Disclosed is a package for storing one or more disc-shaped elements. The package includes a housing structure that defines an internal chamber. The housing structure has at least one open end that provides access to the internal chamber. The package also includes at least one tray for holding a disc-shaped element. The tray is pivotably mounted to the housing and is movable from a first position wherein the tray is contained entirely within the internal chamber of the housing and a second position wherein the tray extends at least partially from the open end of the housing structure. The tray(s) used in the package include a first tray portion having upper and lower surfaces and a second tray portion having upper and lower surfaces. The second tray portion is hingedly attached to the first tray portion and is movable between a first position, wherein the respective upper surfaces of the first and second tray portions are coplanar and a second position wherein the respective upper surfaces are oriented at an angle with respect to each other.
FIG. 15
PACKAGE HAVING PIVOTED TRAY FOR RETAINING DISC-SHAPED ELEMENT

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to U.S. Provisional Patent Application Ser. No. 60/695,201 filed Jan. 29, 2005, entitled “PACKAGE HAVING PIVOTED TRAY FOR RETAINING DISC-SHAPED ELEMENT” the disclosure of which is herein incorporated by reference in its entirety.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates generally to a package for storing one or more disc-shaped elements and, more particularly, to a package housing at least one tray for supporting a disc-shaped element, which tray is pivotally supported within the package and hinged to permit one part of the tray to pivot away from the remainder of the tray for facilitating insertion and removal of the disc-shaped element.

[0004] 2. Description of the Prior Art

[0005] Many different types of products, such as pharmaceuticals, cosmetics and entertainment media are either disc shaped or packaged in disc-shaped containers. In particular, various types of planar discs are in use at the present time to record and store information which is to be retrieved by various means, such as by optical or magnetic means. Typical of such discs are compact discs in which information is digitally recorded by use of a laser beam and then read optically by a laser beam. Such discs are used to record audio information, such as musical renditions, video information such as visual images and digital information for use as read only and other memories for use in various applications, such as computer applications. In most instances, at the present time, such discs are sold with information already recorded thereon. In other applications, such discs are sold in blank form and are used by the customer to record information thereon. In the latter case, for example, optical discs are sold for use as computer storage media and are used in hard disc storage systems. As used herein, the term compact disc, CD or disc is intended to encompass all such discs and disc-shaped packaging, e.g., for pharmaceuticals or cosmetics, whatever their size, for all known or proposed uses.

[0006] It is one purpose of this invention to provide a package for storing disc-shaped elements in which the disc-shaped elements are easy to access. It is another purpose of the present invention to provide a package for storing disc-shaped elements into which the disc-shaped elements can be easily inserted and from which they can be readily removed. It is yet another purpose of this invention to provide a package in which disc shaped elements are stored on trays and the trays are pivotable into and out of a storage enclosure. Efforts to date directed at such packages suffer from one or more shortcomings which make the resulting packaging unsatisfactory. This is because prior art packaging is, typically, either uneconomical to manufacture and/or is expensive to transport, store and display in retail stores. Accordingly, there remains a need for a simple, inexpensive to manufacture, inexpensive to ship and display package capable of storing one or more disc-shaped elements, which is reliable for use over the long term.

SUMMARY OF THE INVENTION

[0007] The subject invention is directed to a package for storing one or more disc-shaped elements. The package includes a housing structure that defines a internal chamber for storing one or more disc-shaped elements. The housing structure has at least one open end that provides access to the internal chamber. The package also includes at least one tray for holding a disc-shaped element. The tray is pivotally mounted to the housing and is movable from a first position wherein the tray is contained entirely within the internal chamber of the housing and a second position wherein the tray extends at least partially from the open end of the housing structure.

[0008] In certain embodiments the tray(s) used in the package include, a first tray port having upper and lower surfaces and a second tray port having upper and lower surfaces. The second tray portion is hingedly attached to the first tray portion and is movable between a first position, wherein the respective upper surfaces of the first and second tray portions are coplanar and a second position wherein the respective upper surfaces are oriented at an angle with respect to each other. The tray further includes a mechanism for securing a disc-shaped element to the tray which is provided on the upper surface of at least one of the first and second tray portions. The securing mechanism is configured such that movement of the second tray portion from the first position to the second position allows a disc-shaped element to be engaged with or disengaged from the securing mechanism/tray. Preferably, the tray is substantially planar and D-shaped.

[0009] It is presently envisioned that the upper surface of at least one of the first and second tray portions defines a recess for receiving at least a portion of a disc-shaped element. In certain embodiments, the upper surfaces of the first and second tray portions in combination define a circular recess for receiving a disc-shaped element, the circular recess having a substantially planar floor and a peripheral wall.

[0010] Preferably, the tray further includes at least one flange member projecting from the peripheral wall of the circular recess and spaced from the floor of the recess so as to define a channel for receiving an outer edge of a disc-shaped element. Moreover, it is presently envisioned that the tray further include an upstanding circular wall projecting from the floor of the circular recess and configured for supporting a disc-shaped element adjacent its inner diameter. Still further the tray can include a semi-circular rib extending from the upper surface of the second tray portion and dimensioned and configured to frictionally engage an inner edge of a central aperture provided in a disc-shaped element.

[0011] In certain preferred embodiments, the package includes means for ejecting the at least one tray from within the internal chamber of the housing structure. For example, the tray can include a spring arm which extends from the periphery of the tray and contacts a cylindrical post supported within the interior chamber of the housing structure. The operation of the spring arm will be described in more detail hereinbelow.
It is also envisioned that the package can include a mechanism for maintaining the tray(s) in the first position wherein each tray is contained entirely within the internal chamber of the housing. In certain embodiments, the mechanism can be readily releasable and associated with or integral to the housing and the tray. In alternative embodiments, the securing mechanism can be a separate element such as a locking element that includes anti-theft features.

The subject invention is also directed to a tray for storing at least one disc-shaped element that includes, a first tray portion having upper and lower surfaces and a second tray portion having upper and lower surfaces. The second tray portion is hingedly attached to the first tray portion and is movable between a first position, wherein the respective upper surfaces of the first and second tray portions are coplanar and a second position wherein the respective upper surfaces are oriented at an angle with respect to each other. The tray further includes a mechanism for securing a disc-shaped element to the tray which is provided on the upper surface of at least one of the first and second tray portions. The securing mechanism is configured such that movement of the second tray portion from the first position to the second position allows a disc-shaped element to be engaged with or disengaged from the securing mechanism/tray. Preferably, the tray is substantially planar and D-shaped.

It is presently envisioned that the upper surface of at least one of the first and second tray portions defines a recess for receiving at least a portion of a disc-shaped element. In certain embodiments, the upper surfaces of the first and second tray portions in combination define a circular recess for receiving a disc-shaped element, the circular recess having a substantially planar floor and a peripheral wall.

Preferably, the tray further includes at least one flange member projecting from the peripheral wall of the circular recess and spaced from the floor of the recess so as to define a channel for receiving an outer edge of a disc-shaped element. Moreover, it is presently envisioned that the tray further include an upstanding circular wall projecting from the floor of the circular recess and configured for supporting a disc-shaped element adjacent its inner diameter. Still further the tray can include a semi-circular rib extending from the upper surface of the second tray portion and dimensioned and configured to frictionally engage an inner edge of a central aperture provided in a disc-shaped element.

The subject application is also directed to a tray for holding a disc-shaped element that includes first and second tray portions connected through a hinge. The second tray is movable between a first position wherein the first and second tray portions are coplanar and a second position wherein the first and second tray portions are oriented at an angle with respect to each other. At least one of the first and second tray portions includes a mechanism, (e.g., a rosette), for securing a disc-shaped element to the tray such that movement of the second tray portion from the first position to the second position allows a disc-shaped element to be engaged with or disengaged from the securing means.

In a preferred embodiment, the hinge is a living hinge. Moreover, in certain constructions the disc-shaped element is a compact disc. It is envisioned that the upper surfaces of the first and second tray portions in combination define a circular recess that is adapted for receiving a disc-shaped element. The circular recess has a substantially planar floor and a peripheral wall. Preferably, is such embodiments, the hinge extends diametrically across the circular recess defined by the upper surfaces of the first and second tray portions.

These and other aspects of the subject invention will become more readily apparent to those having ordinary skill in the art from the following detailed description of the preferred embodiments of the invention taken in conjunction with the figures.

BRIEF DESCRIPTION OF THE DRAWINGS

So that those having ordinary skill in the art will better understand how to make and use the packages and trays of the subject invention, embodiments thereof will be described below with reference to the drawings wherein:

FIG. 1 is a perspective view of the improved tray of the package of the present invention.

FIG. 2 is a perspective view of the improved tray of FIG. 1 showing the manner in which disc-shaped elements may be easily inserted and removed therefrom.

FIG. 3 is a top plan view of the package of the present invention with the top removed showing the tray of FIG. 1 in position on the floor of an enclosure therefor.

FIG. 4 is a perspective view of the package of the present invention in its closed position showing an enclosure housing two trays and illustrating a retail security lock for use therewith.

FIG. 5 is a perspective view of the package of the present invention comprising two trays in an enclosure with one tray shown in the pivoted position.

FIG. 6 is a top perspective view of the package of FIG. 5 with the top removed and showing one tray in the enclosed position and one tray in the pivoted position.

FIG. 7 is a top perspective view of the package of FIG. 5 with the top removed and with two trays supported one above the other in the enclosed position.

FIG. 8 is another perspective view of the package of FIG. 5 with one tray in the enclosed position and one tray in the pivoted position.

FIG. 9 is a perspective view of the package of FIG. 8 showing the pivoted tray pivoted at its hinge to facilitate insertion and removal of a disc-shaped element.

FIG. 10 is a perspective view of the package of FIG. 5 with both trays in the enclosed position.

FIG. 11 is another perspective view of the package of FIG. 7 with the top removed.

FIG. 12 is still another perspective view of the package of FIG. 7.

FIG. 13 is an exploded perspective view of the package of FIG. 5.

FIG. 14 is another exploded perspective view of the package of FIG. 5.
FIG. 15 is a top perspective view of another embodiment of the package of the present invention looking through the top of the package.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Reference is now made to the accompanying figures for the purpose of describing, in detail, preferred and exemplary embodiments of the present disclosure. The figures and detailed description are provided to describe and illustrate examples in which the disclosed subject matter may be made and used, and are not intended to limit the scope thereof.

Embodiments of the present invention are illustrated in FIGS. 1-15, in which there are shown improved packages 10 for housing disc-shaped elements, hereinafter referred to as discs. The package comprises a planar tray 12 which is generally D-shaped and flat and includes an upper planar surface 14 having a generally circular recess 16 formed therein along substantially its entire area except at the corners 18, 20 where the curved wall 22 of the D-shape intersects the leg 24 of the D-shape. The recess defines a disc receiving housing which has a peripheral wall 26 extending between a recess floor 28 and the upper planar surface 14 of the tray 12. The recess peripheral wall 26 is generally cylindrical and is suitably dimensioned to receive the disc to be stored therein. In one embodiment of the package, a circular media disc A having a central aperture is supported on upstanding circular wall portions 30 on the recess floor 28. Upstanding wall portions 30 have a diameter which is slightly larger than the central aperture of the media disc in order to support the media disc on non-information bearing surfaces surrounding the central aperture. A semi-circular upstanding rib 32 dimensioned to correspond to the central aperture of the disc and having a height greater than the circular wall portions 30 is centrally positioned within the circular wall portions 30 to serve as a rosette to aid in positioning and stabilizing the disc within recess 16.

Tray 12 has a diametrically extending hinge, preferably a living hinge 34, dividing recess 16 into two halves 16a, 16b. Desirably, hinge 34 extends between curved wall 22 and leg 24 at a point along leg 24 which is spaced a short distance from pivot aperture 36 defined in corner 20 of planar surface 14. Living hinge 34 divides circular wall portions 30 into two semi-circular wall portions, one semi-circular wall portion on recess half 16a and the other semi-circular wall portion on recess half 16b. Semi-circular rib 32 is located within semi-circular wall portion 30 on recess half 16b. Horizontal projections 38 spaced above recess floor 28 extend into recess 16a and circumferentially, from the intersections of living hinge 34 with peripheral wall 26, at least a short distance along the peripheral wall 26a of recess half 16a for defining between floor 28 and projections 38 two channel-like guides 40 for sliding a disc into and out of recess half 16a. Tray 12 is pivotable about the living hinge 34 to pivot rosette rib 32 on recess half 16b out of the central aperture of a disc within recess 16 and to allow a disc to be inserted into and/or removed from recess half 16a by sliding the disc under, or out from under, projections 38 in guides 40.

Tray 12 is adapted to be pivotally supported within generally rectangular enclosure 42. Enclosure 42 comprises a floor 44, a top 46 and peripheral wall portions extending upward from the floor 44 and downward from the top 46 for defining enclosure longitudinal peripheral wall 48 and transverse peripheral walls 50, 52 connected thereto for defining peripheral walls on three sides of enclosure 42. The fourth side 54 is open for pivotal movement of one or more of trays 12 into and out of enclosure 42.

Tray 12 is supported on floor 44 of enclosure 42 with pivot aperture 36 mounted on upstanding hub 58, serving as a pivot point 60, for pivotal mounting of tray 12 between an enclosed position, where the tray 12 is supported on floor 44 within enclosure 42, and a pivoted position, where tray 12 protrudes through the open side 54 of enclosure 42 at least a sufficient amount to allow tray 12 to be grasped with the fingers. Once the tray 12 can be grasped with the fingers it can be pivoted to a more open position where living hinge 34 is completely out of enclosure 42, allowing tray 12 to pivot about hinge 34, as shown in FIGS. 2 and 9, to allow a disc to slide into or out of guide channels 40 of recess half 16a, without interference from enclosure 42.

Floor 44 of enclosure 42 includes interior walls 62, 64 defining generally a floor area which allows D-shaped tray 12 to be housed therewithin in the enclosed position and to freely pivot about pivot point 60. When supported on floor 44 in the enclosed position, as shown in FIGS. 3, 6-7, 11-12, 15, pivot point 60 is positioned, generally, in the corner 66 defined between transverse peripheral wall 50 and open side 54. A spring arm 68 extends from the edge of tray 12 adjacent recess half 16a toward the longitudinal wall 48 at a point closely adjacent the corner 70 defined between longitudinal wall 48 and transverse wall 50. Spring arm 68 extends into contact with cylindrical post 72 supported on floor 44 in corner 70. In the enclosed position of tray 12, spring arm 68 is static and unbiased by post 72. The purpose of spring arm 68 is to provide the force to pivot tray 12 about pivot point 60 when it is desired to move tray 12 to the pivoted position. To pivot tray 12 to its pivoted position, it is only necessary, using a finger, to push tray 12, in its enclosed position, at a point along leg 24 remote from pivot point 60 (see arrow P in FIG. 3), inwardly toward longitudinal wall 48. This has the effect of compressing spring arm 68 against post 72. When the finger pressure is removed, the spring bias caused by compression causes tray 12 to pivot from its enclosed position to its pivoted position, as indicated by arrow R in FIG. 3. To accomplish this without breaking, spring arm 68 must be quite resilient. In an alternative embodiment, shown in FIG. 15, which does not require spring arm 68 to be quite as resilient, a spring 74 is supported by enclosure 42 and extends from corner 70 toward curved wall 22 and spring arm 68. As tray 12 is pivoted about pivot point 60 from the pivoted position to the enclosed position, spring arm 68 engages spring 74 but remains static and unbiased. However, when tray 12 is pressed toward longitudinal wall 48 to cause tray 12 to move to its pivoted position, both spring arm 68 and spring 74 are compressed. Such an arrangement permits the resilience of both spring arm 68 and spring 74 to provide the resilience necessary to cause tray 12, when unlatched, to pivot about pivot point 60 and move to the pivoted position.

In order to maintain tray 12 in the closed position, a click lock arm 76 (see FIG. 15) extends from transverse peripheral wall 52 spaced from corner 78 between longitu-
dinal peripheral wall 48 and transverse peripheral wall 52 is biased toward curved wall 22 of tray 12. As tray 12 is pivoted from its pivoted position to its enclosed position, the end 76a of click lock arm 76 slides along the outer surface of curved wall 22. At least one nub 80 projects outwardly from curved wall 22 in a direction away from recess 16. When tray 12 is fully pivoted into the enclosed position, end 76a of click lock arm 76 engages the projecting nub 80 and locks tray 12 in its enclosed position. To pivot tray 12 to its pivoted position, it is only necessary, using a finger, to push tray 12, in its enclosed position, at a point along leg 24 remote from pivot point 60 (see arrow P in FIG. 3), inwardly toward longitudinal wall 48. This has the effect of releasing end 76a from projecting nub 80 and allowing tray 12 to pivot about pivot point 60 under the influence of spring arm 68 and, if used, spring 74, to its pivoted position. In doing so, end 76a of click arm 76 slides over projecting nub 80.

[0042] For purposes of retail security, package 10 may be positively locked with the tray 12 in its enclosed position, to protect the disc against damage or pilferage, by a locking dagger 90 comprising a dagger section 92 that passes through enclosure open side 54 and is wedged into a locking position parallel to and between transverse peripheral wall 52 and the adjacent peripheral wall of tray 12. Dagger section 92 is preferably connected to a head portion 94, which includes a locking means (not shown) for engaging the enclosure and retaining the dagger section in its locking position. An Electronic Article Surveillance (EAS) tag 96 may be affixed to dagger section 92. Retail establishments have devices which disengage and remove the dagger section from package 10 after a sale has been completed and before the package 10 is handed over to the customer.

[0043] As can be seen from FIGS. 5-14, package 10 may house more than one tray 12. Additional trays 12 (two trays are shown in the FIGURES) are pivotally mounted on upstanding hub 58 in a stacked but spaced relationship to the one tray 12. When more than one tray 12 is utilized, either tray can be separately pivoted from enclosure 42 in the same manner as described hereinbefore for causing one tray to be pivoted from its enclosed position to a pivoted position. The tray 12 which is to be pivoted out of enclosure 42 is pressed, using a finger, at a point along leg 24 remote from pivot point 60 (see arrow P in FIG. 3), inwardly toward longitudinal wall 48. This causes the tray to be released and to pivot under the influence of spring arm 68 and, if used, spring 74 to its pivoted position from which it may be grasped and pivoted further until living hinge 34 is completely out of enclosure 42 and the tray can be pivoted therealong for removal or insertion of discs into recess 16a of the tray.

[0044] Tray 12 is preferably formed of plastic material and is formed by injection molding. Likewise, enclosure 42 is preferably formed of plastic material and is formed by injection molding. However, it will be appreciated that other materials and processes can be used to form the components of package 10, such as, in some instances, paper board, without departing from the scope of the present invention. It will be appreciated that package 10, particularly when used to retain media discs, may carry graphics on its outer surfaces. Thus, the graphics may include multi-panel outer covers, labels, direct printing onto the surfaces, shrink film, bands (e.g., four or five sided sleeves), and the like.

[0045] While the present invention has been described in terms of specific embodiments thereof, it will be understood that no limitations are intended thereby to the details of construction or design, the present invention contemplating and including any novel feature or novel combination of features which are herein disclosed.

What is claimed is:

1. A package for storing one or more disc-shaped elements, comprising:

a) a housing structure that defines an internal chamber for storing one or more disc-shaped elements, the housing structure having at least one open end that provides access to the internal chamber,

b) at least one tray for holding a disc-shaped element, the tray being pivotally mounted to the housing and movable from a first position wherein the tray is contained entirely within the internal chamber of the housing and a second position wherein the tray extends at least partially from the open end of the housing structure.

2. A package as recited in claim 1, wherein the tray includes:

a) a first tray portion having upper and lower surfaces;

b) a second tray portion having upper and lower surfaces, wherein the second tray portion is hingedly attached to the first tray portion and movable between a first position wherein the respective upper surfaces of the first and second tray portions are coplanar and a second position wherein the respective upper surfaces are oriented at an angle with respect to each other; and

c) means for securing a disc-shaped element to the tray provided on the upper surface of at least one of the first and second tray portions, the securing means configured such that movement of the second tray portion from the first position to the second position allows a disc-shaped element to be engaged with or disengaged from the securing means.

3. A package as recited in claim 1, wherein the tray is substantially planar and D-shaped.

4. A package as recited in claim 2, wherein the upper surface of at least one of the first and second tray portions defines a recess for receiving at least a portion of a disc-shaped element.

5. A package as recited in claim 2, wherein the upper surfaces of the first and second tray portions in combination define a circular recess for receiving a disc-shaped element, the circular recess having a substantially planar floor and a peripheral wall.

6. A package as recited in claim 5, further including at least one flange member projecting from the peripheral wall of the circular recess and spaced from the floor of the recess so as to define a channel for receiving an outer edge of a disc-shaped element.

7. A package as recited in claim 6, further including an upstanding circular wall projecting from the floor of the circular recess and configured for supporting a disc-shaped element adjacent its inner diameter.

8. A package as recited in claim 1, further including a semi-circular rib extending from the upper surface of the second tray portion and dimensioned and configured to frictionally engage an inner edge of a central aperture provided in a disc-shaped element.
9. A package as recited in claim 1, further comprising means for ejecting the at least one tray from within the internal chamber of the housing structure.

10. A package as recited in claim 9, wherein the means for ejecting the at least one tray from within the internal chamber of the housing structure includes a resilient spring arm provided on the at least one tray for engaging the housing.

11. A package as recited in claim 1, further comprising means for maintaining the at least one tray in the first position wherein the tray is contained entirely within the internal chamber of the housing.

12. A tray for holding a disc-shaped element, comprising:
   a) a first tray portion having upper and lower surfaces;
   b) a second tray portion having upper and lower surfaces, wherein the second tray portion is hingedly attached to the first tray portion and movable between a first position wherein the respective upper surfaces of the first and second tray portions are coplanar and a second position wherein the respective upper surfaces are oriented at an angle with respect to each other; and
   c) means for securing a disc-shaped element to the tray provided on the upper surface of at least one of the first and second tray portions, the securing means configured such that movement of the second tray portion from the first position to the second position allows a disc-shaped element to be engaged with or disengaged from the securing means.

13. A tray as recited in claim 12, wherein the tray is substantially planar and D-shaped.

14. A tray as recited in claim 12, wherein the upper surface of at least one of the first and second tray portions defines a recess for receiving at least a portion of a disc-shaped element.

15. A tray as recited in claim 12, wherein the upper surfaces of the first and second tray portions in combination define a circular recess for receiving a disc-shaped element, the circular recess having a substantially planar floor and a peripheral wall.

16. A tray as recited in claim 15, further including at least one flange member projecting from the peripheral wall of the circular recess and spaced from the floor of the recess so as to define a channel for receiving an outer edge of a disc-shaped element.

17. A tray as recited in claim 16, further including an upstanding circular wall projecting from the floor of the circular recess and configured for supporting a disc-shaped element adjacent its inner diameter.

18. A tray as recited in claim 12, further including a semi-circular rib extending from the upper surface of the second tray portion and dimensioned and configured to frictionally engage an inner edge of a central aperture provided in a disc-shaped element.

19. A tray for holding a disc-shaped element, comprising:
   first and second tray portions connected through a hinge, the second tray being movable between a first position wherein the first and second tray portions are coplanar and a second position wherein the first and second tray portions are oriented at an angle with respect to each other, wherein at least one of the first and second tray portions include means for securing a disc-shaped element to the tray such that movement of the second tray portion from the first position to the second position allows a disc-shaped element to be engaged with or disengaged from the securing means.

20. A tray as recited in claim 19, wherein the hinge is a living hinge.

21. A tray as recited in claim 19, wherein the disc-shaped element is a compact disc.

22. A tray as recited in claim 19, wherein upper surfaces of the first and second tray portions in combination define a circular recess for receiving a disc-shaped element, the circular recess having a substantially planar floor and a peripheral wall.

23. A tray as recited in claim 22, wherein the hinge extends diametrically across the circular recess defined by the upper surfaces of the first and second tray portions.