Title: LINE RATE BUFFER USING SINGLE PORTED MEMORIES FOR VARIABLE LENGTH PACKETS

Begin

1. Provide three single ported memory regions associated with a producing processor
   - 220

2. Receive a data stream transmitted to the producing processor
   - 222

3. Determine an availability of the three single ported memory regions
   - 224

4. Write the received variable-size data packets to an available single ported memory of the producing processor
   - 226

5. Read the variable-size data packet from the single ported memory
   - 228

6. Repeat the write and the read for successive variable-size data packets
   - 230

After reading a memory having a maximum amount of data, eliminating a waiting period for the consuming processor between reading each of the successive data packets
   - 232

Done

Abstract: A method for enabling line rate throughput of data communicated in a pipeline of processors having single ported memories is provided. The method initiates with providing three buffers in each processor of a pipeline of processors (operation 220). Then, a plurality of variable-size packets of data associated with a data stream are received (222). Next, the variable-size packets of data are distributed to the three buffers of a first processor of the pipeline of processors (224, 226, 230), wherein one of the plurality of variable-size packets of data distributed to the buffers has a maximum size. Then, the variable-size packets of data are read sequentially (228, 230). A second processor of the pipeline performs the sequential reading, wherein the second processor maintains the line rate after reading the one of the plurality of variable-size packets of data having the maximum size (232). A network interface card and a processor are also provided.
Published:
— with international search report
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(88) Date of publication of the international search report:
22 July 2004
**INTERNATIONAL SEARCH REPORT**

**A. CLASSIFICATION OF SUBJECT MATTER**

<table>
<thead>
<tr>
<th>IPC(7)</th>
<th>US CL</th>
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<td>G06F 13/00</td>
<td>711/169; 710/52</td>
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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)

- U.S.: 711/169, 5; 710/52; 370/419

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

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

Please See Continuation Sheet

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>US 6,044,061 A (AYBAY et al) 28 March 2000 (28.03.2000), see entire document.</td>
<td>1-17</td>
</tr>
<tr>
<td>A</td>
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<td>1-17</td>
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<tr>
<td>A</td>
<td>US 2002/0064170 A1 (SIU et al) 30 May 2002 (30.05.2002), see entire document.</td>
<td>1-17</td>
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<td>US 6,195,739 B1 (WRIGHT et al) 27 February 2001 (27.02.2001), see entire document.</td>
<td>1-17</td>
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<td>A</td>
<td>US 5,926,475 A (SALDINGER et al) 20 July 1999 (20.07.1999), see entire document.</td>
<td>1-17</td>
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</table>

Further documents are listed in the continuation of Box C.

See patent family annex.

**Date of the actual completion of the international search**

14 May 2004 (14.05.2004)

**Date of mailing of the international search report**

02 JUN 2004

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Form PCT/ISA210 (second sheet) (July 1998)
Continuation of B. FIELDS SEARCHED Item 3:
USPTO East search (USPAT, US-PGPUB, EPO, JPO, DERWENT DATABASES)

search terms: buffer, memory, packet, size, length, pipeline, network, arbiter