

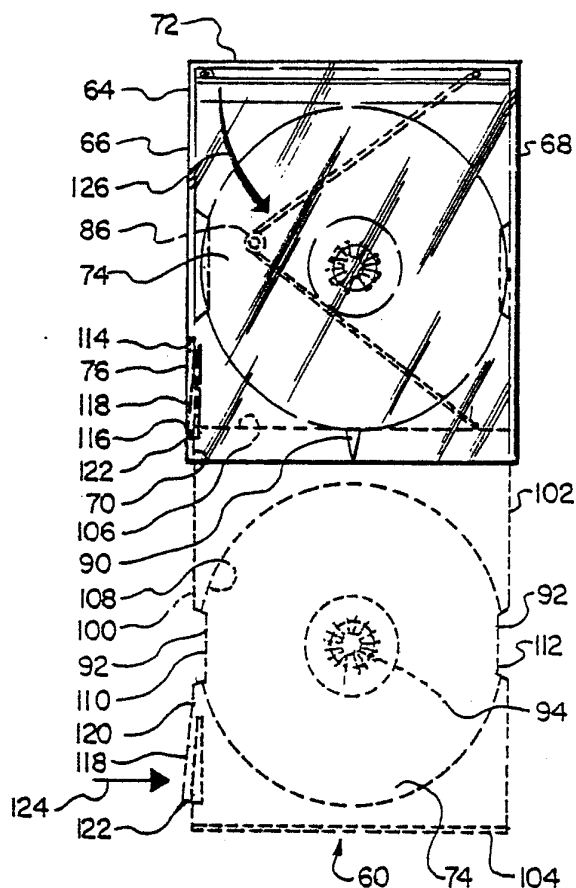


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(54) Title: COMPACT DISC CASE**(57) Abstract**

A compact disc case (60) for storing a compact disc (62). The disc is stored on a drawer (74) that slides into a shell (64). A lock (76) on the first drawer side (100) retains the drawer inside the shell in a closed locked position. When the lock is pushed toward the opposite lateral side (68) of the case, the lock releases the drawer from the locked position. A spring (86) between the rear (106) of the drawer and the rear (72) of the shell pushes the drawer out of the shell when the lock is released. The drawer has notches (92) along the sides (100, 102) allowing the disc to be grasped on the edges and removed from the drawer by spanning the disc across the top without touching and contaminating the faces of the disc.



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TITLE: COMPACT DISC CASE

5 BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention pertains to the special packaging art, and more particularly, to a case for the storage of a compact disc.

2. Background Art

Compact discs are usually sold and stored in plastic "jewel box" cases. A "jewel box" case 20 is illustrated in FIGURES 1 to 3. The case 20 has a bottom 22 rotatably connected to a top 24 by a hinge 26. The bottom 22 has a depression 28 to hold a compact disc 30 and a center spindle 32 on which the hole of the compact disc 30 is placed to retain the compact disc 30 in the proper position inside the case 20. A lock 34 on the first side wall 36 and a similar lock on the second side wall 38 retain the top and bottom 22 and 24 together when the case 20 is stored. The first and second side walls 36 and 38 extend down to the bottom 22 and are spaced from each other a distance only slightly greater than the diameter of the disc 30. Notches 40 and 42 in the sides of the depression 28 open out to the sides of the case 20 when the top 24 is lifted allowing access to the disc 30. The front and back walls 44 and 46 of the case 20 are coupled to the bottom 22.

Several problems are created by the design of the "jewel box" case 20. The case 20 is very difficult to open with one hand. The case 20 is even difficult to open with two hands as illustrated in FIGURE 2. One hand 48 grasps the bottom 22 at the front and back walls 44 and 46 and the other hand 50 grasps the top 24 at the first and second side walls 36 and 38. The bottom 22

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and the top 24 are then forcefully pulled apart. Inherent in the pulling apart process due to the design of the case 20 is the creation of forces tending to keep the bottom 22 and the top 24 together in addition
5 to the forces of the lock 34 and its counterpart on the second side wall 38. The first and second side walls 36 and 38 must be squeezed together by the hand 50 in order for the hand 50 to adequately grasp the top 24. The walls 36 and 38 are flexible and are therefore pressed
10 against the bottom 22 increasing the friction between the bottom 22 and the top 24 that must be overcome in order to raise the top 24. The more difficult the top 24 is to raise, the more the hand 50 must squeeze the walls 36 and 38 in order to retain a grip on the top 24
15 thereby increasing the friction between the walls 36 and 38 and the bottom 22.

The position of the hands 48 and 50 in FIGURE 2 also illustrates another problem. The thumb and fingers are wider than the side walls 36 and 38.
20 Portions of the thumb and fingers therefore bend over onto the top 24 and bottom 22. A narrow lip 52 is positioned on both sides of the bottom 22 under the side walls 36 and 38 to strengthen the case 20. When the case 20 is grasped, portions of the thumb and finger
25 therefore press against the lip 52 making the top 24 even more difficult to separate from the bottom 22 because the portions of the thumb and fingers on the lip 52 must be slid upward over the lip 52 when the top 24 is lifted.

30 An alternate method of opening the case 20 places the thumb and fingers of the hand 50 along side the thumb and fingers, respectively, of the hand 48 on the front and back walls 44 and 46. The thumbs are then pulled in opposite directions pulling the top 24 apart
35 from the bottom 22. In the process, the top 24 is bent slightly in the middle by the thumb of the hand 50

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decreasing the distance between the side walls 36 and 36 in the region of the lock 34 and its counterpart on the second side wall 38. The result is an increase in friction between the side walls 36 and 38 making the top 24 increasingly difficult to raise from the bottom 22. In addition the more force that is applied to the top 24 in the middle to raise the top, the more the top 24 is bent creating additional friction between the top 24 and the side walls 36 and 38.

10 Since the case 20 is approximately the size of the limit of the grasps of the hands 48 and 50, the hands are necessarily fully occupied when the case 20 is being opened. The opening problem is particularly acute when the person opening the case 20 also happens to be 15 driving an automobile. Either the person opens the case 20 prior to starting to drive or fiddles with the case 20 with one hand in an attempt to get the case 20 open.

Once the case 20 is opened as illustrated in FIGURE 3, removal of the compact disc 30 is still a 20 problem. The disc 30 rests on the bottom 22 which is slightly wider than the diameter of the disc 30 in order to fully protect the disc 30 when the case 20 is closed. The disc 30 sits in the bottom 22 in the depression 28 secured by the center spindle 32 and is accessible only 25 because of the notches 40 and 42 in the sides of the depression 28. The disc 30 is approximately the same thickness as the bottom 22 and both are relatively thin. The first structure encountered by the hand 50 when retrieving the disc 30 is the bottom 22. The fingers 30 must then be moved up slightly to feel and grasp the slightly smaller diameter of the disc 30. The disc is then lifted off the securing center spindle 32 with only a minimum contact area between the disc 30 and the 35 fingers of the hand 50.

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Other devices have been developed for holding tape and motion picture film cassettes. U.S. Patent No. 3,836,222 by Kuntze discloses a cassette drawer unit with a latch. U.S. Patent No. 4,030,602 by Muller and Kluge discloses a device for separably coupling section of cassettes for motion picture film or the like. U.S. Patent No. 4,428,480 by Ackeret discloses a container for tape cassettes. And U.S. Patent No. 4,493,417 also by Ackeret discloses a storage device for flat recording media including compact discs. All except Muller and Kluge have drawers for holding the recording media. The drawers are locked inside the cases until released whereupon springs push the drawers out of the cases providing access to the media. The lock in Kuntze releases the drawer when the drawer is pushed further inside the case. The locks in Ackeret release when the locks are pushed against the desired opening direction of the drawer and simultaneously lifted. Another embodiment of Ackeret requires the lock to be drawn outward or pushed outward with the hand in front of the desired opening direction of the drawer. Muller and Kluge require the lifting of the latch away from the side with the aid of an additional tool. A provision for the removal of a compact disc once the drawer is opened is disclosed only in the second Ackeret patent. A notch in the front of the drawer allows the fingers to grasp the top and bottom of the compact disc to remove it from the drawer. However repeated contamination of the recorded media on the faces will result from the oils and dirt on the fingers when this method is used.

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SUMMARY OF THE INVENTION

The present invention is directed to an improved compact disc case for storing a compact disc.

5 The case has a shell with first and second lateral sides and an open front side. A drawer slides to and fro in the shell between the first and second lateral sides and through the open front side for carrying the compact disc. A lock means on the first lateral side
10 retains the drawer inside the shell in a closed locked position. When pressure is applied to the lock means toward the second lateral side, the drawer is released from the closed locked position.

In accordance with one important aspect of the
15 invention, the lock means includes the first lateral side having a slot with a first end adjacent the open front side and the drawer having a tongue with a tip engaging the first end of the slot at the closed locked position. The lock means is released when the tip is
20 pressed out of the slot toward the body of the drawer. In this manner, one hand can easily operate the lock and open the drawer. The hand comfortably fits over the top of the case with the thumb on the tongue and the fingers on the second lateral side of the case. The
25 case is securely and easily held by one hand in this position. When the compact disc is wanted, a simple squeezing of the tongue of the lock inward releases the lock allowing the drawer to open.

In accordance with another important aspect of
30 the invention, the shell includes a top and a bottom fully enclosing the drawer when the drawer is pushed into the shell. The drawer no longer serves the purpose of protecting the disc from the environment and notch means can then be provided in the drawer for permitting
35 the disc to be grasped on the edges without touching and contaminating the disc faces when the notch means are

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outside the shell.

In accordance with yet another aspect of the invention, the case includes biasing means for biasing the drawer away from the closed locked position. The
5 shell has a rear side spaced from the open front side and the drawer has a rear end. The biasing means is a leaf spring bearing on the rear side and the rear end when the drawer is in the closed locked position. Once the lock is released, the spring causes the drawer to
10 immediately move out of the shell for access to the compact disc.

Other features and advantages of the present invention will become apparent from the following detailed description, taken in conjunction with the
15 accompanying drawings, which illustrate, by way of example, the principles of the invention.

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BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a perspective view of a prior art compact disc case;

5 FIGURE 2 is a perspective view of the case of FIGURE 1 being opened;

FIGURE 3 is a perspective view of the opened case of FIGURE 1 with the disc being lifted;

10 FIGURE 4 is a perspective view of a compact disc case of the present invention;

FIGURE 5 is a perspective view of the case of FIGURE 4 being opened;

FIGURE 6 is a perspective view of the opened case of FIGURE 4 with the disc being lifted;

15 FIGURE 7 is a combination top plan view of the case of FIGURE 4 with the drawer closed and a phantom view of the door opened;

FIGURE 8 is a rear side elevational view of the case of FIGURE 4;

20 FIGURE 9 is a combination first side elevational view of the case of FIGURE 4 and a phantom view of the drawer opened;

FIGURE 10 is a combination partial top plan view of another embodiment of the present invention showing a leaf spring and a phantom view of the drawer partially opened; and

25 FIGURE 11 is a partial top plan view of another embodiment showing a combination lock.

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DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring initially to FIGURE 4, there is illustrated a perspective view of a compact disc case, generally designated 60, in accordance with the present invention, storing a compact disc 62 inside. The case 60 has a shell 64 with a first lateral side 66, a second lateral side 68, an open front side 70, and a rear side 72. The shell 64 is preferably fabricated of a clear plastic such as styrene and is represented as such in all the figures permitting the customer and user to view the compact disc 62 inside. A drawer 74 carrying the compact disc 62 is slideable to and fro in the shell 64 between the first and second lateral sides 66 and 68 and through the open front side 70. A lock means 76 on the first lateral side 66 retains the drawer 74 inside the shell 64 in the closed locked position illustrated in FIGURE 1. When pressure is applied to the lock means 76 toward the second lateral side 68 in the direction of the arrow 78, the lock means 76 releases the drawer 74 from the closed locked position permitting the drawer 74 to move through the open front side 70.

FIGURE 5 is a perspective view of the case 60 being opened. The hand 80 grasps the case 60 with the thumb 82 on the lock means 76 and the fingers 84 on the second lateral side 68. The thumb 82 then squeezes the lock means 76 toward the second lateral side 68 releasing the lock means 76. Once the lock means 76 is released, a biasing means in the form of a long arm coiled spring 86 immediately pushes the drawer 74 away from the closed position represented in FIGURE 4 out the open front side 70 of the shell 64 in the direction of the arrow 88. A stop means 90 prevents movement of the drawer 74 entirely outside the shell 64 by stopping the drawer 74 at the open position illustrated in FIGURE 5. The spring 86 maintains the drawer 74 against the stop

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means 90 permitting unencumbered access to the compact disc 62.

FIGURE 6 is a perspective view of the opened case 60 with the disc 62 being lifted by the hand 80.

5 Notch means 92 in the sides of the drawer 74 permit the thumb 82 and the fingers 84 to grasp the edges of the disc 62 without touching and contaminating the faces of the disc 62 when the notch means 92 is outside the shell 64. In comparison, in prior art cases repeated
10 contamination of the recorded media will result when the faces of the discs are touched by the fingers during removal of the discs leaving oils and dirt on the media. The disc 62 is retained on a center spindle 94 of the drawer 74 for storage. The disc 62 is removed from the
15 drawer 74 by lifting the disc 62 up off the center spindle 94. It will be appreciated that while a compact audio disc 62 is illustrated, the case 20 is suitable for storing any audio, video, or computer media disc including compact discs providing read only memory
20 for computers.

FIGURE 7 is a combination top plan view of the case 60 with the drawer 74 closed and a phantom view of the drawer 74 opened. As noted above, the shell 64 is fabricated of a clear plastic allowing a clear view of
25 the drawer 74 inside. The drawer 74 is preferably fabricated of an opaque plastic. The shell 64 has a first lateral side 66, a second lateral side 68, an open front side 70, and a rear side 72. The shell 64 also has a top 96 and a bottom 98 that are shown in FIGURE 9.
30 The shell 64 thereby fully encloses the drawer 74 except for the open front side 70. The stop means 90 on the inside of the top 96 prevents the drawer 74 from moving entirely outside the shell 64.

The drawer 74 has a first drawer side 100, a
35 second drawer side 102, a front end 104, and a rear end 106. As shown in FIGURE 4, the front end 104 fills the

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open front side 70 of the shell 64 when the drawer 74 is in the closed position completely protecting the disc 62. The rear end 106 abuts the stop means 90 when the drawer 74 is opened preventing the drawer from moving outside the shell 64. The stop means 90 is tapered as shown in outline in FIGURE 9 allowing the drawer 74 to be pushed into the shell 64 past the stop means 90 when the case 60 is initially assembled.

A depression 108 in the drawer 74 is provided for the disc that is slightly larger than the diameter of the disc. The disc is retained in the depression 108 by placing the hole in the disc over the center spindle 94. A first notch 110 in the first drawer side 100 and a second notch 112 in the second drawer side 102 together provide the notch means 92 permitting the grasping of the disc without touching the faces of the disc 62 as shown in FIGURE 6.

The lock means 76 retains the drawer 74 inside the shell 64 in the closed locked position shown at the top of FIGURE 7. When pressure is applied on the lock means 76 towards the second lateral side 68, the lock means 76 is released allowing the drawer 74 to move from the closed locked position to the open position indicated in phantom outline at the bottom of FIGURE 7. The lock means 76 enters an aperture such as a slot 114 in the first lateral side 66 of the shell 64 having a first end 116 adjacent the open front side 70. The lock means 76 includes a tongue 118 coupled to the drawer 74 at a base 120 with a tip 122 for engaging the first end 116 of the slot 114. The lock means 76 releases when the tip 122 is pressed off the first end 116 out of the slot 114. The direction of the movement of the tip 122 off the tongue 118 releasing the lock means 76 is shown in the phantom view by the arrow 124.

The long arm coiled spring 86 immediately pushes the drawer 74 out of the shell 64 when the lock means 76 is released. The movement of the spring 86

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from the closed position to the open position is represented by the arrow 126. The stop means 90 prevents the spring 86 from pushing the drawer 74 entirely out of the shell 64.

5 FIGURE 8 is an rear side elevational view of the case 60 when the drawer 74 is in the closed position. The arms 128 and 129 of the coiled spring 86 are pressed together in the closed position.

 FIGURE 9 is a combination first side
10 elevational view of the case 60 with the drawer 74 closed and a phantom view of the drawer 74 open matching the positions of FIGURE 7. The spring 86 is only shown in the closed position. A compact disc fits inside the depression 108 on the center spindle 94. The lock means
15 76 includes the slot 114 in the first lateral side 66 of the shell 74 and the tongue 118 on the drawer 74.

 FIGURE 10 is a combination partial top plan view of another embodiment of the compact disc case, generally designated 130, of the present invention
20 similar to the top of FIGURE 7 showing a leaf spring 132 and a phantom view of the drawer 74' partially opened. All elements of the case 130 are the same as the elements of the case 60 illustrated in FIGURE 7 except for the biasing means. The biasing means for pushing
25 the drawer 74 out of the shell 64 of the case 60 is the long arm coiled spring 86. The biasing means in the present embodiment is the leaf spring 132. The leaf spring 132 can be molded integrally with the drawer 74', molded integrally with the shell 64', or be a separate
30 metal part bearing on both the rear end 106' of the drawer 74' and the rear side 72' of the shell 64' when the drawer 74' is in the locked position. When the lock means is released, the leaf spring 132 pushes the drawer 74' partially out of the shell 64' permitting the drawer
35 74' to be grasped and pulled out sufficiently to allow removal of the compact disc.

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FIGURE 11 is a partial top plan view of another embodiment of the compact disc case, generally designated 140, similar to the bottom left corner of FIGURE 7 showing a combination lock 142. All elements of the case 140 are the same as the elements of the case 60 illustrated in FIGURE 7 except for the lock means. The lock means 76 for the case 60 has the tongue 118 operating against the first end 116 of a slot 114. The combination lock 142 has the identical structure of a tongue 118" on the drawer 74" operating against a slot 114" on the first lateral side 66" of the shell 64". The combination lock 142 is in the closed locked position when the tip 122" of the tongue 118" abuts the first end 116" of the slot 114". The combination lock 142 may be released in the same manner as the lock means 76 by pushing the combination lock in the direction of the arrow 144. The combination lock 142 may also be released by pushing a tongue extension 146 on the front end 104" of the drawer 74" in the direction of the arrow 148. The pushing of the tongue extension 146 in the direction of the arrow 148 pushes the tongue extension 146 and the tongue 118" into the relief slot 150 releasing the tip 122" from the first end 116".

In view of the above, it may be seen that a compact disc case is provided that significantly improves access to a compact disc stored inside. Of course, the structure may be variously implemented and variously used depending upon specific applications. Accordingly, the scope hereof shall not be referenced to the disclosed embodiments, but on the contrary, shall be determined in accordance with the claims as set forth below.

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I claim:

1 1. A compact disc case for storing a compact disc,
2 comprising:
3 a shell having a first lateral side, a second
4 lateral side, an open front side, a top, and a bottom;
5 said first lateral side defining an aperture
6 therethrough;
7 a drawer slideable to and fro in said shell
8 between said first and second lateral sides and through
9 said open front side for carrying said compact disc,
10 said drawer having:
11 a front end positioned adjacent said
12 open front side when said drawer is in said shell;
13 a rear end spaced from said front end;
14 a first drawer side adjacent said shell
15 first lateral side and having a lock means selectively
16 protruding from the plane of said first drawer side; and
17 said lock means entering said aperture
18 to retain said drawer inside said shell in a closed
19 locked position and selectably releasing said drawer
20 from said closed locked position when said lock means
21 is pushed out of said aperture toward said second
22 lateral side.

1 2. The compact disc case according to claim 1 wherein
2 said aperture is a slot with a first end towards said
3 open front side and said lock means is a tongue coupled
4 to said first drawer side towards said rear end and
5 having a tip toward said front end, said tip biased
6 away from said plane to selectively protrude from said
7 plane to engage said first end of said slot at said
8 closed locked position and said lock means releasing
9 when said tip is pressed out of said slot.

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1 3. The compact disc case according to claim 2 wherein
2 said disc has faces and an edge and said drawer further
3 includes notch means for permitting one hand to lift
4 said disc by said edge without touching said disc faces
5 when said notch means is outside said shell.

1 4. The compact disc case according to claim 3 wherein
2 said notch means includes first and second notches in
3 said first and second drawer sides, respectively.

1 5. The compact disc case according to claim 4 and
2 further including biasing means for biasing said drawer
3 away from said closed locked position.

1 6. The compact disc case according to claim 5 wherein:
2 said shell further includes a rear side spaced
3 from said open front side; and
4 said biasing means includes a leaf spring
5 bearing against said rear side and said rear end when
6 said drawer is in said closed locked position.

1 7. The compact disc case according to claim 6 wherein
2 said leaf spring is molded integrally with said drawer.

1 8. The compact disc case according to claim 5 wherein
2 said shell further includes stop means for preventing
3 movement of said drawer outside said shell and said
4 biasing means biases said drawer against said stop
5 means.

1 9. A compact disc case for storing a compact disc
2 having faces and an edge, comprising:
3 a shell having a first lateral side, a second
4 lateral side, an open front side, a top, and a bottom;
5 a drawer slideable to and fro in said shell
6 between said first and second lateral sides and through

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7 said open front side for carrying said compact disc; and
8 said drawer having notch means for permitting
9 one hand to lift said disc by said edge without touching
10 said disc faces when said notch means is outside said
11 shell.

1 10. The compact disc case according to claim 9 wherein
2 said drawer further includes first and second drawer
3 sides and said notch means includes first and second
4 notches in said first and second drawer sides,
5 respectively.

1 11. The compact disc case according to claim 10 and
2 further including biasing means for biasing said drawer
3 outside said shell.

1 12. The compact disc case according to claim 11
2 wherein:
3 said shell further includes a rear side spaced
4 from said open front side;
5 said drawer further includes a front end
6 adjacent said open front side when said drawer is in
7 said shell and a rear end spaced from said front end;
8 and
9 said biasing means includes a leaf spring
10 bearing on said rear side and said rear end when said
11 rear side is adjacent said rear end.

1 13. The compact disc case according to claim 12 wherein
2 said leaf spring is molded integrally with said drawer.

1 14. The compact disc case according to claim 11 wherein
2 said shell further includes stop means for preventing
3 movement of said drawer outside said shell and said
4 biasing means biases said drawer against said stop
5 means.

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1 15. The compact disc case according to claim 1 wherein
2 said lock means is pushed out of said aperture by
3 pushing said lock means through said aperture toward
4 said second lateral side.

1 16. The compact disc case according to claim 1 wherein
2 said lock means includes an extension to said front end
3 wherein said lock means is pushed out of said aperture
4 by pushing said extension toward said second lateral
5 side.

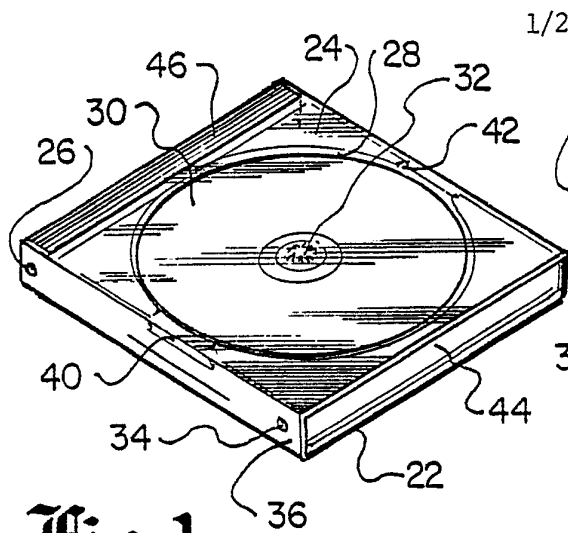


Fig. 1.
(PRIOR ART)

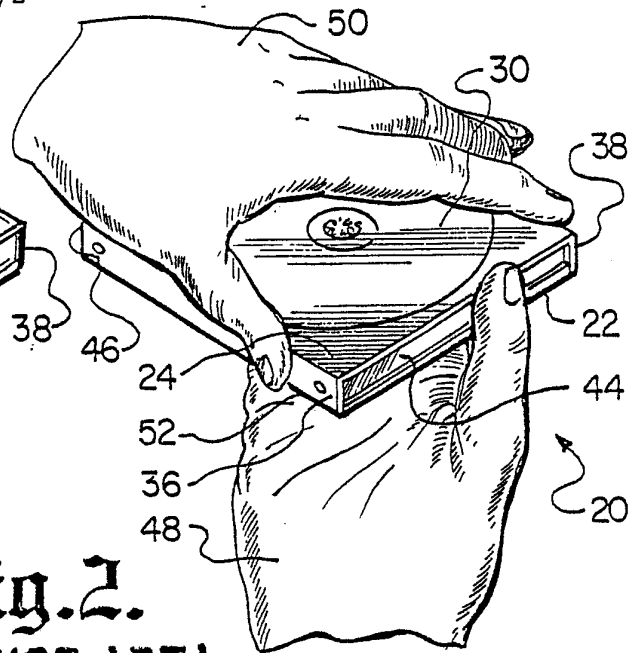


Fig. 2.
(PRIOR ART)

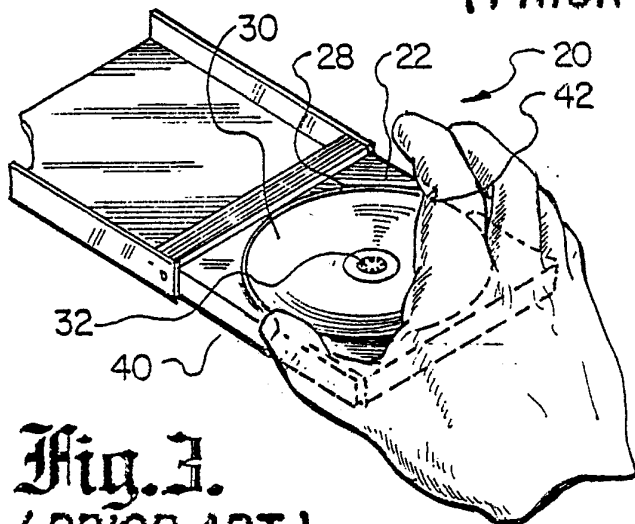


Fig. 3.
(PRIOR ART)

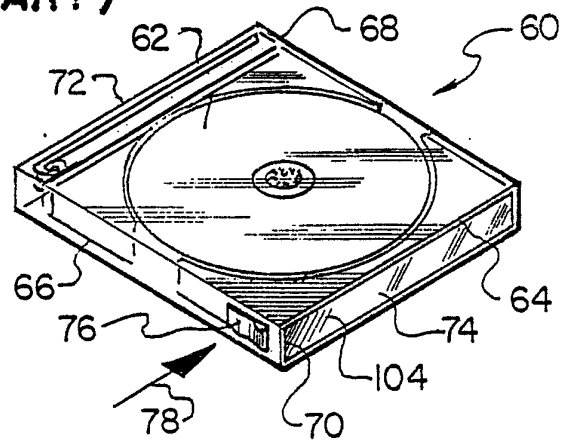


Fig. 4.

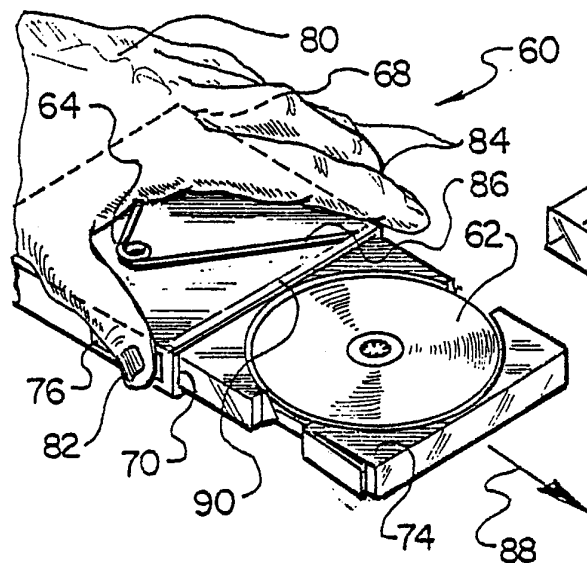


Fig. 5.

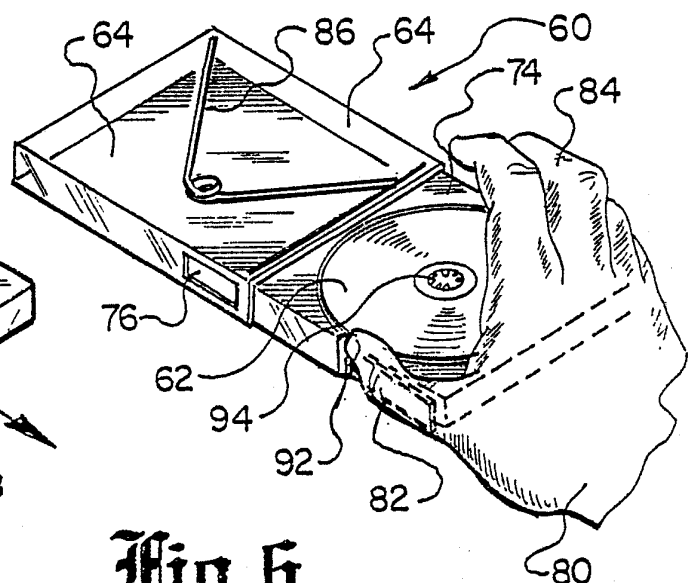


Fig. 6.

Fig. 9.

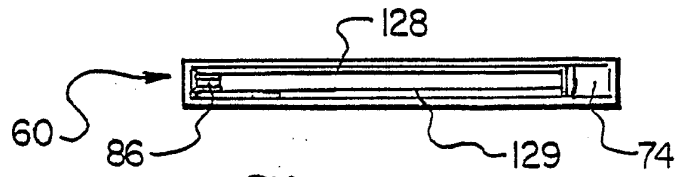
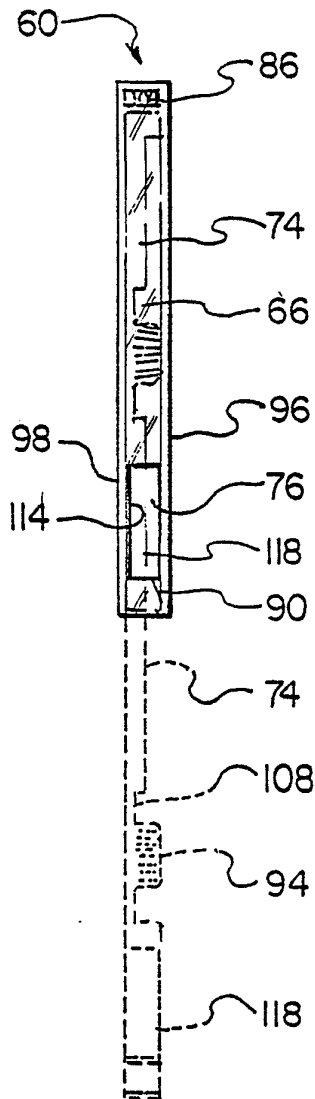


Fig. 8.

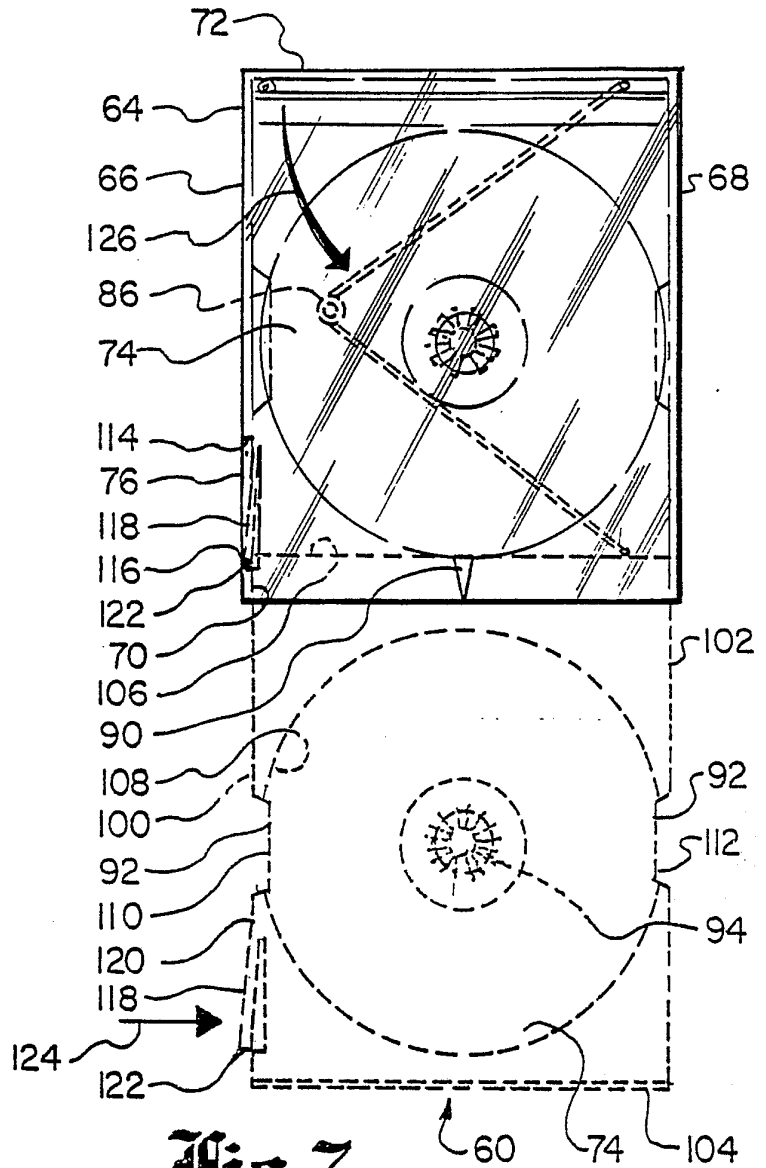


Fig. 7.

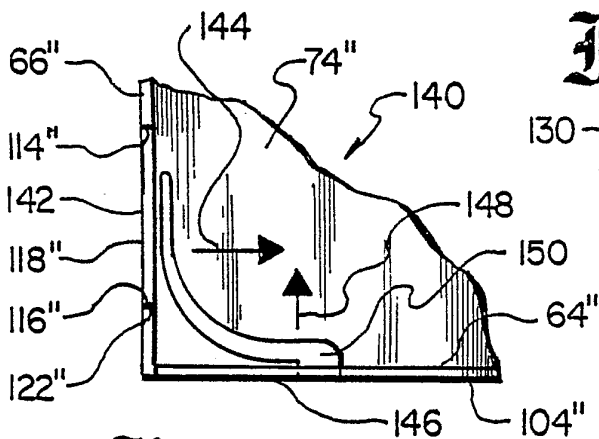


Fig. 11.

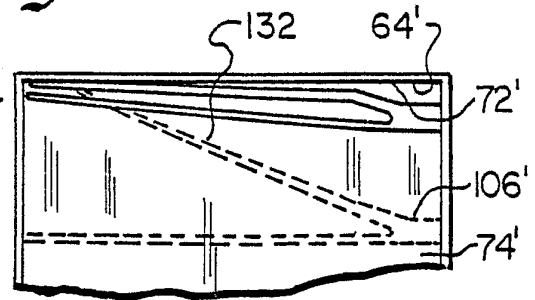


Fig. 10.

INTERNATIONAL SEARCH REPORT

International Application No PCT/US87/00690

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ³		
According to International Patent Classification (IPC) or to both National Classification and IPC IPC (4) B65D 85/30, 85/57, 85/672, 43/20, 85/00; A47B 81/06; A47F 1/04; G11B 33/02		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁴		
Classification System	Classification Symbols	
US	206/307, 309, 312, 313, 387, 444, 445; 220/346, 347, 348; 312/10, 12, 15, 16, 17, 18, 19; 369/77.1, 77.2, 79	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁵		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ¹⁴		
Category *	Citation of Document, ¹⁵ with indication, where appropriate, of the relevant passages ¹⁷	Relevant to Claim No. ¹⁴
Y	US, A, 4,046,255 (Ackeret) 6 Sept. 1977 entire specification	6,7,12,13 15, 16
A	US, A, 4,076,117 (Wisdom et al) 28 Feb. 1987	
<u>X</u> Y	US, A, 4,493,417 (Ackeret) 15 Jan. 1985 entire specification	9 1-3
A	US, A, 4,463,849 (Prusak et al) 7 Aug. 1984	
A	US, A, 4,561,544 (Reeve) 31 Dec. 1985	
Y	GB, A, 0,021,009 (Borrmann) 19 Dec. 1907 Column 6, lines 12-14	4,5,8,10,11 14
A	JP, A, 0,005,466 (Nippon) 12 Jan. 1984	
Y	JP, A, 0,053,512 (Sony) 26 April, 1979 entire specification	1-3
¹⁵ * Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search ²		Date of Mailing of this International Search Report ³
26 May, 1987		11 JUN 1987
International Searching Authority ¹		Signature of Authorized Officer ²⁰
ISA/US		Joseph M. Moy