APPARATUS FOR HOLDING A MEDIA STORAGE DISK

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ABSTRACT

An apparatus is provided for holding a compact disk having a central hole. The apparatus includes a disk-receiving portion possessing a body portion including a central hub and circular outer retaining wall whose radius is slightly larger than media storage disk. The outer retaining wall in conjunction with the hub and securing means provides for securing the media storage disk within case by overlapping the outer diameter of the media storage disc.
FIG. 15

DETAIL A

FIG. 16

DETAIL B
APPARATUS FOR HOLDING A MEDIA STORAGE DISK

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The invention relates in general to an apparatus for holding a media storage disk, more particularly an apparatus having an improved, yet simple, outer diameter retaining means for the retention of the media storage disk.

[0003] 2. Description of the Related Art

[0004] Media storage disks have gained popularity with consumers. Examples of media storage disks include, but are not limited to, the compact disk (CD), the digital video disk (DVD) and the video compact disk (VCD).

[0005] Numerous storage cases have been developed for media storage disks. It is appreciated by designers that a common problem associated with most storage case designs is disk loosening and removal of the media storage discs from their prepackaged case. A prepackaged case typically has an embedded alarm sensor. The actual disk, however, has no alarm-sensing device. Generally, by pressing the center of the outer wall of the container of the prior art, it is possible to loosen and disengage a disk from the central retaining area.

[0006] This design flaw facilitates the theft of disks from their prepackaged cases. In addition, it greatly increases the susceptibility of disk damage during normal handling, transport and storage procedures.

[0007] In addition to addressing the retention of media storage disks, case designs have also provided for the convenient ejection of the disk. Because DVDs consist of two laminated layers of polycarbonate, the bending of the DVDs for engagement and removal can cause disk and hence data damage. To avoid this damage, it is desirable for a case to provide convenient insertion and removal of the disk.

[0008] Thus, the need arises for a media storage case that allows for easy disk insertion and removal, and is not susceptible to disk loosening and removal from the central retaining portion.

[0009] The simplicity of this design allows for the manufacture of substantially slim, yet durable media containers which require less space for storage, and less materials to manufacture.

[0010] Although other slim data storage disk containers exist in the market, none of the products disclose a retaining means which permits insertion or removal of the disk from more than one direction. The product manufactured by NexPak provides a recessed disk bed with a central hub for engaging and retaining the media storage disc through its central diameter, and an outer wall possessing two pair of apertures through the wall opposite each other. Disengagement of the data disk from the NexPak container is accomplished by one of two methods. Either by bending the container and sliding one’s finger or other device under the disk through one of the outer diameter apertures allowing the user to pop the disk off the central hub, or, in the alternative, the user may remove the disk by gripping the outer edge of the disk through the apertures in the outer circumference with his/her thumb and forefinger with an upward tug. Either method of removal results in the media disk flexing and potentially resulting in damage or breakage of the data disk. This design is prone to wear and tear along the central hub engagement means resulting in the inability of the hub to engage the disc after multiple uses. Consequently, the durability of the NexPak product is suspect.

[0011] The product marketed as Slip ’n Clip™ by Knauf MIP Packaging provides a recessed disk bed without a central hub. The means for retaining the disk comprises a half circular recessed portion extending outward from the recessed disk bed bounded by a pair of lips extending inward from the outer wall of the recessed disk bed, and a single lip extending inward from the outer wall bounding the recessed disk portion opposite the half circular recessed with a with a flexible pair of crescent shaped arms below the single lip which engages the disk. The Slip ’n Clip is useable in only one direction because disks may only be engaged or disengaged only from one direction. To disengage the disk the user applies a generally parallel force to the disk using a finger inserted into the half circle depression which forces the disk downward to expand bounded area of the recessed disk bed by forcing the pair of flexible crescent arms outward thereby disengaging the disk from the upper lips for removal. Insertion of the disk can be accomplished by first inserting the disk under the single lip against the crescent arms and applying pressure against the disk to expand the crescent arms to permit placement of the disk in the recessed disk portion and then releasing the pressure to allow the crescent arms to engage the disk under the lips bounding the circular recessed portion. This unidirectional design is prone to wear and tear along lower engagement means resulting in the inability of the crescent arms to engage the disc after multiple uses. Consequently, the durability of the Knauf MIP Packaging product is also suspect.

SUMMARY OF THE INVENTION

[0012] Accordingly, one object of the present invention is to provide a disk storage apparatus having an improved retaining means for the retention of a media storage disk.

[0013] A second object of the invention is to provide a disk storage apparatus that is simple to operate but will not damage the disk retained therein during the removal or insertion process.

[0014] A third object of the invention is to provide a disk storage apparatus that allows for easy insertion and removal of the disk.

[0015] A fourth object of the invention is to provide a disk storage apparatus that is not susceptible to disk loosening and removal when pressure is applied to the center of the storage case.

[0016] A fifth object of the invention is to provide a disk storage apparatus that facilitates the disk packaging process by eliminating the need for performing additional steps when transitioning between a disk-releasing position and a disk-securing position.

[0017] A sixth object of the invention is to provide a disk storage apparatus which is durable.

[0018] A seventh object of the invention is to permit the use of high speed automated machines during the packaging
process for the insertion of media storage disks into the apparatus. The invention disclosed herein permits the use of high speed automated machines for the insertion of disk by only requiring that the disk is aligned with central axis of the recessed body portion and/or the hub, (if a hub is present in the embodiment), and then lowering the disk against all four retaining lips until the lips lock the disk into locked position in the apparatus.

[0019] To achieve these and other advantages and in accordance with the purpose of the invention, as embodied and broadly described herein, the invention provides an apparatus for holding a compact disk having a central hole. The apparatus includes a generally round body portion and at least a pair of half rounded shaped boundaries recesses extending from the body portion opposite from each other. Each half rounded boundary recess extends outwardly from the outer diameter of the body portion. Each half rounded shaped boundary possesses a pair of disc-securing members generally comprising semi-rigid or flexible fingers which overlap the outer diameter of the media disc after it is engaged by the central hub and fingers.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] FIG. 1 is a perspective view of a case that incorporates the apparatus for holding a media storage disk in accordance with the present invention, the case being in a fully open position with the interior portion visible.

[0021] FIG. 2 is a perspective view of a preferred embodiment of the present invention in the disk-locking position for securing the disk.

[0022] FIG. 3 is a cross-sectional view taken along the line A-A of FIG. 2, when the apparatus is in the disk-locking position.

[0023] FIG. 4 is an enlarged cross-sectional view of region C in FIG. 3.

[0024] FIG. 5 is a perspective view of a preferred embodiment of the present invention in the disk-releasing position for removing the disk.

[0025] FIG. 6 is a cross-sectional view taken along the line B-B of FIG. 5, when the apparatus is in the disk-releasing position.

[0026] FIG. 7 is an enlarged cross-sectional view of region D in FIG. 6.

[0027] FIG. 8 is a perspective view of an alternative embodiment of the present invention in the disk-locking position for securing the disk.

[0028] FIG. 9 is a cross-sectional view taken along the line E-E of FIG. 8, when the apparatus is in the disk-locking position.

[0029] FIG. 10 is an enlarged cross-sectional view of region F in FIG. 9.

[0030] FIG. 11 is a perspective view of the alternative embodiment of the present invention in the disk-releasing position for releasing the disk.

[0031] FIG. 12 is a cross-sectional view taken along the line G-G of FIG. 11, when the apparatus is in the disk-releasing position.

[0032] FIG. 13 is an enlarged cross-sectional view of region H in FIG. 12.

[0033] FIG. 14 is a perspective view of the apparatus possessing the disk guides without a hub.

[0034] FIG. 15 is an enlarged detail of the “L”-shaped securing arm in FIG. 14.

[0035] FIG. 16 is an enlarged detail of the disk guide for centralizing the disk when being placed in the locked position.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0036] Referring now to FIG. 1, perspective views of a case that incorporates the apparatus for holding a media storage disk in accordance with the present invention are shown. FIG. 1 illustrates case 10 in a fully open position with the interior portion visible.

[0037] Case 10 can provide enclosure to hold a media storage disk 40 such as, but not limited to, a CD, DVD, or VCD. Case 10 preferably includes a disk-receiving portion 11 and a cover portion 12. Disk-receiving portion 11 can move relative to cover portion 12 via a hinged region 13, so that when case 10 is in a closed position, disk-receiving portion 11 and cover portion 12 form an enclosure around the disk.

[0038] Still referring to FIG. 1, disk-receiving portion 11 contains a body portion 14 which includes a circular outer retaining wall 20 whose radius is slightly larger than media storage disk 40. Body portion 14 may provide for the entire or a substantial part of disk-receiving portion 11, or may be a separate or stepped molding. Body portion 14 may also be an insert receivable within case 10. The outer retaining wall 20 in conjunction with centralizing disk guides 16 and securing means 22 provides for securing the media storage disk within case 10 and is now described in further detail.

[0039] With reference to FIG. 2, a perspective view of the preferred embodiment of the present invention in the disk-locking position for securing the disk is shown. The outer retaining wall 20 includes at least one pair of recessed semi-circular boundaries 21 located opposite each other. Each recessed semi-circular boundary 21 extends outward from the outer retaining wall. Bounding each recessed semi-circular boundary 21 is a pair of securing means 30 extending inwardly from the circular outer retaining wall 20 toward the body portion 14. The securing means 30 are generally horizontal “N”-shaped arms with a lip 23 extending distally therefrom inward toward the body portion 14. Alternatively, the “N”-shaped arms may be “W”-shaped, “V”-shaped or any other shape which permits the securing means to be compressed when the disc is disengaged from the apparatus, and then return to the disc-locking position. The securing arms 22 are composed of semi-rigid flexible material. The lip 23 engages and retains the data disc 40 when in a disk-locking position. To center the disk within the body portion, at least a pair of guides 16 are located generally opposite each other and generally equidistant from the recessed semi-circular boundaries 21. In lieu of the guides 16, a central hub 15 may be located in the center of the body 14 to engage and center the disk between the retaining means through the center aperture of the media storage disk.
Although this embodiment contains a pair of recessed semicircular boundaries 21, two or more pair of recessed semi-circular boundaries 21 with securing means 22 may be employed for the present invention. Additionally, two or more pair of guides 16 may be employed to center the disk in the body portion 14 in lieu of a central hub, or, in the alternative, the guides 16 may be omitted in favor of a central hub 15 alone to center the storage media disk in the disk receiving portion 14.

Referring now to FIG. 3, a cross-sectional view taken along the line A-A of FIG. 2, when the apparatus is in the disk-locking position is shown. The data disc 40 is engaged and retained by the lip 23 of the "N"-shaped arm 30. Lip 23 secures the upper surface of disk 40 while outer-retaining wall 20 and hub 15 retain disk 40 within the body portion 14 within the case 10.

With reference to FIG. 4, an enlarged cross-sectional view of region C in FIG. 3 is shown. Disk 40 can be inserted into case 10 by positioning the outer edge of disc 40 against "N"-shaped engagement arm 30 but below lip 23 and aligning disk within the body portion 14 using guides 16. Alternatively, the arm of guides 16, the disk may be aligned using the central hole of disk 40 around hub 15. The pressure applied to disk 40 transfers to "N"-shaped engagement arm 22. This transferred pressure compresses the "N"-shaped engagement arm 22 increasing the bounded region of the lip 23, allowing the user to place the hole beneath the opposite lip 23 of the opposite "N"-shaped engagement arm to engage and retain disk 40 in body portion 14 of case 10.

With reference to FIG. 5, a perspective view of the preferred embodiment of the present invention in the disk-releasing position for removing the disk is shown. In the disk-releasing position, at least one "N"-shaped securing arm 30 is compressed away from the center, thus expanding the bounded region of the lips 23 attached thereto.

To transition from the disk-locking to the disk-reaching position, inward pressure from fingers or an alternative source must be applied to the disk 40 from one of the semi-circular boundaries. This pressure causes disk 40 to push the opposite "N"-shaped securing arm and lip 23 to compress and tilt backward and increase the bounded region thereby disengaging disk 40 from the opposite "N"-shaped securing arm 22 and lip 23 allowing the user to remove the data disk 40.

Referring now to FIG. 6, a cross-sectional view taken along the line B-B of FIG. 5, when the apparatus is in the disk-releasing position is shown. As inward pressure is applied to the disk 40, the bounded region created by the lip 23 and generally "N"-shaped securing arm 22 increases to a size greater than the outer circumference of the disk 40. At this point, the opposite lip 23 and generally "N"-shaped securing arm 22 no longer secures the upper surface of disk 40 at the location where inward pressure is being applied, and disk 40 becomes loosened for removal. Thus, it can be seen that disk loosening is simplified by requiring the application of pressure only to the disk, and no other portion of the Case 10 or body portion 11.

After the disk is released as depicted in FIG. 6, the lip 23 and generally "N"-shaped securing arm return to their disk locking position to accept the disk when it is returned to the case. The apparatus remains substantially in the disk-locking position after disk 40 is removed.

Disk 40 is not susceptible to loosening when case 10 is closed. In the disk-locking position, the outer-retaining wall 20 in conjunction with the lip 23 and "N"-shaped securing arm retain the disk. No external pressure applied to the exterior of case 10 will disengage the disc from the body portion 14 of the disc receiving portion 11 of the case 10. Only substantially planar pressure applied to the disc will disengage the disc from the body portion 14 of the case 10.

With reference to FIG. 8, a perspective view of an alternative embodiment of the present invention in the disk-locking position for securing the disk is shown. The outer-retaining wall 20 includes at least one pair of recessed semi-circular boundaries 21 located opposite each other. Each recessed semi-circular boundary 21 extends outward from the outer-retaining wall. Bounding each recessed semi-circular boundary 21 is a pair of securing means 22 incorporated into outer retaining wall 20. The securing means 22 are generally "L"-shaped arms with a lip 31 extending inward toward the body portion from the vertical portion of the "L"-shaped arm 32 as depicted in FIG. 15. Alternatively, the securing means may be a pair of vertical posts bounding the semi-circular boundaries 21 with a retaining lip 23 extending from the distal portion of the post inward toward the body portion 14. The securing arms 30 are composed of semi-rigid flexible material. The lip 23 engages and retains the data disc 40 when in a disk-locking position.

Although this embodiment contains a pair of recessed semicircular boundaries 21, two or more pair of recessed semi-circular boundaries 21 with securing means 22 may be employed for the present invention. Additionally, two or more pair of guides 16 may also be employed.

Referring now to FIG. 9, a cross-sectional view taken along the line E-E of FIG. 8 when the apparatus is in the disk-locking position is shown. The data disc 40 is engaged and retained by the lip 23 of the "L"-shaped arm 32. Lip 23 secures the upper surface of disk 40 while outer-retaining wall 20 and hub 15 retain disk 40 within the body portion 14 within the case 10.

With reference to FIG. 10, an enlarged cross-sectional view of region E in FIG. 9 is shown. Disk 40 can be inserted into case 10 by positioning the outer edge of disc 40 against "L"-shaped engagement arm 32 but below lip 31 and aligning the central hole of disk 40 around the hub 15. The pressure applied to disk 40 transfers to "L"-shaped engagement arm 30. This transferred pressure pushes the "L"-shaped engagement arm 30 outward and increases the bounded region of the lip 31, allowing the user to place disk beneath the opposite lip 23 of the opposite "L"-shaped engagement arm 32 to engage and retain disk 40 in body portion 14 of case 10.

With reference to FIG. 11, a perspective view of the preferred embodiment of the present invention in the disk-releasing position for removing the disk is shown. In the disk-releasing position, at least one "L"-shaped securing arm 32 is tilted away from the center, thus expanding the bounded region of the lips 23 attached thereto.

To transition from the disk-locking to the disk-reaching position, inward pressure from fingers or an alternative source must be applied to the disk 40 from one of the semi-circular boundaries 21. This pressure causes disk 40 to push the opposite "L"-shaped securing arm 32 and lip 23 to
tilt backward and increase the bounded region thereby disengaging disk 40 from the opposite “L”-shaped securing arm 30 and lip 31 allowing the user to remove the data disk 40.

[0054] Referring now to FIG. 12, a cross-sectional view taken along the line G-G of FIG. 11, when the apparatus is in the disk-releasing position is shown. As inward pressure is applied to the disk 40, the bounded region created by the lip 23 and generally “L”-shaped securing arm 32 increases to a size greater than the outer circumference of the disk 40. At this point, the opposite lip 23 and generally “L”-shaped securing arm 32 no longer secures the upper surface of disk 40 at the location where inward pressure is being applied, and disk 40 becomes loosened for removal. Thus, it can be seen that disk loosening is simplified by requiring the application of pressure only to the disk, and no other portion of the Case 10 or body portion 11.

[0055] After the disk is released as depicted in FIG. 12, the lip 23 and generally “L”-shaped securing arm 32 return to their disk locking position to accept the disk 40 when it is returned to the case. The apparatus remains substantially in the disk-locking position after disk 40 is removed.

[0056] Disk 40 is not susceptible to loosening when case 10 is closed. In the disk-locking position, the outer-retaining wall 20 in conjunction with the lip 23 and “L”-shaped securing arm retain 32 hold the disk. No external pressure applied to the exterior of case 10 will disengage the disc 40 from body portion 14 of disk receiving portion 11 of case 10. Only substantially planar pressure applied to the disc 40 will disengage the disc from body portion 14 of case 10.

[0057] Other embodiments of the invention will appear to those skilled in the art from consideration of the specification and practice of the invention disclosed herein. It is intended that the specification and examples to be considered as exemplary only, with a true scope and spirit of the invention being indicated by the following claims.

What is claimed is:

1. An apparatus for holding a compact disk having a central hole comprising:
   a. a body portion;
   b. a circular outer retaining wall possessing a radius slightly greater than the compact disk to be held;
   c. at least a pair of recessed semi-circular boundaries extending outward from opposite ends of the circular outer retaining wall;
   d. a pair of disc securing members bonding each recessed semi-circular boundary extending inward from the circular outer retaining wall for securing a top surface of the disk when in a disk-locking position.

2. The apparatus according to claim 1 wherein a pair guide posts are located generally opposite each other along the circular outer retaining wall and generally equidistant from the semi-circular boundaries for centrally aligning the disk when placed into the body portion between the disc securing members.

3. The apparatus according to claim 1 wherein a central hub is located in the middle of the body portion to engage said central hole of said compact disc to centrally align the disc between the disc engaging members.

4. The apparatus according to claim 1 wherein each disc securing member comprises a generally “N”-shaped arm possessing a lip at the distal end for securing a top surface of the disk when in a disk-locking position.

5. The apparatus according to claim 1 wherein each disc securing member comprises a generally “L”-shaped arm possessing a lip at the distal end of the vertical portion of the “L”-shaped arm for securing a top surface of the disk when in a disk-locking position.

6. The apparatus according to claim 1 wherein each disc securing member comprises a vertical post possessing a lip at the distal end for securing a top surface of the disk when in a disk-locking position.

7. The apparatus according to claim 1 wherein the disc securing members are formed from semi-rigid flexible material.

8. The apparatus according to claim 1 further comprising a disk-receiving portion and a cover portion that move relative to each other via a hinged region to form an enclosure around the disk, the body portion being positioned within the disk-receiving portion.

9. The apparatus according to claim 1 wherein the disk can be removed from the disk-locking position by application of pressure to the edge of the disk from one of the recessed semi-circular boundaries against the opposite pair of disc securing members thereby expanding the bounded region created by the lip and disc securing member increasing the size greater than the outer circumference of the disk.

10. An apparatus for holding a compact disk having a central hole comprising:
   a. a body portion;
   b. an outer retaining wall encircling the hub in a radius slightly greater than the compact disk to be held;
   c. at least a pair of recessed semi-circular boundaries extending outward from opposite ends of the outer retaining wall;
   d. a pair of generally “N”-shaped arms possessing a lip at the distal end extending inward from the outer retaining wall and bounding each recessed semi-circular boundary for securing a top surface of the disk when in a disk-locking position.

11. The apparatus according to claim 10 wherein a pair guide posts are located generally opposite each other and generally equidistant from the semi-circular boundaries for centrally aligning the disk when placed into the body portion between the disc engaging members.

12. The apparatus according to claim 10 wherein a central hub is located in the middle of the body portion to engage said central hole of said compact disc for centrally aligning the disc between the disc engagement members.

13. The apparatus according to claim 10 wherein the “N”-shaped arms are formed from semi-rigid flexible material.

14. The apparatus according to claim 10 further comprising a disk-receiving portion and a cover portion that move relative to each other via a hinged region to form an enclosure around the disk, the body portion being positioned within the disk-receiving portion.

15. The apparatus according to claim 10 wherein the disk can be removed from the disk-locking position by application of pressure to the edge of the disk from one of the recessed semi-circular boundaries against the opposite pair.
of generally "N"-shaped arms thereby expanding the bounded region created by the lip and the generally "N"-shaped arm disc increasing the size greater than the outer circumference of the disk.

16. An apparatus for holding a compact disk having a central hole comprising:

a body portion;

an outer retaining wall encircling the hub in a radius slightly greater than the compact disk to be held;

at least a pair of recessed semi-circular boundaries extending outward from opposite ends of the outer retaining wall;

a pair of vertical inverted generally "L"-shaped arms possessing a lip at the distal end extending inward from the outer retaining wall and bounding each recessed semi-circular boundary for securing a top surface of the disk when in a disk-locking position.

17. The apparatus according to claim 16 wherein a pair guide posts are located generally opposite each other and generally equidistant from the semi-circular boundaries for centrally aligning the disk when placed into the body portion.

18. The apparatus according to claim 16 wherein a central hub is located in the middle of the body portion to engage said central hole of said compact disc for centrally aligning the disc between the disc engagement members.

19. The apparatus according to claim 16 wherein the "L"-shaped arms are formed from semi-rigid flexible material.

20. The apparatus according to claim 16 further comprising a disk-receiving portion and a cover portion that move relative to each other via a hinged region to form an enclosure around the disk, the body portion being positioned within the disk-receiving portion.

21. The apparatus according to claim 16 wherein the disk can be removed from the disk-locking position by application of pressure to the edge of the disk from one of the recessed semi-circular boundaries against the opposite pair of inverted generally "L"-shaped arms thereby expanding the bounded region created by the lip and the inverted generally "L"-shaped arm disc increasing the size greater than the outer circumference of the disk.