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(54) Title: DISTRIBUTED CONTROL SYNCHRONIZED RING NETWORK ARCHITECTURE

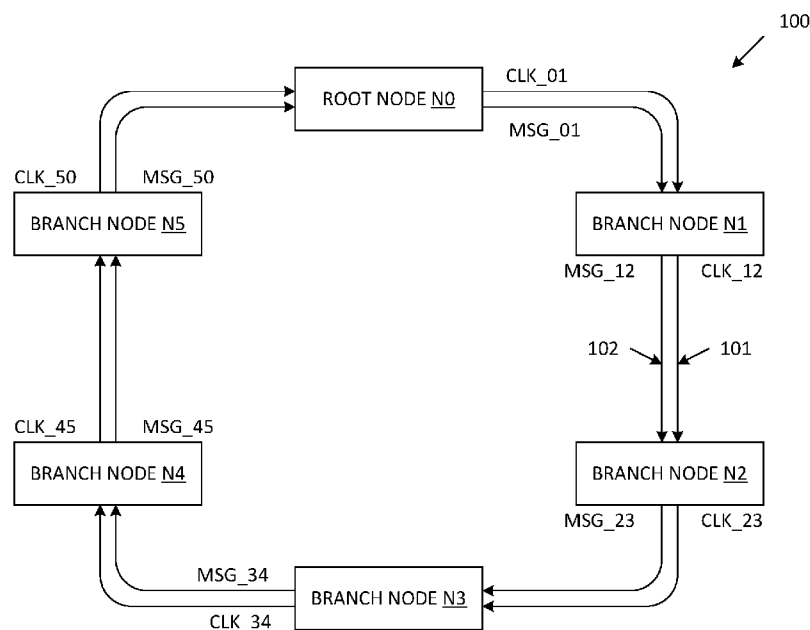


FIG. 1

(57) **Abstract:** A ring network architecture includes multiple communication nodes configured in a ring. Wave pipelining is used to provide for high bandwidth and low latency on-chip communications. Each node implements a source-synchronized clocking scheme, such that there is no need to build an extensive low skew clock-tree across a large die area. A single reference clock signal is generated within a root node, and is routed through each of the nodes of the ring network in a unidirectional manner. Each node includes a timestamp counter and a color bit register, which store values that enable the node to resolve ordered transaction messages issued by the other nodes in a precise order, even though the nodes are operating independently, and receive the various transaction messages in totally different timing orders. Because the control logic is distributed among the nodes, no centralized controller is necessary.



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- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

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A. CLASSIFICATION OF SUBJECT MATTER

IPC - H04J 3/02; H04L 12/02, 12/20 (2018.01)

CPC - H04J 3/0855, 3/0661, 3/067, 3/0679, 3/0635, 14/0283; H04L 12/4637, 12/40195

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)

See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

See Search History document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y -- A	US 2014/0079393 A1 (WOLFE, G et al.) March 20, 2014; figures 1, 3, paragraphs [0017], [0020], [0023], [0026], [0031], [0038], claims 1, 6, 15, 16	1-3, 9, 10, 14-17 -- 4, 5-8, 11, 12
Y -- A	US 2013/0279525 A1 (ZHENG, Q et al.) October 24, 2013; figure 1, paragraph [0029]	1-3, 9, 10, 14-17 -- 4, 12
Y	US 2008/0140891 A1 (FONG, L et al.) June 12, 2008; paragraph [0032]	2
Y -- A	US 2008/0025344 A1 (BIEDERMAN, D et al.) January 31, 2008; paragraph [0052], claim 1	9, 10 -- 11
Y -- A	US 2007/0237153 A1 (SLAUGITER, G et al.) October 11, 2007; paragraph [0190]	14 -- 5-8
Y	US 2006/0098682 A1 (NICHOLS, S) May 11, 2006; abstract, claim 1	15
Y	US 5,815,016 A (ERICKSON, C) September 29, 1998; column 6, lines 36-47, claim 1	16, 17
A	US 2003/0096577 A1 (HEINONEN, T et al.) May 22, 2003; the entire document	1-18

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

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