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(54) **SOFTWARE PUBLISHER AND DEVICE AUTHENTICATION USING CUSTOMIZABLE MULTIMEDIA**

(71) Applicant: **Eric Michael Faccer**, Brisbane (AU)

(72) Inventor: **Eric Michael Faccer**, Brisbane (AU)

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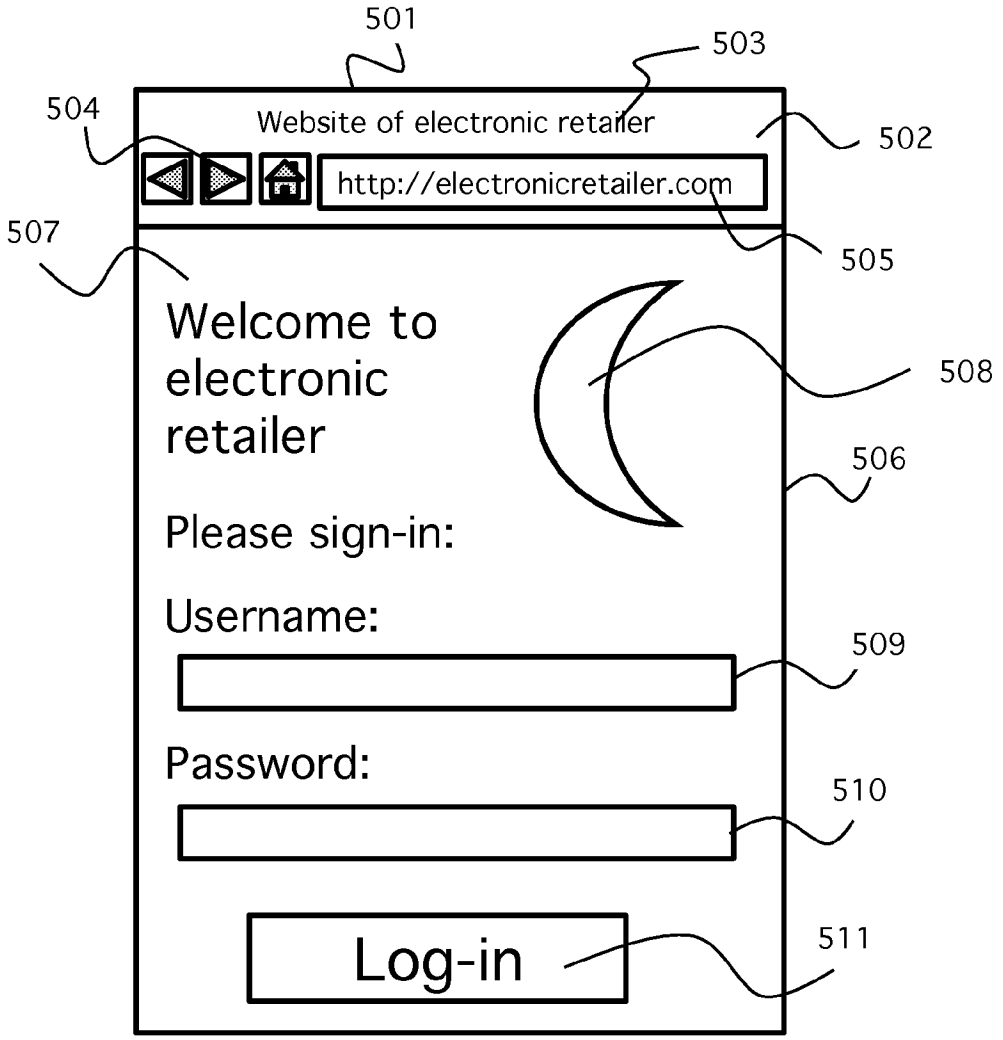
(57) **ABSTRACT**

A process for authentication that gives users a warning against malicious web applications is disclosed. The disclosed process gives the user an audiovisual when viewing the correct web application. The audiovisual is known as a "totem" in this document. The totem can be an image that is shown to the user, audio that is played to the user, or a video or animation (with or without audio) that is played to the user. The user selects their totem as part of the disclosed process. The totem is stored locally using web storage in the user's browser. The totem can only be accessed by the correct web application, and thus cannot be presented to the user by a malicious web application seeking to impersonate the correct web application. The disclosed process thus gives the user, even one not "computer savvy", a strong warning indication about a malicious web applications.



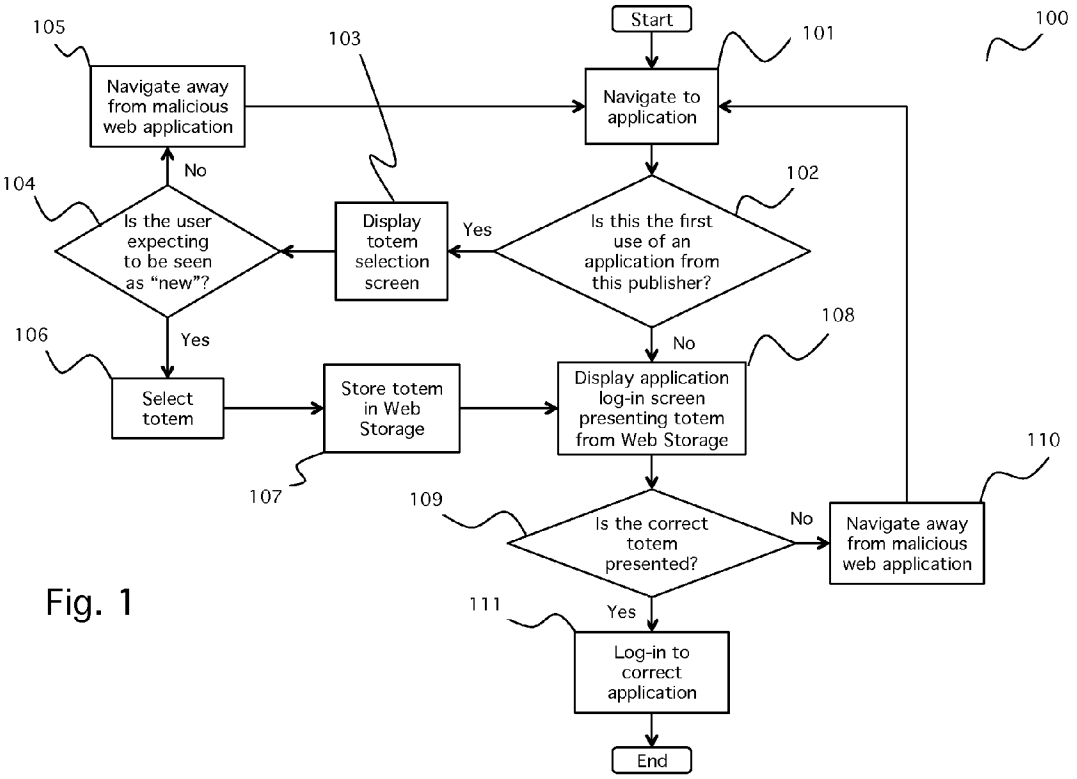

Start
100
101
Navigate to application
102
Is this the first use of an application from this publisher?
Yes
Display totem selection screen
103
Is the user expecting to be seen as "new"?
104
No
Navigate away from malicious web application
105
Yes
Select totem
106
Store totem in Web Storage
107
No
Display application log-in screen presenting totem from Web Storage
108
Is the correct totem presented?
109
No
Navigate away from malicious web application
110
Yes
Log-in to correct application
111
End

Fig. 1

Fig. 2

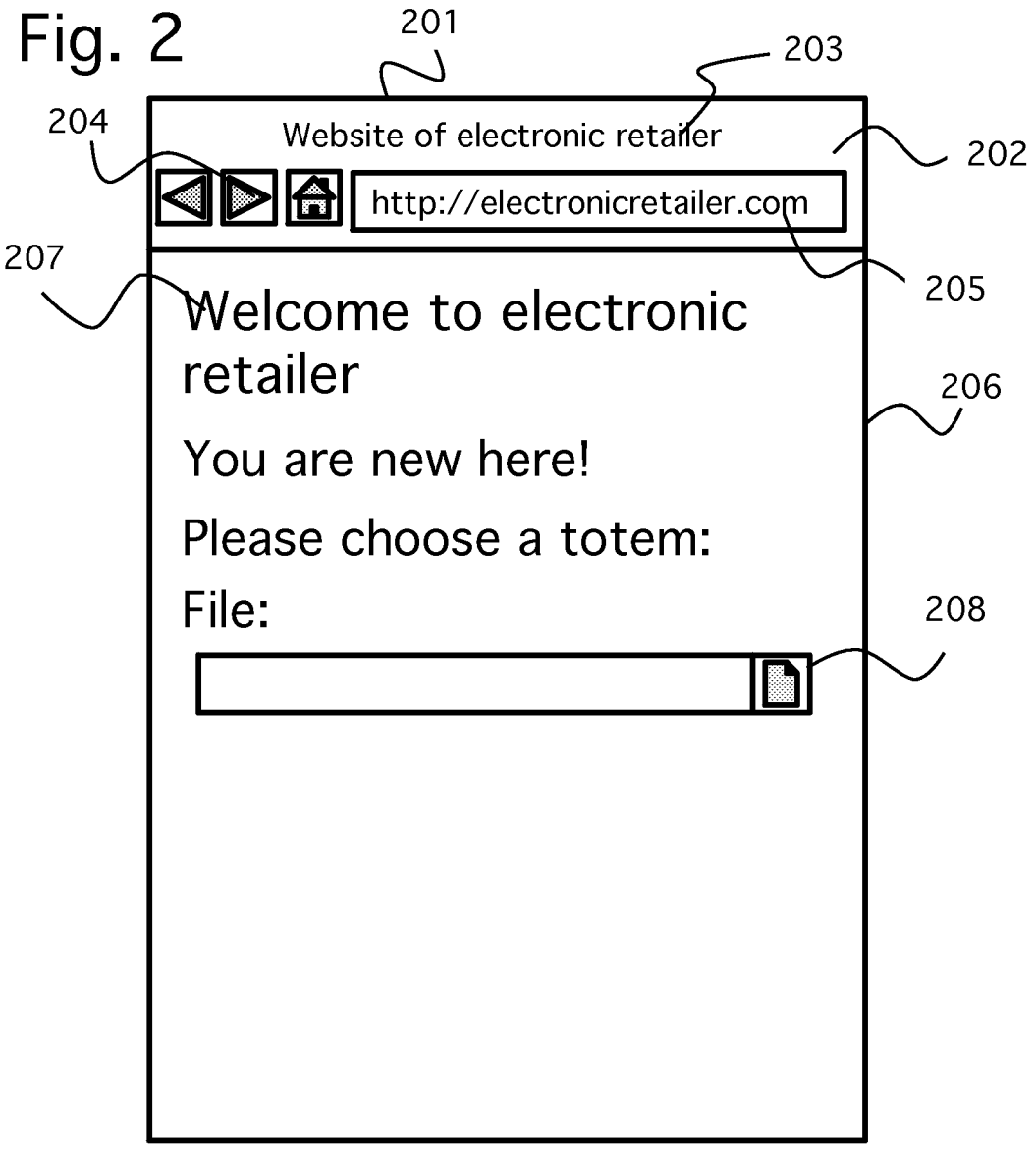

201
203
204
Website of electronic retailer
202
http://electronicretailer.com
207
205
Welcome to electronic retailer
206
You are new here!
Please choose a totem:
File:
208

Fig. 3

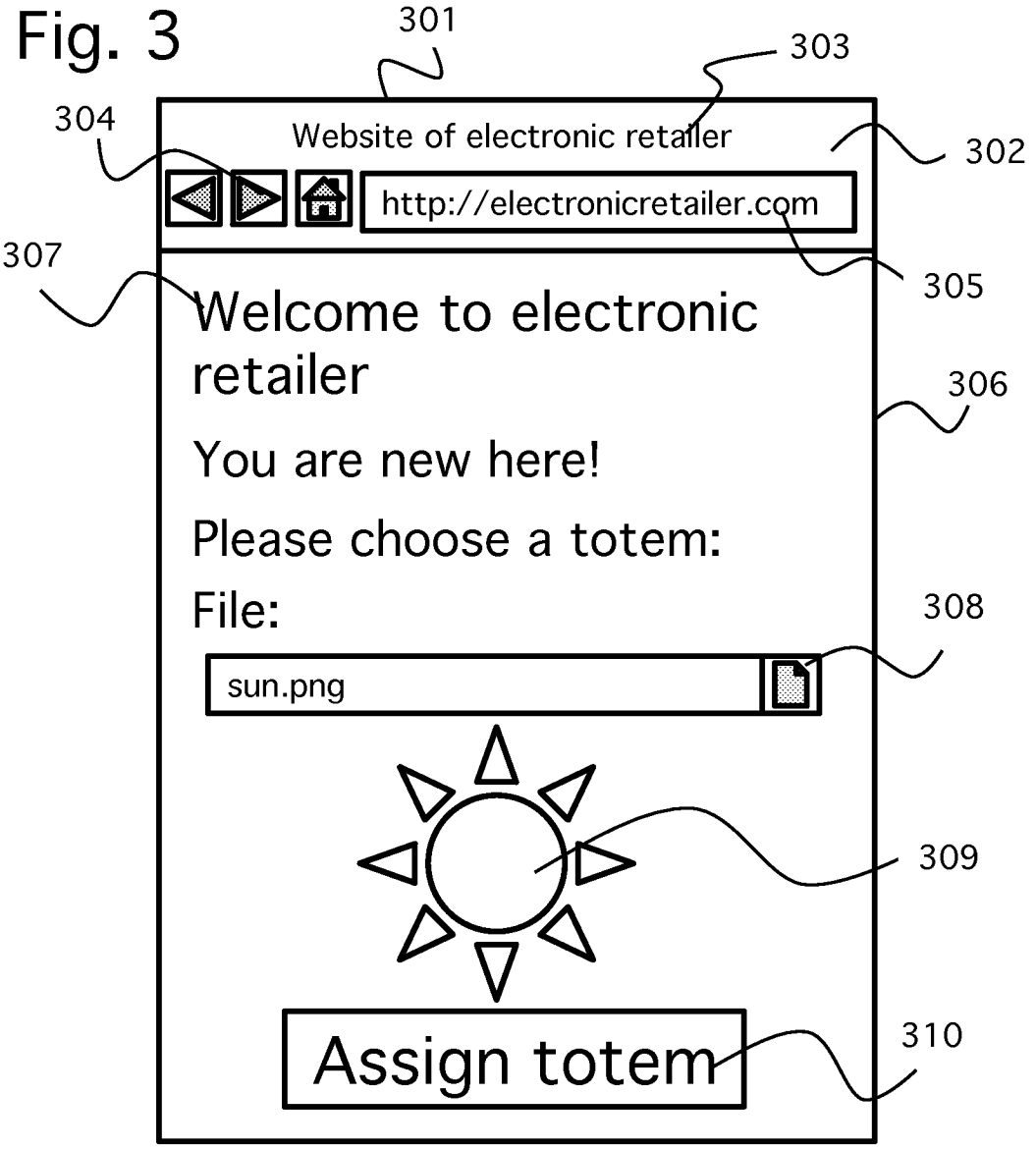

301
303
304
Website of electronic retailer
302
http://electronicretailer.com
307
305
Welcome to electronic retailer
306
You are new here!
Please choose a totem:
File:
308
sun.png
309
Assign totem
310

Fig. 4

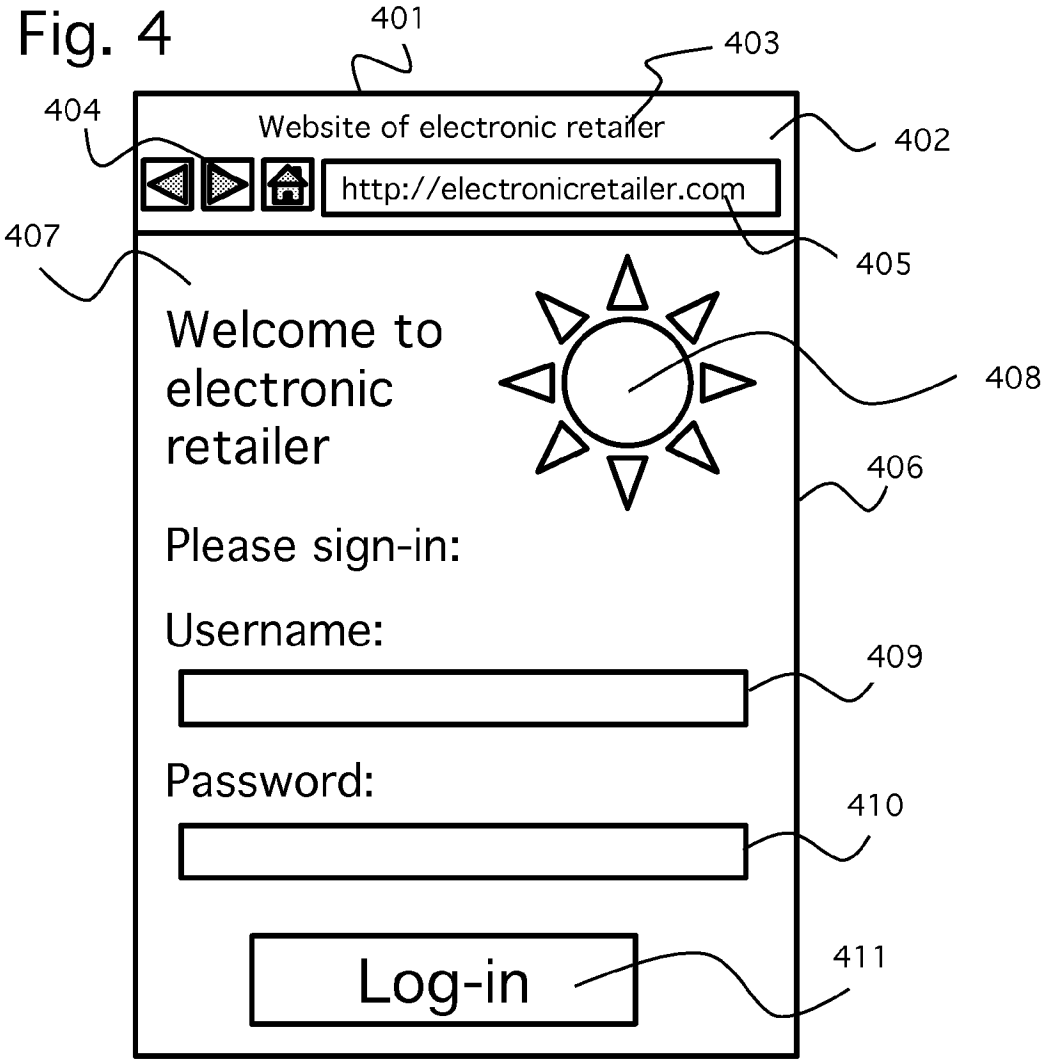

401
403
404
Website of electronic retailer
402
http://electronicretailer.com
407
405
Welcome to electronic retailer
408
406
Please sign-in:
Username:
409
Password:
410
Log-in
411

Fig. 5

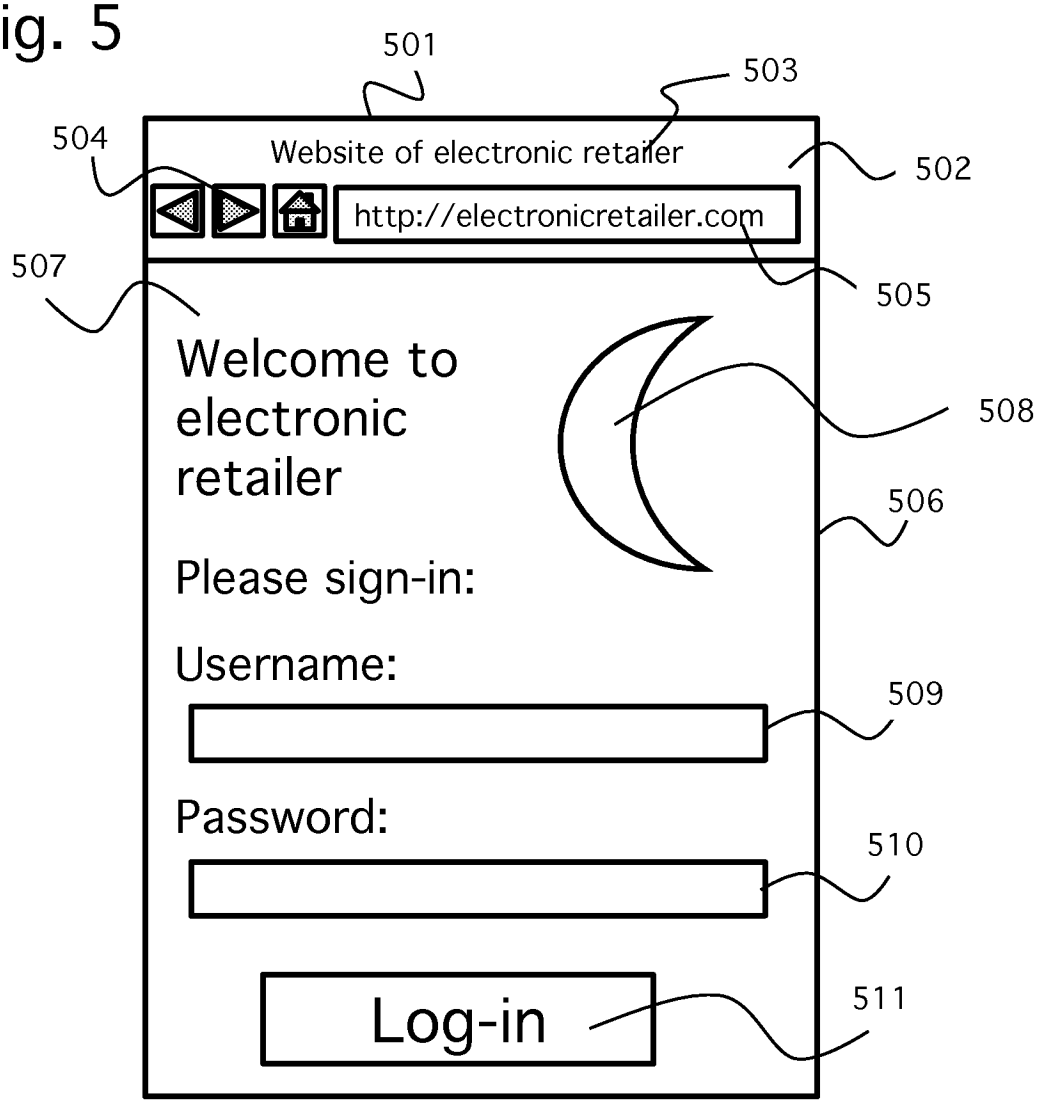

501
503
504
Website of electronic retailer
502
http://electronicretailer.com
507
505
Welcome to electronic retailer
508
506
Please sign-in:
Username:
509
Password:
510
Log-in
511

Fig. 6

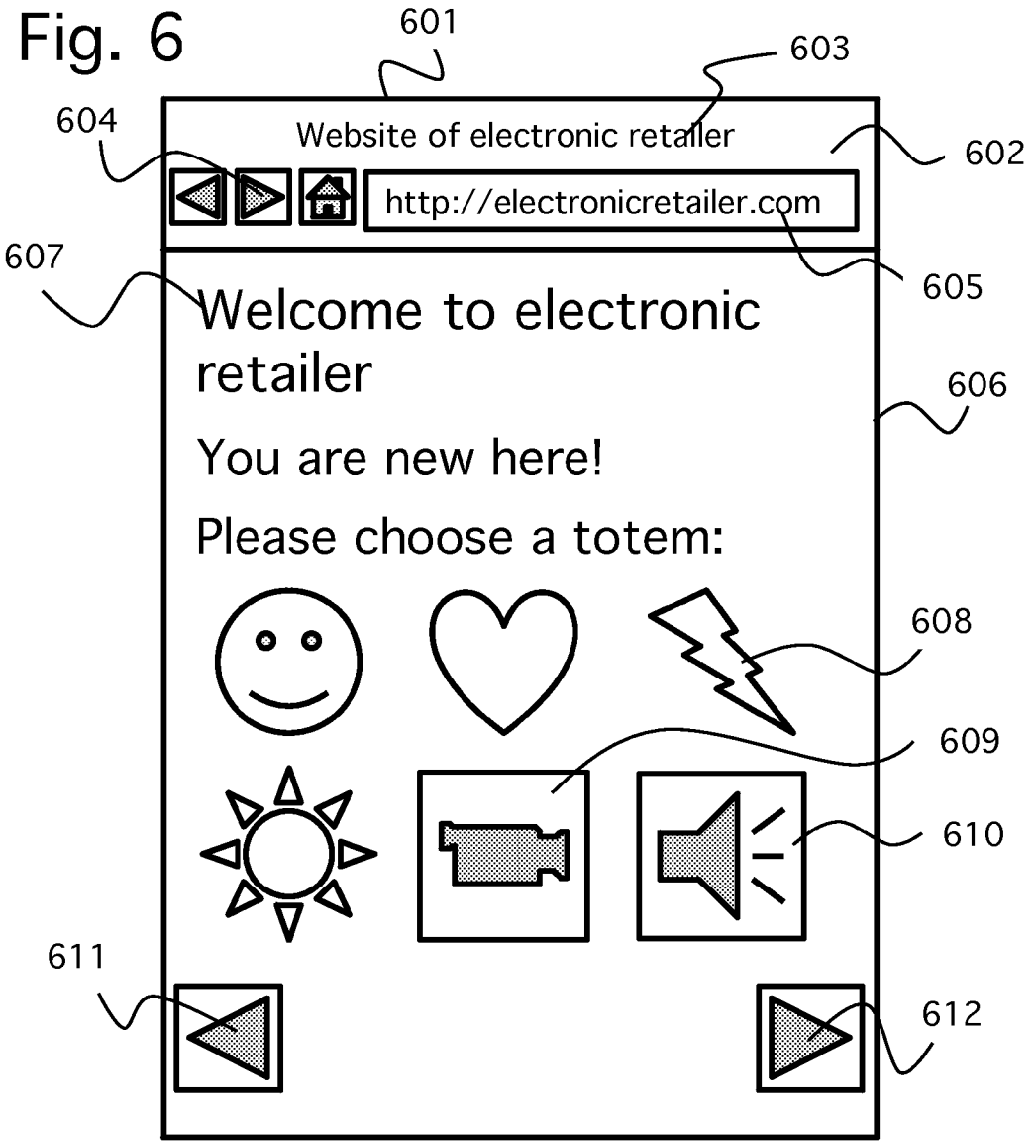

601
603
604
Website of electronic retailer
602
http://electronicretailer.com
607
605
Welcome to electronic retailer
606
You are new here!
Please choose a totem:
608
609
610
611
612

Fig. 7

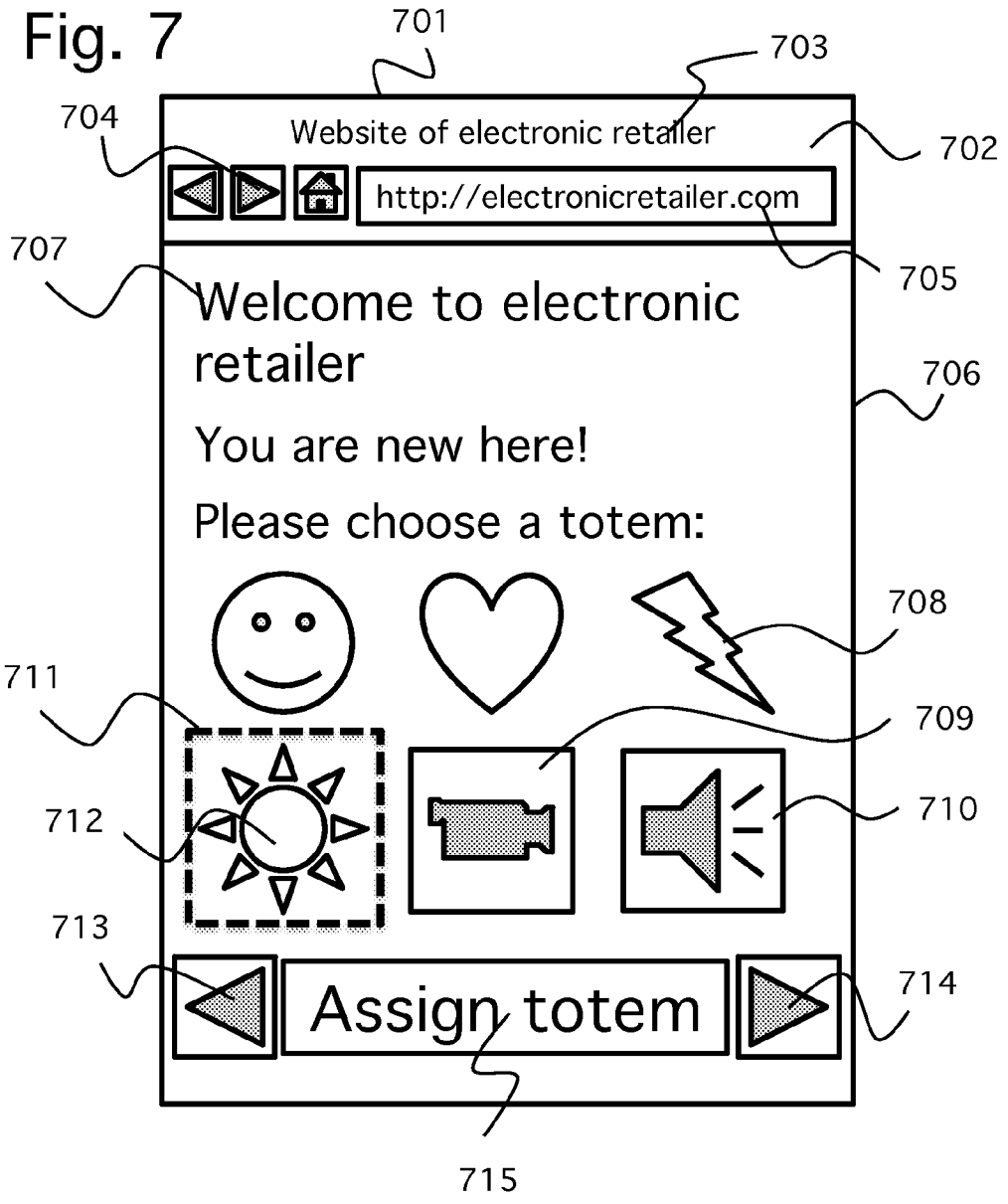

701
703
704
Website of electronic retailer
702
http://electronicretailer.com
707
705
Welcome to electronic retailer
706
You are new here!
Please choose a totem:
708
711
709
712
710
713
714
Assign totem
715

Fig. 8

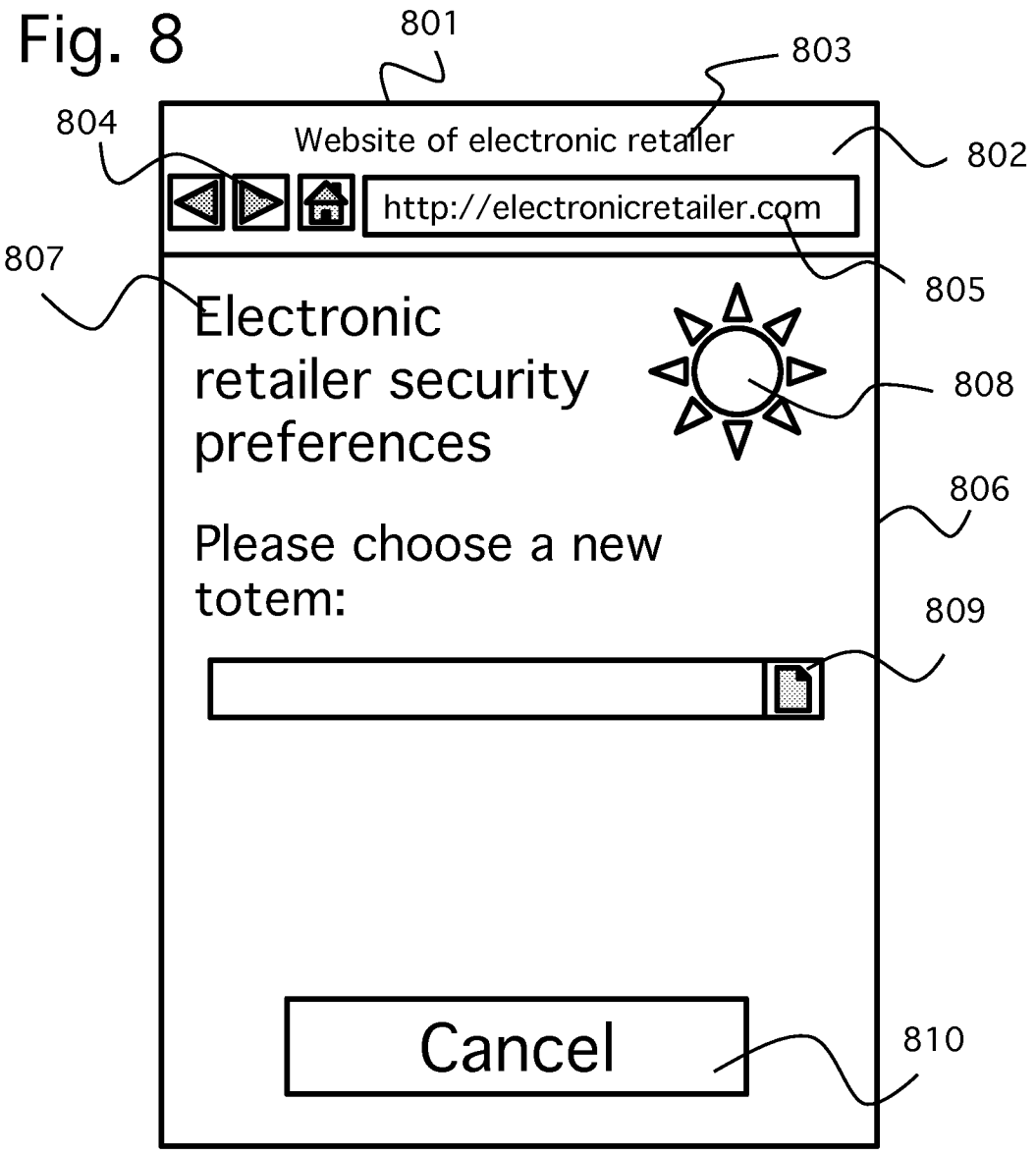

801
803
804
Website of electronic retailer
802
http://electronicretailer.com
807
805
Electronic retailer security preferences
808
806
Please choose a new totem:
809
Cancel
810

Fig. 9

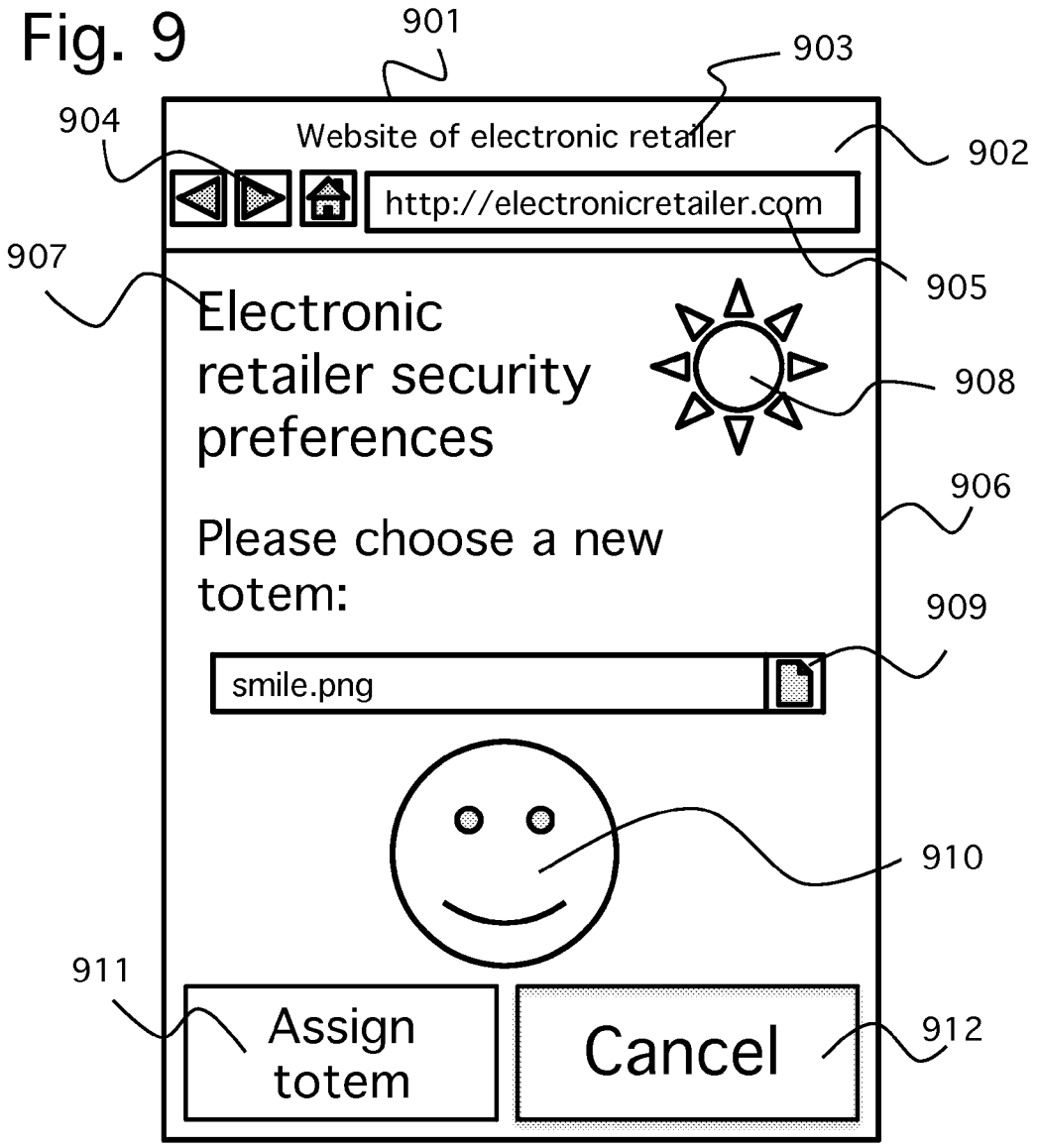
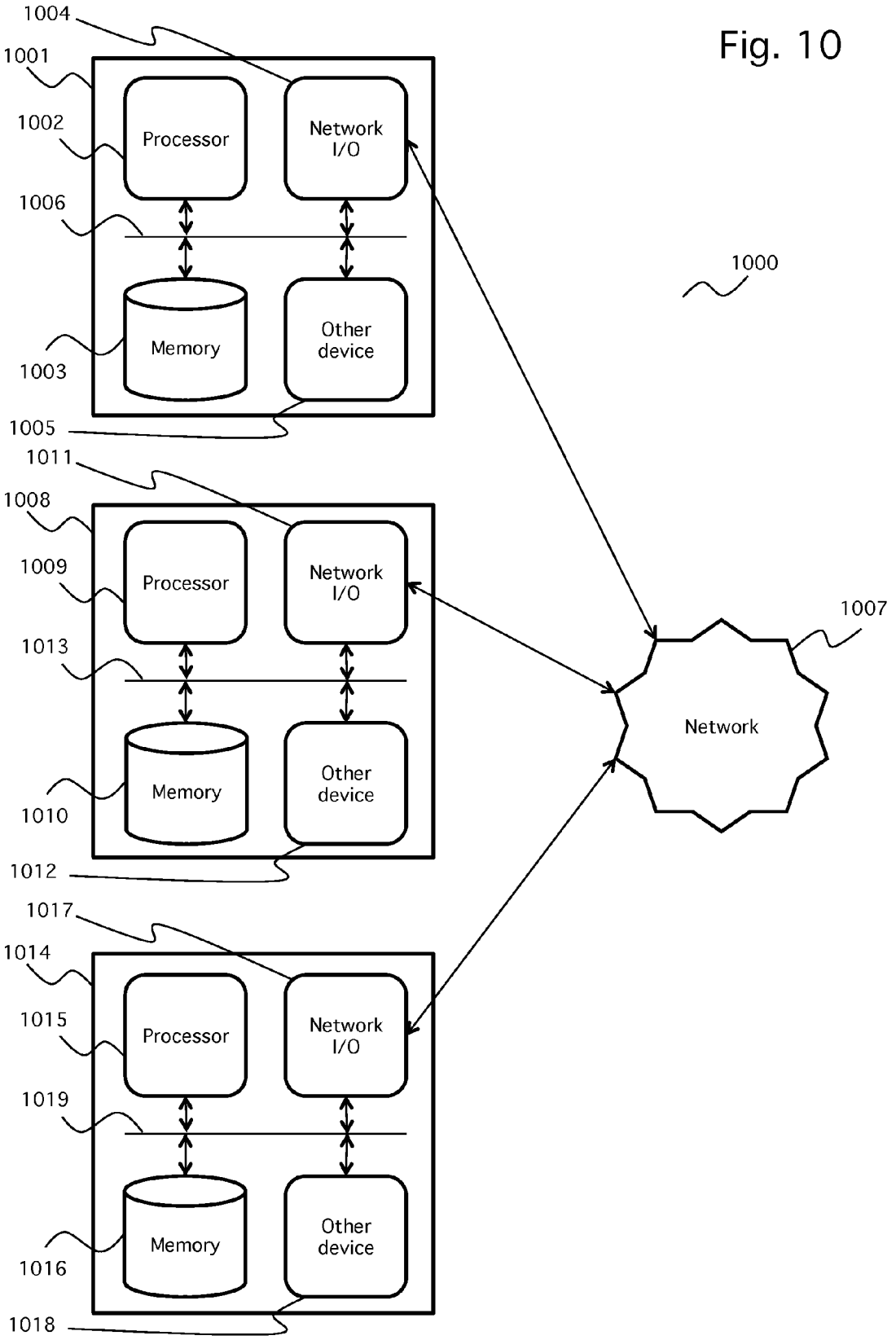

901
903
904
Website of electronic retailer
902
http://electronicretailer.com
907
905
Electronic retailer security preferences
908
906
Please choose a new totem:
909
smile.png
910
911
Assign totem
Cancel
912

Fig. 10


1004
1001
1002
Processor
Network I/O
1006
Memory
Other device
1003
1005
1000
1011
1008
1009
Processor
Network I/O
1013
Memory
Other device
1010
1012
1007
Network
1017
1014
1015
Processor
Network I/O
1019
Memory
Other device
1016
1018

SOFTWARE PUBLISHER AND DEVICE AUTHENTICATION USING CUSTOMIZABLE MULTIMEDIA

CROSS-REFERENCE TO RELATED PATENT APPLICATION

[0001] Not Applicable

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT (IF APPLICABLE)

[0002] Not Applicable

REFERENCE TO SEQUENCE LISTING, A TABLE, OR A COMPUTER PROGRAM LISTING COMPACT DISC APPENDIX (IF APPLICABLE)

[0003] Not Applicable

FIELD OF THE INVENTION

[0004] The current invention generally relates to authentication of a mobile or other internet-enabled device with a web application publisher.

BACKGROUND OF THE INVENTION

[0005] Web sites and applications (collectively known in this document as web applications) frequently wish to show different content depending on the user. This often includes sensitive information that should not be shared with any other user. For example, online banking should allow a user to view and interact with their own bank accounts but not those of another user. Similarly, the user of an online retailer should be able to view the contents of their shopping cart, but not the cart of another user.

[0006] The process of a web application identifying that a particular user is using their application is called authentication. Once authenticated, the web application can then display the content appropriate to the identified user.

[0007] Typically, this is done using HTTP cookies. Cookies are small amounts of text stored by a web site on a user's computer through the user's web browser. Each cookie is associated with the domain of the web site it is created by, and can be set and read only by that domain. The cookies associated with a particular domain are sent in each HTTP request to that particular domain. This allows a web application to send content to the user's browser that is specifically appropriate for them, for example, their bank account.

[0008] A newer alternative to cookies, which allows a web application to store more information in the user's browser is Web Storage. Web Storage comprises two storage areas: session storage and local storage. Session storage is only accessible within a single browser tab or window session and not of relevance to the long term authentication this patent is concerned with. Local storage is kept between sessions and typically allows a web application to write 5 MB of data that is not accessible to web applications whose publisher has a different domain. Unlike cookies, this data is not sent in every HTTP request, and remains client side unless the web application specifically sends it.

[0009] Should a user's cookies be obtained, or similarly, should a user's username and password be compromised, then another, malicious user, would be able to use the web application to access content specific to the intended user, for example, their bank account. An example of how this could occur is if a user is tricked into going to a malicious web application that looks very similar to the web application they desire to visit, for example, by clicking on a link in a malicious email. They may then enter their username and password, thinking they are on the desired web application, which are then recorded by the malicious web application. This is known as a phishing attack.

[0010] There is thus a need to give the user some indication that they are on the correct web application. There are some such existing protections for users. For example, they could check the certificates of a web application through the 'lock' icon in the address bar. However, successful phishing attacks are still commonly reported, and there is thus a need for better warning indications to users. In particular, warning indications that will work for users who are not "computer savvy".

[0011] Furthermore, the solution should work to authenticate a device, such as a mobile phone, with the publisher of a web application, rather than a single application itself. This allows, for example, the user to update to a later version of a web application, or to use another related application from the same publisher, all without the need to repeatedly authenticate.

BRIEF SUMMARY OF THE INVENTION

[0012] The present invention seeks to provide such a solution. Disclosed is an invention for authentication of a mobile or other internet-enabled device with a web application publisher using customizable multimedia.

[0013] According to a first aspect of the present invention, there is provided a method of authenticating a device with the publisher of a web application, the method comprising the steps of:

[0014] selecting, upon the first use of a web application from the publisher on the device, a piece of multimedia content as security information that the user will recognize, where the piece of multimedia content is:

[0015] an image without audio, a video without audio, an animation without audio, an image with audio, a video with audio, an animation with audio, or pure audio;

[0016] storing the selected piece of multimedia content on the device such that it associates the device with the publisher of the web application and is not accessible by another publisher; and

[0017] presenting the selected piece of multimedia content to the user as security information upon each subsequent use on the device of a web application from the publisher with which the selected piece of multimedia content is associated with.

[0018] According to another aspect of the present invention, there is provided an apparatus for authenticating a device with the publisher of a web application, the apparatus comprising:

[0019] a memory for storing a client program;

[0020] a memory for storing a server program;

[0021] a client processor and a server processor for executing the programs, said programs comprising:

[0022] code for selecting, upon the first use of a web application from the publisher on the device, a piece of multimedia content as security information that the user will recognize, where the piece of multimedia content is:

[0023] an image without audio, a video without audio, an animation without audio, an image with audio, a video with audio, an animation with audio, or pure audio;

[0024] code for storing the selected piece of multimedia content on the device such that it associates the device with the publisher of the web application and is not accessible by another publisher; and

[0025] code for presenting the selected piece of multimedia content to the user as security information upon each subsequent use on the device of a web application from the publisher with which the selected piece of multimedia content is associated with.

[0026] According to another aspect of the present invention, there is provided a computer program product including a computer readable storage medium having recorded thereon a computer program or programs for directing a server or client processor to execute a method for authenticating a device with the publisher of a web application, said program comprising:

[0027] code for selecting, upon the first use of a web application from the publisher on the device, a piece of multimedia content as security information that the user will recognize, where the piece of multimedia content is:

[0028] an image without audio, a video without audio, an animation without audio, an image with audio, a video with audio, an animation with audio, or pure audio;

[0029] code for storing the selected piece of multimedia content on the device such that it associates the device with the publisher of the web application and is not accessible by another publisher; and

[0030] code for presenting the selected piece of multimedia content to the user as security information upon each subsequent use on the device of a web application from the publisher with which the selected piece of multimedia content is associated with.

[0031] Other aspects of the invention are also disclosed.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

[0032] One or more embodiments of the present invention will now be described with reference to the drawings, in which:

[0033] FIG. **1** is a flowchart of a process used for authenticating a device with a publisher that provides protection from malicious phishing attempts by way of a totem;

[0034] FIG. **2** shows an example of a web application requesting a totem be selected with a file selection UI element during a device's first interaction with the publisher of the web application;

[0035] FIG. **3** shows an example of a web application being provided with a totem during a device's first interaction with the publisher of the web application;

[0036] FIG. **4** shows an example of a web application displaying the correct totem at the sign-in screen;

[0037] FIG. **5** shows an example of a malicious web application displaying the incorrect totem at the sign-in screen;

[0038] FIG. **6** shows an example of a web application requesting a totem be selected from a presented number of potential totems during a device's first interaction with the publisher of the web application;

[0039] FIG. **7** shows an example of a web application requesting a totem be selected from a presented number of potential totems during a device's first interaction with the publisher of the web application, where a candidate totem has been chosen by the user;

[0040] FIG. **8** shows an example of a web application requesting a new totem be selected;

[0041] FIG. **9** shows an example of a web application requesting a new totem be selected, where a candidate totem has been chosen by the user; and

[0042] FIG. **10** is a block diagram of a computer network upon which the authentication method may take place.

DETAILED DESCRIPTION OF THE INVENTION

[0043] Where reference is made in any one or more of the accompanying drawings to steps and/or features, which have the same reference numerals, those steps and/or features have for the purposes of this description the same function(s) or operation(s), unless the contrary intention appears.

[0044] As noted, the current invention generally relates to authentication of a mobile or other device with a web application publisher. From a terminology perspective, the term "device" refers to a piece of electronic hardware and its associated software which is capable of connecting to a web application, and includes mobile telephones, smartphones, electronic personal assistants, tablet computers, laptop computers, desktop computers, and web kiosks. Such a web application is commonly displayed in a browser. From a terminology perspective, the term "browser" refers to a software application on a device that enables navigation and display of web sites and web applications. An application can also run independently of a browser as a separate application on a device.

[0045] A process for authentication that gives users a warning against malicious web applications is described below. The described process gives the user an audiovisual when viewing the correct web application. The audiovisual is known as a "totem" in this document. The totem can be an image that is shown to the user, audio that is played to the user, or a video or animation (with or without audio) that is played to the user. The user selects their totem as part of the described process. The totem is stored locally using web storage in the user's browser. The totem can only be accessed by the correct web application, and thus cannot be presented to the user by a malicious web application seeking to impersonate the correct web application. The described process thus gives the user, even one not "computer savvy", a strong warning indication about a malicious web applications.

[0046] FIG. **1** is a flowchart of process **100** used for authenticating a device with a publisher that provides protection from malicious phishing attempts by way of a totem. The process **100** will now be described in detail with reference to FIG. **1**. The process **100** begins at step **101**. At step **101** the device navigates to a web application. In the present, first, embodiment, this involves the user of a smartphone or other mobile device using the device's web browser to navigate to the web application. A smartphone user can do this by directly typing the URL of the web application, by following a link from another URL or email, or by using another smartphone application. At step **102** the web application determines whether this is the first visit to a domain of the web application's publisher from the mobile device. In the present embodiment, this is achieved by checking the local storage portion of the Web Storage of the mobile device's browser. If there is no totem stored for the publisher of the web application's domain in the device's browser, then it is determined that either this is the first visit from the device's browser, or the device browser's Web Storage has been cleared. Either way, with no totem stored, the user must pick a totem and the

process proceeds to step **103**. If instead a totem is found in the device browser's Web Storage for the web application's publisher, then the process proceeds to the log-in screen at step **108**.

[0047] At step **103**, the web application prompts the user to select a new totem. An example of the totem selection screen **201** of an example web application is shown in FIG. **2**. The user of the device sees their browser's header **202**, which in this example includes the web application's title **203**, some navigation buttons **204**, and an address bar **205** showing the URL of the web application. The web application's graphical user interface **206** is shown below the browser's header. It shows some welcoming text **207** instructing the user to select a totem using a file selection user interface element **208**. At step **104**, the user decides whether this totem selection screen is what they expected to see. If the user had accidentally navigated to a malicious web application in step **101**, instead of the intended web application of a publisher they have previously used, then this request for a totem selection will be unexpected and the user will take appropriate action by moving to step **105**, otherwise proceed to select their totem at step **106**. At step **105**, having determined they are not viewing the web application they intended, the user navigates away from the malicious web application and returns to navigate to the correct web application in step **101**. Other action the user may take at step **105** includes informing the publisher of the web application of the likely phishing attempt so they can warn other users of their application. If the user was mistaken and this was in fact their first visit to a web application of the publisher from their device, then contacting support of the publisher will inform them of this and they will then expect to arrive at the totem selection screen.

[0048] The user selects their totem at step **106**. In the present embodiment this selection can be made from any file, for example, a photo, present on the user's device. An example of the totem selection screen **301** with the user having chosen a totem **309** is shown in FIG. **3**. The user of the device sees their browser's header **302**, which in this example includes the web application's title **303**, some navigation buttons **304**, and an address bar **305** showing the URL of the web application. The web application's graphical user interface **306** is shown below the browser's header. It shows some welcoming text **307** instructing the user to select a totem using a file selection user interface element **308**, which the user has done in selecting 'sun.png' in **308**, which is the currently selected totem **309**. If the user is satisfied with their choice of totem **309**, they press the button **310** to proceed to assign the totem in step **107**.

[0049] At step **107**, the totem is stored. This is achieved by the web application directing the device's browser to write the totem into local storage of the Web Storage for the web application publisher's domain. The totem is a multimedia file—an image, video, animation, all potentially with or without audio, or pure audio—which must be converted into a String to be stored in Web Storage. In the example depicted in FIG. **3** the totem **309** is an image. In the present embodiment, Base64 encoding converts the multimedia totem into an ASCII String. Once the totem is stored, the process **100** proceeds to the log-in screen at step **108**.

[0050] The user is presented with the log-in screen at step **108**. An example of the log-in screen **401** presenting the user's totem **408** is shown in FIG. **4**. The user of the device sees their browser's header **402**, which in this example includes the web application's title **403**, some navigation buttons **404**, and an address bar **405** showing the URL of the web application. The web application's graphical user interface **406** is shown below the browser's header. It shows some welcoming text **407** instructing the user to sign-in with text boxes for their username **409** and password **410**, and a log-in button **411**. The totem **408** is shown to the user by the web application from their device browser's Web Storage. It was stored in local storage in step **107**. At this step it is retrieved as a String and decoded into a piece of multimedia, in the present embodiment with Base64 decoding. Since the totem is stored in Web Storage on the user's device under the domain of the publisher of the web application, it cannot be presented to the user by the web application of another publisher. A malicious web application making a phishing attempt will not be able to present the correct totem. An example of the log-in screen **501** presenting an incorrect totem **508** is shown in FIG. **5**. The user of the device sees their browser's header **502**, which in this example includes the web application's title **503**, some navigation buttons **504**, and an address bar **505** showing the URL of the web application. The web application's graphical user interface **506** is shown below the browser's header. It shows some welcoming text **507** instructing the user to sign-in with text boxes for their username **509** and password **510**, and a log-in button **511**. At step **109**, the user can make a security decision based on if the totem was correctly presented, as in FIG. **4**, or not, as in FIG. **5**. If the totem is not correctly presented, the user may be experiencing a phishing attempt from a malicious web application and navigates away in step **110**. Otherwise, if the totem is correctly presented, the user proceeds to log-in in step **111**. At step **110**, having determined they are not viewing the web application they intended, the user navigates away from the malicious web application and returns to navigate to the correct web application in step **101**. Other action the user may take at step **110** includes informing the publisher of the web application of the likely phishing attempt so they can warn other users of their application.

[0051] The process **100** ends at step **111**. At this step, the user enters their username **409** and password **410** and presses the log-in button **411**. Sign-in of the user's device with the web application is then performed by the web application, and the totem can continue to be presented to the user whilst they use the web application if desired.

[0052] FIG. **10** is a block diagram of a computer network upon which the authentication method may take place. The architecture depicted **1000** consists of a number of computers **1001**, **1008**, and **1014** which may be clients or servers, connected to a network **1007**. In the best mode of the present embodiment: the network **1007** is the Internet; one of these computers **1001** is the client device to be authenticated; and another computer **1008** is the server of the web publisher with which the client device is to be authenticated. There are other computers **1014** also connected to the network. The block diagram's depiction of three computers **1001**, **1008**, and **1014**, is not limiting and there is no limit to the number of connecting computers. Computers **1001** include a processor **1002**, a computer readable medium **1003**, and a network input/output (I/O) device **1004**, such as a modem, able to connect the computer **1001** through the network **1007** with other computers **1008** and **1014**. A computer may also include other devices **1005** including, but not limited to, additional processors, additional hard drives, CD or DVD drives, other memory or storage, mice, keyboards, monitors, speakers, microphones, printers, scanners, or other input and/or output devices. The computer components **1002**, **1003**, **1004**, and

1005 typically connect and communicate via a bus **1006** in a manner that results in the usual operation of the computer **1001** well known to those skilled in the art. Similarly, other computers **1008** and **1014**, connected to the network **1007**, include processors **1009** and **1015**, computer readable media **1010** and **1016**, and network input/output (I/O) devices **1011** and **1017**, such as modems, able to connect the computers **1008** and **1014** through the network **1007** with other devices. These computers **1010** and **1016** may also include other devices **1012** and **1018** including, but not limited to, additional processors, additional hard drives, CD or DVD drives, other memory or storage, mice, keyboards, monitors, speakers, microphones, printers, scanners, or other input and/or output devices. The computer components **1009**, **1010**, **1011**, and **1012** typically connect and communicate via a bus **1013** in a manner that results in the usual operation of the computer **1008** well known to those skilled in the art. Similarly, the computer components **1015**, **1016**, **1017**, and **1018** typically connect and communicate via a bus **1019** in a manner that results in the usual operation of the computer **1014** well known to those skilled in the art.

[0053] The user of the device **1001** connects to the server of the web application's publisher **1008** through the Internet **1007**. The client's processor **1002** runs the web application client stored in the client's memory **1003**, and uses the I/O device **1004** to receive and transmit data necessary for the function of the web application to the server **1008**. Similarly, one or more processors **1009** of the web application server **1008** run the web application server stored in some computer readable media **1010**, and use the I/O device **1011** to receive and transmit data necessary for the function of the web application to the client device **1001**. Importantly, the totem is stored in memory **1003** at step **107** on the client's device **1001**. It never leaves the client's device **1001**, and neither the server **1008**, nor any other computer **1014**, has access to it.

[0054] In a second embodiment, JavaScript Object Notation (JSON) instead of Base **64** encoding is used to store the totem. At step **107** in this second embodiment, JavaScript Object Notation (JSON) converts the multimedia totem into a String. The String is then stored in Web Storage on the user's device. At step **108** in this second embodiment, the totem is retrieved from Web Storage as a String. JavaScript Object Notation (JSON) converts the String into a piece of multimedia that is presented to the user.

[0055] In a third embodiment, at step **103**, the totem selection is done not by a file selection UI element, as shown by **208** in FIGS. **2** and **308** in FIG. **3**, but instead by presenting a number of potential totems to the user. The web application displays the user with a number of possible totem multimedia files that the user can choose from. This may include multimedia files on their own device. An example of this alternative style of totem selection screen **601** of an example web application is shown in FIG. **6**. The user of the device sees their browser's header **602**, which in this example includes the web application's title **603**, some navigation buttons **604**, and an address bar **605** showing the URL of the web application. The web application's graphical user interface **606** is shown below the browser's header. It shows some welcoming text **607** instructing the user to select a totem from a number of presented totems, such as the image totem **608**, pure audio totem **609**, or movie totem **610**. The user can click on an audio totem **609** to play that potential totem. The user can click on an animation or movie totem **610** to play that potential totem including any accompanying audio. Clicking on a potential totem will also select that totem as a candidate totem. Additional potential totems can be presented by using the navigation buttons **611** and **612** if there are more totems from the web application or the user's device than will fit on one screen of the web application's UI.

[0056] In this third embodiment, at step **106**, the totem selection is done using this same alternative UI as for step **103**. An example of the totem selection screen **701** with the user having chosen a potential candidate totem **712** is shown in FIG. **7**. The user of the device sees their browser's header **702**, which in this example includes the web application's title **703**, some navigation buttons **704**, and an address bar **705** showing the URL of the web application. The web application's graphical user interface **706** is shown below the browser's header. It shows some welcoming text **707** instructing the user to select a totem from a number of presented totems, such as the image totem **708**, pure audio totem **709**, or movie totem **710**. The user has done this by selecting the 'sun' totem **712**, as indicated by the selection indicator **711**. The user can click on an audio totem **709** to play that potential totem. The user can click on an animation or movie totem **710** to play that potential totem including any accompanying audio. Clicking on a potential totem will also select that totem as a candidate totem. Additional potential totems can be presented by using the navigation buttons **713** and **714** if there are more totems from the web application or the user's device than will fit on one screen of the web application's UI. If the user is satisfied with their choice of totem **712**, they press the button **715** to proceed to assign the totem in step **107**, which is as in the first embodiment.

[0057] In a fourth embodiment, the totem associating a device with the publisher of a web application can additionally be changed. This change, via selecting a new totem, is a setting available to the user of a web application. An example of the new totem screen **801** is shown in FIG. **8**. The user of the device sees their browser's header **802**, which in this example includes the web application's title **803**, some navigation buttons **804**, and an address bar **805** showing the URL of the web application. The web application's graphical user interface **806** is shown below the browser's header. It shows some text **807** indicating the setting screen and instructing the user to select a new totem using a file selection user interface element **809**. The user's current totem **808** is also displayed. The user can opt not to select a new totem, and instead keep their current totem **808** by pressing the cancel button **810**. An example of the new totem screen where a new totem has been chosen for assignment **901** is shown in FIG. **9**. The user of the device sees their browser's header **902**, which in this example includes the web application's title **903**, some navigation buttons **904**, and an address bar **905** showing the URL of the web application. The web application's graphical user interface **906** is shown below the browser's header. It shows some text **907** indicating the setting screen and instructing the user to select a new totem using a file selection user interface element **909**, which the user has done in selecting 'smile.png', which is the chosen new totem candidate **910**. The user's current totem **908** is also displayed. If the user is satisfied with their choice of new totem **910**, they press the button **911** to proceed to assign the new totem by storing it in the device's Web Storage as with the first embodiment. The user can opt not to select a new totem, and instead keep their current totem **908** by pressing the cancel button **912**.

[0058] In a fifth embodiment, a new totem can be selected as in the fourth embodiment. However, rather than from a file

selection UI element, the totem can similarly be chosen from number of potential new totems presented to the user. The web application displays the user with a number of possible totem multimedia files that the user can choose from. This may include multimedia files on their own device. This may also include patterns algorithmically generated by the web application. The graphical user interface used for this embodiment is the same as that described in the third embodiment.

[0059] In a sixth embodiment, a new totem can be drawn by the user using finger painting on the touch screen of the device, or other drawing tools provided by the web application.

The invention claimed is:

1. A method of authenticating a device with the publisher of a web application, the method comprising the steps of:
- selecting, upon the first use of a web application from the publisher on the device, a piece of multimedia content as security information that the user will recognize, where the piece of multimedia content is:
  - an image without audio, a video without audio, an animation without audio, an image with audio, a video with audio, an animation with audio, or pure audio;
- storing the selected piece of multimedia content on the device such that it associates the device with the publisher of the web application and is not accessible by another publisher; and
- presenting the selected piece of multimedia content to the user as security information upon each subsequent use on the device of a web application from the publisher with which the selected piece of multimedia content is associated with.

2. A method according to claim **1**, wherein said device is a mobile telephone, smartphone, electronic personal assistant, tablet computer, laptop computer, desktop computer, or web kiosk.

3. A method according to claim **1**, wherein said web application is a software program, web site, web page, point of sale system, or banking system.

4. A method according to claim **1**, wherein the said selecting step determines that this is the first use of a web application from a publisher on a device by checking that there is nothing stored in the Web Storage of the device corresponding to the publisher's domain.

5. A method according to claim **1**, wherein the said storing step encodes the said piece of multimedia content into a String and stores the String in the Web Storage of the device.

6. A method according to claim **5**, wherein the said encoding of the piece of multimedia content is Base64 encoding.

7. A method according to claim **5**, wherein the said encoding of the piece of multimedia content is JSON encoding.

8. A method according to claim **1**, wherein the said selecting step selects the piece of multimedia content by the web application prompting the user with a file selection interface whereby the user chooses any piece of multimedia content stored on their device.

9. A method according to claim **1**, wherein the said selecting step selects the pieces of multimedia content by the web application presenting the user a plurality of pieces of multimedia content and prompting for the user's choice, where the plurality of pieces of multimedia content may include:
- a plurality of pieces of multimedia content already stored on the server of the web application;
- a plurality of pieces of multimedia content already stored on the user's device; and/or a plurality of generated patterns.

10. A method according to claim **1**, wherein the said selecting step selects the pieces of multimedia content by the web application allowing the user to draw their own totem using finger painting on the touch screen of the device, or other drawing tools provided by the web application.

11. A method according to claim **1**, wherein the selected piece of multimedia content used as security information can later be changed by the user of the device.

12. An apparatus for authenticating a device with the publisher of a web application, the apparatus comprising:
- a memory for storing a client program;
- a memory for storing a server program;
- a client processor and a server processor for executing the programs, said programs comprising:
- code for selecting, upon the first use of a web application from the publisher on the device, a piece of multimedia content as security information that the user will recognize, where the piece of multimedia content is:
  - an image without audio, a video without audio, an animation without audio, an image with audio, a video with audio, an animation with audio, or pure audio;
- code for storing the selected piece of multimedia content on the device such that it associates the device with the publisher of the web application and is not accessible by another publisher; and
- code for presenting the selected piece of multimedia content to the user as security information upon each subsequent use on the device of a web application from the publisher with which the selected piece of multimedia content is associated with.

13. A computer readable storage medium having recorded thereon a computer program or programs for directing a server or client processor to execute a method for authenticating a device with the publisher of a web application, said program comprising:
- code for selecting, upon the first use of a web application from the publisher on the device, a piece of multimedia content as security information that the user will recognize, where the piece of multimedia content is:
  - an image without audio, a video without audio, an animation without audio, an image with audio, a video with audio, an animation with audio, or pure audio;
- code for storing the selected piece of multimedia content on the device such that it associates the device with the publisher of the web application and is not accessible by another publisher; and
- code for presenting the selected piece of multimedia content to the user as security information upon each subsequent use on the device of a web application from the publisher with which the selected piece of multimedia content is associated with.

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