continue. The present inventor recognized the need for a system to identify a changed element as associated with an originally sought element.

SUMMARY OF THE INVENTION

According to a first aspect of the present invention, there is provided a computer implemented method of identifying a changed element within a target web page, comprising the step of: identifying within a pre-region of the target web page a pre-region longest matching segment of the pre-region that matches a pre-region segment of a pre-region of a source web page, where the target web page comprises at least one change as compared to the source web page, the pre-region of the source web page comprises an area of the source web page before an encoded position of a sought element in the source web page, the pre-region of the target web page comprises an area of the target web page before the encoded position in the target web page; identifying within a post-region of the target web page a post-region longest matching segment of the post-region that matches a post-region segment of the post-region of the source web page, where the post-region of the source web page comprises an area of the source web page after the encoded position, the post-region of the target web page comprises an area of the target web page after the encoded position in the target web page; determining the pre-region longest matching segment is within a pre-defined distance of the post-region longest matching segment; identifying the changed element in the target web page that is between the pre-region longest matching segment and the post-region longest matching segment in response to the pre-region longest matching segment being determined to be within the pre-defined distance of the post-region longest matching segment.

According to a second aspect of the present invention, there is provided a computer implemented method of identifying a sought element within a target web page as a changed web element, comprising the step of: comparing a one or more locators known to be associated with the sought element to a one or more locators of a one or more elements of the target web page; determining that the one or more elements of the target web page are

not associated with a locator that uniquely identifies the sought element within the target web page and matches a locator of the one or more locators known to be associated with the sought element; and in response to said determining, identifying within a pre-region of the target web page a pre-region longest matching segment of the pre-region that matches a pre-region segment of a pre-region of a source web page, where the target web page comprises at least one change as compared to the source web page, the pre-region of the source web page comprises an area of the source web page before an encoded position of the sought element in the source web page, the pre-region of the target web page comprises an area of the target web page before the encoded position in the target web page; identifying within a post-region of the target web page a post-region longest matching segment of the post-region that matches a post-region segment of a post-region of the source web page, where the post-region of the source web page comprises an area of the source web page after the encoded position, the post-region of the target web page comprises an area of the target web page after the encoded position in the target web page; determining the pre-region longest matching segment is within a pre-defined distance of the post-region longest matching segment; and identifying the changed web element in the target web page that is between the pre-region longest matching segment and the post-region longest matching segment in response to the pre-region longest matching segment being determined to be within the pre-defined distance of the post region longest matching segment.

According to a third aspect of the present invention, there is provided a web element rediscovery system, comprising: a memory; a processor in communication with the memory; a pre-region identifying function executable by the processor to identify within a pre-region of a target web page a pre-region longest matching segment of the pre-region that matches a pre-region segment of a pre-region of a source web page, where the target web page comprises at least one change as compared to the source web page, the pre-region of the source web page comprises an area of the source web page before an encoded position of a sought element in the source web page, the pre-region of the target web page comprises

an area of the target web page before the encoded position in the target web page; a post-region identifying function executable by the processor to identify within a post-region of the target web page a post-region longest matching segment of the post-region that matches a post-region segment of the post-region of the source web page, the post-region of the source web page comprises an area of the source web page after the encoded position, the post-region of the target web page comprises an area of the target web page after the encoded position in the target web page; a determining function executable by the processor to determine the pre-region longest matching segment is within a pre-defined distance of the post-region longest matching segment; a web element identifying function executable by the processor to identify a changed web element in the target web page that is between the pre-region longest matching segment and the post-region longest matching segment in response to the pre-region longest matching segment being determined to be within the pre-defined distance of the post-region longest matching segment.

According to a fourth aspect of the present invention, there is provided a web element rediscovery computer system, comprising: a memory; a processor in communication with the memory; a comparing function executable by the processor to compare a one or more locators known to be associated with a sought element to a one or more locators of a one or more elements of a target web page; and a first determining function executable by the processor to determine whether the one or more elements of the target web page are associated with a locator that uniquely identifies the sought element within the target web page and matches a locator of the one or more locators known to be associated with the sought element; a pre-region identifying function executable by the processor to identify within a pre-region of the target web page a pre-region longest matching segment of the pre-region that matches a pre-region segment of a pre-region of a source web page, where the target web page comprises at least one change as compared to the source web page, the pre-region of the source web page comprises an area of the source web page before an encoded position of the sought element in the source web page, the pre-region of the target web page comprises an area of the target web page before the encoded position in the

target web page; a post-region identifying function executable by the processor to identify within a post-region of the target web page a post-region longest matching segment of the post-region that matches a post-region segment of the post-region of the source web page, where the post-region of the source web page comprises an area of the source web page after the encoded position, the post-region of the target web page comprises an area of the target web page after the encoded position in the target web page; a second determining function executable by the processor to determine the pre-region longest matching segment is within a pre-defined distance of the post-region longest matching segment; and a web element identifying function executable by the processor to identify a changed web element in the target web page that is between the pre-region longest matching segment and the post-region longest matching segment in response to the pre-region longest matching segment being determined to be within the pre-defined distance of the post-region longest matching segment.

A system and method of identifying an element within a target web page that has been changed is disclosed. A pre-region longest matching segment of the pre-region that matches a pre-region segment of a pre-region of a source web page is identified within a pre-region of the target web page. The source web page is the target web page before the element was changed. A post-region longest matching segment of the post-region that matches a post region segment of the post-region of a source web page is identified within a post-region of the target web page. The web element of the target web page is identified as the changed web element that is between the pre-region longest matching segment and the post-region longest matching segment in response to the pre-region longest matching segment being determined to be within a pre-defined distance of the post-region longest matching segment.

In some embodiments, method and system includes the step of proceeding, starting with the pre-region longest matching segment not being within a pre-defined distance of the postregion longest matching segment, to reduce a size of the pre-region of the source web

page and of the pre-region of the target web page by excluding the pre-region longest matching segment from the pre-regions and/or to reduce a size of the post-region of the source web page and of the post-region of the target web page by excluding the post-region longest matching segment from the post-regions, with the reduced pre-regions and the reduced post-regions acting as initial values for a next iteration, until the pre-region longest matching segment is within a pre-defined distance of the post-region longest matching segment.