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SPECIFICATION

Title of the Invention

CPU CHIP PARTS FOR ELECTRONIC GAME MACHINE AND SUBSTRATE LOADED WITH SAID CPU CHIP PARTS USABLE FOR ELECTRONIC GAME MACHINE

Field of the Invention

The present invention relates to a technology applicable to an electronic game machine such as a "pachinko" game machine or a slot machine. More particularly the invention relates to a CPU chip parts usable for an electronic game machine to function as a main controller for serially controlling execution of games and also to a substrate usable for an electronic game machine incorporating said CPU chip parts loaded on a printed circuit board.

Background Art

In order to electronically control operation, any of modern game machines such as a "pachinko" game machine or a slot machine uses a microcomputer. Generally, any conventional microcomputer comprises a CPU for mainly executing control and arithmetic logical operations, a ROM for storing programs, and a RAM for reading and writing data, which are respectively loaded on a printed circuit board by way of being assembled into an integrated circuit.

Independent of such a ROM (hereinafter called a "game control ROM") storing game programs for controlling execution of games, in order to ensure security of an electronic game machine, any of the above-cited electronic game

machines incorporates another ROM that stores programs for checking propriety of programs by way of accessing the above-referred game-control ROM at the time of feeding power source. Conventionally, such a packaged CPU chip parts comprising a CPU and the latter ROM has been used by way of loading respective functions of a RAM on a single CPU chip if deemed necessary.

Fig. 19 through Fig. 21 respectively exemplify structure of a CPU chip parts 105 cited above. A plurality of pins 101 are projectively set along external circumference of a flat package 102. A CPU chip 103 cited above and a plurality of lead wires 104 interconnecting the CPU chip 103 and the pins 101 are set inside of the flat package 102.

When power source is fed, the CPU chip 103 checks game programs by accessing the above-referred game-control ROM mounted as a ROM chip parts on the identical control substrate. If game programs were identified to be proper, the CPU chip 103 decodes to execute game programs so that a predetermined game can be proceeded.

In Japan, contents of games executed by any of conventional electronic game machines such as "pachinko" game machines or slot machines have been controlled by laws on "business affecting public morals", thereby manufacturers of electronic game machines respectively set up game programs within the scope of the above regulations and manufacture chip parts and control substrates before eventually delivering electronic game machines conforming to the above laws to end-users such as the one running "pachinko" game halls for example.

Nevertheless, there are some vicious end-users who extract the above-referred control substrates from electronic game machines delivered from game-machine manufacturers and falsely remodel CPU chip parts so that illegal games

can be executed.

More particularly, illegality is committed by way of executing the following method. The above-referred package 102 of the CPU chip parts 105 contains hollow portion S solely composed of molded resin in which neither the CPU chip 103 nor the lead wire 104 is provided. For example, back surface of the package 102 is scraped off so that a hole can be provided in the hollow portion S to internally secure a chip parts of a game-control ROM 106 storing false game programs (hereinafter called "illegal ROM chip parts") without externally being discerned.

In addition, as shown in Fig. 22 for example, although being thin, there is hollow portion T solely composed of molded resin in the CPU chip parts 105 at the position in which the CPU chip 103 is accommodated. As was done in the above-cited illegal case, it is anticipated that illegality may also be committed by way of scraping back surface of the package 102 to provide a hole in the hollow portion T so that the above-referred illegal ROM chip parts can be accommodated therein.

Such an illegally remodeled game machine cited above permits the game-machine to execute illegal game operation by accessing game programs of the above-referred illegal ROM chip parts 106 on the way of checking security at the time of feeding power source by way of causing the CPU chip 103 to erroneously identify that the game programs are correct and proper by means of accessing the proper game- control ROM chip loaded on the control substrate.

OBJECT OF THE INVENTION

It is an object of the invention to overcome the above problems by providing a CPU chip parts solely usable for an electronic game machine wherein the CPU chip parts prevents the above-referred illegal ROM chip parts from being accommodated

in the portion on the back surface of the above-referred package in which neither a CPU chip nor a lead wire is present.

It is a second object of the invention to provide a CPU chip parts solely usable for an electronic game machine and a substrate loadable on an electronic game machine respectively being capable of readily detecting the above-referred illegal ROM chip parts even when internally being accommodated in the portion on the back surface of said package in which neither a CPU chip nor a lead wire is present or in the portion in which a CPU chip is preset or even when the illegal ROM chip is externally set to any location on the back surface of said package.

DISCLOSURE OF THE INVENTION

The invention corresponding to Claims 1 through 8 relates to a CPU chip parts usable for an electronic game machine wherein the CPU chip parts comprises a flat package having a plurality of pins projectively being secured on the external surface thereof, a CPU chip internally being secured inside of the package, and lead wires respectively interconnecting the CPU chip and the pins. The CPU chip parts usable for an electronic game machine corresponding to Claim 1 is provided with a through-hole penetrating the package in the direction of thickness thereof in the portion in which neither the CPU chip nor the lead wire of the package is accommodated.

According to the above structure, space for accommodating such an illegal ROM chip parts is significantly reduced, thereby illegal act can be prevented from being committed. Moreover, even when such an illegal ROM chip parts is fixed on the back surface of the package or by way of using the above-referred through-hole, presence of the illegal ROM chip parts can be identified via the through-hole from

the upside, and thus, illegal act can readily be detected, and yet, illegal act can effectively be suppressed as well.

The CPU chip parts usable for an electronic game machine corresponding to Claim 3 designates an illegality-detection mark which is erasable by act of scraping back surface of the package on the back surface thereof at the position internally accommodating a CPU chip.

According to the above structure, even when an illegal ROM chip parts is internally set by scraping the CPU-chip-secured position on the back surface of the package, the illegality-detection mark is erased by the scraping, thus facilitating detection of illegality. This will also anticipates an effect for restraining illegal act.

As a preferred embodiment of the invention corresponding to Claim 3, the invention corresponding to Claim 4 provides the above-referred mark formed with projections and recesses carved on the back surface of the package so that the mark can securely be erased when the back surface of the package is scraped off. In addition, by way of another preferred embodiment, the invention corresponding to Claim 5 forms the above-referred mark by irradiating the back surface of the package with laser beam. According to this structure, in the same manner as was done for Claim 4, the mark can securely be erased by the act of scraping, and yet, it is not easy to restore the identical mark after scraping off the back surface of the package.

According to the CPU chip parts usable for an electronic game machine set forth in Claim 7, whole or part of a plurality of pins are projectively set to the back surface of the package. This will lead to reduction of space available for internally accommodating an illegal ROM chip parts by the space occupied by the pins.

The above-referred package in the CPU chip parts usable for an electronic

game machine corresponding to Claims 1, 3, and 7, is preferably provided with fully or partially colored external surface, thereby facilitating detection of illegal act when the genuine CPU chip parts is replaced by an illegal colorless CPU chip parts.

The invention corresponding to Claims 9 through 11 relates to a substrate usable for an electronic game machine wherein the substrate comprises a CPU chip parts comprising a flat package having a plurality of pins projectively being set to external surface thereof, a CPU chip and lead wires for interlinking the CPU chip with the pins respectively being set inside of the package, and a printed circuit board on which the CPU chip parts is loaded.

In the structure of the substrate usable for an electronic game machine corresponding to Claim 9, a through-hole enabling perspective observation of the whole of the package is formed at the position at which the CPU chip parts of the printed circuit board is secured.

According to the above structure, even though an illegal ROM chip parts is set to the back surface of the package or inside of the through-hole, presence of the illegal ROM chip parts can be identified via the through-hole from the back surface of the substrate.

In the structure of the substrate usable for an electronic game machine corresponding to Claim 10, through-holes are formed at the position at which the CPU chip parts of the printed circuit board is secured, wherein the through-holes enable perspective observation of partial portion of the back surface of the package corresponding to the portion where neither the CPU chip nor the lead wire of the CPU chip parts is internally accommodated.

According to the above structure, even though an illegal ROM chip parts is set to the back surface of the package corresponding to the portion where neither

the CPU chip parts nor the lead wire of the CPU chip parts is internally set, presence of the illegal ROM chip parts can be identified via the through-holes from the back surface of the loaded substrate.

In the structure of the substrate usable for an electronic game machine corresponding to Claim 11, a through-hole is formed at the position where the CPU chip parts of the printed circuit board is secured, wherein the through-hole enables perspective observation of partial portion of the back surface of the package corresponding to the position at which the CPU chip is internally accommodated.

According to the above structure, even though an illegal ROM chip parts is set to the back surface of the package corresponding to the position at which the CPU chip is internally secured, presence of the illegal ROM chip parts can be identified via the through-hole from the back surface of the loaded substrate.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a front view representing appearance of a slot machine incorporating the CPU chip parts related to the invention;

Fig. 2 is a block diagram designating electrical structure of the slot machine shown in Fig. 1;

Fig. 3 is a front view representing appearance of the CPU chip parts;

Fig. 4 is a plan representing appearance of the CPU chip parts;

Fig. 5 is a sectional view along line A-A shown in Fig. 4;

Fig. 6 is a plan designating internal structure of portion B shown in Fig. 4;

Fig. 7 is a bottom-surface view of the CPU chip parts;

Fig. 8 is a sectional view along line C-C shown in Fig. 7;

Fig. 9 is a bottom-surface view of the CPU chip parts designating another

embodiment of an illegality detection mark;

Fig. 10 is a front view representing appearance of the CPU chip parts according to another embodiment;

Fig. 11 is a plan representing appearance of the CPU chip parts shown in Fig. 10;

Fig. 12 is a sectional view along line D-D shown in Fig. 11;

Fig. 13 is a plan designating internal structure of portion E shown in Fig. 11;

Fig. 14 is a sectional view of the CPU chip parts according to another embodiment;

Fig. 15 is a sectional view of the CPU chip parts according to another embodiment;

Fig. 16 is a sectional view of the CPU chip parts according to a still further embodiment;

Fig. 17 is a partial sectional view representing a chip-loaded substrate usable for an electronic game machine;

Fig. 18 is a partial sectional view representing a chip-loaded substrate according to another embodiment;

Fig. 19 is a plan designating appearance of a conventional CPU chip parts internally accommodating an illegal ROM chip parts;

Fig. 20 is a sectional view along line F-F shown in Fig. 19;

Fig. 21 is a plan designating internal structure of portion G shown in Fig. 19; and

Fig. 22 is a front view representing appearance of a conventional CPU chip parts.

BEST FORM FOR EMBODYING THE INVENTION

Fig. 1 represents appearance of a slot machine using the CPU chip parts related to the invention.

It should be noted that the CPU chip parts according to the invention is applicable not only to a slot machine but also to any kind of electronic game machine such as a "Pachinko" game machine or the like for example.

The slot machine exemplified in Fig. 1 is structured by way of setting a door 2 to the front aperture of a box-form machine body 1 so that the door 2 can be opened or closed as required. Front surface of the door 2 is provided with a reel-display window 3, a medal-inserting port 4, a starting lever 5, switches 6a, 6b, and 6c corresponding to 3 stopper buttons, a medal eject port 7, and a medal receiving tray 8.

A total of 5 stop lines L1 through L5 are designated on the reel display window 3 in the upper/middle/lower ranks and in the oblique direction. When a single piece of medal is inserted, a stop line L1 in the center is effective. When two pieces of medal are inserted, 3 stop lines L1 through L3 in the upper/middle/lower ranks respectively become effective. When 3 pieces of medal are inserted, all the 5 stop lines L1 through L5 become effective.

In alignment with position of the reel display window 3, three reels 9a, 9b, and 9c, are built inside of the machine body 1. A plurality of symbols are illustrated on the peripheral surfaces of respective reels 9a, 9b, and 9c. When the reels are brought to a stop, symbols corresponding to three frames align themselves on the 5 stop lines L1 through L5.

When a certain number of medals are inserted via the medal inserting port 4, stop lines corresponding to the number of inserted medals become effective. When

the starting lever 5 is operated, all the three reels 9a, 9b, and 9c, simultaneously start up themselves. In the following sequence, whenever any of the stop-button switches 6a, 6b, and 6c, is operated, any of the corresponding reels 9a, 9b, and 9c, discretely comes to a stop. While all the reels 9a, 9b, and 9c, remain in a stop, simultaneous with formation of assortment of predetermined symbols, a medal-ejecting unit (not shown) provided inside of the machine body 1 starts up operation to eject a predetermined number of medals onto the medal receiving tray 8 via the medal eject port 7.

Fig. 2 diagrammatizes an example of electrical structure of the above-referred slot machine. The reference numeral 10 shown in Fig. 2 designates a controller comprising a CPU 11 mainly executing control and arithmetic logical operations, a ROM 12 storing programs needed for controlling security, a RAM 13 used for reading/writing data, and another ROM 15 for controlling game sequence by way of storing game programs.

In the structure of the controller 10, the CPU 11 and the ROM 12 are integrally loaded on a control substrate in the form of a single CPU chip parts 14. In addition, in the form of discrete chip parts, the game-controlling ROM 15 and the RAM 13 are respectively loaded on the identical control substrate.

Not only the above-referred starting lever 5 and three of the stop-button switches 6a, 6b, and 6c, but a reel-driver 16 for driving the above-referred three reels 9a, 9b, and 9c, and the medal-ejecting unit 17, are also discretely connected to the controller 10 via a bus 20.

Based on an operating signal from the starting lever 5 or any of the stop-button switches 6a, 6b, and 6c, the CPU 11 outputs a control signal to the reel-driver 16 so that startup or stopping operation of respective reels 9a, 9b, and 9c, can

be controlled. In addition, using drive timing data for driving respective reels and symbol arrangement data stored in the game-controlling ROM 15, the CPU 11 identifies per reel whether prize-winning symbol assortment has been formed on the effective stop line or not. When the prize-winning symbol assortment is identified, the CPU 11 drives the medal-eject unit 17 to externally deliver a predetermined number of medals.

Fig. 3 through Fig. 6 respectively illustrate concrete examples of the above-referred CPU chip parts 14. Fig. 3 and Fig. 4 respectively illustrate appearance of the CPU chip parts 14, whereas Fig. 5 and Fig. 6 respectively illustrate internal structure of the CPU chip parts 14. Note that Fig. 6 illustrates internal structure of a portion designated by chained lines B shown in Fig. 4. Other portions are also provided with the same internal structure.

The exemplified CPU chip parts 14 comprises a synthetic-resin molded package 31 having flat rectangular shape and a plurality of pins 33 which respectively make up externally connected terminals. The package 31 internally accommodates a CPU chip 32 and a plurality of lead wires 34. The package 31 is made from molded synthetic resin material containing insulating property, where the whole external surface of the package 31 is complete with aventurine-lacquer finish. The center portion of the package 31 is mirror-polishable as required so that characters or marks can be displayed.

The above-referred pins 33 are disposed along long-sides of external periphery of the package 31. As shown in Fig. 5, base-end portions of respective pins 33 are secured inside of molded resin, where respective pins 33 are folded at the center of length by substantially a right angle in such a manner to orient tapered tip portions downward.

The above-referred CPU chip 32 has thinly-formed sheet-like shape, which is positioned in the center of the package 31, while the whole of the CPU chip 32 is buried inside of the resin-molded package 31.

As shown in Fig. 6, one-ends of the lead wires 34 are respectively connected to appropriate portions of the CPU chip 32, whereas the other ends are respectively connected to base-end portions of respective pins 33. Whole of the lead wires 34 are buried inside of the resin-molded package 31 in conjunction with the CPU chip 32. The pins 33 and the lead wires 34 are molded from identical conductive material.

The portion designated by chained lines S shown in Fig. 4 is substantially hollow portion solely comprising molded resin in which neither the CPU chip 32 nor the lead wire 34 is accommodated. Each hollow portion S is provided with a through-hole 35 penetrating in the direction of the thickness of the package 31. Each through-hole 35 substantially extends across the whole of the hollow portion S. Each through-hole 35 is formed in the course of forming up the package 31.

As shown in Fig. 7, an illegality-detection mark 40 erasable by scraping the back surface 31b off from the package 31 is displayed at the position where the CPU chip 32 is internally secured on the back surface 31b of the package 31.

As shown in Fig. 8, in consideration of the presence of hollow portion consisting of thinly molded resin, the illegality detection mark 40 is formed beneath the position at which the CPU chip 32 of the package 31 is accommodated. When the hollow portion is scraped off in order to internally set an illegal ROM chip parts, the erasable mark 40 is effective for detecting illegality.

The exemplified illegality detection mark 40 consists of projections and recesses carved on the back surface 31b of the package 31. By effect of forming

such a portion capable of forming the mark 40 in the mold for forming up the package 31, the projected and recessed mark 40 is formed simultaneous with formation of the package 31.

Fig. 9 exemplifies another embodiment of the illegality detection mark 40. In Fig. 9, by effect of mirror-polishing process executed against a portion corresponding to the position at which the CPU chip 32 is internally secured, a mirror-surface portion 31c is formed on the back surface 31b of the package 31. The illegality detection mark 40 is formed by irradiating the mirror-surface portion 31c with laser beam.

According to the embodiment shown in Fig. 9, no matter how an attempt is exerted to restore the identical mark 40 after scraping the back surface 31b off from the package 31, unless making use of an expensive laser-irradiation unit, the mark 40 cannot be restored at all, thus making it possible to anticipate practical effect of suppressing illegal act from being committed.

In the above-referred embodiment, a through-hole 35 is formed by way of penetrating the package 31 in the thickness direction in the hollow portion S in which neither the CPU chip 32 nor the lead wire 34 is accommodated, and yet, the illegality detection mark 40 erasable by act of scraping the back surface 31b off from the package 31 is displayed at a specific position of the back surface 31b of the package 31 at which the CPU chip is internally accommodated. However, it should be understood that the scope of this embodiment is by no means limited to the above structure, but it is also practicable to merely form the through-hole 35 in the package 31 and merely designate the illegality detection mark 40 on the back surface 31b of the package 31.

Fig. 10 through Fig. 13 respectively exemplify other embodiments of the CPU

chip parts 14 related to the invention.

In the exemplified CPU chip parts 14, all the pins 33 are projectively set to the back surface 31b of the package 31. This in turn results in the reduced space on the back surface 31b of the package 31 needed for internally or externally fixing an illegal ROM chip parts.

According to the embodiments shown in Fig. 10 through Fig. 13, a through-hole 35 is formed in the portion S in which neither the CPU chip 32 nor the lead wire 34 of the package 31 is present, wherein the through-hole 35 penetrates the package 31 in the direction of thickness. However, as is designated by chained lines shown in Fig.12, by way of arranging projective position of all the pins 33 on the back surface 31b of the package 31 to be closer to the width center, it is possible to delete provision of the through-hole 35 or contract diameter thereof to effectively prevent proper strength of the package 31 from being lowered.

Fig. 14 exemplifies an embodiment in which the above-referred through-hole 35 is deleted by way of setting projective position of the whole pins 33 on the back surface 31b of the package 31 substantially in the center portion of width. According to this embodiment, the pins 33 on both sides are wholly accommodated inside of the package 31 in such a manner in which base-end portions are inwardly bent.

Fig. 15 exemplifies an embodiment in which diameter of the through-hole 35 is contracted by arranging positions of all the projective pins 33 on the back surface 31b of the package 31 close to the center portion. In this embodiment, respective pins 33 on both sides are internally accommodated inside of the package 31 in such a manner in which base-end portions are inwardly bent.

Fig. 16 exemplifies another embodiment of the CPU chip parts 14

projectively set to the back surface 31b of the package 31. In the exemplified CPU chip parts 14, respective pins 33 externally project themselves from both-side surfaces of the package 31, which are then folded along the back surface 31b from both-side surfaces of the package 31 and then further bent in the downward direction.

The above embodiments projectively set all the pins 33 on the back surface 31b of the package 31. However, method for setting the pins 33 is not only limited to the above embodiments, but it is also practicable to projectively set only those pins 33 corresponding to potential position at which an illegal ROM chip parts may be set on the back surface 31b of the package 31, whereas those pins 33 corresponding to other positions may projectively be set on lateral surfaces of the package 31.

In the above embodiments, as was done for any conventional example, the whole of the package 31 is monochromatically colored either in black or in gray. If the package 31 were wholly or partly colored in bright color such as red for example, it will facilitate easier detection of an illegally replaced CPU chip parts.

Further, in order to facilitate easier detection of such an illegal ROM chip parts loaded on the back surface 31b of the CPU chip parts 14, a novel device can be applied to any printed circuit board loaded with the CPU chip parts 14.

Fig. 17 exemplifies a chip-loaded substrate 50 usable for an electronic game machine having the CPU chip parts 14 loaded on a printed circuit board 41.

In the above-exemplified substrate 50, a through-hole 42 is formed in the position at which the CPU chip parts 14 is loaded on the printed circuit board 41 so that substantially the whole of the package 31 can perspectively be observed. The back surface 31b of the CPU chip parts 14 can easily be observed via the through-

hole 42.

Fig. 18 exemplifies another embodiment of the chip-loaded substrate 50. A pair of first through-holes 42a/42a are formed in the position at which the CPU chip parts 14 is loaded on the printed circuit board 41, where the through-holes 42a/42a enable a viewer to perspectively observe local portion of the back surface 31b of the package 31 corresponding to the portion S in which neither the CPU chip 32 nor the lead wire 34 of the CPU chip parts 14 is provided. In addition, a second through-hole 42b is also formed so that local portion of the back surface 31b of the package 31 corresponding to the position internally accommodating the CPU chip 32 can perspectively be observed. Viewer can easily observe appropriate portions of the back surface 31b of the CPU chip parts 14 via the first and second through-holes 42a and 42b.

It is also practicable to solely form either of the first and second through-holes 42a/42b according to the form and structure of the CPU chip parts 14.

In order to provide both the printed circuit board 41 and the CPU chip parts 14 with means for preventing and detecting illegality, it is also effective to form the above-exemplified through-holes 42, 42a, and 42b in the printed circuit board 41 and form the above-exemplified through-hole 35 and the illegality-detection mark 40 in the CPU chip parts 14 or arrange erectable position of the above-referred pins 33 on the back surface 31b of the package 31.

After completing the control substrate usable for an electronic game machine such as a slot machine via loading of the CPU chip parts 14 having structures shown in Fig. 3 through Fig. 15 on the printed circuit board 41, even though an attempt is exerted to extract the CPU chip parts 14 from the control substrate and internally accommodate an illegal ROM chip parts by scraping the back surface 31b

off from the package 31, since the through-hole 35 penetrating the package 31 in the thickness direction has been formed in the package 31 in the portion devoid of the CPU chip 32 and the lead wire 34, there is little space available for internally setting such an illegal ROM chip parts.

Even in the case of the CPU chip parts 14 having structures shown in Fig. 10 through Fig. 16, since respective pins 33 are projectively set to the back surface 31b of the package 31, there is little space available for internally setting such an illegal ROM chip parts.

Further, even when such an illegal ROM chip parts has externally been set to the back surface 31b of the package 31 or even though such an illegal ROM chip parts has internally been set availing of the through-hole 35, presence of the illegal ROM chip parts can be confirmed via the through-hole 35 from the upper side of the CPU chip parts 14, thus facilitating easier detection of illegality.

Further, even when such an illegal ROM chip parts has internally been set after scraping the internal portion accommodating the CPU chip 32 on the back surface 31b of the package 31, since the CPU chip parts 14 having structures shown in Fig. 7 through Fig. 9 designates the illegality-detection mark 40 at the position accommodating the CPU chip 32 on the back surface 31b of the package 31, subsequent to the scraping work, the illegality-detection mark 40 is erased to enable easier detection of the committed illegality. Further, since illegality can easily be detected, practical effect to restrain illegality can be anticipated.

Further, the above-exemplified substrate 50 having structure shown in Fig. 17 is provided with the through-hole 42 at the position of the CPU chip parts 14 loaded on the printed circuit board 41 to enable a viewer to perspectively view substantially the whole of the package 31. In the case of the substrate 50 having

structure shown in Fig. 18, the first through-holes 42a/42a are formed at the position at which the CPU chip parts 14 is loaded on the printed circuit board 41 to enable perspective observation of local portions of the back surface 31b of the package 31 corresponding to the local portion of the CPU chip parts 14 in which neither the CPU chip 32 nor the lead wire 34 is accommodated. In addition, the substrate 50 shown in Fig. 18 is also provided with the second through-hole 42b enabling perspective observation of local portion of the back surface 31b of the package 31 corresponding to the position at which the CPU chip 14 is internally accommodated. Accordingly, even when an illegal ROM chip parts has been set to the back surface 31b of the package 31, presence of the illegal ROM chip parts can be confirmed via the through-holes 42, 42a, and 42b from the back surface of the chip-loaded substrate 50, thus facilitating easier detection of the committed illegality.



WHAT IS CLAIMED IS:

1. A CPU chip parts usable for an electronic game machine comprising a plurality of pins projectively being set to external surface of a flat package; said flat package internally accommodates a CPU chip and lead wires which respectively interlink said CPU chip with said pins;

said package is characterized in that a through-hole is formed by way of penetrating said package in thickness direction in a portion thereof in which neither said CPU nor said lead wire is present.

2. A CPU chip parts usable for an electronic game machine set forth in Claim 1, wherein said package is of external appearance having fully or partially been covered with colors.

3. A CPU chip parts usable for an electronic game machine comprising a plurality of pins projectively being set to external surface of a flat package; said flat package internally accommodates a CPU chip and lead wires which respectively interlink said CPU chip with said pins;

said package is characterized in that an illegality-detection mark is designated at a position on the back surface of said package at which said CPU chip is internally accommodated, said detection mark is erasable by act of scraping back surface of said package.

4. A CPU chip parts usable for an electronic game machine set forth in Claim 3, wherein said detection mark is composed of projections and recesses carved on the back surface of said package.

5. A CPU chip parts usable for an electronic game machine set forth in

Claim 3, wherein said detection mark is formed by irradiating back surface of said package with laser beam.

6. A CPU chip parts usable for an electronic game machine set forth in Claim 3, wherein said package is of external appearance having fully or partially been covered with colors.

7. A CPU chip parts usable for an electronic game machine comprising a plurality of pins projectively being set to external surface of a flat package, said package internally accommodates a CPU chip and lead wires which respectively interlink said CPU chip with said pins;

either whole or part of said pins are projectively set to back surface of said package.

8. A CPU chip parts usable for an electronic game machine set forth in Claim 7, wherein said package is of external appearance having fully or partially been covered with colors.

9. A substrate usable for an electronic game machine comprising;

a CPU chip parts; and a printed circuit board on which said CPU chip parts is fixed; said CPU chip parts includes a flat package having external surface on which a plurality of pins are projectively set; said flat package internally accommodates a CPU chip and lead wires which respectively interlink said CPU chip with said pins;

said printed circuit board is characterized in that a through-hole enabling perspective observation of substantially whole of said package is formed at a position at which said CPU chip parts is loaded.

10. A substrate usable for an electronic game machine comprising;

a CPU chip parts; and a printed circuit board on which said CPU chip parts is fixed; said CPU chip parts includes a flat package having external surface on which a plurality of pins are projectively set; said flat package internally accommodates a CPU chip and lead wires which respectively interlink said CPU chip with said pins;

said printed circuit board is characterized in that a through-hole is formed at a position at which said CPU chip parts is loaded, said through-hole enables perspective observation of local portion of back surface of said package of said CPU chip parts corresponding to a portion at which neither said CPU chip nor lead wire is internally accommodated.

11. A substrate usable for an electronic game machine comprising;

a CPU chip parts; and a printed circuit board on which said CPU chip parts is fixed; said CPU chip parts includes a flat package having external surface on which a plurality of pins are projectively set; said flat package internally accommodates a CPU chip and lead wires which respectively interlink said CPU chip with said pins;

said printed circuit board is characterized in that a through-hole is formed at a position at which said CPU chip parts is loaded, said through-hole enables perspective observation of local portion of back surface of said package corresponding to a position at which said CPU chip is internally accommodated.

ABSTRACT

CPU CHIP PARTS FOR ELECTRONIC GAME MACHINE AND SUBSTRATE LOADED WITH SAID CPU CHIP PARTS USABLE FOR ELECTRONIC GAME MACHINE

Disclosed is a CPU chip parts solely usable for an electronic game machine such as a "pachinko" game machine or a slot machine for example installed in any game-playing hall. A through-hole penetrating a package in the thickness direction is formed in the package of the CPU chip parts in a portion at which neither a CPU chip nor a lead wire is internally accommodated.

By virtue of formation of the through-hole, space needed for illegally fixing an illegal ROM chip parts inside of the package is minimized. Even when such an illegal ROM chip parts has already been fixed therein, illegality can readily be detected.

(Fig No. 4)

FIG. 1

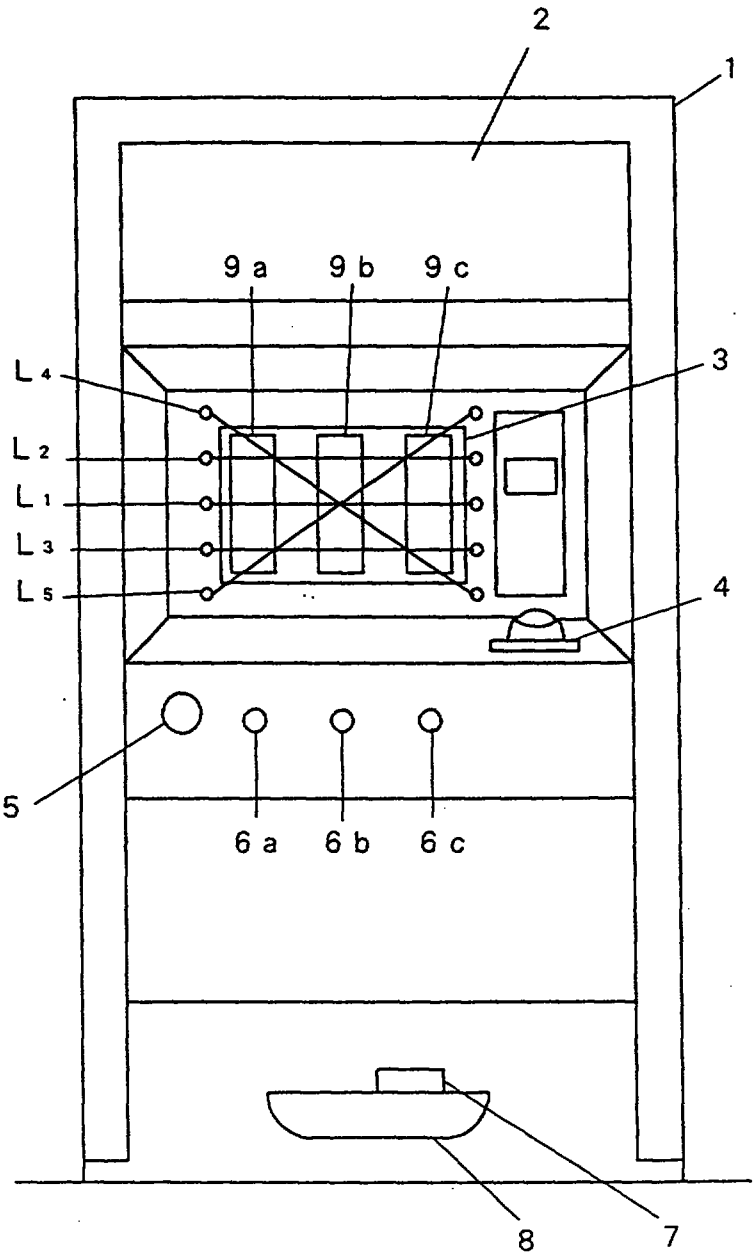


FIG. 2

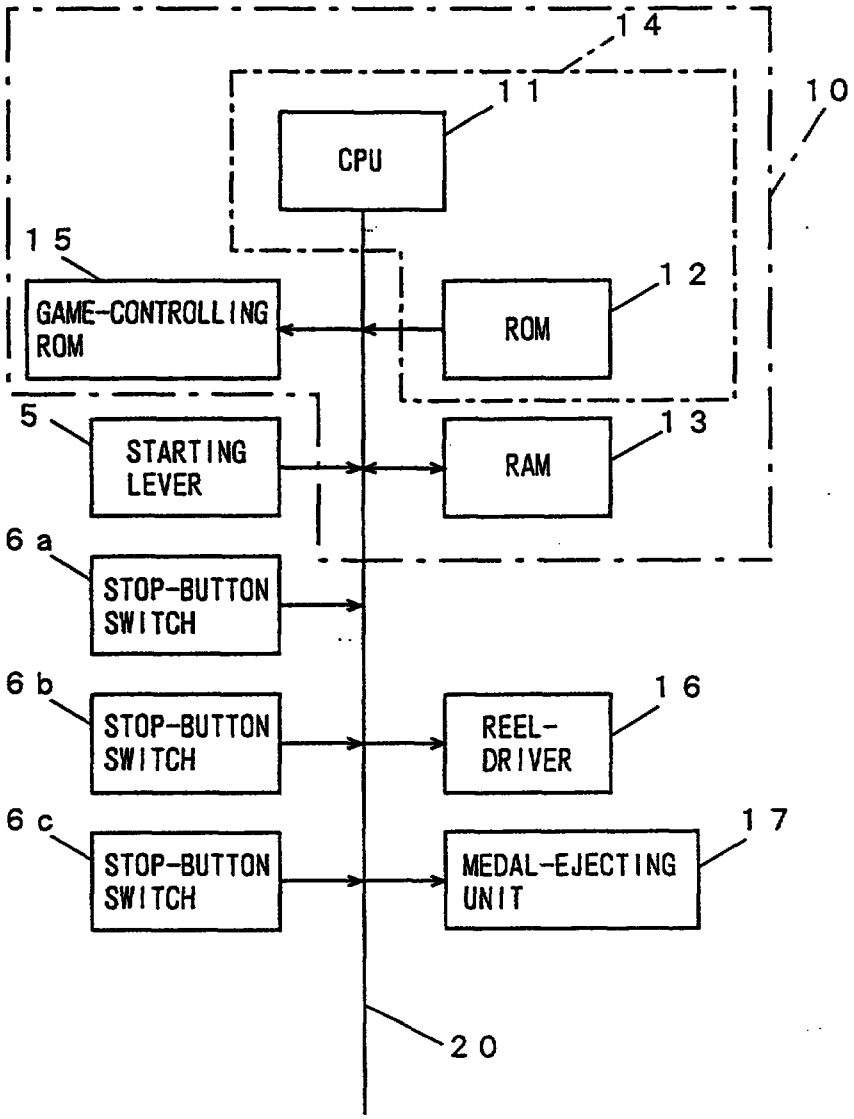

14
11
10
CPU
15
12
GAME-CONTROLLING ROM
ROM
5
13
STARTING LEVER
RAM
6a
STOP-BUTTON SWITCH
6b
16
STOP-BUTTON SWITCH
REEL-DRIVER
6c
17
STOP-BUTTON SWITCH
MEDAL-EJECTING UNIT
20

FIG. 3

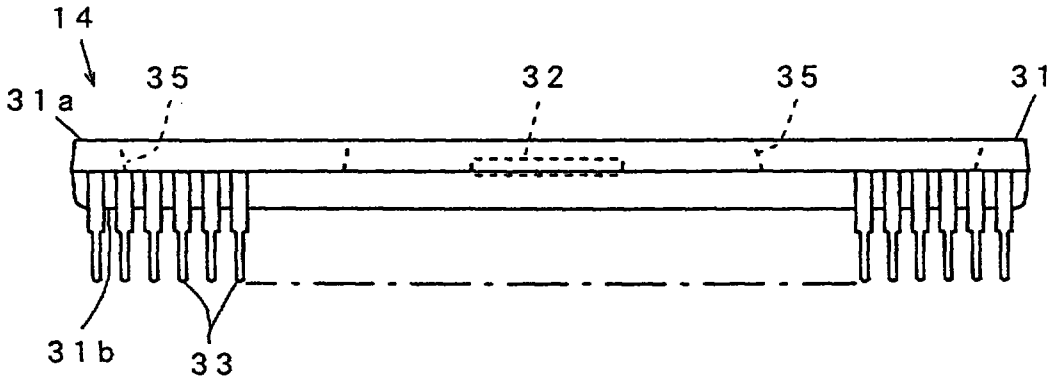


FIG. 4

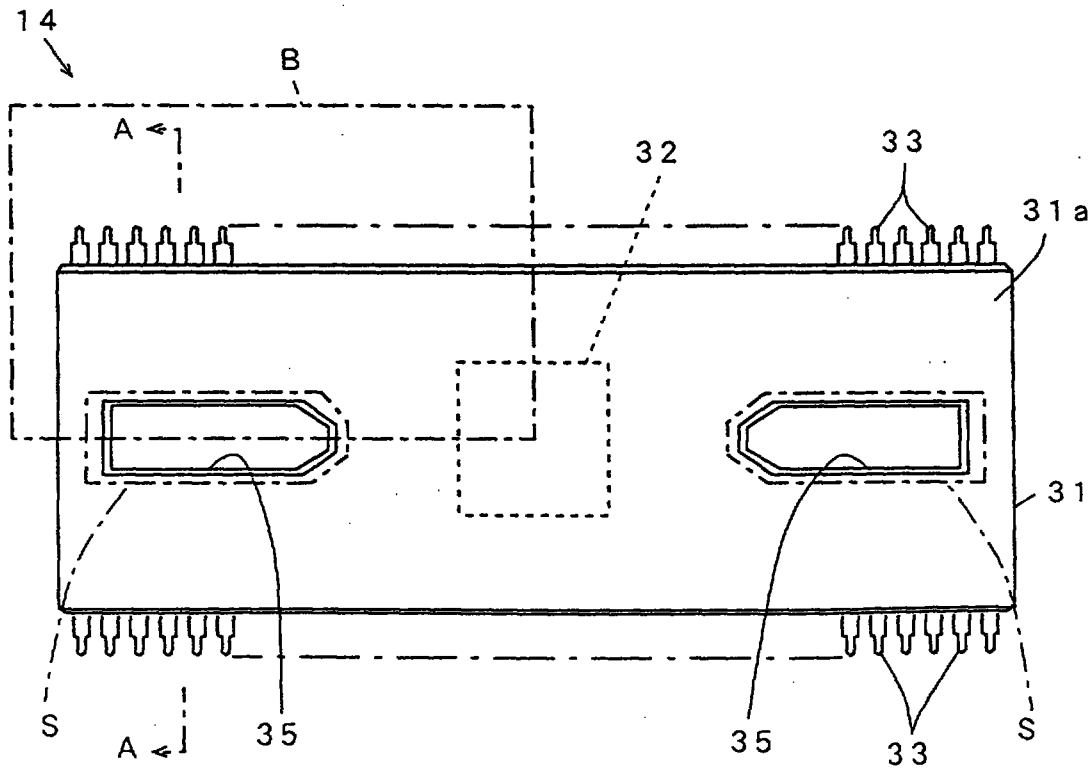


FIG.5

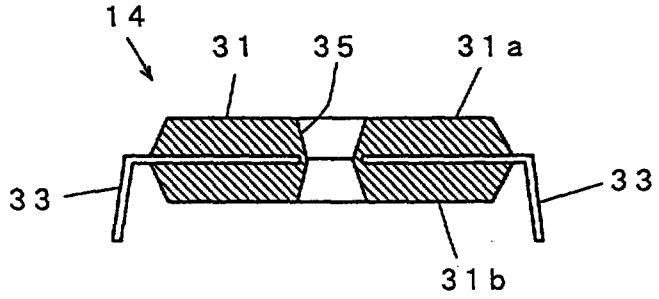


FIG.6

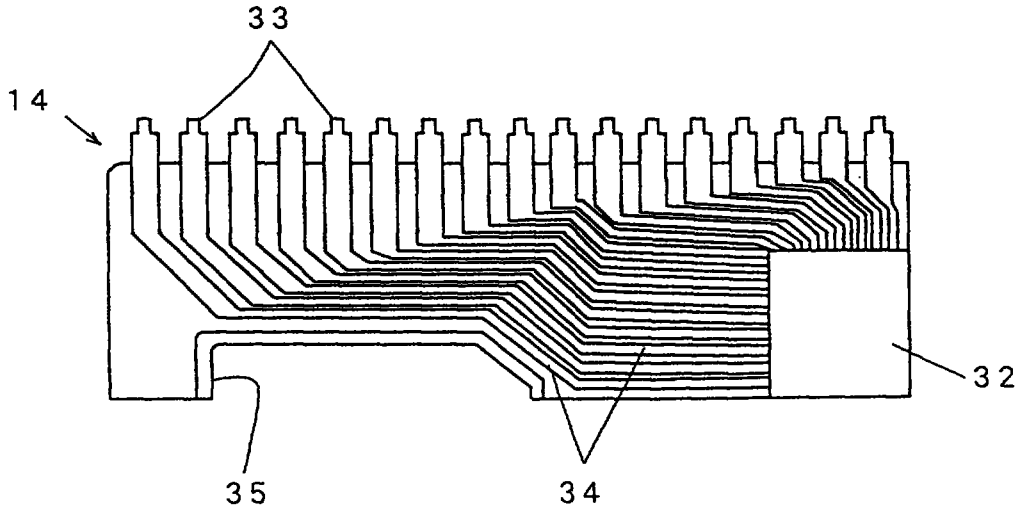


FIG. 7

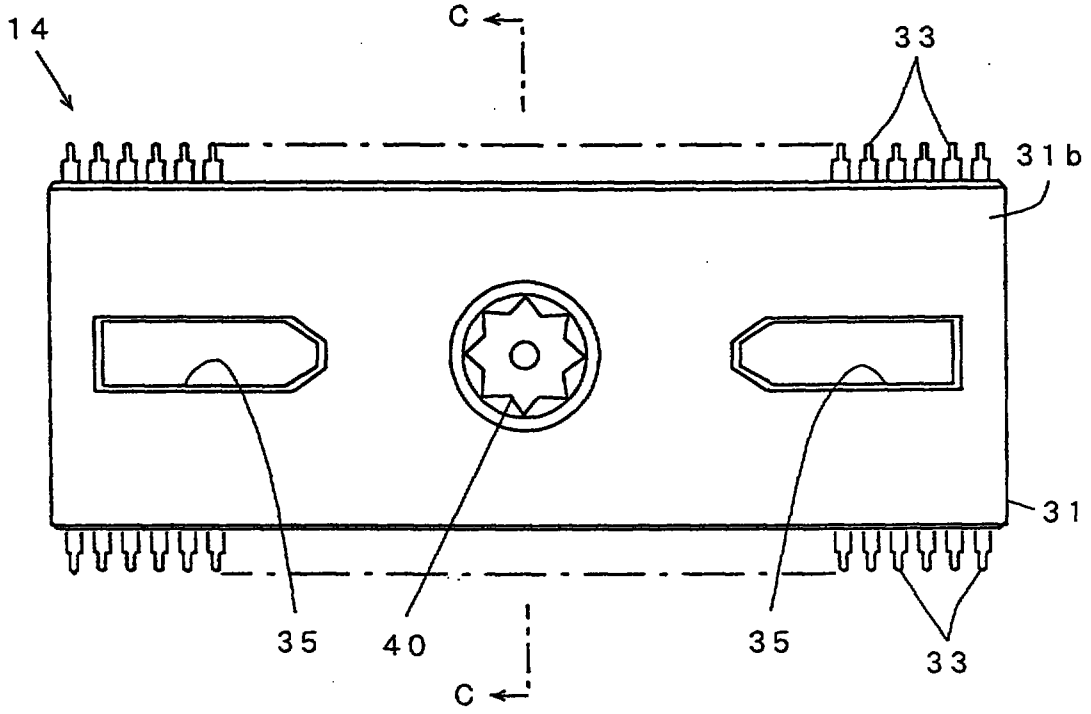


FIG. 8

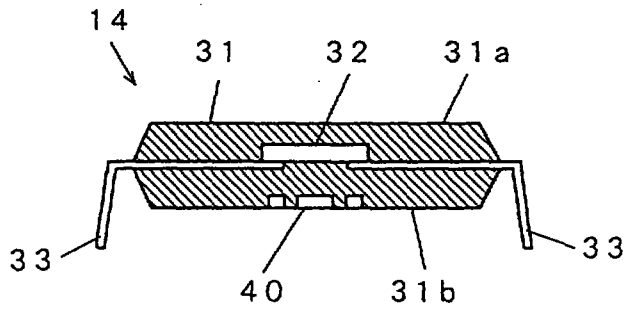


FIG. 9

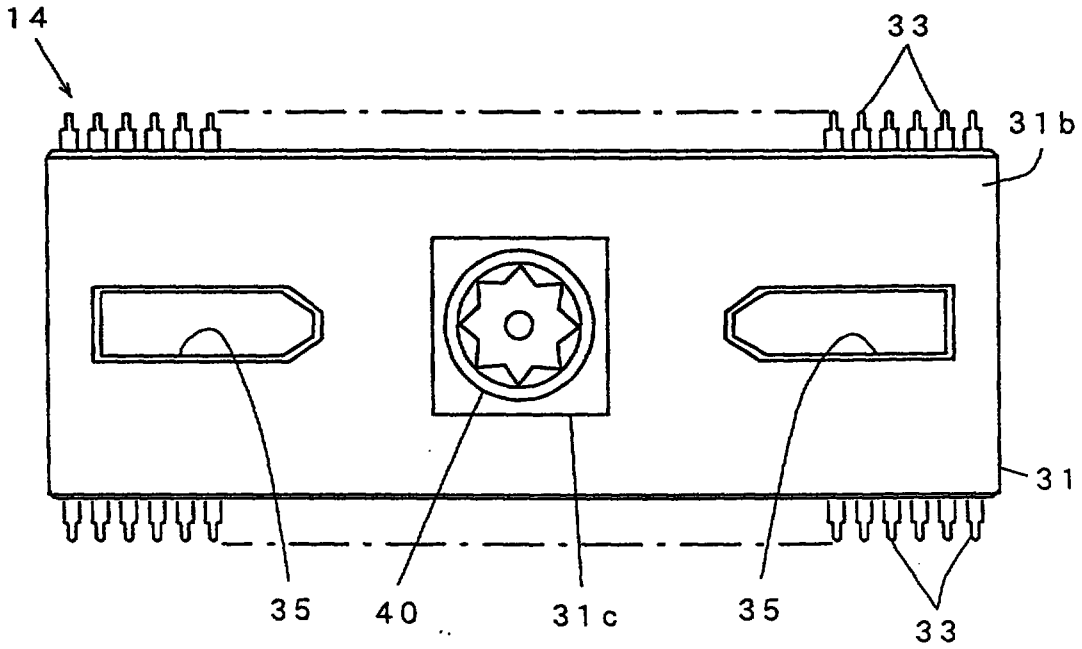


FIG. 10

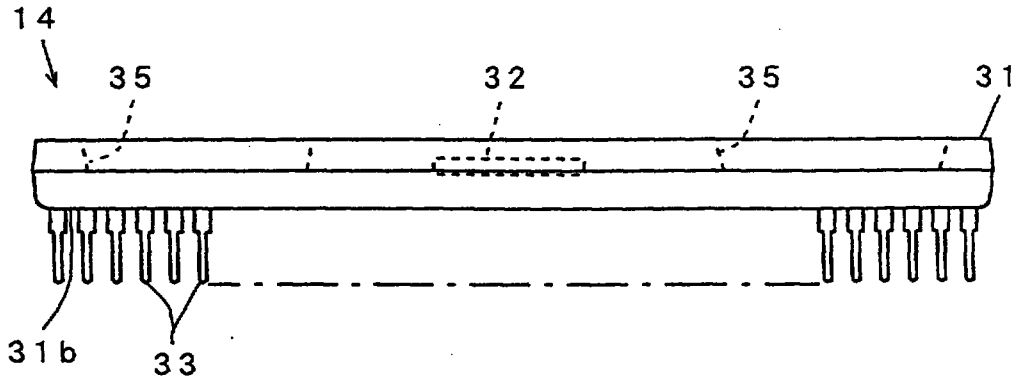


FIG. 11

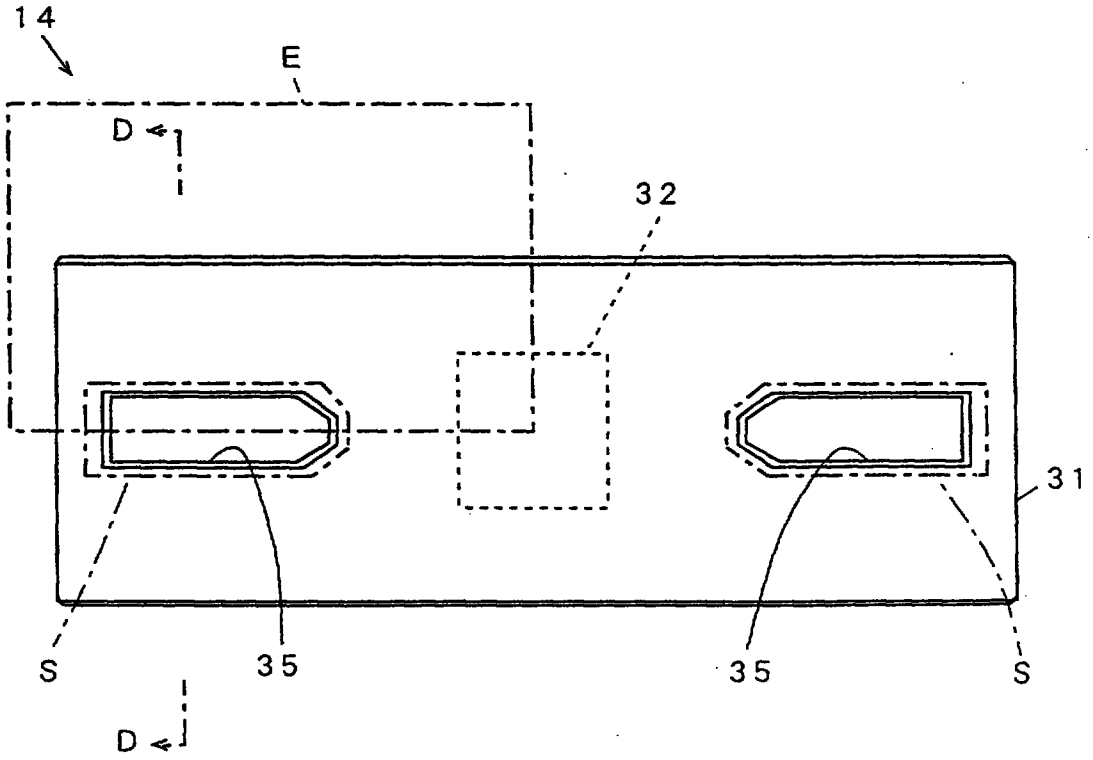


FIG.12

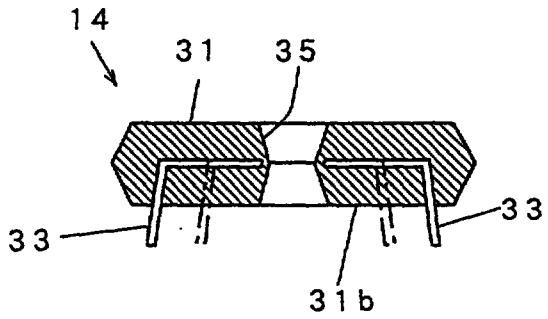


FIG.13

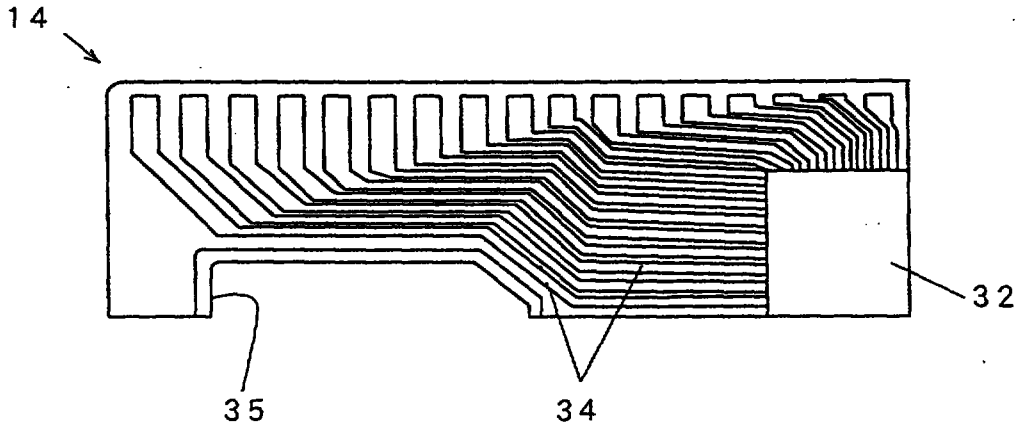


FIG.14

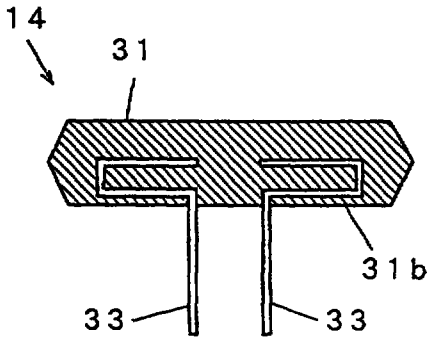


FIG.15

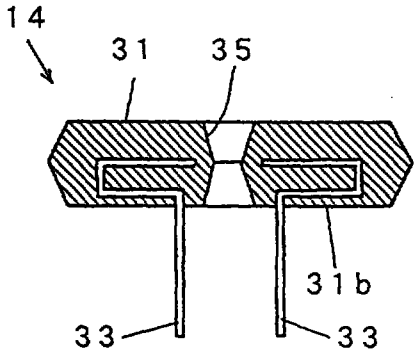


FIG.16

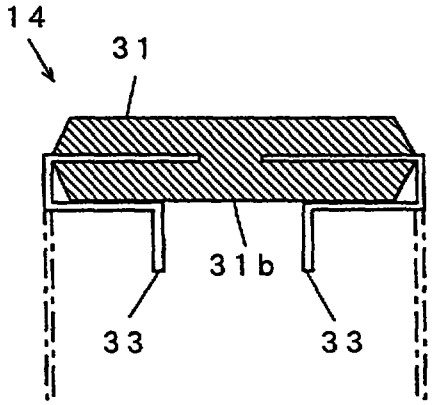


FIG.17

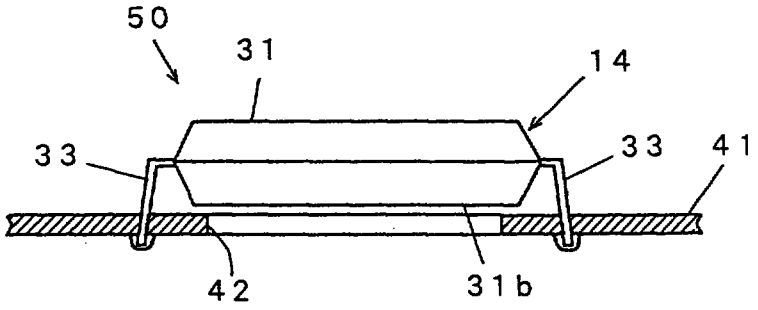


FIG.18

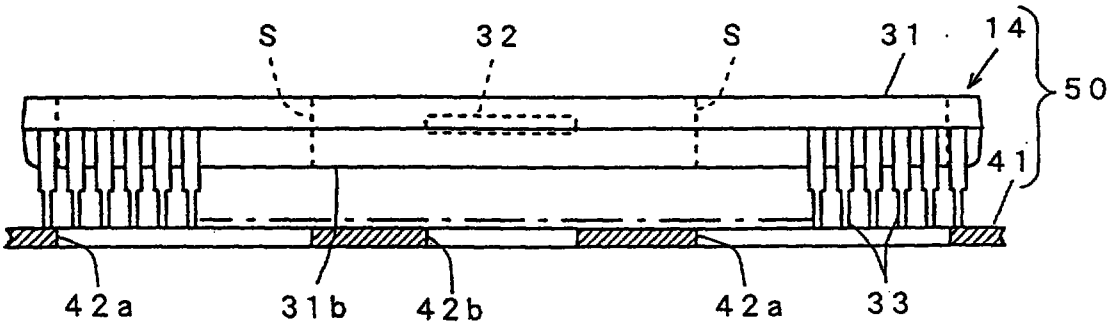


FIG.19

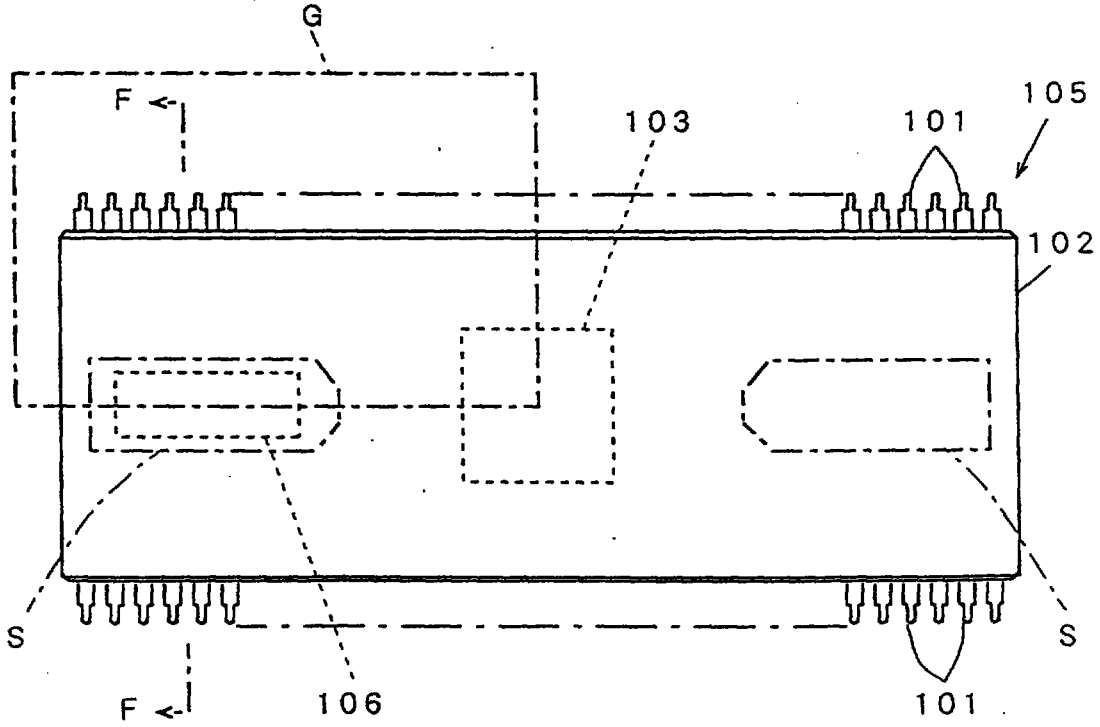


FIG. 20

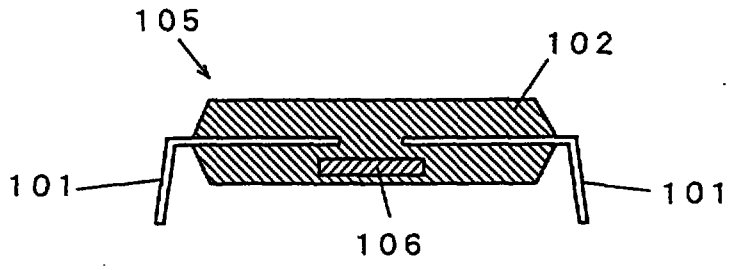


FIG. 21

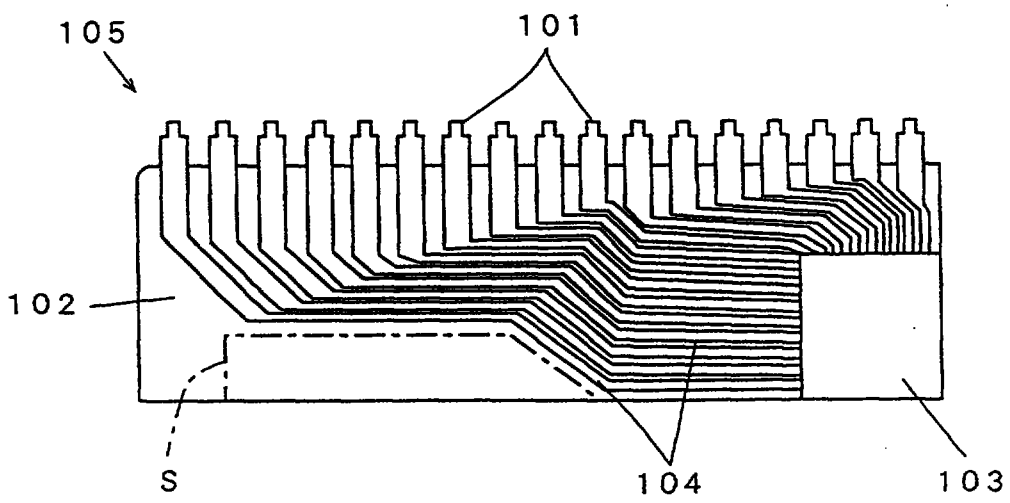


FIG. 22

