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(54) METHOD FOR IDENTIFYING BANKNOTES WITH A UNIQUENESS DEFECT AND SYSTEM FOR PERFORMING SAME (EMBODIMENTS)

(57) The inventions relate to checking devices and in particular to devices for money documents checking and can be used for detection of counterfeit money documents - banknotes.

Claimed inventions work is based on the fact that banknotes owe their individual uniqueness comprising such a complex as producer, nominal value, individual number (usually represented by its alphanumeric assignment). Detection of banknotes with the coinciding individual characteristics at several payees makes it evident that at least one of such banknotes is counterfeit.

Method of identifying banknotes defective in uniqueness is as follows: banknote identification data values are inserted to the memory of data store, incoming banknotes accepted by the payee are identified by recognizing required banknote characteristics which determine identification data of these banknotes and by their transforming into digital signals, digital signals are transmitted via electronic communication channels, digital signals values corresponding to incoming banknote identification data values are compared to values of identification data of banknotes in data store, if a coincidence in digital signals values with values of identification data of banknotes in data store is detected, a decision is made on detection of banknotes defective in uniqueness, payee which has sent digital signals is identified, results of comparison to be sent to him, period of actuality is established within which incoming banknote identification data remain vital for a particular payee, digital signals are formed in such a way that they correspond not only to incoming banknote identification data but also to the established actuality period of these data, digital signals values corresponding to incoming banknote identification data are stored in the memory of data store taking into account the established actuality period of these data.

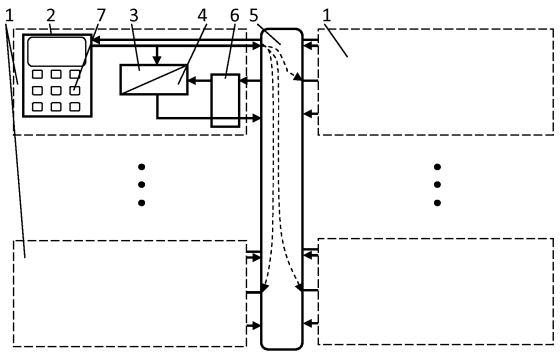

Fig. 1

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Description

Technical Field

[0001] The inventions relate to checking devices and namely to checking devices for money documents and can be used for detection of suspected counterfeit money documents.

Background Art

[0002] The problem of illegal production of counterfeit monetary notes - banknotes is still of current interest in the world. During the last 6 months of 2005 the European Central Bank immobilized 250 000 counterfeit banknotes ("Tekhnika Molodezhy" magazine, No 12, 2005, p. 17, subscription index in the Rospechat' catalogue - 70973). Considerable resources including methods and engineering systems are directed by the society to the counterwork against production and spread of bad money.

[0003] The closest in its technical essence is the method of counterfeit banknote recognition that compares banknotes under check with characteristics already available after comparing authentic banknotes and established counterfeit ones, uses additional comparison data of counterfeits of a new type, and in which to define if a banknote under checking is a counterfeit one it is compared with both comparison data already available and with additional comparison data related to the counterfeits of a new type (See RU 2006126788 A , cl. G07D7/00).

[0004] A time-lag between counterfeit banknotes detection and current market situation as for counterfeit banknotes is a disadvantageous feature of method currently in use. This time-lag is connected with a preliminary identification of counterfeit banknotes in the market or recognition of the presence of counterfeit banknotes that have been put into circulation but are not identified yet, necessary to insert counterfeit banknotes or suspected counterfeit banknotes into a database. As current situation is constantly changing, suspected counterfeit banknotes detection based on data of counterfeit banknotes having been duly recognized will be always behind a real presence of counterfeit banknotes in the market. Wherefrom a low reliability of detection of suspected counterfeit not having unique features banknotes.

[0005] The closest in its technical essence to variant 1 of the suggested system is a machine for banknote processing, comprising an actuation device, a nonvolatile storage and a sensor device permitting to recognize counterfeit banknotes where banknotes under check are registered by a sensor providing data which are compared with those in nonvolatile storage having been obtained while comparing authentic banknotes with established counterfeit ones, characterized in that some additional characteristics related to counterfeits of a new type are stored in a nonvolatile storage wherein data achieved by sensor for banknotes under check are compared with both comparison data and additional comparison data related to the counterfeits of a new type (see RU 2006126788 A , cl. G07D7/00) by an actuation device to determine if a banknote under check is counterfeit or not.

[0006] A time-lag between counterfeit banknotes detection and current market situation as for the presence of bad (counterfeit) banknotes is a disadvantage of method currently in use. Such time-lag is connected with a preliminary identification of counterfeit banknotes in the market or detection of the presence of counterfeit banknotes that have been put into circulation but are not identified yet, which is necessary to insert counterfeit banknotes or suspected counterfeit banknotes into database. As current situation is constantly changing, a detection of suspected counterfeit banknotes based on data of counterfeit banknotes having been duly recognized will be always behind a real presence of counterfeit banknotes in the market. Wherefrom there is a low reliability of suspected counterfeit, not having unique features banknotes.

[0007] The closest in its technical substance to variant 2 of the suggested system is a machine for banknote processing, comprising an actuation device, a nonvolatile storage and a sensor device permitting recognition of counterfeit banknotes where banknotes under check are registered by sensor providing data which are compared with those in nonvolatile storage, having been obtained while comparing authentic banknotes with established counterfeit ones, characterized in that some additional characteristics related to a new type of counterfeiting are stored in a nonvolatile storage wherein data achieved by sensor for banknotes under check are compared with both comparison data and additional comparison data related to the counterfeits of a new type (see RU 2006126788 A , cl. G07D7/00) by an actuation device to determine if a banknote under check is counterfeit or not.

[0008] A time-lag between counterfeit banknotes recognition and current market situation as for the presence of counterfeit banknotes is a disadvantage of the method currently in use. This time-lag is connected with a preliminary identification of counterfeit banknotes in the market or recognition of the presence of counterfeit banknotes that have been put into circulation but are not identified yet, necessary to insert counterfeit banknotes or suspected counterfeit banknotes into database. As current situation is constantly changing, a detection of suspected counterfeit banknotes based on data of counterfeit banknotes having been duly recognized will be always behind a real presence of counterfeit banknotes in the market. Wherefrom there is a low reliability of suspected counterfeit, not having unique features banknotes.

Description of embodiments

[0009] The objective of the invention is enhancing of reliability and probability of identification of suspected

counterfeit banknotes.

[0010] Technical result of the invention is to provide detection of two and more banknotes with identical identification characteristics which must be unique, that is an evidence of counterfeiting of banknotes having these identification characteristics before detection of counterfeit banknotes presence in the market, as well as possibility to determine identification data of banknotes that have been put into circulation illegally well in advance of detection of any counterfeit banknotes

[0011] To achieve technical result in the method of identifying banknotes defective in uniqueness wherein values of identification data of banknotes are stored in the memory, incoming banknotes received by payees are identified by recognition of required characteristics of banknotes, determining identification data of these banknotes, and their digitization, digital signals are transmitted via electronic communication channels, values of digital signals corresponding to identification data of incoming banknotes are compared with identification data of banknotes in the memory; as long as values of digital signals are found to agree with values of identification data of banknotes in the memory, decision is taken on detection of banknotes defective in uniqueness, payee, the digital signals have been transmitted by, is identified to be informed on the results of the comparison, period of data actuality is established within which identification data of incoming banknotes remain vital for a particular payee having transmitted the digital signals, digital signals are formed in such a way that they conform not only to identification data of incoming banknotes, but also to the established actuality period of these data, values of digital signals corresponding to identification data of incoming banknotes are stored in the memory taking into account the established actuality period of these data.

[0012] In addition the method establishes period of actuality of identification data of incoming banknotes not longer than the period of time within which the involved banknotes can stay at not more than one payee;

[0013] - comparison of values of digital signals corresponding to identification data of incoming banknotes with values of identification data of banknotes in the data store is made only within the period of actuality, values of identification data of these banknotes are to be deleted from the data store, this period having been over;

[0014] - required characteristics of banknotes determining identification data of incoming banknotes are data on money producer and/or nominal value and/or banknote number and/or banknote serial;

[0015] - prior to transmitting of digital signals corresponding to identification data of several incoming banknotes through electronic communication channels similarity of values of their identification data is checked;

[0016] - comparison of values of digital signals corresponding to identification data of incoming banknotes with values of identification data of banknotes in the memory is made for each payee, meanwhile digital signals corresponding to identification data of incoming banknotes are transmitted via electronic communication channels to all payees who in turn transmit the comparison result via electronic communication channels only to the payee which has transmitted the digital signals, and values of identification data of incoming banknotes are stored for each payee separately in his data store;

[0017] - comparison of values of digital signals corresponding to identification data of incoming banknotes with values of identification data of banknotes in the memory is made in a single point whereto via electronic communication channels are transmitted digital signals corresponding to identification data of incoming banknotes of different payees to be stored then in memory, and result of comparison is transmitted via electronic communication channels to payees of corresponding banknotes;

[0018] - values of identification data of counterfeit banknotes having been detected previously are also stored in the memory;

[0019] - banknotes are received by payees in receiving points distanced from each other;

[0020] - incoming banknotes are banknotes in hand of a payee;

[0021] - banknotes are soft money.

[0022] The objective of the invention is enhancing of reliability and probability of identification of suspected counterfeit banknotes.

[0023] Technical result of the invention is to provide detection of two and more banknotes with identical identification characteristics which must be unique, that is an evidence of counterfeiting of banknotes having these identification characteristics prior to detection of counterfeit banknotes presence in the market, as well as possibility to determine identification data of banknotes that have been put into circulation illegally well in advance of detection of any counterfeit banknotes.

[0024] To achieve technical result a system implementing method of identifying banknotes defective in uniqueness, including facilities for processing soft money received from other payees, variant 1, comprises an input/output terminal of a soft money payee, a memory block and a comparison block forming soft money processing facility, wherein outputs of I/O terminals of each soft money processing facility are connected via electronic communication channels with inputs of comparison blocks of other soft money processing facilities that are made capable to transmit comparison results to the I/O terminal of a payee's banknote processing facility via electronic communication channels, and I/O terminals themselves are made capable to input not only identification data of incoming banknotes but also incoming banknotes actuality time within which soft money cannot stay at more than one payee.

[0025] In addition, - at least a part of I/O terminals of soft money payees is made in the form of banknote counters recognizing their producer, nominal value and alphanumeric banknote number assignment;

[0026] - at least a part of I/O terminals of soft money payees are capable to check agreement of identification

data of incoming banknotes at their receiving point;

[0027] - communication channels are represented by local and/or global computer networks and/or phone communication channels;

[0028] - terminals are provided with an input keyboard to insert time of incoming banknotes actuality;

[0029] - banknote processing facilities are provided with blocks for identification of payees' I/O terminals to transmit comparison results there;

[0030] - soft money processing facilities are distanced from each other.

[0031] The objective of the invention is enhancing of reliability and probability of identification of suspected counterfeit banknotes.

[0032] Technical result of the invention is to provide detection of two and more banknotes with identical identification characteristics which must be unique, that is an evidence of counterfeiting of banknotes having these identification characteristics prior to detection of counterfeit banknotes presence in the market, as well as possibility to determine identification data of banknotes that have been put into circulation illegally well in advance of detection of any counterfeit banknotes.

[0033] To achieve technical result a system implementing method of identifying banknotes defective in uniqueness, variant 2, including an input/output terminal of a soft money payee, a memory block and a comparison block comprises input/output terminals of other payees wherein I/O terminals of each payee are connected via electronic communication channels with input of comparison block capable to transmit comparison results to I/O terminal of payee, and terminals themselves are capable to input not only identification data of incoming banknotes but also incoming banknotes actuality time within which soft money cannot stay at more than one payee, wherein memory block and comparison block form a comparison facility made separately from, at least, one I/O terminal of a payee.

[0034] In addition, - at least a part of I/O terminals of soft money payees is made in the form of banknote counters recognizing banknote producer, nominal value and alphanumeric banknote number assignment;

[0035] - at least a part of I/O terminals of soft money payees is capable to check agreement of identification data of incoming banknotes at their receiving point;

[0036] - communication channels are represented by local and/or global computer networks and/or phone communication channels;

[0037] - terminals are provided with an input keyboard to insert time of incoming banknotes actuality;

[0038] - I/O terminals of soft money payees are distanced from each other;

[0039] - comparison facility is provided with a block for identification of payees' I/O terminals to transmit comparison results there.

Industrial Applicability

[0040] The inventions are explained by drawings where functional diagram of the system for embodiment of the method of identifying banknotes defective in uniqueness (variant 1) is shown in Fig.1, functional diagram of the system for embodiment of the method of identifying banknotes defective in uniqueness (variant 2) is shown in Fig.2.

[0041] Method of identifying banknotes defective in uniqueness wherein values of identification data of banknotes are stored in the memory, incoming banknotes received by payees are identified by recognition of required characteristics of banknotes determining identification data of these banknotes, and their digitization, digital signals are transmitted via electronic communication channels, values of digital signals corresponding to identification data of incoming banknotes are compared with identification data of banknotes in the data store; as long as values of digital signals are found to agree with values of identification data of banknotes in the store, decision is taken on detection of banknotes defective in uniqueness, payee, the digital signals have been transmitted by, is identified to be informed on the results of the comparison, period of data actuality is established wherein identification data of incoming banknotes remain vital for a particular payee having transmitted the digital signals, digital signals are formed in such a way that they conform not only to identification data of incoming banknotes, but also to the established actuality period of these data, values of digital signals corresponding to identification data of incoming banknotes are stored in the memory taking into account the established actuality period of these data.

[0042] To provide for the possibility of banknotes payee identification, digital signals transmission via communication channels is accompanied by transmission of service signals which permit to identify the payee having transmitted digital signal, i.e. his e-mail account or phone number.

[0043] Actuality time of identification data of incoming banknotes is established not to overcome a limit of time within which these banknotes can stay at not more than one payee.

[0044] Comparison of values of digital signals corresponding to identification data of incoming banknotes with values of identification data of banknotes in the data store is made only for the period of actuality, values of identification data of these banknotes are to be deleted from the memory, this period having been over.

[0045] Required characteristics of banknotes determining identification data of incoming banknotes are money producer and/or nominal value and/or banknote number and/or banknote serial.

[0046] Prior to transmitting of digital signals corresponding to identification data of several incoming banknotes via electronic communication channels, similarity of values of their identification data is checked.

[0047] Comparison of values of digital signals corresponding to identification data of incoming banknotes with values of identification data of banknotes in the data store is made for each payee, digital signals corresponding to identification data of incoming banknotes are transmitted via electronic communication channels to all payees who in turn transmit the comparison result via electronic communication channels only to the payee which has transmitted the digital signals, and values of identification data of incoming banknotes are stored for each payee separately in his data store.

[0048] Comparison of values of digital signals corresponding to identification data of incoming banknotes with values of identification data of banknotes in the data store is made in a single point whereto via electronic communication channels are transmitted digital signals corresponding to identification data of incoming banknotes of different payees to be stored then in data store, and via electronic communication channels is transmitted result of comparison for payees of corresponding banknotes.

[0049] Values of identification data of counterfeit banknotes having been detected beforehand are also stored in the memory.

[0050] Banknotes are received by payees in receiving points distanced (geographically) from each other.

[0051] Incoming banknotes are banknotes in hand of a payee, and banknotes are soft money.

[0052] Method of identifying banknotes defective in uniqueness is used as follows.

[0053] Possibility of achieving technical result of the suggested method is defined by the following. Money in hand can exist both in coins and in banknotes. All monetary units are issued by a definite producer and have some nominal value. Unlike coins banknotes have some identifying characteristic essential for banknotes. As a rule it is an alphanumerical code: serial and number. So each banknote (note) is unique as for the set of the required characteristics: producer designation, nominal value designation, and alphanumerical code. Such is banknote issuing practice practically in all modern countries, and the suggested technical decision is based precisely on this uniqueness of each banknote. Banknote payees i.e. persons - participants of commodity-money relations receive banknotes for temporary possession, and due to their uniqueness other payees cannot possess banknotes with the same set of the required characteristics of banknotes with the same set of the required identifying characteristics (violation of uniqueness of a banknote) shows that at least one of such " not-unique" banknotes is counterfeit, and the suggested method implements detection of suspected counterfeit banknotes.

[0054] The suggested method work is explained by the following actual examples.

[0055] Example1. Payees, for example lending institutions, supermarkets etc, who receive money in hand, have receiving points for money in hand and are interested in receiving valid instruments of payment, cohere on terms which they have defined, and form a necessary communications infrastructure via electronic channels: Internet or phone, for instance mobile telephony. However, payees can act anonymously, their actual names (denominations) unannounced.

[0056] Producer, nominal value and registration number of banknotes accepted at cash payment, are identified in a money receiving point of each payee. Identification of these characteristics is made either automatically, for instance with a counter device identifying banknotes, or manually. Banknote incoming can be accompanied with an additional check for detection of counterfeit or rejected banknotes. As a result of identification or manual input, digital signals corresponding to the identification characteristics unique for each banknote that have been found while recognizing the banknote required characteristics, are formed at the output of the terminal. From entry keyboard every payee sets up a period of time, so called period of actuality, while incoming banknotes are sure not to be put into further circulation and not to be received by any other payee. Values of identification data of the incoming banknotes are stored by the payee during the set period of actuality and sent via the internet or telephone, e.g. mobile one, to other payees to check similar banknotes emergence at other payees, i.e. to check incoming banknotes uniqueness.

[0057] Therefore each payee belonging to the system stores values of identification data of banknotes that are kept in stock at the moment and will be kept on for some time according to the established period of actuality, in the data store of the machine for banknote processing. This particular payee also receives signals sent via communication channels by other payees whose addresses and phone numbers are identified to send them back results of comparison, so in case of a telephone communication automated phone number identifier can be used. Incoming signals correspond to identification data of banknotes, received by the payees who have sent these signals. Receiving digital signals from other payees, the payee who is checking banknotes uniqueness compares incoming signals with the content of his data store. Comparison can be made with both software tools and standard digital integrated circuits provided with function of comparison, or "manually" i.e. by the payee himself. Comparison is made taking into account the time of actuality, as the time of actuality being over, correspondent values are deleted from the memory.

[0058] If this payee receives a digital signal corresponding to the identification data of the banknote that has come to him, then as a result of the comparison a warning signal is formed which is sent through electron communication channels to the payee who has initiated this digital signal and informing this very payee that banknotes of the mentioned nominal value and number are found simultaneously at two or more payees. So the payee having received the banknote of the mentioned identification data can conclude that this is a suspected counterfeit banknote and take appropriate measures to define

a counterfeit banknote.

[0059] Example2. Payees, for example lending institutions, supermarkets etc, who receive money in hand, have receiving points for money in hand and are interested in receiving valid instruments of payment and creating a centralized data base of incoming banknotes, join infrastructure containing means of communication with a comparison facility provided with means of recording of identification data values of incoming banknotes. The internet or telephone, e.g. mobile (cellular) communication can be used.

[0060] Producer, nominal value and registration number of banknotes accepted at cash payment, are identified in a money receiving point of each payee. Identification of these characteristics is made either automatically, e.g. with a counter device identifying banknotes, or manually from the keyboard of the terminal. Banknote incoming can be also accompanied with an additional check for detection of counterfeit or rejected banknotes. As a result of identification or manual input, digital signals corresponding to the identification characteristics unique for each banknote that have been found while recognizing the banknote required characteristics, are formed at the output of the terminal.

[0061] From entry keyboard every payee sets up a period of time, so called period of actuality, while incoming banknotes are sure not to be put into further circulation and not to be received by any other payee. Digital signals having been formed in such a way and corresponding to the incoming banknotes identification data as well as to their period of actuality are sent via the internet or telephone, e.g. mobile one to comparison facility of digital signals with values of banknote identification data stored in the data store of the comparison facility being detached from the payee.

[0062] In the comparison facility, addresses and phone numbers of payees are identified to send them results of comparison; payee's registration in the site of the comparison facility or, for example, phone number identifier if phone communication is used, can act as means of payee's e-mail account identification.

[0063] Values stored in the memory of the comparison facility correspond to the identification data of banknotes that are kept in stock at other payees. Values of digital signals sent by the payees are also stored in the memory taking into account their period of actuality.

[0064] Comparison is made automatically using standard hardware components and correspondent software. The result of comparison is messaged to the payee who has sent the correspondent digital signal. The message can mention that at the moment no payees have banknotes with the same identification data as the payee who has sent the digital signal or some of the payees have banknotes with the same identification data. In the first case the payee has no presumptions for suspecting banknotes of counterfeiting, in the second - on the contrary, banknotes received by one of the payees should be considered counterfeit.

[0065] Values corresponding to identification data of banknotes which have already been found counterfeit can be also stored in the memory. Their receiver decides what to do further on all by himself.

[0066] The suggested method can be embodied using standard equipment, standard hardware components and with actual telecommunication means.

[0067] So the method of identifying banknotes defective in uniqueness provides for higher probability and reliability of suspected counterfeit banknotes detecting because there is probably not yet any information detected in due course on the counterfeit banknotes in the market with the same identification characteristics as the banknotes detected by the suggested method.

[0068] The method of identifying banknotes defective in uniqueness makes it possible to detect two or more banknotes with identical identification data, which give evidence of a fact of forging of banknotes with such identification characteristics before finding of the fact of counterfeit banknotes presence in the market, as well as to detect data of banknotes having been put into circulation illegally well in advance, before counterfeit banknotes detection, as presence of two banknotes of the same nominal value and of the same series is illegal.

[0069] System that embodies the method of identifying banknotes defective in uniqueness, variant 1, includes a lot of payees' banknote processing facilities 1 (Fig.1) represented by a set of hardware and software with input-output terminal 2 of a banknote receiver, memory block 3 to store banknote identification data base and block of comparison 4, where the output of the memory block is connected to the first input of the block of comparison, I/O terminals of each payee's banknote processing facilities are connected to the second inputs of blocks of comparison of other payees' banknote processing facilities through electronic communication channels 5, and payees' banknote processing facilities are capable to transmit results of comparison to I/O terminal of each payee's banknote processing facilities through electronic communication channels, wherefore processing facilities are provided with identification blocks 6. I/O terminals are capable to insert time of incoming banknotes actuality within which these banknotes can stay at not more than one payee wherefore they are provided with keyboard 7.

[0070] At least a part of I/O terminals of soft money payees is made in the form of banknote counters recognizing banknote producer, nominal value and alphanumeric banknote number assignment.

[0071] At least a part of I/O terminals of soft money payees is capable to check agreement of identification data of incoming banknotes at their receiving point.

[0072] Communication channels are made in the form of local and/or global computer networks and/or phone communication channels.

[0073] I/O terminals of soft money payees are (geographically) distanced one from another.

[0074] System that implements the method of identifying banknotes defective in uniqueness (variant 1) works

as follows.

[0075] Possibility of achieving technical result of the suggested system is defined by the following. Money in hand can exist both in coins and in banknotes. All monetary units are issued by a definite producer and have some nominal value. Unlike coins banknotes have some identifying characteristic essential for banknotes. As a rule it is an alphanumerical code: serial and number. So each banknote (note) is unique as for the set of the required characteristics: producer designation, nominal value designation, and alphanumerical code. Such is banknote issuing practice practically in all modern countries, and the suggested technical decision is based quite on this uniqueness of each banknote. Banknote payees i.e. persons - participants of commodity-money relations receive banknotes for temporary possession, and due to their uniqueness other payees cannot possess banknotes with the same set of the required characteristics. Emergence of banknotes with the same set of the identifying required characteristics (violation of uniqueness of a banknote) shows that at least one of such "not-unique" banknotes is counterfeit, and the suggested system implements detection of suspected counterfeit banknotes.

[0076] Incoming banknotes are recognized, i.e. their unique identification data - required banknote characteristics are defined. Identification of these characteristics is made either automatically, for instance with a counter device identifying banknotes, or manually by inserting banknote producer, nominal value and serials with a terminal keyboard. A banknote counter device, provided with identification function, a personal computer or telephone can be used as a terminal. A payee sets up a period of actuality of incoming banknotes for the payee, while incoming banknotes will stay at this very payee and will not to be put into further circulation. Banknote incoming can be accompanied with an additional check for detection of counterfeit or rejected banknotes.

[0077] As a result of identification or manual input, digital signals obtained as a result of recognizing banknote required characteristics and corresponding to the identification characteristics of incoming banknotes are stored in the memory block of banknote processing facilities of a particular payee and are also sent to memory blocks of other payees' banknote processing facilities via electronic communication channels to check incoming banknotes identification data uniqueness. The same thing occurs to the incoming banknotes of other payees in their banknote processing facilities. So values of identification data of incoming banknotes are stored in the memory blocks of banknote processing facilities of every payee for the time of their actuality, and corresponding digital signals are sent to banknote processing facilities of other payees via electron communication channels. Transmission of digital signals via communication channels is also accompanied by transmission of service signals of the corresponding banknote processing facilities of the payee, the latter permitting to identify banknote processing facilities of the payee who has sent the digital signal, i.e. his e-mail account or phone number, in case of phone communication an automated phone number identifier can be used.

[0078] Values of identification data of banknotes received by a particular payee which have been sent via electron communication channels are directed to the banknote processing facilities of other payees forming a request wherein values of digital signals are compared to values stored in the memory of the banknote processing facilities of the payees receiving the request. Simultaneously identification block of banknote processing facilities of the payees identifies e-mail account of the request originator if computer networks are used as communication channels, or phone number of the request originator if phone lines are used as communication channels.

[0079] Results of comparison of digital signal of the request to banknotes identification data values stored in the memory block are sent to the terminal of banknote processing facilities of the payee which has made the request. In accordance with the results the payee makes a decision as for his further actions, e.g. a decision of careful counterfeit examination of banknotes bearing identification data coinciding with identification data of other payee's banknotes.

[0080] The system suggested in variant 1 can be made using standard equipment, standard hardware components and actual telecommunication means.

[0081] So the system that implements the method of identifying banknotes defective in uniqueness (variant 1) provides for higher probability and reliability of suspected counterfeit banknotes detection because there is probably not yet any information on the counterfeit banknotes in the market with the same identification characteristics as the banknotes detected in due course.

[0082] The system that implements the method of identifying banknotes defective in uniqueness makes it possible to detect two or more banknotes with identical identification data, which give evidence of the fact of forging of banknotes with such identification characteristics before finding of the fact of counterfeit banknotes presence in the market, as well as to detect data of banknotes numbers having been put into circulation illegally well in advance of counterfeit banknotes detection.

[0083] System that embodies the method of identifying banknotes defective in uniqueness, variant 2, includes payee's input-output terminal 8 (Fig.2) with a keyboard 9, a memory block 10, its output is connected to the first input of the comparison block 11, memory block and comparison block having formed a comparison facility 12 represented by a set of hardware and software geographically and functionally autonomous and not having any energy sources in common with at least one I/O terminal of a payee. I/O terminals of each payee are connected through electronic communication channels 13 to the input of memory block and second input of comparison block that is capable to transmit results of comparison to

the I/O terminal of banknotes payee therefore comparison facility is provided with identification block 14. Terminal is enabled with a possibility to insert actuality time of incoming banknotes within which these banknotes can stay at not more than one payee wherefore it is provided with a keyboard.

[0084] At least a part of I/O terminals of soft money payees is made in the form of banknote counters recognizing banknote type, nominal value and alphanumeric number assignment.

[0085] At least a part of I/O terminals of soft money payees is capable to check agreement of identification data of incoming banknotes at their receiving point.

[0086] Communication channels are represented by local and/or global computer networks and/or phone communication channels.

[0087] I/O terminals of soft money payees are (geographically) distanced from each other.

[0088] System that implements the method of identifying banknotes defective in uniqueness (variant 2) works as follows.

[0089] Possibility of achieving technical result of the suggested system is defined by the following. Money in hand can exist both in coins and in banknotes. All monetary units are issued by a definite producer and have some nominal value. Unlike coins banknotes have some identifying characteristic essential for banknotes. As a rule it is an alphanumerical code: serial and number. So each banknote (note) is unique as for the set of the required characteristics: producer designation, nominal value designation, and alphanumerical code. Such is banknote issuing practice practically in all modern countries, and the suggested technical decision is based quite on this uniqueness of each banknote. Banknote payees, i.e. persons - participants of commodity-money relations receive banknotes for temporary possession, and due to their uniqueness other payees cannot possess banknotes with the same set of the required characteristics. Emergence of banknotes with the same set of the required identifying characteristics (violation of uniqueness of a banknote) shows that at least one of such "not-unique" banknotes is counterfeit, and the suggested system implements detection of suspected counterfeit banknotes.

[0090] Incoming banknotes are recognized, i.e. their unique identification data - required banknote characteristics are defined. Identification of these characteristics can be made either automatically, for instance with a counter device identifying banknotes, or manually by inserting producer, nominal value and registration number of banknotes with a keyboard. A payee sets up a period of incoming banknotes actuality for the payee that is a period of time within which incoming banknotes will stay at this very payee and will not be put into further circulation. Banknote incoming can be accompanied with an additional check for detection of counterfeit or rejected banknotes.

[0091] Formed as a result of identification of banknotes, digital signals corresponding to the identification characteristics of incoming banknotes and their actuality period are transmitted via communication channels and their values are stored for the fixed period of actuality in the store of the comparison facility memory block. Digital signals transmission via communication channels is accompanied by transmission of service signals of payee's terminal, the latter permitting to identify the terminal in the comparison facility i.e. e-mail account or phone number of the payee wherein comparison facility site registration may be necessary for e-mail account identification and in case of phone communication an automated phone number identifier can be used.

[0092] A base of identification data of banknotes, which are at the moment at all these payees, is being formed in such a way, using identification data of banknotes received from different payees.

[0093] Prior to storing values of signals, coming from payees' terminals, in the comparison facility memory, they are moved to the comparison block of the comparison facility wherein they are compared to the values of identification data of banknotes received from other payees, that have been already stored there. So digital signal moved from the terminal, represent a request for checking uniqueness of values of incoming banknotes identification data which are being transmitted.

[0094] Results of comparison are messaged through electron communication channels to the I/O terminal of the payee, sending the request. E-mail account or phone number of the payee's terminal where the comparison result is moved to, is identified with the help of identification block.

[0095] In accordance with the results of comparison the payee makes a decision as for his further actions, e.g. a decision of further, more careful counterfeit examination of banknotes bearing identification data coinciding with identification data of other payee's banknotes.

[0096] The system suggested in variant 2 can be made using standard equipment, standard hardware components and actual telecommunication means.

[0097] So the system that implements the method of identifying banknotes defective in uniqueness (variant 2) provides for higher probability and reliability of suspected counterfeit banknotes detection because there is probably not yet any information on the counterfeit banknotes in the market with the same identification characteristics as the banknotes detected in due course.

[0098] The system that implements the method of identifying banknotes defective in uniqueness, variant 2, makes it possible to detect two and more banknotes with identical identification data, which give evidence of forging of banknotes with such identification characteristics before finding counterfeit banknotes presence in the market, as well as to detect data of banknotes numbers having been put into circulation illegally well in advance of counterfeit banknotes detection.

[0099] The claimed inventions can be embodied with the help of means and components known in the art and

conform to condition of industrial applicability.

Claims

1. A method of identifying banknotes defective in uniqueness wherein values of banknote identification data are inserted in the memory of data store, incoming banknotes accepted by payees are identified by recognizing of required characteristics of banknotes defining identification data of these banknotes and by their digitalization into digital signals, digital signals are transmitted via electron communication channels, digital signals values conforming to incoming banknotes identification data are compared to identification data values of banknotes in data store, decision of detection of banknotes defective in uniqueness is made if digital signals values coincide with identification data values of banknotes in data store **characterized in that** payee having sent digital signals is identified for the purpose of sending results of comparison to him, period of actuality is established within which incoming banknotes identification data remain relevant for the payee having sent digital signals, digital signals are produced in such a way that they correspond not only to incoming banknotes identification data but also to the established period of actuality of these data, values of digital signals corresponding to incoming banknotes identification data in the memory of data store are stored taking into account the established period of actuality of these data.

2. The method according to claim 1 **characterized in that** incoming banknotes identification data actuality period is established to be not longer than the period of time within which the involved banknotes can stay at not more than one payee.

3. The method according to claim 1 **characterized in that** comparison of digital signals values corresponding to incoming banknotes identification data, with values of identification data of banknotes in data store is made only within the actuality period,
these banknotes identification data values are to be deleted from the data store, this period having been over.

4. The method according to claim 1 **characterized in that** banknotes required characteristics defining incoming banknotes identification data are the following: information on their producer and/or nominal value and/or number and/or series.

5. The method according to claim 1 **characterized in that** prior to transmitting digital signals corresponding to identification data of several incoming banknotes via electronic communication channels, their identification data are tested for their reciprocal similarity.

6. The method according to claim 1 **characterized in that** comparison of digital signals values corresponding to incoming banknotes identification data, with values of identification data of banknotes in data store is made at each payee of these banknotes wherein digital signals corresponding to incoming banknotes identification data are transmitted via electronic communication channels to all the payees, who in turn send result of comparison only to the payee who has sent digital signals, and incoming banknotes identification data values are stored separately for each payee in the memory of his data store.

7. The method according to claim 1 **characterized in that that** comparison of digital signals values corresponding to incoming banknotes identification data, with values of identification data of banknotes in data store is made in a single place whereto digital signals corresponding to incoming banknotes identification data from different payees are transmitted via electronic communication channels to be stored in the memory of data store, and the result of comparison is sent via electronic communication channels to the payees of correspondent banknotes.

8. The method according to any of claims 1, 6 or 7 **characterized in that** values of identification data of counterfeit banknotes detected beforehand are also inserted to the memory of data store.

9. The method according to claim 1 **characterized in that** banknote are received by payees located in places of banknote acceptance distanced from one another.

10. The method according to claim 1 **characterized in that** incoming banknotes are banknotes on hand of a payee.

11. The method according to claim 1 **characterized in that** banknotes are soft money.

12. A system that implements the method of identifying banknotes defective in uniqueness including input-output terminal of soft money payee, memory block and comparison block, forming soft money processing facility **characterized in that** banknote processing facilities of other soft money payees are included into it wherein outputs of I/O terminals of each banknote processing facility are connected by electronic communication channels to inputs of comparison blocks of the rest banknote processing facilities which are provided with a capability to transmit results of comparison via electronic communication

channels to I/O terminal of banknote payee's processing facility, and I/O terminals themselves are capable to input incoming banknotes identification data together with incoming banknotes actuality time within which banknotes cannot stay at more than one payee.

13. The system according to claim 12 **characterized in that** at least a part of I/O terminals of soft money payees is made as banknote counters recognizing banknote producer, nominal value and alphanumeric number assignment.

14. The system according to claim 12 **characterized in that** at least a part of I/O terminals of soft money payees is made capable to test incoming banknotes identification data for their reciprocal similarity at the place of their acceptance.

15. The system according to claim 12 **characterized in that** local and/or global computer networks and/or telephone communication channels are used for its communication channels.

16. The sstem according to claim 12 **characterized in that** terminals are provided with keyboard for inserting actuality time of incoming banknotes.

17. The system according to claim 12 **characterized in that** soft money processing facilities are provided with identification blocks of banknote payees' I/O terminals to send there results of comparison.

18. The system according to claim 12 **characterized in that** soft money processing facilities are distanced from one another.

19. A system that implements the method of identifying banknotes defective in uniqueness including input-output terminal of soft money payee, memory block and comparison block, **characterized in that** other soft money payees' I/O terminals are added to it wherein I/O terminal of each soft money payee are connected through electronic communication channels to the input of comparison block made capable to send results of comparison to I/O terminal of banknote payee, and terminals themselves are made capable to insert incoming banknotes identification data together with incoming banknotes actuality time within which banknotes cannot stay at more than one payee, wherein memory block and comparison block form a comparison facility made separately of at least one I/O terminal of payee.

20. The system according to claim 19 **characterized in that** at least a part of I/O terminals of soft money payees is made in the form of banknote counters recognizing their producer, nominal value and alphanumeric number assignment.

21. The system according to claim 19 **characterized in that** at least a part of I/O terminals of soft money payees is made capable to test incoming banknotes identification data for their reciprocal similarity at the place of their acceptance.

22. The system according to claim 19 **characterized in that** local and/or global computer networks and/or telephone communication channels are used for its communication channels.

23. The system according to claim 19 **characterized in that** terminals are provided with keyboard for inserting actuality time of incoming banknotes.

24. The system according to claim 19 **characterized in that** I/O terminals of soft money payees are distanced from one another.

25. The system according to claim 19 **characterized in that** comparison facility is provided with a block of identification of I/O terminals of payees for sending there results of comparison.

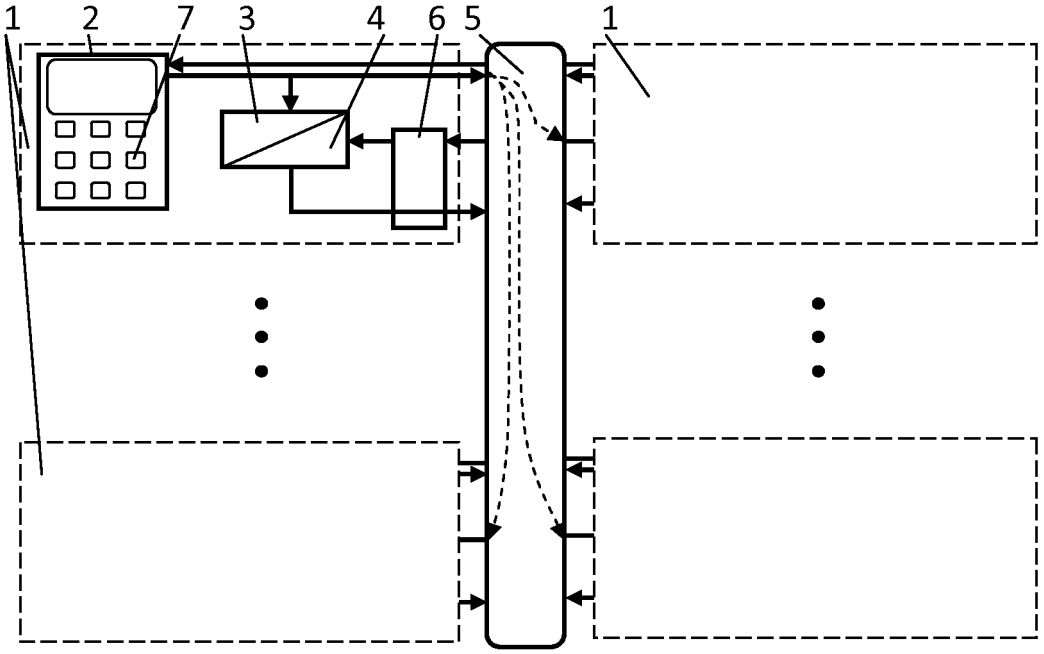

Fig. 1

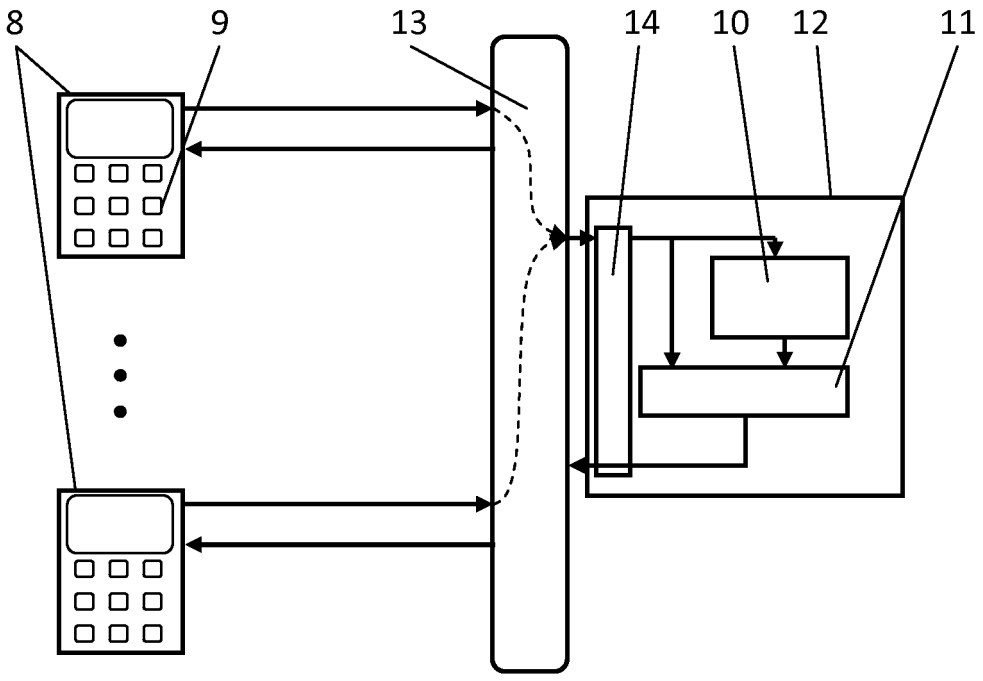

Fig. 2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/RU 2009/000409

A. CLASSIFICATION OF SUBJECT MATTER

G07D 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)

G06Q 10/00, H04L 12/00, H04L 12/28, H04L 12/58, G06K 5/00

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2005/064549 A1 (GIESECKE & DEVRIENT GMBH) 14.07.2005, p. 1, lines 23-28, p.4, lines 10-28, p.5, lines 14-26	1-2, 10-11
Y	RU 2176107 C1 (GAEB DMITRY VLADIMIROVICH) 20.11.2001, p.3, col.2, lines 10-71, p.4, col.2, lines 42-45, p.5, col.2, lines 1-25	1-2, 10-11
A	EP 1160737 A1 (OBSHESTVO S OGRANICHENNOI OTVETSTVENNOSTIJU FIRMA "DATA-TSENTR") 05.12.2001	1-25
A	GB 2425873 A (MOHAMMED IQBAL) 08.11.2006	1-25

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

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
15 December 2009 (15.12.2009)	24 December 2009 (24.12.2009)
Name and mailing address of the ISA/ RU Facsimile No.	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 1998)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- RU 2006126788 A **[0003] [0005] [0007]**

Non-patent literature cited in the description

- *Tekhnika Molodezhy,* 2005, 17 **[0002]**