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(12) **United States Patent**  
So et al.

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(54) **MICRO-FLOW LABEL SWITCHING**

(56) **References Cited**

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#### U.S. PATENT DOCUMENTS

6,408,005 B1 \* 6/2002 Fan et al. .... 370/412  
6,473,404 B1 \* 10/2002 Kaplan et al. .... 370/238  
6,574,195 B1 \* 6/2003 Roberts ..... 370/235  
6,678,264 B1 \* 1/2004 Gibson ..... 370/352

\* cited by examiner

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(\*) Notice: Subject to any disclaimer, the term of this  
patent is extended or adjusted under 35  
U.S.C. 154(b) by 1069 days.

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(21) Appl. No.: **09/733,783**

(57) **ABSTRACT**

(22) Filed: **Dec. 8, 2000**

#### Related U.S. Application Data

(63) Continuation-in-part of application No. 09/552,278,  
filed on Apr. 19, 2000, now Pat. No. 6,574,195.

(51) **Int. Cl.**  
**H04L 12/56** (2006.01)

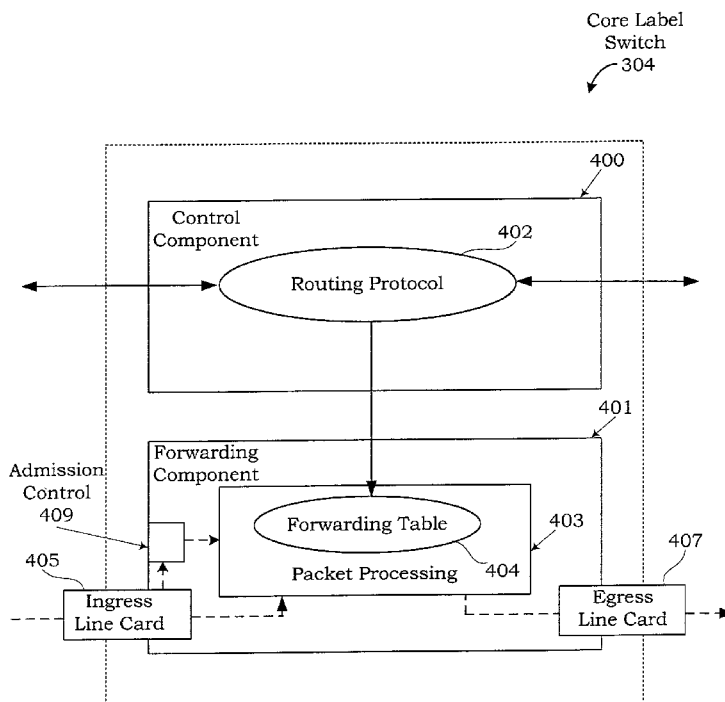
(52) **U.S. Cl.** ..... 370/392; 370/235

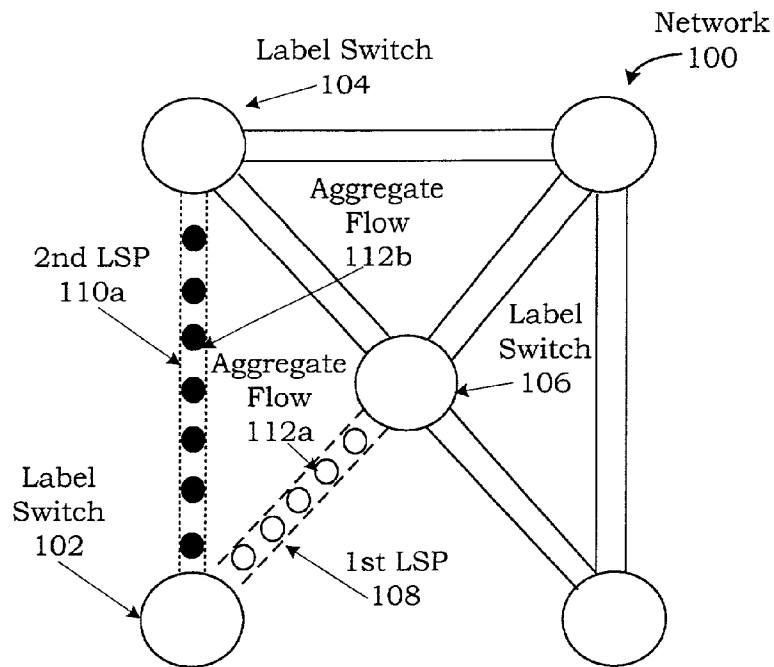
(58) **Field of Classification Search** ..... 370/401,  
370/229, 230, 231, 232, 233, 234, 235, 237,  
370/411, 412–418, 465, 351, 352, 444, 503,  
370/395.1, 395.52, 395.61, 395.4, 395.41,  
370/395.21, 395.2, 395.42, 395.32, 384

See application file for complete search history.

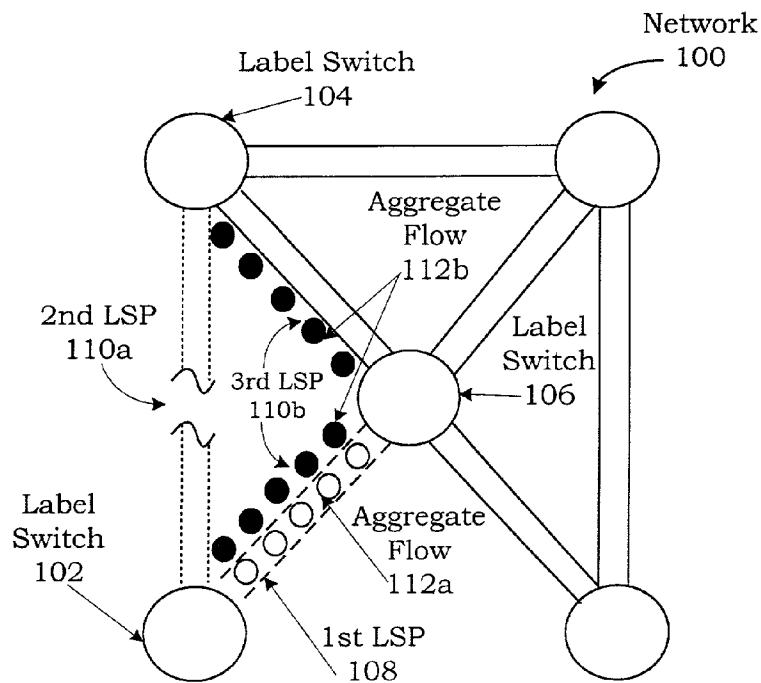
An invention is provided for affording an aggregate micro-flow having intelligent load balancing. Initially, a set of label switched paths (LSPs) is defined for a network domain. Then, as the network receives a set of data packets, a micro-flow comprising the set of data packets is defined. In addition to the information included in each received data packet, the micro-flow includes a quality of service (QoS) type. A particular label switched path (LSP) is selected from the defined set of LSPs, based on the QoS type of the micro-flow, and the micro-flow is transmitted along the selected LSP.

**29 Claims, 15 Drawing Sheets**

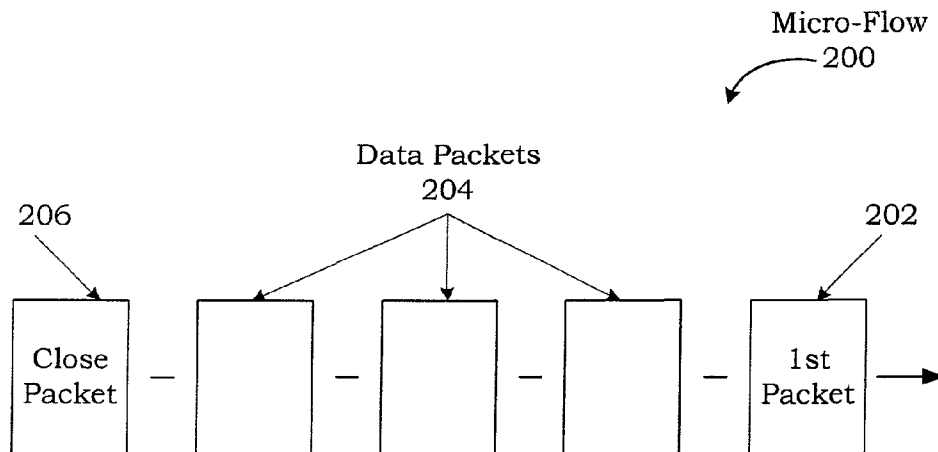




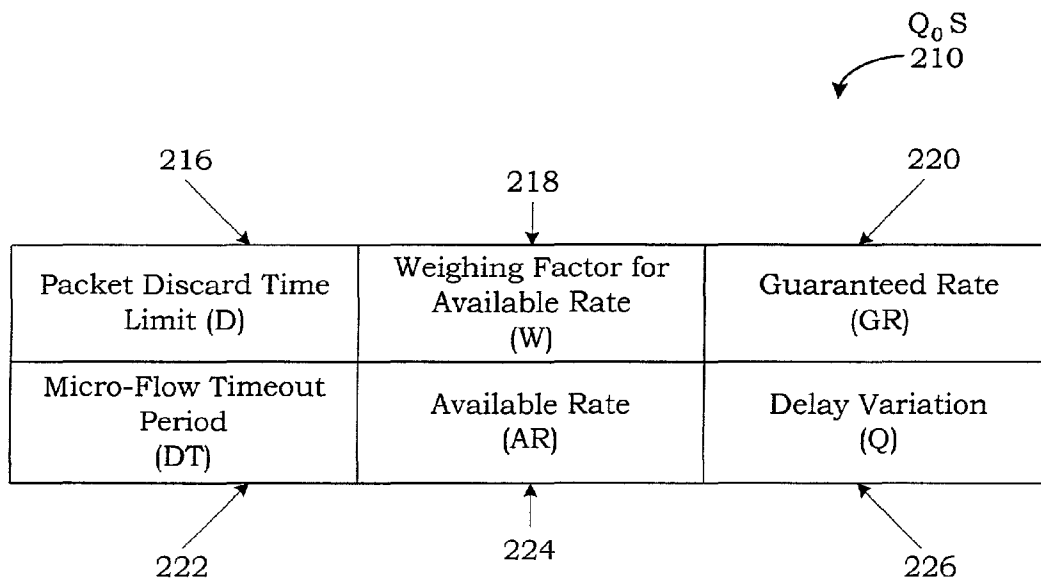
**FIG. 1A**  
(Prior Art)



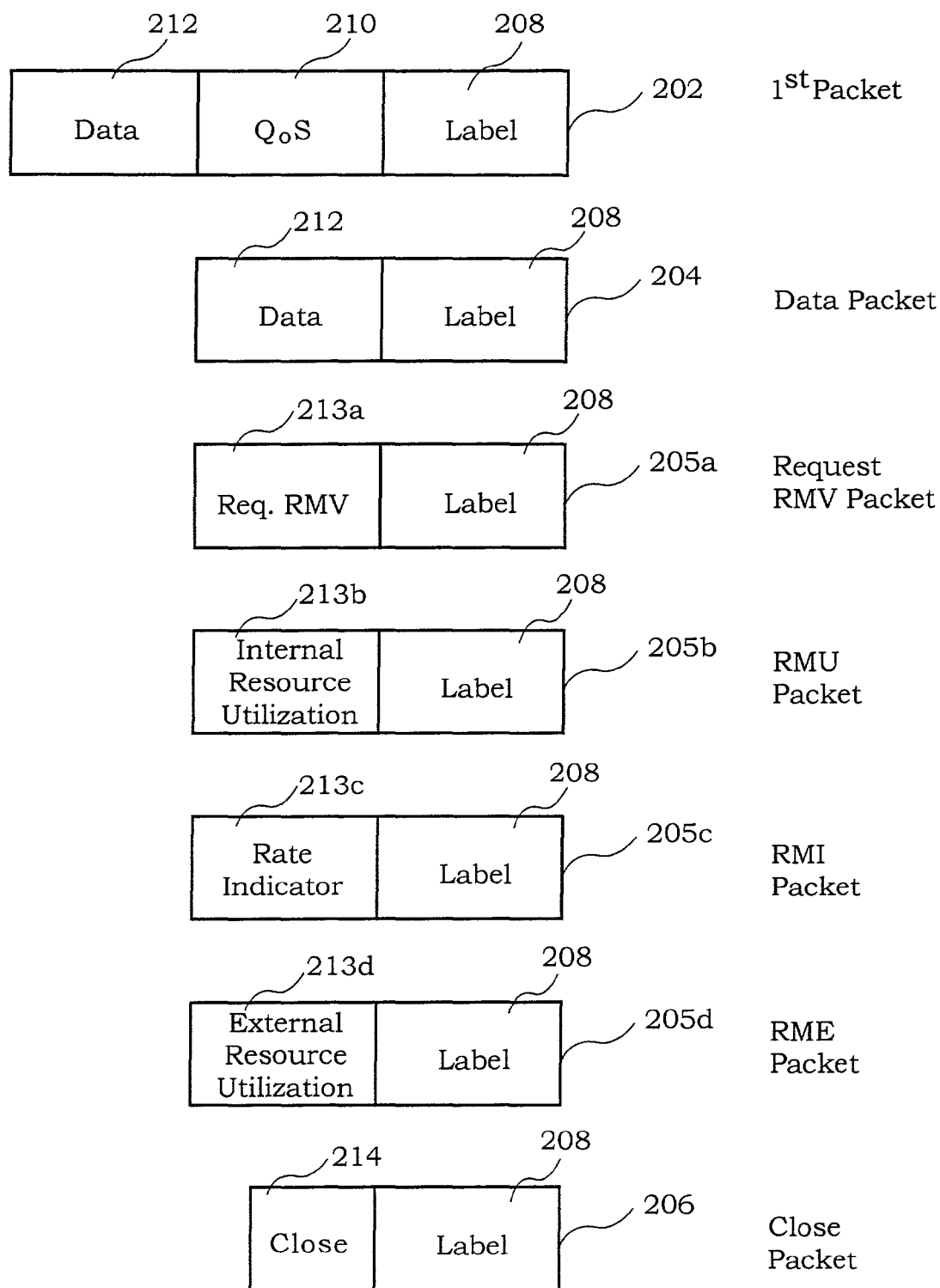
**FIG. 1B**  
(Prior Art)

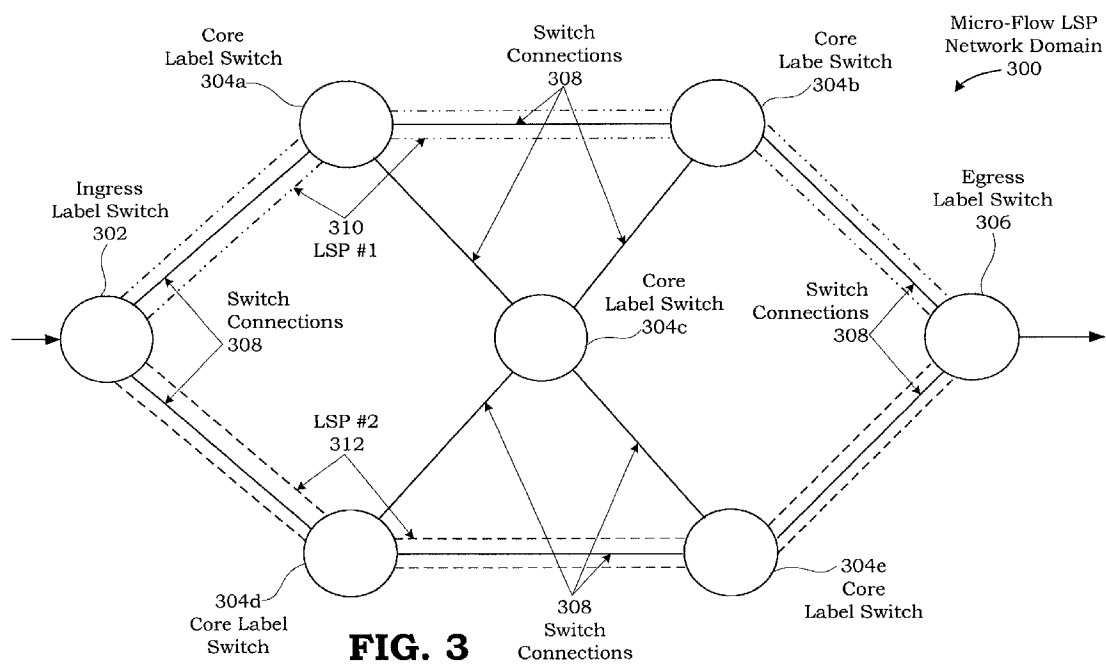


**FIG. 2A**



**FIG. 2C**

**FIG. 2B**



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