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# United States Patent [19]

Freivald et al.

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[54] **CHANGE-DETECTION TOOL INDICATING DEGREE AND LOCATION OF CHANGE OF INTERNET DOCUMENTS BY COMPARISON OF CYCLIC-REDUNDANCY-CHECK(CRC) SIGNATURES**

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[22] Filed: **Jan. 14, 1997**

[51] Int. Cl.<sup>6</sup> ..... **H04L 12/00**

[52] U.S. Cl. .... **395/200.48; 707/513**

[58] Field of Search ..... 395/200.48, 400.49; 707/10, 203, 511, 513

### [56] References Cited

#### U.S. PATENT DOCUMENTS

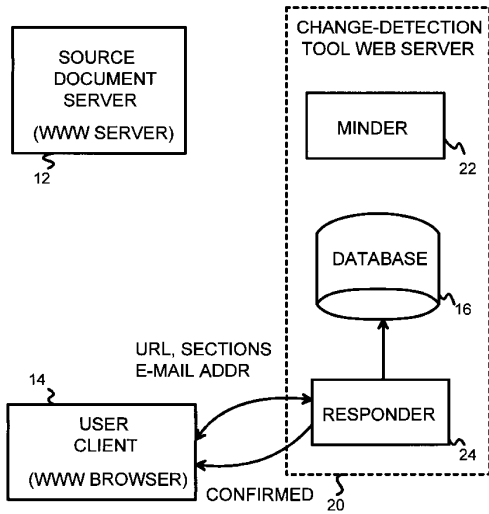
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Primary Examiner—Lance Leonard Barry  
Attorney, Agent, or Firm—Stuart T. Auvinen

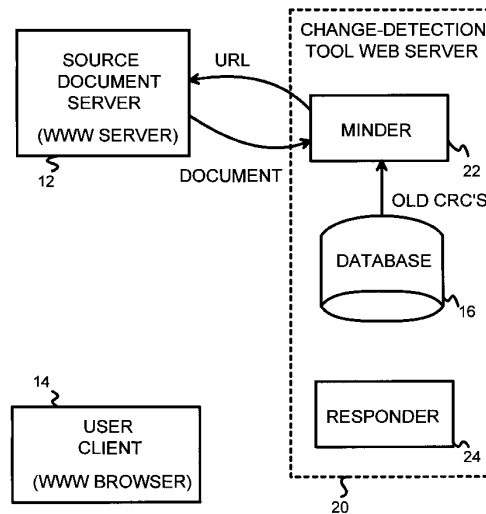
### [57] ABSTRACT

A change-detection web server automatically checks web-page documents for recent changes. The server retrieves and compares documents one or more times a week. The user is notified by electronic mail when a change is detected. The user registers a web-page document by submitting his e-mail address and the uniform-resource locator (URL) of the desired document. The document is fetched and the user can select text on the page of interest. Non-selected text is ignored; only changes in the selected text are reported back to the user. Thus changes to less relevant parts of the document are ignored. The document is divided into sections bounded by hyper-text markup-language (HTML) tags. A checksum is generated and stored for each HTML-bound section. Storage requirements are reduced since only checksums are stored rather than the original documents. During periodic comparisons a fresh copy of the document is retrieved, divided into HTML-bound sections and checksums generated for each section. The freshly-generated checksums are compared to the archived checksums. Sections with non-matching checksums are highlighted as changed, and the percentage of changed sections is reported. The user-defined selection is also stored as a checksum and compared to a freshly-generated checksum. Changed checksums outside the user-defined selection do not generate a change notification. Re-ordering of sections does not generate a change notification when the checksums otherwise match. Thus format and layout changes do not generate change notifications, and the frequency of notices to user is reduced.

19 Claims, 10 Drawing Sheets



USER SETUP



WEEKLY COMPARE

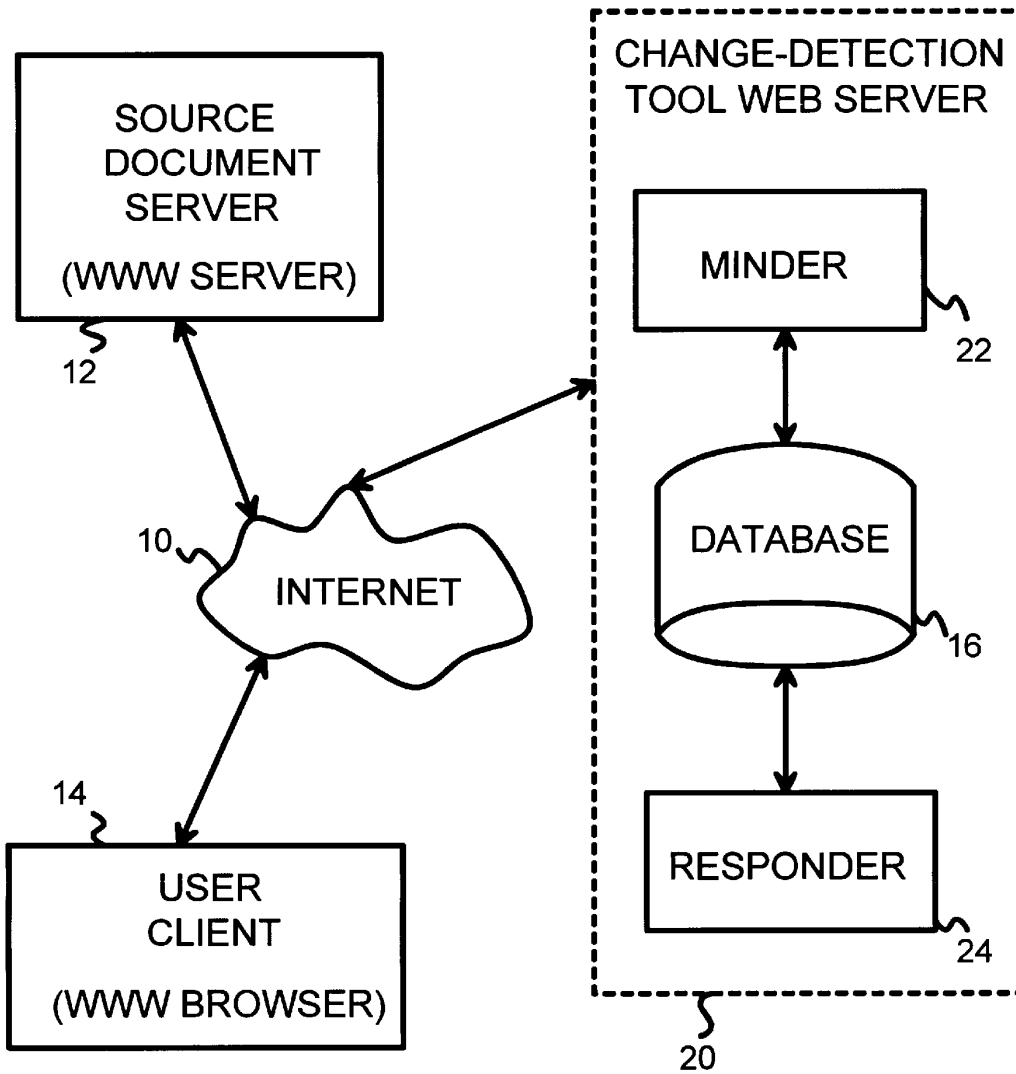
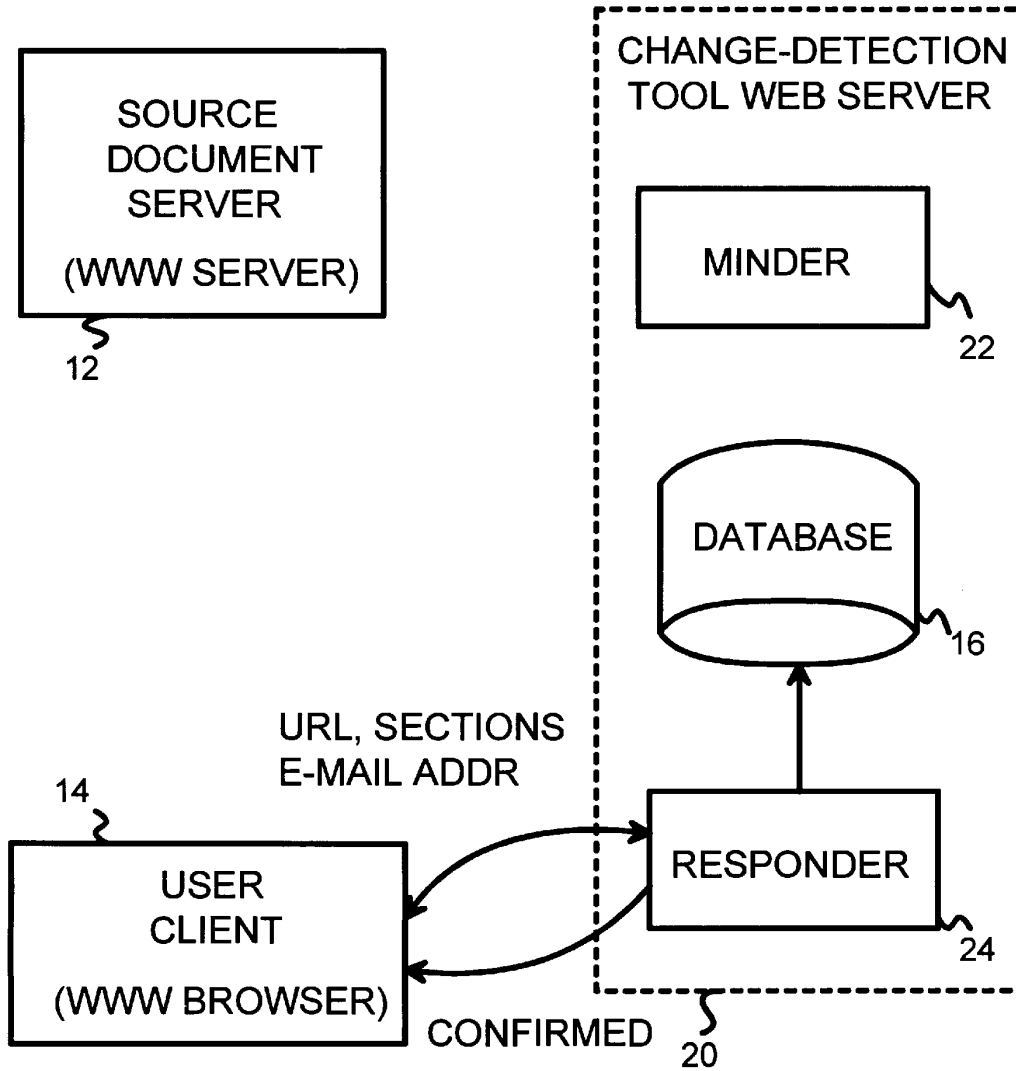
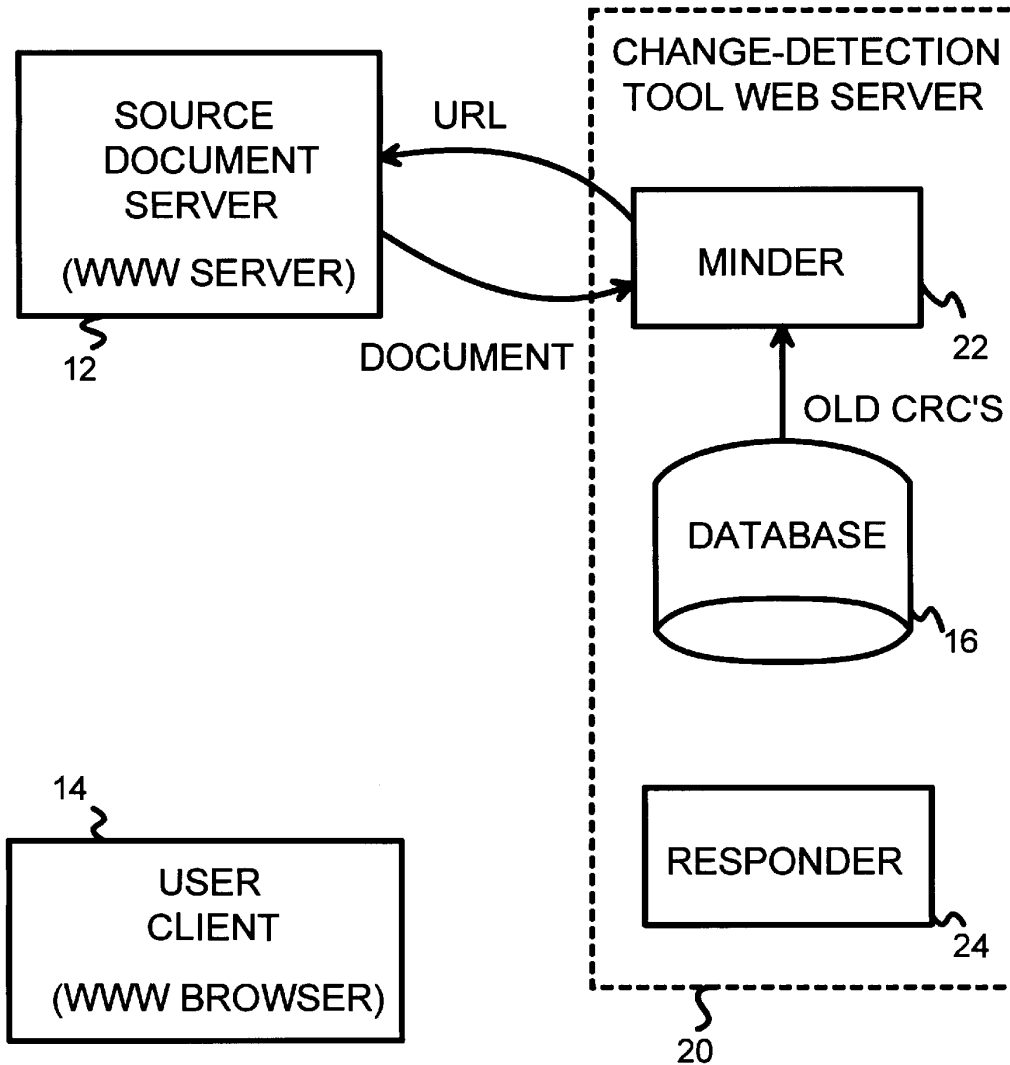


FIG. 1

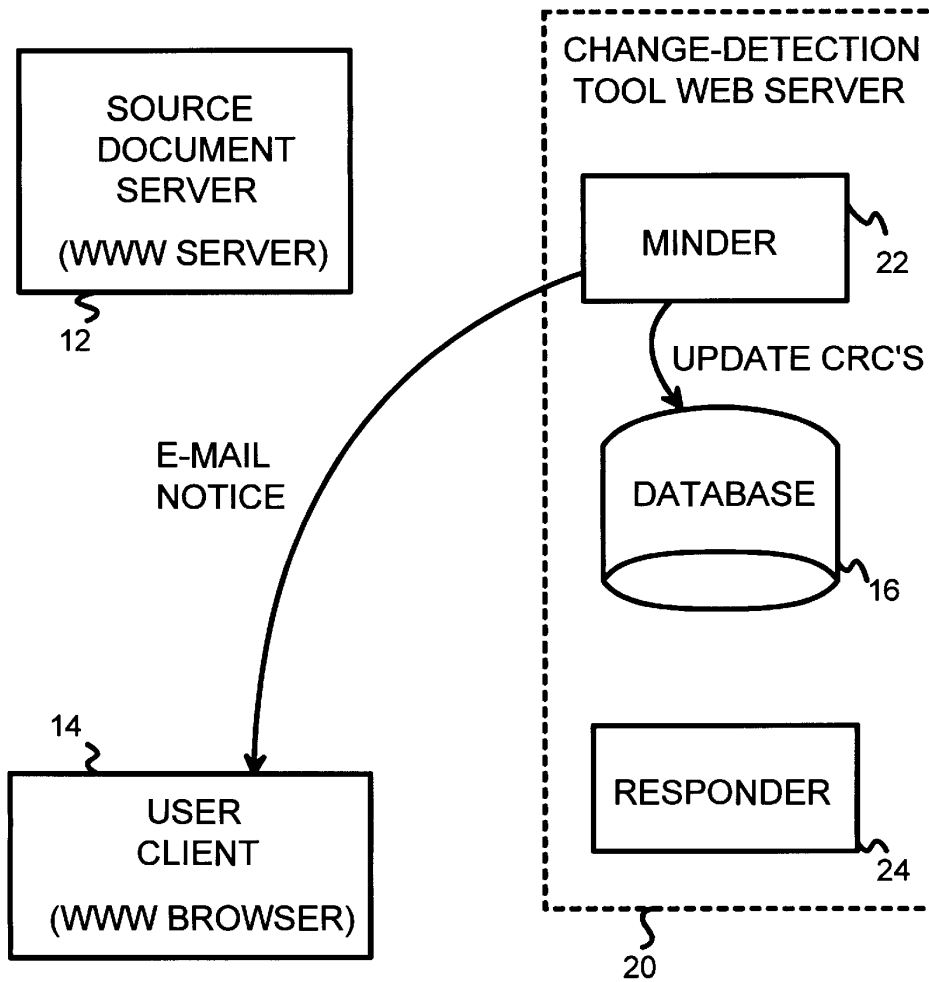


USER SETUP

FIG. 2



WEEKLY COMPARE FIG. 3



REPORT CHANGE FIG. 4

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