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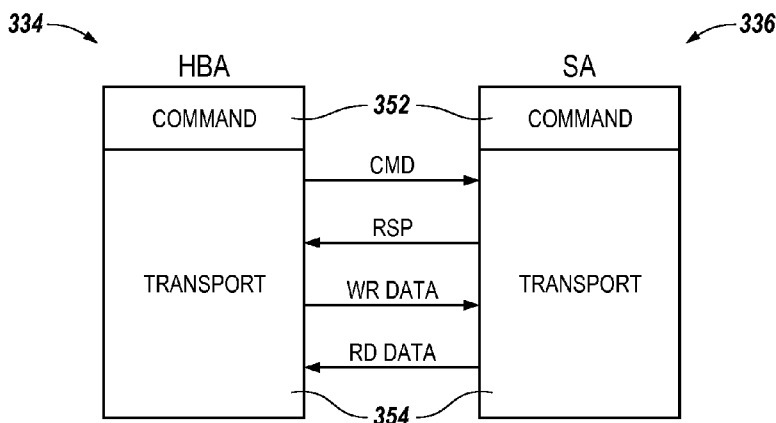




Fig. 3A

(57) Abstract: Memory system controllers can include a host bus adapter (HBA) and a serial advanced technology attachment (SA) programming compliant device coupled to the HBA via a function-specific interconnect configured to simultaneously transfer a command, a response, and other information between the HBA and the SA programming compliant device.

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INTERNATIONAL SEARCH REPORT

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| A. CLASSIFICATION OF SUBJECT MATTER | | |
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| <i>G11C 7/10(2006.01)i, G11C 16/06(2006.01)i, G06F 13/14(2006.01)i</i> | | |
| 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) G11C 7/10; G06F 12/02; G06F 15/173; G06F 13/10; G06F 13/00 | | |
| Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Korean utility models and applications for utility models Japanese utility models and applications for utility models | | |
| Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) eKOMPASS(KIPO internal) & Keywords: SSD, host, bus, adapter, serial, attachment, interconnect, transfer, simultaneously | | |
| C. DOCUMENTS CONSIDERED TO BE RELEVANT | | |
| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| A | US 2011-0040924 A1 (SELINGER) 17 February 2011 See abstract, paragraphs [0024],[0025],[0047],[0048],[0068], claims 1,11, and figures 1,3,5-7,11. | 1-20 |
| A | US 2009-0259749 A1 (BARRETT et al.) 15 October 2009 See abstract, paragraphs [0054],[0058], claims 1-3, and figures 1,2. | 1-20 |
| A | US 7627709 B2 (BACOM et al.) 01 December 2009 See abstract, page 2, lines 3-19, page 3, line 33 - page 4, line 31, claims 1,2,4, and figure 2A. | 1-20 |
| A | US 2009-0132729 A1 (FAULHABER et al.) 21 May 2009 See abstract, paragraphs [0011]-[0012], claim 8, and figures 1,4. | 1-20 |
| <input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> 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 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 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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Information on patent family members

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| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|--|------------------|--|--|
| US 2011-0040924 A1 | 17.02.2011 | WO 2011-019600 A1 | 17.02.2011 |
| US 2009-0259749 A1 | 15.10.2009 | US 2007-0208849 A1 US 7716381 B2 | 06.09.2007 11.05.2010 |
| US 7627709 B2 | 01.12.2009 | US 2008-0140898 A1 | 12.06.2008 |
| US 2009-0132729 A1 | 21.05.2009 | US 2008-0120438 A1 US 7502874 B2 US 7636798 B2 | 22.05.2008 10.03.2009 22.12.2009 |