 803 to produce two different clip actions.

[0060] Various different arrangements of magnets for the device 800 are shown in FIGS. 23B-23F.

[0061] In all of the embodiments described above, the neodymium disc magnets may be replaced with magnets made of samarium cobalt, ceramic, alnico or the like. The shape and material of the magnetic components may vary. The silicone rubber housing may be made of an alternative material.

[0062] Thus, while there have shown and described and pointed out fundamental novel features of the invention as applied to a preferred embodiment thereof, it will be under-

stood that various omissions and substitutions and changes in the form and details of the devices illustrated, and in their operation, may be made by those skilled in the art without departing from the spirit of the invention. For example, it is expressly intended that all combinations of those elements which perform substantially the same function in substantially the same way to achieve the same results are within the scope of the invention. Moreover, it should be recognized that structures and/or elements shown and/or described in connection with any disclosed form or embodiment of the invention may be incorporated in any other disclosed or described or suggested form or embodiment as a general matter of design choice. It is the intention, therefore, to be limited only as indicated by the scope of the claims appended hereto.

What is claimed is:

1. A magnetic device for magnetically adhering to a magnetically attractive surface, comprising:

a housing having a first end and a second end opposing said first end, a substantially flat front side and a rear side, wherein said rear side has a first surface proximate said first end and substantially parallel to said front side, and a second surface proximate said second end and inclined relative to said first surface such that said first and second surfaces meet at a first fulcrum;

at least one magnet arranged in said housing under an area defined by said first surface and arranged at a distance from said first fulcrum, wherein

said at least one magnet is arranged and dimensioned for maintaining said housing at a first position on the magnetically attractive surface in which said first surface is held against the magnetically attractive surface by magnetic attraction between said at least one magnet and the magnetically attractive surface, and said housing being pivotable from said first position to a second position about a first pivoting axis defined by said first fulcrum in response to a digitally applied force on said front side in an area opposing said second surface, said first surface being pivoted away from the magnetically attractive surface in the second position, wherein a magnetic attraction between said at least one magnet and the magnetically attractive surface causes said housing to pivot back to said first position when the digitally applied force is removed, whereby said first surface and the magnetically attractive surface define jaws of a normally closed clip.

2. The magnetic device of claim 1, wherein said housing defines an indentation in said first surface on said rear side which divides said first surface into two discrete areas, said indentation forming a stop when the housing is in said second position, such that an object inserted into the space between said first surface and the magnetically attractive surface is prevented from being inserted past said indentation.

3. The magnetic device of claim 2, wherein said at least one magnet comprises first and second magnets, said first magnet being arranged under an area defined by said first part of said first surface and said second magnet being arranged under an area defined by said second part of said first surface.

4. The magnetic device of claim 3, wherein said first part of said first surface is arranged distally from said first

pivoting axis and said second surface is arranged proximate said first pivoting axis, wherein the object inserted between said magnetic device and said magnetically attractive surface is held onto the magnetically attractive surface solely by said second magnet and said magnetic device is held onto the magnetically attractive surface by said first magnet in the first position.

5. The magnetic device of claim 1, further comprising a rigid plate having first and second opposing sides arranged in said housing, said at least one magnet being arranged on one side of first and second opposing sides of said rigid plate.

6. The magnetic device of claim 5, wherein said housing comprises silicone rubber molded over said rigid plate and said at least one magnet.

7. The magnetic device of claim 5, wherein said housing comprises a first layer of material arranged on said front side and a second layer of material arranged on said rear side, said rigid plate and said at least one magnet being sandwiched between said first and second layers.

8. The magnetic device of claim 7, wherein said first layer comprises a flat sheet of styrene and said second layer comprises thermoformed sheet of styrene having at least one bulge in which said at least one magnet is respectively accommodated.

9. The magnetic device of claim 5, wherein said rigid plate comprises a magnetically attractive material.

10. The magnetic device of claim 1, wherein said housing comprises silicone rubber molded over said at least one magnet.

11. The magnetic device of claim 1, wherein said second surface has a width that increases from the fulcrum toward said second end.

12. The magnetic device of claim 11, wherein said first surface has a width that is smaller than a width of said housing and is arranged centrally relative to a central longitudinal axis of said housing.

13. The magnetic device of claim 12, wherein the widths of said first and second surfaces at said fulcrum are substantially equal.

14. The magnetic device of claim 1, wherein said housing comprises a first layer of material arranged on said front side and a second layer of material arranged on said rear side, said at least one magnet being sandwiched between said first and second layers.

15. The magnetic device of claim 14, wherein said first layer comprises a flat sheet of styrene and said second layer comprises thermoformed sheet of styrene having at least one bulge in which said at least one magnet is respectively accommodated.

16. The magnetic device of claim 14, wherein at least said first surface comprises a rubberized coating.

17. The magnetic device of claim 16, wherein said second surface includes a rubberized coating.

18. The magnetic device of claim 16, wherein a perimeter of said housing comprises a rubberized coating.

19. The magnetic device of claim 14, wherein said first layer comprises a flat sheet of styrene and said second layer comprises an injection-molded piece of rubber having at least one bulge in which said at least one magnet is respectively accommodated.

20. The magnetic device of claim 19, wherein said second layer is embedded in said first layer.

21. The magnetic device of claim 1, wherein said at least one magnet comprises first and second magnets, said first magnet being arranged distally from said first pivoting axis and said second magnet is arranged proximate said first pivoting axis.

22. The magnetic device of claim 21, wherein said housing comprises a single layer of material having two cavities for receiving said first and second magnets, wherein said first and second magnets protrude from said cavities.

23. The magnetic device of claim 22, wherein said first and second magnets are rubber encapsulated magnets.

24. The magnetic device of claim 2, further comprising a string, rope, or wire ring extending through said indentation.

25. The magnetic device of claim 1, further comprising a third surface on said rear side inclined relative said first surface such that said first and third surfaces meet at a second fulcrum, said housing being pivotable from said first position to a third position about a second pivoting axis defined by said second fulcrum in response to a digitally applied force on said front side in an area opposing said third surface, said first surface being pivoted away from the magnetically attractive surface in the third position, wherein a magnetic attraction between said at least one magnet and the magnetically attractive surface causes said housing to pivot back to said first position when the digitally applied force opposing said third surface is removed, whereby said first and second surfaces produce a first clipping action and

said first and third surfaces produce a second clipping action, separate from said first clipping action.

26. The magnetic device of claim 25, wherein said at least one magnet comprises first and second magnets.

27. The magnetic device of claim 26, wherein said first magnet is proximate said first pivoting axis and said second magnet is arranged distally from said first pivoting axis.

28. The magnetic device of claim 27, wherein said first magnet is proximate said second pivoting axis and said second magnet is arranged distally from said second pivoting axis.

29. The magnetic device of claim 27, wherein said first magnet is distally from said second pivoting axis and said second magnet is arranged proximate said second pivoting axis.

30. The magnetic device of claim 26, wherein said first magnet is proximate said second pivoting axis and said second magnet is arranged distally from said second pivoting axis.

31. The magnetic device of claim 25, wherein said substantially flat front side has a rectangular shape defined by first opposing edges and second opposing edges of said front side, said first pivoting axis being substantially parallel to said first opposing edges and said second pivoting axis being substantially parallel to said second opposing edges.

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