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(54) **INJECTION MOLDED DVD CASE HAVING AT LEAST ONE RECESS ON AN OUTER SURFACE FOR THE INSTALLATION OF A DECORATIVE INSERT**

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(57) **ABSTRACT**

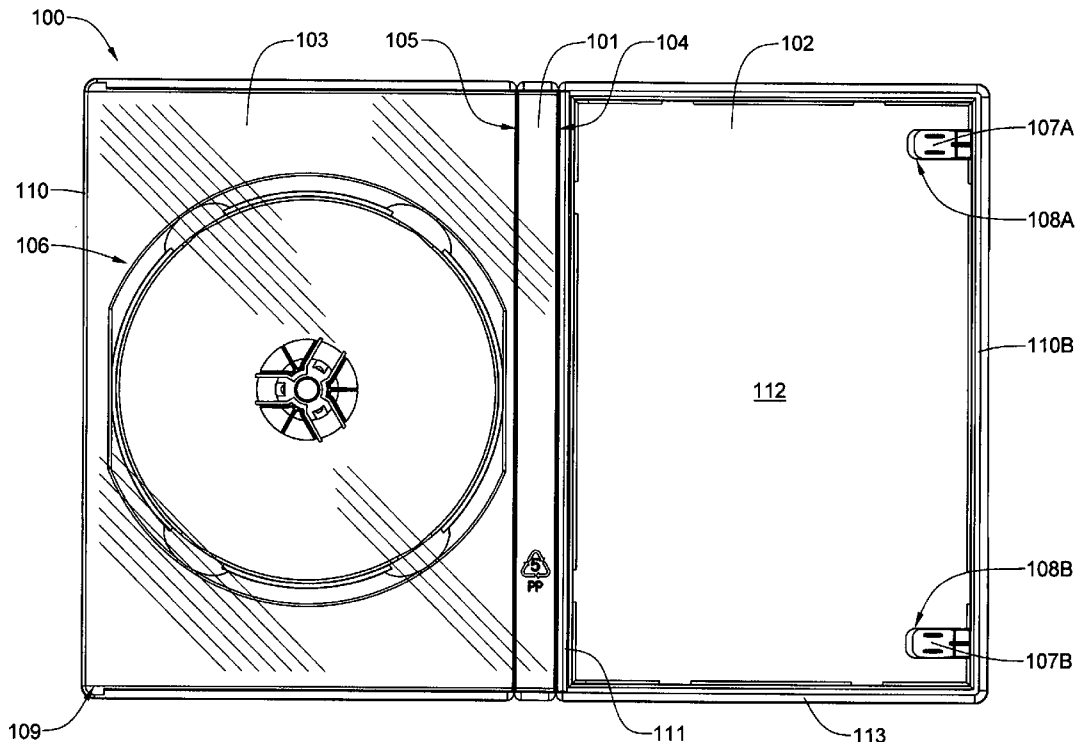
A one-piece, standard thickness, injection molded DVD case has at least one recess on an outer surface for the installation of a decorative insert. For one preferred embodiment, the recess is coextensive with the front cover, with the exception of a narrow perimetric border. The decorative insert may be formed from vacuum-formed polymeric material, molded plastic, or stamped from sheet metal having a thickness in a range of about 0.005 to 0.01 inch (0.127 to 0.254 millimeters). Optimum thickness for the preferred embodiments disclosed herein is deemed to be about 0.0075 inch (about 0.2 millimeters). The decorative insert may include graphic images and text in relief, which may be painted for further affect. For another preferred embodiment, the recess on the front cover may cover only a portion of the available area. On the back cover, similar recesses may be formed above and below the disk storage region.

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(60) Provisional application No. 60/635,329, filed on Dec. 13, 2004.



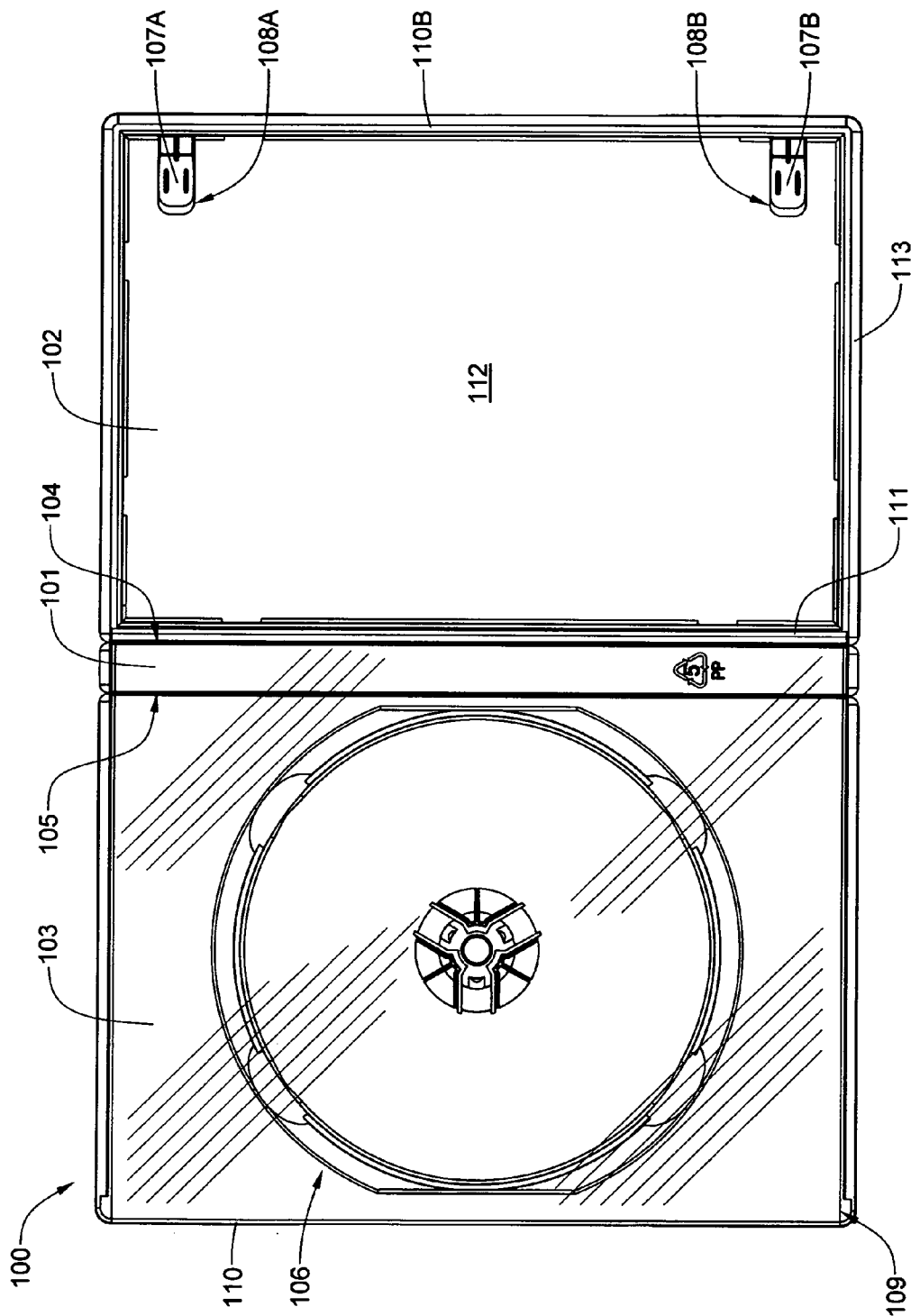


FIG. 1

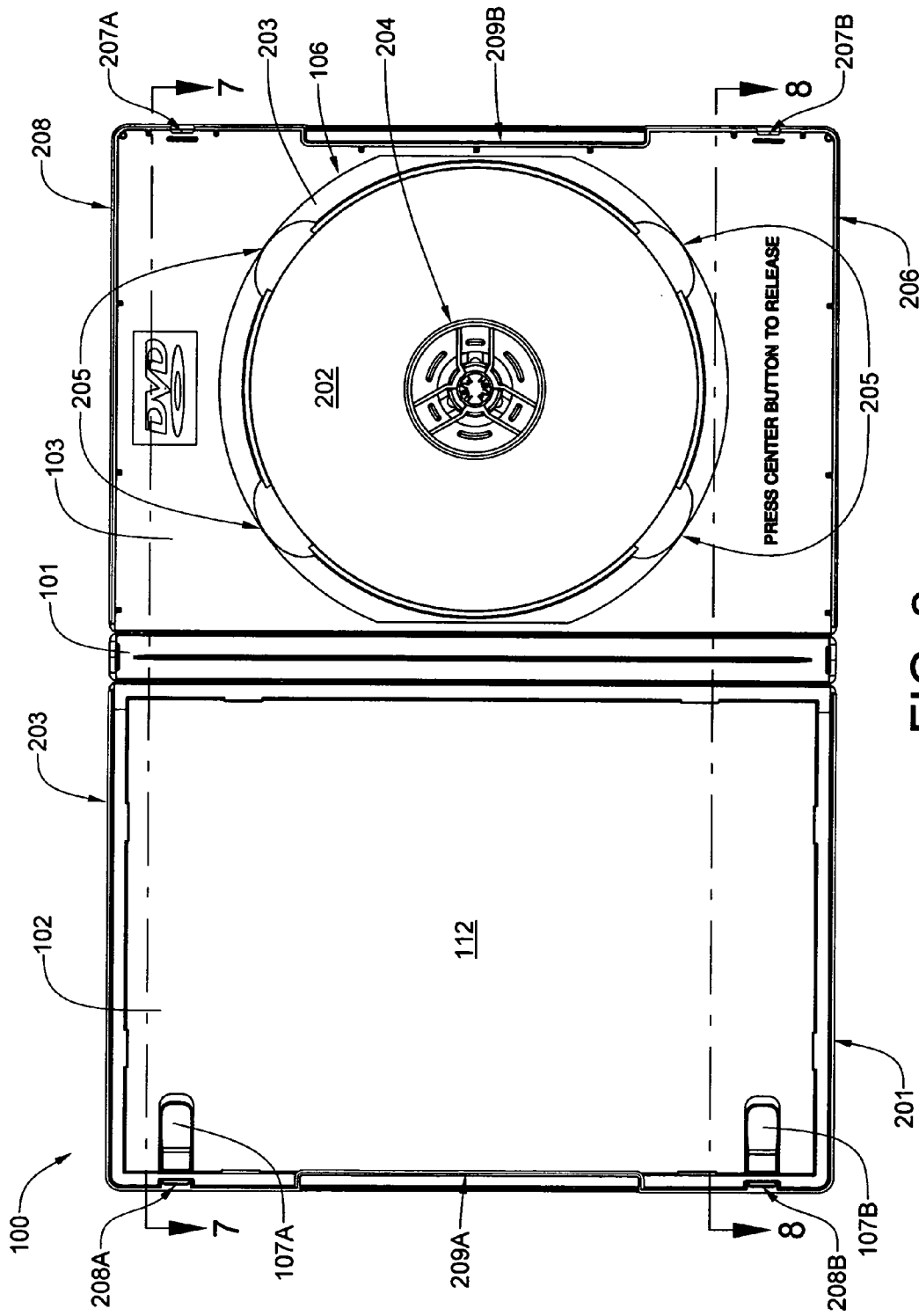


FIG. 2

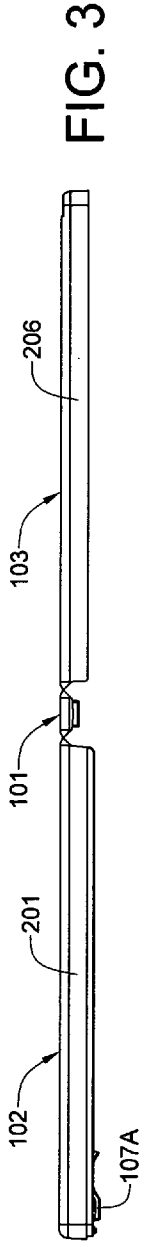


FIG. 3

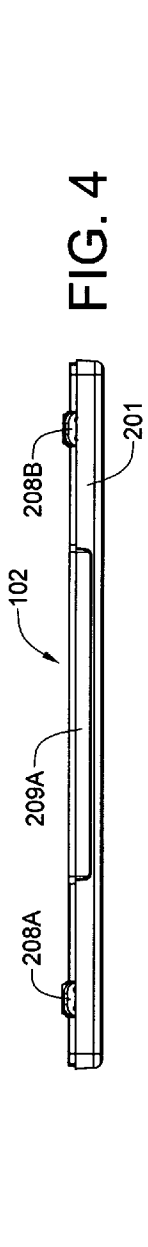


FIG. 4

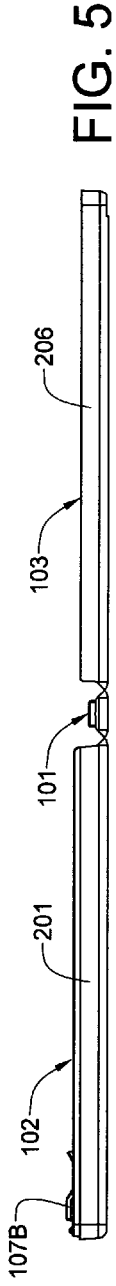


FIG. 5

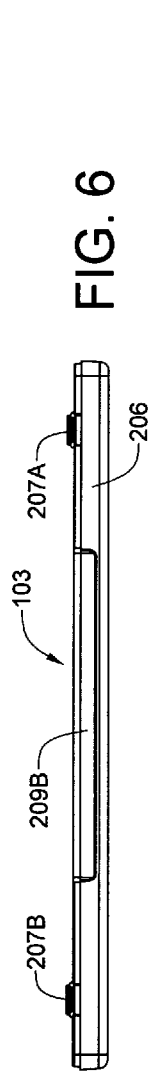


FIG. 6

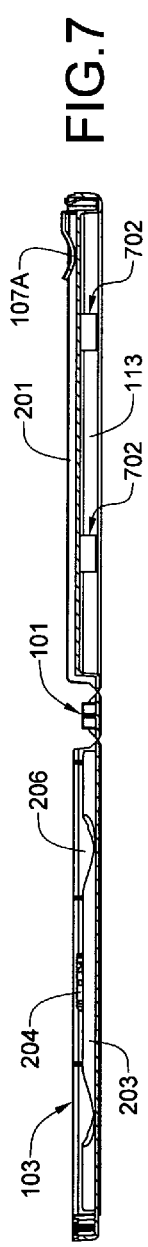


FIG. 7

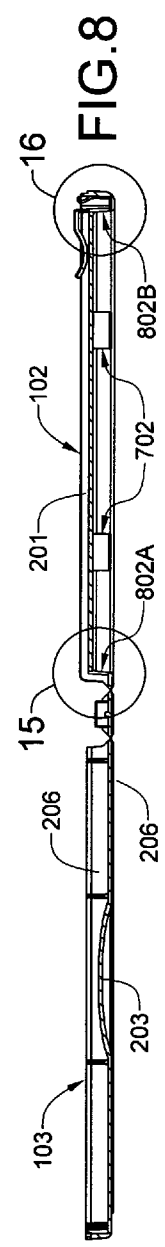


FIG. 8

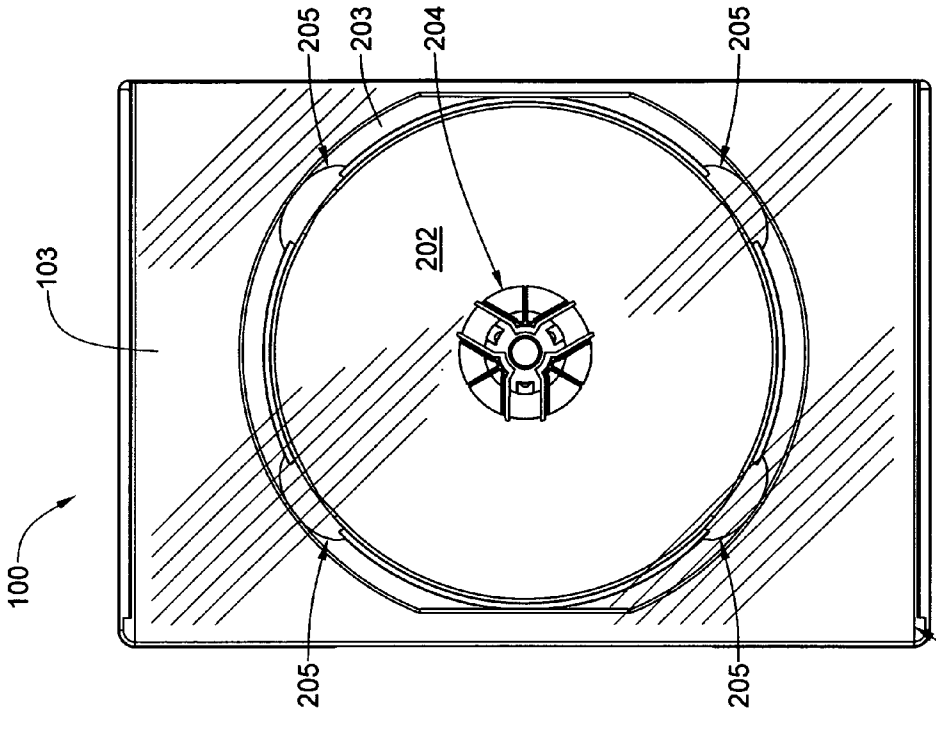


FIG. 10

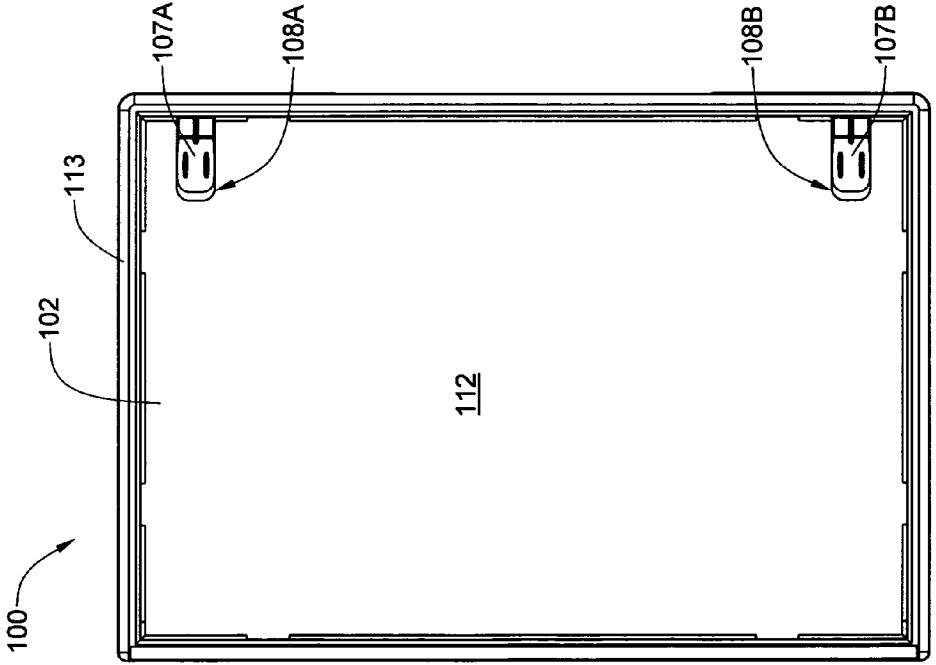


FIG. 9

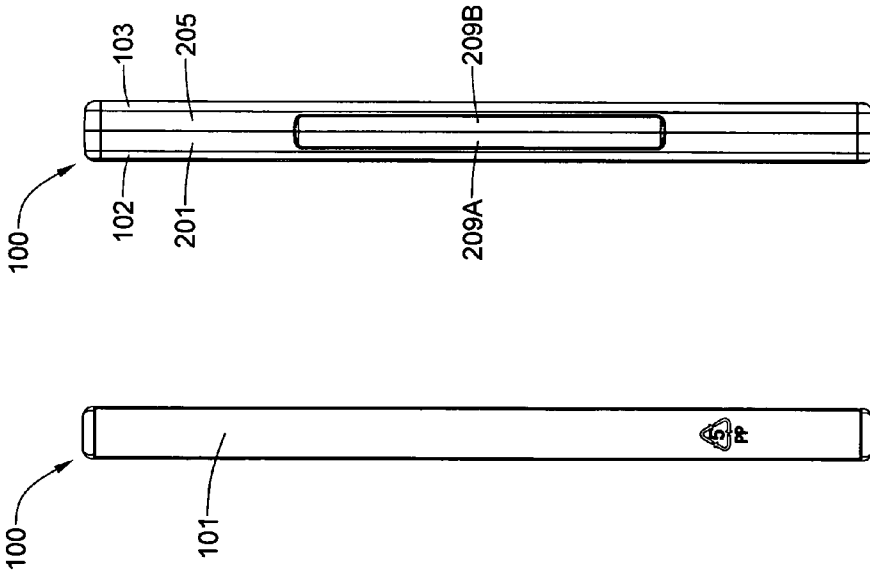


FIG. 11 FIG. 12

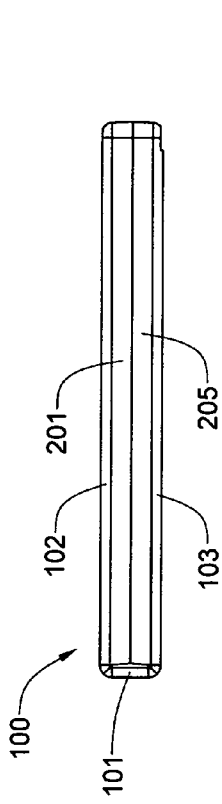


FIG. 13

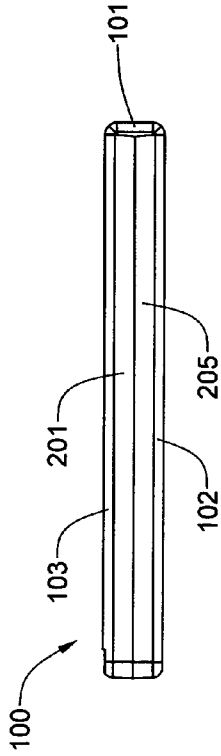


FIG. 14

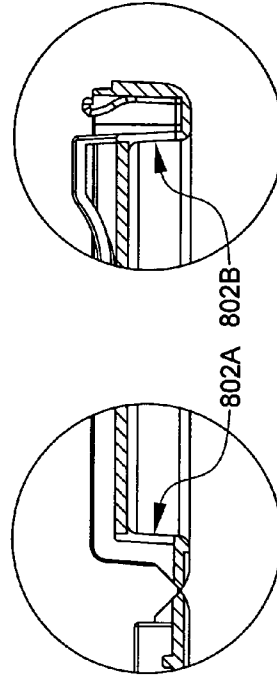


FIG. 15 FIG. 16

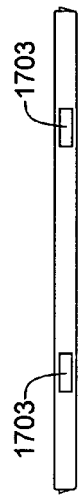
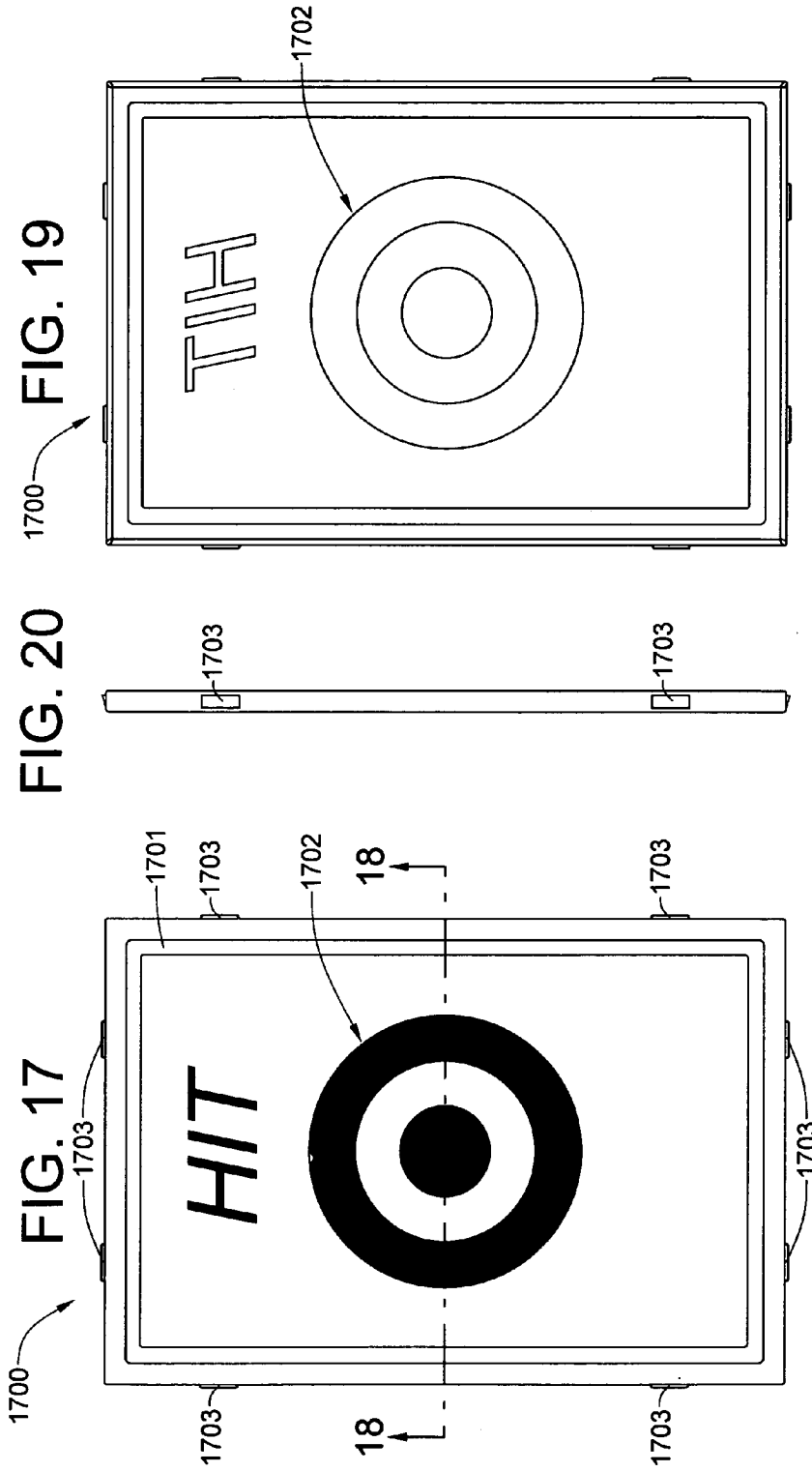


FIG. 21

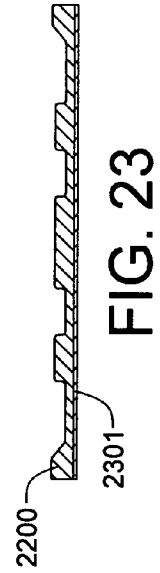
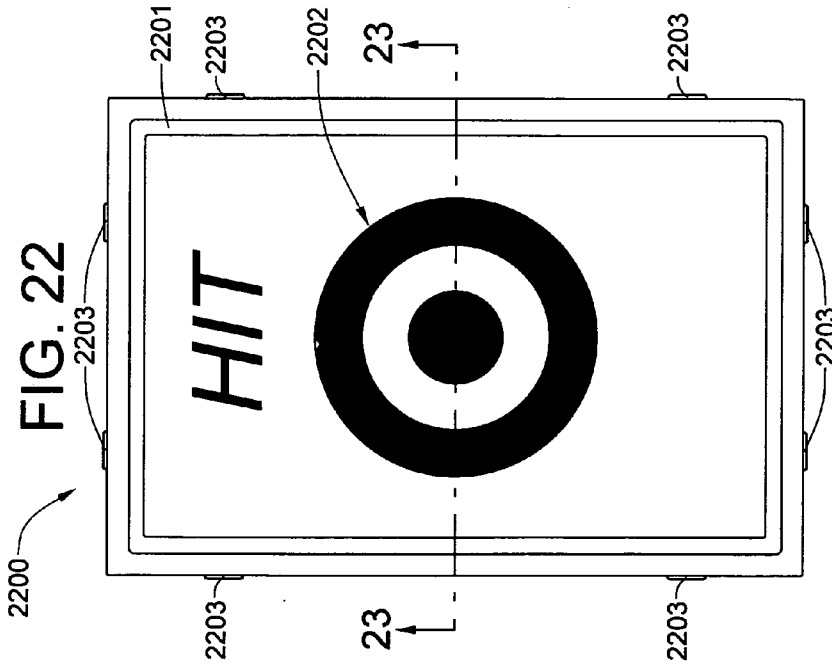
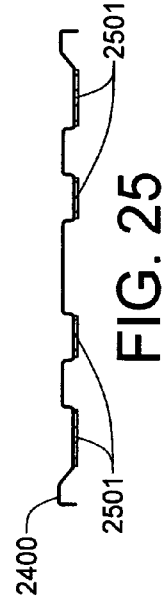
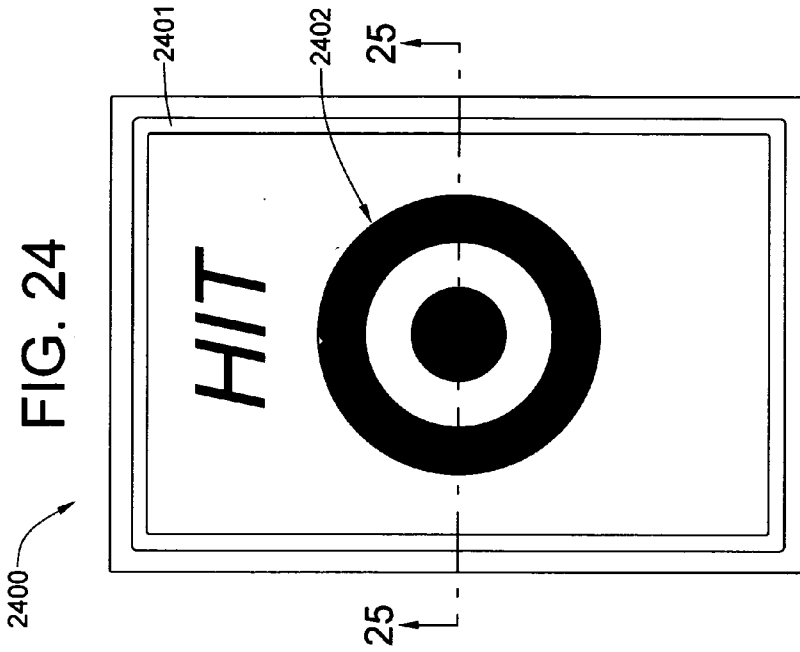
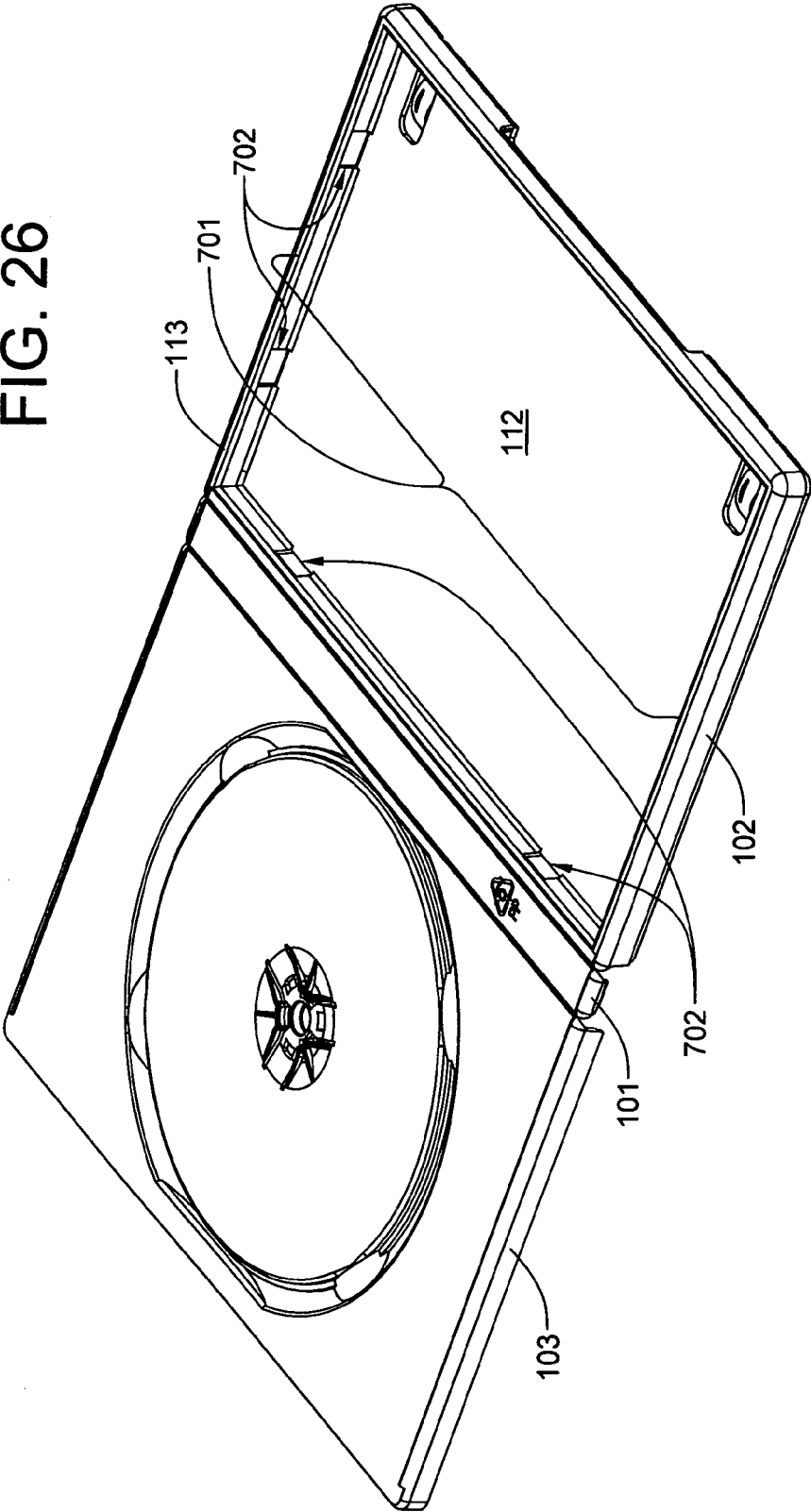


FIG. 26



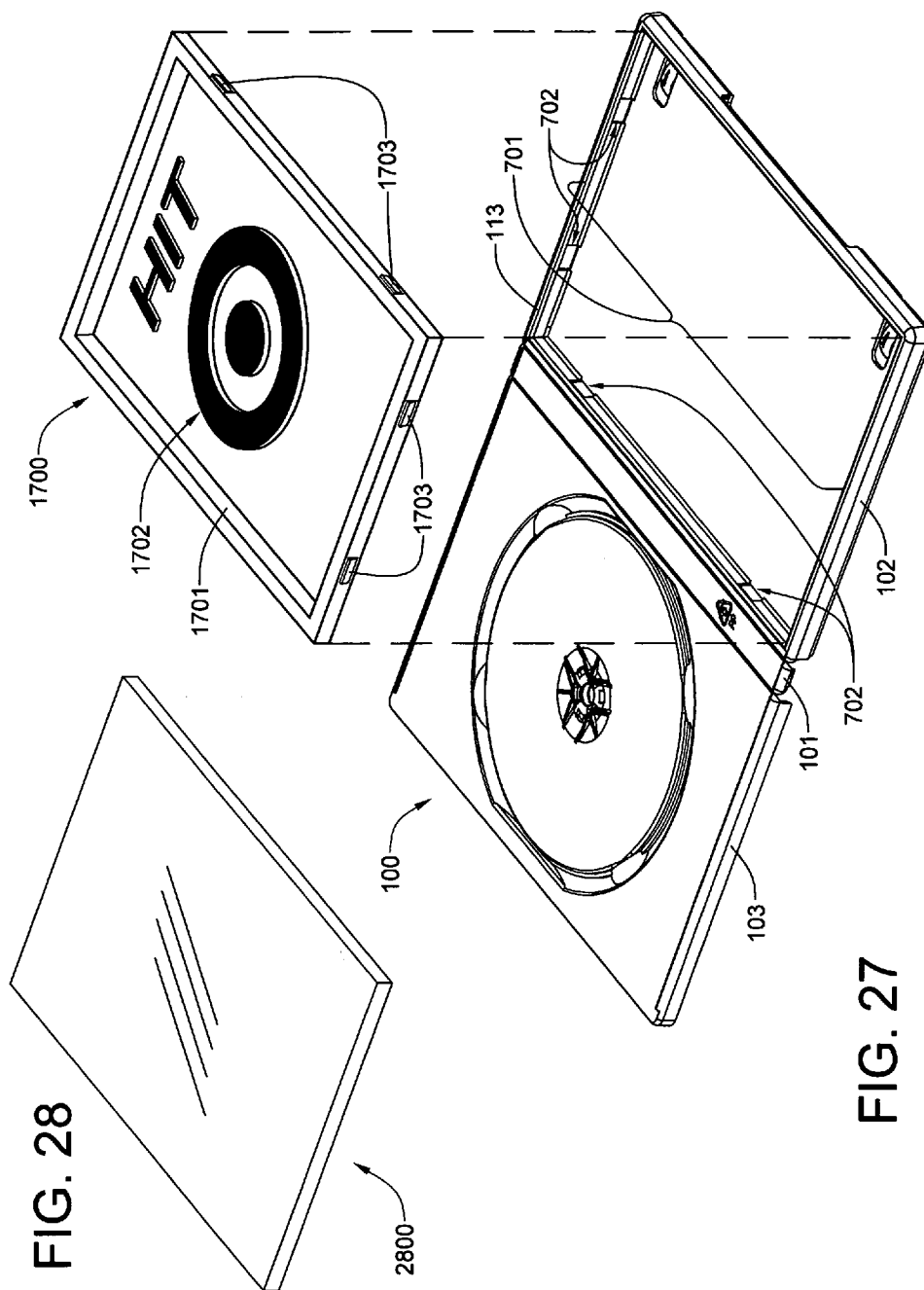


FIG. 28

FIG. 27

INJECTION MOLDED DVD CASE HAVING AT LEAST ONE RECESS ON AN OUTER SURFACE FOR THE INSTALLATION OF A DECORATIVE INSERT

[0001] This application has a priority date based on Provisional Patent Application No. 60/635,329, which has a filing date of Dec. 13, 2004, and is titled Media Carrier, Transport and Storage Device, with Interchangeable Customizable Outside Surface or Lid.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The invention relates generally to protective cases for packaging and storing optical information storage disks, such as CDs and DVDs and, more particularly to injection molded, one-piece protective cases.

[0004] 2. History of the Prior Art

[0005] In recent times, most recorded music is purchased by the consumer either on a cassette tape or a compact disc. Cassettes tapes and compact discs have supplanted vinyl records and 8-track tapes as the dominant forms of recorded music. Along with the growth of compact discs, numerous storage containers have been developed to hold the discs during shipping, display for sale, and subsequent home storage of the discs. A disc may spend over 99% of its life stored in one such storage container because the same storage container is typically used to ship the disc, to display the disc, and to store the disc at the home of the consumer. Most of the storage containers known in the art hold the compact disc on a hub that engages the center hole of the disc to hold the disc in place in the storage container.

[0006] Digital video discs (DVDs) have recently been developed and are expected to grow as more consumers are exposed to the benefits of a digital video picture combined with a digital audio track on a single DVD. DVDs also have a larger storage capacity than a compact disc and may be used to hold feature length films as well as multiple music recordings. It is likely that DVDs may also be used to hold data in computer readable forms. One problem with DVDs is that they currently trade durability for their increased storage capacity. It is believed that a DVD may be damaged over time by the forces that are commonly created in a compact disc storage container. These forces are the outwardly directed forces created by the hub that typically radially engages the interior wall that forms the center hole in a disc. Compact discs are durable enough to be insensitive to this force but it is believed that a DVD will eventually warp as a result of these constant radial forces. Such warping can prevent the data on a DVD from being correctly read by a DVD player.

[0007] In view of the perceived problems with the constant bending forces, the industry has moved in the direction of requiring all DVD storage containers to loosely retain the DVD such that it may freely rotate while securely retained by the storage container. The storage container thus must retain the DVD in a manner that allows it to freely rotate while also securely holding the DVD during a standard drop test. It is thus desired in the art to provide a storage container for a DVD that holds the DVD without creating constant bending stresses in the DVD while securely retaining the DVD to prevent it from coming loose.

[0008] Standard one-piece injection molded DVD cases include a spine, a front cover coupled to the spine with a first living hinge, a rear cover coupled to the spine via a second living hinge, disk retention on the inside surface of the rear cover, and a pair of clips on the inside surface of the front cover for holding a paper booklet. In addition, a flexible sleeve is often heat sealed to the outer cover surfaces so that a paper title and credits insert may be slipped beneath it and cover the front and back outer surfaces while wrapping around the spine. The cases, themselves, are essentially generic, with only the title page and credits insert providing any measure of distinctiveness. What is needed, therefore, is a new one-piece injection molded DVD case that presents a distinctive, even elegant, appearance to the consumer.

SUMMARY OF THE INVENTION

[0009] A one-piece, injection molded case for optical data storage disks, such as DVDs, DVD-ROMs, CDs, and CD-ROMs, has at least one recess on an outer surface for the installation of a decorative insert. For a preferred embodiment of the invention, the DVD case is injection molded from a polyolefin such as polyethylene or polypropylene. The storage case includes a spine, a front cover coupled to said spine via a first living hinge, and a rear cover coupled to said spine via a second living hinge. The front and rear covers close together to form a generally enclosed chamber in which at least one optical data storage disk may be stored. The storage case also includes at least one recess inset into an exterior surface of at least one of said covers and a decorative insert for installing within each recess.

[0010] For one preferred embodiment, the recess is of generally uniform depth and coextensive with the front cover, with the exception of a narrow perimetric border. The decorative insert may be formed from vacuum-formed polymeric material, molded plastic, reflective plastic or metal laminates which have been cut to size, wood panels, textile-covered panels, tooled or embossed leather, cast metal, or stamped from sheet metal having a thickness in a range of about 0.005 to 0.01 inch (0.127 to 0.254 millimeters). Optimum thickness for the preferred embodiments disclosed herein is deemed to be about 0.0075 inch (about 0.2 millimeters). The decorative insert may include graphic images and/or text in relief, and the exposed surface of the insert may be painted or printed to enhance its aesthetic appearance. For prototype cases made in accordance with the present invention, offset lithography has been used successfully to apply graphic images to sheet metal prior to the insert stamping and forming process. For another preferred embodiment, the recess on the front cover may cover only a portion of the available area. On the back cover, similar recesses may be formed above and below the disk storage region. Additionally, one or more recesses may be formed on the outer surface of the spine. Stamped sheet metal and injection molded plastic inserts may incorporate hooks on the side edges thereof. The hooks may be formed during the stamping of the sheet metal or during the injection molding of the insert. The hooks mate with hook receptacles formed during the injection molding process in the side walls of the recess and, thereby, retain the insert within the recess. Alternatively, an insert may be adhesively bonded to the DVD case within the recess.

BRIEF DESCRIPTION OF THE DRAWING

[0011] **FIG. 1** is a plan view of the outer major surfaces of the open one-piece decorative DVD case having a recess incorporated into the outer surface of the front cover;

[0012] **FIG. 2** is a plan view of the inner major surfaces of the open one-piece decorative DVD case of **FIG. 1**;

[0013] **FIG. 3** is an elevational view of the top edge of the open one-piece decorative DVD case;

[0014] **FIG. 4** is an elevational view of the open one-piece decorative DVD case, as seen from the closure edge of the rear cover closure;

[0015] **FIG. 5** is an elevational view of the open one-piece decorative DVD case, as seen from the closure edge of the front cover;

[0016] **FIG. 6** is an elevational view of the bottom edge of the open one-piece decorative DVD case;

[0017] **FIG. 7** is a cross-sectional view of the open one-piece decorative DVD case, than through section line 7-7 of **FIG. 2**;

[0018] **FIG. 8** is a cross-sectional view of the open one-piece decorative DVD case, taken through section line 8-8 of **FIG. 2**;

[0019] **FIG. 9** is a plan view of the closed one-piece decorative DVD case, looking down at the front cover;

[0020] **FIG. 10** is a plan view of the closed one-piece decorative DVD case, looking down at the rear cover;

[0021] **FIG. 11** is an elevational view of the spine of the closed one-piece decorative DVD case;

[0022] **FIG. 12** is an elevational view of the closure edges of the closed one-piece decorative DVD case;

[0023] **FIG. 13** is an elevational view of the top edge of the closed one-piece decorative DVD case;

[0024] **FIG. 14** is an elevational view of the bottom of the closed one-piece decorative DVD case;

[0025] **FIG. 15** is an enlarged view of the encircled region 15 of **FIG. 8**;

[0026] **FIG. 16** is an enlarged view of the encircled region 16 of **FIG. 8**;

[0027] **FIG. 17** is a top plan view of a stamped sheet metal insert;

[0028] **FIG. 18** is a thin-slice view of the stamped sheet metal insert of **FIG. 17**, taken through section line 18 -18 of **FIG. 17**;

[0029] **FIG. 19** is a bottom plan view of the stamped sheet metal insert of **FIG. 17**;

[0030] **FIG. 20** is a right-side elevational view of the stamped sheet metal insert of **FIG. 17**, the left-side elevational view thereof being a mirror image of **FIG. 20**;

[0031] **FIG. 21** is a bottom-edge elevational view of the stamped sheet metal insert of **FIG. 17**, the top-edge elevational view thereof being a mirror image of **FIG. 21**;

[0032] **FIG. 22** is a top plan view of an insert that has been injection molded, carved, cast;

[0033] **FIG. 23** is a thin-slice view of the injection molded insert of **FIG. 22**, taken through section line 23-23;

[0034] **FIG. 24** is a top plan view of a vacuum-formed laminar insert;

[0035] **FIG. 25** is a thin-slice view of the vacuum-formed laminar insert of **FIG. 24**, taken through section line 25-25;

[0036] **FIG. 26** is an isometric view of the open, downward-facing one-piece decorative DVD case in an open configuration;

[0037] **FIG. 27** is an isometric view of the open, downward-facing one-piece decorative DVD case of **FIG. 26** and of a stamped metal insert that is ready for installation within the front cover recess of the case; and

[0038] **FIG. 28** is an isometric view of an alternative insert made of generally a planar, laminar material that has been trimmed to fit the recess.

DETAILED DISCLOSURE OF THE INVENTION

[0039] The present invention is a one-piece, injection-molded case for packaging and storing optical digital information storage disks, such as digital video disks (DVDs), compact disks (CDs) and/or data storage versions of each. Patterned loosely after a conventional case for digital video discs (DVDs), it is of clamshell design, having a spine connected to both a front cover and a rear cover via a pair of "living" or "live" hinges. A living hinge is a thin flexible web of material that joins two rigid or semi-rigid bodies together. The DVD case is preferably made of a medium-density polyolefin, such as polypropylene or polyethylene, as both of these materials have excellent flexural qualities that permit a living hinge to be flexed thousands of times without breaking. If the hinge is not expected to last forever, other polymeric compounds, such as nylon and acetal may be used. The present invention differs markedly from a conventional DVD case in that at least one recess is incorporated into the surface of the front and/or back covers. A decorative insert is installed within the recess. Many types of decorative inserts may be used. For example, the decorative insert may be formed from polymeric materials, wood, metal, leather, paper, textiles, composite materials, or a combination of the foregoing. Polymeric materials may be vacuum formed, cast or injection molded. Wood panels may be hand-carved, machine-carved, or laser-etched. Metal inserts may be formed by casting, sheet metal stamping, and/or by the trimming of planar sheets to fit the recess. Leather inserts may be tooled, embossed or laser etched. The new decorative DVD case will now be described in detail with reference to the attached drawing figures.

[0040] Referring now to **FIG. 1**, the new decorative DVD case **100** has a spine **101**, a generally rectangular front cover **102** and a generally rectangular rear cover **103**. A first living hinge **104** interconnects the spine **101** with the front cover **102**, and a second living hinge **105** interconnects the spine **101** with the rear cover **103**. The rear cover **103** incorporates a circular disk storage station **106**, the outlines of which can be seen on the outer surface of the rear cover **103**. A pair of internal clips **107A** and **107B**, which can be used to secure a paper booklet (not shown) inside the front cover **102** of the

case **100**, can be seen through apertures **108A** and **109B** in the front cover **102** that were required by the molding process. An optional sleeve **109**, made of transparent flexible plastic material may be heat bonded to the outer edge **110** of the rear cover **103** and the inner edge **111** of the front cover. A title and credits paper or plastic insert (not shown) may be inserted within the sleeve in a conventional manner. The primary difference between this decorative DVD case **100** and conventional DVD cases is that the front cover **102** incorporates a recessed generally laminar front panel **112** that is surrounded by a narrow border **113** having generally the same height as the front cover of a conventional DVD case.

[0041] Referring now to **FIG. 2**, the features within the interior of the decorative DVD case **100** are readily visible. The inner surface of the recessed front panel **112** of the front cover **102** is fully visible in this view. The front cover **102** also includes a front half-height closure wall **201** that is generally perpendicular to said laminar front panel **112**, and continuous with the narrow border **113**. The tops of the internal clips **107A** and **107B** can also be seen in this view. The rear cover **103** also includes a generally laminar rear panel **202** into which is molded the disk storage station **106**. The disk storage station **106** has an elevated disk support ring **203**, which supports the outer edge of a stored DVD. The disk storage station **106** also includes a disk securing hub **204** in the center of the elevated disk support ring **203**, which releaseably secures a stored DVD by the edges of its central aperture. Finger cutouts **205** in the elevated ring allow the owner of the DVD to grasp the edges thereof and remove it from the case. The rear cover **103** also has a rear, half-height closure wall **206** that is generally perpendicular to said laminar rear panel **202**, and continuous therewith. The rear cover **103** has a pair of male case latches **207A** and **207B**, while the front cover **102** has a pair of female case latches **208A** and **208B**. Each male case latch snaps into its mating female case latch. It will be noted that the front cover **102** has a first access recess **209A**, while the rear cover **103** has a second access recess **209B**. When the case **100** is closed, the owner of the DVD can insert the tips of his fingers into these recesses **209A** and **209B** and unsnap the front cover **102** from the rear cover **103** in order to access the DVD.

[0042] Referring now to **FIGS. 3, 4, 5, and 6**, the open decorative DVD case **100** is seen in a variety of elevational views. Item numbers for various features correspond with those of **FIGS. 1 and 2**.

[0043] Referring now to the cross-sectional view of **FIG. 7**, the profile of the front cover recess **701** within the front cover that is formed by the recessed generally laminar front panel **112** and the surrounding narrow border **113** is clearly visible, as are a pair of lower hook receptacles **702** which are useful for securing an insert within the front cover recess **701**. The profile of the clips **107A** and **107B** and of the disk storage station **203** are also evident in this view.

[0044] Referring now to **FIG. 8**, this view differs from that of **FIG. 7** in that only the outer edge **801** of the elevated disk support ring **204** is visible. In addition, the cross section of this view passes through a pair of side hook receptacles **802A** and **802B**, which are more readily apparent in the enlarged views of **FIGS. 15 and 16**.

[0045] Referring now to **FIG. 9**, it will be noted that when the decorative DVD case **100** is closed, the spine **101** fits

neatly into the front cover **102**. The pair of internal clips **107A** and **107B** are visible in this view through apertures **108A** and **108B**, respectively. The front cover recess **701**, formed by the recessed generally laminar front panel **112** and the surrounding narrow border **113**, is seen from above in this view.

[0046] Referring now to **FIG. 10**, the closed decorative DVD case **100** is seen from the rear. As with the front cover, the spine **101** fits neatly into the rear cover **103**. The outer surface generally laminar rear panel **202** is visible in this view, as are the lower, or exterior surfaces of the disk storage station **106**, which includes the elevated disk support ring **203** and the disk securing hub **204**. The transparent sleeve **109** is also visible in this view.

[0047] Referring now to **FIGS. 11 to 14**, these elevational views of the closed decorative DVD case show features that have heretofore been described.

[0048] Referring now to **FIG. 15 and 16**, the circled areas of **FIG. 8** have been enlarged to show details of the sectioned figures.

[0049] Referring now to **FIG. 17**, a stamped sheet metal insert **1700** is sized for installation within the front cover recess **701**. A beveled border **1701** and a simple relief design **1702** have been stamped in the insert **1700**. It should be understood that the simple target design is shown merely for illustrative purposes. For a preferred embodiment of the invention, the sheet metal may be painted or printed using a lithographic offset process or other similar painting or printing process prior to stamping and forming of the insert **1700**. Eight hooks **1703**, which have been stamped into the sidewalls of the insert **1700** are visible in this view. The hooks **1703** engage hook receptacles **702** which are molded in the decorative DVD case **100** and retain the insert **1700** within the front cover recess **701**.

[0050] Referring now to **FIG. 18**, this thin-slice view of the stamped sheet metal insert **1700** clearly shows the profile of thereof. It will be noted that the insert **1700** has sidewalls **1801** that terminate in a rolled lower edge **1802**. The hooks **1703** (not shown in this thin-slice view) are stamped into the sidewalls **1801**.

[0051] Referring now to **FIG. 19**, the underside of the stamped sheet metal insert **1700** is visible. The relief nature of the stamping is also visible from the underside, as the relief of the word "HIT" and of the target design **1702** have transferred through the sheet metal.

[0052] Referring now to **FIGS. 20 and 21**, these side and bottom views, respectively, of the stamped sheet metal insert **1700** show pairs of the hooks **1703**.

[0053] Referring now to **FIG. 22** an injection molded insert **2200** is sized for installation within the front cover recess **701**. A beveled border **2201** and a simple relief target design **2202** have been molded in the insert **2200**. For a preferred embodiment of the invention, the injection molded insert may be painted or printed using a lithographic offset process or other similar painting or printing process after the molding process. The insert may be formed from polystyrene, polyurethane, or other similar compounds to which ink or paint readily adheres. Eight hooks **2203**, which have been molded into the sidewalls of the insert **2200** are visible in this view. The hooks **2203** engage hook receptacles **702** which are molded in the decorative DVD case **100** and retain the insert **2200** within the front cover recess **701**. Alternatively, as shown in **FIG. 23**, the injection-molded insert

2200 may be adhesively bonded to the decorative DVD case **100**. This thin-slice view is also representative of any insert made of solid material, whether it be an injection-molded or cast polymeric material, cast metal, wood, fiberboard, or any other material capable of being formed in relief.

[**0054**] Referring now to **FIG. 23**, this thin-slice view of the injection-molded insert **2200** clearly shows that this item is not a laminar product, but rather an item of varied thickness over its area. An adhesive layer **2301** provides an alternative method for securing the injection-molded insert **2200** within the front cover recess **701**. Referring now to **FIG. 24**, a vacuum formed laminar polymeric insert **2400** is sized for installation within the front cover recess **701**. A beveled border **2401** and a simple relief target design **2402** have been formed in the insert **2400**. For a preferred embodiment of the invention, the injection molded insert may be painted or printed using a lithographic offset process prior to vacuum forming or spray painted subsequent to the forming process. The insert may be formed from polyvinylchloride, polystyrene, polyurethane, or other similar compounds.

[**0055**] Referring now to **FIG. 25**, this thin-slice view of the vacuum-formed insert **2400** clearly shows that the laminar nature of this item. An adhesive layer **2501**, applied to the bottom-most portions of the insert **2400**, enable the vacuum-formed insert **2400** to be adhesively bonded within the front cover recess **701**.

[**0056**] Referring now to **FIG. 26**, this view of the one-piece decorative DVD case **100** in an open configuration clearly shows the front cover recess **701** that is formed by the recessed generally laminar front panel **112** and the surrounding narrow border **113**, as well as four of the hook receptacles **702** which are useful for securing an insert within the front cover recess **701**.

[**0057**] Referring now to **FIG. 27**, this view shows a stamped sheet metal insert **1700** positioned above the one-piece decorative DVD case **100**, ready for installation within the front cover recess **701**. Four of the eight hooks **1703** on the sheet metal insert **1700** are visible, as is the in-relief target design **1702**.

[**0058**] Referring now to **FIG. 28**, an alternative insert **2801** made of generally a planar, laminar material that has been trimmed to fit the recess **701**. The laminar material may be polished or brushed sheet metal, cardboard that has been covered with a textile layer, wood, or polymeric compounds to which a reflective coating has been applied.

[**0059**] Although only several embodiments of the present invention has been disclosed herein, it will be obvious to those having ordinary skill in the art that changes and modifications may be made thereto without departing from the scope and spirit of the invention as hereinafter may be claimed.

What is claimed is:

1. A case for packaging and storing an optical digital information storage disk, said case comprising:

- a one-piece, injection-molded main body including:
 - a spine;
 - a front cover coupled to said spine via a first living hinge;
 - a rear cover coupled to said spine via a second living hinge;

at least one recess inset into an exterior surface of at least one of said covers; and

a decorative insert for installing within each recess.

2. The case of claim 1, wherein said decorative insert is made of a material selected from the group consisting of metal, polymeric compounds, wood, paper, leather, textiles, fiberboard and combinations thereof.

3. The case of claim 2, wherein said decorative insert includes multi-color artwork.

4. The case of claim 2, wherein said decorative insert is formed from sheet metal stamped in relief to which artwork is applied prior to the relief stamping.

5. The case of claim 1, wherein the decorative insert is formed in a mold which provides an in-relief surface.

6. The case of claim 1, wherein the decorative insert is a generally planar, laminar material that has been trimmed to fit the recess, said laminar material being selected from the group consisting of textiles, sheet metal, wood, and polymeric compounds to which a reflective coating has been applied.

7. The case of claim 1, wherein the decorative insert is a generally laminar, vacuum-formed polymeric panel to which color graphics have been applied.

8. The case of claim 1, wherein the one-piece, injection-molded main body is made from a polyolefin selected from the group consisting of polyethylene and polypropylene.

9. The case of claim 2, wherein said decorative insert is polygonally shaped, stamped from sheet metal to provide an in-relief graphic design on a major portion thereof, said insert having outer edges that are downwardly bent to form sidewalls that are generally perpendicular to said major portion, each of said sidewalls being inwardly-rolled to form a tube, with the tubes so formed from all outer edges lying in a common plane.

10. The case of claim 9, wherein portions of each tube are stamped to form an outwardly extending hooks, each of said hooks engaging a hook receptacle located within the recess.

11. A generally rectangular case for packaging and storing an optical information storage disk, said case comprising:

- a main body having intercoupled front and rear covers that close to form a generally enclosed chamber, said main body having at least one recess inset into an exterior surface of at least one of said covers; and

a decorative insert for installing within each recess.

12. The case of claim 11, wherein the one-piece, injection-molded main body is made from a polyolefin selected from the group consisting of polyethylene and polypropylene.

13. The case of claim 11, wherein said decorative insert is made of sheet metal that has been stamped to include an in-relief design on an exposed major portion thereof.

14. The case of claim 13, wherein said sheet metal panel includes multi-color artwork.

15. The case of claim 11, wherein said recess is coextensive with said front cover, with the exception of a narrow perimetric border.

16. The case of claim 11, wherein the decorative insert is an injection-molded panel having in relief multi-color graphics.

17. A case for packaging and storing an optical digital information storage disk, said case comprising:

a one-piece, injection-molded main body including:

a spine;

a front cover coupled to said spine via a first living hinge;

a rear cover coupled to said spine via a second living hinge; and

at least one recess inset into an exterior surface of at least one of said covers.

18. The case of claim 17, wherein said recess is of generally uniform depth and covers a major portion of said front cover.

19. The case of claim 17, which further comprises a decorative insert made from a material selected from the group consisting of textiles, metal, metal alloys, wood, leather, polymeric compounds, and polymeric compounds to which reflective coating has been applied.

20. The case of claim 19, wherein said decorative insert is stamped from sheet metal to which colored artwork is applied prior to the stamping process.

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