

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

CLASSIFICATION ORDER 1868

OCTOBER 2, 2007

PROJECT Y-7219

The following classification changes will be effected by this order:

	<u>Class</u>	<u>Subclass</u>	<u>Art Unit</u>	<u>Ex'r Search Room</u>
Abolished:	None			
Established:				
E-Subclasses:	711	E12.001-E12.009, E12.01, E12.011- E12.019, E12.02, E12.021-E12.029, E12.03, E12.031- E12.039, E12.04, E12.041-E12.049, E12.05, E12.051- E12.059, E12.06, E12.061-E12.069, E12.07, E12.071- E12.079, E12.08, E12.081-E12.089, E12.09, E12.091- E12.099, E12.1, E12.101-E12.103	2186	ELEC0000

No other classes were impacted by this order.

This order includes the following:

- A. CLASSIFICATION MANUAL CHANGES
- D. DEFINITION CHANGES AND NEW OR ADDITIONAL DEFINITIONS

CLASSIFICATION ORDER 1868

OCTOBER 2, 2007

PROJECT Y-7219

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Editor: David Delzingaro

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1	ADDRESSING COMBINED WITH SPECIFIC MEMORY CONFIGURATION OR SYSTEM	152	..Memory access blocking
2	.Addressing extended or expanded memory	153	..Shared memory partitioning
3	.Addressing cache memories	154	.Control technique
4	.Dynamic-type storage device (e.g., disk, tape, drum)	155	..Read-modify-write (RMW)
5	.For multiple memory modules (e.g., banks, interleaved memory)	156	..Status storage
6	.Virtual machine memory addressing	157	..Interleaving
100	STORAGE ACCESSING AND CONTROL	158	..Prioritizing
101	.Specific memory composition	159	..Entry replacement strategy
102	..Solid-state read only memory (ROM)	160	...Least recently used (LRU)
103	...Programmable read only memory (PROM, EEPROM, etc.)	161	..Archiving
104	..Solid-state random access memory (RAM)	162	...Backup
105	...Dynamic random access memory	163	..Access limiting
106	....Refresh scheduling	164	...With password or key
107	..Ferrite core	165	..Internal relocation
108	..Content addressable memory (CAM)	166	..Resetting
109	..Shift register memory	167	.Access timing
110	...Circulating memory	168	..Concurrent accessing
111	..Accessing dynamic storage device	169	..Memory access pipelining
112	...Direct access storage device (DASD)	170	.Memory configuring
113	....Caching	171	..Based on data size
114	....Arrayed (e.g., RAID's)	172	..Based on component size
115	..Detachable memory	173	..Memory partitioning
116	..Bubble memory	200	ADDRESS FORMATION
117	.Hierarchical memories	201	.Slip control, misaligning, boundary alignment
118	..Caching	202	.Address mapping (e.g., conversion, translation)
119	...Multiple caches	203	..Virtual addressing
120	....Parallel caches	204	...Predicting, look-ahead
121	....Private caches	205	...Directories and tables (e.g., DLAT, TLB)
122	....Hierarchical caches	206	...Translation tables (e.g., segment and page table or map)
123	....User data cache and instruction data cache	207	...Directory tables (e.g., DLAT, TLB)
124	....Cross-interrogating	208	...Segment or page table descriptor
125	...Instruction data cache	209	...Including plural logical address spaces, pages, segments, blocks
126	...User data cache	210	..Resolving conflict, coherency, or synonym problem
127	...Interleaved	211	.Address multiplexing or address bus manipulation
128	...Associative	212	.Varying address bit-length or size
129	...Partitioned cache	213	.Generating prefetch, look-ahead, jump, or predictive address
130	...Shared cache	214	.Operand address generation
131	...Multiport cache	215	.In response to microinstruction
132	...Stack cache	216	.Hashing
133	...Entry replacement strategy	217	.Generating a particular pattern/sequence of addresses
134	....Combined replacement modes	218	..Sequential addresses generation
135	....Cache flushing	219	.Incrementing, decrementing, or shifting circuitry
136	....Least recently used	220	.Combining two or more values to create address
137	...Look-ahead	221	.Using table
138	...Cache bypassing		
139	....No-cache flags		
140	...Cache pipelining		
141	...Coherency		
142	...Write-through		
143	...Write-back		
144	...Cache status data bit		
145	...Access control bit		
146	...Snooping		
147	.Shared memory area		
148	..Plural shared memories		
149	..Multiport memory		
150	..Simultaneous access regulation		
151	..Prioritized access regulation		

Title Change
* Newly Established Subclass

@ Indent Change
& Position Change

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*	E-SUBCLASSES	*	
	The following subclasses beginning with the letter E are E-subclasses. Each E-subclass corresponds in scope to a classification in a foreign classification system, for example, the European Classification system (ECLA). The foreign classification equivalent to an E-subclass is identified in the subclass definition. In addition to U.S. documents classified in E-subclasses by U.S. examiners, documents are regularly classified in E-subclasses according to the classification practices of any foreign Offices identified in parentheses at the end of the title. For example, "(EPO)" at the end of a title indicates both European and U.S. patent documents, as classified by the EPO, are regularly added to the subclass. E-subclasses may contain subject matter outside the scope of this class. Consult the E-subclass definitions, or the documents themselves, to clarify or interpret titles.	* E12.018Using pseudo-associative means, e.g., set-associative, hashing, etc. (EPO)
		* E12.019	....For peripheral storage systems, e.g., disc cache, etc. (EPO)
		* E12.02	....With dedicated cache, e.g., instruction or stack, etc. (EPO)
		* E12.021	....Using selective caching, e.g., bypass, partial write, etc. (EPO)
		* E12.022	....Using clearing, invalidating, or resetting means (EPO)
		* E12.023	....Multi-user, multiprocessor, multiprocessing cache systems (EPO)
		* E12.024	....With multilevel cache hierarchies (EPO)
		* E12.025	....With a network or matrix configuration (EPO)
		* E12.026	....Cache consistency protocols (EPO)
		* E12.027	.....Using directory methods (EPO)
		* E12.028	.....Copy directories (EPO)
		* E12.029	.....Associative directories (EPO)
		* E12.03	.....Distributed directories, e.g., linked lists of caches, etc. (EPO)
		* E12.031	.....Limited pointers directories; state-only directories without pointers (EPO)
* E12.001	ACCESSING, ADDRESSING OR ALLOCATING WITHIN MEMORY SYSTEMS OR ARCHITECTURES (EPO)	* E12.032	.....With concurrent directory accessing, i.e., handling multiple concurrent coherency transactions (EPO)
* E12.002	..Addressing or allocation; relocation (EPO)	* E12.033	.....Using a bus scheme, e.g., with bus monitoring or watching means, etc. (EPO)
* E12.003	..With multidimensional access, e.g., row/column, matrix, etc. (EPO)	* E12.034	.....In combination with broadcast means, e.g., for invalidation or updating, etc. (EPO)
* E12.004	..With look-ahead addressing means (EPO)	* E12.035	.....For main memory peripheral accesses, e.g., I/O or DMA, etc. (EPO)
* E12.005	..User address space allocation, e.g., contiguous or noncontiguous base addressing, etc. (EPO)	* E12.036	.....With software control, e.g., non-cacheable data, etc. (EPO)
* E12.006	...Free address space management (EPO)	* E12.037	.....With cache invalidating means (EPO)
* E12.007	....In block-addressed memory (EPO)	* E12.038	.....With shared cache (EPO)
* E12.008	.....In block-erasable memory, e.g., flash memory, etc. (EPO)	* E12.039	.....For multiprocessing or multitasking (EPO)
* E12.009	....Garbage collection, i.e., reclamation of unreferenced memory (EPO)	* E12.04	....With main memory updating (EPO)
* E12.01	.....Using reference counting (EPO)	* E12.041	....Organization and technology of caches (EPO)
* E12.011	.....Incremental or concurrent garbage collection, e.g., in real-time systems, etc. (EPO)	* E12.042	.....Of parts of caches, e.g., directory or tag array, etc. (EPO)
* E12.012	.....Generational garbage collection (EPO)	* E12.043	.....With plurality of cache hierarchy levels (EPO)
* E12.013	...Multiple users address space allocation, e.g., using different base addresses, etc. (EPO)	* E12.044	....Multiple simultaneous or quasi-simultaneous cache accessing (EPO)
* E12.014	...Using tables or multilevel address translation means (EPO)	* E12.045	.....Cache with multiple tag or data arrays being simultaneously accessible (EPO)
* E12.015	..Addressing variable-length words or parts of words (EPO)	* E12.046	.....Partitioned cache, e.g., separate instruction and operand caches, etc. (EPO)
* E12.016	..In hierarchically structured memory systems, e.g., virtual memory systems, etc. (EPO)	* E12.047	.....Cache with interleaved addressing (EPO)
* E12.017	...Addressing of memory level in which access to desired data or data block requires associative addressing means, e.g., cache, etc. (EPO)	* E12.048	.....Cache with multi-port tag or data arrays (EPO)

Title Change
* Newly Established Subclass

@ Indent Change
& Position Change

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ACCESSING, ADDRESSING OR ALLOCATING
WITHIN MEMORY SYSTEMS OR
ARCHITECTURES (EPO)

- .Addressing or allocation; relocation (EPO) * E12.075With special data handling, e.g., priority of data or instructions, pinning, errors, etc. (EPO)
- ..In hierarchically structured memory systems, e.g., virtual memory systems, etc. (EPO) * E12.076Using additional replacement algorithm (EPO)
- ...Address translation (EPO) * E12.077Adapted to multidimensional cache systems, e.g., set-associative, multi-cache, multi-set, or multilevel, etc. (EPO)
-Multiple simultaneous or quasi-simultaneous cache accessing (EPO) * E12.078 ..Addressing physical block of locations, e.g., base addressing, module addressing, memory dedication, etc. (EPO)
- * E12.049Overlapped cache accessing, e.g., pipeline, etc. (EPO) * E12.079 ...Interleaved addressing (EPO)
- * E12.05By multiple requestors (EPO) * E12.08Address space extension (EPO)
- * E12.051With reload from main memory (EPO) * E12.081For memory modules (EPO)
- * E12.052Cache access modes (EPO) * E12.082For I/O modules, e.g., memory mapped I/O, etc. (EPO)
- * E12.053Burst mode (EPO) * E12.083 ...Combination of memories, e.g., ROM and RAM, etc., to permit replacement or supplementing of words in one module by words in another module (EPO)
- * E12.054Page mode (EPO) * E12.084 ...Configuration or reconfiguration (EPO)
- * E12.055Parallel mode, e.g., in parallel with main memory or CPU, etc. (EPO) * E12.085With centralized address assignment (EPO)
- * E12.056Variable-length word access (EPO) * E12.086And decentralized selection (EPO)
- * E12.057With pre-fetch (EPO) * E12.087With decentralized address assignment (EPO)
- * E12.058 ...Address translation (EPO) * E12.088Address being position dependent (EPO)
- * E12.059Using page tables, e.g., page table structures, etc. (EPO) * E12.089With feedback, e.g., presence or absence of unit detected by addressing, overflow detection, etc. (EPO)
- * E12.06Involving hashing techniques, e.g., inverted page tables, etc. (EPO) * E12.09Multi-configuration, e.g., local and global addressing, etc. (EPO)
- * E12.061Using associative or pseudo-associative address translation means, e.g., translation look-aside buffer (TLB), address translation buffer (ATB), address cache, etc. (EPO) * E12.091 .Protection against unauthorized use of memory (EPO)
- * E12.062Associated with data cache (EPO) * E12.092 ..By using cryptography (EPO)
- * E12.063Data cache being concurrently physically addressed (EPO) * E12.093 ..By checking subject access rights (EPO)
- * E12.064Data cache being concurrently virtually addressed (EPO) * E12.094 ...Key-lock mechanism (EPO)
- * E12.065For multiple virtual address spaces, e.g., segmentation, etc. (EPO) * E12.095In virtual system, e.g., with translation means, etc. (EPO)
- * E12.066Decentralized address translation, e.g., in distributed shared memory systems, etc. (EPO) * E12.096 ...Using access table, e.g., matrix or list, etc. (EPO)
- * E12.067For peripheral accesses to main memory, e.g., DMA, etc. (EPO) * E12.097 ...In hierarchical protection system, e.g., privilege levels, memory rings, etc. (EPO)
- * E12.068For multiple virtual address spaces, e.g., segmentation, etc. (EPO) * E12.098 ..By checking object accessibility, e.g., type of access defined by the memory independently of subject rights, etc. (EPO)
- * E12.069 ...Replacement control (EPO) * E12.099 ...Protection being physical, e.g., cell, word, block, etc. (EPO)
- * E12.07Using a replacement algorithm (EPO)
- * E12.071Of the least frequently used type, e.g., with individual count value, etc. (EPO)
- * E12.072With age list, e.g., queue, MRU-LRU list, etc. (EPO)
- * E12.073Being minimized, e.g., nonMRU, etc. (EPO)
- * E12.074Being generated by decoding array or storage (EPO)

- * E12.1For module or part of module (EPO)
 - * E12.101For range (EPO)
 - * E12.102 ...Protection being virtual, e.g., for virtual blocks or segments before translation mechanism, etc. (EPO)
 - * E12.103 .Protection against loss of memory contents (EPO)
- *****
FOREIGN ART COLLECTION

- FOR 000 CLASS-RELATED FOREIGN DOCUMENTS

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D. CHANGES TO THE DEFINITIONSCLASS 711 – ELECTRICAL COMPUTERS AND DIGITAL PROCESSING SYSTEMS:
MEMORYDefinitions Established

E-SUBCLASSES

The E-subclasses in U.S. Class 711 provide for methods and apparatus for addressing or allocating computer memory space including space management and address translation. They also provide for methods and means for protecting against unauthorized use of memory and protection against loss of memory contents.

- E12.001 ACCESSING, ADDRESSING, OR ALLOCATING WITHIN MEMORY SYSTEMS OR ARCHITECTURES (EPO):**
This main group provides for methods and apparatus for addressing or allocating computer memory space including space management and address translation. It also provides for methods and means for protecting against unauthorized use of memory and protection against loss of memory contents. This subclass is substantially the same in scope as ECLA classification G06F12/00.
- E12.002 Addressing or allocation; relocation (EPO):**
This subclass is indented under subclass E12.001. This subclass is substantially the same in scope as ECLA classification G06F12/02.
- E12.003 With multidimensional access, e.g., row/column, matrix, etc. (EPO):**
This subclass is indented under subclass E12.002. This subclass is substantially the same in scope as ECLA classification G06F12/02B.
- E12.004 With look-ahead addressing means (EPO):**
This subclass is indented under subclass E12.002. This subclass is substantially the same in scope as ECLA classification G06F12/02C.
- E12.005 User addresses space allocation, e.g., contiguous or noncontiguous base addressing, etc. (EPO):**
This subclass is indented under subclass E12.002. This subclass is substantially the same in scope as ECLA classification G06F12/02D.
- E12.006 Free address space management (EPO):**
This subclass is indented under subclass E12.005. This subclass is substantially the same in scope as ECLA classification G06F12/02D2.
- E12.007 In block-addressed memory (EPO):**
This subclass is indented under subclass E12.006. This subclass is substantially the same in scope as ECLA classification G06F12/02D2E.

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- E12.008 In block-erasable memory, e.g., flash memory, etc. (EPO):**
This subclass is indented under subclass E12.007. This subclass is substantially the same in scope as ECLA classification G06F12/02D2E2.
- E12.009 Garbage collection, i.e., reclamation of unreferenced memory (EPO):**
This subclass is indented under subclass E12.006. This subclass is substantially the same in scope as ECLA classification G06F12/02D2G.
- E12.01 Using reference counting (EPO):**
This subclass is indented under subclass E12.009. This subclass is substantially the same in scope as ECLA classification G06F12/02D2G2.
- E12.011 Incremental or concurrent garbage collection, e.g., in real-time systems, etc. (EPO):**
This subclass is indented under subclass E12.009. This subclass is substantially the same in scope as ECLA classification G06F12/02D2G4.
- E12.012 Generational garbage collection (EPO):**
This subclass is indented under subclass E12.011. This subclass is substantially the same in scope as ECLA classification G06F12/02D2G4G.
- E12.013 Multiple users address space allocation, e.g., using different base addresses, etc. (EPO):**
This subclass is indented under subclass E12.005. This subclass is substantially the same in scope as ECLA classification G06F12/02D4.
- E12.014 Using tables or multilevel address translation means (EPO):**
This subclass is indented under subclass E12.005. This subclass is substantially the same in scope as ECLA classification G06F12/02D6.
- E12.015 Addressing variable-length words or parts of words (EPO):**
This subclass is indented under subclass E12.002. This subclass is substantially the same in scope as ECLA classification G06F12/04.
- E12.016 In hierarchically structured memory systems, e.g., virtual memory systems, etc. (EPO):**
This subclass is indented under subclass E12.002. This subclass is substantially the same in scope as ECLA classification G06F12/08.
- E12.017 Addressing of memory level in which access to desired data or data block requires associative addressing means, e.g. cache, etc. (EPO):**
This subclass is indented under subclass E12.016. This subclass is substantially the same in scope as ECLA classification G06F12/08B.
- E12.018 Using pseudo-associative means, e.g., set-associative, hashing, etc. (EPO):**
This subclass is indented under subclass E12.017. This subclass is substantially the same in scope as ECLA classification G06F12/08B10.

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- E12.019 For peripheral storage systems, e.g., disc cache, etc. (EPO):**
This subclass is indented under subclass E12.017. This subclass is substantially the same in scope as ECLA classification G06F12/08B12.
- E12.02 With dedicated cache, e.g., instruction or stack, etc. (EPO):**
This subclass is indented under subclass E12.017. This subclass is substantially the same in scope as ECLA classification G06F12/08B14.
- E12.021 Using selective caching, e.g., bypass, partial write, etc. (EPO):**
This subclass is indented under subclass E12.017. This subclass is substantially the same in scope as ECLA classification G06F12/08B18.
- E12.022 Using clearing, invalidating, or resetting means (EPO):**
This subclass is indented under subclass E12.017. This subclass is substantially the same in scope as ECLA classification G06F12/08B20.
- E12.023 Multi-user, multiprocessor, multiprocessing cache systems (EPO):**
This subclass is indented under subclass E12.017. This subclass is substantially the same in scope as ECLA classification G06F12/08B4.
- E12.024 With multilevel cache hierarchies (EPO):**
This subclass is indented under subclass E12.023. This subclass is substantially the same in scope as ECLA classification G06F12/08B4L.
- E12.025 With network or matrix configuration (EPO):**
This subclass is indented under subclass E12.023. This subclass is substantially the same in scope as ECLA classification G06F12/08B4N.
- E12.026 Cache consistency protocols (EPO):**
This subclass is indented under subclass E12.023. This subclass is substantially the same in scope as ECLA classification G06F12/08B4P.
- E12.027 Using directory methods (EPO):**
This subclass is indented under subclass E12.026. This subclass is substantially the same in scope as ECLA classification G06F12/08B4P2.
- E12.028 Copy directories (EPO):**
This subclass is indented under subclass E12.027. This subclass is substantially the same in scope as ECLA classification G06F12/08B4P2C.

SEE OR SEARCH THIS CLASS, SUBCLASS:

E12.033, for local copy tags for implementing a bus snooping protocol.

- E12.029 Associative directories (EPO):**
This subclass is indented under subclass E12.027. This subclass is substantially the same in scope as ECLA classification G06F12/08B4P2A.

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- E12.03 Distributed directories, e.g., linked lists of caches, etc. (EPO):**
This subclass is indented under subclass E12.027. This subclass is substantially the same in scope as ECLA classification G06F12/08B4P2D.
- E12.031 Limited pointers directories; state-only directories without pointers (EPO):**
This subclass is indented under subclass E12.027. This subclass is substantially the same in scope as ECLA classification G06F12/08B4P2E.
- E12.032 With concurrent directory accessing, i.e., handling multiple concurrent coherency transactions (EPO):**
This subclass is indented under subclass E12.027. This subclass is substantially the same in scope as ECLA classification G06F12/08B4P2R.
- E12.033 Using a bus scheme, e.g., with bus monitoring or watching means, etc. (EPO):**
This subclass is indented under subclass E12.026. This subclass is substantially the same in scope as ECLA classification G06F12/08B4P4.
- E12.034 In combination with broadcast means, e.g., for invalidation or updating, etc. (EPO):**
This subclass is indented under subclass E12.033. This subclass is substantially the same in scope as ECLA classification G06F12/08B4P4B.
- E12.035 For main memory peripheral accesses, e.g., I/O or DMA, etc. (EPO):**
This subclass is indented under subclass E12.033. This subclass is substantially the same in scope as ECLA classification G06F12/08B4P4P.
- E12.036 With software control, e.g., noncacheable data, etc. (EPO):**
This subclass is indented under subclass E12.026. This subclass is substantially the same in scope as ECLA classification G06F12/08B4P6.
- E12.037 With cache invalidating means (EPO):**
This subclass is indented under subclass E12.023. This subclass is substantially the same in scope as ECLA classification G06F12/08B4J.
- E12.038 With shared cache (EPO):**
This subclass is indented under subclass E12.023. This subclass is substantially the same in scope as ECLA classification G06F12/08B4S.
- E12.039 For multiprocessing or multitasking (EPO):**
This subclass is indented under subclass E12.023. This subclass is substantially the same in scope as ECLA classification G06F12/08B4T.
- E12.04 With main memory updating (EPO):**
This subclass is indented under subclass E12.017. This subclass is substantially the same in scope as ECLA classification G06F12/08B2.

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- E12.041 Organization and technology of caches (EPO):**
This subclass is indented under subclass E12.017. This subclass is substantially the same in scope as ECLA classification G06F12/08B22.
- E12.042 Of parts of caches, e.g., directory or tag array, etc. (EPO):**
This subclass is indented under subclass E12.041. This subclass is substantially the same in scope as ECLA classification G06F12/08B22D.
- E12.043 With plurality of cache hierarchy levels (EPO):**
This subclass is indented under subclass E12.041. This subclass is substantially the same in scope as ECLA classification G06F12/08B22L.
- E12.044 Multiple simultaneous or quasi-simultaneous cache accessing (EPO):**
This subclass is indented under subclass E12.017. This subclass is substantially the same in scope as ECLA classification G06F12/08B6.
- E12.045 Cache with multiple tag or data arrays being simultaneously accessible (EPO):**
This subclass is indented under subclass E12.044. This subclass is substantially the same in scope as ECLA classification G06F12/08B6M.
- E12.046 Partitioned cache, e.g., separate instruction and operand caches, etc. (EPO):**
This subclass is indented under subclass E12.045. This subclass is substantially the same in scope as ECLA classification G06F12/08B6M2.
- E12.047 Cache with interleaved addressing (EPO):**
This subclass is indented under subclass E12.045. This subclass is substantially the same in scope as ECLA classification G06F12/08B6M4.
- E12.048 Cache with multi-port tag or data arrays (EPO):**
This subclass is indented under subclass E12.044. This subclass is substantially the same in scope as ECLA classification G06F12/08B6N.
- E12.049 Overlapped cache accessing, e.g., pipeline, etc. (EPO):**
This subclass is indented under subclass E12.044. This subclass is substantially the same in scope as ECLA classification G06F12/08B6P.
- E12.05 By multiple requestors (EPO):**
This subclass is indented under subclass E12.049. This subclass is substantially the same in scope as ECLA classification G06F12/08B6P2.
- E12.051 With reload from main memory (EPO):**
This subclass is indented under subclass E12.049. This subclass is substantially the same in scope as ECLA classification G06F12/08B6P4.
- E12.052 Cache access modes (EPO):**
This subclass is indented under subclass E12.017. This subclass is substantially the same in scope as ECLA classification G06F12/08B16.

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- E12.053 Burst mode (EPO):**
This subclass is indented under subclass E12.052. This subclass is substantially the same in scope as ECLA classification G06F12/08B16B.
- E12.054 Page mode (EPO):**
This subclass is indented under subclass E12.052. This subclass is substantially the same in scope as ECLA classification G06F12/08B16D.
- E12.055 Parallel mode, e.g., in parallel with main memory or CPU, etc. (EPO):**
This subclass is indented under subclass E12.052. This subclass is substantially the same in scope as ECLA classification G06F12/08B16F.
- E12.056 Variable-length word access (EPO):**
This subclass is indented under subclass E12.052. This subclass is substantially the same in scope as ECLA classification G06F12/08B16V.
- E12.057 With pre-fetch (EPO):**
This subclass is indented under subclass E12.017. This subclass is substantially the same in scope as ECLA classification G06F12/08B8.
- E12.058 Address translation (EPO):**
This subclass is indented under subclass E12.016. This subclass is substantially the same in scope as ECLA classification G06F12/10.
- E12.059 Using page tables, e.g., page table structures, etc. (EPO):**
This subclass is indented under subclass E12.058. This subclass is substantially the same in scope as ECLA classification G06F12/10D.
- E12.06 Involving hashing techniques, e.g., inverted page tables, etc. (EPO):**
This subclass is indented under subclass E12.059. This subclass is substantially the same in scope as ECLA classification G06F12/10D2.
- E12.061 Using associative or pseudo-associative address translation means, e.g., translation look-aside buffer (TLB), address translation buffer (ATB), address cache, etc. (EPO):**
This subclass is indented under subclass E12.058. This subclass is substantially the same in scope as ECLA classification G06F12/10L.
- E12.062 Associated with data cache (EPO):**
This subclass is indented under subclass E12.061. This subclass is substantially the same in scope as ECLA classification G06F12/10L4.
- E12.063 Data cache being concurrently physically addressed (EPO):**
This subclass is indented under subclass E12.062. This subclass is substantially the same in scope as ECLA classification G06F12/10L4P.
- E12.064 Data cache being concurrently virtually addressed (EPO):**
This subclass is indented under subclass E12.062. This subclass is substantially the same in scope as ECLA classification G06F12/10L4V.

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- E12.065 For multiple virtual address spaces, e.g., segmentation, etc. (EPO):**
This subclass is indented under subclass E12.061. This subclass is substantially the same in scope as ECLA classification G06F12/10L2.
- E12.066 Decentralized address translation, e.g., in distributed shared memory systems, etc. (EPO):**
This subclass is indented under subclass E12.058. This subclass is substantially the same in scope as ECLA classification G06F12/10M.
- E12.067 For peripheral accesses to main memory, e.g., DMA, etc. (EPO):**
This subclass is indented under subclass E12.058. This subclass is substantially the same in scope as ECLA classification G06F12/10P.
- E12.068 For multiple virtual address spaces, e.g., segmentation, etc. (EPO):**
This subclass is indented under subclass E12.058. This subclass is substantially the same in scope as ECLA classification G06F12/10S.
- E12.069 Replacement control (EPO):**
This subclass is indented under subclass E12.016. This subclass is substantially the same in scope as ECLA classification G06F12/12.
- E12.07 Using replacement algorithm (EPO):**
This subclass is indented under subclass E12.069. This subclass is substantially the same in scope as ECLA classification G06F12/12B.
- E12.071 Of the least frequently used type, e.g., with individual count value, etc. (EPO):**
This subclass is indented under subclass E12.07. This subclass is substantially the same in scope as ECLA classification G06F12/12B2.
- E12.072 With age list, e.g., queue, MRU-LRU list, etc. (EPO):**
This subclass is indented under subclass E12.07. This subclass is substantially the same in scope as ECLA classification G06F12/12B4.
- E12.073 Being minimized, e.g., nonMRU, etc. (EPO):**
This subclass is indented under subclass E12.072. This subclass is substantially the same in scope as ECLA classification G06F12/12B4B.
- E12.074 Being generated by decoding array or storage (EPO):**
This subclass is indented under subclass E12.072. This subclass is substantially the same in scope as ECLA classification G06F12/12B4C.
- E12.075 With special data handling, e.g., priority of data or instructions, pinning, errors, etc. (EPO):**
This subclass is indented under subclass E12.07. This subclass is substantially the same in scope as ECLA classification G06F12/12B6.

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- E12.076 Using additional replacement algorithm (EPO):**
This subclass is indented under subclass E12.075. This subclass is substantially the same in scope as ECLA classification G06F12/12B6B.
- E12.077 Adapted to multidimensional cache systems, e.g., set-associative, multi-cache, multi-set, or multilevel, etc. (EPO):**
This subclass is indented under subclass E12.07. This subclass is substantially the same in scope as ECLA classification G06F12/12B8.
- E12.078 Addressing physical block of locations, e.g., base addressing, module addressing, memory dedication, etc. (EPO):**
This subclass is indented under subclass E12.002. This subclass is substantially the same in scope as ECLA classification G06F12/06.
- (1) Note. This group is limited to module addressing or allocation.
- SEE OR SEARCH THIS CLASS, SUBCLASS:
- E12.005, for base addressing.
- E12.079 Interleaved addressing (EPO):**
This subclass is indented under subclass E12.078. This subclass is substantially the same in scope as ECLA classification G06F12/06A.
- E12.08 Address space extension (EPO):**
This subclass is indented under subclass E12.078. This subclass is substantially the same in scope as ECLA classification G06F12/06C.
- E12.081 For memory modules (EPO):**
This subclass is indented under subclass E12.08. This subclass is substantially the same in scope as ECLA classification G06F12/06C2.
- E12.082 For I/O modules, e.g., memory mapped I/O, etc. (EPO):**
This subclass is indented under subclass E12.08. This subclass is substantially the same in scope as ECLA classification G06F12/06C4.
- E12.083 Combination of memories, e.g., ROM and RAM, etc., to permit replacement or supplementing of words in one module by words in another module (EPO):**
This subclass is indented under subclass E12.078. This subclass is substantially the same in scope as ECLA classification G06F12/06D.
- E12.084 Configuration or reconfiguration (EPO):**
This subclass is indented under subclass E12.078. This subclass is substantially the same in scope as ECLA classification G06F12/06K.

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- E12.085 With centralized address assignment (EPO):**
This subclass is indented under subclass E12.084. This subclass is substantially the same in scope as ECLA classification G06F12/06K2.
- E12.086 And decentralized selection (EPO):**
This subclass is indented under subclass E12.085. This subclass is substantially the same in scope as ECLA classification G06F12/06K2D.
- E12.087 With decentralized address assignment (EPO):**
This subclass is indented under subclass E12.084. This subclass is substantially the same in scope as ECLA classification G06F12/06K4.
- E12.088 Address being position dependent (EPO):**
This subclass is indented under subclass E12.087. This subclass is substantially the same in scope as ECLA classification G06F12/06K4P.
- E12.089 With feedback, e.g., presence or absence of unit detected by addressing, overflow detection, etc. (EPO):**
This subclass is indented under subclass E12.084. This subclass is substantially the same in scope as ECLA classification G06F12/06K6.
- E12.09 Multi-configuration, e.g., local and global addressing, etc. (EPO):**
This subclass is indented under subclass E12.084. This subclass is substantially the same in scope as ECLA classification G06F12/06K8.
- E12.091 Protection against unauthorized use of memory (EPO):**
This subclass is indented under subclass E12.001. This subclass is substantially the same in scope as ECLA classification G06F12/14.
- (1) Note. This subclass covers protection against unauthorized access to memory.
- E12.092 By using cryptography (EPO):**
This subclass is indented under subclass E12.091. This subclass is substantially the same in scope as ECLA classification G06F12/14B.
- E12.093 By checking subject access rights (EPO):**
This subclass is indented under subclass E12.091. This subclass is substantially the same in scope as ECLA classification G06F12/14D.
- E12.094 Key-lock mechanism (EPO):**
This subclass is indented under subclass E12.093. This subclass is substantially the same in scope as ECLA classification G06F12/14D1.
- E12.095 In virtual system, e.g., with translation means, etc. (EPO):**
This subclass is indented under subclass E12.094. This subclass is substantially the same in scope as ECLA classification G06F12/14D1A.

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- E12.096 Using access table, e.g., matrix or list, etc. (EPO):**
This subclass is indented under subclass E12.093. This subclass is substantially the same in scope as ECLA classification G06F12/14D2.
- E12.097 In hierarchical protection system, e.g., privilege levels, memory rings, etc. (EPO):**
This subclass is indented under subclass E12.093. This subclass is substantially the same in scope as ECLA classification G06F12/14D3.
- E12.098 By checking object accessibility, e.g., type of access defined by memory independently of subject rights, etc. (EPO):**
This subclass is indented under subclass E12.091. This subclass is substantially the same in scope as ECLA classification G06F12/14C.
- E12.099 Protection being physical, e.g., cell, word, block, etc. (EPO):**
This subclass is indented under subclass E12.098. This subclass is substantially the same in scope as ECLA classification G06F12/14C1.
- E12.1 For module or part of module (EPO):**
This subclass is indented under subclass E12.099. This subclass is substantially the same in scope as ECLA classification G06F12/14C1A.
- E12.101 For range (EPO):**
This subclass is indented under subclass E12.099. This subclass is substantially the same in scope as ECLA classification G06F12/14C1B.
- E12.102 Protection being virtual, e.g., for virtual blocks or segments before translation mechanism, etc. (EPO):**
This subclass is indented under subclass E12.098. This subclass is substantially the same in scope as ECLA classification G06F12/14C2.
- E12.103 Protection against loss of memory contents (EPO):**
This subclass is indented under subclass E12.001. This subclass is substantially the same in scope as ECLA classification G06F12/16.