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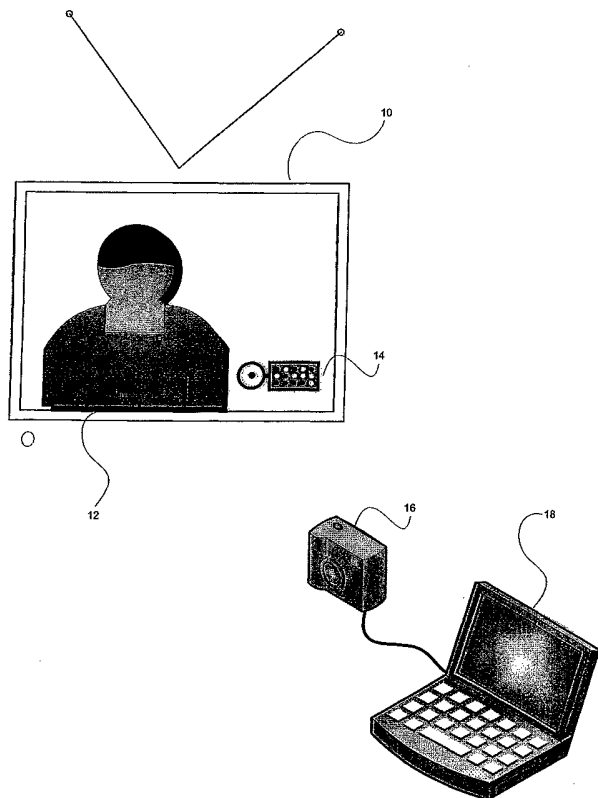
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(54) Title: A METHOD FOR CAPTURING AN IMAGE USING AN APPARATUS AND OBTAINING INFORMATION REGARDING THE IMAGE, THE IMAGE CONTAINING A TAG



(57) Abstract: A method for capturing an image (12) using an apparatus (16) and obtaining information regarding the image (12), the image (12) containing a tag (14), the method comprising: capturing the image (12) using the apparatus (16); sending the captured image (12) to a server (22); the server (22) processing the captured image (12) to locate therein the tag (14), and from the tag (14) extracting data; the server (22) conducting a match search for the extracted data with stored data in its database (32); upon a match being made, the server (22) sending a response message to the apparatus (16).

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A METHOD FOR CAPTURING AN IMAGE USING AN APPARATUS AND OBTAINING INFORMATION REGARDING THE IMAGE, THE IMAGE CONTAINING A TAG

Field of the Invention

This invention relates to a system and method for capturing an image and obtaining information regarding the image and refers particularly, though not exclusively, to such a system and method for capturing an image from a television or other image source and using a telecommunications enabled apparatus to obtain information relating to the image.

Background of the Invention

Advertising is now a global industry. In many instances, though, user interaction is not possible, and users cannot readily, and speedily, obtain information relating to the product being advertised. Furthermore, normally a separate and unrelated action is required for following-up a promotion, offer, initiating a commercial transaction, or the like.

Another area requiring user interaction is electronic/mobile payment systems which have been in use for some time, particularly for payments over the Internet. Payments using mobile telephony devices are in the process of evolving. Various methods of mobile payment methods are used for payment via SMS or MMS payments using inbuilt RFID. Many have problems with security and authentication. Quite often, complex systems are involved to provide security and authentication. Many such systems have not been a success, or even adopted, due to their inherent complexity and/or cost and/or inconvenience to users.

Summary of the Invention

In a first preferred aspect, there is provided a method for capturing an image using an apparatus and obtaining information regarding the image, the image containing a tag, the method comprising:

- (a) capturing the image using the apparatus;
- (b) sending the captured image to a server;
- (c) the server processing the captured image to locate therein the tag, and from the tag extracting data;
- (d) the server conducting a match search for the extracted data with stored data in its database;
- (e) upon a match being made, the server sending a response message to the apparatus.

The information obtained regarding the image may be whether a user is authenticated for a payment transaction, the image being a representation forming a part of a financial instrument, the representation comprising an encrypted version of data pertaining to the user.

The data pertaining to the user may be compressed in the image.

The data pertaining to the user may be compressed in the server.

The data pertaining to the user may comprise at least one selected from the group consisting of: a number of the financial instrument, an expiry date of the financial instrument, the user's name, the user's date of birth, the user's address, and a photograph of the user's face.

The financial instrument may be selected from the group consisting of: credit card, debit card and letter of credit.

Authentication may comprise:

- (a) extracting from a key database a key of the user;
- (b) using the key to decrypt the representation and extracting therefrom the data pertaining to the user;
- (c) extracting from an identity database identity information regarding the user, the identity information comprising at least the data pertaining to the user; and
- (d) comparing the identity information and the data pertaining to the user for authentication of the user.

The method may further comprise sending an authentication message to a financial institution.

The method may further comprise sending an acknowledgement of authentication.

The image may be captured using at least one of: a mobile telephone with a digital camera, a mobile camera phone, a telecommunications enabled PDA with a digital camera, a digital camera able to be connected to a telecommunications enabled computer, a digital camera able to be connected to a mobile telephone, a telecommunications enabled digital camera, and a web cam operatively connected to a computer.

The image may be sent by one selected from the group consisting of: MMS, SMS, email, instant message, and digital data transfer.

In a second aspect, there is provided a method for capturing an image using an apparatus and obtaining information regarding the image, the image containing a tag, the method comprising:

- (a) capturing the image using the apparatus;
- (b) sending the captured image to a server for enabling the server to:
 - (i) process image to locate therein the tag and to extract data from the tag;
 - (ii) conduct a match search for the extracted data with stored data in its database;and
- (c) the apparatus receiving a response message from the server,

In a third aspect, there is provided a method for capturing an image using an apparatus and obtaining information regarding the image, the image containing a tag, the method comprising:

- (a) receiving from the apparatus the captured image;
 - (b) processing captured image to locate the tag therein and processing the tag to extract data therefrom;
 - (c) conducting a match search for the extracted data with stored data in a database;
- and
- (d) upon a match being made, sending a response message to the apparatus.

The information obtained regarding the image may be whether a user is authenticated for a payment transaction, and the captured image containing a representation of encrypted version of data pertaining to the user.

The method may further comprise:

- (a) extracting from a key database of decryption keys a key for the user;
- (b) using the key to decrypt the representation to obtain the data pertaining to the user;
- (c) extracting from an identity database identity information regarding the user, the identity information comprising at least the data pertaining to the user; and
- (d) comparing the data pertaining to the user and the identity information to authenticate the user.

The representation may form part of a financial instrument.

The data pertaining to the user may also be compressed.

The data pertaining to the user may comprise at least one selected from the group consisting of: a number of the financial instrument, an expiry date of the financial instrument, the user's name, the user's date of birth, the user's address, and a photograph of the user's face.

The financial instrument may be selected from the group consisting of: credit card, debit card, and letter of credit.

The method may further comprise sending an authentication message to a financial institution.

The method may further comprise sending an acknowledgement of authentication.

The apparatus may be selected from the group consisting of: a mobile telephone with built in digital camera, a digital camera with built-in telecommunications ability, and a digital camera operatively connected to a telecommunications enabled computer.

The image may be displayed on at least one selected from the group consisting of: television screen, motion picture screen, billboard, computer monitor, a screen of a laptop, notebook or tablet computer; a screen of a portable computing device, a personal digital assistant, mobile or cellular telephone, book, magazine, newspaper, newsletter, and another printed publication.

The captured image may be part of an advertisement and is sent to the server using a system selected from the group consisting of: MMS, SMS, email, instant message and to a URL of the server.

The tag may comprise:

(a) a first section containing a visual guide for identifying a location of the tag in the captured image; and

(b) a second-section containing the data.

The data may contain an identifier for the tag.

The data may also be encrypted by the server.

The visual guide may comprise a regular geometric shape with a second shape within the regular geometric shape.

The regular geometric shape may be a circle, the centre of the second shape located in the centre of the circle.

The second section may comprise a border, all data being within the border, the border being joined to the visual guide by a link.

The tag may further comprise a third section comprising a brand or logo.

The second section may comprise a plurality of coloured sections, where each coloured section represents a data value.

The location of each coloured section may determine a message and/or processing of the tag.

The message may be CRC encoded to ensure data integrity.

The response message may comprise at least one selected from the group consisting of:

- (a) information regarding a product promoted by the tag;
- (b) an offer;
- (c) a redemption message;
- (d) a prize draw result;
- (e) a confirmation of receipt of an order; and
- (f) a confirmation of placement of the order.

In a fourth aspect, there is provided a tag comprising:

- (a) a first section containing a visual guide for identifying a location of the tag in a captured image; and

(b) a second-section containing data.

The tag may be a financial instrument for a payment transaction, the instrument comprising a representation comprising an encrypted version of data pertaining to a user.

The data pertaining to the user may also be compressed.

The data pertaining to the user may comprise at least one selected from the group consisting of: a number of the financial instrument, an expiry date of the financial instrument, the user's name, the user's date of birth, the user's address, a photograph of the user's face.

The financial instrument may be one selected from the group consisting of: credit card, a debit card, a letter of credit, prepaid card, postpaid card, an account, virtual bank account, P2P payment instruments, a payment, receipt, and transfer of funds.

In a fifth aspect, there is provided a system for capturing an image using an apparatus and obtaining information regarding the image, the image containing a tag, the system comprising:

- (a) the apparatus for capturing the image and sending the captured image to a server;
- (b) the server being for extracting the tag from the image and processing the tag to extract therefrom data; conducting a match search for the extracted data with stored data in its database; and, upon a match being made, sending a response message to the apparatus.

The information obtained regarding the image may be whether a user is authenticated for a payment transaction, the image being a representation forming a part of a financial instrument, the representation comprising an encrypted version of data pertaining to the user.

The server may also be for:

- (i) receiving the image;
 - (ii) decrypting the representation to obtain the data pertaining to the user by using a key for the user extracted from a key database;
 - (iii) extracting from an identity database identity information regarding the user;
- and

- (iv) comparing the identity information regarding the user with the data pertaining to the user for authentication of the user.

The apparatus may be selected from the group consisting of: a mobile telephone with built in digital camera, a digital camera with built-in telecommunications ability and a digital camera operatively connected to a telecommunications enabled computer.

The captured image may be sent to the server using a system selected from the group consisting of: MMS, SMS, email, and to a URL of the server.

The method may further comprise:

performing image recognition on a captured digital image to obtain authentication data, the captured digital image being a representation forming a part of a financial instrument, the representation comprising an encrypted version of data pertaining to the user;

processing the authentication data by decrypting the encrypted version of data pertaining to the user; and

transmitting the decrypted data to a server.

In a sixth aspect, there is provided a method for producing the representation of the tag according to claim 34, the method comprising:

encrypting the data pertaining to the user with a private key of the Public Key Infrastructure (PKI) key pair, the encrypted data pertaining to the user including trailing identification numbers of the financial instrument, an anti-fraud number and expiration date of the financial instrument; and

converting the encrypted version of data pertaining to the user into a predetermined number of slots to define the representation.

The anti-fraud number may be a Card Verification Value (CVV) number.

The trailing identification numbers may not be a Bank Identification Number (BIN).

The slots may be arranged in a matrix.

The slots may be circular.

In a seventh aspect, there is provided a computer usable medium comprising a computer program code that is configured to cause a process or to execute one or more functions to perform the method as described.

Brief Description of the Drawings

In order that the invention may be fully understood and readily put into practical effect, there shall now be described by way of non-limitative example only a preferred embodiment of the present invention, the description being with reference to the accompanying illustrative drawings in which:

Figure 1 is a schematic perspective view of apparatus for use in the preferred embodiment;

Figure 2 is a schematic overall view of the process of the preferred embodiment;

Figure 3 is front views of three preferred forms of a tag;

Figure 4 is a flow chart of the process of the preferred embodiment at the transmission site;

Figure 5 is a flow chart of the process of the preferred embodiment at a reception site;

Figure 6 is a schematic illustration of an authentication system for authenticating a user for a payment transaction;

Figure 7 is a schematic illustration of the server architecture of the authentication system of Figure 6;

Figure 8 is a flow chart of the authentication process;

Figure 9 are illustrations of tags comprising a first and second section; and

Figure 10 is an illustration of an alternative second section for a tag.

Detailed Description of the preferred Embodiments

Referring to Figure 1, an apparatus 10 for displaying an image 12 is provided. The apparatus 10 may be a: billboard, movie screen, television screen, computer monitor, a screen of a laptop, notebook or tablet computer, or a screen of a portable device such as, for example a personal digital assistant (PDA), mobile or cellular telephone, or the like. The image 12 may be in a book, magazine, newspaper, newsletter, or other printed publication. The image 12 may be of a performer, or a product, or of a brand. The image includes or comprises a tag 14.

Turning to Figures 3(a) to (c) and Figure 9, the tag 14 is constituted by a plurality of sections. Figures 3(a) to (c) illustrate a first section 26 containing two concentric circles 11, 13 that define the location of the tag 14 in a given area, even when the image is captured from a distance and the capturing may include a background; and a second section 28 containing data. The two concentric circles are a circle with a concentric dot. Figure 9 illustrates that

rather than a concentric dot 13, any image 13 may be used such as for example, a flower, a bottle cap, or a cartoon character. The image 13 may be selected based on marketing or advertising requirements.

For a server 22 to easily locate the tag 14 and its data, a circle 11 with a black dot 13 at its centre is the easiest geometric figure that can be located at any angle. However, it may be any regular geometric shape such as, for example, an equilateral triangle, a square, regular pentagon, regular hexagon, regular heptagon, regular octagon, and so forth. A regular shape is preferred as all sides are of equal length thus making it the same when viewed from all sides. The dot will be at the geometric centre of the geometric shape.

The second section 28 may contain other data, and some or all of the data 21 may be encrypted. The encryption process may be performed by a server 22. The data in second section 28 may be a hash of the image 12. Data 21 may be in the form of encrypted dots, images of faces, image of brands (Figure 9), and so forth.

Referring to Figure 10, an alternative second section 28 for a tag 14 is illustrated in both an exploded and actual representation (8x8 mm). Data 21 is contained in the second section 28 in coloured sections. 00 represents black, 01 represents green, 10 represents red and 11 represents blue. These coloured sections correspond to data values. Although a 4-bit colour element has been described, it is envisaged that more colours may be used. Also, the location of the coloured sections on the tag 14 may determine the message of the second section 28 and processing of the tag 14. The message may be CRC encoded to ensure data integrity by applying, for example, a CRC-CCITT polynomial.

The tag 14 may have a third section 24 comprising the brand or logo being promoted as depicted in Figure 3(a).

The second section 28 has a border 19 and all data 21 is contained within the border 19. First section 26 is joined to second section 28 by a link 23. In this way when first section 24 is detected, a search of its perimeter 25 will find link 23. Link 23 is followed to border 19. Within border 19 is the data 21.

The image 12 is to be captured by a digital camera 16 that is operatively connected to a computer 18 able to send the captured image over the Internet to a URL of server, or by MMS, SMS or email; or by a camera-equipped telephone 20 able to send the captured image

by MMS or SMS; or a by digital camera that has a telecommunications module able to send the captured image by SMS or MMS.

The tag 14 of Figure 3(b) is suitable for being printed whereas that of Figure 3(c) is suitable for motion pictures, television, video, and so forth. The tag 14 of Figure 3(a) is suitable for all purposes.

As shown in Figures 2 to 5, the tag 14 may be created for a particular advertising campaign, event or promotion. In this case the well known "TIGER BEER™" is being used during a sporting event broadcast over television. The tag 14 is as described above.

As shown in Figures 2 and 4, the tag 14 is created by creating the image 29 used for third section 24 (30). The data 21 to be inserted in second section 28 determined (31) by server 22 and, if required, encrypted (32) as described above. The tag 14 is then "assembled" or created. It is then embedded (34) so that it can be broadcast or displayed (35) during transmissions of the television signal.

The second section 28 may also contain other data such as, for example, an identifier for the tag 14 (38). The identifier may be changed by server 22 each time the tag 14 is broadcast or displayed by incrementing or otherwise changing the identifier (36) then re-transmitting or displaying the tag (37).

The data 21 may be any required data. The identifier for the tag 14 may be changed for each broadcast of the advertisement containing the tag 14. Therefore, during all or part of an advertising campaign it is possible to track the effectiveness of the placement and/or the advertisement by responses from viewers.

The data 21 may include an order identifier so that the tag 14 may be used to initiate a commercial transaction. If the data 21 contains an order identifier, the server 22 proceeds to process the order in accordance with known techniques.

The tag 14 identifier may have a limited life, the limit being linked to the proposed length of the advertising campaign.

The data 21 may also contain data for a specific activity. In this way, when conducting an event such as, for example, an on-line search, the tag 14 becomes a matter tag for that activity. For example, if the tag 14 appears in a movie or an advertisement for a movie, upon the image being sent to the server 22, the server 22 can search for related matters including, but not limited to one or more of: movies with the same: actor(s), director, producer, subject, and so forth; or related: products, promotional products, or merchandise.

Referring to Figures 2 and 5, at the reception end, the tag 14 is displayed on the apparatus 10 as is shown in Figure 2 (40). An image of the tag 14 is broadcast and camera 16 or telephone 20 is used to capture (41) an image of tag 14. This captured image may be close up, or at a distance depending on the resolution of camera 16 and telephone 20.

The captured image is then sent to server 22 via a mobile network operator or the Internet 30 (42). The server 22 receives the image (43) and locates the tag 14 within the image by locating the first section 26 in the image. It then locates the data 21 in tag 14 and, if required, decrypts the data 21 (44). The server 22 then matches the data 21 with the data in its database 22A (45). The match may include the matching of the identifier of the tag 14. Upon a match being made, the server 22 sends a message to the telephone 20/computer 18 (46). The message may contain one or more of: information and/or for audio for display/reproduction on telephone 20/computer 18; an offer; a redemption message; prize draw result; confirmation of receipt of an order; confirmation of placement of the order; and so forth. The message is finally received at the telephone 20/computer 18 (47) and is displayed and/or reproduced.

Authentication System for a Payment Transaction

Referring to Figure 6, there is shown a financial instrument 50 that is to be used to effect a financial transaction at a financial institution 60. The financial instrument 50 may be a credit card (as shown), debit card, letter of credit, prepaid card, postpaid card, an account, virtual bank account, P2P payment instruments, or other suitable financial instrument. The financial transaction may be a payment, receipt, transfer of funds, or the like.

The financial instrument 50 contains financial instrument data 51 relating to the owner, holder or user of the financial instrument 50. For example, and as shown for a credit card the financial instrument data 51 may be the account number 53 of the credit card, the expiry date 55 of the credit card, and the name 57 of the card holder.

The financial instrument 50 also includes a representation 59 containing an encrypted version of data pertaining to the user. The representation 59 may also be compressed. The data pertaining to the user may be one or more of: the financial instrument data 51, or any other data identifying or pertaining to the card holder. For example, the other data may include the date of birth of the card holder, a facial photograph of the card holder, biometric information, the address of the card holder, the maiden family name of the mother of the card holder, and so forth.

A tag 14 or a digital image of the representation 59 is captured using an image capturing device 20. The image capturing device 20 is capable of capturing a digital image 14 such as, for example, a digital camera, a mobile camera phone 20 or PDA with a digital camera that is telecommunications enabled or can be operatively connected to a computer that is telecommunications enabled, a web-cam operatively connected to a computer that is telecommunications enabled and so forth. Capturing the tag initiates a mobile payment transaction. As part of the financial transaction, the image 14 of the representation 59 is sent to a server 22. The sending may be as digital data transfer, as an MMS message, as an SMS message, as an email or instant message, or otherwise as required or desired. The methodology for sending the image 14 may depend on the nature of image capturing device 20.

The process of encryption and authentication for credit card based tags 59 is described as an example. Encryption of the tag 59 requires the financial institution 60 or card issuer to sign up and associate with a Tag Authentication Provider. The Tag Authentication Provider generates a PKI key pair (RSA 1024 bytes key length) for the financial institution 60. Tag generation and encryption software is supplied to financial institution 60 or card issuer. This software is used to encrypt the credit card number, CVV number 53A, and expiration date of the card with the Private Key of the PKI key pair which is embedded in the software. The first six digits of the card number or BIN number for uniquely identifying the financial institution 60 are left unencrypted in plain text form. The remaining digits of the card number, the CVV number 53A and expiration date are encrypted. The software converts this encrypted card information into a 25 slot tag 59. (4 X 25 matrix or 25 circular tags) sixteen for the credit card number; three for the CVV number 53A; and six for the expiration date. This generated tag 59 is affixed or embedded onto the credit card.

Authentication for Credit Card Based Tags 59 requires capturing the customer's credit card tag 59 when receiving payment confirmation. In one embodiment, the customer sends the captured Tag 59 to the Tag Authentication Provider via MMS through their camera-enabled mobile phone 20. The tag 59 is converted into a numerical format by a Tag Authentication

Processor at the Tag Authentication Provider. The first six digits of the tag 59 are used to identify the Card Issuer or financial institution 60. The corresponding Public Key of the PKI key pair is used to decrypt the remaining credit card numbers, the CVV number 53A and expiration date. This decrypted information is sent for authentication to the Card Issuer, financial institution 60 or Visa/MasterCard network. Subsequently, the appropriate amount is debited from the card by the card issuer.

From the server end, the server 22 receives, decrypts and attempts to match the captured image with a corresponding image stored in an image database (not shown). The image database is connected to and communicates with the server 22. If the captured image is compressed, the server 22 decompresses the representation 59 in the image 14 to obtain the data pertaining to the user. This is used to authenticate the user, and the authentication can be passed to the financial institution 60.

Referring to Figure 7, the server 22 has several modules. These include a processor 71 that receives the data of the image 14 from an inwards communication module 77. The processor 71 also communicates with a database controller 73 for extracting the necessary key of the user for decryption from a key database 74 of such keys, and also information relative to the user from an identity database 75 of user identities. The user identities contain at least the data pertaining to the user as encrypted and used for the representation 59. The processor 71 uses an authentication module 72 for authenticating the user by comparing the information relating to the user and the data pertaining to the user. If there is a sufficient match, there is authentication, otherwise there is no authentication. An outwards communications module 76 is used to send an authentication code or message to the financial institution 60. The keys of the users are kept only in the database 24. Each financial instrument 50 will have a unique key. The unique key is generated randomly at the time of creation of the financial instrument 50 and is used to create the representation 59.

Figure 8 illustrates the process flow of authenticating a payment transaction. Upon the payment transaction being initiated (31), the image 14 of representation 59 is captured (32) and send to server 22 (33). At server 22, the representation 59 is decrypted (34) using the correct user key extracted from keys database 74 and, if necessary, decompressed to obtain the data pertaining to the user. Authentication then takes place (35) using the information relating to the user extracted from identity database 75.

The information relating to the user includes at least the data pertaining to the user. Authentication is performed by comparing the decrypted version of the data pertaining to the user with the information relating to the user as obtained from the identity database 25. Upon

authentication, an authentication code or message is sent to the financial institution 60 (36) and a confirmation is sent to the user (37). The authentication process then ends (38).

Whilst there has been described in the foregoing description preferred embodiments of the present invention, it will be understood by those skilled in the technology that many variations or modifications in details of design or construction or operation may be made without departing from the present invention.

The Claims

1. A method for capturing an image using an apparatus and obtaining information regarding the image, the image containing a tag, the method comprising:
 - (f) capturing the image using the apparatus;
 - (g) sending the captured image to a server;
 - (h) the server processing the captured image to locate therein the tag, and from the tag extracting data;
 - (i) the server conducting a match search for the extracted data with stored data in its database;
 - (j) upon a match being made, the server sending a response message to the apparatus.
2. The method according to claim 1, wherein the information obtained regarding the image is whether a user is authenticated for a payment transaction, the image being a representation forming a part of a financial instrument, the representation comprising an encrypted version of data pertaining to the user.
3. The method according to claim 2, wherein the data pertaining to the user is compressed in the image.
4. The method according to claim 2, wherein the data pertaining to the user is compressed in the server.
5. The method according to any one of claims 2 to 4, wherein the data pertaining to the user comprises at least one selected from the group consisting of: a number of the financial instrument, an expiry date of the financial instrument, the user's name, the user's date of birth, the user's address, and a photograph of the user's face.
6. The method according to any one of claims 2 to 5, wherein the financial instrument is selected from the group consisting of: credit card, debit card and letter of credit.
7. The method according to any one of claims 2 to 6, wherein authentication comprises:

- (a) extracting from a key database a key of the user;
- (b) using the key to decrypt the representation and extracting therefrom the data pertaining to the user;
- (c) extracting from an identity database identity information regarding the user, the identity information comprising at least the data pertaining to the user; and
- (d) comparing the identity information and the data pertaining to the user for authentication of the user.

8. The method according to any one of claims 2 to 7, further comprising sending an authentication message to a financial institution.

9. The method according to any one of claims 2 to 8, further comprising sending an acknowledgement of authentication.

10. The method according to any one of claims 2 to 9, wherein the image is captured using at least one of: a mobile telephone with a digital camera, a mobile camera phone, a telecommunications enabled PDA with a digital camera, a digital camera able to be connected to a telecommunications enabled computer, a digital camera able to be connected to a mobile telephone, a telecommunications enabled digital camera, and a web cam operatively connected to a computer.

11. The method according to any one of claims 2 to 10, wherein the image is sent by one selected from the group consisting of: MMS, SMS, email, instant message, and digital data transfer.

12. A method for capturing an image using an apparatus and obtaining information regarding the image, the image containing a tag, the method comprising:

- (a) capturing the image using the apparatus;
- (b) sending the captured image to a server for enabling the server to:
 - (iii) process image to locate therein the tag and to extract data from the tag;
 - (iv) conduct a match search for the extracted data with stored data in its database;and
- (c) the apparatus receiving a response message from the server,

13. A method for capturing an image using an apparatus and obtaining information regarding the image, the image containing a tag, the method comprising:

- (a) receiving from the apparatus the captured image;
- (b) processing captured image to locate the tag therein and processing the tag to extract data therefrom;
- (c) conducting a match search for the extracted data with stored data in a database; and
- (d) upon a match being made, sending a response message to the apparatus.

14. The method according to claim 13, wherein the information obtained regarding the image is whether a user is authenticated for a payment transaction, and the captured image containing a representation of encrypted version of data pertaining to the user.

15. The method according to claim 14, further comprising:

- (a) extracting from a key database of decryption keys a key for the user;
- (b) using the key to decrypt the representation to obtain the data pertaining to the user;
- (c) extracting from an identity database identity information regarding the user, the identity information comprising at least the data pertaining to the user; and
- (d) comparing the data pertaining to the user and the identity information to authenticate the user.

16. The method according to claim 15, wherein the representation forms part of a financial instrument.

17. The method according to claim 15 or 16, wherein the data pertaining to the user is also compressed.

18. The method according to claim 16 or 17, wherein the data pertaining to the user comprises at least one selected from the group consisting of: a number of the financial instrument, an expiry date of the financial instrument, the user's name, the user's date of birth, the user's address, and a photograph of the user's face.

19. The method according to any one of the claims 16 to 18, wherein the financial instrument is selected from the group consisting of: credit card, debit card, and letter of credit.
20. The method according to any one of claims 15 to 19, further comprising sending an authentication message to a financial institution.
21. The method according to any one of claims 15 to 20, further comprising sending an acknowledgement of authentication.
22. The method according to any one of claims 1 to 21, wherein the apparatus is selected from the group consisting of: a mobile telephone with built in digital camera, a digital camera with built-in telecommunications ability, and a digital camera operatively connected to a telecommunications enabled computer.
23. The method according to any one of claims 1 to 22, wherein the image is displayed on at least one selected from the group consisting of: television screen, motion picture screen, billboard, computer monitor, a screen of a laptop, notebook or tablet computer; a screen of a portable computing device, a personal digital assistant, mobile or cellular telephone, book, magazine, newspaper, newsletter, and another printed publication.
24. The method according to any one of claims 1 to 23, wherein the captured image is part of an advertisement and is sent to the server using a system selected from the group consisting of: MMS, SMS, email, instant message and to a URL of the server.
25. The method according to any one of claims 1 to 24, wherein the tag comprises:
(a) a first section containing a visual guide for identifying a location of the tag in the captured image; and
(b) a second-section containing the data.
26. The method according to claim 25, wherein the data contains an identifier for the tag.
27. The method according to claim 25 or 26, wherein the data is also encrypted by the server.

28. The method according to any one of claims 25 to 27, wherein the visual guide comprises a regular geometric shape with a second shape within the regular geometric shape.

29. The method according to claim 28, wherein the regular geometric shape is a circle, the centre of second shape located in the centre of the circle.

30. The method according to any one of claims 25 to 29, wherein the second section comprises a border, all data being within the border, the border being joined to the visual guide by a link.

31. The method according to any one of claims 25 to 30, the tag further comprising a third section comprising a brand or logo.

32. The method according to any one of claims 1, 12 or 13, wherein the response message comprises at least one selected from the group consisting of:

- (a) information regarding a product promoted by the tag;
- (b) an offer;
- (c) a redemption message;
- (d) a prize draw result;
- (e) a confirmation of receipt of an order; and
- (f) a confirmation of placement of the order.

33. A tag comprising:

- (a) a first section containing a visual guide for identifying a location of the tag in a captured image; and
- (b) a second-section containing data.

34. The tag according to claim 33, wherein the tag is a financial instrument for a payment transaction, the instrument comprising a representation comprising an encrypted version of data pertaining to a user.

35. The tag according to claim 34, wherein the data pertaining to the user is also compressed.

36. The tag according to claim 34 or 35, wherein the data pertaining to the user comprises at least one selected from the group consisting of: a number of the financial instrument, an expiry date of the financial instrument, the user's name, the user's date of birth, the user's address, a photograph of the user's face.

37. The tag according to any one of claims 34 to 36, wherein the financial instrument is one selected from the group consisting of: credit card, a debit card, a letter of credit, prepaid card, postpaid card, an account, virtual bank account, P2P payment instruments, a payment, receipt, and transfer of funds.

38. The tag according to any one of claims 33 to 37, wherein the data also contains an identifier for the tag.

39. The tag according to any one of claims 33 to 38, wherein the visual guide comprises a regular geometric shape with a second shape within the regular geometric shape.

40. The tag according to claim 39, wherein the regular geometric shape is a circle, the centre of second shape located in the centre of the circle.

41. The tag according to any one of claims 33 to 40, wherein the second section comprises a border, all data being within the border, the border being joined to the visual guide by a link.

42. The tag according to any one of claims 33 to 41, further comprising a third section comprising a brand or logo.

43. The tag according to any one of claims 33 to 42, wherein the second section comprises a plurality of coloured sections, where each coloured section represents a data value.

44. The tag according to claim 43, wherein the location of each coloured section determines a message and/or processing of the tag.

45. The tag according to claim 44, wherein the message is CRC encoded to ensure data integrity.

46. A system for capturing an image using an apparatus and obtaining information regarding the image, the image containing a tag, the system comprising:

- (a) the apparatus for capturing the image and sending the captured image to a server;
- (b) the server being for extracting the tag from the image and processing the tag to extract therefrom data; conducting a match search for the extracted data with stored data in its database; and, upon a match being made, sending a response message to the apparatus.

47. The system according to claim 46, wherein the information obtained regarding the image is whether a user is authenticated for a payment transaction, the image being a representation forming a part of a financial instrument, the representation comprising an encrypted version of data pertaining to the user.

48. The system according to claim 47, wherein the server is also for:

- (i) receiving the image;
- (ii) decrypting the representation to obtain the data pertaining to the user by using a key for the user extracted from a key database;
- (iii) extracting from an identity database identity information regarding the user; and
- (iv) comparing the identity information regarding the user with the data pertaining to the user for authentication of the user.

49. The system according to claims 47 or 48, wherein the apparatus is selected from the group consisting of: a mobile telephone with built in digital camera, a digital camera with built-in telecommunications ability and a digital camera operatively connected to a telecommunications enabled computer.

50. The system according to any one of claims 47 to 49, wherein the captured image is sent to the server using a system selected from the group consisting of: MMS, SMS, email, and to a URL of the server.
51. The system according to any one of claims 47 to 50, wherein the tag comprises:
- (a) a first section containing a visual guide for identifying a location of the tag in the captured image; and
 - (b) a second-section containing the data.
52. The system according to claim 51, wherein the data also contains an identifier for the tag.
53. The system according to claim 47, wherein the response message comprises at least one selected from the group consisting of:
- (a) information regarding a product promoted by the tag;
 - (b) an offer;
 - (c) a redemption message;
 - (d) a prize draw result;
 - (e) a confirmation of receipt of an order; and
 - (f) a confirmation of placement of the order.
54. The system according to any one of claims 47 to 53, wherein the image is displayed on at least one selected from the group consisting of: television screen, motion picture screen, billboard, computer monitor, a screen of a laptop, notebook or tablet computer; a screen of a portable computing device, a personal digital assistant, mobile or cellular telephone, book, magazine, newspaper, newsletter, and another printed publication.
55. The method according to claim 14, further comprising:
- performing image recognition on a captured digital image to obtain authentication data, the captured digital image being a representation forming a part of a financial instrument, the representation comprising an encrypted version of data pertaining to the user;
 - processing the authentication data by decrypting the encrypted version of data pertaining to the user; and

transmitting the decrypted data to a server.

56. A method for producing the representation of the tag according to claim 34, the method comprising:

encrypting the data pertaining to the user with a private key of the Public Key Infrastructure (PKI) key pair, the encrypted data pertaining to the user including trailing identification numbers of the financial instrument, an anti-fraud number and expiration date of the financial instrument; and

converting the encrypted version of data pertaining to the user into a predetermined number of slots to define the representation.

57. The method according to claim 56, wherein the anti-fraud number is a Card Verification Value (CVV) number.

58. The method according to claim 56, wherein the trailing identification numbers are not a Bank Identification Number (BIN).

59. The method according to claim 56, wherein the slots are arranged in a matrix.

60. The method according to claim 56, wherein the slots are circular.

61. A computer usable medium comprising a computer program code that is configured to cause a process or to execute one or more functions to perform the method of any one of claims 1, 12, 13 or 15.

Figure 1

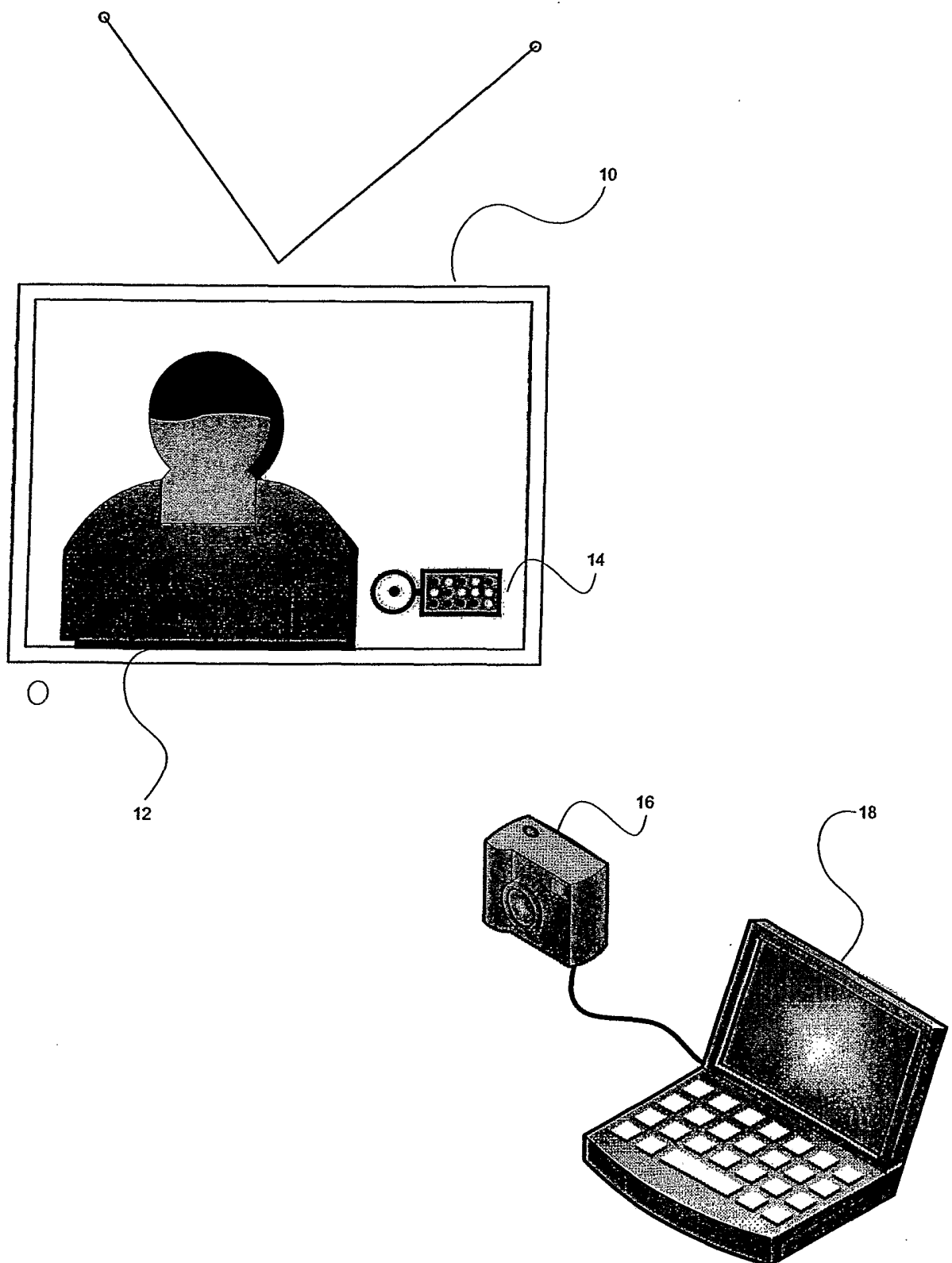


Figure 2

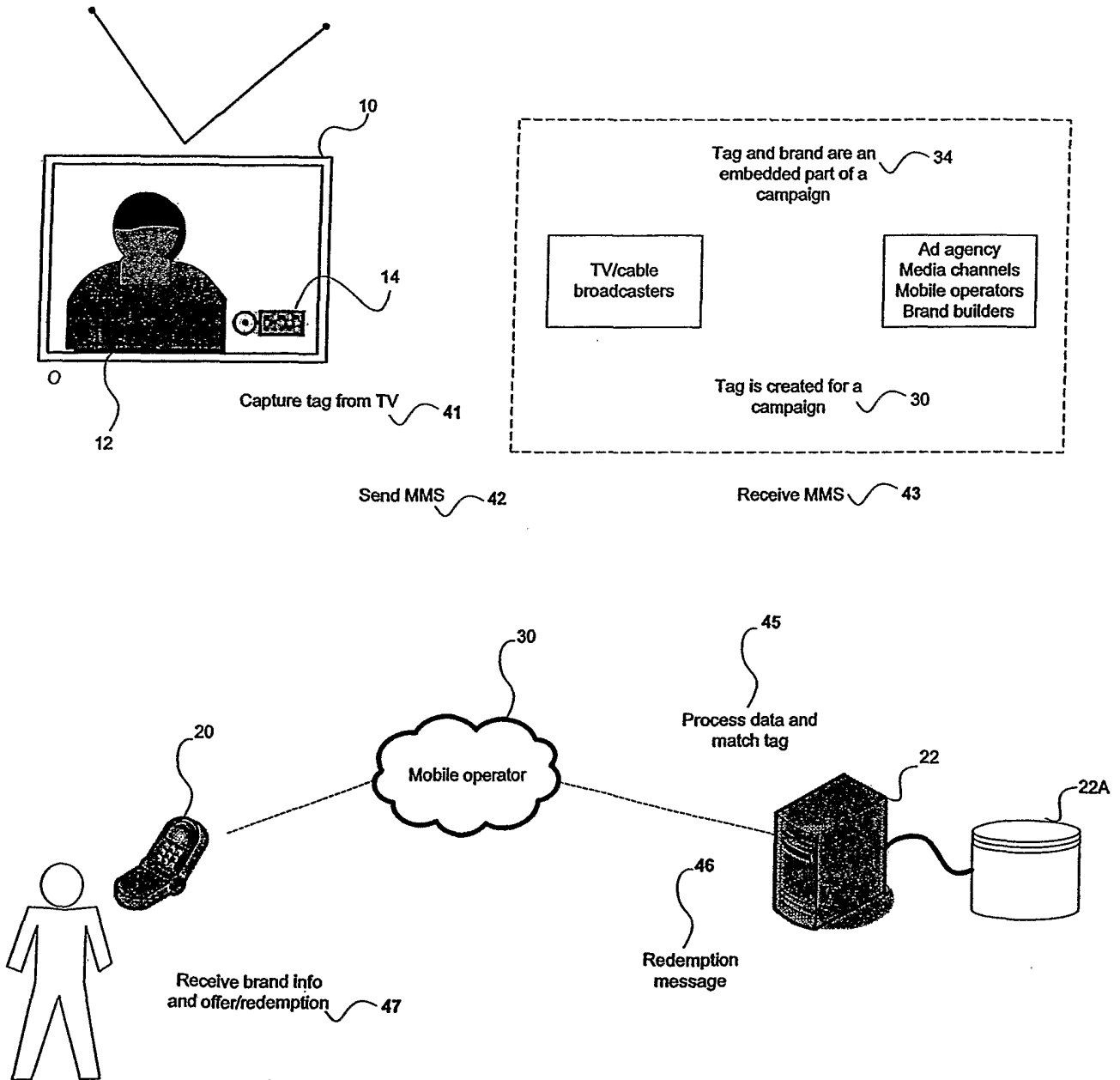


Figure 3(a)

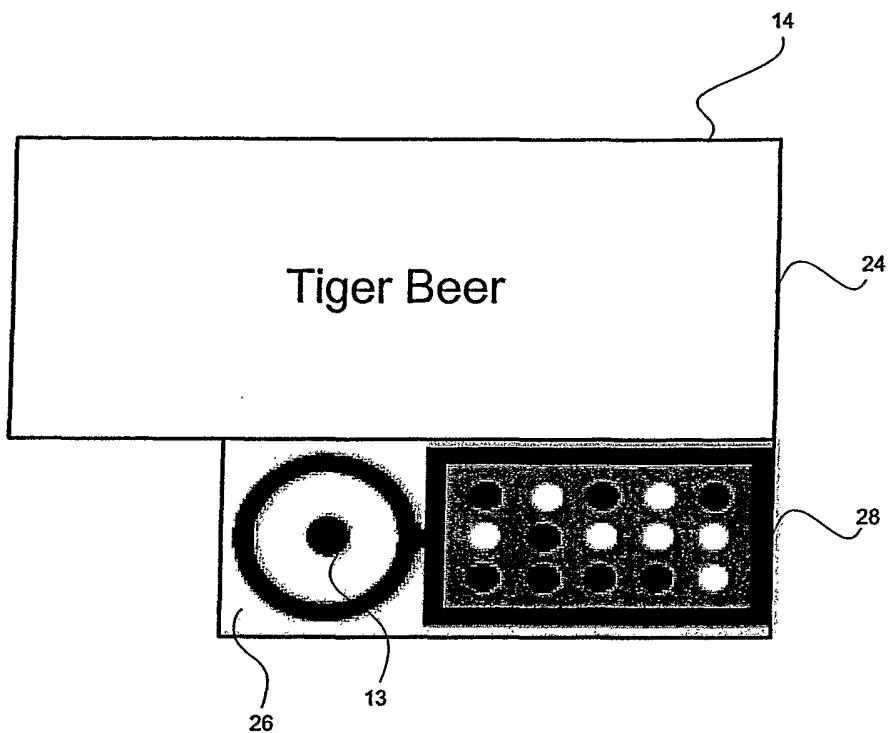


Figure 3(b)

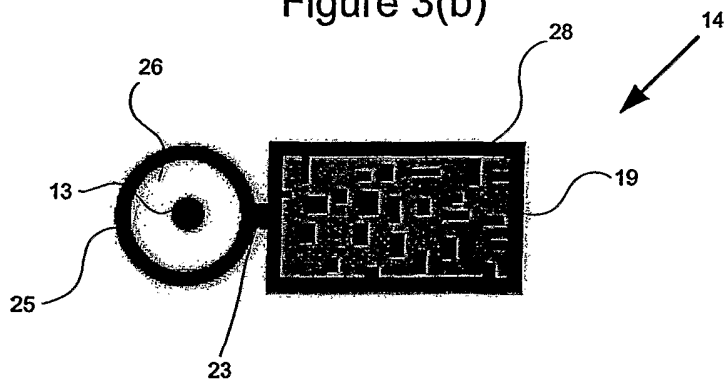


Figure 3(c)

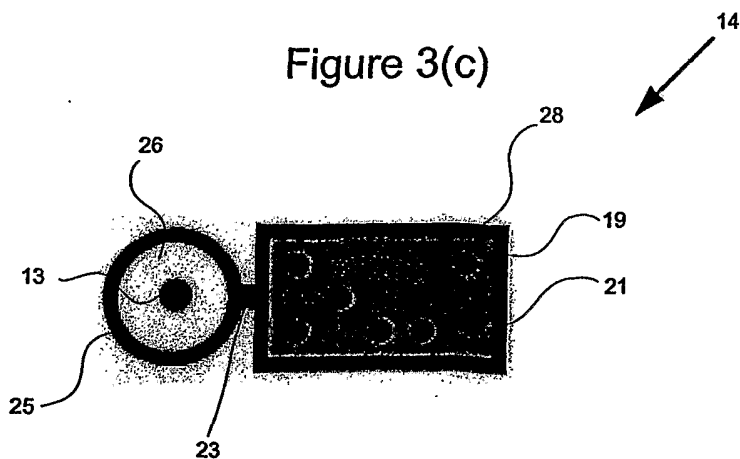


Figure 4

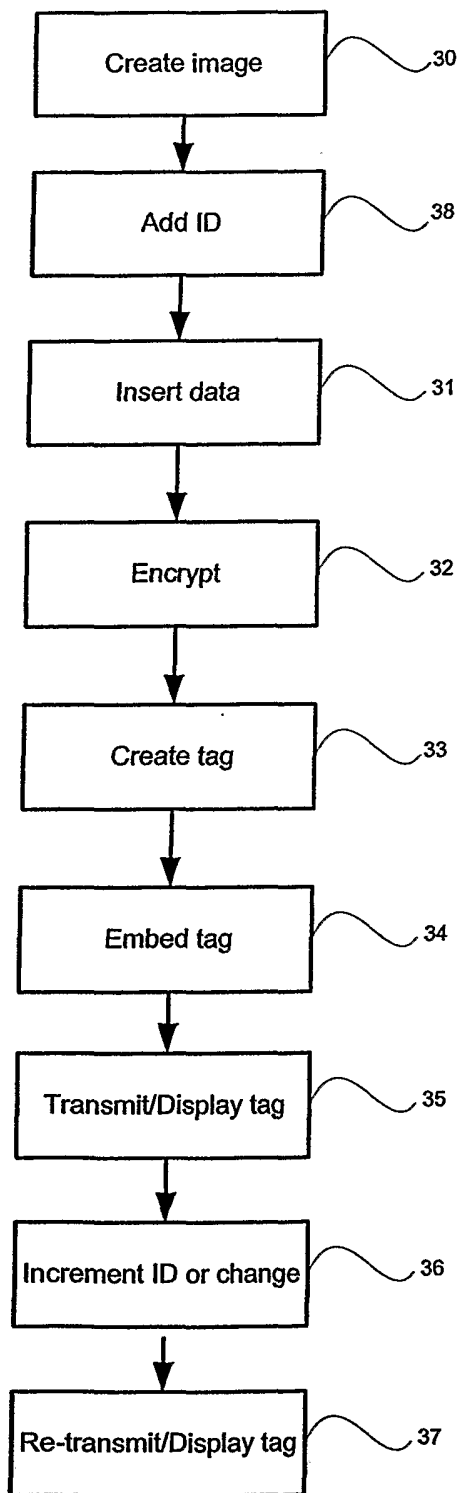
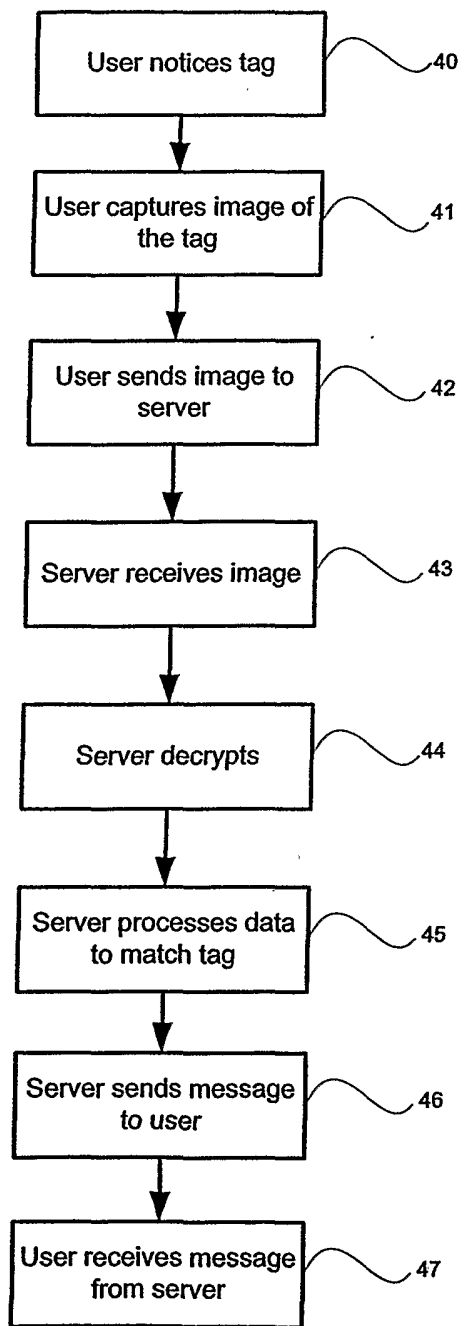


Figure 5



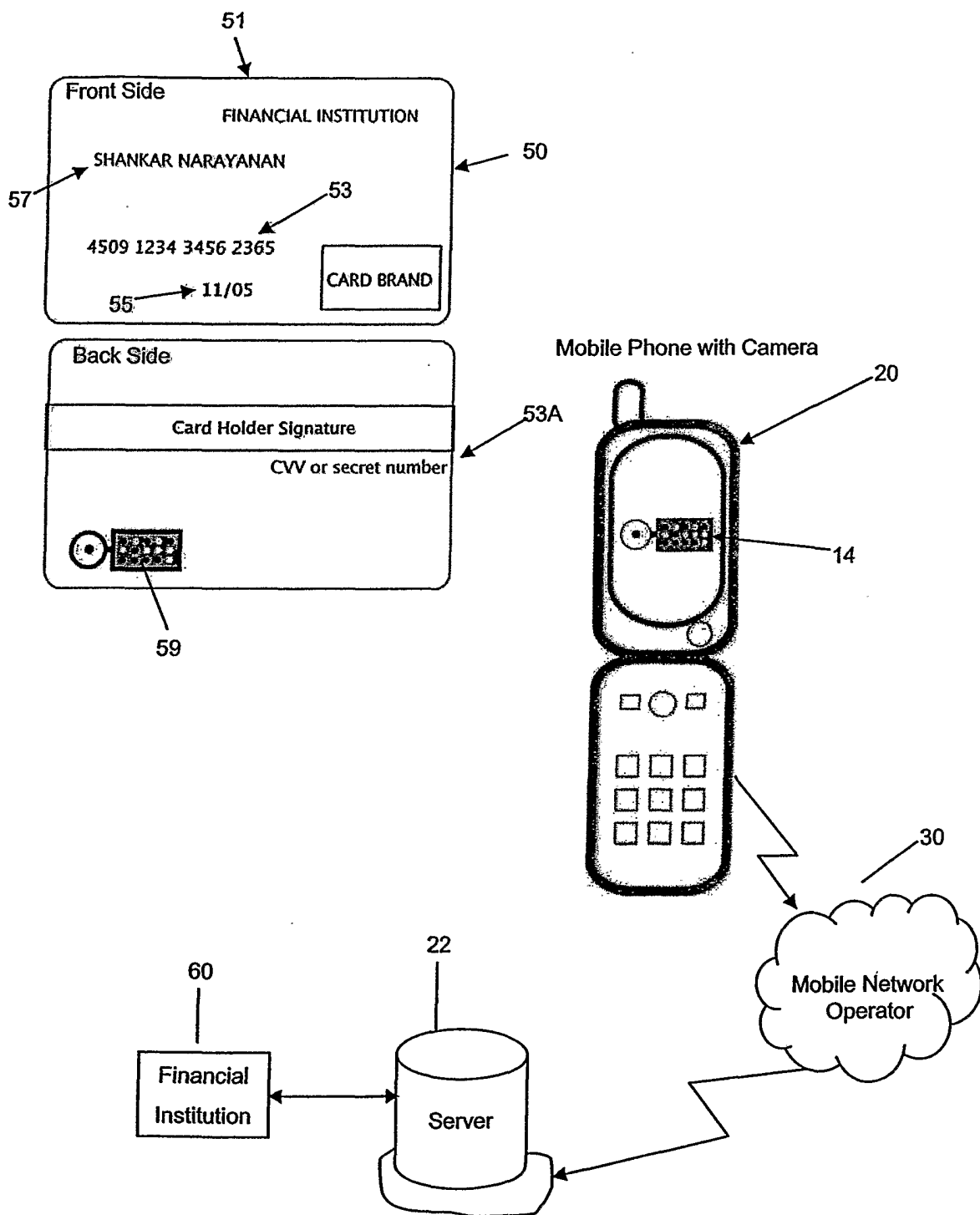


Figure 6

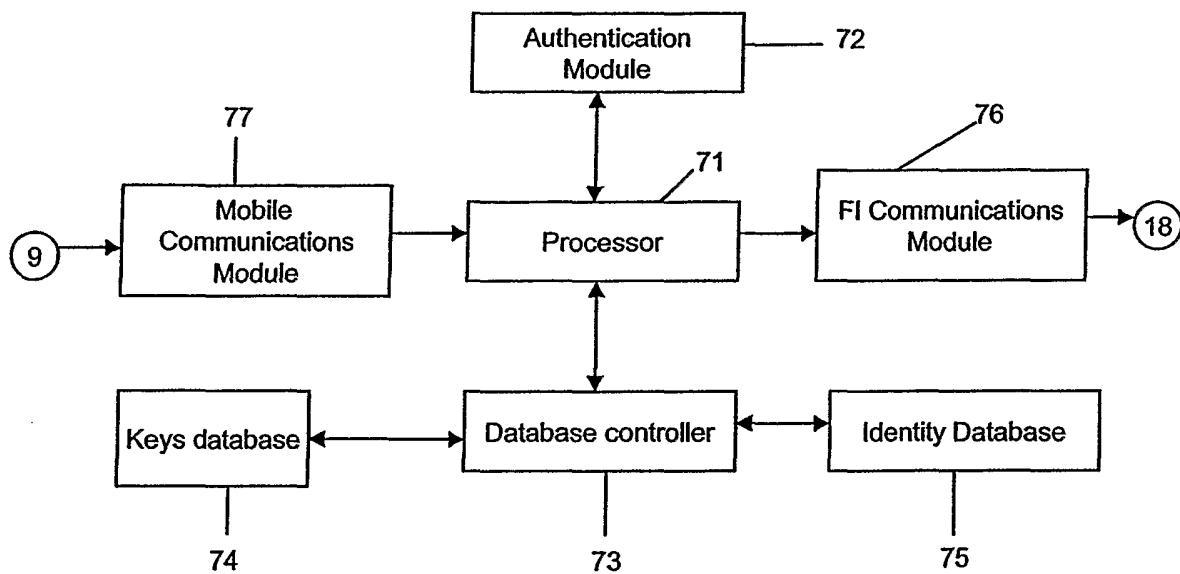


Figure 7

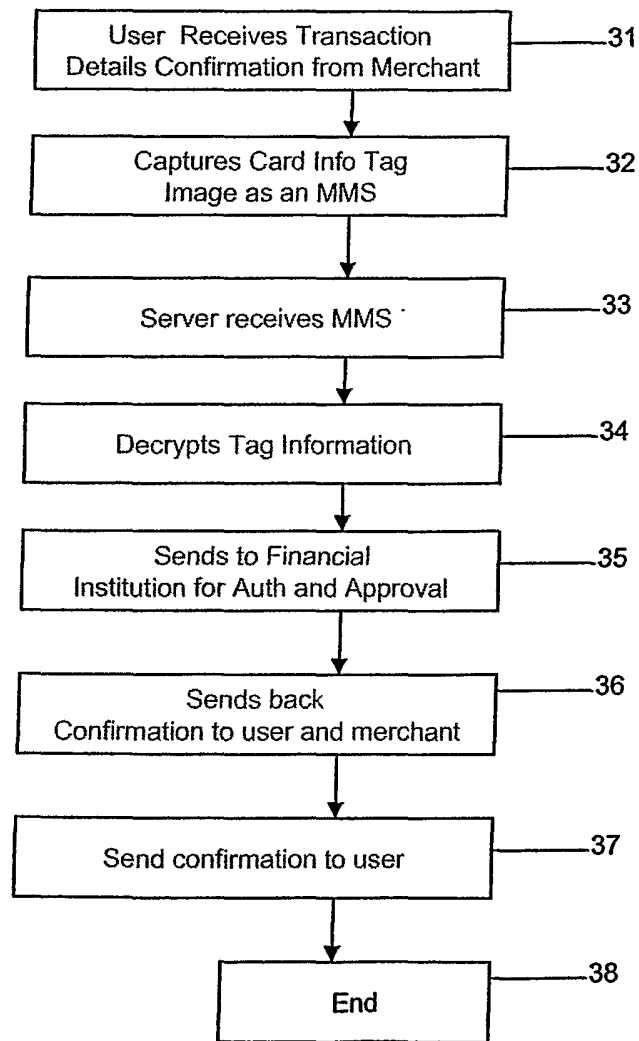


Figure 8

Figure 9

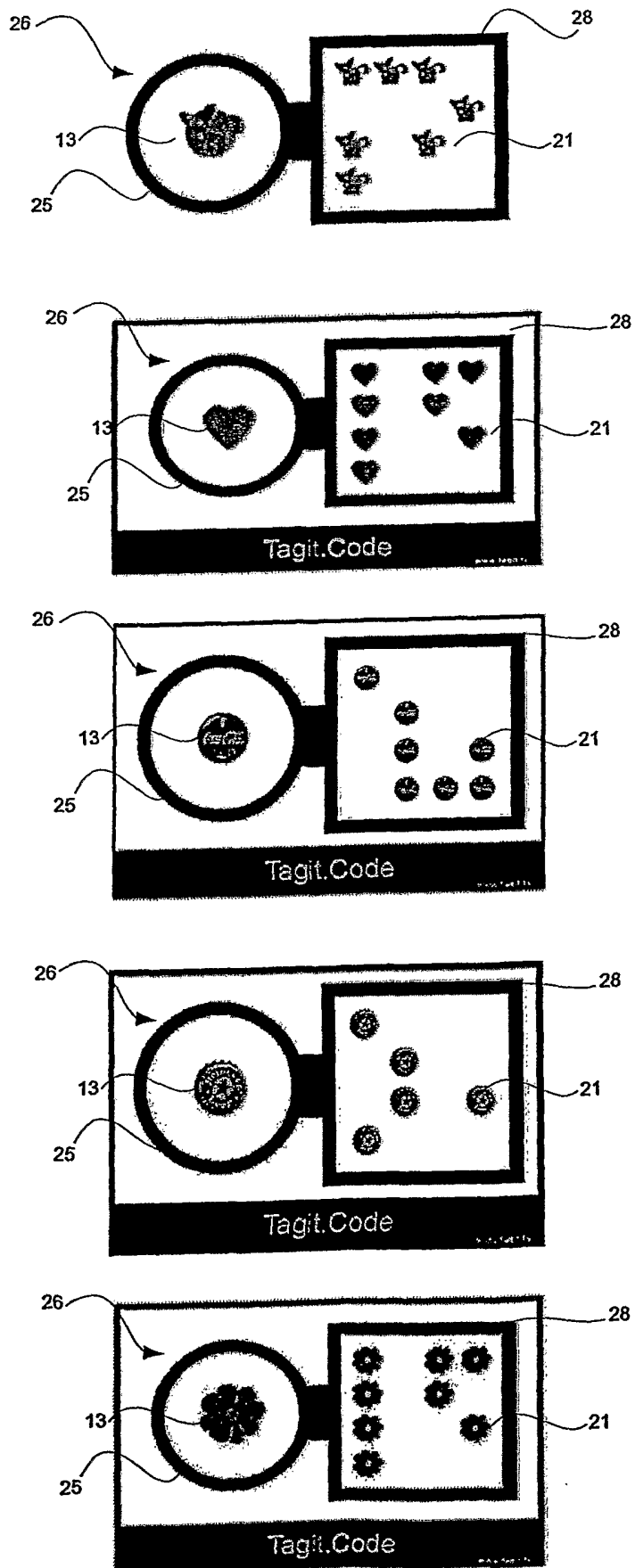
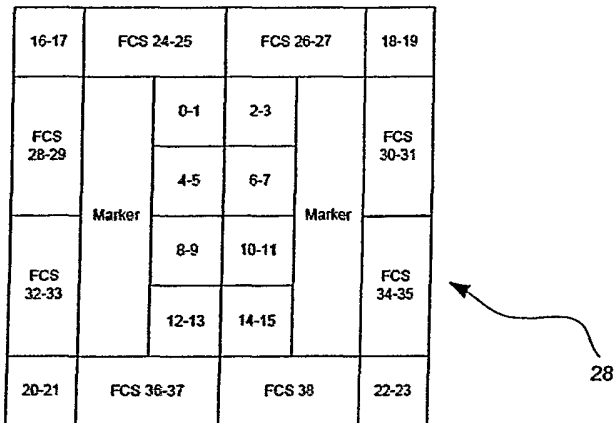


Figure 10



4-bit colour element

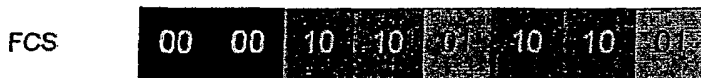
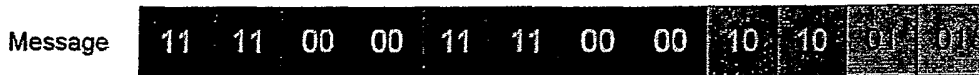


CRC-CCITT polynomial: 0x1021

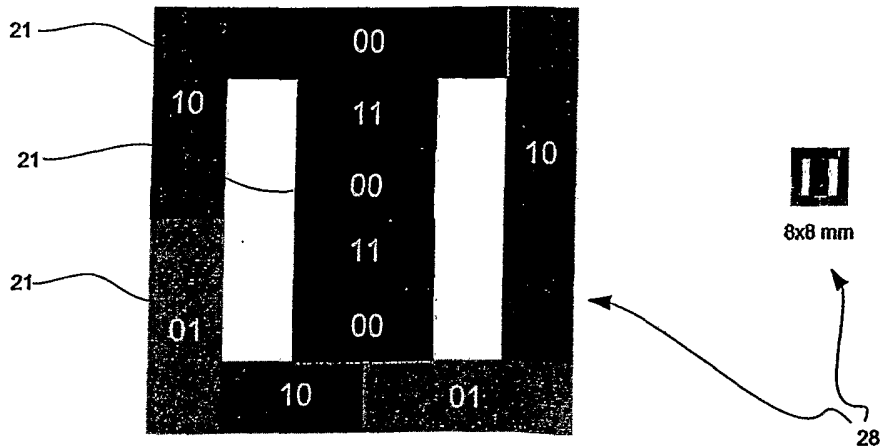
Example

Message (24-bit): 11110000 11110000 10100101

CRC encoding (40-bit): 11110000 11110000 10100101 00001010 01101001



Final pattern



INTERNATIONAL SEARCH REPORT

International application No.

PCT/SG2005/000318

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl.

G06K 9/62 (2006.01) **G06T 7/00** (2006.01)

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)

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 practicable, search terms used)

DWPI, USPTO + keywords (image, processor, tag, graphic, data, matching, transmitting, display, advertise, cheque, verify and similar terms)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|---|------------------------------|
| X | US 2004/0201460 A1 (BUCHOLZ et al) 14 October 2004 Whole document | 1, 12, 13, 22, 23, 46, 61 |
| X | US 2003/0172030 A1 (VOLGUNIN) 11 September 2003 Whole document | 1, 12, 13, 22, 23, 46, 61 |
| X | WO 1994/010654 A1 (PORT OF SINGAPORE AUTHORITY et al) 11 May 1994 Whole document | 1, 12, 13, 22, 23, 46, 61 |
| X | US 5042073 A (COLLOT et al) 20 August 1991 Whole document | 1, 12, 13, 22, 23, 46, 61 |

 Further documents are listed in the continuation of Box C See patent family annex

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"O" document referring to an oral disclosure, use, exhibition or other means

"&" document member of the same patent family

"P" document published prior to the international filing date but later than the priority date claimed

Date of the actual completion of the international search
05 January 2006Date of mailing of the international search report
1.0 JAN 2006

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INTERNATIONAL SEARCH REPORT

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|--|------------------------------|
| X | US 4817166 A (GONZALEZ et al) 28 March 1989 Whole document | 1, 12, 13, 22, 23, 46, 61 |

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/SG2005/000318

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

| Patent Document Cited in Search Report | Patent Family Member |
|--|----------------------|
| US 2004/0201460 | NIL |
| US 2003/0172030 | NIL |
| WO 1994/010654 | HK 213896 |
| US 5042073 | EP 0407307 |
| US 4817166 | WO 1987/007057 |