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(11) **EP 1 066 604 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention
of the grant of the patent:

18.09.2002 Bulletin 2002/38

(21) Application number: **99911625.4**

(22) Date of filing: **24.03.1999**

(51) Int Cl.7: **G07D 5/00**

(86) International application number:
PCT/DK99/00172

(87) International publication number:
WO 99/049423 (30.09.1999 Gazette 1999/39)

(54) **AN APPARATUS AND A METHOD FOR RECEIVING AND ACCEPTING TOKENS**

VORRICHTUNG UND VERFAHREN ZUM EMPFANGEN UND AKZEPTIEREN VON WERTMARKEN

APPAREIL ET PROCEDE POUR RECEVOIR ET ACCEPTER DES JETONS

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE**

(30) Priority: **24.03.1998 DK 41898**

(43) Date of publication of application:
10.01.2001 Bulletin 2001/02

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Description

[0001] The present invention relates to an apparatus for receiving and accepting tokens and especially to an apparatus, which may be, remote controlled to accept tokens not previously accepted by the apparatus.

[0002] Apparatus of the present type are typically apparatus performing a service, such as pay phones, performing the service after insertion and acceptance of a coin.

[0003] Normally, apparatus of this type have a part generating parameters relating to tokens received thereby. These parameters are compared to criteria, which the parameters of a given token are to fulfil, before the token is accepted. Different types of tokens, such as coins with different monetary values, normally have different parameters and therefore different criteria.

[0004] In apparatus of this type, the parameters derived from a given token will differ between apparatus, as the measurements or derivations of these parameters normally comprise an uncertainty relating to the manufacturing processes used for manufacturing the apparatus. Such differences may stem from mechanical uncertainties in the positioning or manufacturing of the parts defining the positions where the measurements are performed at the tokens, or the parts of the apparatus performing these measurements.

[0005] In order for an apparatus to be able to correctly accept a token of a given type and still reject tokens of non-acceptable types (and to be able to determine which type of token has been received), the criteria which the parameters should fulfil therefore have to be generated for each individual apparatus. Otherwise, too broad criteria, which could otherwise be used in a number of apparatus, might be so broad that not acceptable tokens are accepted by some of the apparatus (but not by others).

[0006] Naturally, such differences could be avoided or sufficiently reduced by tightening the manufacturing process in order to have all apparatus measure or provide the same parameters for tokens. This, however, vastly increases the manufacturing cost of the apparatus.

[0007] Instead, it has been until now accepted that each individual apparatus requires individual calibration at the factory for each type of token. This, however, incorporates the disadvantage that if the apparatus subsequently, when positioned at its operating position in the field, has to be able to accept a new type of token, a standard calibration can not be used.

[0008] Therefore, normally when apparatus of this type are to be calibrated to accept a new type of token, the apparatus, or at least the part thereof evaluating the token, is brought to a central location where a number of tokens of the new type are introduced in the apparatus or part thereof in order to generate or provide parameters for these tokens. These generated parameters are subsequently used for calculating or generating the criteria for use in that specific apparatus for that specific new type of token, where after these criteria are fed to the apparatus. This, however, is a labour intensive step, which also removes the apparatus from their operating positions or renders these inoperative during calibration.

[0009] An alternative way is to have a trusted person visit and calibrate all apparatus at their sites of operation using a set of calibration tokens.

[0010] Apparatus of those types may be seen in WO 97/27567, US-A-5,067,604, EP-A-0 395 067, GB-A-2 293 039, GB-A-2 199 978, EP-A-0 328 441, WO 94/04998, and US-A-4,538,719.

[0011] WO97 127567 discloses the features of the preamble of claim 1.

[0012] The present invention addresses this problem, and in a first aspect, the invention relates to an apparatus for performing a service upon receiving and accepting a token, the apparatus comprising:

- means for receiving a token,
- means for deriving one or more parameters relating to the token,
- storing means for holding criteria relating to the derived one or more parameters, and
- means for accepting the token based on a determination of whether the derived one or more parameters fulfil the criteria,
- means for receiving initial information comprising initial criteria relating to parameters of tokens of a new type of token,
- means for, on the basis of the initial criteria, generating final criteria on the basis of subsequently derived parameters relating to a number of subsequently received tokens of the new type of token, the final criteria being more restrictive than the initial criteria, and
- means for transferring the final criteria to the storing means, so as to adapt the accepting means to subsequently accept a token of the new type of token, when derived parameters relating thereto fulfil the final criteria,

where the apparatus is adapted to perform the service in response to receiving and accepting each of the number of subsequently received tokens of the new type of token,

[0013] In this manner, a standard calibration may be provided and transmitted to a number of apparatus, where after,

in each apparatus, an apparatus specific calibration is performed on the basis of parameters derived by the specific deriving means - parameters derived from a number of subsequently received tokens of the new type.

[0014] Having performed this calibration, subsequently received tokens of the new type will be accepted, if the parameters thereof fulfil the final criteria

5 [0015] However, as the apparatus performs the service expected by the user, the user of the apparatus will not note that the apparatus is, in fact, in the process of being calibrated to the new type of token. The only difference is that the apparatus may, during this process, accept tokens, which might not be accepted, when the apparatus is fully calibrated. This is not possible for the user to notice.

10 [0016] Thus, performing the service will make the users think that the apparatus has already been calibrated, and fraudulent attempts to diverge the calibration will be prevented or at least greatly reduced. Also, a certain amount of fraud or monetary loss may be accepted due to the large savings on manpower relating to the previous labour-consuming manner of calibrating the apparatus.

[0017] In the present context, a new type of token is a token, which was not acceptable by the apparatus at the time of receipt of the initial information relating to that type of token.

15 [0018] Also, narrower criteria means criteria which, compared to the wider criteria, are fulfilled by a relatively smaller number of tokens of a given type, where the tokens have differing parameters.

[0019] Preferably, the criteria comprise a number of intervals, the means for accepting the token being adapted to accept the token, if the derived parameters lie within the intervals. Normally, there will be one interval for each derived parameter, and the token will only be accepted if all parameters lie within their respective intervals.

20 [0020] Thus, the initial criteria suitably comprise a number of initial intervals of initial sizes, and wherein the generating means are adapted to narrow the initial intervals - such as to final intervals of predetermined widths.

[0021] Alternatively, the criteria may specify a relation, which should exist between the parameters in order for the token to be acceptable.

25 [0022] Normally, the apparatus will be adapted to receive and accept not only a single type of token but a number of types at the time of calibration to yet another type of token. Thus, preferably

- the receiving means are adapted to receive tokens of a number of predetermined types,
- the deriving means are adapted to derive one or more parameters relating to tokens of the predetermined types, the parameters relating to one type of token being distinguishable from those relating to another type of token, and preferably
- the storing means are adapted to hold criteria relating to derived parameters from each of the number of predetermined types of tokens.

35 [0023] A number of different schemes may be derived for the generation of the final criteria. The main feature is that parameters relating to a number of tokens of the new type are used in the apparatus specific calibration.

[0024] In one situation, the generating means may be adapted to generate the final criteria on the basis of parameters derived from subsequently received tokens, the number of which is less than a total number of subsequently received tokens of the new type of token. In this situation, it should be determined which of the subsequently received tokens are to be used in the generation of the final criteria. This determination may be a stochastic selection - or tokens with a predetermined spacing - such as every third token - may be selected.

40 [0025] This is especially desired, when the tokens represent a monetary value and where it is to be ensured that fraud is avoided or made difficult during this non-supervised calibration. If a fraudulent person does not know which of the subsequently received tokens will be taken into account in the calibration, a larger number of tokens have to be "spent" in order to e.g. force the apparatus into accepting fraudulent tokens having parameters fulfilling the initial criteria but not final criteria as these would have been derived using tokens of the correct, new type.

45 [0026] Alternatively, the generating means may be adapted to generate the final criteria on the basis of parameters derived from subsequently received tokens, the number of which is at least substantially equal to a total number of subsequently received tokens of the new type of token. In this situation, no selection may be required

50 [0027] A further alternative or option is one wherein the generating means are adapted to generate the final criteria on the basis of parameters derived from a predetermined number of subsequently received tokens of the new type of token. This number of tokens will depend on the desired precision of the calibration or the expected variation of the parameters of the tokens. Normally, parameters from at least 10 tokens, such as at least 50 tokens, preferably at least 100 tokens, such as 100-200 tokens are used in the calibration.

55 [0028] Optionally, the calibration may proceed until the criteria have been altered to a given degree compared to the initial criteria. In the situation where the criteria are represented by intervals, the calibration may proceed until all intervals are reduced to a given degree or to predetermined widths.

[0029] An especially preferred embodiment is one where the apparatus needs not be removed from its position in order for it to be calibrated. In a situation of that type, the means for receiving the initial information preferably comprise

means for communicating with a remote computer means generating or providing the initial information.

[0030] In that situation, it may be preferred that

- the generating means comprise a controlling means adapted to perform actions defined by a set of instructions,
- the generating means are controllable by the controlling means,
- the remote computer is adapted to generate or provide the set of instructions, and that
- the means for receiving the initial information are adapted to receive the set of instructions and forward these to the controlling means.

[0031] When the remote computer is adapted to generate the set of instructions, the calibration is remote controllable to a degree where new schemes, for e.g. selecting which of subsequently received tokens are to be used in the calibration, may be subsequently devised and programmed centrally. Also, the manner in which the initial criteria are narrowed into the final criteria may be devised and altered without having to remove the apparatus from their operative positions.

[0032] In a simpler embodiment, the set of instructions may be parameters for use in a more fixed calibration procedure taking place in the apparatus. Parameters of this type may specify the number of tokens to be used in the calibration, how, if applicable, to select these from those received, how to reduce the initial criteria to the final criteria - and any demands put on to the final criteria. Also that calibration may be performed with the apparatus in its operative position. The possibility to calibrate the apparatus in its operative position, has several advantage over the existing factory calibration. There is no need to remove the apparatus, or at least a part of it, and transport it to the factory. Since the users of the apparatus are supplying the tokens used for calibration during normal operation, a large number of tokens can be used in determining the correct final criteria, and thus giving a better confidence.

[0033] More specifically, the remote computer may be adapted to generate or provide, in the set of instructions, instructions relating to

- a subsequent number of subsequently received tokens of the new type of token, and/or
- information relating to which of the subsequently received tokens of the new type of token, the parameters of which are used by the generating means in the generation of the final criteria.

[0034] The remote computer may be adapted to generate or provide the initial information comprising initial criteria determined on the basis of parameters derived from a number of tokens of the new type of token having been introduced into one or more means for deriving one or more parameters relating to the tokens. In that situation, the initial criteria may be derived in a manner so as to be sufficiently broad to take into account the variation of the parameters of the tokens of the new type and the variation of the derived parameters due to manufacturing variations of the deriving means of the apparatus. In that situation, the one or more means for deriving the one or more parameters may be selected at the factory due to their standard or typical responses and retained for subsequent initial calibration of the remaining means which are used in the field.

[0035] Depending on the actual generation of the final criteria on the basis of the initial criteria, the generating means may be adapted to generate the final criteria in a number of steps, where the tokens of the new type received subsequently to the receipt of the initial information are received over a period of time during which the steps take place, each step being performed on the basis of parameters derived from previously received tokens.

[0036] In that situation, the generating means may be adapted to, in a step, generate intermediate criteria representing criteria more narrow than the initial criteria and broader than the final criteria. In that manner, the criteria relating to the new type of token gradually approach the final criteria.

[0037] In one embodiment, the accepting means are adapted to accept tokens of the new type of token (subsequent to that step and before the next step), if parameters derived from a received token of the new type fulfil the intermediate criteria, and wherein the generating means are adapted to perform a subsequent step of the generation of the final criteria on the basis of the parameters derived from the accepted token of the new type.

[0038] In that situation, the criteria gradually narrow, and only tokens of the new type fulfilling the gradually narrowing criteria are accepted and used in the subsequent steps in the calibration. In that manner, the criteria, which the tokens of the new type are to fulfil, are restricted gradually, as knowledge is obtained relating to the actual read-outs of the deriving means.

[0039] In another embodiment, the decision to use or discard parameters from a received token fulfilling the intermediate criteria, in the generation of the next intermediate criteria, can be made to depend on how close the parameters of the received token are to a current statistical measure of the parameters. It is preferred to use a median estimate as the statistical measure of a parameter. By comparing a parameter of the received token with its median estimate, a decision is made to either use or discard the parameter value in the calculation of the next intermediate criteria. In one situation the decision is derived from the median estimate, the parameter, and a predetermined value. The decision

making property described above is a special case of utilising a general function to derive a weight factor for the current parameter value, and use this weight factor in the calculation of the next intermediate criteria.

[0040] Alternatively, the generating means may be adapted to generate the final criteria in a single step. In that manner, the parameters relating to the all required subsequently received tokens of the new type are firstly derived, where after the generation of the final criteria takes place.

[0041] It should be noted that the present apparatus may be used for receiving and accepting any type of token. However, the most widely used apparatus of that type would be one used for tokens representing a monetary value, such as coins or notes.

[0042] The parameters derived from the tokens and used in the determination of whether the tokens are acceptable will depend on the actual token. Naturally, the parameters should be ones varying between the types of tokens.

[0043] For example, the new type of token may be a token having, compared to previously acceptable tokens, a different

- physical size, such as a different weight, thickness, width, height and/or diameter,
- monetary value,
- electrical and/or magnetic properties,
- composition of the material forming the token, such as a different alloy, metal, paper quality and/or
- optical properties, such as a different reflection, transmission or fluorescence, such as at one or more predetermined wavelengths,

and/or wherein the tokens of the new type do or do not have a watermark and/or other characteristics, such as indentations, recognisable outer contours, and/or embedded characteristics, such as metal wires.

[0044] In order to further prevent or reveal fraud, the apparatus preferably further comprises means for holding received tokens.

[0045] Especially when the holding means are adapted to store those tokens of the new type of token the parameters of which are used by the generating means, it is firstly ensured that the same token cannot be used repeatedly and thereby "misguide" the calibration into assuming that the variation of the parameters of the tokens of the new type is very small, and secondly, fraudulent or incorrect tokens used for misguiding the calibration will be revealed when collected.

[0046] An alternative or optional manner of revealing or preventing fraud would be one wherein the apparatus is adapted to forward information relating to the final criteria to the remote computer, when the final criteria have been generated. In this manner, it may be evaluated whether the final criteria could have been obtained by using tokens of the new type or whether the final criteria deviate sufficiently for it to be possible that they may be obtained by using other tokens. In that manner, the apparatus may be "reset" by annulling the previous calibration relating to the new type of token and provided with initial information in order to start a new calibration.

[0047] Apparatus according to the invention comprise pay phones and pay terminals used at gas stations or for offering other products for sale. In those situations, the means for performing the service are means for enabling a user to perform a telephone conversation or means enabling a user to purchase gas or other products.

[0048] In a second aspect, the invention relates to a method according to claim 24.

[0049] Preferably, the generation of the final criteria is obtained in a number of steps wherein intermediate criteria are generated which are narrower than the initial criteria and broader than the final criteria.

[0050] In that manner, the intermediate criteria relating to a step may be generated from the intermediate criteria relating to a previous step and parameters derived from one or more received tokens of the new type which fulfil the intermediate criteria relating to the previous step.

[0051] Also, the method may comprise generating, at a location remote from the apparatus, the initial information comprising the initial criteria and additional information for controlling the generation of the final criteria, where the initial criteria may be generated on the basis of parameters provided by inserting a number of tokens of the new type of token into at least one means for providing parameters.

[0052] The generation of the final criteria may be based on parameters derived from a predetermined number of subsequently received tokens of the new type, or the generation of the final criteria may be based on parameters derived from a subset of the subsequently received tokens of the new type, where the tokens of the subset of the subsequently received tokens can be selected randomly from the subsequently received tokens.

[0053] As described above, preferably the method further comprises the step of holding those of the tokens of the new type the derived parameters of which are used in the generation of the final criteria.

[0054] The invention will now be described with reference to the drawing, wherein Fig. 1 is a schematic view of a pay phone according to the preferred embodiment of the invention.

[0055] Fig.1 diagrammatically illustrates the key components of a pay phone 5 set to operate according to the invention. The outer housing 10 of the pay phone contains a coin check unit 30, a modem circuit 70, a MPU system 40,

an EEPROM memory device 50 connected to the MPU system 40 through a data line 60. The pay phone 5 is connected to the telephone network with the line cable 20. The line cable 20 is also connected to a remote facility computer 80. A handset 100 and a coin inlet 95 are provided for the pay-phone user.

5 **[0056]** During normal operation of the pay phone 5, the line cable 20 is used to transmit a voice signal from the person using the handset 100 to make an ordinary phone call. The line cable 20 is also during quiet periods typically at night, utilised to transmit data information regarding the current operation status of the payphone 5 to the remote facility computer 80, by utilising the modem 70. This ensures that the condition of a large number of pay phones can be monitored from the central facility computer 80, and it ensures that an error or a need for maintenance occurring on any pay phone 5 is quickly detected. The data transmitting capability of the pay-phone 5, likewise makes it possible
10 for the remote computer 80 to transmit data to the pay-phone 5, and this possibility is used in the present invention to adapt the pay-phone 5 to accept new coin denominations.

[0057] The MPU system 40 comprises a microprocessor (not illustrated) which controls the operation of the coin check unit 30. The microprocessor loads an operation program from the EEPROM 50 through data line 60, and this operation program is responsible for the functions of the coin check unit 30.

15 **[0058]** The importance of the invention can best be understood by explaining the combined role of the operation program and the coin check unit 30 in determining whether a coin inserted in the inlet 95 is valid. The technical details of the coin check unit 30 is described in detail in EP-A-224946 from Alcatel Kirk AS, and a summary of the key features is included here for the purpose of describing the preferred embodiment of the present invention.

[0059] The coin runs through a channel 35 to the coin check unit 30. The coin check unit 30 includes a coin measurement unit, which contains two magnetic coupled coils physically arranged to lie on the same longitudinal axis with a narrow air gap between them. The air gap is suitable for the passage of a coin runway.

20 **[0060]** One coil is used as a transmission coil and is supplied with a 32 kHz sine wave signal from an oscillator. The sine wave signal is transmitted to the second coil by means of a mutual magnetic coupling between the coils.

[0061] When a coin enters the passage between the coils, a change occurs in the magnetic coupling between the coils due to the magnetic properties of the coin. The change in coupling is measured by detecting the magnitude of the 32 kHz sine wave signal on the secondary coil. By measuring the magnitude of the 32 kHz signal on the secondary coil at four different positions of the coin on the runway, characteristic values for a specific coin denomination are obtained. The four different positions, at which the magnetic coupling measurement takes place, are defined by four LED's and four phototransistors arranged along the coin runway, each LED and phototransistor being positioned on
25 opposite sides of the runway, and being positioned just before the coin enters the air gap between the coils. By detecting the presence or absence of light in each of the channels defined by the LED and phototransistor arrangement, an inductive measurement is triggered at known positions of the passing coin. Five values are extracted from the four measurements, since a measurement of the minimum coupling between the coils is performed along with the four measurements of coupling at the positions mentioned above. The five measurement values P1, P2, P3, P4, P5 are coin parameters which are specific for a coin denomination. The coin parameters P1 - P5, which are the results of a passing coin, are latched in a register in the coin check unit 30, and the register is accessible by the CPU contained in the MPU system 40, by means of data line 90.
30

[0062] The role of the operation program in the MPU system 40 is to read the five coin parameters P1 - P5 obtained during the coin measurement procedure and compare the parameters with values contained in a coin table in the EEPROM 50. The operation program accepts the coin as valid, if P1 - P5 all fit within corresponding parameter intervals or acceptance windows around the parameter mean values for a given coin denomination. The mean value and acceptance window for each parameter P1 - P5, for each coin denomination in the coin table, have previously been found during a calibration procedure of the coin check unit 30 at the factory. The calibration procedure has to be carried out on each coin check unit 30, due to a unit to unit random variation in measurement results from a given population of
35 coins. The variation in measurement results is the result of production tolerances on the coin check unit 30, which include: sensitivity of LED's, phototransistor sensitivity, magnetic coupling between coils, mechanical tolerances.

[0063] The correct mean values and acceptance windows for each coin denomination on a specific coin check unit 30 have previously been obtained by inserting a known coin population in each unit 30, recording the readout values, transferring the values to a PC program for statistical analysis, and letting the PC program calculate suitable mean values and acceptance windows for the unit 30 in question. The calculated mean values and acceptance windows for a coin denomination are finally transferred to the coin table in the EEPROM 50.
40

[0064] The previous calibration procedure had a serious drawback, since every time the pay-phone 5 had to accept a new coin denomination, it was necessary to remove the coin check unit 30 physically from each pay-phone 5, bring the unit 30 to the factory, and perform the above described calibration procedure.

45 **[0065]** It is a feature of a preferred embodiment of the present invention that the operation program in the MPU system 40 includes a sub-program, which can be activated from the remote facility computer 80. The sub-program performs a dynamic calibration of the coin check unit 30 in order to make the pay phone 5 accept a new coin denomination.
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[0066] An initial coin table for the new coin denomination, which the pay-phone 5 has to accept, is transmitted from the remote facility computer 80 to the MPU system 40, and the dynamic calibration sub-program is activated. This initial coin table has wider acceptance windows for coin parameters of the new coin denomination than the ordinary acceptance windows obtained by the described factory calibration procedure. The wider windows are necessary due to the unit-to-unit random variation on measurement values of coin parameters.

[0067] The preferred embodiment of the dynamic calibration procedure, which is performed by the sub-program, is described in detail now:

The initial coin table and the calibration algorithm uses the following variables:

[0068] MEDIAN is a byte holding the current value of the median for a coin parameter.

[0069] COUNT is a 2 byte variable holding the current number of coins that have passed the window defined by TRACKWIN.

[0070] FLAG is a 2-byte variable storing possible MEDIAN adjustments of all parameters P1 - P5, until the next coin is cashed. A total of 5 FLAG variables are used.

[0071] ADJUST is a byte variable containing a signed counter for a coin parameter.

[0072] MINWIN is a byte variable for a coin parameter, in which byte the 4 MSB represent the minimum allowed distance from the MEDIAN to the upper limit of the acceptance window, and the 4 LSB represent the minimum distance to the lower limit of the acceptance window. So, the acceptance window for a coin parameter is never allowed to be narrower than the sum of the values represented by these bits.

[0073] TRACKWIN is a byte variable, which holds the width of the acceptance window for a coin parameter. TRACKWIN is centred around the current value of the variable MEDIAN. The measurement value of a coin parameter, has to be within this window to affect an adjustment of the MEDIAN.

[0074] THRESHOLD is a byte variable, its value determines whether a given value of ADJUST will trigger a movement of the MEDIAN.

[0075] MINCOUNT is a byte. A number of approved coins larger than this variable has to be inserted in a coin check unit 30 before a boundary movement of the acceptance window is approved.

[0076] STOPCOUNT is a byte. The calibration procedure terminates when this value has been reached for variable COUNT.

[0077] MIN, MAX is the smallest and the largest value respectfully of a coin parameter in the coin table. The difference between MIN, MAX is the width of the acceptance window for the coin parameter. The values of MIN and MAX are altered dynamically during the calibration procedure in order to make the acceptance window narrower.

The calibration algorithm for one variable P1:

[0078]

MEDIAN-P1:= MIN + (MAX - MIN)/2

Initialise coin module: Reset FLAG and ADJUST

Coin measured, P1 value results. Coin in escrow.

Check MIN < P1 < MAX, if yes

Coin to escrow

if no

Return coin(counterfeit)

Check $MEDIAN - TRACKWIN(\text{low nibble}) < P1 < MEDIAN + TRACKWIN(\text{high nibble})$, if yes
 Compare P1 and MEDIAN-P1 and set FLAG bits for P1-adjust Up/down accordingly

5 If no

No FLAG set

10 **Cash coin when due**

15 **Take the relevant bit settings(P1) of all used FLAG variables and count ADJUST-P1 up/down according to bit settings.**

Reset all FLAG variables.

20 **Check $|ADJUST-P1| > THRESHOLD-P1$ if true,**

MEDIAN-P1 := MEDIAN-P1 +/- 1 according to sign of ADJUST-P1

25 If false, MEDIAN-P1 := MEDIAN-P1

30 **COUNT = COUNT + 1**

Check $COUNT/MINCOUNT = \text{Integer value}$, if yes

35 **{Check $MEDIAN - MINWIN(\text{low nibble}) \geq MIN$, if yes**

MIN := MIN + 1

Write new MIN to EEPROM

40 **If no,**

MIN := MIN

45 **Check $MEDIAN + MINWIN(\text{high nibble}) \leq MAX$, if yes**

MAX := MAX - 1

Write new MAX to EEPROM

50 **If no,**

MAX := MAX}

55 **if no,**

Check COUNT = STOPCOUNT, if yes

End calibration

If no

Await new coin

END.

Comments to the calibration algorithm:

[0079] In order to minimise memory usage and the calculation burden placed on the MPU system 40, all variables in the calibration procedure are represented as integer numbers. The calculation of the mean value for the five parameters P1 - P5, is altered to be a calculation of the median values of the parameters in order to simplify the calculations.

[0080] The use of the TRACKWIN ensures that only coins, which parameter values are reasonably close to the current median estimates, are used in the adjustment of the medians. This ensures that a large number of counterfeit coins with parameter values close to MIN values or MAX values, are not used to move the MEDIAN value in a wrong direction.

[0081] The intermediate storage of parameter measurements in the FLAG bytes until a coin is actually cashed, is a precaution against pay-phone users who might insert counterfeit coins in the pay phone 5 during calibration. When inserted coins are in the escrow, their parameters P1 - P5 have already been measured and stored in the FLAG bytes, but the FLAG settings will only have an effect in the calibration algorithm, if the coins are actually cashed.

[0082] When the preset minimum value for the width of the acceptance window, defined by means of MINWIDTH, has been reached, the dynamic calibration sub-program has completed its task. The modified values for variables MIN and MAX of parameters P1 - P5 in the coin table are stored permanently in the EEPROM 50.

The control of the pay phone 5 is transferred back to the main part of the operation program, and the pay phone 5 accepts the new coin denomination.

[0083] The coin table acceptance window width for the new coin denomination, at the end of the dynamic calibration procedure, has been contracted to the final value defined by variable MINWIDTH. This final value for the acceptance window width is equal to the window width found by the traditional factory calibration procedure, and thus a good rejection of counterfeit coins for the new denomination is obtained without ever bringing the coin check unit 30 back to the factory for calibration. Each pay phone 5 just has to receive a standardised file, which is sent from the remote computer 80 by means of modem 70 and line cable 20. The file contains the initial coin table and the calibration algorithm variables for the new coin denomination, and the pay-phone 5 is adjusted to the new coin denomination by means of the calibration sub-program which utilises coins inserted by the users during normal operation of the pay-phone 5, to find the correct coin parameter values P1 - P5 for each coin check unit 30.

Claims

1. An apparatus for performing a service upon receiving and accepting a token, the apparatus comprising:

- means (95) for receiving a token,
- means (30) for deriving one or more parameters relating to the token,
- storing means (50) for holding criteria relating to the derived one or more parameters, and
- means (40) for accepting the token based on a determination of whether the derived one or more parameters fulfil the criteria,
- means (70) for receiving initial information comprising initial criteria relating to parameters of tokens of a new type of token,
- means (40) for, on the basis of the initial criteria, generating final criteria on the basis of subsequently derived parameters relating to a number of subsequently received tokens of the new type of token, the final criteria being more restrictive than the initial criteria, and
- means for (40, 60) transferring the final criteria to the storing means (50), so as to adapt the accepting means

to subsequently accept a token of the new type of token, when derived parameters relating thereto fulfil the final criteria,

characterised in that the apparatus is adapted to perform the service in response to receiving and accepting each of the number of subsequently received tokens of the new type of token.

2. An apparatus according to claim 1, wherein the criteria comprise a number of intervals, the means (40) for accepting the token being adapted to accept the token, if the derived parameters lie within the intervals.

3. An apparatus according to claim 2, wherein the initial criteria comprise a number of initial intervals of initial sizes, and wherein the generating means (40) are adapted to narrow the initial intervals.

4. An apparatus according to any of the preceding claims, wherein

- the receiving means (95) are adapted to receive tokens of a number of predetermined types,
- the deriving means (30) are adapted to derive one or more parameters relating to tokens of the predetermined types, the parameters relating to one type of token being distinguishable from those relating to another type of token,
- the storing means (50) are adapted to hold criteria relating to derived parameters from each of the number of predetermined types of tokens.

5. An apparatus according to any of the preceding claims, wherein the generating means (40) are adapted to generate the final criteria on the basis of parameters derived from subsequently received tokens, the number of which is less than a total number of subsequently received tokens of the new type of token.

6. An apparatus according to any of claims 1-4, wherein the generating means (40) are adapted to generate the final criteria on the basis of parameters derived from subsequently received tokens, the number of which is at least substantially equal to a total number of subsequently received tokens of the new type of token.

7. An apparatus according to any of the preceding claims, wherein the generating means (40) are adapted generate the final criteria on the basis of parameters derived from a predetermined number of subsequently received tokens of the new type of token.

8. An apparatus according to claim 3, wherein the generating means (40) are adapted to narrow the initial intervals to final intervals of predetermined widths.

9. An apparatus according to any of the preceding claims, wherein the means (70) for receiving the initial information comprise means for communicating with a remote computer means (80) generating or providing the initial information.

10. An apparatus according to claim 9, wherein

- the generating means (40) comprise a controlling means adapted to perform actions defined by a set of instructions,
- the generating means (40) are controllable by the controlling means,
- the remote computer (80) is adapted to generate or provide the set of instructions, and
- the means (70) for receiving the initial information are adapted to receive the set of instructions and forward these to the controlling means.

11. An apparatus according to claim 9 or 10, wherein the remote computer (80) is adapted to generate or provide the initial information comprising initial criteria determined on the basis of parameters derived from a number of tokens of the new type of token introduced into one or more means for deriving one or more parameters relating to the tokens.

12. An apparatus according to claim 10 or 11, wherein the remote computer (80) is adapted to generate or provide, in the set of instructions, instructions relating to

- a subsequent number of subsequently received tokens of the new type of token, and/or

- information relating to which of the subsequently received tokens of the new type of token,

the parameters of which are used by the generating means (40) in the generation of the final criteria.

5 13. An apparatus according to any of the preceding claims, wherein the generating means (40) are adapted to generate the final criteria in a number of steps.

10 14. An apparatus according to claim 13, wherein the generating means (40) are adapted to generate the final criteria in a single step.

15 15. An apparatus according to claim 13, wherein the generating means (40) are adapted to, in a step, generate intermediate criteria representing criteria more narrow than the initial criteria and broader than the final criteria.

20 16. An apparatus according to claim 15, wherein the accepting means (40) are adapted to accept tokens of the new type of token, if parameters derived from a received token of the new type fulfil the intermediate criteria, and wherein the generating means (40) are adapted to perform a subsequent step of the generation of the final criteria on the basis of the parameters derived from the accepted token of the new type.

25 17. An apparatus according to claim 15, wherein the accepting means (40) are adapted to accept tokens of the new type of token, if parameters derived from a received token of the new type fulfil the intermediate criteria, and wherein the generating means (40) are adapted to perform a subsequent step of the generation of the final criteria on the basis of the parameters derived from the accepted token of the new type, only if the parameters fulfil criteria relating to the intermediate criteria restricted in a predetermined manner.

30 18. An apparatus according to any of the preceding claims, wherein the token is a coin or a note.

35 19. An apparatus according to any of the preceding claims, wherein the new type of token is a token having, compared to previously acceptable tokens, a different

- physical size, such as a different weight, thickness, width, height and/or diameter,
- monetary value,
- electrical and/or magnetic properties,
- composition of the material forming the token, such as a different alloy, metal, paper quality and/or
- optical properties, such as a different reflection, transmission or fluorescence, such as at one or more predetermined wavelengths,

and/or wherein the tokens of the new type do or do not have a watermark and/or other characteristics, such as indentations, recognisable outer contours, and/or embedded characteristics, such as metal wires.

40 20. An apparatus according to any of the preceding claims and further comprising means for holding received tokens.

45 21. An apparatus according to claim 20, wherein the holding means are adapted to store those tokens of the new type of token the parameters of which are used by the generating means.

50 22. An apparatus according to any of the preceding claims and constituting a pay phone (5), wherein the means for performing the service are means for enabling a user to perform a telephone conversation.

55 23. An apparatus according to any one of claims 1-21 and constituting a pay terminal at a gas station, wherein the means for performing the service are means enabling a user to purchase gas.

24. A method of updating an apparatus for performing a service so as to accept a new type of token, the apparatus being adapted to perform a service upon receiving and accepting a token, the method comprising the steps of:

- receiving initial information comprising initial criteria relating to parameters of tokens of a new type of token and deriving therefrom the initial criteria,
- receiving a token,

- deriving one or more parameters relating to the token,
- accepting the token based on a determination of whether the derived one or more parameters fulfil the criteria,
- 5 - subsequent to acceptance of a token of the new type, performing the service,
- generating, on the basis of the initial criteria, final criteria on the basis of subsequently derived parameters relating to a number of subsequently received tokens of the new type of token, the final criteria being more restrictive than the initial criteria, and
- 10 - adapting the apparatus to subsequently accept a token of the new type of token, when derived parameters relating thereto fulfil the final criteria.

25. A method according to claim 24, wherein the generation of the final criteria is obtained in a number of steps wherein the intermediate criteria are more restrictive than the initial criteria and less restrictive than the final criteria.

26. A method according to claim 25, wherein the intermediate criteria relating to a step are generated from the intermediate criteria relating to a previous step and parameters derived from one or more received tokens of the new type and fulfilling the intermediate criteria relating to the previous step.

27. A method according to any of claims 24-26, wherein the initial information is generated at a location remote from the apparatus, the initial information comprising the initial criteria and additional information for controlling the generation of the final criteria.

28. A method according to claim 27, wherein the initial criteria are generated on the basis of parameters provided by inserting a number of tokens of the new type of token into at least one means for providing parameters.

29. A method according to any of claims 24-28, wherein the generation of the final criteria is based on parameters derived from a predetermined number of received tokens of the new type.

30. A method according to any of claims 24-29, wherein the generation of the final criteria is based on parameters derived from a subset of the received tokens of the new type.

31. A method according to claim 30, wherein the subset of the received tokens is selected randomly from the received tokens.

32. A method according to any of claims 24-31, further comprising the step of holding those of the tokens of the new type, the derived parameters of which are used in the generation of the final criteria.

Patentansprüche

1. Vorrichtung zur Durchführung eines Dienstes beim Empfangen und Akzeptieren einer Wertmarke, wobei die Vorrichtung aufweist:

- Mittel (95) zum Empfangen einer Wertmarke,
- Mittel (30) zum Herleiten eines oder mehrerer, auf die Wertmarke bezogenen(r) Parameter,
- Speichermittel (50) zum Halten von Kriterien, die sich auf den einen oder die mehreren hergeleiteten Parameter beziehen,
- 50 - Mittel (40) zum Akzeptieren der Wertmarke, basierend auf einer Bestimmung dahingehend, ob der/die hergeleitete(n) eine oder mehreren Parameter die Kriterien erfüllen,
- Mittel (70) zum Empfang von Ausgangsinformation, die Ausgangskriterien umfaßt, die sich auf Parameter von Wertmarken eines neuen Typs Wertmarke beziehen,
- 55 - Mittel (40), um auf der Basis der Ausgangskriterien Endkriterien zu erzeugen, die auf der Basis darauffolgend hergeleiteter Parameter beruhen, die sich beziehen auf mehrere aufeinanderfolgend empfangene Wertmarken des neuen Typs Wertmarke, wobei die Endkriterien restriktiver sind als die Ausgangskriterien, und
- Mittel (40, 60), welche die Endkriterien auf die Speichermittel (50) übertragen, um die Akzeptiermittel derart anzupassen, daß sie darauffolgend eine Wertmarke des neuen Typs Wertmarke akzeptieren, wenn darauf

bezogene, hergeleitete Parameter die Endkriterien erfüllen,

dadurch gekennzeichnet, daß die Vorrichtung angepaßt ist, um die Dienstleistung in Reaktion auf ein Empfangen und Akzeptieren jeder der mehreren darauffolgend aufgenommenen Wertmarken des neuen Typs Wertmarke, durchzuführen.

5

2. Vorrichtung nach Anspruch 1, wobei die Kriterien mehrere Intervalle umfassen und die Mittel (40) zum Akzeptieren der Wertmarke angepaßt sind, um die Wertmarke zu akzeptieren, falls die hergeleiteten Parameter innerhalb der Intervalle liegen.

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3. Vorrichtung nach Anspruch 2, wobei die Ausgangskriterien mehrere Ausgangsintervalle an Ausgangsgrößen umfassen, und wobei die Erzeugungsmittel (40) angepaßt sind, um die Ausgangsintervalle einzuengen.

15

4. Vorrichtung nach einem der vorstehenden Ansprüche, wobei

- die Empfangsmittel (95) angepaßt sind, um Wertmarken mehrerer vorbestimmter Typen zu empfangen,
- die Herleitmittel (30) angepaßt sind, um einen oder mehrere Parameter herzuleiten, der/die Wertmarken der vorbestimmten Typen betrifft/betreffen, wobei die einen Typ Wertmarke betreffenden Parameter unterscheidbar sind von denjenigen, einen anderen Typ Wertmarke betreffend,
- die Speichermittel (50) angepaßt sind, um Kriterien zu halten, die sich auf hergeleitete Parameter von jedem der mehreren vorbestimmten Typen Wertmarken beziehen.

20

5. Vorrichtung nach einem der vorstehenden Ansprüche, wobei die Erzeugungsmittel (40) angepaßt sind, um die Endkriterien basierend auf den von darauffolgend empfangenen Wertmarken hergeleiteten Parametern zu erzeugen, deren Anzahl geringer ist als eine Gesamtanzahl an darauffolgend empfangenen Wertmarken des neuen Typs Wertmarke.

25

6. Vorrichtung nach einem der Ansprüche 1 bis 4, wobei die Erzeugungsmittel (40) angepaßt sind, um die Endkriterien basierend auf von darauffolgend empfangenen Wertmarken hergeleiteten Parametern zu erzeugen, deren Anzahl zumindest im wesentlichen gleich einer Gesamtanzahl an darauffolgend empfangenen Wertmarken des neuen Typs Wertmarke ist.

30

7. Vorrichtung nach einem der vorstehenden Ansprüche, wobei die Erzeugungsmittel (40) angepaßt sind, um die Endkriterien basierend auf von einer vorbestimmten Anzahl an darauffolgend empfangenen Wertmarken des neuen Typs Wertmarke hergeleiteten Parametern zu erzeugen.

35

8. Vorrichtung nach Anspruch 3, wobei die Erzeugungsmittel (40) angepaßt sind, um die Ausgangsintervalle auf Endintervalle vorbestimmter Breiten einzuengen.

40

9. Vorrichtung nach einem der vorstehenden Ansprüche, wobei die Mittel (70) zum Empfang der Ausgangsinformation Mittel umfassen zum Kommunizieren mit einer fernliegenden Computereinrichtung (80), welche die Ausgangsinformation erzeugt oder liefert.

45

10. Vorrichtung nach Anspruch 9, wobei

- die Erzeugungsmittel (40) eine Steuereinrichtung umfassen, die angepaßt ist zur Durchführung von Aktionen, die definiert sind durch einen Satz an Instruktionen,
- die Erzeugungsmittel (40) durch die Steuereinrichtung steuerbar sind,
- der fernliegende Computer (80) angepaßt ist, um den Satz Instruktionen zu erzeugen oder zu liefern, und
- die Mittel (70) zum Empfang der Ausgangsinformation angepaßt sind zum Empfang des Satzes Instruktionen und zum Weitergeben dieser an die Steuereinrichtung.

50

11. Vorrichtung nach Anspruch 9 oder 10, wobei der fernliegende Computer (80) angepaßt ist, um die Ausgangsinformation zu erzeugen oder zu liefern, welche Ausgangskriterien umfaßt, die auf der Basis von Parametern bestimmt sind, welche hergeleitet sind von mehreren Wertmarken des neuen Typs Wertmarke, die eingeführt sind in ein oder mehrere Mittel zum Herleiten eines oder mehrerer, die Wertmarken betreffender Parameter.

55

12. Vorrichtung nach Anspruch 10 oder 11, wobei der fernliegende Computer (80) angepaßt ist, um in dem Satz In-

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struktionen, Instruktionen zu erzeugen oder zu liefern betreffend

- eine darauffolgende Anzahl darauffolgend empfangener Wertmarken des neuen Typs Wertmarke und/oder
- Information betreffend die darauffolgend empfangenen Wertmarken des neuen Typs Wertmarke,

deren Parameter von den Erzeugungsmitteln (40) bei der Erzeugung der Endkriterien, verwendet werden.

13. Vorrichtung nach einem der vorstehenden Ansprüche, wobei die Erzeugungsmittel (40) angepaßt sind, um die Endkriterien in mehreren Schritten zu erzeugen.

14. Vorrichtung nach Anspruch 13, wobei die Erzeugungsmittel (40) angepaßt sind, um die Endkriterien in einem Einzelschritt zu erzeugen.

15. Vorrichtung nach Anspruch 13, wobei die Erzeugungsmittel (40) angepaßt sind, um in einem Schritt Zwischenkriterien zu erzeugen, welche Kriterien repräsentieren, die enger sind als die Ausgangskriterien und breiter als die Endkriterien.

16. Vorrichtung nach Anspruch 15, wobei die Akzeptiermittel (40) angepaßt sind, um Wertmarken des neuen Typs Wertmarke zu akzeptieren, falls Parameter, die von einer empfangenen Wertmarke des neuen Typs hergeleitet sind, die Zwischenkriterien erfüllen und wobei die Erzeugungsmittel (40) angepaßt sind, um einen darauffolgenden Schritt der Erzeugung der Endkriterien durchzuführen, basierend auf den von der akzeptierten Wertmarke des neuen Typs hergeleiteten Parametern.

17. Vorrichtung nach Anspruch 15, wobei die Akzeptiermittel (40) angepaßt sind, um Wertmarken des neuen Typs Wertmarke zu akzeptieren, falls Parameter, die von einer empfangenen Wertmarke des neuen Typs hergeleitet sind, die Zwischenkriterien erfüllen und wobei die Erzeugungsmittel (40) angepaßt sind, um einen darauffolgenden Schritt der Erzeugung der Endkriterien durchzuführen, basierend auf den von der akzeptierten Wertmarke des neuen Typs hergeleiteten Parametern, und zwar nur dann, wenn die Parameter Kriterien erfüllen, die sich auf die Zwischenkriterien beziehen, die in einer vorbestimmten Weise restriktiert sind.

18. Vorrichtung nach einem der vorstehenden Ansprüche, wobei die Wertmarke eine Münze oder eine Note ist.

19. Vorrichtung nach einem der vorstehenden Ansprüche, wobei der neue Typ Wertmarke eine Wertmarke ist, die verglichen mit früher akzeptierten Wertmarken eine unterschiedliche

- physikalische Größe, wie beispielsweise unterschiedliches Gewicht, Dicke, Breite, Höhe und/oder Durchmesser,
- monetären Wert,
- elektrische und/oder magnetische Eigenschaften,
- Zusammensetzung des die Wertmarke bildenden Materials, wie beispielsweise ein(e) unterschiedliche(s) Legierung, Metall, Papierqualität und/oder
- optische Eigenschaften wie beispielsweise unterschiedliche Reflexion, Transmission oder Fluoreszenz, wie beispielsweise bei einer oder mehreren vorbestimmten Wellenlänge(n), hat,

und/oder wobei die Wertmarken des neuen Typs ein Wasserzeichen und/oder andere Charakteristiken haben oder nicht haben, wie beispielsweise Vertiefungen, erkennbare Außenkonturen und/oder eingebettete Charakteristiken, wie beispielsweise Metalldrähte.

20. Vorrichtung nach einem der vorstehenden Ansprüche und des weiteren mit Mitteln zum Halten empfangener Wertmarken.

21. Vorrichtung nach Anspruch 20, wobei die Haltemittel angepaßt sind, um diejenigen Wertmarken des neuen Typs Wertmarke zu speichern, deren Parameter von den Erzeugungsmitteln verwendet werden.

22. Vorrichtung nach einem der vorstehenden Ansprüche und ein Bezahltelefon (5) bildend, wobei die Mittel zum Durchführen des Dienstes Mittel sind, die es einem Nutzer ermöglichen, eine Konversation per Telefon durchzuführen.

23. Vorrichtung nach einem der Ansprüche 1 bis 21 und einen Bezahlterminal bei einer Tankstelle bildend, wobei die Mittel zum Durchführen des Dienstes Mittel sind, die es dem Nutzer ermöglichen, Treibstoff zu kaufen.
- 5 24. Verfahren zum Aktualisieren einer Vorrichtung zum Durchführen eines Dienstes, um einen neuen Typ Wertmarke zu akzeptieren, wobei die Vorrichtung angepaßt ist zur Durchführung eines Dienstes beim Empfang und Akzeptieren einer Wertmarke, wobei das Verfahren die Schritte aufweist:
- Empfangen von Ausgangsinformation, die Ausgangskriterien umfaßt, die sich beziehen auf Parameter von Wertmarken eines neuen Typs Wertmarke und daraus Herleiten der Ausgangskriterien,
 - 10 - Empfangen einer Wertmarke,
 - Herleiten eines oder mehrerer, auf die Wertmarke bezogener Parameter,
 - Akzeptieren der Wertmarke, basierend auf einer Bestimmung, ob der eine oder die mehrere(n) hergeleitete (n) Parameter die Kriterien erfüllen,
 - 15 - Durchführen des Dienstes nach dem Akzeptieren einer Wertmarke des neuen Typs,
 - basierend auf den Anfangskriterien, Erzeugen von Endkriterien, basierend auf darauffolgend hergeleiteten Parametern, bezogen auf mehrere, darauffolgend empfangenen Wertmarken des neuen Typs Wertmarke, wobei die Endkriterien restriktiver sind als die Ausgangskriterien und
 - Anpassen der Vorrichtung, um darauffolgend eine Wertmarke des neuen Typs Wertmarke zu akzeptieren, wenn die darauf bezogenen, hergeleiteten Parameter die Endkriterien erfüllen.
- 20 25. Verfahren nach Anspruch 24, wobei die Erzeugung der Endkriterien in mehreren Schritten erzielt wird, wobei die Zwischenkriterien restriktiver sind als die Ausgangskriterien und weniger restriktiv als die Endkriterien.
26. Verfahren nach Anspruch 25, wobei die sich auf einen Schritt beziehenden Zwischenkriterien erzeugt werden durch auf einen vorhergehenden Schritt bezogene Zwischenkriterien und Parameter, die hergeleitet werden von einer oder mehreren empfangenen Wertmarke(n) des neuen Typs und die auf den vorhergehenden Schritt bezogenen Zwischenkriterien erfüllen.
27. Verfahren nach einem der Ansprüche 24-26, wobei die Ausgangsinformation an einem von der Vorrichtung entfernt liegenden Ort erzeugt wird, und die Ausgangsinformation die Ausgangskriterien sowie zusätzliche Information zur Steuerung der Erzeugung der Endkriterien, umfaßt.
28. Verfahren nach Anspruch 27, wobei die Ausgangskriterien erzeugt werden auf der Basis von Parametern, die geliefert werden durch Einführen mehrerer Wertmarken des neuen Typs Wertmarke in wenigstens ein Mittel zum Vorsehen von Parametern.
29. Verfahren nach einem der Ansprüche 24-28, wobei die Erzeugung der Endkriterien auf Parametern basiert, die von einer vorbestimmten Anzahl an empfangenen Wertmarken des neuen Typs, hergeleitet sind.
30. Verfahren nach einem der Ansprüche 24-29, wobei die Erzeugung der Endkriterien auf Parametern basiert, die hergeleitet werden von einer Teilmenge der empfangenen Wertmarken des neuen Typs.
31. Verfahren nach Anspruch 30, wobei die Teilmenge der empfangenen Wertmarken willkürlich aus den empfangenen Wertmarken ausgewählt ist.
32. Verfahren nach einem der Ansprüche 24 bis 31, des weiteren mit dem Schritt des Haltens derjenigen Wertmarken des neuen Typs, deren hergeleitete Parameter bei der Erzeugung der Endkriterien verwendet werden.

50 **Revendications**

1. Dispositif pour effectuer un service lors de la réception et de l'acceptation d'un jeton, le dispositif comportant :
- des moyens (95) pour recevoir un jeton,
 - 55 - des moyens (30) pour dériver un ou plusieurs paramètres relatifs au jeton,
 - des moyens de mémorisation (50) destinés à garder des critères concernant le ou les plusieurs paramètres dérivés, et
 - des moyens (40) pour accepter le jeton sur la base de la détermination du fait que le ou les paramètres dérivés

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remplissent les critères,

- des moyens (70) pour recevoir des informations initiales comportant des critères initiaux concernant les paramètres de jeton d'un nouveau type de jeton,
- des moyens (40) pour, sur la base des critères initiaux, produire des critères finaux sur la base de paramètres dérivés par la suite concernant plusieurs jetons reçus par la suite du nouveau type de jeton, les critères finaux étant plus restrictifs que les critères initiaux, et
- des moyens pour (40, 60) transférer les critères finaux vers les moyens de mémorisation (50), de manière à adapter les moyens d'acceptation pour accepter par la suite un jeton du nouveau type de jeton, lorsque les paramètres dérivés concernant celui-ci remplissent les critères finaux,

caractérisé en ce que le dispositif est adapté pour effectuer le service en réponse à la réception et l'acceptation de chacun de plusieurs jetons reçus par la suite du nouveau type de jeton.

2. Dispositif selon la revendication 1, dans lequel les critères comportent plusieurs intervalles, les moyens (40) pour accepter le jeton étant adaptés pour accepter le jeton si les paramètres dérivés se trouvent dans les intervalles.

3. Dispositif selon la revendication 2, dans lequel les critères initiaux comportent plusieurs intervalles initiaux de dimensions initiales, et dans lequel les moyens de production (40) sont adaptés pour rétrécir les intervalles initiaux.

4. Dispositif selon l'une quelconque des revendications précédentes, dans lequel :

- les moyens de réception (95) sont adaptés pour recevoir des jetons de plusieurs types prédéterminés,
- les moyens de dérivation (30) sont adaptés pour dériver un ou plusieurs paramètres concernant des jetons des types prédéterminés, les paramètres concernant un type de jeton pouvant être distingués de ceux concernant un autre type de jeton,
- les moyens de mémorisation (50) sont adaptés pour garder des critères concernant des paramètres dérivés à partir de chacun des plusieurs types prédéterminés de jetons.

5. Dispositif selon l'une quelconque des revendications précédentes, dans lequel les moyens de production (40) sont adaptés pour produire les critères finaux sur la base de paramètres dérivés de jetons reçus par la suite, dont le nombre est plus petit qu'un nombre total de jetons reçus par la suite du nouveau type de jeton.

6. Dispositif selon l'une quelconque des revendications 1 à 4, dans lequel les moyens de production (40) sont adaptés pour produire les critères finaux sur la base des paramètres dérivés de jetons reçus par la suite, dont le nombre est au moins pratiquement égal au nombre total de jetons reçus par la suite du nouveau type de jeton.

7. Dispositif selon l'une quelconque des revendications précédentes, dans lequel les moyens de production (40) sont adaptés pour produire les critères finaux sur la base de paramètres dérivés d'un nombre prédéterminé de jetons reçus par la suite du nouveau type de jeton.

8. Dispositif selon la revendication 3, dans lequel les moyens de production (40) sont adaptés pour rétrécir les intervalles initiaux en des intervalles finaux de largeurs prédéterminées.

9. Dispositif selon l'une quelconque des revendications précédentes, dans lequel les moyens (70) pour recevoir les informations initiales comportent des moyens pour communiquer avec des moyens d'ordinateur éloignés (80) produisant ou fournissant les informations initiales.

10. Dispositif selon la revendication 9, dans lequel :

- les moyens de production (40) comportent des moyens de commande adaptés pour effectuer des actions définies par un ensemble d'instructions,
- les moyens de production (40) peuvent être commandés par les moyens de commande,
- l'ordinateur éloigné (80) est adapté pour produire ou fournir l'ensemble d'instructions, et
- les moyens (70) pour recevoir les informations initiales sont adaptés pour recevoir l'ensemble d'instructions et envoyer celles-ci vers les moyens de commande.

11. Dispositif selon la revendication 9 ou 10, dans lequel l'ordinateur éloigné (80) est adapté pour produire ou fournir les informations initiales comportant des critères initiaux déterminés sur la base de paramètres dérivés de plusieurs

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jetons du nouveau type de jeton introduits dans un ou plusieurs moyens de dérivation d'un ou plusieurs paramètres concernant les jetons.

- 5
- 12.** Dispositif selon la revendication 10 ou 11, dans lequel l'ordinateur éloigné (80) est adapté pour produire ou fournir, dans l'ensemble d'instructions, des instructions concernant :
- un nombre ultérieur de jetons reçus par la suite du nouveau type de jeton, et/ou
 - des informations concernant ceux des jetons reçus par la suite du nouveau type de jeton,
- 10
- dont les paramètres sont utilisés par les moyens de production (40) dans la production des critères finaux.
- 13.** Dispositif selon l'une quelconque des revendications précédentes, dans lequel les moyens de production (40) sont adaptés pour produire les critères finaux en plusieurs étapes.
- 15
- 14.** Dispositif selon la revendication 13, dans lequel les moyens de production (40) sont adaptés pour produire des critères finaux en une seule étape.
- 15.** Dispositif selon la revendication 13, dans lequel les moyens de production (40) sont adaptés pour, dans une étape, produire des critères intermédiaires représentant des critères plus étroits que les critères initiaux et plus larges que les critères finaux.
- 20
- 16.** Dispositif selon la revendication 15, dans lequel les moyens d'acceptation (40) sont adaptés pour accepter des jetons du nouveau type de jeton, si des paramètres dérivés d'un jeton reçu du nouveau type remplissent les critères intermédiaires, et dans lequel les moyens de production (40) sont adaptés pour effectuer une étape ultérieure consistant à créer les critères finaux sur la base des paramètres dérivés du jeton accepté du nouveau type.
- 25
- 17.** Dispositif selon la revendication 15, dans lequel les moyens d'acceptation (40) sont adaptés pour accepter des jetons du nouveau type de jeton, si des paramètres dérivés d'un jeton reçu du nouveau type remplissent les critères intermédiaires, et dans lequel les moyens de production (40) sont adaptés pour effectuer une étape ultérieure consistant à produire les critères finaux sur la base des paramètres dérivés du jeton accepté du nouveau type, seulement si les paramètres remplissent des critères concernant les critères intermédiaires limités d'une manière prédéterminée.
- 30
- 18.** Dispositif selon l'une quelconque des revendications précédentes, dans lequel le jeton est une pièce ou un billet.
- 35
- 19.** Dispositif selon l'une quelconque des revendications précédentes, dans lequel le nouveau type de jeton est un jeton ayant, comparé aux jetons pouvant être acceptés au préalable, une différence :
- de dimension physique, telle que différence de poids, d'épaisseur, de largeur, de hauteur et/ou de diamètre,
 - de valeur monétaire,
 - de propriétés électriques et/ou magnétiques,
 - de composition du matériau formant le jeton, tel qu'un alliage, un métal, un papier d'une qualité différente et/ou
 - de propriétés optiques telles qu'une réflexion, une transmission, une fluorescence différentes, à une ou plusieurs longueurs d'onde prédéterminées,
- 40
- 45
- et/ou dans lequel les jetons du nouveau type ont ou n'ont pas de filigrane et/ou autres caractéristiques, telles que des creux, des contours extérieurs pouvant être reconnus, et/ou des caractéristiques enrobées, telles que des fils métalliques.
- 50
- 20.** Dispositif selon l'une quelconque des revendications précédentes et comportant en outre des moyens pour retenir les jetons reçus.
- 21.** Dispositif selon la revendication 20, dans lequel les moyens de retenue sont adaptés pour stocker les jetons du nouveau type de jeton dont les paramètres sont utilisés par les moyens de production.
- 55
- 22.** Dispositif selon l'une quelconque des revendications précédentes et constituant un téléphone payant (5), dans lequel les moyens pour effectuer le service sont des moyens pour permettre à un utilisateur d'avoir une conversation téléphonique.

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23. Dispositif selon l'une quelconque des revendications 1 à 21 et constituant un terminal de paiement au niveau d'une station service, dans lequel les moyens pour effectuer le service sont des moyens permettant à un utilisateur d'acheter de l'essence.
- 5 24. Procédé de mise à jour d'un dispositif destiné à effectuer un service de manière à accepter un nouveau type de jeton, le dispositif étant adapté pour effectuer un service lors de la réception et de l'acceptation d'un jeton, le procédé comportant les étapes consistant à :
- 10
- recevoir des informations initiales comportant des critères initiaux concernant des paramètres de jeton d'un nouveau type de jeton et dériver à partir de ceux-ci les critères initiaux,
 - recevoir un jeton,
 - dériver un ou plusieurs paramètres concernant le jeton,
 - accepter le jeton sur la base de la détermination qu'un ou plusieurs paramètres dérivés remplissent les critères, par la suite accepter un jeton du nouveau type, effectuer le service,
 - 15 - produire, sur la base des critères initiaux, des critères finaux sur la base de paramètres dérivés par la suite concernant plusieurs jetons reçus par la suite du nouveau type de jeton, les critères finaux étant plus restrictifs que les critères initiaux, et
 - adapter le dispositif pour accepter par la suite un jeton du nouveau type de jeton, lorsque les paramètres dérivés concernant celui-ci remplissent les critères finaux.
- 20
25. Procédé selon la revendication 24, dans lequel la production des critères finaux est obtenue en plusieurs étapes dans lesquelles les critères intermédiaires sont plus restrictifs que les critères initiaux et moins restrictifs que les critères finaux.
- 25 26. Procédé selon la revendication 25, dans lequel les critères intermédiaires concernant une étape sont produits à partir des critères intermédiaires concernant une étape précédente et de paramètres dérivés à partir d'un ou plusieurs jetons reçus du nouveau type et remplissant les critères intermédiaires concernant l'étape précédente.
- 30 27. Procédé selon l'une quelconque des revendications 24 à 26, dans lequel les informations initiales sont produites à un emplacement situé à distance du dispositif, les informations initiales comportant les critères initiaux et les informations supplémentaires destinées à commander la production des critères finaux.
- 35 28. Procédé selon la revendication 27, dans lequel les critères initiaux sont produits sur la base de paramètres fournis par l'insertion de plusieurs jetons du nouveau type de jeton dans au moins un moyen pour fournir des paramètres.
- 40 29. Procédé selon l'une quelconque des revendications 24 à 28, dans lequel la production des critères finaux est basée sur des paramètres dérivés à partir d'un nombre prédéterminé de jetons reçus du nouveau type.
- 45 30. Procédé selon l'une quelconque des revendications 24 à 29, dans lequel la production des critères finaux est basée sur des paramètres dérivés d'un sous-ensemble de jetons reçus du nouveau type.
- 50 31. Procédé selon la revendication 30, dans lequel le sous-ensemble de jetons reçus est sélectionné de manière aléatoire à partir des jetons reçus.
- 55 32. Procédé selon l'une quelconque des revendications 24 à 31, comportant de plus l'étape consistant à retenir ceux des jetons du nouveau type, dont les paramètres dérivés sont utilisés dans la production des critères finaux.

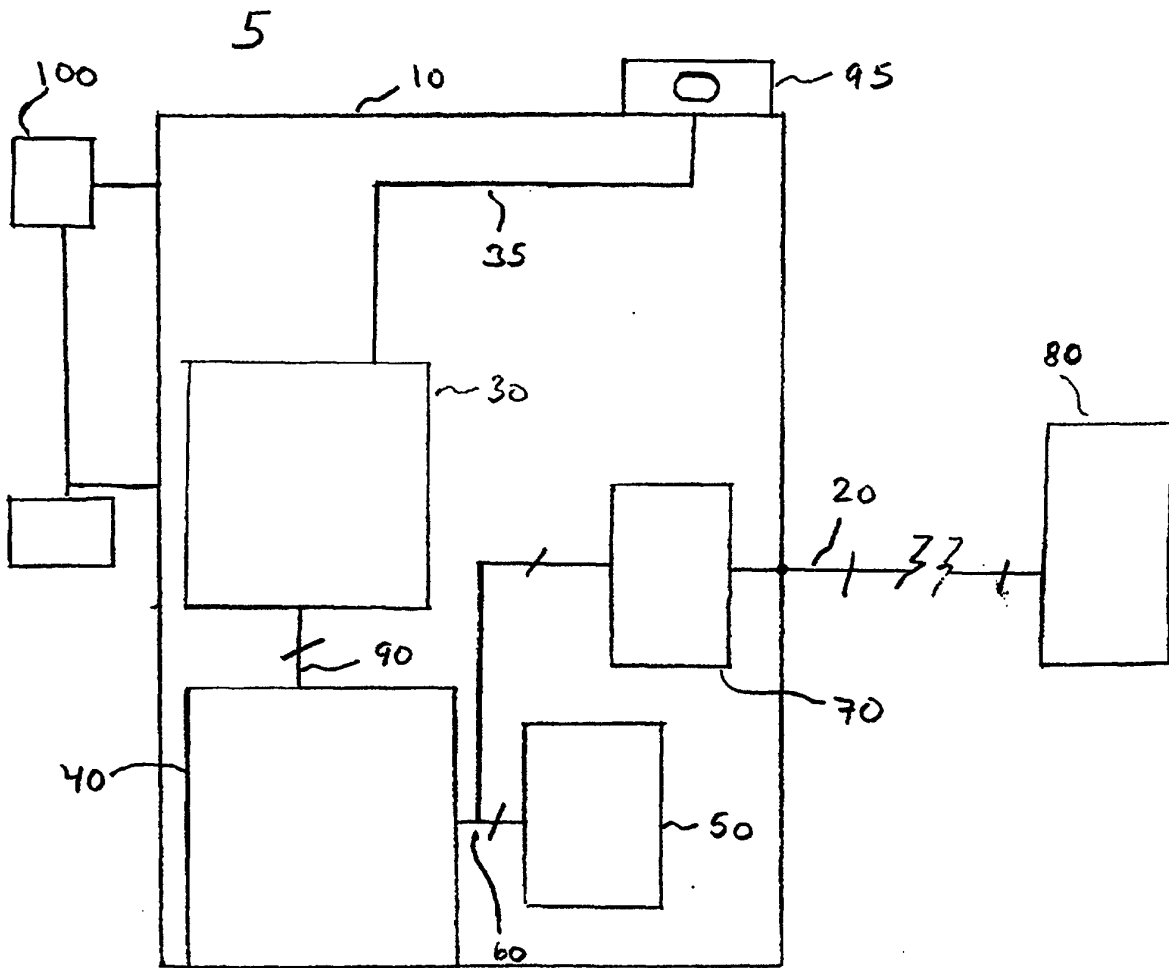


Fig. 1