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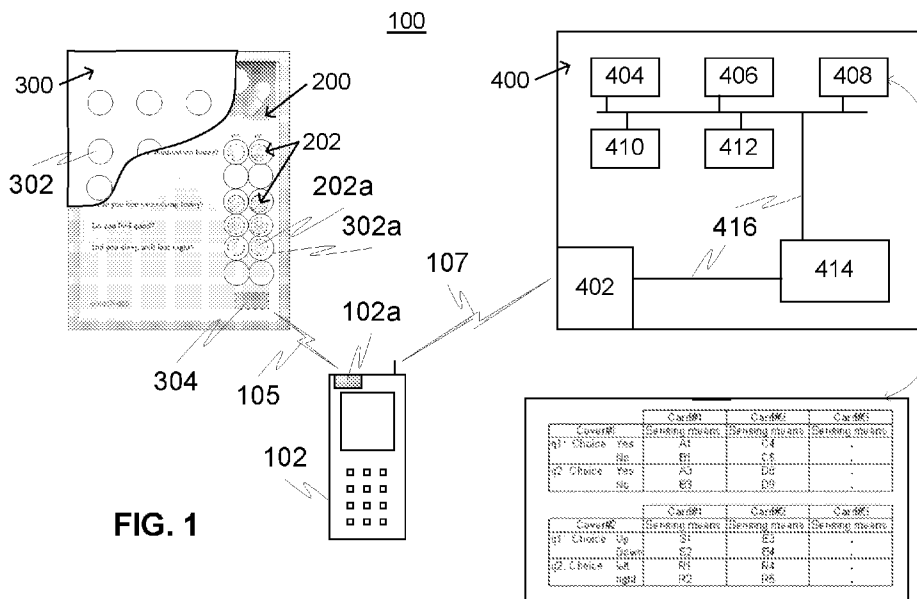
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(54) Title: AN OFF-LINE RESPONSE CARD AND ARRANGEMENT FOR ENQUIRING A RESPONSE FROM THE RESPONSE CARD



(57) Abstract: An off-line response card having plurality of sensing means is provided with a replaceable cover, where the cover is provided with plurality of questions and choices for questions. The choices are arranged into the cover so that each choice correspond one sensing means in the response card when the cover is placed on the response card. The sensing means is adapted to sense whether the choice in the cover is influenced and output identifying information of said sensing means as a result of the influence.

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## **An off-line response card and arrangement for enquiring a response from the response card**

### TECHNICAL FIELD OF THE INVENTION

- 5 The invention relates to an off-line response card and arrangement for enquiring a response from the response card.

### BACKGROUND OF THE INVENTION

10 Different kind of enquiries are sent nowadays to users for enquiring their opinions about certain event or experiences, such as asking their opinions about medicines and asking their feelings or conditions after intake of medicines and possible effects of medicines. Often used methods of a prior art includes e.g sending SMS enquiries or enquiries via internet or email, where the user should use either modern mobile terminals and phones or computers. However, often those users  
15 are elder people who are not familiar with technical devices and are not able to use those apparatuses, or even have none. In addition one problem is that often elder people cannot remember to answer separately to questions after they have taken their medicines, for example.

20 Some solutions are known from a prior art to follow e.g. medicament dispense or asking some questions. EP 1 006 982 B1 describes a medicament dispense sensing device solution, where sensing elements detect when the medicament is dispensed and an electronic unit registers this with time indication. In addition EP 1 115 363 B1 describes a response form comprising an answer field including questions to enquiry e.g. opinions and corresponding input means for incurring  
25 electrical signal to be registered by an electric unit as a response to the question.

The known prior art solutions have, however, some drawbacks, namely typically those response cards are disposable increasing thus waste of materials. In addition the response cards are prepared for a certain use known beforehand, which make the use of them clumsy, namely one should know beforehand how  
30 many response cards (s)he need for a first use, and how many cards another use, for example.

## SUMMARY OF THE INVENTION

An object of the invention is to offer a solution for enquiring a response from users in an easy and effective way so that any conventional expensive computers or mobile phones are not needed to answering queries, but still the answers can be gathered and analysed in an accurate way. In addition an additional object of the invention is to provide a response form, which can be used for numerous different purposes so that the final use can be decided even only just the response form is taken into the use.

The invention overcomes the above problems and drawbacks by providing an off-line response card of claim 1, an arrangement of claim 8 and a cover of claim 12.

According to an embodiment of the invention the off-line response card consist of an inexpensive base having plurality of sensing means, such as electrical sensors implemented by capacitive or resistive means, for example, sensing whether they are influenced for example by a finger. The sensing means are identifiable so that afterwards it can be determined which sensing means were influenced.

According to an embodiment of the invention also plurality of replaceable covers are provided with plurality of questions and corresponding choices so that at least one choice relates to one question. The covers and questions in the covers may relate e.g. to enquiring opinions about certain event or experiences, such as asking user opinions about medicines and feelings or conditions after intake of medicines and possible effects of medicines. However, the invention does not limit only the medical related questions, but using different questions in the cover every kind of opinions can be asked.

In an embodiment of the invention the response card is provided with the replaceable cover so that each choice do correspond one sensing means in the response card when the cover is placed on the response card. Now when the choice in the cover is selected the corresponding sensing means in the response card advantageously determines the influence or selecting. After determining the selection of a certain choice the corresponding sensing means outputs an electrical signal as a result of the selection. The electrical signal is according to an embodiment of the invention indentifying information of said sensing means. However, the signal may also be another electrical signal, such as a plain voltage pulse, and the identity of said sensing means is determined otherwise. The response card may advantageously determine said output and store information

that a certain sensing means (actually a corresponding choice in the cover) is selected. In an embodiment it is enough to store only said identifying information of the influenced sensing means.

5 The response card may also comprise a memory means to store information, where the memory means are readable outside the response card. In an embodiment the memory means are either implemented by an RFID means or the memory means are in data communication with RFID means so that memory means can be read outside e.g. with an RFID reader. In this way the technological structure of the response card can be kept simple and also inexpensive.

10 In addition to keep the response card's technological structure simple and inexpensive stored information is advantageously analysed outside the response card. For example, information stored by the response card is read outside by an RFID reader means and delivered to an exterior analyzing means of the response card, which may be implemented for example with a server being in data  
15 communication connection with the RFID reader means. In an embodiment the RFID reader means may be either in data communication with a communication means, such as a mobile phone, computer or other communication terminal, or the RFID reader means are integrated with the communication means, such as the mobile phone, computer or other communication terminal.

20 According to an embodiment of the invention the cover (or at least the type of the cover) is provided with unique ID information identifying said cover. In an embodiment the questions and especially choices and their placement can be determined based on ID information of the cover or at least cover type. Again it can be determined based on the cover's ID information and placing of the sensing  
25 means in the response card which choice of the cover falls to which sensing means in the response card, when said cover is placed on the response card. In an embodiment all response cards have similar structure and sensing means in every response card are placed similarly, whereupon no special information about the response card used is needed.

30 However, in another embodiment of the invention also response card (or at least the type of the response card) may be provided with unique ID information identifying the response card used. Said ID information of the response card may be stored for example in connection with the memory or RFID means advantageously so that it cannot be copied or changed. In an embodiment unique  
35 ID information of the response card may also be used for identifying a user of the

card. However, in an embodiment the response card may be provided also with information of a user, such as information relating to user's patient data, social security number, and medication.

5 In an embodiment, where the response cards are structurally identical, it is enough to deliver only identifying information of the influenced sensing means and ID information of the used cover to the exterior analysing means, whereupon the analysing means can determine at first which cover (or cover type) has been used and at second based on identifying information of the influenced sensing means which choice of the cover has been selected.

10 However, if there are also plurality of response cards used then also information identifying the used response card should be delivered to the analysing means so that the analysing means can be sure e.g. of the placing of the sensing means in the response card, or even be secured about the user of the card.

15 In an embodiment of the invention the response card sends ID information of the response card to said RFID-reader, when stored information is read. In an embodiment also ID information of the used cover is delivered at the same time to the analysing means when stored information is read. However, this is optional.

20 Now, when the exterior analysing means knows the used cover, it can determine the choices for each questions used in said cover. In addition the exterior analysing means knows based on the cover information the placing of the choices and based on information of the used response card also the placing of the sensing means, whereupon it also can determine which choice corresponds which sensing means. Now, when the exterior analysing means are provided with ID information of used cover and ID information of influenced sensing means, the  
25 analysing means can determine which choices have been selected by the user and again form response information based on said determined choices of the used cover.

30 In addition according to an embodiment the response card comprises also means for time stamping stored information. Now, for example when the memory of the response card is read only few times in a week or month, or even in a year, the events (e.g. identifying information of the influenced sensing means) may be stored into the memory means with time stamp so that also the instant of each event can be determined afterwards if needed.

In addition the response card may be provided with reminders so that the user can be reminded to answer to the query. Reminders can be separate for each user, such as patient. Furthermore stored information and/or information to be delivered may be encrypted so that it cannot be manipulated or stolen over the internet, for example. The encryption method used may be e.g. a 128 bit AES encryption method.

According to the invention it is possible to use one response card as a base for different types of covers dedicated for different types of questions or enquiries, such as enquiring information about effects of used medicine, therapy or treatment, opinion about an event, such as TV show, movie, competition, and feeling of a patient for example after medical operation or after taking medicine. In addition the response card may be used for example for a viva voce, evaluation a movie, or for any evaluation of a service event, such as restaurant service or fare.

Especially it should be noted that the final use of the response card can be decided even only just when the response card is taken into the use, because the purpose of used can be selected by choosing the cover in an appropriate way. Furthermore, by using replaceable covers the use of response card is hygienic even if it is reused.

The exemplary embodiments of the invention presented in this document are not to be interpreted to pose limitations to the applicability of the appended claims. The verb "to comprise" is used in this document as an open limitation that does not exclude the existence of also unrecited features. The features recited in depending claims are mutually freely combinable unless otherwise explicitly stated.

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## BRIEF DESCRIPTION OF THE DRAWINGS

Next the invention will be described in greater detail with reference to exemplary embodiments in accordance with the accompanying drawings, in which

Figure 1 illustrates an exemplar arrangement for enquiring response information from a user using a response card according to an advantageous embodiment of the invention,

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Figure 2 illustrates an example of a cover used in a response card according to an advantageous embodiment of the invention, and

Figure 3 illustrates an example of a response card according to an advantageous embodiment of the invention.

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#### DETAILED DESCRIPTION

Figure 1 illustrates an exemplar arrangement 100 for enquiring response information from a user using a response card 300 according to an advantageous embodiment of the invention. The response card 300 can be provided with the replaceable cover 200 so that each choice 202 corresponds with one sensing means 302 in the response card 300 when the cover 300 is placed on the response card 200. For example the choice 202a (No) for the last question (Did you sleep well last night?) in the cover 200 corresponds with the sensing means of 302a of the response card, when the cover is placed on the response card.

15 Now when for example the choice 202a in the cover 200 is selected, the corresponding sensing means 302a in the response card 300 determines the influence or selecting. After determining the selection of a certain choice 202a the corresponding sensing means 302a outputs an electrical signal as a result of the selection, whereafter said signal is stored in a memory means of the response  
20 card. The memory means may be read outside the response card for example via RFID means 304 and communication link 105 by an RFID reader 102a, which may be integrated into a mobile phone 102, for example. When stored information has been read, information is delivered to analysing means 400, which may be a server, for example. The analysing means 400 then determines the response  
25 based on received information, such as based on received identifying information of the sensing means influenced as well as identifying information of the used cover type, whereupon the analysing means can determine which choice of the used cover type corresponds with which sensing means.

In this example the user has selected for example a choice 202a "No" for a  
30 question "Did you sleep well last night?", whereupon identifying information of the sensing means 302a has been delivered to the analysing means, because the sensing means 302a corresponds with the choice of 202a in the cover 200. In addition the analysing means 400 is also provided with identifying information of the used cover, like Medicine card #1, whereupon the analysing means knows the

location of each choice 202 on the cover 200, and is thus able to determine the location of each choice 202 on the response card 300 as well as corresponding sensing means 302. Thus the analysing means is in this example able to determine based on identifying information of sensing means 302a and identifying information of the used cover (Medicine card #1) that user has selected the choice 202a, which is an answer to the last question "Did you sleep well last night?". The analysing means can be adapted to form different kinds of conclusions of responses, like trend or numbers of Yes / No –answers, for example.

Figure 2 illustrates an example of a replaceable cover 200 used in a response card 300 according to an advantageous embodiment of the invention. The cover is provided with plurality of questions 204 and choices 202 so that at least one choice relates to one question. The cover 200 may also be provided with a sliding scale choice 202b, where the user can select the choice for example in a scale from 1 to 5. The corresponding question may be e.g. "What is a degree of pain?".

According to an embodiment the cover is provided with unique ID information identifying said cover 200 or at least the type of the cover 200, such as "*Medicine card #1*" 206 referring to the first type of card relating to medicine. In an embodiment the questions and especially choices and their placement can be determined based on the cover's ID information.

The cover material may be e.g. an adhesive label onto which the questions and choices are printed. However, also other kind of cover material can be used.

Figure 3 illustrates an example of a response card 300 according to an advantageous embodiment of the invention, where the response card 300 comprises plurality of identifiable sensing means 302 each of which is adapted to sense whether the choice in the cover corresponding with said sensing means is influenced and output identifying information (such as 302a) of said sensing means as a result of the influence. The response card 300 comprises means 306 for determining said output and memory means 308 for storing said identifying information of the influenced sensing means. The memory means 308 are readable outside the response card 300 advantageously via an RFID means 304 of the response card.

In an embodiment the response card 300 may be provided with unique ID information identifying the response card 300 (such as RC#1) or at least the type of the response card 300, especially if there are plurality of different kind of



response cards, or otherwise if the response card used should be identified. Said ID information of the response card may be stored for example in connection with the memory or RFID means.

In addition the response card 300 may comprise means 310 for time stamping stored information. Furthermore the response card 300 may also comprise means  
5 312 for reminding the user for example to answer the query once a day. Furthermore the response card 300 may also comprise means 314 for encrypting information (stored or delivered).

Furthermore the response card 300 may comprise a power source 316 for feeding  
10 energy to different means in the response card needing power, as well as a wiring to connect appropriate means to each other in an appropriate way.

In addition relating to Figure 1, an example of an analysing means 400 used for analysing response information from a response card 300 is described next in more details. The analysing means, such as a server, comprises means 402 for  
15 receiving information from the RFID reader means via a communication connection 107 (illustrated in Figure 1). The analysing means comprises also means 404 for determining a cover used and means 406 for determining influenced sensing means based on identifying information of said influenced sensing means delivered to the analysing means.

Advantageously the analysing means comprises a database 408, such as a table,  
20 comprising information relating to possible covers (or cover types), such as "Cover #1" in table #A, choices of the cover, such as "Yes" and "No" and corresponding sensing means, such as "A1" and "B1". In addition the table may also comprise information about the questions so that for question "q1" there is two choices "Yes"  
25 and "No" and the sensing means A1 in card#1 corresponds with "Yes" for the question "q1" in the cover "Cover1", and the sensing means B1 in card#1 corresponds with "No" for the question "q1" in the cover "Cover1".

Furthermore the table may also comprise information about different types of response cards, so that the sensing means A1 in card#1 corresponds with "Yes"  
30 for the question "q1" in the cover "Cover1", but the sensing means C4 corresponds with "Yes" for the question "q1" in card#2 for the cover "Cover1".

The analysing means comprises means 410 using the above mentioned database or table for determining the choices for each questions used in each cover, as well as a placing of the choices and based on information of the used response card

also the placing of the sensing means (optional), determining which choice corresponds which sensing means, and determining which choices have been selected by the user. The analysing means may also comprise means 412 for forming and also outputting response information based on said determined  
5 choices of the used cover.

Advantageously the analysing means comprises data analysing means 414, such as a processor for processing data and controlling function of the means of the analysing means and data flow between the means via a data bus 416. In addition data operations and determining operations is advantageously implemented by a  
10 computer program product run on the analysing means.

The invention has been explained above with reference to the aforementioned embodiments, and several advantages of the invention have been demonstrated. It is clear that the invention is not only restricted to these embodiments, but comprises all possible embodiments within the spirit and scope of the inventive  
15 thought and the following patent claims.

**Claims**

1. An off-line response card, comprising
  - plurality of identifiable sensing means,wherein
  - 5 - the card is adapted to receive an exchangeable (replaceable) cover provided with plurality of questions and at least one choice for each question, where choices are arranged into the cover so that each choice corresponds one sensing means in the response card when the cover is placed on the response card,
  - 10 - the each of the identifiable sensing means is adapted to sense whether the choice in the cover corresponding said sensing means is influenced and output an electrical signal as a information of the influence, and
    - the response card is adapted to determine and store said output electrical signal.
- 15 2. The off-line response card of claim 1, wherein said output electrical signal is indentifying information of said sensing means.
3. The off-line response card of any of preceding claims, wherein unique ID information indentifying said response card is connected to said response card.
4. The off-line response card of any of preceding claims, wherein the card
  - 20 comprises a means for time stamping information to be stored.
5. The off-line response card of any of preceding claims, wherein the card comprises RFID-means adapted to being read outside by an RFID-reader and send stored information via an RFID-connection established between said RFID-means and RFID-reader to said RFID-reader.
- 25 6. The off-line response card of claim 5, wherein the card is adapted to send said unique ID information indentifying the response card to said RFID-reader.
7. The off-line response card of any of preceding claims, wherein the card is adapted to being configured by information of a user, such as information relating to user's patient data, social security number, and medication.
- 30 8. An arrangement for enquiring response information from the response card of claim 1, the arrangement comprising a server and reader means for reading information indentifying of influenced sensing means from the response card and

sent it to said server via a connection established between said reader means and server.

9. The arrangement of claim 8, wherein

- 5 - said server is provided with unique ID information identifying said response card,
- said server is provided with indentifying information of sensing means of said response card,
- said server is provided with unique ID information identifying said cover type used on the response card as well as information about which choice of said cover (having said unique ID information) corresponds to which sensing means of a card having said unique ID information when said cover type is placed on the response card,
- 10 - whereupon said arrangement is adapted to determine influenced choices of said cover used on said response card based on determined identifying information of sensing means, and thereby adapted to form response information based on said determined choices of said cover.
- 15

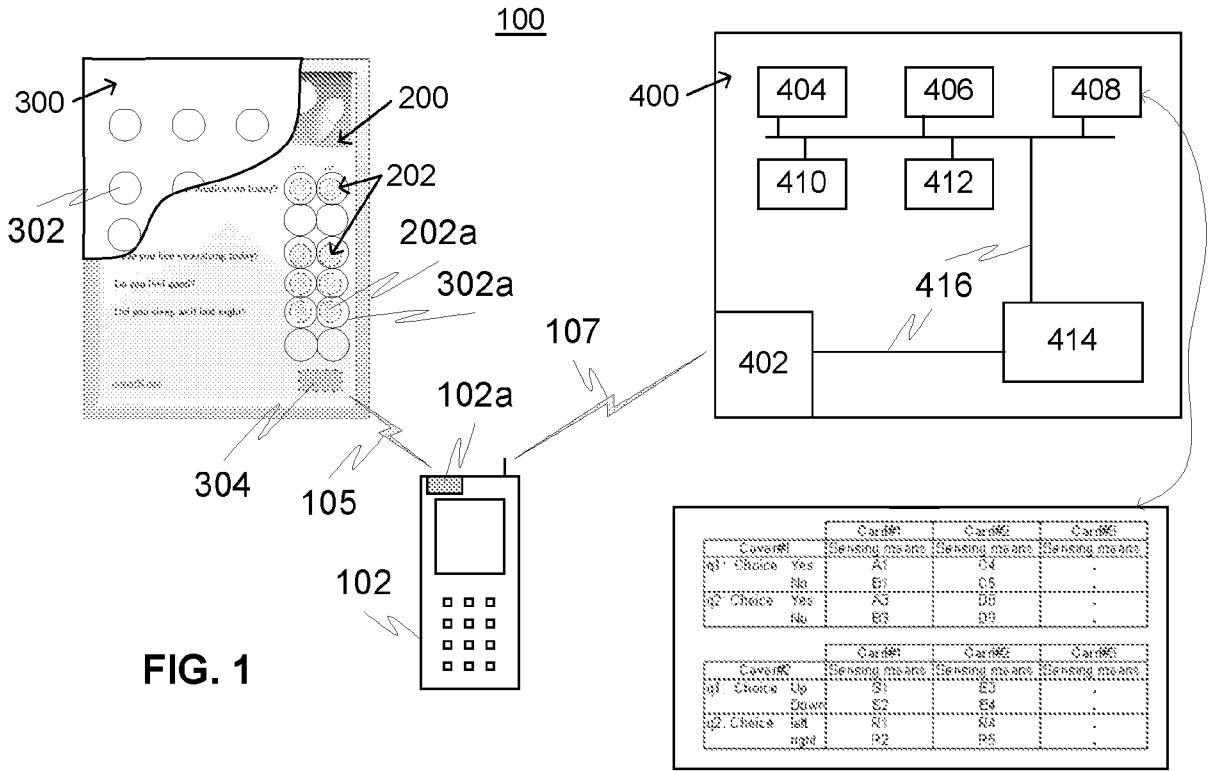
10. The arrangement of any of claims 8-9, wherein the card comprises RFID-means adapted to being read outside by an RFID-reader and send stored information via an RFID-connection established between said RFID-means and RFID-reader to said RFID-reader.

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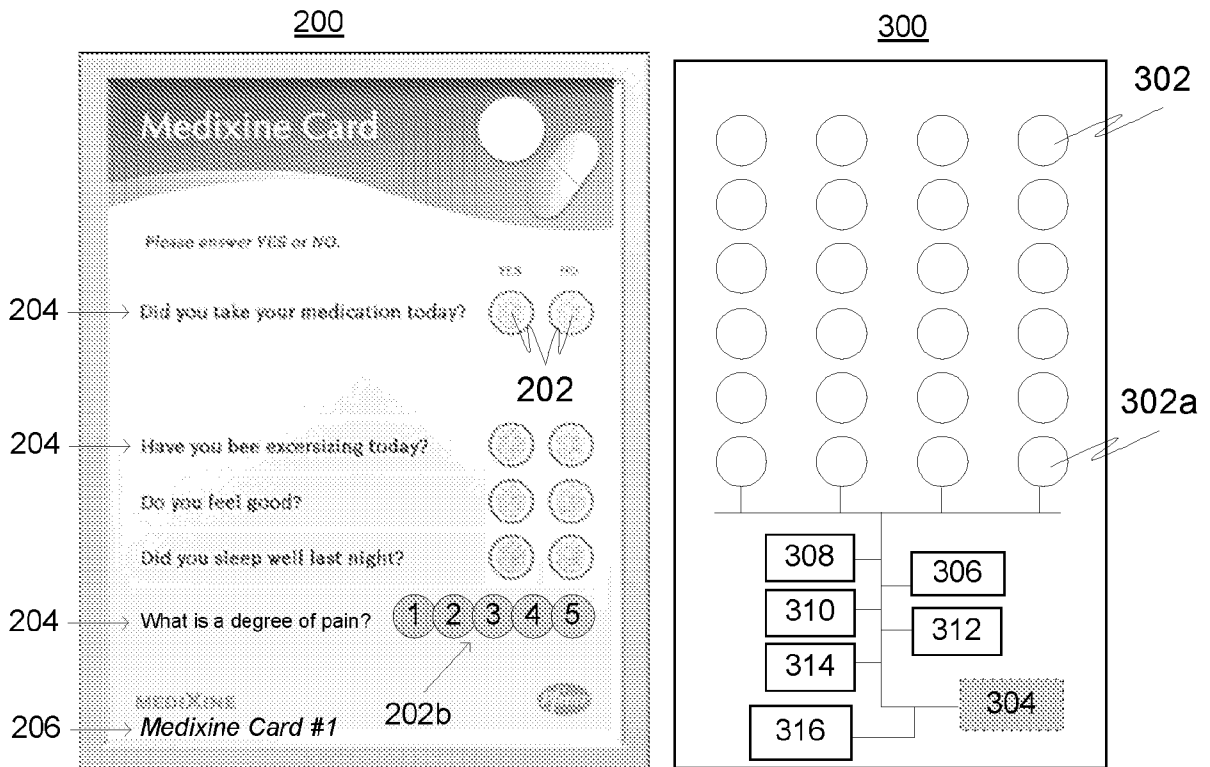
11. The arrangement of any of claims 8-10, wherein the card is adapted to send said unique ID information identifying the response card to said RFID-reader.

12. The cover of any of preceding claims, wherein the cover comprises unique ID identifying the cover type, and identifiable questions and choices.

25 13. The cover of claim 12, wherein the cover type is used for enquiring information relating to intake or effects of medication, therapy or treatment, feeling of a patient, or opinion about an event or evaluation.



**FIG. 1**



**FIG. 2**

**FIG. 3**

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI2008/050792

## A. CLASSIFICATION OF SUBJECT MATTER

See extra sheet

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)

IPC: A61B, A61J, G06F, G06K, G06Q, G09B, H04B, H04L, H04M, H04N, H04W

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
FI, SE, NO, DK

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

EPO-Internal, WPI

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

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

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**Information on patent family members**

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