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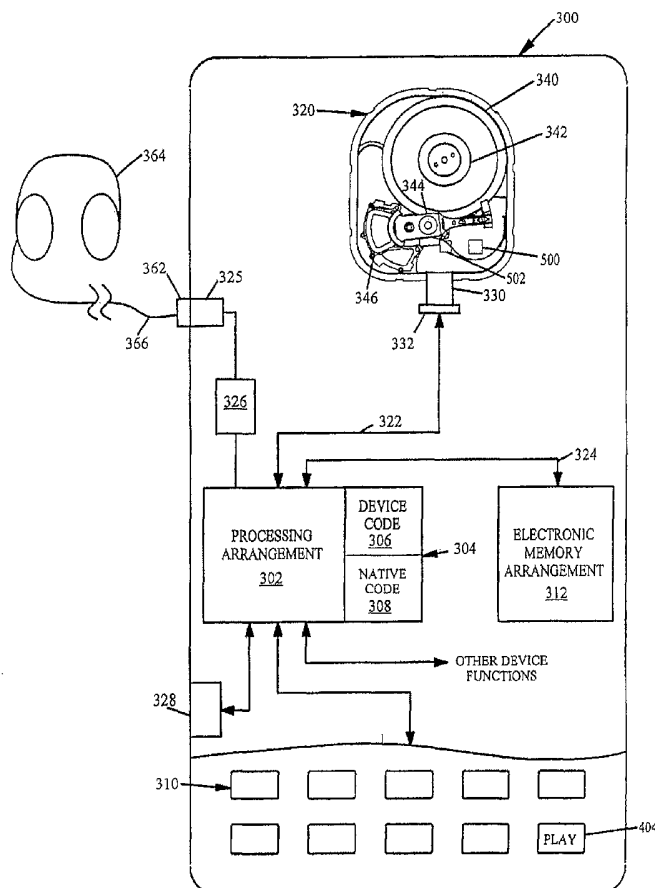
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(54) Title: DIGITAL DEVICE CONFIGURATION AND METHOD



(57) Abstract: An electromechanical data storage arrangement is interfaced with a host. The interface may include a conductor that carries read and write gate signals. Another conductor carries both a servo sync mark and an error signal. The storage arrangement includes an external serial interface connected to a host serial interface applying a device identification to a portion of serial control-related data that travels over the interface. A serial router in the storage arrangement uses the device identification to manage the control-related data between the interface and a number of serial devices and associated interfaces within the storage arrangement. The serial router is in selective data communication with each of the device serial interfaces, for using the device identification to direct a host-asserted command to a targeted device where each device is controlled by a different command set such that the system can be customized for different command sets of different devices.



Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/12554

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G06F 3/06; G06F 9/445; G11B 5-09; G11B 20/10

US CL : 369/47.1, 59.19, 59.27; 710/10, 61, 74; 711/112; 717/168

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. : 360/51; 369/33.01, 47.1, 47.2, 59.19, 59.27; 710/3, 8, 10, 33, 58, 61, 62, 74; 711/111, 112; 717/168

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)
USPGPUB, USOCR, EPO, JPO, DERWENT, IBM_TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,415,349 B1 (HULL et al.) 2 July 2002 (02.07.2002), Abstract, Figs. 1-3, col. 4 lines 56-64, and col. 5 lines 7-48.	49-60
X	US 6,260,106 B1 (VOGLEY) 10 July 2001 (10.07.2001), Abstract, Fig. 4, and col. 6 lines 4-17.	61, 62
X,E	US 6,944,854 B2 (KEHNE et al.) 13 September 2005 (13.09.2005), Abstract, Figs. 1-2, col. 2 lines 51-55, col. 3 lines 28-47, and col. 4 lines 21-37.	79-82
A,E	US 2005/0066119 A1 (AZIMI) 24 March 2005 (24.03.2005), whole document.	1-6
A,E	US 6,941,453 B2 (RAO) 6 September 2005 (06.09.2005), whole document.	63-82



Further documents are listed in the continuation of Box C.



See patent family annex.

* 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 application or patent 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 when the document is taken alone

"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

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/12554

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of any additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

- Remark on Protest**
- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
 - ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
 - ☒ No protest accompanied the payment of additional search fees.

BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

- I. Claims 1-6, drawn to a disk assembly and method with mutually exclusive server synchronization and error signal on a single conductor of an interconnect.
- II. Claims 7-48, drawn to a disk system and method with serial router using device identification on bi-directional serial control interface to control disk interfaces.
- III. Claims 49-60, drawn to a disk device and method that uses a data line that carries read and write user data also for control related data.
- IV. Claims 61-62, drawn to a disk device and method of writing data to a disk through a bi-directional serial port using a clock.
- V. Claims 63-78, drawn to a disk system and method of a host automatically querying and detecting updated firmware installed on a disk device.
- VI. Claims 79-82, drawn to a disk system and method of storing and transferring from a host and installing to a disk arrangement information for updating firmware disk control data.

The inventions listed as Groups I. to VI. do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Each invention has a separate utility as a device or method as stated above, without regard to any of the other devices or methods stated above.