US007072828B2

(12) **United States Patent**
Petty

(10) **Patent No.: US 7,072,828 B2**
(45) **Date of Patent: Jul. 4, 2006**

(54) **APPARATUS AND METHOD FOR IMPROVED VOICE ACTIVITY DETECTION**

(75) Inventor: **Norman W. Petty**, Columbia Falls, MT (US)

(73) Assignee: **Avaya Technology Corp.**, Basking Ridge, NJ (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 745 days.

(21) Appl. No.: **10/145,370**

(22) Filed: **May 13, 2002**

(65) **Prior Publication Data**

US 2003/0212548 A1 Nov. 13, 2003

(51) **Int. Cl.**
G10L 11/02 (2006.01)

(52) **U.S. Cl.** **704/210**; 704/215

(58) **Field of Classification Search** 704/201, 704/206, 208, 210, 211, 215
See application file for complete search history.

(56) **References Cited**

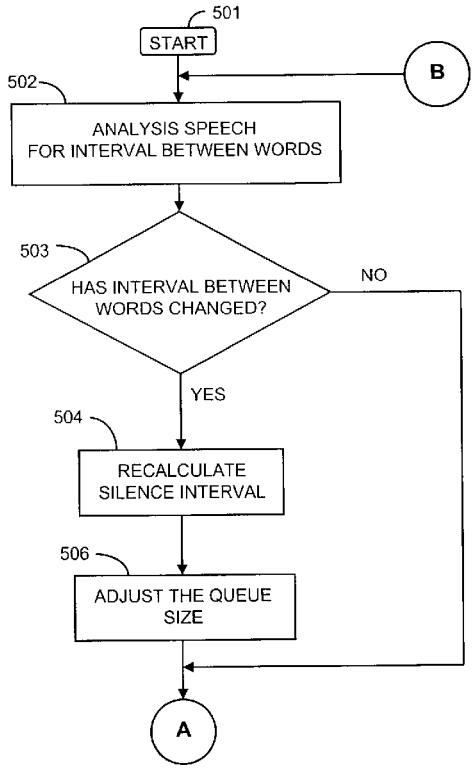
U.S. PATENT DOCUMENTS

3,909,532 A * 9/1975 Rabiner et al. 704/215
4,053,712 A * 10/1977 Reindl 704/215
4,110,560 A * 8/1978 Leary et al. 704/214
4,376,874 A * 3/1983 Karban et al. 704/215
4,449,190 A * 5/1984 Flanagan et al. 706/22
4,696,039 A * 9/1987 Doddington 704/215
5,579,431 A * 11/1996 Reaves 704/214
5,790,538 A 8/1998 Sugar
5,890,109 A * 3/1999 Walker et al. 704/215
6,157,653 A 12/2000 Kline et al.
6,161,087 A * 12/2000 Wightman et al. 704/215
6,256,606 B1 * 7/2001 Thyssen et al. 704/221
6,259,677 B1 7/2001 Jain
6,490,556 B1 * 12/2002 Graumann et al. 704/233
6,535,844 B1 * 3/2003 Wood et al. 704/210
6,711,536 B1 * 3/2004 Rees 704/210
6,725,191 B1 * 4/2004 Mecayten 704/215
2003/0223443 A1 * 12/2003 Petty 370/412
2003/0225573 A1 * 12/2003 Petty 704/205

* cited by examiner

Primary Examiner—Martin Lerner
(74) *Attorney, Agent, or Firm*—John C. Moran

(57) **ABSTRACT**

Problems of front-end clipping and excessively long hold-over times in digitally encoded speech are resolved by the introduction of a queue at the transmitting end of a digital conversation. Samples are transmitted from the queue until an interval of low energy samples is encountered upon which time samples are not transmitted from queue until energy samples are present.

3 Claims, 6 Drawing Sheets