

[0017] Web Access from Braille Documents

[0018] Recently, due mainly to the widespread use of personal computers and the universal access of millions of users to the World Wide Web, "multimedia publishing" has veritably exploded. Due to the widespread penetration of CD-ROM drives, an enormous number of multimedia titles combining text, images, and sounds, are now accessible to owners of personal computers. In this evolution, a large amount of hypermedia information is accessible today via the Internet on the World Wide Web, by sighted as well as by blind people. Today, many people agree that Braille documents are the most universal and convenient source of information for the blind, and that, in the future, the Web could be an important source of information.

[0019] Consequently, an object of the invention is to promote the use of Braille by enhancing the information provided to blind people when reading Braille documents.

[0020] Another object of the present invention is to enable blind people to select and access electronic multimedia services provided by one or a plurality of servers connected on a communication network, preferably the World Wide Web.

[0021] Another object of the present invention is to enable blind people to select and access an electronic multimedia service directly from Braille documents.

[0022] Yet another object of the present invention is to enable blind people to sense, over a Braille document, hyperlinked physical regions that can be selected to access electronic multimedia services.

[0023] A further object of the present invention is to select and access an electronic multimedia service simply by detecting the proximity of the user's fingertips to hyperlinked physical regions over a Braille document while preserving the integrity of the document.

[0024] It is a particular object of the invention to improve the access to the World Wide Web for blind people.

SUMMARY

[0025] The invention relates generally to the accessibility of blind and vision impaired people to interactive hypermedia systems such as the Web directly from Braille documents.

[0026] The invention is directed to a system and method for use, in a user system, for accessing hyperlinks to information or services from a Braille document comprising one or more pages. The method comprises the steps of:

[0027] identifying and selecting one or more pages;

[0028] for each selected page of the Braille document:

[0029] detecting, using a proximity sensing foil placed and aligned under the page, items touched by the user on the surface of the page;

[0030] for each touched item on the page:

[0031] determining the physical position of the touched item on the page by means of the proximity sensing foil;

[0032] storing, in a hyperlink table, an identification of the touched item based on the physical position, on the proximity sensing foil, of the touched item;

[0033] creating, in the hyperlink table, a hyperlink from the touched item to information and/or service (both of which are referred to generically herein below as "information").

[0034] Braille in every situation. Aside from using Braille to read all kinds of textbooks and documents, Braille is useful in a variety of other ways. Braille can be used at home to label, for example, tapes, CDs, clothes, thread, spices, cans of food, and computer disks. People who read Braille can play card games such as bridge and board games such as Scrabble. At school, a student who is visually impaired and knows Braille can take notes using a slate and stylus, scan a text to find the part to study, and re-read homework assignments before handing them in. Braille readers can look things up and go back and forth in the text more easily. Children can write personal messages and leave notes for parents and caregivers in Braille. Braille can be easily read by sighted people with some Braille training. And, of course, there are computer programs that transcribe Braille to print or vice versa".

[0035] Web Access from Braille Documents

[0036] During the last years, due mainly to the widespread use of personal computers and the universal access of millions of users to the World Wide Web, the "multimedia publishing" has veritably exploded. Due to the widespread penetration of CD-ROM drives an enormous amount of multimedia titles combining text, images and sounds, are now accessible to owners of personal computers. In this evolution, an incredible amount of hypermedia information is today accessible via the Internet on the world Wide Web, by sighted as well as by blind people. Today most people agree that for the blind:

[0037] Braille documents constitute today the most universal and convenient source of information;

[0038] the Web could be in the future an important source of information.

[0039] Publication entitled "Inexpensive Tactile Interaction for Blind Computer Users: Two Application Domains" by Helen Petrie et al. (IEE Colloquium on Developments in Tactile Displays, London 21 Jan. 1997) discloses a multimedia interface for blind computer users integrating audio (both speech and non-speech) and tactile information. Interfaces for hypermedia information, including a WWW browser and an interface to a geographic information system (GIS), have been developed to allow blind people to explore digitized map information. These interfaces use touchtablets which may be covered with tactile overlays to provide interaction, and a 40 character Braille display. A non visual interface called DAHNI has been designed to help blind computer users to navigate through hypermedia applications such as the WWW. The commands used in DAHNI are designed to be easy to use by novice blind computer users and are arranged in a symmetrical shape called Workspace. The sideways "H" shape of layout for the commands is to provide more spatial diversity to aid proprioceptive feedback. All the commands on the workspace are spoken by a digitized human voice, in order to distinguish the commands from the content of the