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(71) Applicant: **Electronic Game Card, Inc.**
New York NY 10003 (US)

(72) Inventor: **Bentley, John**
Barcombe
Near Lewes
Sussex BN8 5EH (GB)

(74) Representative: **Harrison Goddard Foote**
40-43 Chancery Lane
London
WC2A 1JA (GB)

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(54) **Electronic device**

(57) An electronic device comprises a case containing: a printed circuit board 8 having a plurality of tracks 6 and a microprocessor chip 2 programmable with software, the microprocessor chip having a plurality of ports 4 set aside for connection of none or one of more of the set aside ports on the chip to at least one of the plurality of tracks on the printed circuit board in a configuration. The case also contains a power source arranged to power the microprocessor chip and a switch 12, 26 for switch-

ing power from the power source to the microprocessor chip. There is further provided at least one display window 28, each of the at least one display windows being arranged to display successively a respective plurality of characters output from the microprocessor chip ending in the at least one respective final character to be displayed. The configuration in which the none or one or more of the plurality of ports is or are connected to the tracks of the printed circuit board determines the at least one final character to be displayed.

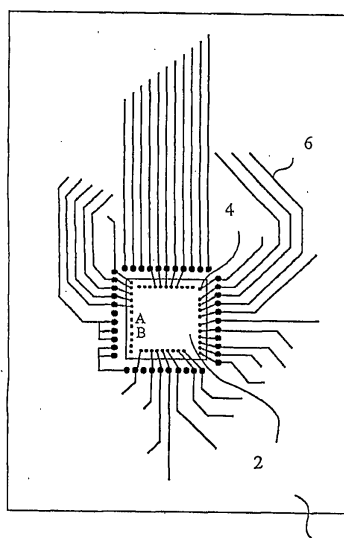


Fig. 1a

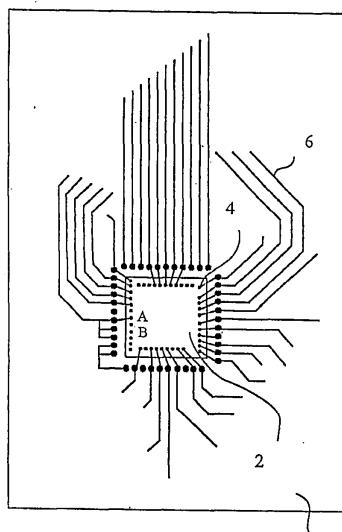


Fig. 1a

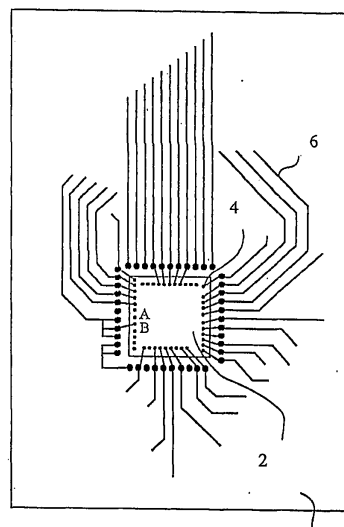


Fig. 1a

Description

[0001] The present invention concerns electronic game devices and in particular an electronic game device that can be used in instant lottery games or promotional games.

[0002] Paper Lottery Tickets are currently produced by a number of international manufacturers for lotteries in almost all countries of the world. Many variations of lottery games exist. Typically "instant win" type of lottery games will utilise a paper ticket that processed through a highly automated printing machine which creates not only the game graphics, but which prints on each individual ticket completely unique game play data usually including a barcode or other unique identifier.

[0003] The unique game play data makes each ticket a potential winner - although since the games are created and the tickets are printed from a "seeded deck" it is predetermined which are winners and which are non-winners. To play the game the purchaser will scratch off a number of latex patches to reveal if the ticket is a winning ticket and if it is present the ticket to a ticket vendor. The barcode is read by a barcode scanner on the lottery terminal to determine which is which so that a winner can be paid his/her winnings in the corner shop.

[0004] In addition, a unique to each ticket VIRN (Void If Removed Number) is contained under a latex patch. This number is designed to be a human enterable code, once the barcode on the ticket is swiped, into the lottery terminal which is used by lotteries as a secondary security device.

[0005] The instant lottery tickets appeal to consumers because they provide an "instant Win" and instant payment of the winnings after the ticket is validated as a winner. However, a paper ticket can typically only contain up to 5 or 6 games on a large ticket - 4" by 6". If many games are required several tickets need to be purchased. In addition paper tickets do not offer a dynamic or interactive element to the gaming experience.

[0006] An alternative is needed that provides the same instant win as present tickets but which can provide for many games and multiple wins and which provides additional attraction to the player. Accordingly the present invention provides a game device for playing a game having one or more win levels the win level of the device having been predetermined, comprising an electronic chip programmed with software for playing one or more games, the game having one or more winning levels and a printed circuit board for mounting the chip, the chip having a plurality of ports that can be connected to the circuit board wherein the ports can be connected to the pcb in a plurality of configurations, the configuration of the connection of the ports of the chip to the pcb determining the win level of the game.

[0007] A game device according to the present invention will generally comprise a pcb and microprocessor chip mounted thereon programmed with software to run the particular game type and these will generally be in-

corporated into a case and further include one or more windows on which characters generated during game play or other information can be displayed and one or more controls such as a button to start or stop game play. Additional devices such as a sound generator may also be included. A power source such as a battery or solar cell or such device will also be included. The components will usually be housed in a case of dimensions similar to a credit card or the like but can be incorporated into any type of case such as a novelty or promotional item.

[0008] The chip will be programmed prior to assembly with characters to be generated for each game, including a winning character or characters if applicable. There can for example, be only one level of win, i.e. either win or lose or there can be several different levels of win.

[0009] As with printed lottery type tickets the devices will be "seeded" so that only certain predetermined devices will be programmed with a winning game or games. For example, 10% could be winning games at a first level of prize, 5% at the second level, 1% at the third and only one device at the highest level. The number of winning games can be varied as desired depending on the programming applied to the chips. In some promotional games it may even be arranged so that all games give at least a base level win but a certain proportion give higher level wins.

[0010] All chips for a particular game type will be programmed with the same software so that it is not necessary to produce a different chip for each win level which reduces the cost of production for each game. To obtain different win levels the chips are bonded to the pcb in different configurations. This is achieved by having a plurality of ports or pins on the chip and a plurality of connections on the pcb so arranged that the chip can be connected to the pcb in a number of different configurations.

[0011] Each chip contains substantially identical software for running the game or games and typically a number of ports/pins can be connected to elements of the device common to each game whether or not a winning game has been predetermined for that device. Other ports will be connected in a number of different configurations. The identity and/or combination of the connected ports determining the win level of a game in accordance with the software programmed on the chip. The configuration of the ports to be connected can be programmed into the assembly apparatus. The configuration of the ports can also be determined by connections made or broken, for example by jumpers, on the pcb. It is possible to obtain tens, hundreds or thousands of different configurations depending on the number of pins and connections to the pcb. In another arrangement the ports/pins on the chip and the connections on the pcb are arranged in a circular fashion so that the chip or board can be rotated relative to each other so that the angular displacement prior to the bonding of the chip to the pcb will determine the configuration in which the chip is bonded to the pcb connections.

[0012] Once connections between the chip and pcb have been made the bonding may be completed by fixing the chip to the pcb using an adhesive such as epoxy resin or the like so that the chip cannot be removed. The chip may also be bonded to the gamecard device so that any attempt to open the device will result in the chip being destroyed and rendered inoperable. The resin and/or the gamecard device are preferable made opaque so that it is not possible to determine the configuration by for example exposure to a strong light source. Additional shielding may also be included in the device

[0013] The chip may also be programmed with an internal security code that is unique to each winning prize and/or prize level so that a winning game will generate a security code comprising a plurality of digits, letters or any other symbols that can be checked against records of codes programmed into the chip held by the game organizer to verify a winning game. All chips may contain a security codes but the configuration of the bonding of the chip to the pcb will determine the security code, if any, that is displayed. Attempts to tamper with the chip or pcb will cause the code not to be displayed. The security code may be displayed in a separate window or alternate with display of characters in one or more other windows.

[0014] The device may also incorporate a random number generator. The random number generator can be used to randomise the sequence in which games are played so that for example if a game device includes 50 games, one of which is a winning game, the winning game could occur on any of the 50 game plays rather than the first or any particular order. More than one winning game may be present on a device. Alternatively or in addition, the random number generator can control the sequence of the characters as they are displayed before stopping on the final character for that game. This ensures that the game plays differently each time and enhances the play appeal.

[0015] The characters can be any combination of digits, letters or other symbols such as a card suit or pictorial representation of a prize and combinations thereof such as a digit or letter and a card suit symbol. The characters generated will appear on a display window or windows provided on the device. Preferably as a game is played each character generated will appear as a series of random characters before coming to rest at the predetermined character and will occur either sequentially or simultaneously for each character position to be generated according to the rules of the game being played.

[0016] Another feature that can be incorporated in the device is that of a timer or countdown mechanism which may also include a calendar. The timer can be set to run from production of the device but since there may be a significant time between production of the gamecard device and its use, in order to preserve the power source it is preferably activated on activation of the gamecard device. Preferably, the timer is of the type which on activation generates a regular series of impulses from which

the timing of events is determined. The timer device can be used to time certain events such as the number of times the gamecard can be played over a predetermined time period, e.g. a number of hours, days or weeks. The timing device can be used in conjunction with a game or series of games played over any period of time but is particularly useful where a number of games are played over a long period of time. For example, as part of a promotional campaign the game device can be activated on a particular day or at a particular time and then permit play of a specified number of games for that day or week etc and winning combinations of characters can be issued each day for that days game in a newspaper or online ensuring that the game is being played in conjunction with the correct winning characters for that day.

[0017] Preferably on activation of the game device the device will reset the chip by momentarily cutting off power to the chip. This clears the chip of any static electricity that has built up during assembly and transit/storage that might prevent the chip from operating and can cause considerable problems which could render sales uneconomic.

[0018] The game device can be provided with an on/off button to activate the device. In a preferred embodiment activation may in addition, or as an alternative to an on/off button, comprise a tab or other device associated with the battery or power source. For example, a tab may be provided that on removal from a battery activates the device. This ensures that the device is not accidentally activated but also acts as an additional security measure so that the user can see that the device has not been interfered with if the tab is intact on purchase. The tab may incorporate a holographic seal or other security features that will indicate if it has been tampered with.

[0019] The game device can be powered by any suitable power source such as a battery, e.g. a watch type battery or the like.

[0020] Various security measures in addition to any internal security code that may or may not be included can be incorporated in or on the game device to ensure the gamecard correlates with a winning device when presented and also to make apparent if attempts have been made to tamper with the gamecard or to "read" if a gamecard includes a winning game. These include incorporation of a temperature sensitive indicator that will change colour if a temperature above a predetermined limit has been applied to the device. Such indicators are available as discs that can be affixed to a surface of the device. To detect attempts to bend or distort the game device one or more areas of the gamecard may include a lacquer or ink that will crack and or fall off the gamecard if the card is significantly bent or distorted. Such ink or lacquers may for example be used to print the game rules on the gamecard or as a stripe or border around the edge of the gamecard.

The gamecard may also be produced with a unique barcode on the back of each unit. A conventional VIRN can also be printed on the back and covered with a latex

patch. A range of ink jet or holographic markings can also be encrypted onto the exterior surface of the card device as an additional precaution to control the use of the device from manufacture through to return to the game organisers for verification and payment of a prize.

[0021] In another aspect of the invention there is provided a method of producing a game device for playing a game having one or more win levels in which the win level of the device being predetermined which method comprises providing a chip programmed with software to run the game device including said one or more win levels and connecting a plurality of ports on the chip to a plurality of tracks on the pcb in a set configuration according to the win level that has been predetermined for the device.

[0022] The devices of the present invention can be produced using conventional assembly apparatus which makes connections between the chip and pcb under control of a software programme. The software controlling the assembly apparatus is adapted to permit multiple configuration of the connections between the pcb and the ports determining win level so that a predetermined proportion of devices in a given run can be assigned a particular win level.

[0023] The invention will now be described by way of example with reference to the accompanying drawings in which:-

Figure 1a - 1c show an example of schematic plan of chip connections to PCB of a game device of the present invention.

Figure 2, is front elevation of a game card incorporating a device of the present invention

Figure 3, is a side elevation of the device of Figure 2.

[0024] In the device shown in Figures 1a to 1c a chip 2 having been programmed with all software necessary for running a chosen game of the type requiring the matching of three numbers is shown.

[0025] The chip has a number of ports 4 that are connected to the tracks of a PCB 8 having number of tracks 6 on it.

[0026] The ports on the chip 4 are bonded using thin wire elements onto the PCB to control the function of the device - e.g. operate the LCD, buttons, connect power, sound etc

[0027] A number of the ports A to F are set aside for determining the prize level. The combinations in which these ports are bonded to the tracks on the PCB determine which level of prize the device will show. For example in Fig 1a shows none of the ports A through F bonded, this results in a non winning combination. Fig 1b shows port A is bounded to track W to produce a prize winning combination matching 3 numbers e.g. of 11, 11,11. In Figure 1c port B is bounded to track X to give a prize winning combination of 22, 22, 22. It is not necessary to

have one port for each prize level, combinations of parts can be used. Depending on the number of ports set aside for prize determination the number of bonding combination that can be used runs into the hundreds, for example 7 ports will allow for 128 different unique combination, 8 ports 256, etc. A device can include more than one winning combination if a plurality of plays have been programmed into the device.

[0028] Once the chip is in placed on the PCB and bonded to the required tracks the PCB (and tracks) are set in resin.

[0029] Alternatively the tracks of the PCB and parts/pins of the chip can be arranged, for example in a circular arrangement, so that relative rotation of the chip and PCB results in the ports determining prize level being bonded to different tracks appropriate for a given prize level.

[0030] Referring to Figures 2 and 3 a rectangular gamecard device of the present invention.

[0031] The device takes the form of a game card formed of front 20 and rear 22 halves between which the electronic components [PCB, LCD, Chip, and Battery] are sandwiched to have an approximate thickness of 3mm and a surface area similar to a credit card.

[0032] The PCB and/or chip can also be bonded to either or both halves so that attempts to separate the two halves will destroy the chip and/or PCB.

[0033] The gamecard device includes a play-push button 24, an On button 26.

[0034] Display windows 28 are spaced along the length of the device. Alternatively a single display window capable of displaying a plurality of characters can be provided. Typically the display windows 28 will be a LCD type display and display characters generated during game play.

[0035] Different play mechanics can be used in the device shown, in this example the figures in each of the windows have to match each other to produce a winning combination e.g. 77, in each of the three windows. Alternatively the game can be designed to replicate a number of different play styles, such as:

- Key number match - whereby the player has to match the number produced on the device to an external number placed for example on a website
- Beat the score - the windows are divided into 2 play areas, the players and the computer. The players score has to be higher than the computers to win
- Find and win - the windows are divided into a several of sections and the player has to decide which of the windows as symbol will appear

[0036] A battery activation tab 12 is also shown which is pulled out to allow contact to be made with an internal battery to activate the device.

[0037] To play game, the player first removed the battery tag 12. The windows 28 display the number of play on the device in this example PLAY 25. The player then presses the play button 26 and the characters in the win-

dows 28 appear to spin. The characters come to rest in the first window then after a small delay characters appear in the second and third windows. One of two outcomes will occur;

1. The characters in the windows 28 do not match one another. In this case the player has not won. After approx. 2 seconds the windows 28 will display the number of plays left e.g. PLAY 24, PLAY 23.... The player then presses the play button 24 again for another set of characters
2. All three characters match resulting in the player winning. The prize will be decided upon by the promoter at the time of promotion. Depending on which characters match will determine the prize level, for example match 77 77 77 means the player has won \$10 whereas match 55 55 55 means the player has won a t-shirt. At this point in the windows 28, the characters flash for a couple of seconds and then the word WIN appear in the windows, followed by a security code relating to the prize level won for a further couple of seconds. The window will then revert back to displaying the winning characters, followed by the word WIN and security code. It will repeat the cycle for 20seconds upon which it will turn itself off. Pressing the On button 26 will re power the device and the windows will revert back to displaying the above sequence.

[0038] If at any point none of the buttons 24 or 26 are pressed for 20 seconds then the device will turn itself off to save on the life of the battery. Pressing the On button 26 will re-power the unit and it will return to the same status immediately prior to turning it self off.

[0039] The prize amount, numbers of winners of each different prize and the distribution of devices is determined by the promoter and prizes are distributed according to their game rules and procedures and whatever local legalisation needs to be complied with.

Claims

1. An electronic device comprising a case containing:

a printed circuit board (8) having a plurality of tracks (6);
 a microprocessor chip (2) programmable with software, the microprocessor chip having a plurality of ports (4) set aside for connection of none or one of more of the set aside ports on the chip to at least one of the plurality of tracks on the printed circuit board in a configuration;
 a power source arranged to power the microprocessor chip;
 switching means (12, 26) for switching power from the power source to the microprocessor chip; and

at least one display window (28), each of the at least one display windows being arranged to display successively a respective plurality of characters output from the microprocessor chip ending in the at least one respective final character to be displayed;
 wherein the configuration in which the none or one or more of the plurality of ports is or are connected to the tracks of the printed circuit board determines the at least one final character to be displayed.

2. An electronic device as claimed in claim 1, wherein the microprocessor chip (2) is programmable with an internal security code and is arranged so that a display of a particular final character causes generation of a security code for display.
3. An electronic device as claimed in claim 2, wherein the configuration of the bonding of the chip (2) to the printed circuit board (8) determines the security code.
4. An electronic device as claimed in any of the preceding claims, further comprising a random number generator arranged to control a sequence of characters displayed before ending on the final character.
5. An electronic device as claimed in any of the preceding claims, further comprising a timer or countdown mechanism arranged to determine a number of times the device can be used over a predetermined time period.
6. An electronic device as claimed in claim 5, wherein the timer or countdown mechanism is arranged to allow activation of the device on a predetermined day and to permit use for a predetermined number of times on that day.
7. An electronic device as claimed in any of the preceding claims, wherein the switching means comprises a tab (12) that on removal from a battery activates the device.
8. An electronic device as claimed in claim 7, wherein the tab (12) incorporates a holographic seal or other security feature arranged to indicate whether the tab has been tampered with.
9. An electronic device as claimed in any of the preceding claims including security measures to make apparent attempts to tamper with the device or to determine, before the device is activated, a final character to be displayed.
10. An electronic device as claimed in claim 9, wherein the security measures include one of a temperature

sensitive indicator and lacquer or ink to indicate tampering by bending or distorting the device.

11. An electronic device as claimed in any of the preceding claims wherein the microprocessor chip 5 bonded to the printed circuit board tracks is set in resin.
12. An electronic device as claimed in any of the preceding claims wherein the ports (4) are arranged on the microprocessor chip (2) and connections are arranged on the printed circuit board (8) in a circular fashion such that rotation of the microprocessor chip with respect to the printed circuit board determines the configuration in which the microprocessor chip 10 is bonded to the printed circuit board connections. 15
13. An electronic game card as claimed in any of the preceding claims further including a push button (24) to activate and de-activate the device. 20

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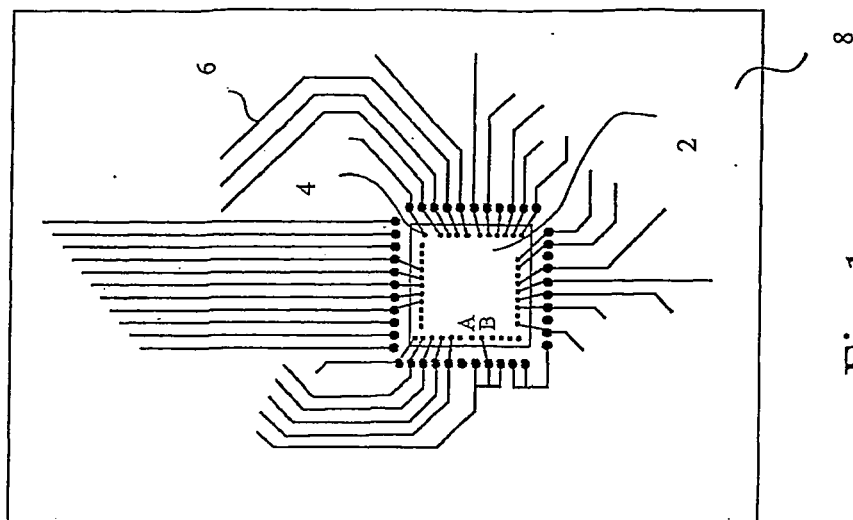


Fig. 1a

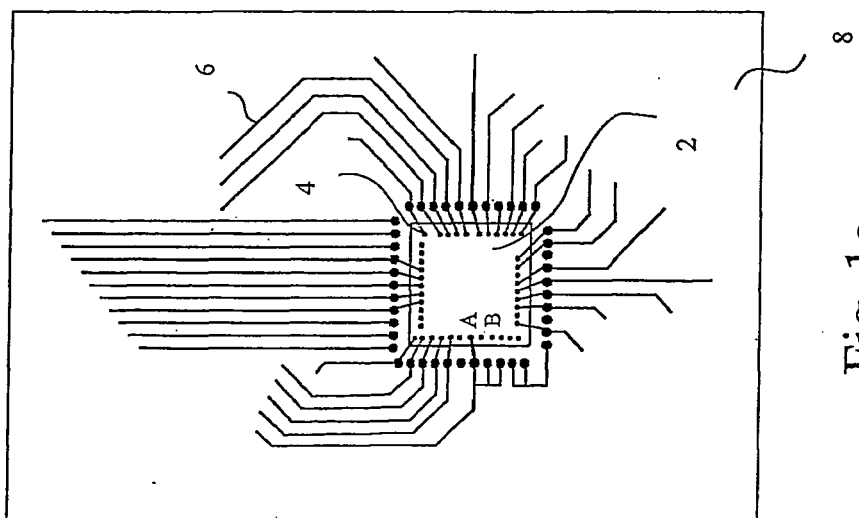


Fig. 1a

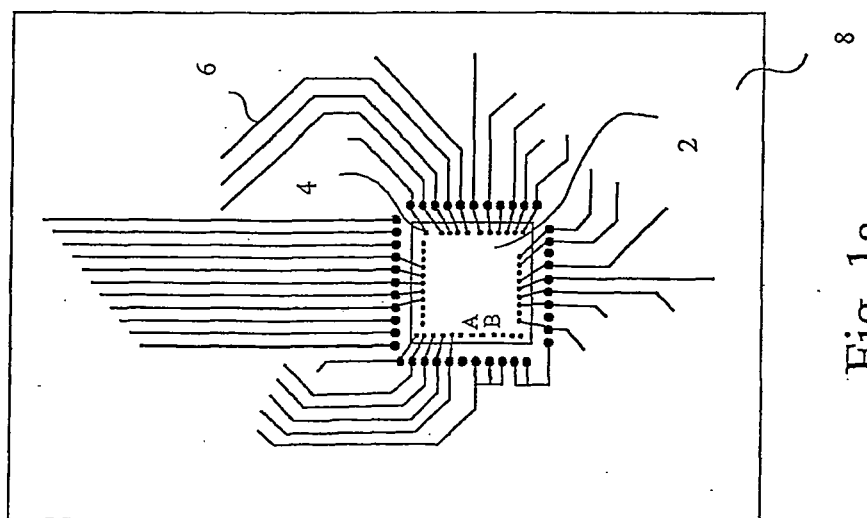


Fig. 1a

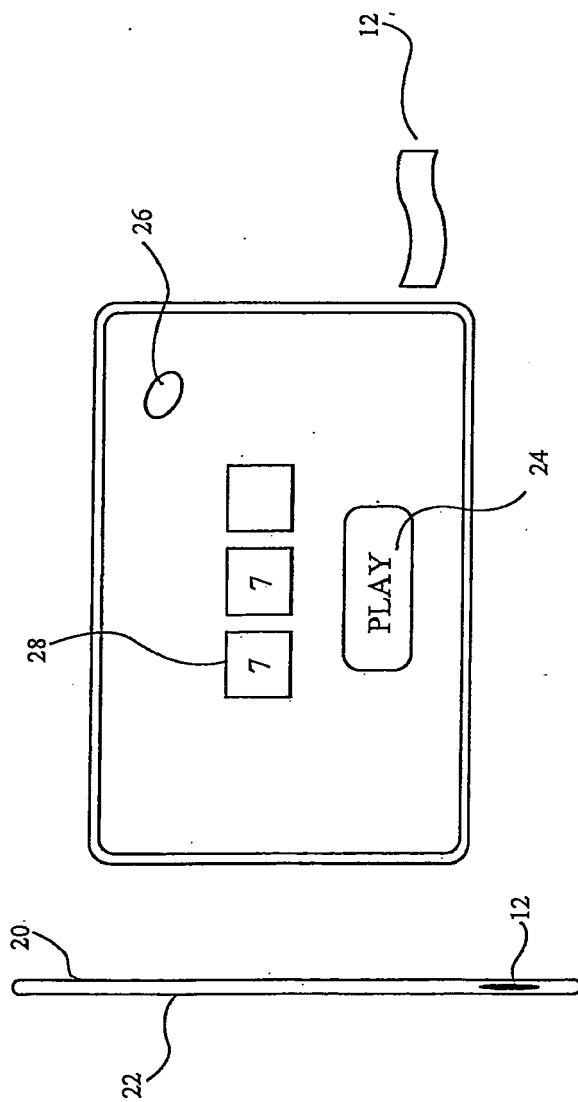


Fig. 2

Fig. 3



EUROPEAN SEARCH REPORT

Application Number
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Place of search Munich		Date of completion of the search 27 May 2009	Examiner Lavin Liermo, Jesus
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)



EUROPEAN SEARCH REPORT

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<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 08 01 8369

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on

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