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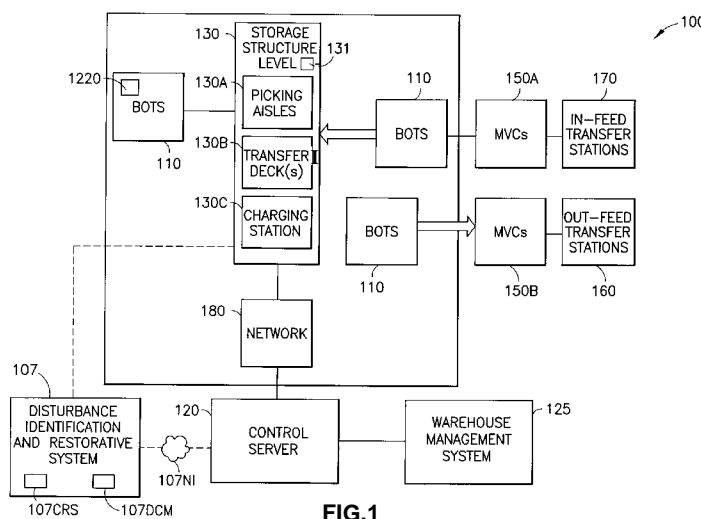
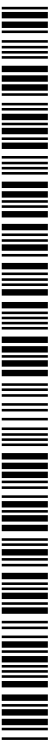


FIG. 1

(57) **Abstract:** An automated storage and retrieval system including a storage structure with storage racks having a seating surface configured to support case units where a position of each case unit is non-deterministic for each storage location on the storage racks, each case unit has a predetermined storage position and a controller is configured to determine the predetermined storage position, a picking aisle configured to provide access to the case units within the storage structure, and a seismic disturbance restorative system including seismic disturbance motions sensors disposed on the storage racks, a seismic disturbance control module in communication with the seismic disturbance sensors and configured to identify a seismic disturbance, and an automated case mapper configured to traverse the picking aisle, the automated case mapper being in communication with and initialized by the seismic disturbance control module to identify a seated position of at least one case unit within the storage structure.



INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - G05B 19/04 (2013.01) USPC - 700/247 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) IPC(8): G05B 19/04 (2013.01); USPC: 700/247 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched IPC(8): G05B 19/04 (2013.01); USPC: 700/245, 247; 901/1 (keyword limited, see terms below) Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) PatBase; Google Patents; Google Scholar. Search term: automate, storage, retrieval, ASRS, AS/RS, seismic, seismal, earthquake, quake, microseism, tremor, robotic, control, placing, load, container, case, unit, pallet, compare, verify, confirm, check, determine, identify, locate, position, place, seat, sit, rest, error, variance, discrepancy, etc.		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2010/0316469 A1 (Lert et al.) 16 December 2010 (16.10.2010), entire document, especially fig. 8-9D; para [0006], [0024], [0026], [0045], [0057], [0077]	1-21
Y	US 2005/0063089 A1 (Starr et al.) 24 March 2005 (24.03.2005), entire document, especially para [0007], [0009], [0030], [0043]-[0049]	1-18, 20
Y	US 2007/0043600 A1 (Solomon) 22 February 2007 (22.02.2007), entire document, especially para [0106], [0110], [0130], [0139], [0149]	5, 14
Y	US 2009/0234500 A1 (Tanaka) 17 September 2009 (17.09.2009), entire document, especially para [0035-0036], [0069]-[0070], [0074]	9, 18-21
A	US 2011/0060449 A1 (Wurman et al.) 10 March 2011 (10.03.2011), entire document	1-21
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Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201		Authorized officer: <p align="center">Lee W. Young</p> PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774