display of other multi-part information pages is within the scope of the present invention.

[0058] Also, while the preferred embodiment of the present invention uses a web browser to aid in the collaboration between sighted users and visually impaired users, the present invention may advantageously be used without a traditional, visual web browser. Yet, when the present invention is used to aid in collaboration efforts between sighted and visually impaired users, it is preferable for the generated tactile display to always correspond to the visible portion of the web page on the screen. By maintaining synchronization between the visual and tactile displays, sighted and visually impaired users can refer to items seen or felt using a shared spatial reference frame (e.g. the item "to the right of this one", "the top left item"). This produces a physical, touchable and tactile analog of the display layout. For easier synchronization of the visual layout and tactile layout, it is preferable to use interface component **116** as the only (shared) input channel while working on a web page.

[0059] While various embodiments have been shown and described, there is no intent to limit the invention by such disclosure, but rather, it is intended to cover all modifications and alternate constructions falling within the spirit and scope of the invention, as defined in the appended claims.

1. A method of non-visually displaying a multi-part information page containing two or more spatially located areas of separate content, said method comprising:

maintaining a non-visual, abstract representation of said multi-part information page, said non-visual, abstract representation comprising non-visual display coordinates, said non-visual display coordinates comprising:

boundary coordinates defining boundaries between said two or more spatially located areas, said boundary coordinates associated with tactile feedback;

content coordinates defining said two or more spatially located areas, said content coordinates associated with auditory feedback, said auditory feedback representative of content meta-information;

receiving input position coordinates;

mapping said position input coordinates to said non-visual display coordinates;

generating a tactile output to cause a tactile output device to generate said tactile feedback for position input coordinates mapped to said boundary coordinates, and

generating an auditory output to cause an auditory output device to generate said auditory feedback for position input coordinates mapped to said content coordinates.

2. A method of non-visually displaying a multi-part information page containing two or more spatially located areas of separate content, as per claim 1, wherein said content meta-information indicates any of: area updated; area contains specific items designated of interest; kind of content within area; area is scrollable; area is visible in its entirety; number of hyperlinks in area; area contains content in a visually impaired user inaccessible form; or area contains content in a visually impaired user accessible form.

3. A method of non-visually displaying a multi-part information page containing two or more spatially located areas of separate content, as per claim 1, said method further comprising:

receiving data representative of said multi-part information page;

determining said two or more spatially located areas from said data;

determining said content meta-information for said separate content from said data, and

generating said non-visual, abstract representation from said area determination and said content meta-information determination.

4. A method of non-visually displaying a multi-part information page containing two or more spatially located areas of separate content, as per claim 3, said method further comprising:

caching said data representative of said multi-part information page.

5. A method of non-visually displaying a multi-part information page containing two or more spatially located areas of separate content, as per claim 4, said method further comprising:

receiving a request for said content in one of said areas;

retrieving said requested content from said cached data, and

transmitting said content to a linear screen reader.

6. A method of non-visually displaying a multi-part information page containing two or more spatially located areas of separate content, as per claim 5, wherein said multi-part information page is a web page containing frames.

7. A method of non-visually displaying a multi-part information page containing two or more spatially located areas of separate content, as per claim 4, said method further comprising:

receiving a request for said content in one of said areas;

retrieving said requested content from said cached data, and

generating a non-visual representation of said content displayable by said tactile output device and said auditory output device.

8. A method of non-visually displaying a multi-part information page containing two or more spatially located areas of separate content, as per claim 7, wherein said multi-part information page is a web page containing frames.

9. A method of non-visually displaying a multi-part information page containing two or more spatially located areas of separate content, as per claim 7, said method further comprising:

displaying said non-visual representation of said content via said tactile output device and said auditory output device.

10. A method of non-visually displaying a multi-part information page containing two or more spatially located areas of separate content, as per claim 1, wherein said multi-part information page is a web page containing frames.