

CARTRIDGE

The present invention relates to a cartridge suitable for accommodating a disc-shaped recording medium such as a CD-ROM for example and, more particularly, to a cartridge having a shutter slidably provided on both sides of an opening formed on one side of a casing of the cartridge to open and close the opening.

As disclosed in U.S. Patent No. 4,746,013 for example, a conventional disc cartridge for accommodating a disc-shaped recording medium such as a CD-ROM is composed of a disc-accommodating case formed with an opening at one side, a shutter slidably attached along one end of the case and between both ends of the opening to open and close it, and a compression coil spring for forcibly returning the shutter to a center position of the opening.

With such a conventional disc cartridge, a metal guide member made of a stainless sheet for example is assembled into one end of the case in parallel with a shutter sliding direction. A guide slider linked with the shutter and a pair of sliders are slidably inserted in the guide member. The two sliders are pulled to each other by means of a compression coil spring attached between ends of the sliders. Thus, the two sliders are abutted against both ends of the guide slider to forcibly return the shutter to the center of the above-mentioned opening.

By selectively sliding the shutter in one direction or another of the above-mentioned opening, one of the above-mentioned two sliders is selectively slid along the guide member against the force of the compression coil spring when opening the above-mentioned opening. It should be noted that a disc cartridge of the above-mentioned type is used on a disc drive as disclosed in U.S. Patent No. 5,119, 358 for example.

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However, with conventional disc cartridges of the above-mentioned type, the metal guide member made of a stainless sheet or the like must be inserted in the case, requiring a number of parts and assembly processes. In addition, the expensive metal guide member makes the final product extremely costly. Especially, an assembly process for assembling the guide member into the case by putting the guide member through the guide slider and the pair of sliders is difficult to automate, thereby reducing productivity. Further, there is a problem that the compression coil spring locked between the sliders is easily detached during assembly process.

It is therefore an object of the present invention to solve the above-mentioned problems by providing a cartridge that requires no metal guide member and therefore is easily assembled.

According to the present invention, there is provided a disc cartridge comprising;

a housing main body for rotatably housing therein a disc-shaped recording medium, said housing main body having an opening on its at least one side surface;

shutter means movable between a closed position at which said opening is closed and a first open position for opening said opening, said first open position being provided away from said closed position along one end of said housing main body in a first direction and between said closed position and a second opening position for opening said opening, said second opening position being provided away from said closed position along said housing main body in a direction opposite to said first direction;

a first slider and a second slider movable along a same straight line running along said one end of said housing main body, said first and second sliders having an engagement portion each, said first slider being disposed on

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a side of said first open position and said second slider being disposed on a side of said second open position;

stopper means disposed between said first and second sliders within a movable locus of said first and second sliders;

force applying means for pressing said first and second sliders toward each other so that end portions inside said sliders are abutted against said stopper means; and

guide means integrally formed with said shutter means, said guide means being engaged with said engagement portion of said first slider when said shutter means is driven in said first direction to press said first slider in said first direction and being engaged with said engagement portion of said second slider when said shutter means is driven in said second direction to press said second slider in said second direction.

The invention will be further described by way of non-limitative example with reference to the accompanying drawings, in which:-

Fig. 1 is an enlarged sectional view taken substantially along line A-A of Fig. 13 and describes a main portion of the disc cartridge practiced as a preferred embodiment of the invention;

Fig. 2 is a sectional view taken substantially along line B-B of Fig. 1;

Fig. 3, (A), (B) and (C) are diagrams for describing an operation of the shutter which opens toward both sides of the center stopper;

Fig. 4 is a perspective view of the guide slider, sliders, and the compression coil spring;

Fig. 5 is a perspective view of the sliders and the guide ribs;

Fig. 6 is a top view illustrating one end of the casing;

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Fig. 7, (A) is a side view taken substantially along line C-C of Fig. 6 and Fig. 7, (B) is a sectional view taken substantially along line D-D of Fig. 6;

Fig. 8, (A) is a top view of the shutter, Fig. 8, (B) is a side view taken substantially along line E-E of Fig. 8, (A), and Fig. 8, (C) is a side view taken substantially along line F-F of Fig. 8, (A).

Fig. 9, (A) is an enlarged side view of Fig. 8, (C) and Fig. 9, (B) is a sectional view taken substantially along line G-G of Fig. 9, (A);

Fig. 10, (A) is a top view of the guide slider, Fig. 10, (B) is a side view taken substantially along line H-H of Fig. 10, (A), and Fig. 10, (C) is a sectional view taken substantially along line I-I of Fig. 10, (A);

Fig. 11, (A) is a top view of the slider and Fig. 11, (B) is a side view taken substantially along line J-J of Fig. 11, (A);

Fig. 12 is a sectional view illustrating a variation of the guide pawl of the shutter;

Fig. 13, (A) is a bottom view of the entire disc cartridge and Fig. 13, (B) is a side view taken substantially along line K-K of Fig. 13, (A); and

Fig. 14, (A) is a top view of the entire disc cartridge and Fig. 14, (B) is a side view taken substantially along line L-L of Fig. 14, (B).

A disc cartridge practiced as a preferred embodiment of this invention will be described by referring to the accompanying drawings.

Description of the disc cartridge in its entirety:
First, the disc cartridge will be described in its entirety by referring to Fig. 13 and Fig. 14.

A disc-shaped recording medium 1 such as a CD-ROM composed of an optical disc is rotatively accommodated in a casing 2. A hole 1a is formed at the center of the disc-shaped recording medium 1. The casing 2 is formed into



a flat, rectangular box made of synthetic resin for example.

The casing 2 has an upper and a lower side. An opening 3 is formed on the lower side 2a. The opening 3 is continuously formed by both a circular opening 3a provided at the center of the casing 2 facing the center hole 1a and a rectangular opening 3b extending from the hole 3a toward the center of an end 2c of the casing 2. The circular opening 3a and the rectangular opening 3b accommodate a disc deck's disc table, not shown, and optical pickup, not shown, respectively.

A recess 4 is formed on the lower surface 2a of the casing 2. In the recess 4, a shutter 5 is disposed so that it slides in directions indicated by arrows a and b to open or close the opening 3. The shutter 5, made of a stainless sheet for example, has a generally rectangular shape. Referring to Fig. 13, (A) and (B), the shutter 5 is disposed so that it slides in the directions indicated by the arrows a and b between a closed position, indicated by solid lines, on a center position P of the opening 3 and an open position, indicated by lines composed of alternating long dashes and single dots on the right side and lines composed of alternating long dashes and double dots on the left side.

Referring to Fig. 14, (A), a generally square opening 6 is formed generally entirely over the upper surface 2b of the casing 2 except for a part of the end 2c. A transparent plate 7 is pivotally disposed on the casing 2 by means of a pair of rocking pins 8 disposed on the right and left sides to open or close the opening 6. The transparent plate 7, made of transparent synthetic resin, has a disc-shaped disc clasper 9 on its center. The transparent plate 7 is pivotally opened to expose the opening 6, thereby providing access to the disc-shaped recording medium 1 in the casing 2.



A short end 5a of the shutter 5 goes from the lower surface 2a of the casing, around the end 2c to the upper surface 2b in a generally "C" shape, and is slidably engaged in a guide groove 12 provided on the upper surface 2b, the guide groove 12 being guiding means parallel to the shutter sliding directions (indicated by the arrows a and b). Another short end 5b of the shutter 5 is slidably engaged in a guide slit 13 provided on a part of the upper surface 2a of the casing 2 in parallel with the shutter sliding directions (indicated by the arrows a and b).

Consequently, the shutter 5 is guided by the guide groove 12 and the guide slit 13 at both the short ends 5a and 5b to be slid in the recess 4 in the a and b directions. It should be noted that the end 5a of the shutter 5 is formed with a pair of shutter open/close arm engagement holes 10 on the right and left sides.

Description of the casing:

The casing 2 will be described in a construction associated with the shutter 5 by referring to Figs. 1, 2, 5, 6 and 7.

The end 2c of the casing 2 is internally formed with a first groove-like portion 14 and a second groove-like portion 15. The second groove-like portion 15 is formed beyond the first groove-like portion 14 continuously. Both the groove-like portions are formed in parallel with the shutter sliding directions (indicated by the arrows a and b). The casing 2 is internally and integrally formed with a guide rib 16 disposed along the center of the second groove-like portion 15, in parallel with the upper and lower surfaces 2a and 2b of the casing 2, and in parallel with the shutter sliding directions. Referring to Fig. 6, it should be noted that this guide rib 16 is integrally formed on a portion of an outer peripheral wall 2d for the disc-shaped recording medium at the center of the wall's height. The wall 2d is also internally and integrally formed on the

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casing 2. A pair of upper and lower center stoppers 17 is integrally formed on the guide rib 16 at its upper and lower sides at a center P of the opening 3. A pair of projections 29a constituting a second engagement portion 29 is
5 integrally formed thereon at the right and left sides of the above-mentioned pair of center stoppers 17.

Description of the shutter:

The shutter 5 will be described by referring to Figs. 1, 8 and 9.

10 The shutter 5, made of a material such as a stainless sheet, has a generally band-like shape. One end 5a of the shutter 5 is integrally formed, along its entire breadth, with a "C"-shaped bend 5c. The bend 5c is
15 integrally formed, on its tip at right and left sides, with a pair of guide pawls 5d at right angles to the bend 5c. Inside the bend 5c, a vertical pair of locking ribs 5e bent in generally "L" shape is integrally formed on the bend 5c in parallel with the shutter sliding directions. The
20 locking ribs 5e are symmetrically disposed with their tips directed inside. A vertical pair of notches 5f is formed on the locking ribs 5e along parts of their lengths.

Description of guide slider:

A guide slider 19 will be described by referring to Figs. 1, 2, 4 and 10.

25 The guide slider 19, made of synthetic resin, is formed into a generally square bar whose length is approximately equal to the entire breadth (the horizontal width of Fig. 9, (A)) of the "C"-shaped bend 5c of the shutter 5. The guide slider 19 is formed with a vertical
30 pair of slits 19c on the outside surface 19a from one end to a neighborhood of the other end of the guide slider 19. The pair of slits 19c is integrally formed with a pair of locking pawls 19d in the neighborhood of closed ends thereof. An inside surface 19b of the guide slider 19 is
35 formed into a generally "U"-shaped groove. The guide slider

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19 is also formed with a horizontal pair of both-sided stoppers 20 at right and left ends thereof. The pair of both-sided stoppers 20 is integrally formed with a horizontal pair of projections 28a that constitutes a horizontal pair of first engagement portions 28. These projections 28a are each formed into a tapered surface 28a' at a tip thereof. The inside surface 19b of the guide slider 19 is integrally formed with a bulging guide portion 30 at the center along its length.

10 Description of sliders:

A horizontal pair of sliders 22 will be described by referring to Figs. 1, 2, 4, 5 and 11.

These sliders 22, made of synthetic resin, are each formed into a horizontally symmetrical, generally cylindrical shape. Each slider 22 is internally formed with a cylindrical hollow portion 23 running along its length. The hollow portion 23 is internally formed with a slit 24 along its length. The sliders 22 are formed with a vertical pair of notches 29b inside ends 22a thereof facing an end of the other slider 22. The notches 29b constitute a second engagement portion 29. An end 22b of each slider 22, facing opposite to each other slider 22, projects from an arc-shaped side of the slider 22 at right angles to it. The projection of the end 22b is formed with an engagement hole 28b that constitutes the first engagement portion 28. The engagement hole 28b is formed with a tapered surface 28b' at an end facing the engagement hole 28b of the other slider 22. The pair of sliders 22 are also integrally formed with a horizontal pair of spring locks 25 in the hollow portions 23 at the ends 22b.

As shown in Figs. 1, 2, 6 and 7, at locations near the horizontal ends of the opening 3, the second groove-like portion 15 of the casing 2 is integrally formed with a horizontal pair of guide projections 31 on an upper surface of an inner wall of the second groove-like portion 15.



As shown in Fig. 1, the second groove-like portion 15 of the casing 2 is also integrally formed with an auxiliary center stopper 17a on the upper surface of the inner wall thereof at the center position P of the opening 3.

Also as shown in Fig. 1, a vertical width (shown horizontally in Fig. 1) of the first groove-like portion 14 disposed inside the end surface 2c of the casing 2 is larger than a width of the second groove-like portion 15. Between the first and second groove-like portions 14, 15, a vertical pair of stopping surfaces 33 is formed. The upper stopping surface 33 (on the upper surface 2b of the casing 2) is formed into a generally "V"-shaped stopper surface 33a in a direction indicated by an arrow c.

Assembling the shutter:

The shutter 5 is assembled as described below.

First, referring to Figs. 1 and 2, attach the guide slider 19 inside the "C"-shaped bend 5c of the shutter 5 in parallel thereto. In doing so, press the vertical pair of slits 24 of the guide slider 19 into the vertical pair of locking ribs 5e of the "C"-shaped bend 5c along their lengths until the vertical pair of locking pawls 19d are locked with the vertical pair of notches 5f. Thus, the guide slider 19 can be attached into the "C"-shaped bend 5c in a single operation.

Next, referring to Figs. 1, 2 and 4, install a compression coil spring 26, means for force application, through the hollow portion 23 of the horizontal pair of sliders 22. Lock both ends 26a of the compression coil spring 26 with the pair of the spring locks 25 of the sliders 22. Then, the both sliders 22 are pulled by the spring 26 toward each other in the directions of the arrow a, with the ends 22a of the sliders 22 abutting against each other in the directions of the arrow a.



It should be noted that the compression coil spring 26 is stably held in the hollow portion 23 of the sliders 22 in the above-mentioned assembly, making it difficult for the spring 26 to be detached from the sliders 22.

Now, as shown in Fig. 4, pull the horizontal pair of the sliders 22 from each other against the force of the spring 26 in the directions of the arrow b and, as shown in Figs. 1 and 2, engage the horizontal pair of engagement holes 28b of both the sliders 22 with the horizontal pair of projections 28a of the guide sliders 19 from the directions of arrows b. The compression coil spring 26 causes the end surfaces 22b of the horizontal pair of sliders 22 to be abutted against the horizontal pair of both-sided stoppers 20 of the guide sliders 19.

Thus, the horizontal pair of sliders 22 and the compression coil spring 26 are assembled inside the "C"-shaped bend 5 of the shutter 5 to be stably held.

Then, referring to Figs. 1 and 2, insert the horizontal pair of sliders 22 and the guide sliders 19 from the end surface 2c of the casing 2 into the first and second groove-like portions 14, 15 in the direction of the arrow c. In doing so, slightly vertically open the "C"-shaped bend 5c of the shutter 5 against elasticity and set the bend 5c over the lower surface 2a of the casing 2 and the end surface 2c and around the upper surface 2b and into the guide groove 12. Insert the horizontal pair of the guide pawls 5d at the tip of the bend 5c into the guide groove 12 in a slidable manner.

Consequently, the horizontal pairs of sliders 22 and guide sliders 19 can be inserted in the first and second groove-like portions 14, 15 in the direction of the arrow c in a single operation, facilitating the assembling of the shutter 5 into the casing 2 to a great extent, thereby permitting automatic assembling.



It should be noted that, in inserting the horizontal pair of sliders 22 in the second groove-like portion 15 in the direction of the arrow c, the horizontal pair of guide projections 31 escapes outside against elasticity. When the sliders 22 have been inserted in the second guide groove 15 in the direction of the arrow c, the guide projections 31 are abutted against the arc-shaped outside surfaces 22c of the sliders 22.

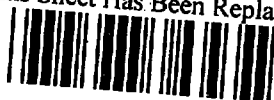
As shown in Fig. 1, a vertical pair of abutting portions 34 formed on upper and lower ends of the "U"-shaped inside surface 19b of the guide slider 19 inserted in the first guide groove 14 in the direction of the arrow c are abutted against the vertical pair of stopper surfaces 33 in the casing 2. It should be noted that the upper abutting portion 34 of the guide slider 19 is also abutted against the "V"-shaped abutting portion 34a in accordance with the "V"-shaped stopper surface 33a, the upper stopper surface 33.

As shown in Figs. 1 and 2, the vertical pair of sliders 22 inserted in the second groove-like portion 15 in the direction of the arrow c are inserted in the upper and lower portions of the guide rib 16 in the direction of the arrow c by means of the slits 24 provided on the sliders 22.

When the shutter 5 has been assembled into the casing 2, the horizontal pair of sliders 22 are pulled to each other in the directions of the arrow a by means of the compression coil spring 26, abutting their ends 22a against the left and right sides of the center stopper 17 and the auxiliary center stopper 17a in the directions of the arrow a, as shown in Figs. 2 and 3 (A).

By means of the force of the compression coil spring 26, the ends 22b of the horizontal pair of sliders 22 uniformly press the horizontal pair of both-sided stoppers 20 of the guide slider 19 in the direction of the arrow a,

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thereby positioning the shutter 5 to the center position P. Thus, the shutter 5 closes the opening 3 as indicated by solid lines in Fig. 13.

5 With the opening 3 closed, the ends 22b of the horizontal pair of sliders 22 overlap with the inside of right and left rims 2f of the opening 3 of the casing 2 by a certain amount indicated by "O" in Fig. 2.

10 Also, with the opening 3 closed, the notches 29b of the ends 22a of the horizontal pair of sliders 22 are engaged with the projections 29a on the left and right sides of the center stopper 17 in the direction of the arrow a as shown in Fig. 2.

As shown in Figs. 1 and 2, the horizontal pair of both-sided stoppers 20 of the guide slider 19 is engaged
15 with the ends 22b of the horizontal pair of sliders 22 by means of the projections 28a and engagement holes 28b of the horizontal pair of first engagement parts 28. The ends 22a of the horizontal pair of sliders 22 are engaged with the left and right sides of the center stopper 17 by means of
20 the projections 29a and notches 29b of the horizontal pair of second engagement portions 29. The horizontal pair of guide projections 31 is engaged with the outside surfaces 22c of the horizontal pair of sliders 22.

The above-mentioned setup prevents the guide
25 slider 19 and the horizontal pair of sliders 22 from inadvertently coming off the first and second groove-like portions 14, 15 of the casing 2 in an direction of the arrow d.

The overlap "O" between the end 22b of the
30 horizontal pair of sliders 22 and the right and left side rims 2f of the opening 3 of the casing 2 prevents the horizontal pair of sliders 22 from being inadvertently pulled out toward the opening 3 (to the left in Fig. 1) of the casing 2.

As shown in Fig. 1, the horizontal pair of guide pawls of the shutter 5 is inserted in the guide groove 12 of the casing 2, preventing the shutter 5 from being inadvertently pulled out of the casing 2 in the direction of the arrow d.

As shown in Fig. 1 again, if an external pressure is applied to the "C"-shaped bend 5c of the shutter 5 in the direction of the arrow c, the vertical pair of abutting portions 34 of the guide slider 19 is abutted, in the direction of the arrow c, against the vertical pair of stopper surfaces 33 integrally formed on the inside wall of the casing 2. Thus, the stopper surfaces 33 securely support the applied external pressure.

Consequently, the above-mentioned setup prevents the guide slider 19 from being pushed by the external pressure in the direction of the arrow c deep into the second groove-like portion 15 of the casing 2 to vertically expand the casing 2, thereby destroying it. Thus, the casing 2 becomes highly durable.

Especially, since the upper stopper surface 33 and the abutting portion 34 are formed into the "V"-shaped stopper surface 33a and the "V"-shaped abutting portion 34a, the upper surface 2b of the casing 2 can be drawn toward the lower surface 2c by pushing the "V"-shaped abutting portion 34a into the "V"-shaped stopper surface 33a by means of wedge action, thereby preventing the upper surface 2b of the casing 2 from being inadvertently pushed open outside.

In the above-mentioned setup, as shown in Fig. 14, the upper surface 2b of the casing 2 is mostly opened by the opening 6 and therefore the upper surface 2b is lower than the lower surface 2a in strength, so that the above-mentioned effect provided by the "V"-shaped abutting portion 34a and the "V"-shaped stopper surface 33a is conspicuous.

Shutter opening and closing operations:

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Opening and closing operations of the opening 3 by means of the shutter 5 will be described by referring to Fig. 3.

Fig. 3, (A) shows the opening 3 closed with the shutter 5 positioned at the center P of the opening 3.

Fig. 3, (B) shows the opening 3 opened as indicated by lines composed of alternating long dashes and single dots with the shutter 5 slid from the center P to the right in the direction of the arrow b.

As shown in Fig. 3, (B), with the left slider abutted against the center stopper 17 in the direction of the arrow a, the both-sided stopper 20 of the right side of the guide slider 19 presses the end 22b of the right slider 22 in the direction of the arrow b to slide the right slider 22 in the direction of the arrow b together with the guide slider 19, pulling the compression coil spring to the right, or in the direction of the arrow b.

Fig. 3, (C) shows the opening 3 opened as indicated by lines composed of alternating long dashes and double dots, with the shutter 5 slid from the center position P to the left in the direction of the arrow b.

In the above-mentioned state, as shown in Fig. 3, (C), with the right slider abutted against the center stopper 17 in the direction of the arrow a, the both-sided stopper 20 of the left side of the guide slider 19 presses the end 22b of the left slider 22 in the direction of the arrow b to slide the left slider 22 in the direction of the arrow b together with the guide slider 19, pulling the compression coil spring to the left, or in the direction of the arrow b.

As shown in Fig. 3, (B) and (C), it is apparent that the shutter 5 slid from the center position P of the opening 3 to the right or left side in the direction of the arrow b is returned to the center position P of the opening 3 in the direction of the arrow a shown in Fig. 3, (A) by

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the compression coil spring 26 which pulls the right and left sliders 22 to each other in the direction of the arrow a.

When the shutter 5 slides in the directions of the arrows a and b, the horizontal pair of sliders 22 is guided by the guide rib 16 inserted by the slit 24 can smoothly slide in the directions of arrows a and b. While these sliders 22 are sliding in the directions of the arrows a and b, the horizontal pair of guide projections 31 prevents the sliders 22 from being pulled out of the second groove-like portion 15 in the direction of the arrow d.

Referring to Fig. 2 and Fig. 3, (A), when the shutter 5 is returned to the center position P of the opening 3 in the direction of the arrow a, the horizontal pair of first and second engagement portions 28, 29 are engaged with the projection 28a with the engagement hole 28b and the projection 29a with the notch 29b.

In the above-mentioned setup, as shown in Fig. 2, the projection 28a and engagement hole 28b of the first engagement portion 28 are guided by the tapered surfaces 28a' and 28b' of these projection and hole to be smoothly engaged with each other. For the second engagement portion 29, the end 22a of each slider 22 is guided by the guide portion 30 of the guide slider 19 to be applied force in the direction of the arrow c, smoothly engaging the projection 29a with the notch 29b.

A variation to the guide pawl 5d of the shutter 5 will be described by referring to Fig. 12.

In this variation example, the horizontal pair of guide pawls 5d on top of the "C"-shaped bend 5c of the shutter 5 is bent at an acute angle θ and the side surface 12a of the guide groove 12 is also formed at the acute angle θ which is parallel to the guide pawls 5d.

According to the above-mentioned variation, a pulling force to be applied to the shutter 5 in the



direction of the arrow d can be securely supported by the guide pawl 5d having the acute angle θ and the side surface 12a having the acute angle θ of the guide groove 12, preventing the shutter 5 from being detached out of the casing 2 in the direction of the arrow d.

While preferred embodiments of the invention have been described using specific terms, such description is for illustrative purposes only, and it is to be understood that changes and variations may be made without departing from the scope of the appended claims.

It is apparent that the present invention is applicable to cartridges of various types for accommodating encased recording media of various types.

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CLAIMS

1. A disc cartridge comprising:

5 a housing main body for rotatably housing therein
a disc-shaped recording medium, said housing main body
having an opening on its at least one side surface;

shutter means movable between a closed position at
which said opening is closed and a first open position for
opening said opening, said first open position being
10 provided away from said closed position along one end of
said housing main body in a first direction and between said
closed position and a second opening position for opening
said opening, said second opening position being provided
away from said closed position along said housing main body
15 in a direction opposite to said first direction;

a first slider and a second slider movable along a
same straight line running along said one end of said
housing main body, said first and second sliders having an
engagement portion each, said first slider being disposed on
20 a side of said first open position and said second slider
being disposed on a side of said second open position;

stopper means disposed between said first and
second sliders within a movable locus of said first and
second sliders;

25 force applying means for pressing said first and
second sliders toward each other so that end portions inside
said sliders are abutted against said stopper means; and

guide means integrally formed with said shutter
means, said guide means being engaged with said engagement
30 portion of said first slider when said shutter means is
driven in said first direction to press said first slider in
said first direction and being engaged with said engagement
portion of said second slider when said shutter means is
driven in said second direction to press said second slider
35 in said second direction.

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2. A disc cartridge according to claim 1, wherein said first and second sliders each have a hollow passing through said housing main body thereof along one end of and said force applying means is composed of a compression coil spring whose ends are engaged with external ends of said first and second sliders.

3. A disc cartridge according to claim 2, further comprising a guide rib formed inside said housing main body in parallel with said one end of said housing main body, and wherein said first and second sliders each have a slit in which said guide rib is inserted.

4. A disc cartridge according to claim 2 or 3, further comprising a guide rib formed inside said housing main body in parallel with said one end of said housing main body, and wherein said first and second sliders each have a slit which opens said hollow and in which said guide rib is inserted.

5. A disc cartridge according to any one of claims 1 to 4, further comprising a plurality of stopper surfaces formed inside said housing main body to restrict a movement of said guide means into said housing main body.

6. A disc cartridge according to claim 5, wherein said plurality of stopper surfaces are disposed on inner walls of an upper case and a lower case of said housing main body, at least one of said plurality of stopper surfaces being formed into a generally "V" shape.

7. A disc cartridge according to any one of claims 1 to 6, further comprising a cover pivotally secured on said housing main body to close, at a closed position, an opening formed on said housing main body for accommodating said

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disc-shaped recording medium and open, at an open position, said housing main body to allow getting said disc-shaped recording medium in and out.

5 8. A disc cartridge according to claim 7, wherein said cover is composed of a transparent plate.

9. A disc cartridge according to claim 7 or 8, further comprising a first stopper surface and a second
10 stopper surface respectively disposed on an inner wall of an upper case of said housing main body and an inner wall of a lower case of said housing main body to restrict a movement of said guide means into said housing main body, said first stopper surface being formed into a generally "V" shape.

15 10. A disc cartridge according to any one of the preceding claims wherein, when said shutter means is at said closed position, non-adjacent ends of said first and second sliders are respectively located at least toward said first
20 and second open positions away from the end of the opening of said housing main body.

11. A disc cartridge constructed and arranged to operate substantially as hereinbefore described with
25 reference to and as illustrated in the accompanying drawings.

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