



US008122141B2

(12) **United States Patent**
Price

(10) **Patent No.:** **US 8,122,141 B2**
(45) **Date of Patent:** ***Feb. 21, 2012**

(54) **STREAMING MEDIA BUFFERING SYSTEM**

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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 0 days.

This patent is subject to a terminal disclaimer.

5,922,048 A	7/1999	Emura	709/219
5,923,655 A	7/1999	Veschi et al.	370/394
5,928,330 A *	7/1999	Goetz et al.	709/231
5,999,525 A	12/1999	Krishnaswamy et al.	370/352
6,002,720 A	12/1999	Yurt et al.	375/240
6,014,693 A	1/2000	Ito et al.	709/219
6,014,694 A	1/2000	Aharoni et al.	709/219
6,014,706 A	1/2000	Cannon et al.	709/231
6,029,194 A	2/2000	Tilt	709/219
6,047,317 A	4/2000	Bisdikian et al.	709/217
6,057,832 A	5/2000	Lev et al.	345/327
6,061,731 A	5/2000	Blakeslee	709/231
6,061,732 A	5/2000	Korst et al.	709/231
6,065,050 A	5/2000	DeMoney	709/219
6,085,221 A	7/2000	Graf	709/202
6,292,834 B1	9/2001	Ravi et al.	

(Continued)

(21) Appl. No.: **12/800,152**

(22) Filed: **May 10, 2010**

(65) **Prior Publication Data**

US 2010/0235536 A1 Sep. 16, 2010

Related U.S. Application Data

(63) Continuation of application No. 10/893,814, filed on Jul. 19, 2004, now Pat. No. 7,716,358, which is a continuation-in-part of application No. 09/819,337, filed on Mar. 28, 2001, now Pat. No. 6,766,376.

(60) Provisional application No. 60/231,997, filed on Sep. 12, 2000.

(51) **Int. Cl.**
G06F 15/16 (2006.01)

(52) **U.S. Cl.** **709/231**

(58) **Field of Classification Search** 709/230,
709/231

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,526,353 A	6/1996	Henley et al.	370/60.1
5,793,980 A	8/1998	Glaser et al.	395/200.61
5,822,537 A	10/1998	Katseff et al.	395/200.61

OTHER PUBLICATIONS

Salehi et al., "Supporting Stored Video: Reducing Rate Variability and End-to-End Resource Requirements through Optimal Smoothing," *IEEE/ACM Transactions on Networking*, vol. 6, Issue 4, p. 397-410, Aug. 1998.

(Continued)

Primary Examiner — Joseph Avellino

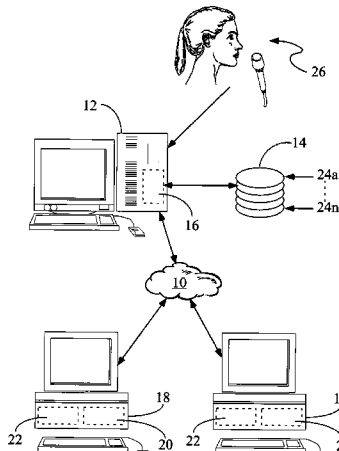
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(57) **ABSTRACT**

Streaming media, such as audio or video files, is sent via the Internet. The media are immediately played on a user's computer. Audio/video data is transmitted from the server more rapidly than it is played out by the user system. The audio/video data in the user buffer accumulates; and interruptions in playback as well as temporary modem delays are avoided.

28 Claims, 3 Drawing Sheets



U.S. PATENT DOCUMENTS

6,588,015 B1 7/2003 Eyer et al.
6,594,699 B1 7/2003 Sahai et al.
6,598,228 B2 7/2003 Hejna
6,637,031 B1* 10/2003 Chou 725/87
6,665,751 B1 12/2003 Chen et al.
6,708,213 B1 3/2004 Bommaiah et al.
6,728,753 B1* 4/2004 Parasnis et al. 709/203
6,829,368 B2 12/2004 Meyer et al.
6,889,257 B1 5/2005 Patel
6,907,481 B2 6/2005 Kovacevic
7,054,500 B1 5/2006 Lillevold
7,111,058 B1 9/2006 Nguyen et al.
7,170,856 B1 1/2007 Ho et al.

7,346,698 B2 3/2008 Hannaway
7,373,413 B1 5/2008 Nguyen et al.
2001/0047377 A1* 11/2001 Sincaglia et al. 709/1

OTHER PUBLICATIONS

Rexford et al., "Smoothing variable-bit-rate video in an internetwork," IEEE/ACM Transactions on Networking, vol. 7, Issue 2, p. 202-215, Apr. 1999.
Bianchi, "Buffer sizing for high speed video information retrieval on ATM networks," Globecom—New York—, 1997, vol. 2, pp. 1057-1061.

* cited by examiner

Fig. 1

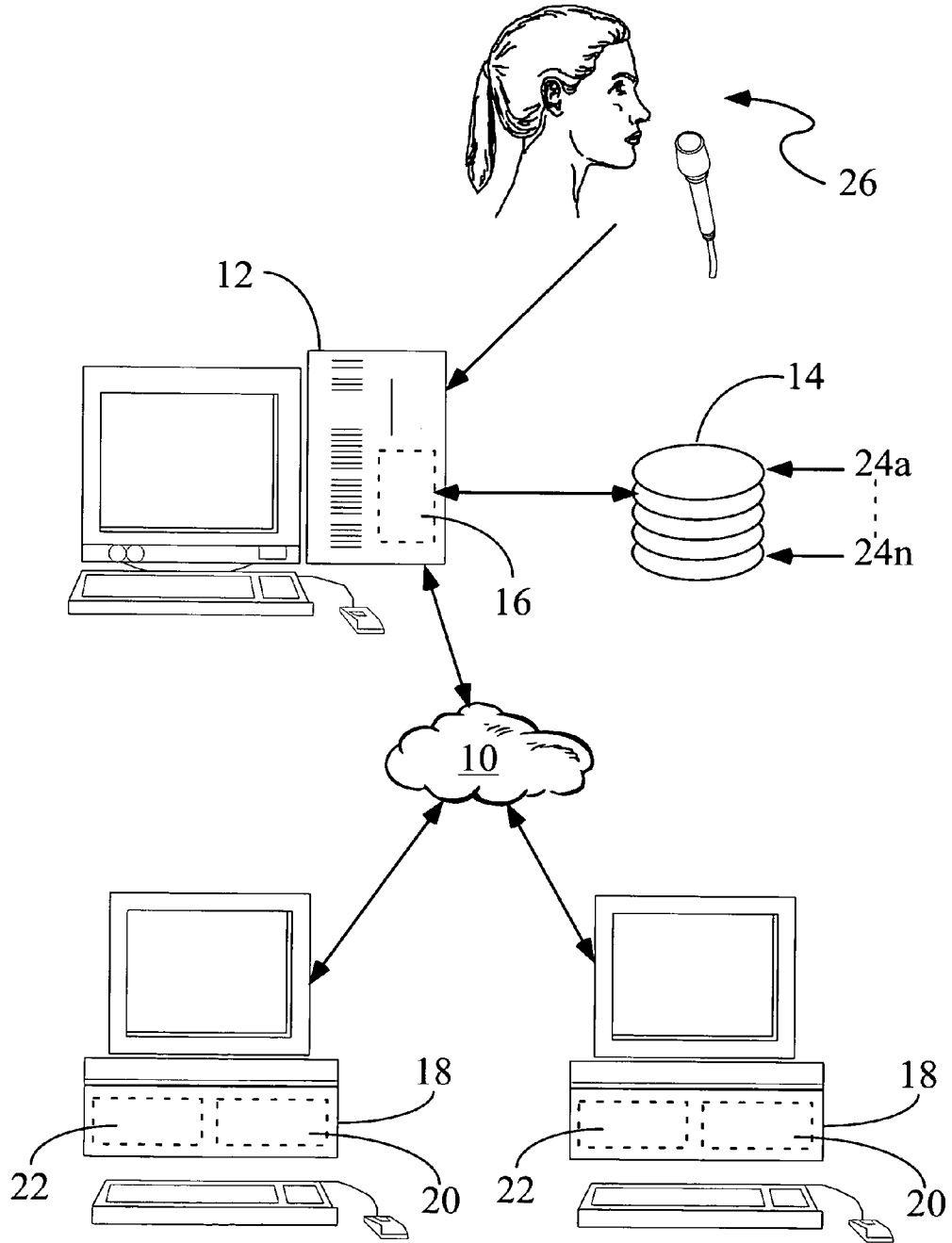


Fig. 2

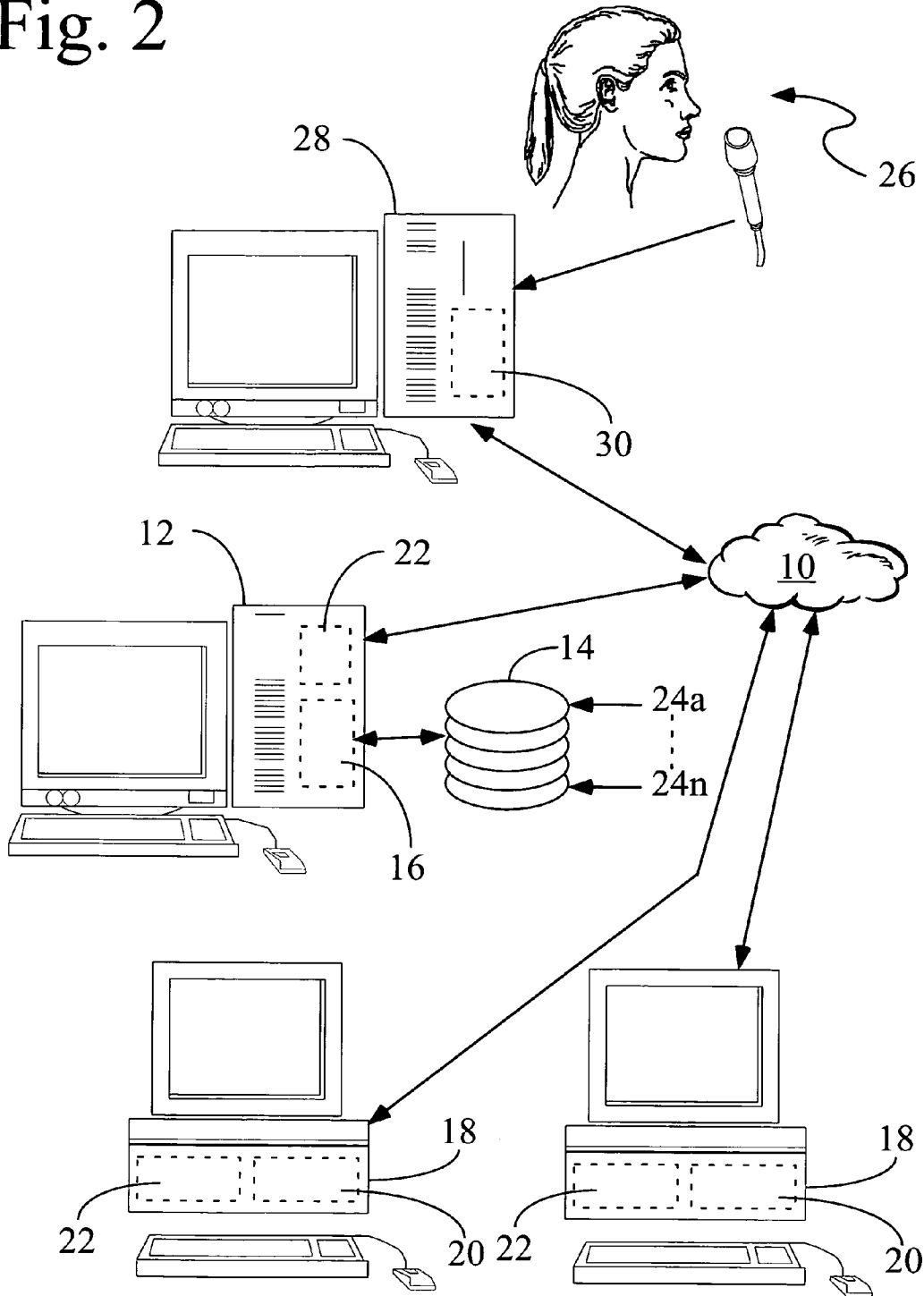
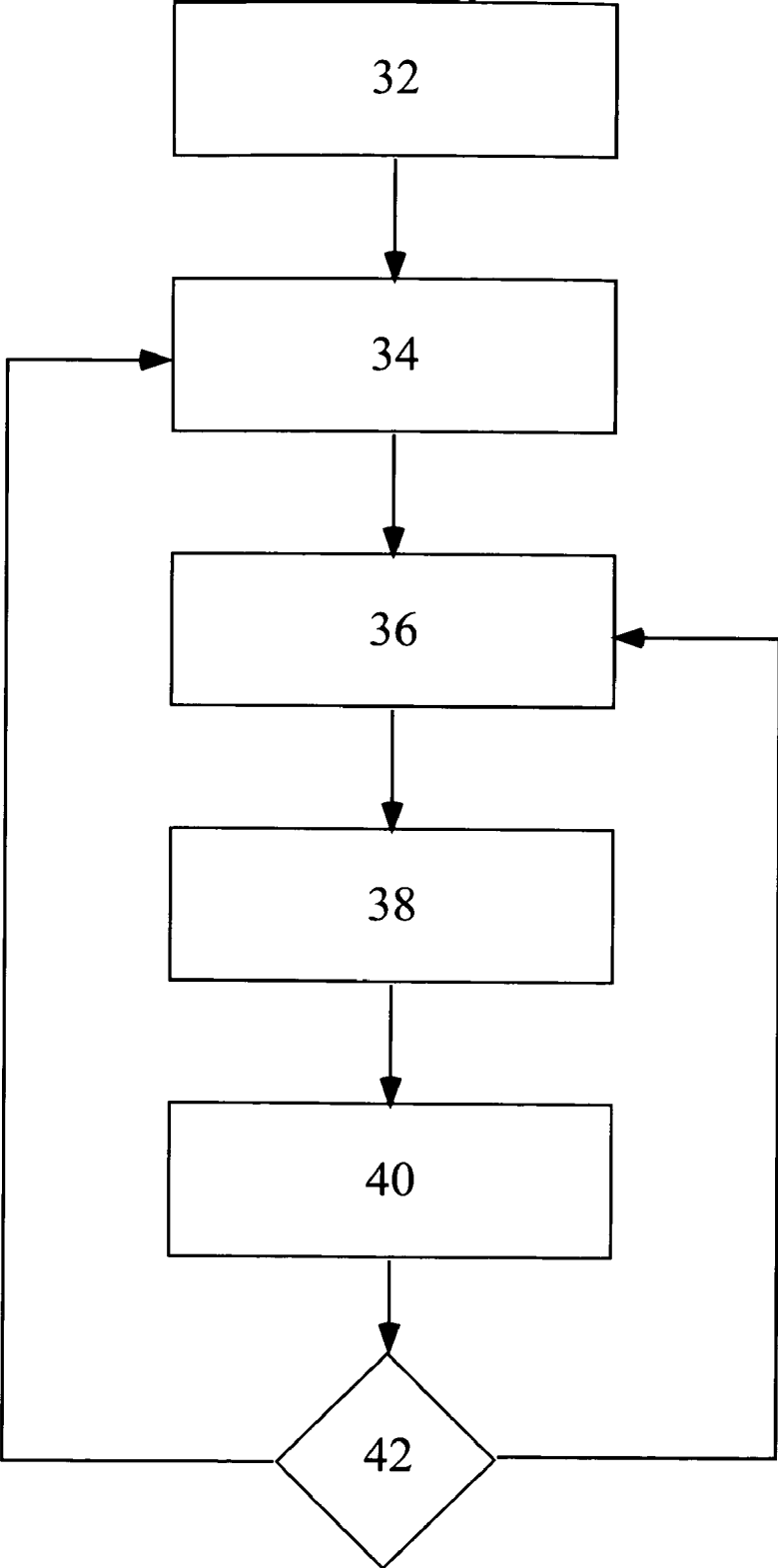


Fig. 3



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