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(12) **United States Patent**  
**Harik**

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(54) **LINK BASED CLUSTERING OF  
HYPERLINKED DOCUMENTS**

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(US)

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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 446 days.  
  
This patent is subject to a terminal disclaimer.

|                |         |                 |         |
|----------------|---------|-----------------|---------|
| 5,890,172 A    | 3/1999  | Borman et al.   |         |
| 5,920,859 A    | 7/1999  | Li              |         |
| 5,941,944 A    | 8/1999  | Messerly        |         |
| 5,999,664 A *  | 12/1999 | Mahoney et al.  | 382/305 |
| 6,038,574 A    | 3/2000  | Pitkow et al.   |         |
| 6,049,799 A *  | 4/2000  | Mangat et al.   | 1/1     |
| 6,078,913 A *  | 6/2000  | Aoki et al.     | 1/1     |
| 6,112,203 A *  | 8/2000  | Bharat et al.   | 1/1     |
| 6,122,647 A    | 9/2000  | Horowitz et al. |         |
| 6,167,397 A    | 12/2000 | Jacobson et al. |         |
| 6,182,066 B1 * | 1/2001  | Marques         | 1/1     |
| 6,272,505 B1 * | 8/2001  | De La Huerga    | 715/235 |
| 6,285,999 B1   | 9/2001  | Page            |         |
| 6,345,253 B1   | 2/2002  | Viswanathan     |         |
| 6,353,827 B1 * | 3/2002  | Davies et al.   | 707/769 |
| 6,356,898 B2   | 3/2002  | Cohen et al.    |         |

(Continued)

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**Related U.S. Application Data**

(63) Continuation of application No. 11/693,522, filed on Mar. 29, 2007, now abandoned, which is a continuation of application No. 09/636,052, filed on Aug. 10, 2000, now Pat. No. 7,213,198.

(60) Provisional application No. 60/148,854, filed on Aug. 12, 1999.

(51) **Int. Cl.**  
**G06F 17/00** (2006.01)  
**G06F 17/20** (2006.01)

(52) **U.S. Cl.**  
USPC ..... 715/200; 715/206; 715/207; 715/208

(58) **Field of Classification Search**  
USPC ..... 715/200, 206, 207, 208  
See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

|               |         |                |         |
|---------------|---------|----------------|---------|
| 5,761,436 A   | 6/1998  | Nielsen        |         |
| 5,835,905 A * | 11/1998 | Pirolli et al. | 1/1     |
| 5,847,708 A * | 12/1998 | Wolff          | 715/764 |
| 5,875,446 A   | 2/1999  | Brown et al.   |         |

**OTHER PUBLICATIONS**

Judit Bar-Ilan et al., "3<sup>rd</sup> International Workshop on Web Dynamics", May 18, 2004, 125 pages.

(Continued)

*Primary Examiner* — Doug Hutton, Jr.

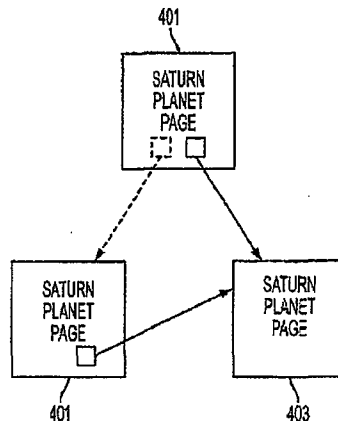
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(57) **ABSTRACT**

Techniques for grouping hyperlinked documents are provided. Links near or in the neighborhood of the hyperlinked documents are analyzed in order to group the hyperlinked documents by topic. For example, links that are search results can be grouped by identifying other hyperlinked documents that have multiple forward links to the search results. The search results can then be grouped according to the forward links of the other hyperlinked documents.

**20 Claims, 18 Drawing Sheets**



**EXHIBIT 2108**

*Facebook, Inc. et al.*

v.

*Software Rights Archive, LLC*

(56)

**References Cited**

U.S. PATENT DOCUMENTS

6,385,602 B1 5/2002 Tso et al.  
6,446,061 B1\* 9/2002 Doerre et al. .... 707/738  
6,457,028 B1 9/2002 Pitkow et al.  
6,510,406 B1 1/2003 Marchisio  
6,549,935 B1 4/2003 Lapstun et al.  
6,562,077 B2\* 5/2003 Bobrow et al. .... 715/204  
6,574,644 B2\* 6/2003 Hsu et al. .... 715/205  
6,665,715 B1 12/2003 Houri  
6,675,170 B1 1/2004 Flake  
6,728,752 B1 4/2004 Chen et al.  
6,990,628 B1\* 1/2006 Palmer et al. .... 715/234  
7,213,198 B1 5/2007 Harik

2001/0047375 A1 11/2001 Fest  
2001/0049698 A1 12/2001 Hsu et al.  
2002/0035611 A1 3/2002 Dooley

OTHER PUBLICATIONS

Haffner et al., "Request-Prediction and Hyperlink-Proposals", Nov. 2000, 177 pages.  
Blank et al., "Interactive Gradebook: The Missing (Hyper)Link", 1998, 5 pages.  
Rennie et al., "Using Reinforcement Learning to Spider the Web Efficiently", 1999, 10 pages.  
Rennie et al., "Efficient Web Spidering with Reinforcement Learning", 1999, 13 pages.

\* cited by examiner

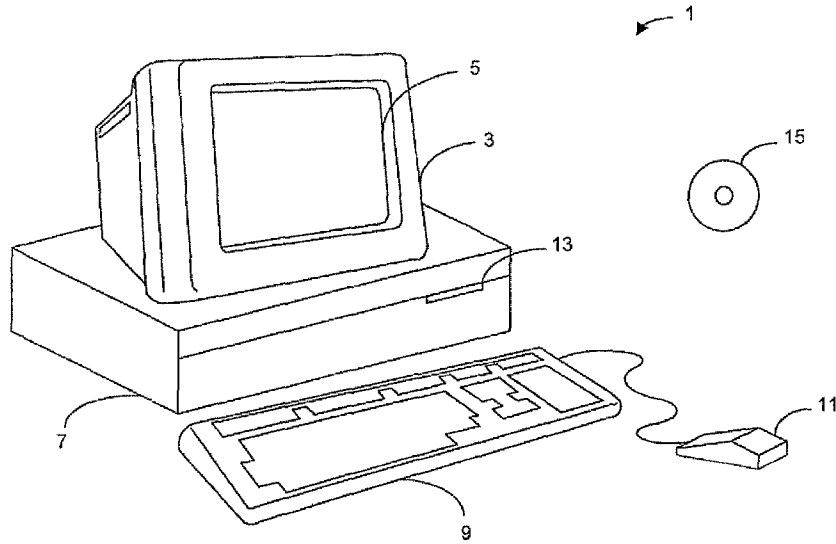


FIG. 1

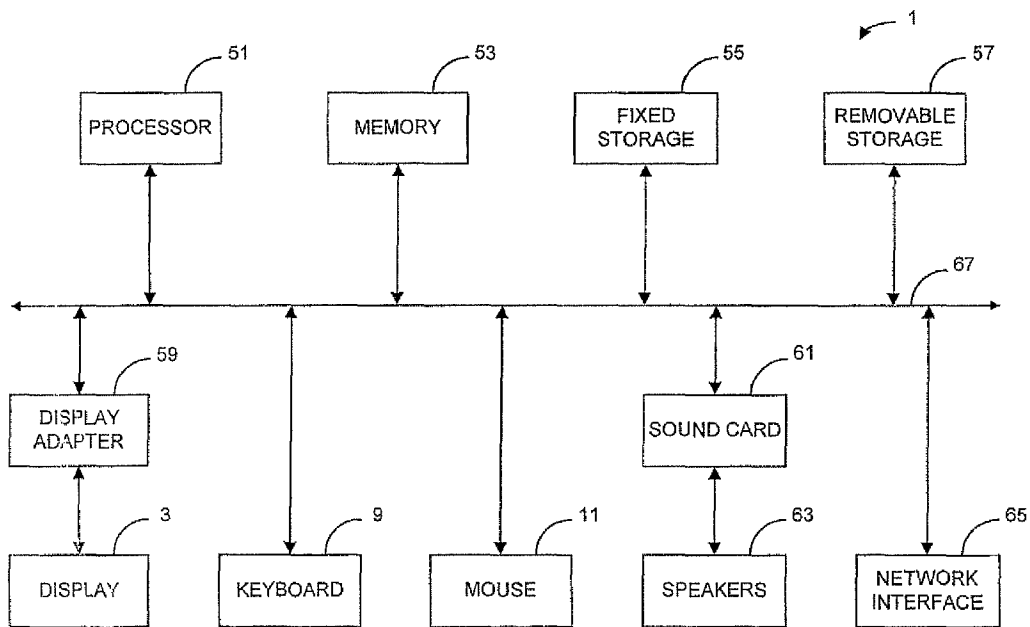


FIG. 2

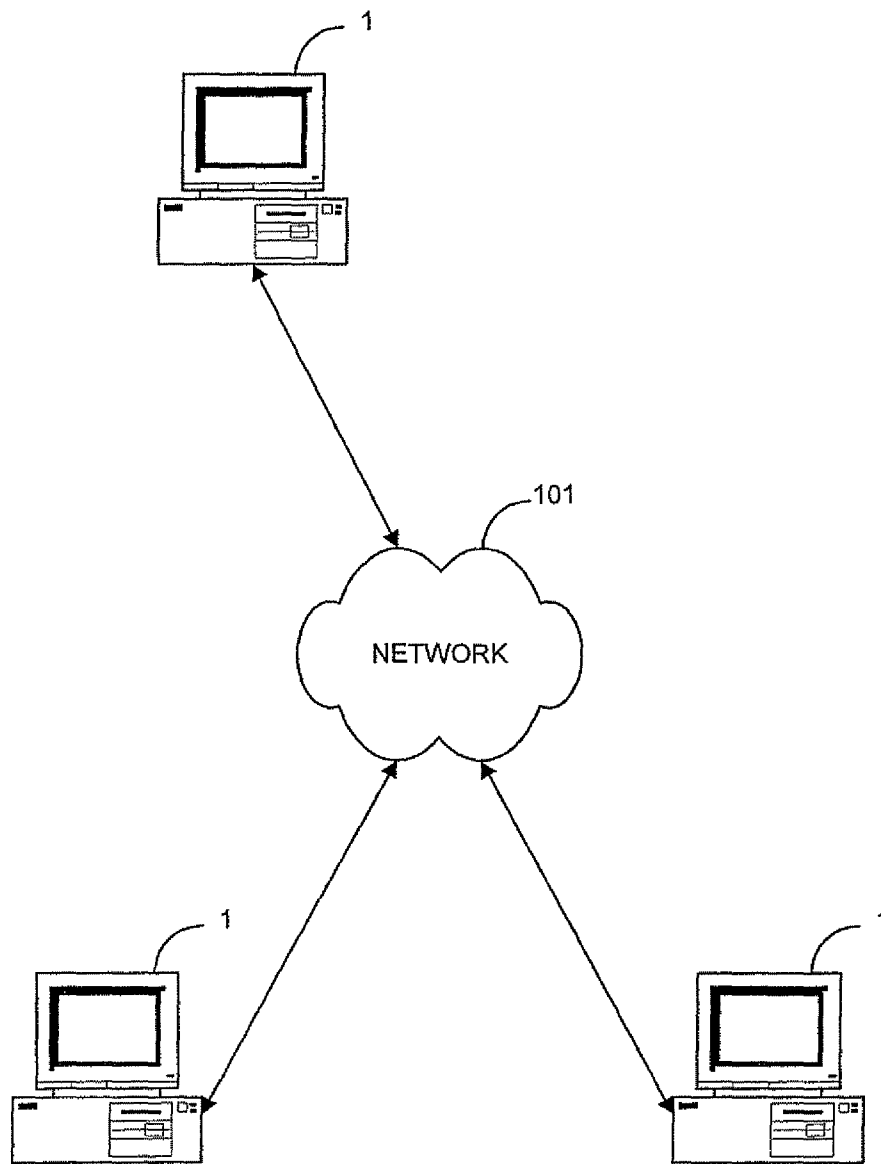


FIG. 3

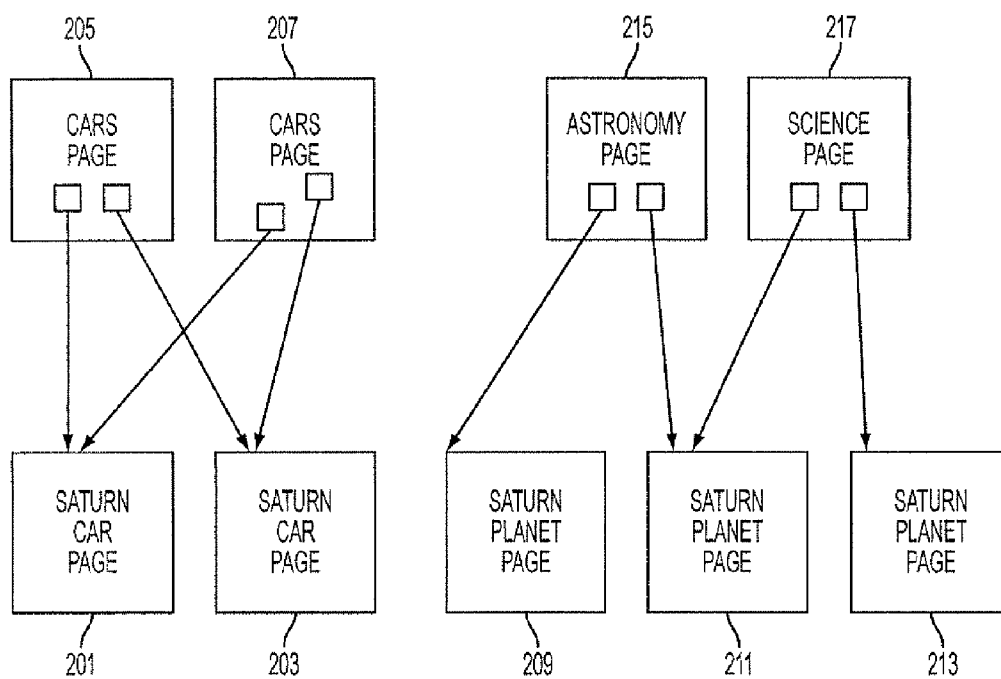


FIG. 4

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