



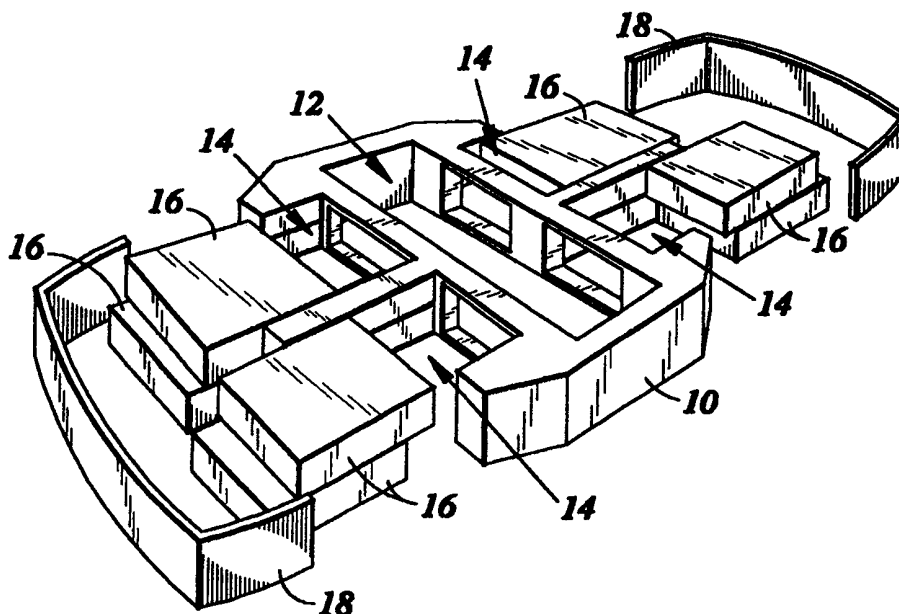
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<p>(21) International Application Number: PCT/US98/21934 (22) International Filing Date: 20 October 1998 (20.10.98) (30) Priority Data: 08/954,554 20 October 1997 (20.10.97) US (71) Applicant: MULTIDISC TECHNOLOGIES [US/US]; Suite 800, 7755 Center Avenue, Huntington Beach, CA 92647 (US). (72) Inventors: BOS, Eric, Rene; 17915 Santa Valera, Fountain Valley, CA 92708 (US). MONTELIUS, Robert, L., Jr.; 26001 LaCuesta Avenue, Laguna Hills, CA 92653 (US). (74) Agents: STETINA, Kit, M. et al.; Stetina Brunda Garred & Brucker, Suite 401, 24221 Calle de la Louisa, Laguna Hills, CA 92653 (US).</p>		<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p>Published <i>With international search report.</i></p>

(54) Title: CONFIGURABLE EXPANDABLE CHANGER MODULES

(57) Abstract

An expandable module chassis (10) for integrating multiple sub-modules (16) is provided with a disc transport channel (12). The disc transport channel is formed to allow a disc extractor device to travel within it. The expandable module chassis is further provided with a plurality of sub-module bays (14). Each sub-module bay is formed to engage a respective sub-module and is open to the disc transport channel such that a disc extractor device traveling in the disc transport channel can access respective sub-modules engaged by the sub-module bays.



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CONFIGURABLE EXPANDABLE CHANGER MODULES**Field of the Invention**

This invention generally relates to a disc module
5 chassis, and in particular to an expandable disc module
chassis for integrating a plurality of sub-modules.

Background of the Invention

Compact disc storage and retrieval have become a
10 significant factor for consideration in view of the
proliferation of use of these discs for data storage in
association with computerized information that must be
readily available, including that on CD-ROM discs. As
used herein, the terms "compact disc" and "disc" are
15 defined to include all such devices, including but not
limited to, CD-ROM, WORM, DVD (digital versatile disc),
DVD-RAM, etc. In addition to storage considerations, a
system planner must address disc retrieval for data
access, the provision of drive, support and control
20 components, and the interconnection of all elements for
efficient operation. While all of these elements must
work in concert with each other, the present approach to
their provision is found in separate, non-united members
that often include redundant apparatus, non-expandable
25 storage capacities, non-optimization of a system for a
specific application, non-integratability of new
technology within a system, and like restrictions that
limit viability of a system and introduce obsolescence.

In view of the limitations found in currently
30 available technology, it is apparent that there is a need
in the art for modifiable systems to accommodate a
variety of applications.

Summary of the Invention

35 In accordance with the present invention, an
expandable module chassis for integrating multiple sub-
modules is provided with a disc transport channel. The

-2-

disc transport channel is formed to allow a disc extractor device to travel within it. The expandable module chassis is further provided with a plurality of sub-module bays. Each sub-module bay is formed to engage
5 a respective sub-module and is open to the disc transport channel such that a disc extractor device traveling in the disc transport channel can access respective sub-modules engaged by the sub-module bays.

It is contemplated that the sub-modules are
10 uniformly sized to engage any of the sub-module bays. Advantageously, this common sizing allows for the relatively rapid modification of the system as a whole, through the addition or deletion of specific sub-modules without requiring special tools or extensive expertise in
15 accomplishing system additions, deletions, sub-module rearrangements, and the like.

The expandable module chassis is further provided with at least one guard member. The guard member is positioned adjacent to at least one sub-module bay and
20 is formed to secure a sub-module onto position with a respective sub-module bay. In addition, the plurality of sub-module bays is grouped into two opposing banks with the disc transport channel disposed there between.

In addition, the sub-modules are selected from a
25 group consisting of a disc loader tray sub-module, a disc magazine sub-module, a configurable disc drive sub-module, a disc label printer sub-module, a power supply sub-module and combinations thereof.

Furthermore, the expandable module chassis is
30 preferably formed to engage at least one other expandable module chassis of a similar design. Each expandable module chassis is positioned with the other one such that their respective disc transport channels are aligned to allow a disc extractor device to travel between the
35 respective disc transport channels such that the disc extractor device can access respective sub-modules engaged by the sub-module bays.

-3-

Accordingly, the present invention overcomes prior art designs because it facilitates a flexible, integrated, modular approach to system design by allowing for relative rapid system reconfiguration, modification and expansion while avoiding system redundancy.

Brief Description of the Drawings

An illustrative and presently preferred embodiment of the invention is shown in the accompanying drawings in which:

Figure 1 is a perspective view of the expandable module chassis of the present invention illustrated with unengaged sub-modules; and

Figure 2 is a perspective view of the present invention illustrated with sub-modules engaged at respective sub-module bays.

Detailed Description of the Preferred Embodiment

Referring now to the drawings wherein in the showings are for purposes of illustrating a preferred embodiment of the present invention only, and not for purposes of limiting the same, Figures 1 and 2 perspectively illustrate an expandable module chassis constructed in accordance with the present invention for integrating multiple sub-modules.

In accordance with the present invention, an expandable module chassis 10 is provided with a disc transport channel 12. The disc transport channel 12 is formed to allow a conventional disc extractor device (not shown) to travel within it. The expandable module chassis 10 is further provided with a plurality of sub-module bays 14. Figures 1 and 2 depict a configuration with eight such sub-module bays 14. Each sub-module bay is formed to engage a respective sub-module 16 and is open to, i.e., communicates with, the disc transport channel 12 such that a disc extractor device traveling in

-4-

the disc transport channel 12 can access respective sub-modules 16 engaged by the sub-module bays 14.

It is contemplated that the sub-modules 16 are uniformly sized to engage any respective one of the plurality of sub-module bays 14. Advantageously, this common sizing allows for the relatively rapid modification of the system as a whole through the addition or deletion of specific sub-modules without requiring special tools or extensive expertise in accomplishing system additions, deletions, sub-module rearrangements, and the like. It is further contemplated that the methods of engaging the sub-modules with the sub-module bays are chosen from those well known to those of ordinary skill in the art. Similarly, the methods of facilitating the traveling of a disc extractor device within the disc transport channel are chosen from those well known to one of ordinary skill in the art.

In the preferred embodiment, the expandable module chassis 10 is provided with at least one guard member 18. The guard member 18 is positioned adjacent to at least one of the plurality of sub-module bays 14 and is formed to secure a sub-module 16 onto position with a respective sub-module bay. It is contemplated that the methods of positioning the guard 18 and securing the sub-module 16 are chosen from those well known to one of ordinary skill in the art. In addition, the plurality of sub-module bays 14 is grouped into two opposing banks with the disc transport channel 12 disposed there between.

The sub-modules 16 are selected from a group consisting of a disc loader tray sub-module, a disc magazine sub-module, a configurable disc drive sub-module, a disc label printer sub-module, a power supply sub-module and combinations thereof (illustrated schematically). For illustrative purposes only, a given configuration may include all of the above sub-modules 16. It is contemplated that the disc loader tray sub-module allows a user to load discs into the system. Once

-5-

a given disc is loaded into the disc loader tray sub-module a disc extractor device traveling in the disc transport channel 12 may be directed via conventional control circuitry to travel to the disc loader tray sub-
5 module and retrieve the disc. The disc extractor device may then travel to the disc magazine sub-module for depositing and storage of the disc or travel to the configurable disc drive sub-module for the playing or reading of the disc. The disc label printer sub-module
10 reads and displays data regarding a given disc. The power supply sub-module, of course, provides power to the system.

Furthermore, the expandable module chassis 10 is formed to engage at least one other expandable module
15 chassis 10 of a similar design. Each expandable module chassis 10 is positioned with the other one such that their respective disc transport channels 12 are aligned to allow a disc extractor device to travel between the respective disc transport channels 12 such that the disc
20 extractor device can access respective sub-modules 16 engaged by the plurality of sub-module bays 14. It is contemplated that the methods of engagement are chosen from those well known to one of ordinary skill in the art.

25 Additional modifications and improvements of the present invention may also be apparent to those of ordinary skill in the art. Thus, the particular combination of parts described and illustrated herein is intended to represent only one embodiment of the present
30 invention, and is not intended to serve as limitations of alternative devices within the spirit and scope of the invention.

-6-

WHAT IS CLAIMED IS:

1. An expandable module chassis for integrating multiple sub-modules comprising:

5 a disc transport channel wherein a disc extractor device can travel; and

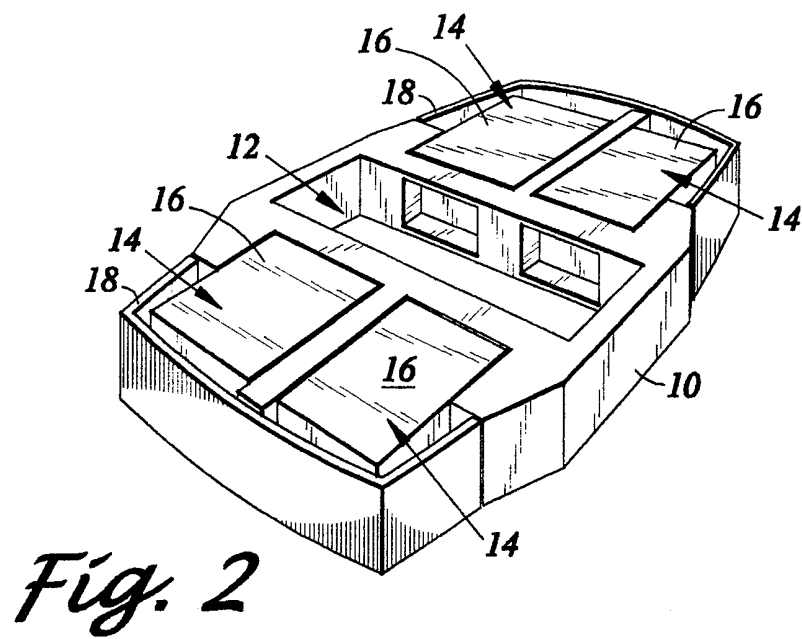
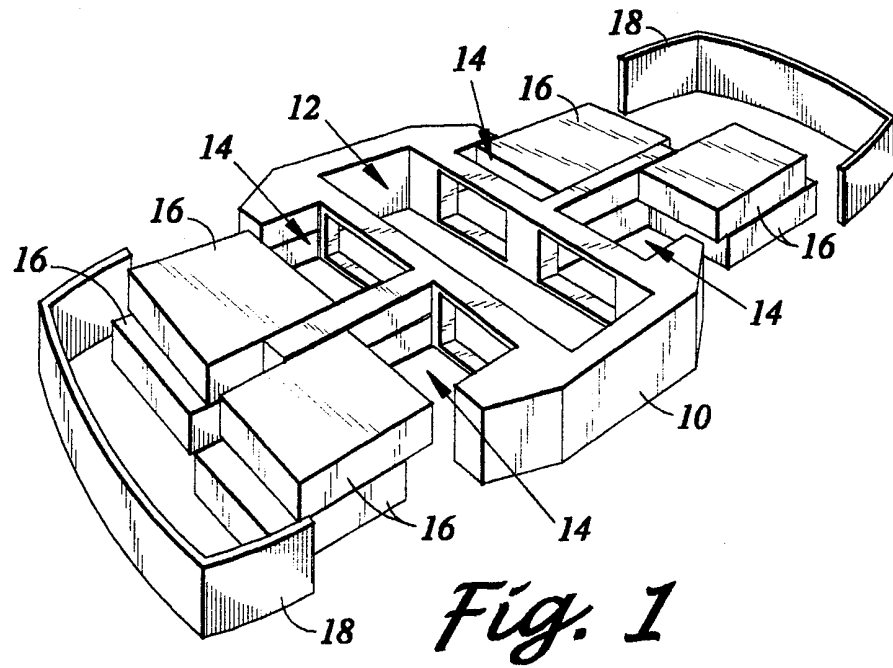
a plurality of sub-module bays, each formed to engage a respective sub-module and open to the disc transport channel such that a disc extractor device traveling in the disc transport channel can access
10 respective sub-modules engaged by the sub-module bays.

2. The expandable module chassis of Claim 1 further comprising at least one guard member, adjacent to at least one sub-module bay and formed to secure a sub-
15 module onto position with a respective sub-module bay.

3. The expandable module chassis of Claim 1 wherein the plurality of sub-module bays is grouped into two opposing banks with the disc transport channel disposed there between.

20 4. The expandable module chassis of Claim 1 wherein the sub-modules are selected from a group consisting of a disc loader tray sub-module, a disc magazine sub-module, a configurable disc drive sub-module, a disc label printer sub-module, a power supply
25 sub-module and combinations thereof.

5. The expandable module chassis of Claim 1 formed to engage at least one other expandable module chassis of Claim 1 with the respective disc transport channels aligned with each other to allow a disc extractor device
30 to travel between the respective disc transport channels such that the disc extractor device can access respective sub-modules engaged by the sub-module bays.



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/21934

A. CLASSIFICATION OF SUBJECT MATTER IPC(6) :G11B 17/00, 17/22 US CL :369/34, 36 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) U.S. 369/34, 36 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X ---- Y	US 4,504,936 A (FABER et al) 12 March 1985, col. 18, lines 19-22, col. 8, lines 56-60, col. 4, lines 5-12, col. 9, lines 11-14.	1, 2, 4, 5 ----- 3
Y	US 5,539,712 A (MENKE et al) 23 July 1996, col. 1, lines 14-18.	3
A	US 5,128,912 A (HUG et al) 07 July 1992,	1-5
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