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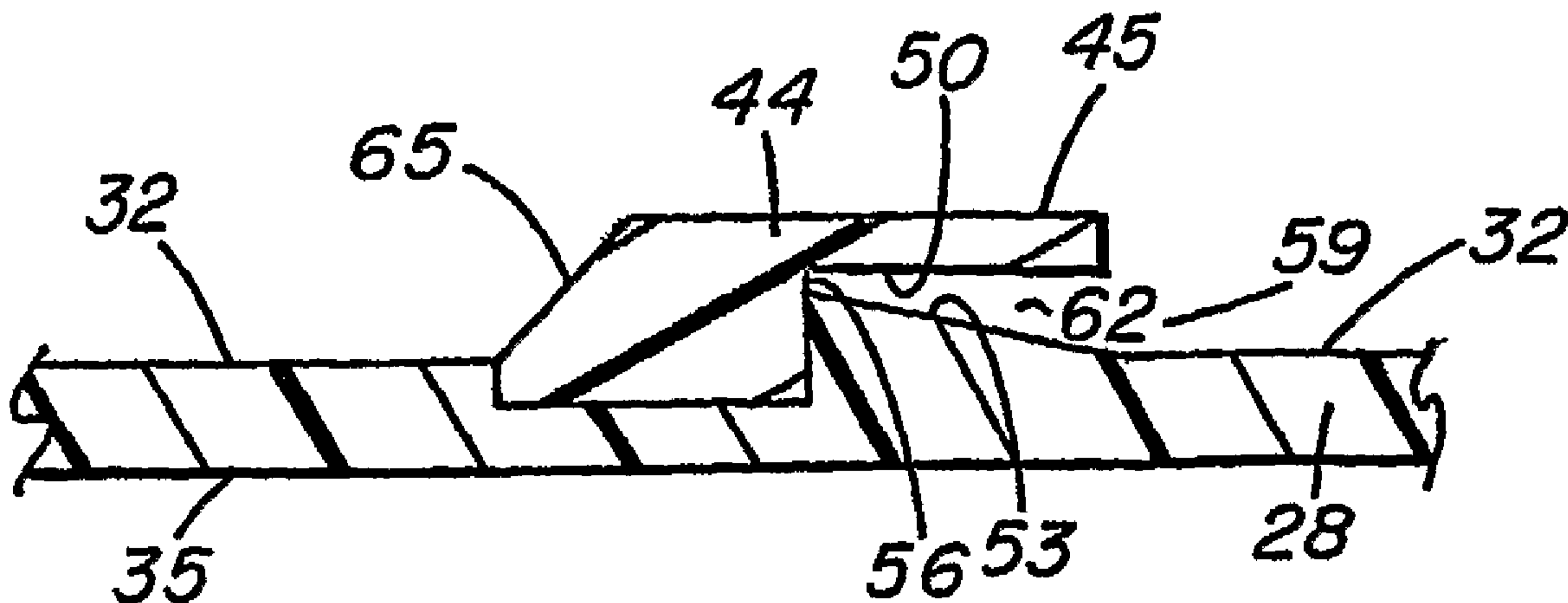
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(54) Title: DIGITAL DATA STORAGE ASSEMBLY



(57) Abrégé/Abstract:

A digital data storage assembly (2), e.g., a flexible thin film compact disc, is described. Digital data storage assembly (2) includes, (a) a thin film data storage carrier (11), having substantially opposed first (14) and second (17) surfaces, a aperture (20) defined in part by a pair of substantially opposed arcuate sides (97, 97') and a pair of substantially opposed substantially straight sides (94, 94'), and at least one tab (23, 26) extending partially into aperture (20). The assembly (2) also includes, (b) a rigid support (29) having substantially opposed first (32) and second (35) surfaces, and an aperture (38). The assembly (2) further includes, (c) a locking device (41) positioned at least partially around aperture (38) of rigid support (29). Locking device (41) includes at least one shelf (44, 47) extending out over a portion of the first surface (32) of rigid support (29). The shelf (e.g., 44) and a portion (e.g., 53) of the first surface (32) of rigid support (29) residing thereunder together define a slot (e.g., 62), having an open end (59) and a closed end (56). The second surface (17) of thin film data storage carrier (11) abuts at least a portion of the first surface (32) of rigid support (29). The aperture (20) of data storage carrier (11), and the aperture (38) of rigid support (29) are substantially aligned. Thin film data storage carrier (11) is reversibly fixed to rigid support (29) by means of the tab (e.g., 23 and 26) of data storage carrier (11) being reversibly received within the slot (e.g., 62 and 62'). Also described is a thin film data storage carrier support (5), and a thin film data storage carrier (11) having an aperture (20).

DIGITAL DATA STORAGE ASSEMBLYDESCRIPTION OF THE INVENTION

The present invention relates to a digital data storage assembly that includes a thin film data storage carrier having an aperture, a rigid support
5 having an aperture, and a locking device positioned at least partially around the aperture of the rigid support. The aperture of the storage carrier has a circular portion and at least one recessed portion extending outward from the circular portion. The locking device includes at least one shelf that extends out over the upper surface of the rigid support, and the
10 two together define a tapered slot having an open end and a closed end. The thin film data storage carrier has at least one tab formed by the intersection of one edge of the circular portion and one edge of the recessed portion. The storage carrier is preferably optically readable, e.g., a thin film compact disc. The thin film data storage carrier is reversibly fixed to
15 the rigid support by means of the tab being reversibly received and fixed within the tapered slot (e.g., by means of rotating the thin film data storage carrier around the locking device).

Data storage carriers include those that are optically readable, such as compact discs, rewritable compact discs, video discs and DVD discs.
20 Optically readable data storage carriers, such as compact discs, are typically rigid and are fabricated by processes that include a thermoplastic injection molding step. The injection molding step typically limits the number of units that can be prepared in a given amount of time. In addition, rigid optically readable data storage carriers, such as rigid
25 compact discs, have space and storage configuration requirements that can limit marketing and transport thereof. For example, rigid compact discs must be physically stored and transported in such a way as to minimize bending, which can result in cracking or catastrophic breakage of the discs.

30 More recently, thin film data storage carriers have been developed, such as thin film flexible compact discs, that combine the advantages of

rigid compact discs (e.g., high data storage capacity) with improved physical storage and transport capabilities. The production rates of thin film flexible data storage carriers are generally greater than those of rigid data storage carriers. Typically, thin film flexible data storage carriers can
5 be prepared in the absence of a limiting injection molding step, e.g., by means of cutting data-embossed thin film flexible discs out of a sheet of thermoplastic material.

Thin film flexible data storage carriers typically must be further supported, for example by means of a rigid adapter or lens, if used in an
10 optical digital accessing apparatus originally adapted for use with rigid carriers, such as rigid compact discs. Rigid adapters developed thus far, typically are complicated to use and/or do not adequately reversibly fix the thin film data carrier in place. Reversibly fixing the thin film data carrier to the rigid adapter allows for ease of switching thin film data carriers, and
15 adequately holding the thin film data carrier in place during its use within an optical digital accessing apparatus, e.g., a compact disc player.

It is desirable to further develop thin film data storage assemblies that provide ease of use. In addition, it would be desirable that such newly developed thin film data storage assemblies include a rigid adapter to
20 which the thin film data carrier, e.g., a thin film flexible compact disc, can be reversibly fixed.

United States Patent Numbers 5,579,296 and 5,869,163 disclose a thin film data storage medium that includes a thin film data carrier, and a reusable adapter that temporally receives and supports the thin film data
25 carrier. The adapter may include a rotational locking mechanism having a slot with an end for receiving a tab of the thin film data carrier.

In accordance with the present invention, there is provided a digital data storage assembly comprising:

- 30 (a) a thin film data storage carrier, having substantially opposed first and second surfaces, i.e., substantially parallel first and second surfaces, having a cruciform aperture defined in part

by a pair of substantially opposed arcuate sides and a pair of substantially opposed substantially straight sides, and having at least one tab extending partially into said aperture;

5 (b) a rigid support having substantially opposed first and second surfaces, i.e., substantially parallel first and second surfaces, and having an aperture; and

10 (c) a locking device positioned at least partially around said aperture of said rigid support, said locking device comprising at least one shelf extending out over a portion of the first surface of said rigid support, said shelf having an upper surface and a lower surface, a portion of the first surface of said rigid support residing under said shelf, the lower surface of said shelf and said portion of said first surface of said rigid support residing under said shelf together defining a tapered slot dimensioned to reversibly receive and reversibly fix the
15 tab of said thin film data storage carrier, said tapered slot having an open end and a closed end,

wherein the second surface of said thin film data storage carrier abuts at least a portion of the first surface of said rigid support, the cruciform
20 aperture of said thin film data storage carrier (a), and the aperture of said rigid support (b) are substantially aligned, and said thin film data storage carrier is reversibly fixed to said rigid support by means of the tab of said thin film data storage carrier being reversibly received within said tapered slot.

25 In further accordance with the present invention, there is provided a thin film data storage carrier support comprising:

(i) a rigid support having substantially opposed first and second surfaces, and having an aperture; and
(ii) a locking device positioned at least partially around said
30 aperture of said rigid support, said locking device comprising at least one shelf extending out over a portion of the first

surface of said rigid support, said shelf having an upper surface and a lower surface, a portion of the first surface of said rigid support residing under said shelf, the lower surface of said shelf and said portion of said first surface of said rigid support residing under said shelf together defining a tapered slot, said tapered slot having an open end and a closed end, wherein said tapered slot is dimensioned to reversibly receive and reversibly fix a tab of a thin film data storage carrier as described above, and thereby allow the thin film data storage carrier to be reversibly fixed to the rigid support of the thin film data storage carrier support.

In accordance with the present invention, there is also provided a thin film data storage carrier having a cruciform aperture therein.

In yet another aspect of the present invention, there is provided a digital data storage assembly comprising:

- (a) a rigid support having a central opening therein;
- (b) a locking device affixed to the support at a periphery of the central opening; and
- (c) a flexible disc having a central aperture therein adapted to be assembled flatwise on the support with the central aperture in the disc aligned with the central opening in the support and with the central aperture in the disc extending into the locking device on the support ;
- (d) said central aperture in the disc having a circular portion defined at least in part by opposing arcuate edges, and at least one recess portion extending outward from said circular portion and defined by at least one recess edge;
- (e) said disc and support being relatively rotatable in one direction to bring said recess edge into locking engagement with said locking device thereby to secure the disc to the support, and being relatively rotatable in an opposite direction for removal of the disc from the support.

