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United States Patent [19]

Lawler et al.

[11] **Patent Number:** 5,978,951[45] **Date of Patent:** Nov. 2, 1999[54] **HIGH SPEED CACHE MANAGEMENT UNIT
FOR USE IN A BRIDGE/ROUTER**

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[52] **U.S. Cl.** **714/758**; 370/392; 370/401

[58] **Field of Search** 371/37.07, 37.7;
370/232, 253, 392, 401, 402, 466; 395/286,
185.02

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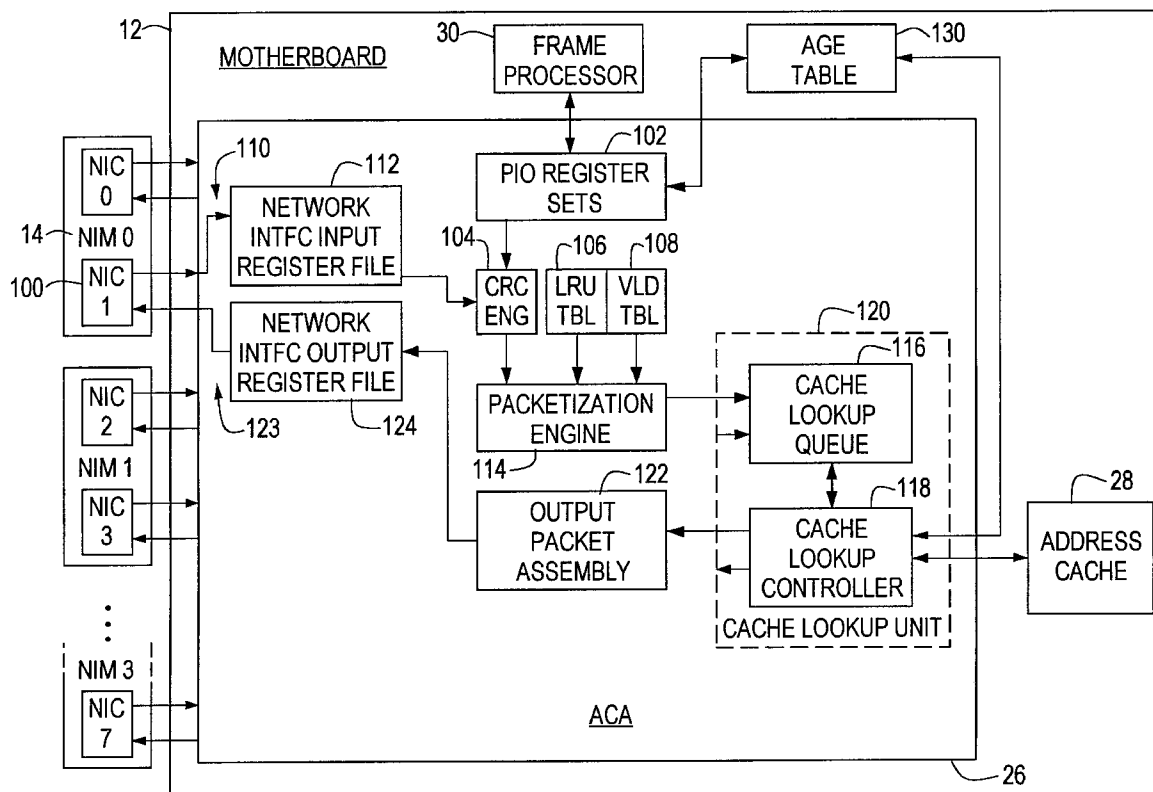
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[57] **ABSTRACT**

A method and cache management for a bridge or bridge/router providing high-speed, flexible address cache management. The unit maintains a network address cache and an age table, searches the cache for layer 2 and layer 3 addresses from received frame headers, and returns address search results. The unit includes an interface permitting processor manipulation of the cache and age table, and supports a 4-way set associative cache to store the network addresses. A plurality of functions implemented in hardware enables software manipulation of the associated cache. Four cache operating modes are selectable. The unit can identify and select destination ports within a Load Balanced Port Group for frame forwarding. The unit utilizes Virtual LAN identification in conjunction with a MAC address for lookup in the cache. A cyclic redundancy code for each address to be looked up in the cache is used as an index into the cache. If a cache thrash rate exceeds a predetermined threshold, CRC table values can be rewritten. Four time-sliced cache lookup units are provided, each consisting of a cache lookup controller for comparing a received network address to an address retrieved from an identified cache set.

26 Claims, 14 Drawing Sheets

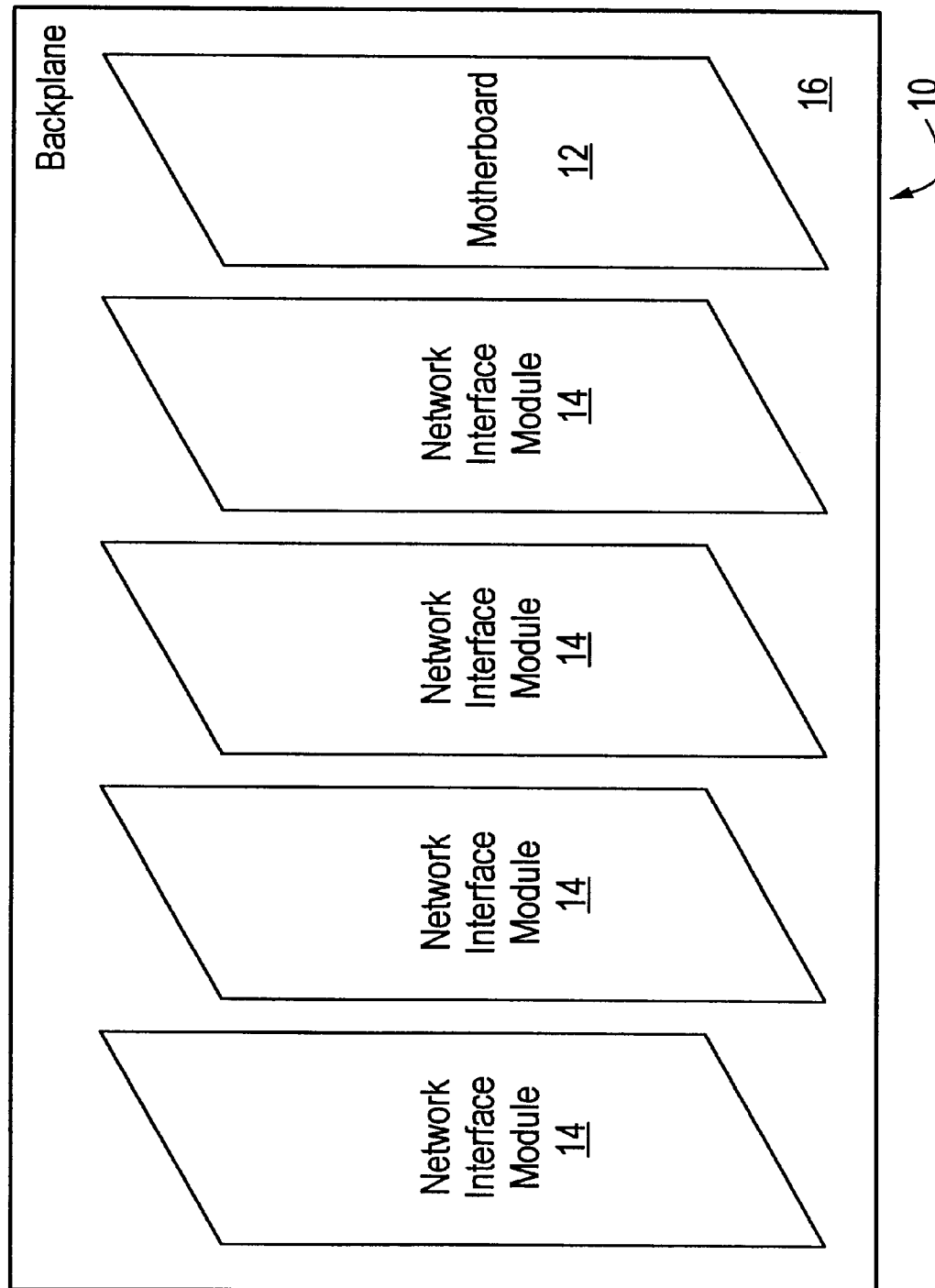
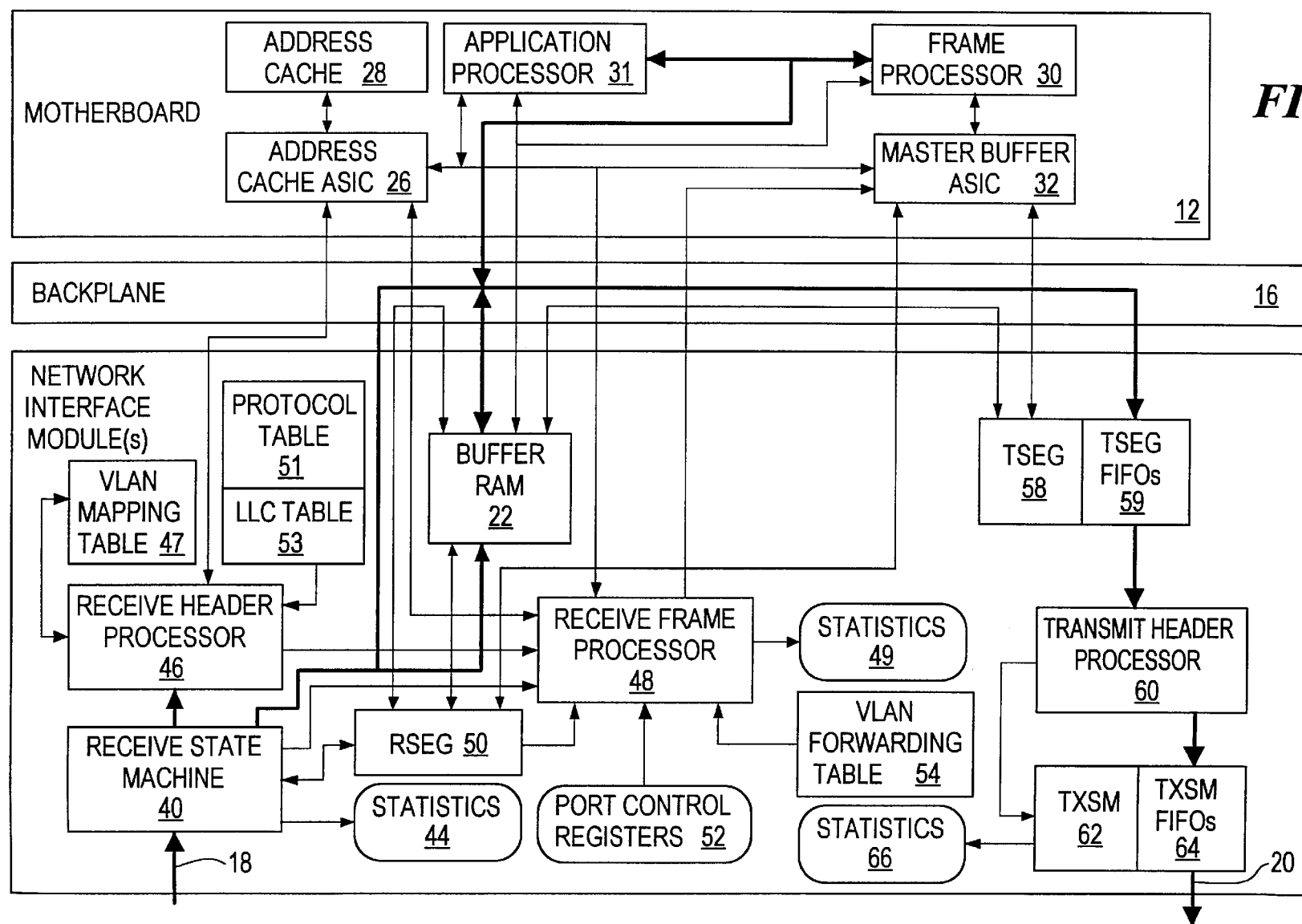
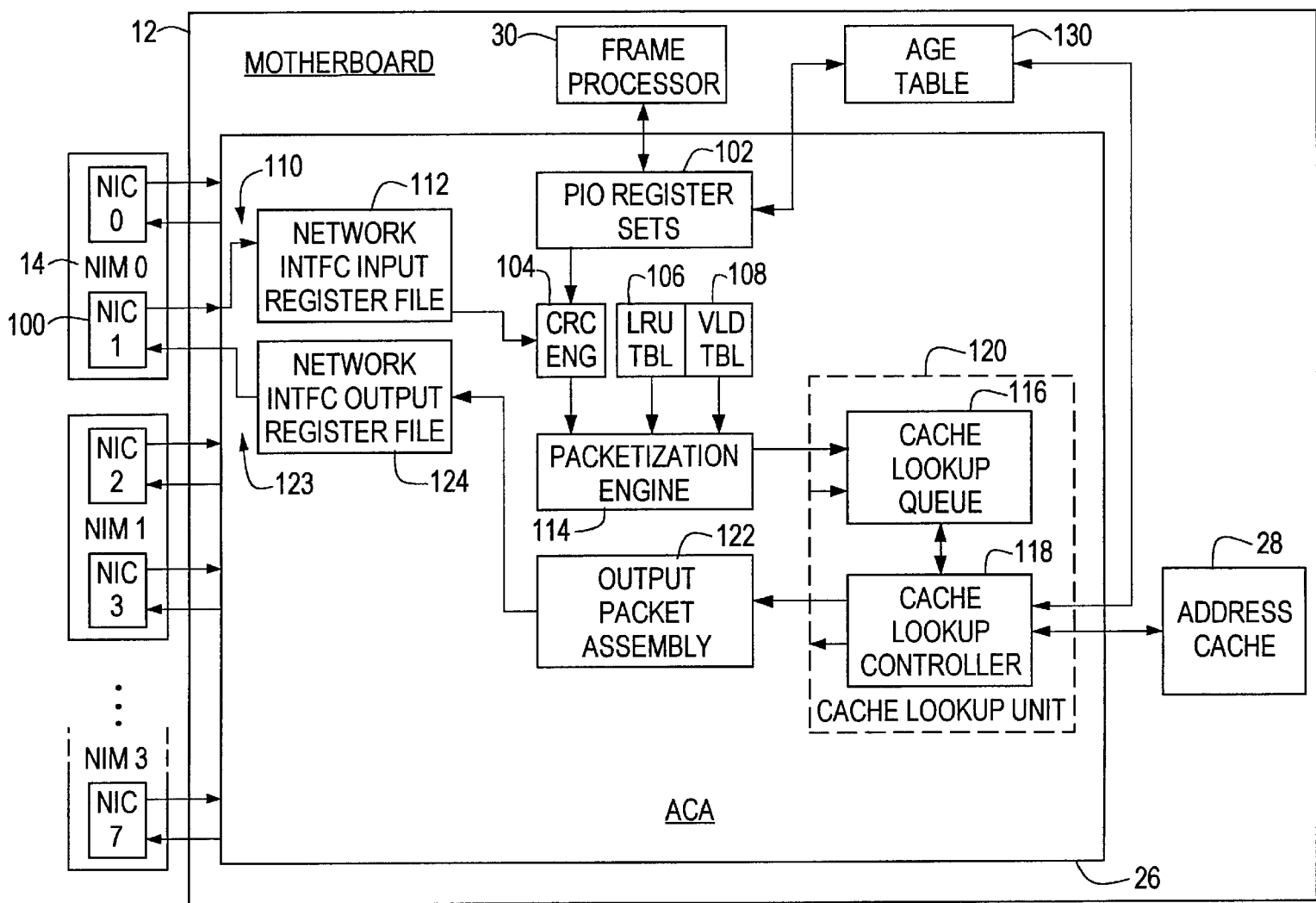
**FIG. 1**

FIG. 2

**FIG. 3**



16	15	4	3	2	1	0
1	Hash(12-1)			Set(1-0)		Cli(1-0)

FIG. 5

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