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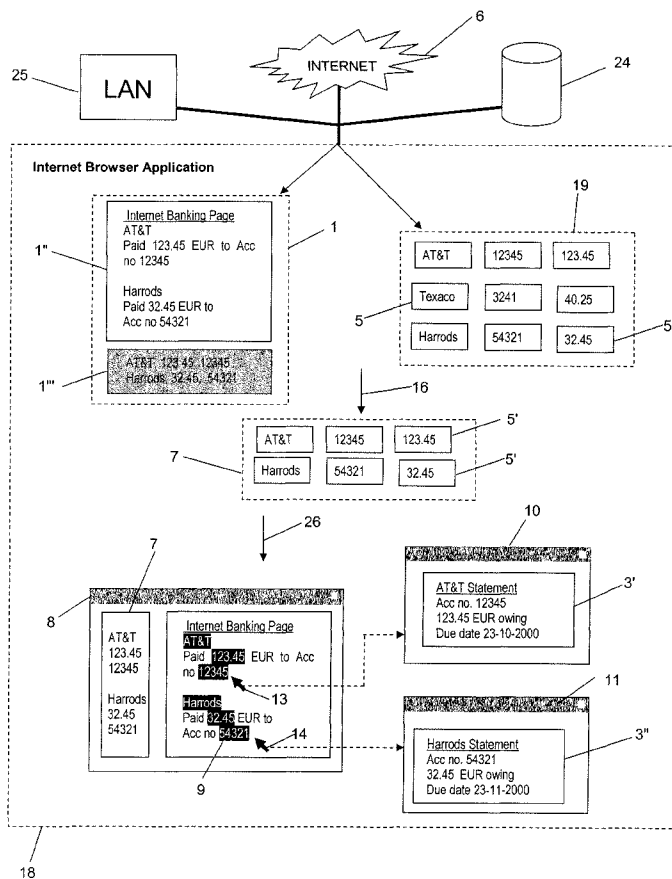
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(54) Title: METHOD FOR CROSS-REFERENCING INFORMATION ON A WEB PAGE



(57) Abstract: The present invention relates to a method for cross-referencing information (1) using an Internet browser (18), comprising the steps of: a) retrieving information (1) using the Internet browser (18), which information comprises: information to be displayed (1') by the Internet browser (18), and hidden data (1''), not displayed by the Internet browser (18), and which is to be cross-referenced; b) retrieving search data (19) using the Internet browser (18), which search data comprises search terms (5) for cross-referencing, where step a) may be performed before step b) or vice versa; c) comparing (16), using the Internet browser (18), the hidden information (1'') with one or more of the search terms (5) to obtain a list (7) of common terms (5'); d) displaying, using the Internet browser (18), a browser window (8) comprising: i) the list (7) of common terms (5') of step c), and ii) the information to be displayed (1'') of step a) where the common terms (5') of step c) are emphasised (9) thereon, wherein the displayed common terms (5') of step i) and/or the emphasised (9) information of step ii) each provide hyperlink areas that may be selected to obtain further information. It also relates to a computer program and system for implementing the method.

WO 2008/034827 A1



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METHOD FOR CROSS-REFERENCING INFORMATION ON A WEB PAGE

FIELD OF THE INVENTION

The field of the invention is in the cross-referencing of information obtained via a web
5 browser. The invention provides a method, computer program and device therefor.

BACKGROUND TO THE INVENTION

A user of the Internet may employ web-based services to store and organise information.
The information can be any type of electronic downloadable data such as alphanumeric
10 text, photographic, audio, video or raw data. Internet sites for retrieval and storage of
personal data are commonly provided as a service by third parties. An Internet user has
the possibility, for example, to access personal billing or financial information such as
utility invoices (e.g. telephone, water, electricity, gas), tax returns, banking statements,
credit cards statements etc. He can also subscribe to an Internet email account, a
15 reminder service, storage services or other data organising services.

A problem with the storage and retrieval of information using the Internet is that data
cannot be easily cross-referenced. For example, a web page providing a record of
invoices provided by a telephone company will require a user to open a second browser
20 for his bank to confirm that each telephone invoice has been paid from his bank account.
In practice, the user would resort to printing both statements, and manually checking each
invoice in a time consuming activity. Where the user is a large company, having multiple
invoices and accounts, cross-referencing can become a laborious task.

25 A solution would be to provide a hypertext document with links, which links provide the
desired cross-reference. For example, the invoice of the telephone company may be
displayed as a series of balances, which are hyperlinks; upon selecting a link, the user
may be shown the corresponding part of his bank statement indicating payment of the
balance.

30

Cross-referencing information, particularly personal information, from one information
provider with that from another is not feasible, however, because organisations would
have to share confidential data. For example, situations may occur where a customer of
two information providers, A and B, wants to have the information held by A and B cross-
35 referenced; this may not be possible when the two providers are remotely located
because they would need to share databases, which sharing may pose a security risk.

Dedicated secured connections between providers A and B would be expensive to implement and maintain. Furthermore, sharing client data between A and B may contravene personal privacy, for example, or may be commercially compromising. These problems are in addition to those posed by the plurality of different information formats which must be cross-referenced.

The present invention provides a solution to the problem of cross-referencing information, which avoids the problems of the art.

10 LEGENDS TO THE FIGURES

FIG. 1 depicts a flow chart showing the steps (from top to bottom) of an embodiment of the present invention, where by the page of an Internet Bank comprises hidden information (grey box) used for cross-referencing against search data.

FIG. 2 depicts a flow chart showing the steps (from top to bottom) of an embodiment of the present invention, whereby symbols (e.g. #*@%) represent alphanumeric words or phrases.

FIG. 3 depicts a flow chart showing the steps (from top to bottom) of an embodiment of the present invention, whereby search data of server B is filtered by the browser application and symbols (e.g. #*@%) represent alphanumeric words or phrases.

FIG. 4 depicts a flow chart showing the steps (from top to bottom) of an embodiment of the present invention, whereby search data of server B is filtered by server B, and symbols (e.g. #*@%) represent alphanumeric words or phrases.

FIG. 5 depicts a flow chart showing the steps (from top to bottom) of an embodiment of the present invention, whereby search data of server B is filtered by server B, the hidden data of server A is coded and symbols (e.g. #*@%) represent alphanumeric words or phrases.

FIG. 6 depicts a web browser implementing a method of the invention, whereby a home-banking account of a user is displayed in one browser window, and the search terms provided by an invoicing search service are displayed in another browser window.

FIG. 7 depicts a web browser implementing a method of the invention, whereby a home-banking account of a user is displayed in one browser window, and the search terms provided by an invoicing search service are displayed in a pop-up window.

FIG. 8 shows an example of XML code that implements an embodiment of the present invention.

SUMMARY OF SOME EMBODIMENTS OF THE INVENTION

One embodiment of the invention is a method for cross-referencing information (1) using an Internet browser (18), comprising the steps of:

- 5 a) retrieving information (1) using the Internet browser (18), which information comprises:
- information to be displayed (1") by the Internet browser (18), and
 - hidden data (1""), not displayed by the Internet browser (18), and which is to be cross-referenced,
- 10 b) retrieving search data (19) using the Internet browser (18), which search data comprises search terms (5) for cross-referencing,
- where step a) may be performed before step b) or *vice versa*,
- c) comparing (16), using the Internet browser (18), the hidden information (1"" with one or more of the search terms (5) to obtain a list (7) of common terms (5'), and
- 15 d) displaying, using the Internet browser (18), a browser window (8) comprising:
- i) the list (7) of common terms (5') of step c), and
 - ii) the information to be displayed (1") of step a) where the common terms (5') of step c) are emphasised (9) thereon,
- wherein the displayed common terms (5') of step i) and/or the emphasised (9)
- 20 information of step ii) each provide hyperlink areas that may be selected to obtain further information.

Another embodiment of the invention is the method as described above, wherein the information to be displayed (1") comprises one or more alphanumeric words, and the

25 hidden data (1"" comprises at least one of said alphanumeric words.

Another embodiment of the invention is the method as described above, wherein the selection of the hyperlink area in step d) obtains further information (1) that is an archive document (3', 3").

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Another embodiment of the invention is the method as described above, wherein the archive document (3', 3") comprises alphanumeric words, and the search terms (5) present in the search data (19) of step b) correspond to said alphanumeric words.

Another embodiment of the invention is the method as described above, wherein the search data (19) is filtered using the Internet browser (18) after retrieval in step b), to provide the one or more search terms (5) used in step c).

5 Another embodiment of the invention is the method as described above, wherein the archive document (3', 3'') comprises alphanumeric words, and the search data (19) comprises search terms (5) that are alphanumeric words filtered from the archive document (3', 3'') prior to retrieval in step b).

10 Another embodiment of the invention is the method as described above, wherein the search data (19) is retrieved from a server in step b), which server also stores the archive document (3', 3'').

15 Another embodiment of the invention is the method as described above, wherein each search term (5) is tagged with an indication of the archive document (3', 3'') with which it corresponds, prior to comparing in step c).

Another embodiment of the invention is the method as described above, wherein the emphasis (9) of step ii) is applied also to the list (7) of common terms (5') in step i).

20 Another embodiment of the invention is the method as described above, wherein said hidden information (1''') is retrieved in an encrypted form, and is decrypted by the Internet browser (18) after retrieval.

25 Another embodiment of the invention is the method as described above, wherein the search data (19) of step b) is retrieved in an encrypted form, and is decrypted by the Internet browser (18) after retrieval.

30 Another embodiment of the invention is the method as described above, wherein a format of the search data (19) and hidden information (1''') is agreed between a provider of information (1) of step a) and a provider of search data (19) of step b).

Another embodiment of the invention is the method as described above, wherein the hidden information (1''') comprises an indication of the location of each alphanumeric word within the information to be displayed (1'').

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Another embodiment of the invention is the method as described above, wherein the hyperlink area is indicated by any of underlining, italicising, highlighting background, transparent overlay, or emboldening.

- 5 Another embodiment of the invention is the method as described above, wherein the display of the list (7) of common (5') terms in step (d)(i) comprises additional indications.

Another embodiment of the invention is the method as described above, wherein the information to be displayed (1") of step ii) is displayed in a main browser window, and the
10 list (7) of common data (5') of step i) is displayed in a frame of said main window, in a new pop-up window, or in a new browser window.

Another embodiment of the invention is the method as described above, wherein access to the search data (19) of step b) is controlled by a user credential.
15

Another embodiment of the invention is the method as described above, wherein said credential controls access also to the information (1) of step a).

Another embodiment of the invention is the method as described above, wherein the
20 search data (19) of step b) is provided by an invoice search service.

Another embodiment of the invention is the method as described above, wherein the search data (19) of step b) corresponds to invoice data.

25 Another embodiment of the invention is the method as described above, wherein the information (1) of step a) is provided by a banking service.

Another embodiment of the invention is the method as described above, wherein said hidden information (1''') corresponds to bank statement information.
30

Another embodiment of the invention is the method as described above, wherein said bank statement information is one or more of balance, date, payment reference number, billing amount, biller, and direct debit reference number.

Another embodiment of the invention is the method as described above, wherein the search data (19) of step b) is divided into that made available to two or more users and that made available to a single user, which availability is user defined.

- 5 Another embodiment of the invention is a computer program held on a computer readable medium, configured to perform the method as described above.

Another embodiment of the invention is a computer program as described, which is a tool bar or java plug-in suitable for use with the Internet browser.

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Another embodiment of the invention is a system comprising one or more computers, further comprising the computer program as described above.

15 **DETAILED DESCRIPTION OF THE INVENTION**

Unless defined otherwise, all technical and scientific terms used herein have the same meaning as is commonly understood by one of skill in the art. All publications referenced herein are incorporated by reference thereto. All United States patents and patent applications referenced herein are incorporated by reference herein in their entirety including the drawings.

20

The articles "a" and "an" are used herein to refer to one or to more than one, i.e. to at least one of the grammatical object of the article. By way of example, "a server" means one server or more than one server.

25

Throughout this application, the term "about" is used to indicate that a value includes the standard deviation of error for the device or method being employed to determine the value.

- 30 The recitation of numerical ranges by endpoints includes all integer numbers and, where appropriate, fractions subsumed within that range (e.g. 1 to 5 can include 1, 2, 3, 4 when referring to, for example, a number of servers, and can also include 1.5, 2, 2.75 and 3.80, when referring to, for example, units of measurement).

- 35 Reference is made in the description below to the drawings which exemplify particular embodiments of the invention; they are not at all intended to be limiting. The skilled person

may adapt the method and substituent components and features according to the common practices of the person skilled in the art. In **FIGs. 2 to 5**, symbols have been used to represent individual alphanumeric words or phrases.

5 With reference to **FIG. 1**, the present invention relates to a method for cross-referencing information using an Internet browser **18**, comprising the steps of:

a) retrieving information **1** using the Internet browser **18**, which information comprises:

- 10 - a displayed part **1''** (a standard Internet bank web page, **FIG. 1**), which is to be displayed by the web-browser, and
- a hidden part **1'''** (grey box, **FIG. 1**), not displayed by the web browser and which is to be cross-referenced,

b) retrieving search data **19** using the Internet browser **18**, comprising search terms **5**,

15 where step a) may be performed before step b) or *vice versa*,

c) comparing **16** the hidden information **1'''** with one or more of the search terms **5** to obtain a list **7** of common terms **5'**, using the Internet browser **18**,

d) displaying **26** using the Internet browser, a browser window **8** comprising:

- 20 - i) the list **7** of common terms **5'** of step c), and
- ii) the displayed information **1''** of step a) where the common terms **5'** of step c) is emphasised **9** thereon,

wherein the common terms **5'** of step i) and/or the emphasised **9** information of step ii) each provide hyperlink areas that may be selected to obtain further information **3'**, **3''**.

25

The information **1** is typically retrieved from a server (first server **2**) connected to the Internet **6**, however, it is within the scope of the invention, that the information may be held on local drive **24** or computer, server or computer-readable storage device connected to a local area network **25**. The information is usually retrieved by typing or selecting a URL within a standard browser adapted with the method of the invention, typically *via* an input box or a pull-down menu. The URL of the displayed information **1** will not normally be the same as the URL of the search data **19**.

30

The search data **19** is also typically retrieved from a server (second server **4**) connected to the Internet **6**; the search data may alternatively be held on local drive **24** or computer, server or computer-readable storage device connected to a local area network **25**. The

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search data **19** is usually retrieved by typing or selecting a URL for retrieval by a standard browser adapted with the method of the invention, typically *via* an input box or pull down menu in a browser toolbar. As mentioned already URL of the search data **19** will not normally be the same as the URL of the displayed information **1**.

5

Using the method above, information held on the server of step a) (*e.g.* from a bank) can be searched with search data held on the server of step b) (*e.g.* from a telephone company) by the browser. Because the method performs the cross-referencing locally, and not at servers of the providers, the method can be performed when the information providers of step a) or b), are unable to share customer data, but can provide it to the customer itself.

10

This will allow a customer of the online bank, for example, to view a list of statements generated (step (i)) by a telephone company, to see them highlighted on his bank account (step (ii)), and to view the statement in full by selecting the highlighted word (step (ii)). No data is transferred between the parties in cross-referencing process. Therefore, there is no requirement to arrange a secure connection therebetween, or the need to breach any client confidentiality since there is no data exchange between the parties.

15

Further, the browser display remains simple, despite providing cross-referencing, because only one page is displayed in its original form, *i.e.* the displayed information **1''** of step a). The only adjustment is that common terms **5'** may have emphasis thereon *e.g.* a colour highlighted background or overlay. Typically, the method will be performed by a web-browser, and implemented in the form of a browser tool bar, a javascript routine, or flash routine, or plug-in. Thus steps a), b), c) and d) are performed locally using the Internet browser; this is a distinction from the present cross-referencing tools which are performed by a server providing the requested web pages *i.e.* at the information provider's location.

20

25

More importantly, the hidden information **1'''** is cross-referenced in the present invention, and not the information to be displayed **1''**. The hidden information **1'''** comprises one or more words and phrases that are present in the displayed information **1''**. Generally, it will comprise a summary of the displayed information **1''**, meaning it comprises a list of keywords found in the displayed information **1''** against which the comparison of step c) is to be performed. The hidden information **1'''** may be automatically generated by the provider of the information of step a) for example by extracting dates, balances, transaction numbers, dates, merchant names from a plurality of transactions.

30

35

The use of hidden information avoids false positives that may occur if the displayed information only was searched. For example, a web page generated by an online bank may display transaction data (e.g. a list of balances, transaction numbers, dates, merchant names) and superfluous data (e.g. advertising, menu options, alerts). If the word "Transfers" appears as an option in a menu bar, and the phrase "Transfer of funds to Vodaphone" as part of a list of transactions, both instances of the word "transfer" may be highlighted by the method if the displayed information "1" was searched. This would not be desirable where the intention was to highlight only the latter transaction. Therefore, by providing a summary of the displayed information as hidden information "1'", which summary contains relevant keywords, the possibility of false positives is reduced or avoided.

The search data of step b) may be provided by a service, which service also supplies the present method e.g. as a browser add-on. In supplying the method, the provider of search data of step b) can choose to leave the display of website of provider of information of step a) untouched except for an optional emphasising of common data, e.g. highlighting with a color as a generally accepted marking technique applied by search engines in the internet world. Provider of step b) can also choose to use other marking techniques in the website of step a) such as changing the found item into a URL or the insertion of a button. Such techniques are accepted practices in browser applications.

The information and search data of steps a) and b) may be provided by separate service providers, which providers agree to support the present method. The format of the hidden data and type of emphasis can be agreed between the separate providers e.g. the highlight colour, use of trademark logos etc.

As mentioned above, a 'first server' may store and supply the information retrieved in step a), and a 'second server' may store and supply the search data retrieved in step b). The meaning of server as used herein, is a system which is capable of providing web pages and/or web services on request from an Internet browser. The server may be connected to the Internet or to a local area network (Intranet). The designations of a first and second server are arbitrary, and includes the possibility that the respective servers are different or the same. When they are different, they may be assigned different IP addresses, for instance when a first server belongs to a bank and a second server belongs to a telephone company. When they are the same, the first and second servers may belong to

the same hosting service which provides web space for a plurality of different enterprises. Thus, a single server may respond to the respective requests for data in step a) and b), which data will have different URLs. The server may comprise a computer with processing means to receive requests for data over the Internet or Intranet and to send data, typically in the form of a web page. It may further comprise a processing means to filter data, manage credentials (e.g. passwords, or other authentication details), manage storage or perform other tasks as a typical processing means can perform. The server may also comprise a database for the storage of invoices, search terms, other data, passwords, or URLs or any other information a typical database may store. The configuration of a server suitable to perform the method of the invention is known in the art. The number of servers from which information or search data is retrieved may be any number (e.g. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 or more)

Information of step a)

The information **1** of step a) comprises a part to be displayed **1"** in a browser window (known also as displayed information herein) and a hidden part **1'"** (known also as hidden information herein) that is used for cross referencing.

Displayed information

The displayed information **1"** typically takes the form of a web page content encoded in HTML, and comprises words, phrases, pictures elements, numbers, graphics, embedded JAVA scripts, or embedded FLASH scripts, or a combination of these. The displayed information **1"** may be, for example, a standard web page containing a list of transactions from an Internet banking account, a list of credit card transactions, a list mortgage account transactions etc.

Generally, the displayed information **1"** comprises a mixture of alphanumeric text and graphics, to provide a web page having sentences in a particular language (e.g. English, French, German, Dutch, Spanish), graphical logos and pictures. The alphanumeric text (referred to also as text herein) will comprise one or more "words", also known as alphanumeric words herein. A "word" (or "alphanumeric word") as used here refers to the words, numbers, letters and punctuation displayed on a web page that can be incorporated into written sentences and paragraphs and can be separated by spaces. Examples of words include "statement", "John", "12345", "01-12-87", "01/12/87", "001-9283745-84", "Vodafone" etc. A collection of words may form a phrase such as "12 Jan 2006" or "account number: 001-9283745-84". Thus, alphanumeric text part of the web

page comprising a plurality of words, and includes, for example, names, addresses, descriptive language, reference numbers, telephone numbers, bank sort codes, dates, and times etc.

5 The alphanumeric text is normally encoded using HTML, where a paragraph of text to be displayed on an Internet browser will be encoded essentially verbatim in the source code for the web page as is commonly known in the art. Alternatively, the alphanumeric text may be present in an image file such as a JPEG, PICT, GIF or other image format that the browser can read.

10

Graphics part of the displayed information 1" in a web page is pictorial in nature, such as a photograph, an illustration, an animation, an icon, and has no alphanumeric text content. The graphics part may be retrieved as an image file in a suitable format such as a JPEG, PICT, GIF or other image format that the browser can read.

15

While the displayed information 1", comprises alphanumeric words and phrases, it may be sent to the Internet browser in any format that can be interpreted by the browser application, e.g. as HTML, fully encrypted, or partly encrypted formats. A decrypting algorithm may present in the method of the invention implemented by the browser application. The encryption/decryption may or may not make use of public key cryptography (e.g. PGP).

20

Hidden information

As mentioned above, the information 1 of step a) also comprises hidden information 1"^{'''} i.e. information not displayed by the browser window, against which the comparison of step c) is to be performed. The hidden data 1"^{'''} is typically a summarised version of the displayed information 1", comprising, for example, keywords indicating balances, transaction numbers and a consistent use of date formats.

25

30 This aspect is illustrated in **FIG. 1**, which shows the information 1 of step a) comprising hidden information 1"^{'''} (grey box) and displayed information 1". The hidden information 1"^{'''} is that used in the comparison step 16; the displayed information 1" may not be used in the comparison step 16.

35 The hidden information 1"^{'''} may be hidden by the use of tags such as meta tags, which instruct the browser not to display content indicated as meta-tagged; these are well known

in the art. Other ways to provide information-rich hidden information are within the scope of the invention.

Composition of hidden information

5 Hidden information 1''' corresponds to at least part of the displayed information 1''. As mentioned earlier, the hidden information 1''' may be a summary of the displayed information 1'', meaning it is a list of keywords extracted from the displayed information 1'' against which the comparison of step c) is to be performed. The hidden information 1''' preferably comprises one or more alphanumeric words and/or phrases that are present in
10 the displayed information 1''. As mentioned above, alphanumeric words are words, numbers, letters and punctuation displayed on a web page that can be incorporated into written sentences and paragraphs and can be separated by spaces. Examples of words include "statement", "John", "12345", "01-12-87", "01/12/87", "001-9283745-84", "Vodafone" etc. A collection of words may form a phrase such as "12 Jan 2006" or
15 "account number: 001-9283745-84". While the hidden information 1''', comprises alphanumeric words and phrases, it may be sent to the Internet browser in any format that can be interpreted by the browser application, e.g. as HTML, fully encrypted, partly encrypted formats. A decrypting algorithm may present in the method of the invention implemented by the browser application. The encryption/decryption may or may not make
20 use of public key cryptography (e.g. PGP).

The hidden information 1''' comprises words and phrases that summarise the information displayed 1'', and is devoid of superfluous words that are not relevant for cross-referencing. Superfluous words might be present in the information displayed 1'' as
25 advertising, navigation menus, alerts and buttons.

According to one aspect of the invention, the hidden information 1''' comprises extra information in addition to the alphanumeric words and/or phrases present in the information displayed 1''. In other words, the hidden information 1''' may not only
30 correspond to the displayed information 1'', but may include extra information, for example, an indication that a number refers to a balance, or to a transaction number, to a date. This gives more flexibility to the information providers, allowing them develop the presentation of displayed data 1'', without need to optimise it for the comparison step 16. The extra information may include a tag associated with each word present in the hidden
35 information 1''' which tag indicates the location of the occurrence of the word and/or

phrase on the displayed information **1''**. In the event of a match, such tag allows the rapid placement of emphasis on the displayed information **1''**.

According to one aspect of the invention, the hidden information **1'''** is not encrypted. This configuration is depicted in **FIGs. 1 to 4**. Being unencrypted, the alphanumeric words may readily appear in the source code allowing, for example, the word "statement" to be read as such by reading the HTML source code or the like.

Equally, the hidden information **1'''** may be retrieved in an encrypted form, and decrypted using the Internet browser application **18** prior to the comparison step. An example of this embodiment is shown in **FIG. 5**. **FIG. 5** describes, from the top of the page downwards, information **1** comprising a part to be displayed **1''** and a hidden part **1'''** (to be compared) stored on a first server (A) **2**, and an archived document **3', 3''** (see below) stored on a second server (B) **4**. The hidden part **1'''** of the information **1** is encrypted **80** by server A to produce encrypted hidden information **1'** *i.e.* the words represented by "+", "*", and "-" are converted to an encrypted form "c", "c", "c" using an algorithm. In this embodiment, the words present in the archive document **3', 3''** are filtered **21** by the server **4**, to remove unmeaningful words **20** (*i.e.* "#", "§", "Ω", "™", "%", "\$", "@", "Δ", dotted-lined boxes) and to retain words that would provide meaningful search terms **5** (*i.e.* "+", "-", bold boxes in **FIG. 5**). The information **1** comprising the information to be displayed **1''** and encrypted hidden information **1'**, and search data **19** are retrieved by the browser application **18** *via* the Internet **6**. Within the browser application **18**, the encrypted hidden information **1'** is decrypted **81** *i.e.* "c", "c", "c" is converted back to "+", "*", and "-". The decrypted hidden information **1'''** is compared **16** with filtered search terms **5** present in the search data **19** to obtain a list **7** of common terms **5'**. A browser window **8** comprising the list **7** of common terms **5'**, and the displayed information **1''** where the common terms **5'** are emphasised **9** thereon is produced. By selecting **13, 14, 15** the common terms or emphasised displayed information, the respective archived documents **3', 3''**, are displayed (**10, 11, 12**).

30 *Automatic generation of hidden data*

Hidden information **1'''** may be automatically generated by the provider of the information **1** of step a) for example by extracting dates, balances, transaction numbers, dates, merchant names from a plurality of documents, which documents are also used to form the displayed information **1''**.

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Hidden information may be generated from an electronic version of a document, for example, from an HTML version, or an image or document file such as a JPEG, PICT, GIF, PDF, or other known format. An electronic version of a document will typically comprise a mixture of alphanumeric text and graphics, to provide a document having sentences in a particular language (e.g. English, French, German, Dutch, Spanish), graphical logos and pictures. As already mentioned herein, alphanumeric text (referred to also as text herein) comprises one or more words (alphanumeric words) such as "statement", "John", "12345", "01-12-87", "01/12/87", "001-9283745-84", "Vodaphone". In automatically generating hidden information 1^{'''}, keywords are selected from the alphanumeric words present in the electronic document. Trigger words or phases in the electronic document such as "date", "amount", "vendor", "comment" may be recognised, and used to extract the data which suffixes such words. After the keywords are selected, they may be tagged with extra information identifying the document from which it came, identifying the location of the word within the document, identifying a category of the word etc. The hidden information 1^{'''} is then added to the information to be displayed 1^{''} to form part of the information 1 retrieved in step a). The hidden information 1^{'''} and displayed information 1^{''} may be retrieved as a single combined file, or a separate files.

Agreements

According to one aspect of the invention, the format of the hidden information 1^{'''} is agreed between a provider (A) of information of step a) and a provider (B) of search data of step b). For example, the method may be made available by provider B as a program such as a toolbar, javascript, or plug-in, for use in a web browser, which program recognises the hidden data 1^{'''} information. Because the hidden information 1^{'''} may summarise the displayed information 1^{''} in a pre-agreed format, the comparison step 16 can be optimised to read rapidly the pre-agreed format. Through agreements between providers A and B, the hidden information 1^{'''}, for example, may be standardised to indicate a hidden tag, the type of information hidden information, categories of hidden information.

Under an agreement, providers A and B may determine unique data elements that link information 1 on server A with archive data 3', 3^{''} on server B. For example, where provider B is an invoicing service (see below), and provider A is an online bank, both parties can agree the categories of information that can be hidden. For instance, providers A and B may agree that the hidden information 1^{'''} will comprise name of the biller, the bill reference number, the direct debit reference number and the total billing amount. Provider

A, which is a bank, may then put this hidden information **1'''** in a pre-agreed format; for example, the hidden information **1'''** may be inserted in the information **1** by attaching an appropriate tag to the displayed transaction line from the online bank that corresponds with the payment of this bill. When the method made available by provider B (e.g. tool bar) performs the comparison step **16** on the web site of provider A, it will look for this preagreed format in the hidden information **1'''**. When the content matches with data of provider B, the common terms **5'** are indicated.

An advantage of using hidden information in an agreed format, is the comparison step can be performed robustly. It does not need to rely on searching all the data **1** of step a), or on the quality of the comparison algorithm **16**. For example anomalies in date formatting can be corrected in the hidden data **1'''**, so the comparison algorithm **16** need not search for alternatives.

Furthermore, the hidden data **1'''** can be encrypted so that it can only be read by the method made available by provider B. This allows the two providers to protect their data from other parties and underline their cooperation through an optimised matching mechanism.

20 Search data of step b)

The search data **19** is the data that is received by the browser **18** for cross-referencing against the hidden information **1'''**. The search data **19** of step b) comprises search terms **5**, one or more of which are used for the comparison of step c). A search term **5** is generally an alphanumeric word or phrase such as a name, reference number, telephone number, bank sort code, date, or time etc that is to be compared against the hidden information.

As mentioned above, an alphanumeric word refers to a word, number, letter and punctuation displayed on a web page that can be incorporated into sentences and paragraphs and separated by spaces. Examples of words include "statement", "John", "12345", "01-12-87", "01/12/87", "001-9283745-84", "Vodafone" etc. A collection of words may form a phrase such as "12 Jan 2006" or "account number: 001-9283745-84". While the search data **19**, comprises alphanumeric words and phrases, it may be sent to the Internet browser in any format that can be interpreted by the browser application, e.g. as HTML, encrypted, partly encrypted formats. A decrypting algorithm may present in the method of the invention implemented by the browser application. The

encryption/decryption may or may not make use of public key cryptography (e.g. PGP). According to one aspect of the invention, encrypted search data of step b) may only be read by the method of the invention made available by provider of the search data **19** of step b).

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The search data **19** is typically retrieved from a server (second server **4**) connected to the Internet **6**, though it may alternatively be retrieved from a local hard drive **24** or local area network **25**. In practice, the search data **19** can be, for example, that held on the server of a supplier e.g. a utility company, an online shop, a financial service provider. The search data **19** is usually retrieved by typing or selecting a URL for retrieval by the browser, typically *via* an input box or pull down menu in a browser toolbar that the method provides. The URL of the information **1** will not normally be the same as the URL of the search data **19**.

15 As mentioned above, the search data **19** comprises search term **5**, one or more of which are used for cross referencing. The method of the invention may use all the available alphanumeric words present in the search data **19** as search terms **5**; alternatively, it may employ a local filtering step to select certain key words from the search data **19** which are employed as search terms **5** in step c).

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It is within the scope of the invention that the method filters the search data **19** of step b) in accordance with the Internet address being accessed, such filtering being performed by the browser application **18**. For example, the method may filter out information that does not mention a predetermined account number or a balance for an internet site of a telecoms company. In the case of an electricity supply company, the method may filter out information that does not mention a date and a balance. The trigger for these different filters may be the URL address (IP address or DNS address) or domain name key word (e.g. "sprint", "vodaphone", "orange").

30 Where different filters are applied to different addresses, tables of filters and corresponding internet domain name identifiers may be held on the local computer. Alternatively, they may be held on an external server e.g. on a dedicated server connected to the Internet such as a (second) server from which search data is retrieved step b). Alternatively, they may be held on a combination of the two.

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Archive document

According to one aspect of the invention, the search data **19** is derived from one or more archive documents **3'**, **3**. An archive document is an electronic format of a page comprising alphanumeric text and optionally graphics, having sentences in a particular language (e.g. English, French, German, Dutch, or Spanish), optionally graphical logos and pictures. The alphanumeric text (referred to also as text herein) will comprise one or more "words", also known as alphanumeric words herein. As mentioned elsewhere, a "word" (or "alphanumeric word") refers to the words, numbers, letters and punctuation displayed on a web page that can be incorporated into written sentences and paragraphs and separated by spaces. Examples of words include "statement", "John", "12345", "01-12-87", "01/12/87", "001-9283745-84", "Vodafone" etc. A collection of words may form a phrase such as "12 Jan 2006" or "account number: 001-9283745-84". Thus, the alphanumeric text part an archive document comprises a plurality of words, and includes, for example, names, addresses, descriptive language, reference numbers, telephone numbers, bank sort codes, dates, and times etc.

The archive document **3'**, **3"** may be encoded using HTML, where a paragraph of text to be displayed on an Internet browser is encoded essentially verbatim in the source code for the web page as is commonly known in the art. Alternatively, the alphanumeric text may be present in an image or document file such as a JPEG, PICT, GIF, PDF or other image format in which case extraction techniques such as optical character recognition (OCR) techniques may be employed to obtain the alphanumeric text from the file, which OCR techniques are well known in the art. The search data **19** comprises at least part of the alphanumeric information of the archive document **3'**, **3"**, which search data **19** is cross-referenced by the invention.

An archive document **3'**, **3"** may be an invoice, letter, statement or any document that will later need to be retrieved when the search data **19** indicates a match against the hidden information **1'''**. The archive document **3'**, **3"** will typically be the further information of step d). An archive document **3'**, **3"** may contain information such as dates, account numbers, balances, a name and address, previous payment information, interest rates, options for payment, contact telephone numbers, hours of business etc. An archive document **3'**, **3"** may be sent to the Internet browser in step d) in any format that can be interpreted by the browser application, e.g. as HTML, encrypted, partly encrypted formats. A decrypting algorithm may present in the method of the invention implemented by the browser application. The encryption/decryption may or may not make use of public key cryptography (e.g. PGP). According to one aspect of the invention, encrypted archive

document **3'**, **3''** may only be read by the method of the invention made available by provider of the search data **19** of step b).

The archive document **3'**, **3''** thus comprises alphanumeric words, and the search terms **5** present in the search data **19** of step b) correspond to said alphanumeric words. As can be deduced from elsewhere, the search data **19** may comprise all the alphanumeric words of the archive document **3'**, **3''**, or may comprise some words (key words) extracted from an archive document **3'**, **3''**, relevant for cross referencing such as, for example, dates, account numbers and balances. Embodiments describing the case where search data **19** contains all the alphanumeric words of the archive document **3'**, **3''**, is given in embodiments (A) and (B) below; embodiment (A) employs all the alphanumeric words as search terms **5** for cross-referencing, while embodiment (B) includes a filtering step of the search data **19** to provide fewer search terms **5** for cross-referencing. A third embodiment (C) is also described where the search data **19** has been-filtered before it is retrieved; the latter embodiment is applicable to invoicing services such as MyCertipost@.

A: Search data is not filtered prior to comparison step

According to one embodiment of the invention, the search data **19** contains all or substantially all the alphanumeric words of the archive documents **3'**, **3''**. **FIG. 2** shows an example of this embodiment of invention. Described in the following from the top of the page downwards, **FIG. 2** shows the information **1** comprising a part to be displayed **1''** and a hidden part **1'''** (to be compared) is stored on a first server (A) **2**, and the archived document **3'**, **3''** - which will be the search data - is stored on a second server (B) **4**. The information **1** and search data **19** are retrieved by the browser application **18** via the Internet **6**. Within the browser application **18**, the search data **19** comprises the archive documents **3'**, **3''**; each word present in the archive document is a search term **5** (*i.e.* "#", "\$", "+", "Ω", "*", "-", "%", "\$", "@", "Δ", selected search terms indicated in **FIG. 2**). The hidden information **1'''** is compared **16** with all the search terms **5** to obtain a list **7** of common terms **5'**. A browser window **8** comprising the list **7** of common terms **5'**, and the displayed information **1''** where the common terms **5'** are emphasised **9** thereon is produced. By selecting **13**, **14**, **15** the common terms or emphasised displayed information, the respective archived documents **3'**, **3''**, are displayed (**10**, **11**, **12**). Thus, according to this embodiment, all or substantially all the alphanumeric words of the archive document **3'**, **3''** are retrieved as search data **19** (step b), and are used as search terms **5** to cross-reference the hidden information **1'''**.

The emphasis **9** may be indicated on the displayed information **1''**, particularly on the text content by any means. For example, by highlighting the text in colour/pattern, highlighting the background in colour/pattern, providing an overlay in colour/pattern, emboldening the text, italicising the text, underlining the text, flashing (blinking) the text etc. The emphasis **9** may be the same for every common element; for example, every occurrence may be highlighted with a black background. Alternatively, emphasis **9** may be unique for each unique search term **5**. This instance is shown for example in **FIG. 2** in Browser window **8**, where the "+" term has a grey emphases, the "*" term has a dotted emphases and the "-" has a wave-like emphasis. The corresponding emphasising may be used to highlight the displayed list **7** of common terms **5'** (step d, i), as also shown in **FIG. 2**. It is also an embodiment that the list **7** of common terms **5'** are not emphasised.

These emphasised **9** elements and/or the common terms **5'** displayed in the browser window **8** may be hyperlink areas. When the common terms **5'** are selected in the browser **8** the archive documents **3, 3''** can be obtained that may be displayed by the Internet browser, for example in new windows **10, 11, 12**.

Because the browser retrieves the archive document **3', 3''** as search data in step b) in this embodiment, its display may entail accessing a local cache or memory storing the archive document **3', 3''**. It is also within the scope of the invention, however, the archive document **3', 3''** is retrieved from an Internet URL associated with the hyperlink area.

It will be appreciated that each search term **5** and ultimately each common term will be associated with a hyperlink area to the corresponding archive document **3', 3''**. This allows selection of the common term to open a new window containing the archive document **3', 3''** pertinent to the common term. The skilled person will therefore understand that the search data **19** may include additional tags, associating each search term **5** with the archive document **3', 3''** in which the search term **5** is found. Such tags may be added by the browser application after it has retrieved the search data **19**.

30

B: Search data is filtered by the Internet browser prior to comparison step

According to an alternative embodiment, the search data **19** retrieved in step b) contains search terms **5** corresponding to all the alphanumeric words of the archive documents **3', 3''**. However, in this embodiment, the one or more search terms **5** used in comparison step c) are filtered **21** from the search data **19** prior to step c). By filtered, it is meant the search terms **5** are selected from the search data **19** that are to be employed in the

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comparison step. It is within the scope of the invention that the method so filters the search data **19** of step b) to provide more meaningful search terms **5**, namely keywords. For example, it may filter the search data **19** to provide only account numbers, transaction numbers, reference codes, balances and credits etc. The information that is filtered-out or
5 filtered-in may be definable by the user.

It is within the scope of the invention that the method filters **21** the search data **19** of step b) in accordance with the Internet address being accessed. For example, the method may filter out information that does not mention a predetermined account number or a balance
10 for an internet site of a telecoms company. In the case of an electricity supply company, the method may filter out information that does not mention a date and a balance. The trigger for these different filters may be the URL address (IP address or DNS address) or domain name key word (e.g. "sprint", "vodaphone", "orange").

15 The filtered search data **19** described provides the search terms **5** used in step c) to search the data of step a), and to prepare the list **7** of common terms **5'**. By selecting the common terms or emphasised information in step d), the archive document is displayed in its complete form.

20 The filtering **21** according to this embodiment is performed by the method, implemented as a part of the web-browser application e.g. as a plug-in or toolbar. This means the method filters the search terms **5** in the search data **19** on the local computer.

An example of this embodiment is illustrated in **FIG. 3**. Described in the following from the
25 top, downwards, **FIG. 3** shows the information **1** comprising a part to be displayed **1''** and a hidden part **1'''** (to be compared, i.e. "+", "*", "-") is stored on a first server (A) **2**, and the archived documents **3'**, **3''** - which will be the search data - are stored on a second server (B) **4**. The respective information **1** and search data **19** are retrieved by the browser application **18** across the Internet **6**. Within the browser application **18**, the search data **19**
30 comprises the alphanumeric words present in archive documents **3'**, **3''**. In other words, the search data **19** comprises search terms **5** which correspond with the alphanumeric words present in archive documents **3'**, **3''**. In this embodiment, the search terms **5** present in the search data **19** are filtered **21**, to remove unmeaningful search terms **20** (i.e. "#", "\$", "Ω", "*", "%", "\$", "@", "Δ", dotted-lined boxes) and to retain search terms **5**
35 that would provide meaningful cross referencing (i.e. "+", "-", bold boxes, selected search terms indicated in **FIG. 3**). The hidden information **1'''** is compared **16** with the filtered

search terms **5** to obtain a list **7** of common terms **5'**. A browser window **8** comprising the list **7** of common terms **5'**, and the displayed information **1''** where the common terms **5'** are emphasised **9** thereon is displayed. By selecting **13**, **14** the common terms in the list **7** or emphasised in the displayed information, the respective archive documents **3'**, **3''**, are displayed (**10**, **11**).

Because the browser retrieves the archive documents **3'**, **3''** as search data in step b) in this embodiment, its display may entail accessing a local cache or memory storing the archive document **3'**, **3''**. It is also within the scope of the invention, however, the archive document **3'**, **3''** is retrieved from an Internet URL associated with the hypertext link. It will be appreciated that each search term **5** and ultimately each common term will be associated with a hypertext link to the corresponding archive document **3'**, **3''**. This allows selection of the common term to open a new window containing the archive document **3'**, **3''** pertinent to the common term. The skilled person will therefore understand that the search data **19** may include additional tags, associating each search term **5** with the archive document **3'**, **3''** in which the search term **5** is found. Such tags may be added by the browser application after it has retrieved the search data **19**.

C: Search data is filtered by prior to its retrieval in step b)

According to one aspect of the invention, search data **19** is retrieved in step b) that comprises keywords, pre-filtered from the archive documents **3'**, **3''**. In other words, the search data (**19**) comprises search terms **5** that are alphanumeric words filtered from the archive document **3'**, **3''** prior to retrieval in step b). By filtered, it is meant the search terms **5** are selected from the archive document **3'**, **3''** that are to be employed in the comparison step. According to this embodiment, a filtering is performed beforehand, preferably by a server that stores a plurality of archive documents **3'**, **3''** as shown in **FIG. 4**. Thus, all the search term present in the search data may be employed in step c). Pre-filtering avoids that large archive documents **3'**, **3''** are retrieved by the Internet browser application **18**; instead the search data **19** comprises keywords from filtered archive documents **3'** **3''**.

FIG. 4 illustrates an embodiment of this method. **FIG. 4** shows the method of the invention, including a filtering step **21** performed on the server side. Described in the following from the top, downwards, **FIG. 4** shows the information **1** comprising a part to be displayed **1''** and a hidden part **1'''** (to be compared) is stored on a first server (A) **2**, and the archive documents **3'**, **3''** are stored on a second server (B) **4**. In this embodiment, the

words present in the archive document are filtered **21** by the server **4**, to remove unmeaningful words **20** (*i.e.* "#", "§", "Ω", "*", "%", "\$", "@", "Δ", dotted-lined boxes) and to retain words that would provide meaningful search terms **5** (*i.e.* "+", "-", bold boxes in **FIG. 4**). Both the information **1** and search data **19** comprising filtered search terms **5** are
5 retrieved by the browser application **18** across the Internet **6**. The hidden information **1''** is compared **16** with said search terms **5** to obtain a list **7** of common terms **5'**. A browser window **8** comprising the list **7** of common terms **5'**, and the emphasised **9** displayed information **1''** is produced. By selecting **13**, **14** the common terms **5'** present in the list **7** or emphasised in the information **1''**, the respective archived documents **3'**, **3''**, are
10 displayed (**10**, **11**). According to one aspect of the invention, the emphasis **9** is indicated in the same colour when common terms **5'** belong to the same archived document **3'**, **3''**.

It will be appreciated that each search term **5** and ultimately each common term **5'** will be associated with a hyperlink area to the corresponding archive document **3'**, **3''**. In other
15 words, each search term **5** may be tagged with an indication of the archive document **3'**, **3''** with which it corresponds, prior to comparing in step c). This allows selection of the common term to open a new window containing the archive document **3'**, **3''** pertinent to the common term. The skilled person will, therefore, understand that the search data **19** may include additional tags, associating each search term **5** with the archive document **3'**,
20 **3''** in which the search term **5** is found. Such tags may be added to the search data **19** by the (second) server **4** as it filters a plurality of archive documents **3'**, **3''**.

A practical example of this embodiment is a telecoms company that stores on its server the complete invoices (**3'**, **3''**) of a client. It also stores a filtered list of search terms (**5**)
25 such as the account number, statement date and amount, which filtered list is prepared by the telecoms company by parsing each invoice. The filtered list is the search data (**19**) retrieved by the method in step b) over the Internet (**6**). It provides the search terms (**5**) used in step c) and d); the full invoice (**3'**, **3''**), is retrieved and displayed (**10**, **11**, **12**) by selecting the hyperlink areas of step d).

30 The method may retrieve data from more than one server of step b). This allows the comparison of step c) across several sources of information. For example, the method may retrieve in step b) data from a utility company, an online shop, and a telecoms provider. All these servers would provide search terms **5** against a single online bank
35 statement, for example, allowing the user to see multiple invoices summaries and his bank statement on single page.

The method may also retrieve information **1** from more than one server of step a). This also allows the comparison of step c) across several sources of information. For example, the method may retrieve in step a) information **1** from a bank statement of a current
5 account and a bank statement of a mortgage account. These statements may be displayed in the same browser window **8**, side by side. The statements would be searched by the search terms **5**, allowing the user to see multiple bank statements and invoices thereto on single page.

10 **Common terms of step c)**

The method compares the hidden information **1'''** of step a) with one or more of the search terms **5** of step b) and prepares a list **7** of common terms **5'** in step c). The comparison may be performed on a word-for-word basis, where occurrences of the same alphanumeric words in both the hidden information **1'''** and search term **5** are indicated as
15 a common terms. The comparison may, in addition or alternatively, be performed on a phrase-for-phrase basis, where occurrences of the same phrases (e.g. "Great Ormond Street Hospital") in both the hidden information **1'''** and search term **5** are indicated as a common terms.

20 In performing the comparison **16**, the degree of matching identity between the hidden information **1'''** and the search terms **5** can be absolute *i.e.* a word may align digit for digit which allows no mismatches. Alternatively, it can allow some degree of mismatching. In the case of dates, these can be automatically translated e.g. "24-12-2005" may be match if "December 24, 2005" or "12-24-2005" or other indicators of this date are present in the
25 other data. Methods for searching absolute or partial identity or performing date searches are well known in the art.

In performing the comparison, a category of search terms **5** of step b) applied to the hidden information **1'''** from step a) can optionally be predefined based on the source of
30 information e.g. the user may defined the search terms **5** to be in the category of dates, balances, account transaction numbers, etc. The user may customise and extend the category of search words for any information source.

Step c) is generally performed by the method, implemented as a part of the web-browser
35 application e.g. as a plug-in or tool bar. This means the comparison **16** is performed on the local computer as the data is received from the respective servers.

Displaying of step d)

The method displays a browser window **8** comprising the displayed information **1''** of step a) in essentially the original form; the common terms present in the displayed information **1''** may have emphasis **9** thereon (step ii). The emphasis **9** may be indicated by any means. For example, by highlighting the relevant words or phrases in colour/pattern, highlighting the background in colour/pattern, providing an overlay in colour/pattern, boldening the text, italicising the text, underlining the text, flashing (blinking) the text etc. The emphasis **9** may be the same for every common term; for example, every occurrence may be highlighted with a green background. Alternatively, emphasis **9** may be unique for each unique occurrence of a common term. This instance is shown for example in **FIG. 2** in Browser window **8**, where the "+" term has a grey emphases, the "*" term has a dotted emphases and the "-" has a wave-like emphasis.

The emphasised displayed information **1''** of step ii) displayed in the browser window **8** may provide hyperlink areas (e.g. hypertext) that may be selected to obtain further information. The indication of the hyperlink nature of the area may be the emphasising described above (e.g. highlighting, bold lettering, underlined lettering, coloured background, coloured overlay etc). Thus, when the emphasised **9** displayed information **1''** of step ii) is selected in the browser **8**, the further information may be displayed by the Internet browser, for example in new windows **10, 11, 12**.

Also displayed by the browser at the same time is a list **7** of common terms **5'** (step i). The emphasising scheme described above may be used to highlight the common terms **5'** of step i), as also shown in **FIG. 2**. It is also an embodiment that the common terms **5'** are not emphasised. The common terms **5'** may be displayed along side the information of step ii) by any means. For example, it may be displayed in a frame, in a pop up window, in a new browser window, in a side bar, in a tool bar etc. **FIGs. 1 to 4** depict the instance where the list **7** of common terms **5'** is displayed in a frame, however, it could equally be present as a pop-up window that can be moved around the computer display using a pointing tool.

The list **7** of common terms **5'** of step i) displayed, may also provide hyperlink areas. The indication of the hyperlink nature of the common terms **5'** may be the emphasising described above (e.g. bold lettering, underlined lettering, coloured background, coloured overlay etc). Selecting **13, 14, 15** the hyperlink leads to the displaying **10, 11, 12** by the

Internet browser, of the complete data of step b). The further information (e.g. archive document 3', 3'') may be displayed in a separate window. Further information may be retrieved over the Internet. Alternatively, it may be already available in a memory buffer, for example, where the archive documents 3', 3'' were retrieved in step b) (e.g. FIGs. 2 and 3) in which case the data may be retrieved from said memory buffer.

The hyperlink areas used herein may be generated by the method, within the Internet Browser application. In the case of the displayed information 1'', the hyperlink areas may be generated by modifying the parts of the HTML code corresponding to the common terms 5'. Techniques for achieving this are well known in the art. If displayed information 1'' comprises alphanumeric text as part of an image, a hyperlink area may be generated by placing an overlay at the location of the image. Information regarding to the location of the overlay may be provided in the hidden information 1''' as already mentioned elsewhere herein. Techniques for providing such overlays are well known in the art.

According to one embodiment of the invention, the display of the list 7 of common terms 5' in the present method (step i) also comprises additional indications. These additional indications may be derived from the further information of step d). They may be search terms 5, not present in the list 7 of common terms 5'. An example of an additional indication might be a date of a transaction present in an invoice held on server of step b), but absent from a bank statement held on a server of step a). The presence of such additional indication is illustrated in FIG. 7 (see below).

The user may customise which additional indication to display and the organisation of the display of the common data (e.g. grouping by date of the transaction).

Data protection

The method may store the URLs of certain visited internet sites and/or the user credentials, (e.g. logins and passwords, smart-card data, fingerprint data, iris data, face recognition data or other authentication details), so that the sites can be visited again by a user without retyping the URL or logging-in to each site. According to an aspect of the present method, the visited/favourite URLs and user credentials may themselves be protected by a separate user credential (e.g. logins and passwords, smart-cards, fingerprints, iris print, face recognition or other authentication details etc). The URLs and credentials may be held on the local computer. Alternatively, they may be held on an

external server e.g. on a dedicated server connected to the Internet such as the server of step b). Alternatively, they may be held on a combination of the two.

Invoicing service (MyCertipost®)

- 5 As already described above, the archive documents **3'**, **3''** of step b) may be held on a server **4** connected to the Internet and later retrieved by the method in step d). This embodiment of the invention may be employed by an invoice search service, for example, MyCertipost®.
- 10 An invoice search service may receive a variety of invoices such as telephone bills, utility bills, credit card statements etc. directly from the issuing company, or from the user. The service may archive them electronically and store them in a database. They may be received by the service electronically in which case archiving would entail storing the electronic files corresponding to the invoice. Alternatively they may be received as a paper
- 15 document, in which case the document would require scanning before archiving.

The service may prepare search data **19** from each received invoice, which search data **19** comprises relevant search terms **5** such as account numbers, dates, and balances. The preparation may be automatic, or performed according to user-defined parameters.

20 Each search data **19** word may be linked to a particular invoice **3'**, **3''**, for example, by way of a tag.

The search data **19** and archived documents **3'**, **3''** may be stored by the service in the (second) server **4** of step b). The user would then only need to access the server **4** via a

25 single URL in step b), rather than visiting multiple URLs of, for example, credit card companies, telecoms suppliers, utilities. A single URL will allow the user to access this disparate information in a filtered, summarised form in order to compare it against a retrieved web page **1** such as a bank statement.

30 **FIG. 6** shows a screenshot of a web browser running a method of the invention, where an invoice search service provides the data of step b). A main browser window **40** displays a page from an online bank account of a customer 'Katrien De Cuyper' **48**. A new browser window **41** displays a page provided by an invoice search service in respect of the same customer, **42**. In this case, the customer is the same, but the method also applies when

35 the customers are different.

The new browser window **41** displays a list (**7**) common terms (**5'**) of, for example, two telecoms companies 'Belgacom' **43** and 'Telenet' **44**. The list (**7**) common term (**5'**) is the result of a third party (MyCertipost) scanning the invoices (**3'**, **3''**) of the account holder **42** to provide search terms (**5**) and comparing the search terms (**5**) with the hidden information (**1'''**) sent by her online banking service along with the display information (**1''**).
5 In the main window **40**, the transactions of Belgacom **45** and Telenet **46** which match those in the MyCertiPost database are also present. The method has emphasised these Belgacom **45** and Telenet **46** transactions by highlighting their backgrounds. The search terms **5** cross-referenced in both the new browser window **41** and the main window **40**
10 are, in particular "Telenet" **47, 49**, "1234-ABCD", **50, 51**, "48.63", **52, 53**, "Belgacom" **54, 55**, "63000490589", **56, 57**, "123.45", **58, 59**. The service indicates to the user that it can also provide the service *i.e.* storage and filtering for bills received from "Brico" **60, 61**.

FIG. 7 shows an alternative display employing the same concept of the invention. A main browser window **60** displays a page from an online bank account of a customer John Dow
15 **61**. A pop-up window **75** displays page from invoice search service account of the same customer, **61**. In this case, the customer is the same, but the method also applies when the customers are different.

20 The pop-up window **75** displays a list (**7**) of common terms (**5'**) of the company 'Belgacom' as two transactions **64, 65**. The list (**7**) of common terms (**5'**) is the result of a third party (MyCertipost) scanning from the invoices (**3'**, **3''**) of the account holder **61** and comparing the search terms **5** obtained with hidden information (**1'''**) sent by his online banking service along with the display information (**1''**). In the main window **60**, the transactions of
25 Belgacom **66, 67** which match those in the MyCertiPost database are also present. The method has emphasised these Belgacom **66, 67** transactions by highlighting their backgrounds. The search terms **5** in common to both the pop-up window **75** and the main window **60** are, in particular "Belgacom", **68, 69, 70, 71**, "180.43", **72, 73**, "561882365910", **74, 78**, and "80.09", **76, 77**.

30

FIG. 7 also shows an embodiment where the pop-up window **75** displays the list of common terms, supplemented with additional indications, which indications are not present in the bank statement window **60**. In this case the date **63** of each transaction is indicated. Furthermore a transaction number is indicated **79** which does not appear on the
35 bank statement.

An example of how a (second) server **4** of step b) would respond to a request for invoicing information from a customer is given below:

- 1) XML Web service request for invoice information for specified period of time is received by server **4** of step b),
- 5 2) Server **4** verifies incoming Web service request which is signed using W3C XML signature specification,
- 3) Server **4** authenticates Basic Security profile or eID authentication certificate,
- 4) Server **4** obtains user invoices (**3'**, **3''**) for specified period of time,
- 5) Server **4** obtains search terms **5** corresponding to each invoice (**3'**, **3''**) by parsing
10 content of each invoice (**3'**, **3''**),
- 6) Server **4** saves the search terms **5** for future requests,
- 7) Server **4** returns web result comprising existing search terms and new search terms of step 5),
- 8) Server **4** constructs web page, signed with WS security.

15

The service may not be limited only to invoices, but could also be employed by the user to store non-financial information such as email records, contact information and schedule information. The method still permits cross-referencing of this information against any other information e.g. an email text invoice against a credit card statement.

20

Where two separate users of the service have some joint accounts (e.g. a credit card in joint names) and certain individual accounts (e.g. separate mobile phone accounts) the service may make available the joint invoices in both accounts, while making available only to the individual account holder, the individual invoices.

25

For example, a husband and wife sharing a joint bank account would each have separate credentials (e.g. login and password) to access the service, *i.e.* the server (**1**) of step b). The credentials may permit access to the documents stored by the service, and to their user-defined URLs, the user credentials of said URLs etc.

30

The husband may cross-reference invoices addressed solely or jointly to him against the joint bank account; the service will prevent him from accessing the invoices solely in the name of his wife, even though they may be available in the service and they may share the same address. Similarly, the wife may cross-reference invoices addressed solely or
35 jointly to her against the joint bank account, but not see the invoices solely addressed to her husband.

Where online bank implements encryption, for example, the invoicing service may co-operate with the bank so that the bank information **1** retrieved from its server comprises hidden information **1'''** in a pre-agreed format and encrypted, which hidden data **1'''** can
5 be readily cross-referenced by the method with search terms **5** available from the invoicing service.

Implementing the invention

The method of the invention may be implemented as an application (computer program) in
10 a web-browser, the application being stored on a computer readable storage medium. The application may be a browser tool bar, which can be accessed by the user by selecting the relevant toolbar part of the browser. Alternatively, the application may be a javascript plug-in.

15 The skilled person can readily implement the invention using known programming techniques *e.g.* in javascript, XML etc. An example where an embodiment of the present invention is implemented in XML is provided in **FIG. 9**.

An example of steps performed by the tool bar or javascript plug-in, implemented in the
20 invention is given below:

- 1) Logon onto the server **4** of step b),
- 2) Retrieve search data **19** comprising search terms **5** therefrom,
- 3) Match these search terms **5** with any hidden information **1'''** using the browser, and highlight common terms **5'** on the displayed data **1''**,
- 25 4) Create hyperlink areas towards corresponding documents in an explorer bar,
- 5) Retrieve archive documents **3'**, **3''** from server **4** and display them in a secondary window.

The methods of the invention may be provided as a computer program held on a
30 computer readable medium, said program comprising computer code for performing one or more steps of the method. Examples of media include an optical disk, tape, magnetic disk, solid-state memory, hard-drive. The program may be available for download across a network.

35 According to one aspect of the invention a system comprising one or more computers, adapted and programmed to carry out the computer program for performing one or more

steps of the method. The system may comprise, for example, a desktop computer with a screen and input device, a laptop computer, a PDA, a smart phone, interactive television, or IDTV etc.

5 One embodiment of the invention is a device for performing a method of the invention.

Additional embodiments of the invention

The following alternative embodiments describe the invention wherein the data (1) of step a) corresponds to information (1) in the foregoing description, the data to be displayed (1") of step a) corresponds to displayed information (1") in the foregoing description, data of
 10 of step a) corresponds to displayed information (1") in the foregoing description, data of step b) corresponds to search data (19) in the foregoing description, the hidden data (1''') of step a) corresponds to hidden information (1''') in the foregoing description, data of step b) corresponds to search data (19) in the foregoing description, the server of step a) corresponds to the first server in the foregoing description, the server of step b)
 15 corresponds to the second server in the foregoing description, the complete data (3, 3'') corresponds to the archive document (3, 3'') in the foregoing description, and the list of common data (7) corresponds to the list of common terms (7) in the foregoing description.

One embodiment of the present invention is a method for cross-referencing using an
 20 Internet browser (8), data retrieved over the Internet (6), comprising the steps of:

a) retrieving data (1) from one or more servers (2), which data comprises:

- data to be displayed (1") by the web-browser, and
- hidden data (1'''), not displayed by the web browser, which corresponds to at least part of the data to be displayed (1"), and

25 b) retrieving data from one or more servers (4), which data comprises search terms (5) corresponding to complete data (3', 3''),

where step a) may be performed before step b) or *vice versa*,

c) comparing (16) the hidden data (1''') of step a) with the search terms (5) of step b) to obtain a list of common data (7),

30 d) displaying a browser window (8) comprising:

- i) the list of common data (5') of step c), and
- ii) the data (1") of step a) where the common data (5') of step c) is emphasised (9) thereon,

35 wherein the displayed common data (7) of step i) and/or the emphasised (9) data of step ii) provide hyperlink areas directed towards the complete data (3', 3'') of step b).

Another embodiment of the present invention is a method as described above, wherein the search terms (5) of step b) are the complete data (3', 3").

5 Another embodiment of the present invention is a method as described above, wherein the search terms (5) of step b) are obtained by filtering (21) the complete data (3', 3").

Another embodiment of the present invention is a method as described above, wherein the filtering (21 – Figure 2) is performed by the server of step b).

10 Another embodiment of the present invention is a method as described above, wherein the filtering (21 – Figure 3) is performed by the Internet browser.

Another embodiment of the present invention is a method as described above, wherein the emphasis (9) of step ii) is applied also to the list of common data (5') in step i)
15

Another embodiment of the present invention is a method as described above, wherein said hidden data (1'') is retrieved from server (2) encrypted, and is decrypted by the method.

20 Another embodiment of the present invention is a method as described above, wherein said hidden data (1'') is retrieved from the server (2) of step a) in a coded form (1' – Figure 4), and is decoded (81) by the method prior to the comparing of step c).

Another embodiment of the present invention is a method as described above, wherein
25 the data of step b) is retrieved from server (4) encrypted, and is decrypted by the method.

Another embodiment of the present invention is a method as described above, wherein a format of the search terms (5) and hidden data (1'') is agreed between a provider of data of step a) and a provider of data of step b).

30

Another embodiment of the present invention is a method as described above, wherein the hidden data (1'') comprises data in addition to that corresponding to at least part of the data to be displayed (1").

Another embodiment of the present invention is a method as described above, wherein the hyperlink area is indicated any of underlining, italicising, highlighting background, transparent overlay, or emboldening.

5 Another embodiment of the present invention is a method as described above, wherein the data of step ii) is displayed in a main browser window, and the common data of step i) is displayed in a frame of said main window, in a new pop-up window, or in a new browser window.

10 Another embodiment of the present invention is a method as described above, wherein access to the data of step b) is controlled by a user credential.

Another embodiment of the present invention is a method as described above, wherein said credential controls access also to the data of step a).

15

Another embodiment of the present invention is a method as described above, wherein the data of step b) is provided by an invoice search service.

20 Another embodiment of the present invention is a method as described above, wherein the data of step b) corresponds to invoice data.

Another embodiment of the present invention is a method as described above, wherein the data of step a) is provided by a banking service.

25 Another embodiment of the present invention is a method as described above, wherein said hidden data (1'') corresponds to bank statement information.

30 Another embodiment of the present invention is a method as described above, wherein said bank statement information is one or more of balance, date, payment reference number, billing amount, biller, and direct debit reference number.

Another embodiment of the present invention is a method as described above, wherein the data of step b) can be divided into that made available to two or more users and that made available to a single user, which availability is user defined.

35

Another embodiment of the present invention is a computer program held on a computer readable medium, configured to perform the method as defined above.

Another embodiment of the present invention is a system comprising one or more
5 computers, further comprising the computer program as defined above.

CLAIMS

1. A method for cross-referencing information (1) using an Internet browser (18), comprising the steps of:

5 a) retrieving information (1) using the Internet browser (18), which information comprises:

- information to be displayed (1") by the Internet browser (18), and
- hidden data (1""), not displayed by the Internet browser (18), and which is to be cross-referenced,

10 b) retrieving search data (19) using the Internet browser (18), which search data comprises search terms (5) for cross-referencing,

where step a) may be performed before step b) or *vice versa*,

c) comparing (16), using the Internet browser (18), the hidden information (1"" with one or more of the search terms (5) to obtain a list (7) of common terms (5'), and

15 d) displaying, using the Internet browser (18), a browser window (8) comprising:

- i) the list (7) of common terms (5') of step c), and
- ii) the information to be displayed (1") of step a) where the common terms (5') of step c) are emphasised (9) thereon,

20 wherein the displayed common terms (5') of step i) and/or the emphasised (9) information of step ii) each provide hyperlink areas that may be selected to obtain further information.

2. Method according to claim 1, wherein the information to be displayed (1") comprises one or more alphanumeric words, and the hidden data (1"" comprises at least one of said
25 alphanumeric words.

3. Method according to claim 1 or 2, wherein the selection of the hyperlink area in step d) obtains further information (1) that is an archive document (3', 3").

30 4. Method according to claim 3, wherein the archive document (3', 3") comprises alphanumeric words, and the search terms (5) present in the search data (19) of step b) correspond to said alphanumeric words.

35 5. Method according to claim 4, wherein the search data (19) is filtered using the Internet browser (18) after retrieval in step b), to provide the one or more search terms (5) used in step c).

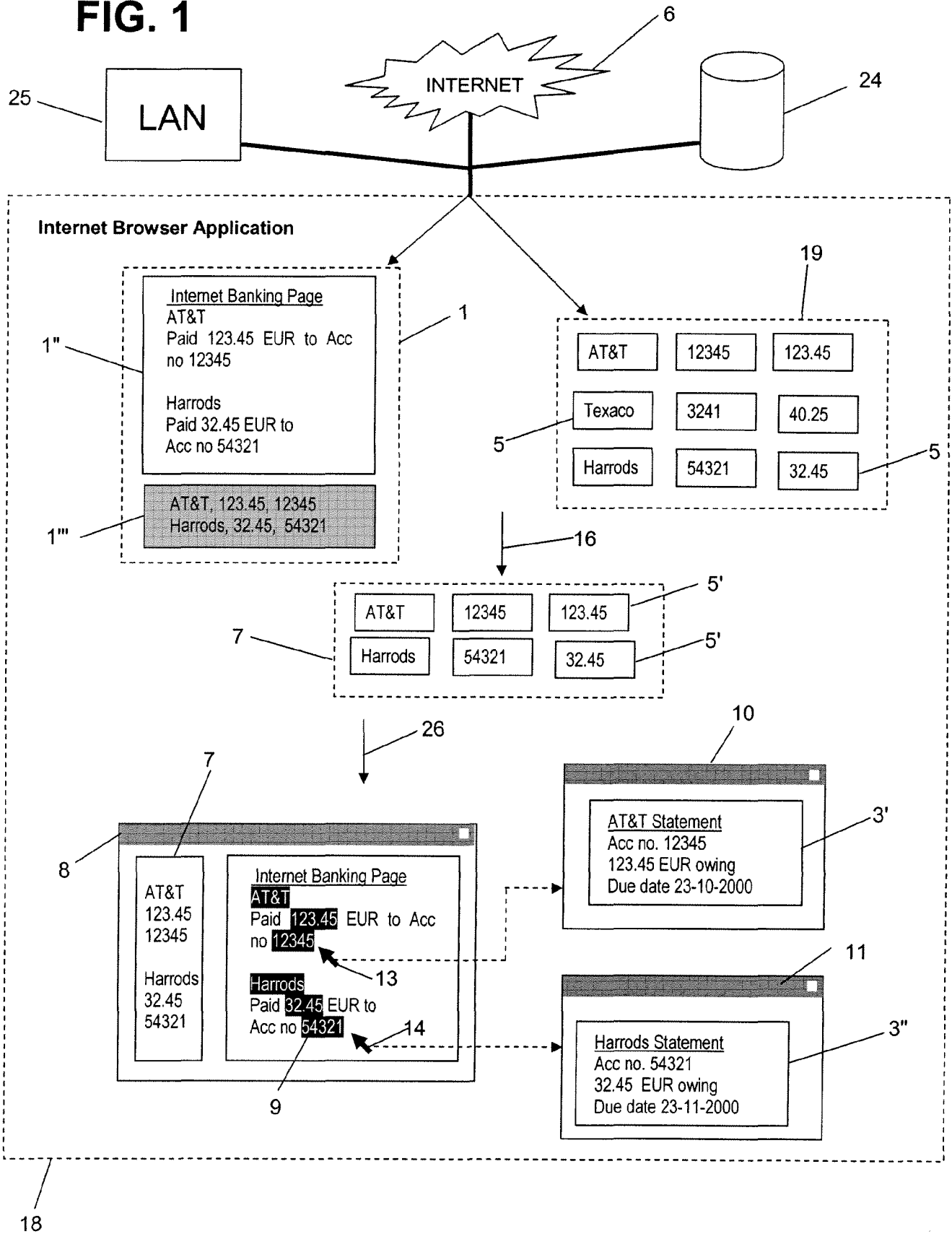
6. Method according to claim 3, wherein the archive document (3', 3'') comprises alphanumeric words, and the search data (19) comprises search terms (5) that are alphanumeric words filtered from the archive document (3', 3'') prior to retrieval in step b).
- 5 7. Method according to claim 6, wherein the search data (19) is retrieved from a server in step b), which server also stores the archive document (3', 3'').
8. Method according to any of claims 2 to 7 wherein each search term (5) is tagged with an indication of the archive document (3', 3'') with which it corresponds, prior to comparing
10 in step c).
9. Method according to any of claims 1 to 8 wherein the emphasis (9) of step ii) is applied also to the list (7) of common terms (5') in step i).
- 15 10. Method according to any of claim 1 to 9, wherein said hidden information (1''') is retrieved in an encrypted form, and is decrypted by the Internet browser (18) after retrieval.
11. Method according to any of claims 1 to 10, wherein the search data (19) of step b) is
20 retrieved in an encrypted form, and is decrypted by the Internet browser (18) after retrieval.
12. Method according to any of claims 1 to 11, wherein a format of the search data (19) and hidden information (1''') is agreed between a provider of information (1) of step a) and
25 a provider of search data (19) of step b).
13. Method according to any of claims 2 to 12, wherein the hidden information (1''') comprises an indication of the location of each alphanumeric word within the information to be displayed (1'').
30
14. Method according to any of claims 1 to 13, wherein the hyperlink area is indicated by any of underlining, italicising, highlighting background, transparent overlay, or boldening.
- 35 15. Method according to any of claims 1 to 14, wherein the display of list (7) of common (5') terms in step (d)(i) comprises additional indications.

16. Method according to any of claims 1 to 15, wherein the information to be displayed (1") of step ii) is displayed in a main browser window, and the list (7) of common data (5') of step i) is displayed in a frame of said main window, in a new pop-up window, or in a new browser window.
17. Method according to any of claims 1 to 16 wherein access to the search data (19) of step b) is controlled by a user credential.
18. Method according to claim 17 wherein said credential controls access also to the information (1) of step a).
19. Method according to any of claims 1 to 18 wherein the search data (19) of step b) is provided by an invoice search service.
20. Method according to claim 1 to 19 wherein the search data (19) of step b) corresponds to invoice data.
21. Method according to any of claims 1 to 20, wherein the information (1) of step a) is provided by a banking service.
22. Method according to any of claims 1 to 21 wherein said hidden information (1'") corresponds to bank statement information.
23. Method according to claim 22 wherein said bank statement information is one or more of balance, date, payment reference number, billing amount, biller, and direct debit reference number.
24. Method according to any of claims 1 to 23 wherein the search data (19) of step b) is divided into that made available to two or more users and that made available to a single user, which availability is user defined.
25. A computer program held on a computer readable medium, configured to perform the method according to any of claims 1 to 23.

26. Computer program according to claim 25, which is a tool bar or java plug-in suitable for use with the Internet browser.

27. A system comprising one or more computers, further comprising the computer
5 program according to claims 25 or 26.

FIG. 1



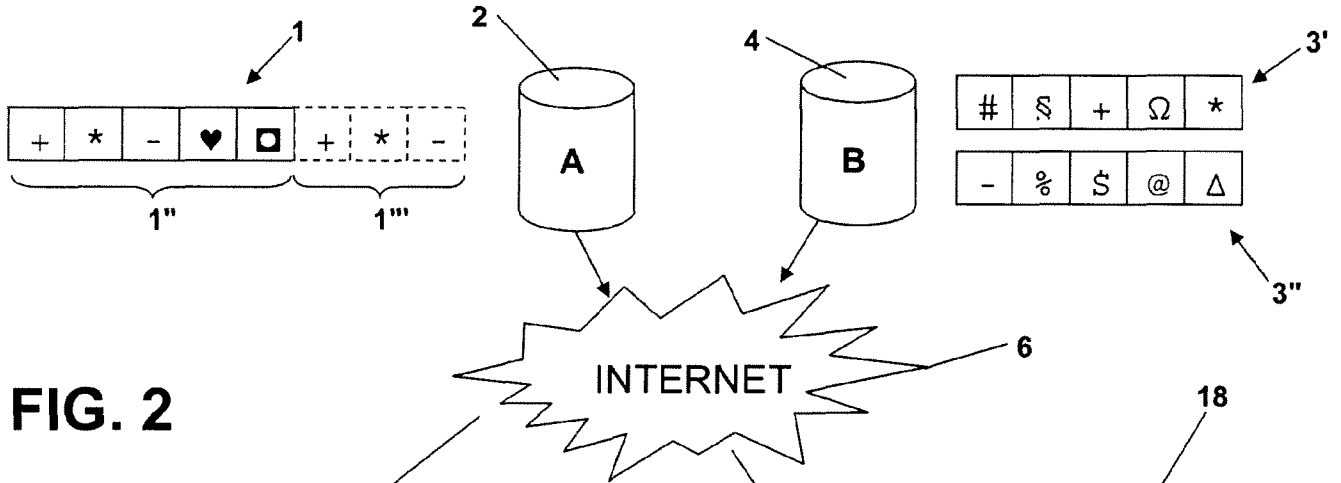
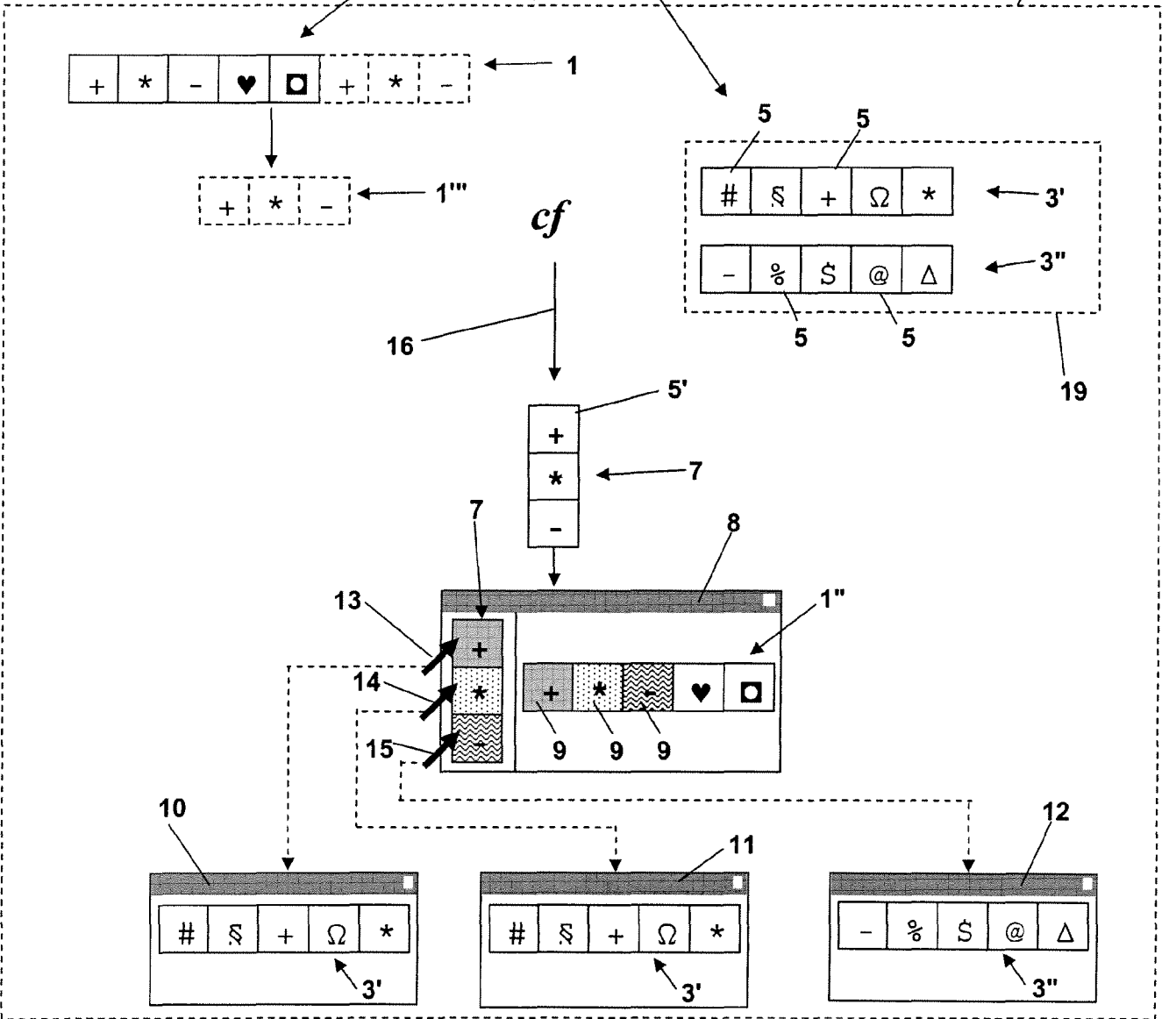


FIG. 2



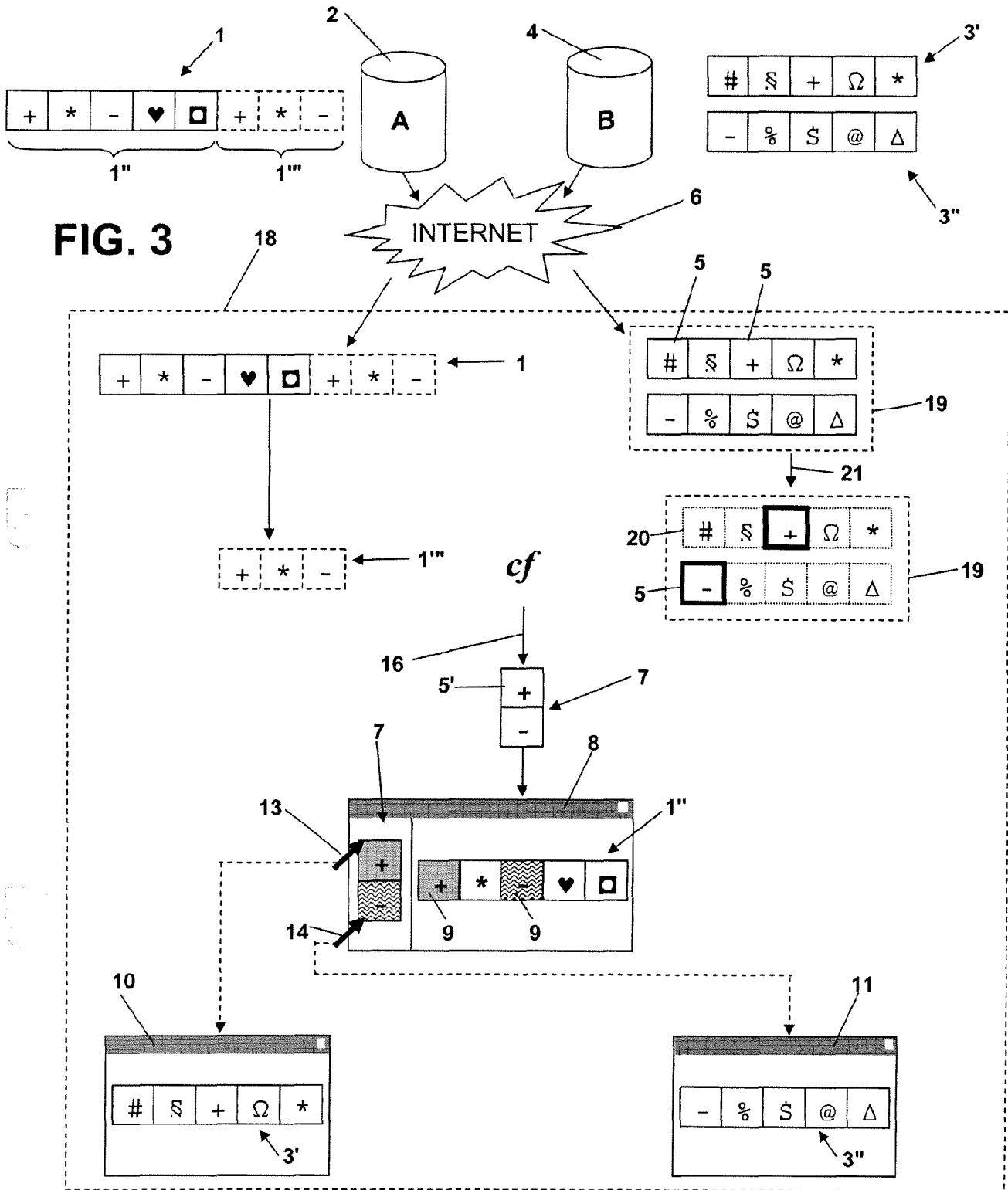
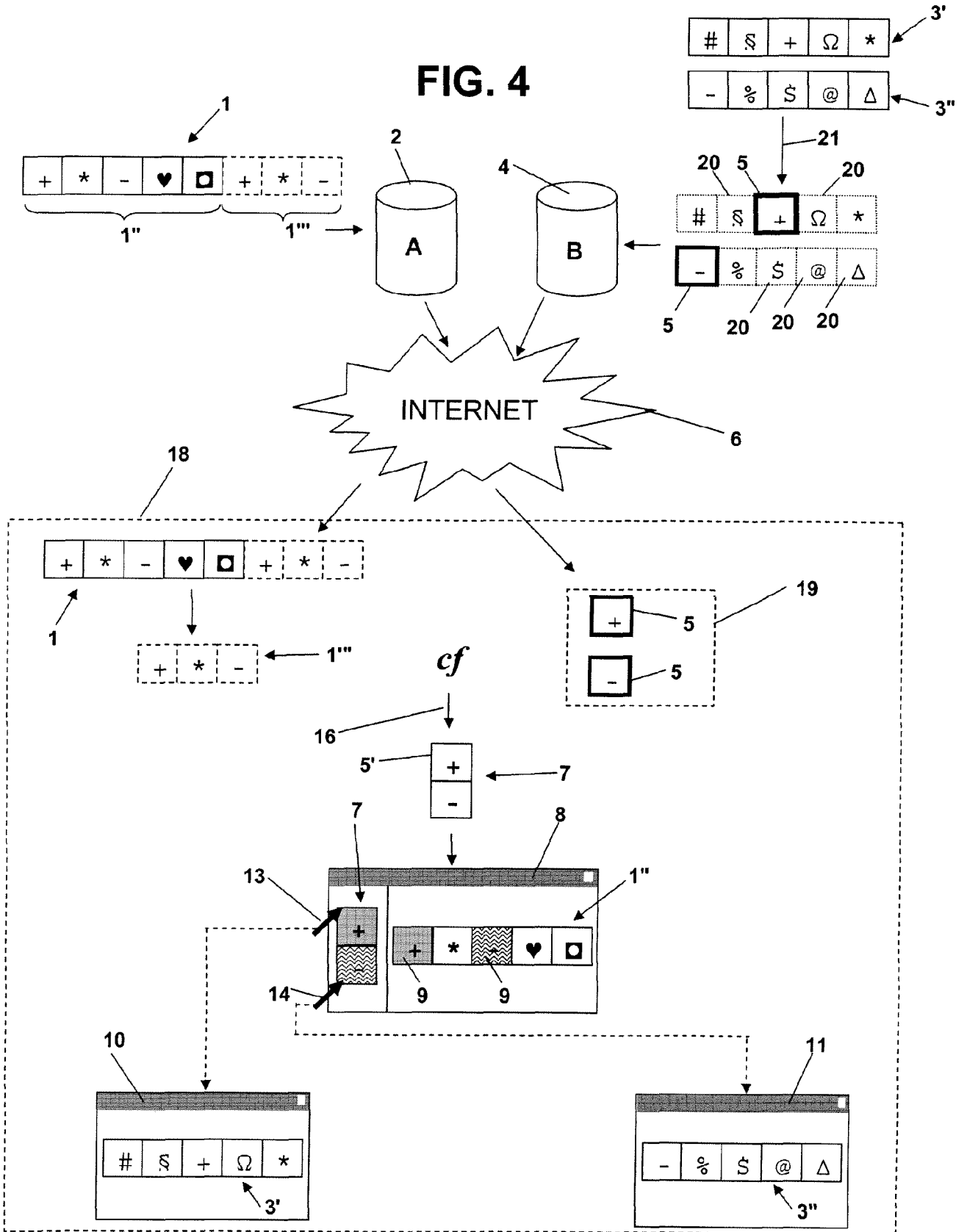


FIG. 4



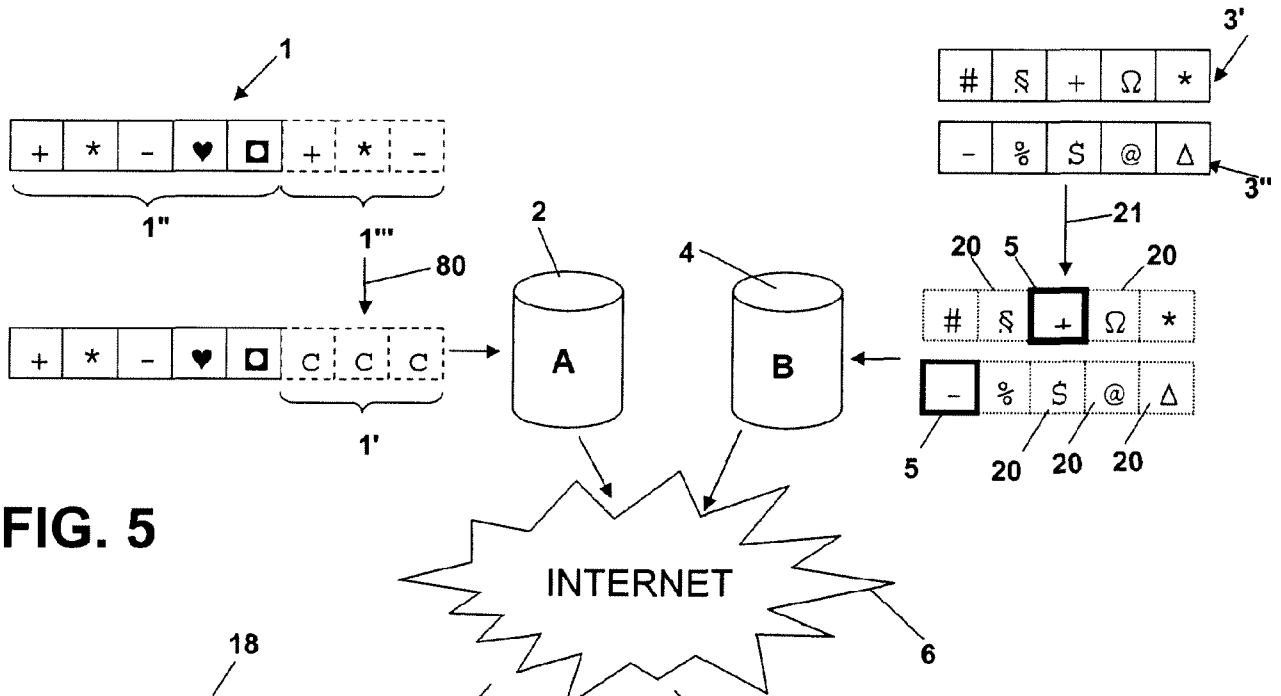
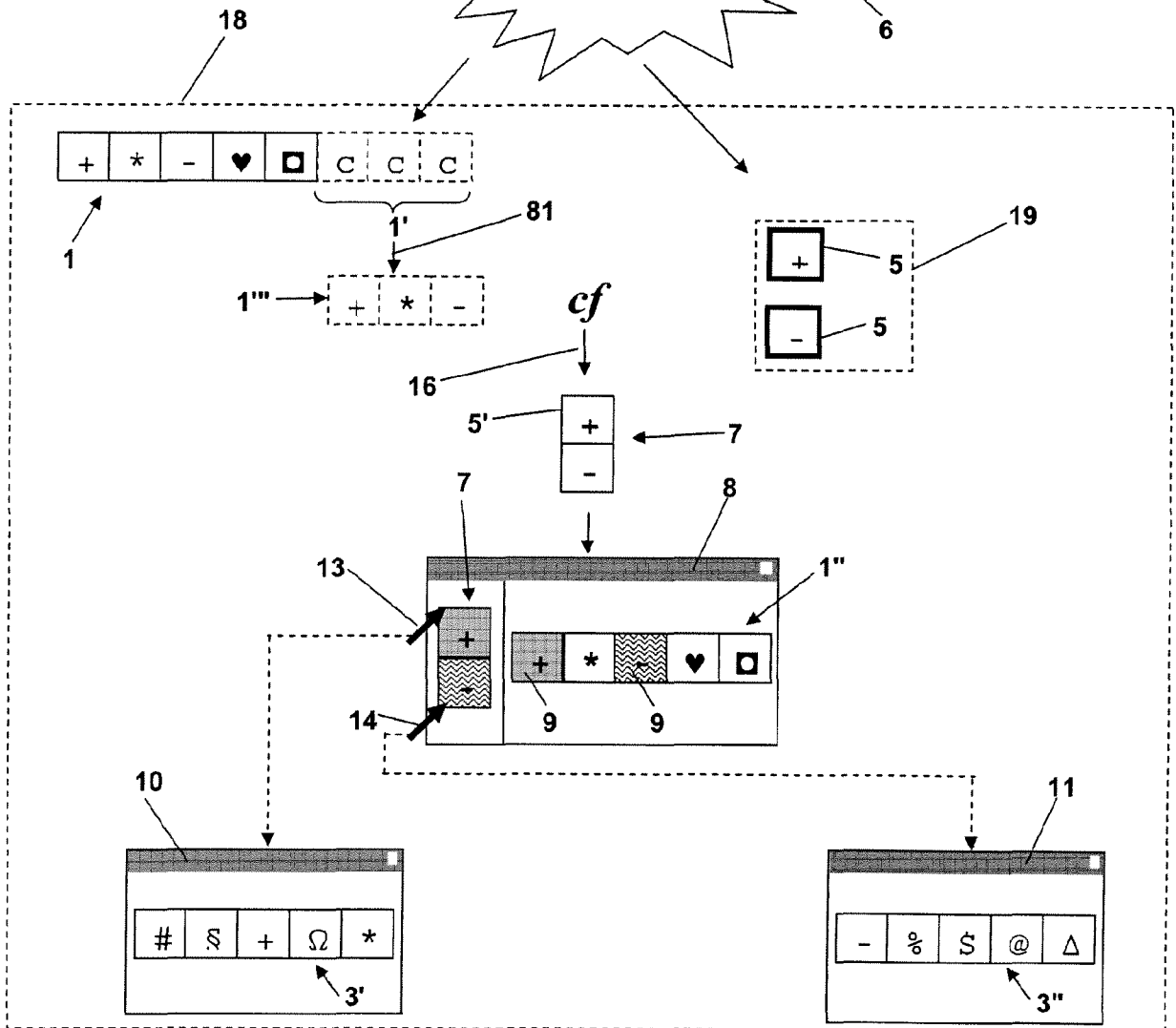


FIG. 5



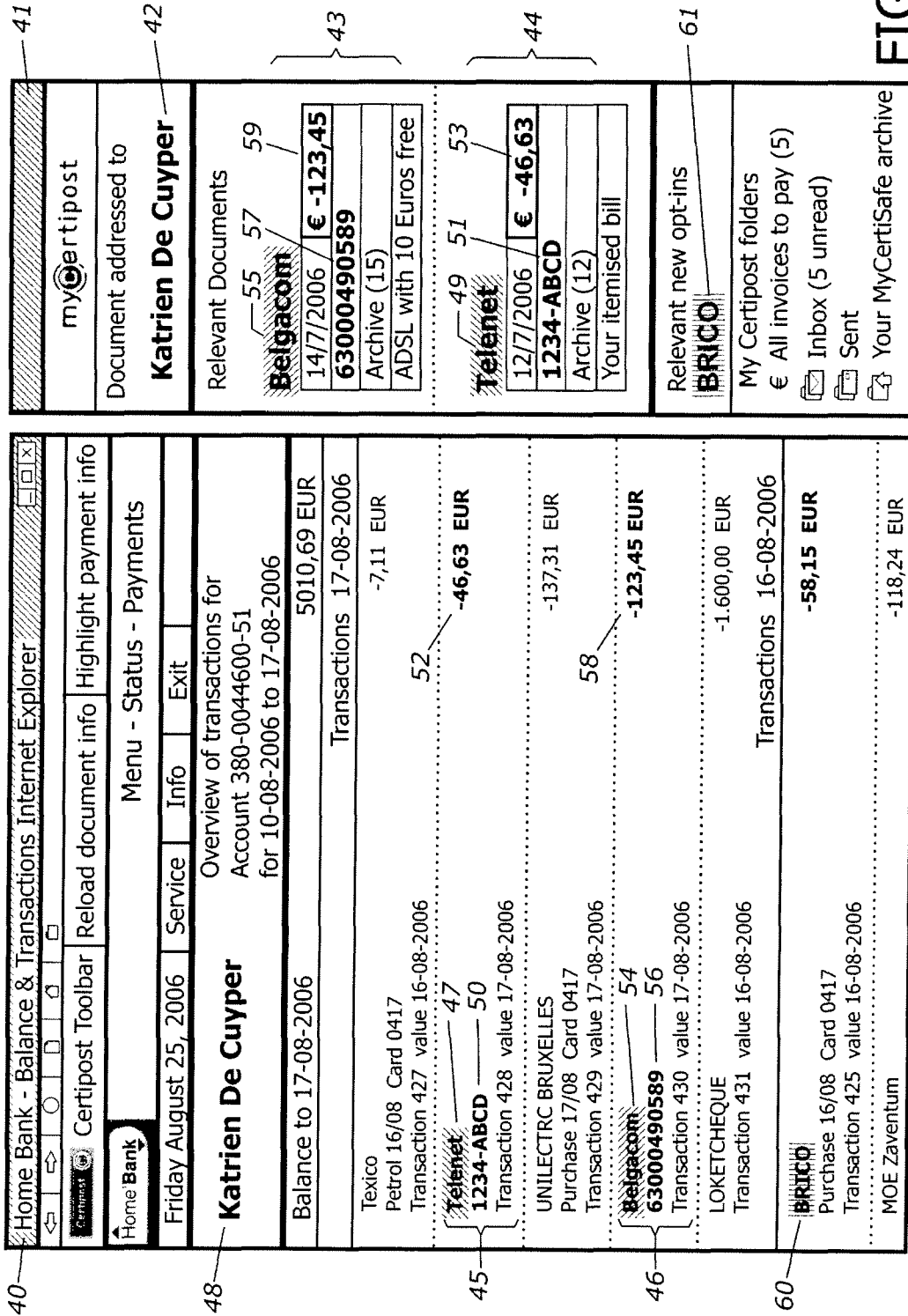


FIG. 6

7/14

KBC Online - Mozilla Firefox

File Edit View Bookmarks Tools Help

61 John Dow, you are logged on to KBC

Transaction menu

68 BELGACOM 561/8823/65910 Mon Aug 07 2006 180.43 73

69 BELGACOM 561/8823/65910 Mon Aug 07 2006 180.43 64

BELGACOM 004488944 Mon Aug 07 2006 80.09 65

77

my@ertipost 78

Account information

Transaction menu > Basic transactions > Account information

Account	Description	Balance/Currency
421-231783-99 EUR JOHN DOW &	KBC Convenience Account	000,00 EUR

Overview of transactions

Statement	Transaction	Value	Description	Amount
66	017	16-08-2006	PAYMENT OF PURCHASE 16-08-2006 TIME, BELGACOM WITH KBC BANK CARD 421-231783-99 0323 — 80	-80,09 EUR 76
	016	11-08-2006	TRANSFER TO 000-1710031-18 BELGACOM 561882365910 WITH KBC ONLINE	-180,43 EUR 72

74 Next page 70

60 Legal disclaimer

FIG. 7


```

</searchIndex>
- <searchIndex>
<amount>383.46</amount>
<auditid>539517</auditid>
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ditno=539517&envmsgid=453631</mess
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ditno=539519&envmsgid=453636</mess
ageViewUrl>
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ditno=539518&envmsgid=453635_447405</mess
ageViewUrl>
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<reference>704/1002/92091</reference>
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argeSenderLogoUrl>
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ditno=539519&envmsgid=453636</mess
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argeSenderLogoUrl>
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ditno=539005&envmsgid=450443_446883</mess
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ssName>
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```

FIG. 8-3

```

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ditno=548619&envmsgid=474814_456331</mess
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FIG. 8-4

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FIG. 8-5

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FIG. 8-6

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FIG. 8-7

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2007/059856

A. CLASSIFICATION OF SUBJECT MATTER
INV. G06F17/30 G06Q30/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G06F G06Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2001/047332 A1 (GONEN-FRIEDMAN EDITT [US] ET AL GONEN-FRIEDMAN EDITT [US] ET AL) 29 November 2001 (2001-11-29) paragraphs [0009] - [0013], [0028] - [0033], [0037], [0038]; figures -----	1-27
Y	WO 03/107145 A2 (MASTERCARD INTERNAT INC [US]) 24 December 2003 (2003-12-24) page 2, line 2 - page 4, line 13 page 5, line 27 - page 8, line 13 page 10, line 4 - page 12, line 29 -----	1-27
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Further documents are listed in the continuation of Box C.

See patent family annex.

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Date of the actual completion of the international search

15 January 2008

Date of mailing of the international search report

23/01/2008

Name and mailing address of the ISA/
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Fax: (+31-70) 340-3016

Authorized officer

Herry, Tzvetanka

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2007/059856

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2007/059856

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