INSPECTION SYSTEM AND INSPECTION DEVICE

Abstract

The present disclosure is related to an inspection system capable of inspecting a plurality of gaming chips. A game chip of the plurality of game chips includes a wireless tag storing first chip information and to which the optically readable second chip information is on a side of the game chip. The inspection system includes an inspection device configured to inspect one or more game chips. The inspection device includes a wireless tag reader configured to read the wireless tag of the game chip and acquire the first chip information. The inspection device includes a camera configured to reading the side surface of the game chip to obtain the second chip information. The inspection device includes a unit configured to determine whether the game chip passes one or more rules based on the first chip information and the second chip information.

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Background/Summary

CROSS REFERENCE TO RELATED APPLICATION [0001] This application is a continuation of U.S. patent application Ser. No. 18/108,943 filed Feb. 13, 2023, which is a continuation of U.S. patent application Ser. No. 17/341,590 filed Jun. 8, 2021 (now U.S. Pat. No. 11,615,672), which is a continuation of U.S. patent application Ser. No. 16/461,914 dated May 17, 2019 (now U.S. Pat. No. 11,094,167), which is a national phase application under 35 U.S.C. § 371 of International App. PCT/JP2017/040920 filed Nov. 14, 2017, which claims priority to JP Pat. App. 2016-225540 filed Nov. 18, 2016. The entire contents of each disclosure are hereby incorporated by reference.

TECHNICAL FIELD
[0002] The present invention relates to an inspection system and an inspecting device which are capable of inspecting a gaming chip, and more particularly to, an inspection system and an inspecting device which are capable of inspecting a plurality of gaming chips contained in a case.
BACKGROUND
[0003] Gaming chips used in game halls such as casinos are manufactured in factories and then transported to game halls, stored in a storage, and moved from the storage to cashiers or game tables in the hall, but it is necessary to prevent gaming chips from being stolen or being replaced with fake gaming chips in the process of transporting, storing, and moving. To this end, a case containing gaming chips is used. If a plurality of gaming chips are contained in the case and, then the case is sealed, it is possible to discover a situation in which the gaming chips are withdrawn from the case after the sealing.
[0004] As a gaming chip in which a radio tag storing identification information or type information is internally installed, and optically readable code information indicating the identification information or the type information is assigned to a side surface is known (for example, JP 2009-66172 A).
[0005] A system using a gaming chip is disclosed in JP 2009-66172 A. In the system, the number of gaming chips placed on a betting board of a game table is calculated on the basis of identification information stored in a radio tag, the number of gaming chips is calculated on the basis of identification information assigned to a side surface, and the calculated numbers of gaming chips are compared. Accordingly, it is possible to detect an unauthorized gaming chip when the unauthorized gaming chip is used in the game table.
[0006] However, since the system disclosed in JP 2009-66172 A detects a fraud by calculating the number of bet gaming chips (placed on the betting board), the system is unable to inspect a plurality of gaming chips contained in the case in a state where the gaming chips are contained in the case and detect the unauthorized gaming chip.

SUMMARY OF THE INVENTION

[0007] In this regard, it is an object of the embodiment to provide an inspection system and an inspecting device which are capable of inspecting a plurality of gaming chips contained in a case in a state where the gaming chips are contained in the case.

[0008] An inspection system according to a first aspect of the embodiment is an inspection system that inspects a gaming chip having at least first gaming chip information and second gaming chip information, the second gaming chip information is arranged on a side surface of the gaming chip in an optically readable form, the inspection system includes a case that contains a plurality of gaming chips in a stacked manner and an inspecting device that inspects the gaming chip contained in the case, wherein the inspecting device includes a first reading device that acquires the first gaming chip information of the gaming chip contained in the case, a second reading device that optically reads the side surface of the gaming chip contained in the case and acquires the second gaming chip information, and a determining unit that determines whether a plurality of gaming chips contained in the case are pass or fail by determining the authenticity or damages of all the gaming chips contained the case or the number of gaming chips for each value using the first gaming chip information acquired by the first reading device and the second gaming chip information acquired by the second reading device.

[0009] With this configuration, since both the first reading unit and the second reading unit acquire the first gaming chip information and the second gaming chip information from the gaming chip contained in the case, it is possible to inspect the gaming chips contained in the case. Further, since two pieces of information, that is, the first gaming chip information and the second gaming chip information are acquired from the gaming chip, and the inspection is performed, the pass/fail determination can be reliably performed.

[0010] In an inspection system according to a second aspect of the embodiment, in the inspection system of the first aspect, the first gaming chip information and the second gaming chip information in a common gaming chip include common information, and the determining unit determines that a plurality of gaming chips contained in the case are fail when common information portions of a plurality of pieces of first gaming chip information acquired by the first reading device do not coincide with common information portions of a plurality of pieces of second gaming chip information acquired by the second reading device.

[0011] With this configuration, when an unauthorized gaming chip in which the common information portion of the first gaming chip information does not coincide with the common information portion of the second gaming chip information is contained in the case, the determining unit can determine that the gaming chips contained in the case are fail.

[0012] For example, when common identification information is recorded in the radio tag and the side surface, fail is determined if a plurality of pieces of identification information read out from a plurality of radio tags do not coincide completely with a plurality of pieces of identification information read out from a plurality of side surfaces. Further, when a value of the gaming chip is recorded in the radio tag and the side surface, fail is determined if the number of each value read from the radio tag does not coincide with the number of each value read from the side surface.

[0013] In an inspection system according to a third aspect of the embodiment, in the inspection system of the first aspect, both or either of the first gaming chip information and the second gaming chip information includes individual identification information individually identifying the gaming chip.

[0014] In an inspection system according to a fourth aspect of the embodiment, in the inspection system of the first aspect, the second gaming chip information includes information indicated by a designated color indicating the value of the gaming chip and is information indicating the value of the gaming chip through the designated color.

[0015] In an inspection system according to a fifth aspect of the embodiment, in the inspection system of the third aspect, both the first gaming chip information and the second gaming chip

information include individual identification information, and a plurality of gaming chips contained in the case are determined to be fail when the individual identification information of a plurality of pieces of first gaming chip information acquired by the first reading device does not coincide with the individual identification information of a plurality of pieces of second gaming chip information acquired by the second reading device.

[0016] With this configuration, when an unauthorized gaming chip in which the individual identification information of the first gaming chip information does not coincide with the individual identification information of the second gaming chip information is contained in the case, the determining unit determines that the gaming chips contained in the case are fail.

[0017] In the inspection system of the first aspect, an inspection system according to a sixth aspect of the embodiment includes a storage unit that stores the individual identification information of at least the first gaming chip information or the second gaming chip information of a plurality of gaming chips to be contained in the case, and the determining unit determines that a plurality of gaming chips contained in the case are fail when the individual identification information of a plurality of pieces of first gaming chip information acquired by the first reading device or a plurality of pieces of second gaming chip information acquired by the second reading device does not coincide with the individual identification information of the first gaming chip information or the second gaming chip information stored in the storage unit.

[0018] With this configuration, when an unauthorized gaming chip in which the first gaming chip information or the second gaming chip information is incorrect is contained in a case, the determining unit can determine that the gaming chips contained in the case are fail.

[0019] For example, when the individual identification information indicated by characters is recorded in the radio tag, and the individual identification information indicated by numbers is recorded on the side surface, a plurality of pieces of individual identification information indicated by characters are stored in the storage unit for the radio tag for each case, a plurality of pieces of individual identification information indicated by numbers are stored for the side surface, and fail is determined when a plurality of pieces of individual identification information read out from a plurality of radio tags do not coincide with a plurality of pieces of individual identification information stored in the storage unit for the radio tag of the case or when a plurality of pieces of individual identification information read out from a plurality of side surfaces do not coincide with a plurality of pieces of individual identification information stored in the storage unit for the side surface of the case.

[0020] In the inspection system of the first aspect, an inspection system according to a seventh aspect of the embodiment further includes a storage unit that stores a correspondence relation between the first gaming chip information and the second gaming chip information, and the determining unit determines that the plurality of gaming chips contained in the case are fail when a plurality of pieces of first gaming chip information acquired by the first reading device and a plurality of pieces of second gaming chip information acquired by the second reading device do not coincide with the correspondence relation stored in the storage unit.

[0021] With this configuration, when a gaming chip in which the correspondence relation between the first gaming chip information and the second gaming chip information is inaccurate is contained in the case, fail can be determined.

[0022] For example, when the identification information is recorded in the radio tag, and the value is recorded in the side surface, any value is allocated to each piece of identification information and stored in the storage unit, the number of each value is obtained with reference to the storage unit for a plurality of pieces of identification information read out from the plurality of radio tags, and fail is determined when the number of each value read out from the side surface does not coincide with the obtained number of each value. Conversely, the same applies when the value is recorded in the radio tag, and the identification information is recorded in the side surface. In these cases, the storage unit need not store which case contains a gaming chip of which identification information.

[0023] In an inspection system according to an eighth aspect of the embodiment, in the inspection system of any one of the first to seventh aspects, the determining unit determines that a plurality of gaming chips contained in the case are fail when the number of pieces of the first gaming chip information acquired by the first reading device and the number of pieces of the second gaming chip information acquired by the second reading device are not a predetermined number.

[0024] With this configuration, when the gaming chip is withdrawn from the case or the gaming chip is added to the case, the determining unit can determine that the gaming chips contained in the case are fail.

[0025] For example, when the number of gaming chips contained in the case is 100, fail is determined when any one of the number of pieces of the first gaming chip information read from the radio tag and the number of pieces of the second gaming chip information read from the side surface is not 100.

[0026] In an inspection system according to a ninth aspect of the embodiment, in the inspection system of any of the first to eighth aspects, the gaming chip includes color information indicating the value of the gaming chip as the second gaming chip information, and includes value information identifying the value of the gaming chip as the first gaming chip information, and the determining unit determines that a plurality of gaming chips contained in the case are fail when the color information does not coincide with the value information of the first gaming chip information.

[0027] In an inspection system according to a tenth aspect of the embodiment, in the inspection system of the ninth aspect, the second gaming chip information further includes value information of the gaming chip in addition to the color information, and the determining unit determines that a plurality of gaming chips contained in the case are fail when the value of the gaming chip indicated by the color information in the second gaming chip information does not coincide with both or either of the value information of the second gaming chip information and the value information of the first gaming chip information.

[0028] In an inspection system according to an eleventh aspect of the embodiment, in the inspection system of any one of the first to tenth aspects, the gaming chip includes a radio tag having the first gaming chip information.

[0029] In an inspection system according to a twelfth aspect of the embodiment, in the inspection system of any one of the first to eleventh aspects, at least either or both of the first gaming chip information and the second gaming chip information include group information indicating a group to which the gaming chip belongs, and the group is a group classified in accordance with the value of the gaming chip, a manufacturing time, a manufacturer, and/or a use game hall.

[0030] In an inspection system according to a thirteenth aspect of the embodiment, in the inspection system of the tenth aspect, the determining unit determines that a plurality of gaming chips contained in the case are fail when the color information does not coincide with at least of the value information or common information of the first gaming chip information and the second gaming chip information, and individual identification information.

[0031] In an inspection system according to a fourteenth aspect of the embodiment, in the inspection system of the tenth aspect, the determining unit determines the number of a plurality of gaming chips contained in the case for each value or a total amount of the values of all the gaming chips on the basis of the color information or the value information of the first gaming chip information or the second gaming chip information.

[0032] In an inspection system according to a fifteenth aspect of the embodiment, in the inspection system of the first aspect, the second gaming chip information includes information indicated by a designated color indicating a value of the gaming chip on a side surface of the gaming chip and is information indicating the value of gaming chip through the designated color, and the second reading device includes a camera that photographs the side surfaces of a plurality of gaming chips contained in the case and an identifying unit that analyzes an image captured by the camera,

specifies the designated color of each of the plurality of gaming chips, and specifying the values of the plurality of gaming chips in accordance with the specified designated colors.

[0033] With this configuration, the determining unit can perform pass/fail determination using the value information of the gaming chip.

[0034] In an inspection system according to a sixteenth aspect of the embodiment, in the inspection system of the fifteenth aspect, the designated color indicating the second gaming chip information is interposed, in a thickness direction of the gaming chip, between common colors which are commonly assigned to gaming chips having different values in the side surface of the gaming chip.

[0035] With this configuration, even when a plurality of gaming chips are stacked in the case, the identifying unit can specify types of a plurality of gaming chips in the case by extracting the designated color interposed between the common colors from the image of the side surface.

[0036] In an inspection system according to a seventeenth aspect of the embodiment, in the inspection system of the first aspect, the second gaming chip information is notation information which is inscribed on the side surface to be optically readable, and the second reading device includes a camera that photographs the side surfaces of a plurality of gaming chips stacked and contained in the case and an identifying unit that analyzes the image captured by the camera, specifies the notation information of each of the plurality of gaming chips, and specifies the second gaming chip information of each of a plurality of gaming chips in accordance with the specified notation information.

[0037] With this configuration, the determining unit can perform the pass/fail determination using the notation information of the gaming chip.

[0038] In an inspection system according to an eighteenth aspect of the embodiment, in the inspection system of the seventeenth aspect, the notation information is inscribed using infrared reaction ink which emits in response to infrared rays or infrared absorption ink which absorbs infrared rays, and the camera is an infrared camera.

[0039] With this configuration, it is possible to cause identification information attached to the side surface to be invisible under natural light.

[0040] In an inspection system according to a nineteenth aspect of the embodiment, in the inspection system of the seventeenth aspect, the notation information is inscribed using ink that emits light in response to ultraviolet rays, and the inspecting device includes an ultraviolet irradiating unit that irradiates the side surfaces of a plurality of gaming chips contained in the case with ultraviolet rays.

[0041] With this configuration, it is possible to cause identification information attached to the side surface to be invisible under natural light.

[0042] In an inspection system according to a twentieth aspect of the embodiment, in the inspection system of the first aspect, the case has a seal which is broken when the case is opened to allow the contained gaming chip to be withdrawn, and the inspecting device further includes a detecting unit that detects an unbroken seal, and the determining unit determines that a plurality of gaming chips contained in the case are fail when the unbroken seal is not detected by the detecting unit.

[0043] With this configuration, when the seal is broken, the determining unit can determine that the gaming chips contained in the case are fail.

[0044] In an inspection system according to a twenty-first aspect of the embodiment, in the inspection system of the first aspect, the case includes a light transmitting portion, and the second reading device optically reads the side surface of the gaming chip contained in the case through the light transmitting portion.

[0045] With this configuration, the second gaming chip information can be read in a state where the case is closed.

[0046] In the inspection system according to a twenty-second aspect of the embodiment, in an inspection system according to the twenty-first aspect, the light transmission portion is configured with a transparent member.

[0047] With this configuration, it is possible to provide a sealed structure including the light transmitting portion in the case.

[0048] In an inspection system according to a twenty-third aspect of the embodiment, in the inspection system of the first aspect, the inspecting device includes a case receiving portion that receives the case.

[0049] With this configuration, when the case is arranged in the case receiving portion, the first gaming chip information and the second gaming chip information can be read.

[0050] In an inspection system according to a twenty-fourth aspect of the embodiment, in the inspection system of the twenty-first aspect, the case is portable.

[0051] With this configuration, it is possible to inspect the gaming chips in the case at an arbitrary point in the process of moving the case from a factory to a table or a cashier.

[0052] In an inspection system according to a twenty-fifth aspect of the embodiment, in the inspection system of the first aspect, the case is a two-stage chip float or chip tray holding the gaming chips in the game table.

[0053] An inspection system according to a twenty-sixth aspect of the embodiment is an inspection system that inspects gaming chips to which a designated color indicating a value on a side surface and notation information inscribed to be optically readable are assigned and includes a case that contains a plurality of gaming chips in a stacked manner and an inspecting device that inspects the gaming chips contained in the case, wherein the inspecting device includes a camera that photographs the side surfaces of the gaming chips contained in the case, an identifying unit that analyzes an image captured by the camera and specifies the designated color and the notation information of each of the plurality of gaming chips, and a determining unit that determines whether the gaming chips are pass or fail for each case on the basis of the designated color and the notation information specified by the identifying unit.

[0054] With this configuration, since the identifying unit specifies the designated color and the notation information for the gaming chips contained in the case, it is possible to inspect the gaming chips contained in the case. Further, since two pieces of information, that is, the designated color and the notation information are specified from the side surface of the gaming chip, and the inspection is performed, the pass/fail determination can be performed reliably.

[0055] An inspection system according to a twenty-seventh aspect of the embodiment is an inspection system that inspects gaming chips to which a designated color indicating a value on a side surface is assigned, a radio tag storing gaming chip information being embedded in each of the gaming chips, and the inspection system includes a case that contains a plurality of gaming chips in a stacked manner and an inspecting device that inspects the gaming chips contained in the case, wherein the inspecting device includes a reading unit that reads a radio tag of the gaming chip contained in the case and acquires the gaming chip information, a camera that photographs the side surfaces of the gaming chips contained in the case, an identifying unit that analyzes an image captured by the camera and specifies the designated color of each of the plurality of gaming chips, and a determining unit that determines whether the gaming chips are pass or fail for each case on the basis of the gaming chip information acquired by the reading unit and the designated color specified by the identifying unit.

[0056] With this configuration, since the reading unit acquires the gaming chip information from the gaming chip contained in the case, and the identifying unit also specifies the designated color for the gaming chip contained in the case, it is possible to inspect the gaming chips contained in the case. Further, since two pieces of information, that is, the gaming chip information and the designated color are specified from the side surface of the gaming chip, and the inspection is performed, the pass/fail determination can be performed reliably.

[0057] An inspecting device according to a twenty-eighth aspect of the embodiment is an inspecting device that inspects a plurality of gaming chips contained in a case in a stacked manner, a radio tag storing first gaming chip information being embedded in each of the gaming chips,

optically readable second gaming chip information being assigned to a side surface of the gaming chip, and the inspecting device includes a first reading device that reads the radio tags of a plurality of gaming chips contained in the case and acquires the first gaming chip information, a second reading device that optically reads the side surfaces of a plurality of gaming chips contained in the case and acquires the second gaming chip information, and a determining unit that determines whether the gaming chips are pass or fail for each case on the basis of the first gaming chip information acquired by the first reading device and the second gaming chip information acquired by the second reading device.

[0058] With this configuration, since both the first reading unit and the second reading unit acquire the first gaming chip information and the second gaming chip information from the gaming chips contained in the case, it is possible to inspect the gaming chips contained in the case. Further, since two pieces of information, that is, the first gaming chip information and the second gaming chip information are acquired from the gaming chips, and the inspection is performed, the pass/fail determination can be reliably performed.

[0059] An inspecting device according to a twenty-ninth aspect of the embodiment is an inspecting device that inspect a plurality of gaming chips contained in a case in a stacked manner, a designated color indicating a value on a side surface and optically readable notation information being assigned to each of the gaming chips, and the inspecting device includes a camera that photographs the side surfaces of a plurality of gaming chips contained in the case, an identifying unit that analyzes an image captured by the camera and specifies the designated color and the notation information of each of the plurality of gaming chips, and a determining unit that determines whether the gaming chips are pass or fail for each case on the basis of the designated color and the notation information specified by the identifying unit.

[0060] An inspecting device according to a thirtieth aspect of the embodiment is an inspecting device that inspects a plurality of gaming chips contained in a case in a stacked manner, a radio tag storing gaming chip information being embedded in each of the gaming chips, a designated color indicating a value on a side surface being assigned to each of the gaming chips, and the inspecting device includes a reading unit that reads the radio tags of a plurality of gaming chips contained in the case and acquires the gaming chip information, a camera that photographs the side surfaces of a plurality of gaming chips contained in the case, an identifying unit that analyzes an image captured by the camera and specifies the designated color of each of the plurality of gaming chips, and a determining unit that determines whether the gaming chips are pass or fail for each case on the basis of the gaming chip information acquired by the reading unit and the designated color specified by the identifying unit.

[0061] An inspection system according to a thirty first aspect of the embodiment is an inspection system that inspects gaming chip, a radio tag storing gaming chip information being embedded in each of the gaming chips, and the inspection system includes a case that contains a plurality of gaming chips in a stacked manner and an inspecting device that inspects the gaming chips contained in the case, wherein the inspecting device includes a reading unit that reads the radio tags of the gaming chips contained in the case and acquires the gaming chip information, and a determining unit that determines whether the gaming chips are pass or fail for each case on the basis of the gaming chip information acquired by the reading unit, and a storage unit that stores the gaming chip information of a plurality of gaming chips to be contained in the case, and the determining unit determines that a plurality of gaming chips contained in the case are fail when a plurality of pieces of gaming chip information acquired by the reading unit do not coincide with the gaming chip information stored in the storage unit.

[0062] An inspecting device according to a thirty second aspect of the embodiment is an inspecting device that inspects a plurality of gaming chips contained in a case in a stacked manner, a radio tag storing gaming chip information being embedded in each of the gaming chips, and the inspecting device includes a reading unit that reads the radio tags of a plurality of gaming chips contained in

the case and acquires the gaming chip information and a determining unit that determines whether the gaming chips are pass or fail for each case on the basis of the gaming chip information acquired by the reading unit.

[0063] A case according to a thirty third aspect of the embodiment is a case that contains a plurality of gaming chips in a stacked manner, wherein the case is used in the inspection system of the first to twenty seventh aspect of the embodiment.

[0064] A case according to a thirty fourth aspect of the embodiment is a case that contains a plurality of gaming chips in a stacked manner, wherein the case is configured by combining an upper portion and a lower portion, the upper portion made of transparent resin, and the case has a structure capable of reading a designation color representing the value attached to the side face of the contained gaming chip or notation information inscribed to be optically readable on the side face by allowing light to pass through the upper portion or a structure capable of reading an RFID tag embedded in the contained gaming chip with an RFID reader.

[0065] In the case according to a thirty-fifth aspect of the embodiment, in the case of thirty-fourth aspect, the case is given a case identification information for uniquely specifying the case.

[0066] In the case according to a thirty-sixth aspect of the embodiment, in the case of thirty-fifth aspect, the case identification information is related to gaming chip information of the contained gaming chip, the gaming chip information is capable of optically reading or capable of reading by a RFID reader.

[0067] In the case according to thirty-seventh aspect of the embodiment, in a case according to any one of the thirty-fourth to thirty-sixth aspects, a top surface of the upper portion is formed as a flat surface.

[0068] A case according to a thirty-eighth aspect of the embodiment is a case that contains a plurality of gaming chips in a stacked manner, the case is used in an inspection system that inspects a gaming chip having at least first gaming chip information and second gaming chip information, wherein an inspecting device used in the inspection system comprising: a first reading device that acquires the first gaming chip information of the gaming chip contained in the case, a second reading device that optically reads the side surface of the gaming chip contained in the case and acquires the second gaming chip information; and a determining unit that determines whether a plurality of gaming chips contained in the case are pass or fail by determining the authenticity or damages of all the gaming chips contained the case or the number of gaming chips for each value using the first gaming chip information acquired by the first reading device and the second gaming chip information acquired by the second reading device.

[0069] A case according to a thirty-ninth aspect of the embodiment is a case that contains a plurality of gaming chips in a stacked manner, the case is used in an inspection system that inspects gaming chips to which a designated color indicating a value on a side surface and notation information inscribed to be optically readable are assigned, wherein an inspecting device used in the inspection system comprising: a camera that photographs the side surfaces of the gaming chips contained in the case; an identifying unit that analyzes an image captured by the camera and specifies the designated color and the notation information of each of the plurality of gaming chips; and a determining unit that determines whether the gaming chips are pass or fail for each case on the basis of the designated color and the notation information specified by the identifying unit.

[0070] A case according to a fortieth aspect of the embodiment is a case that contains a plurality of gaming chips in a stacked manner, the case is used in an inspection system that inspects gaming chips to which a designated color indicating a value on a side surface is assigned, a radio tag storing gaming chip information being embedded in each of the gaming chips, wherein an inspecting device used in the inspection system comprising: a reading unit that reads a radio tag of the gaming chip contained in the case and acquires the gaming chip information; a camera that photographs the side surfaces of the gaming chips contained in the case; an identifying unit that analyzes an image captured by the camera and specifies the designated color of each of the

plurality of gaming chips; and a determining unit that determines whether the gaming chips are pass or fail for each case on the basis of the gaming chip information acquired by the reading unit and the designated color specified by the identifying unit.

[0071] A case according to a forty-first aspect of the embodiment is a case that contains a plurality of gaming chips in a stacked manner, the case is used in an inspection system that inspects gaming chip, a radio tag storing gaming chip information being embedded in each of the gaming chips, wherein an inspecting device used in the inspection system comprising: a reading unit that reads the radio tags of the gaming chips contained in the case and acquires the gaming chip information; a determining unit that determines whether the gaming chips are pass or fail for each case on the basis of the gaming chip information acquired by the reading unit; and a storage unit that stores the gaming chip information of a plurality of gaming chips to be contained in the case.

[0072] An inspection system according to a forty-second aspect of the embodiment is an inspection system that inspects a gaming chip having at least first gaming chip information and second gaming chip information, wherein the second gaming chip information is arranged on the gaming chip in a manner capable of reading by a method different from a method of reading the first gaming chip information, the inspection system comprising: a case that contains a plurality of gaming chips in a stacked manner; and an inspecting device that inspects the gaming chip contained in the case, a first reading device that acquires the first gaming chip information of the gaming chip contained in the case, a second reading device that acquires the second gaming chip information of the gaming chip contained in the case; and a determining unit that determines whether a plurality of gaming chips contained in the case are pass or fail by determining the authenticity or damages of all the gaming chips contained the case or the number of gaming chips using the first gaming chip information acquired by the first reading device and the second gaming chip information acquired by the second reading device.

[0073] A case according to a forty-third aspect of the embodiment is a case using for the inspection system according to the forty-second aspect, wherein the first gaming chip information is stored in a radio tag of the gaming chip, the case contains a plurality of the gaming chips in a stacked manner, and the case contains a plurality of gaming chips to be inspected by the inspection system, the inspection system determining whether the gaming chips are pass or fail for each case on the basis of a gaming chip information, the gaming chip information is acquired by a reading unit that reads the radio tags of the gaming chips contained in the case and acquires the gaming chip information.

[0074] A gaming chip according to a forty-fourth aspect of the embodiment is a gaming chip to be inspected by the inspection system according to the forty-second aspect, wherein the first gaming chip information is stored in a radio tag of the gaming chip, the case contains a plurality of the gaming chips in a stacked manner, a gaming chip information is acquired from a radio tag of the gaming chip contained in the case by the reading unit, and the gaming chip has a configuration in which the inspection system determines whether the gaming chips are pass or fail for each case on the basis of the gaming chip information.

[0075] According to the present invention, since both the first reading unit and the second reading unit acquire the first gaming chip information and the second gaming chip information from the gaming chip contained in the case, it is possible to inspect the gaming chips contained in the case. Further, since two pieces of information, that is, the first gaming chip information and the second gaming chip information are acquired from the gaming chip, and the inspection is performed, the pass/fail determination can be reliably performed.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0076] FIG. **1** is a diagram illustrating a configuration of an inspection system according to an embodiment of the present invention;

[0077] FIG. **2** is a perspective view of a gaming chip according to the embodiment of the present invention;

[0078] FIG. **3** is a side view of a gaming chip according to the embodiment of the present invention;

[0079] FIG. **4** is a diagram illustrating an example of an image obtained by photographing a plurality of gaming chips in the embodiment of the present invention;

[0080] FIG. **5** is a diagram for describing a configuration of code information according to the embodiment of the present invention;

[0081] FIG. **6** is a block diagram illustrating a configuration of an inspecting device according to the embodiment of the present invention;

[0082] FIG. **7** is a perspective view of a case according to the embodiment of the present invention;

[0083] FIG. **8** is a perspective view of a case according to a modified example of the embodiment of the present invention;

[0084] FIG. **9** is a plan view of a case according to a modified example of the embodiment of the present invention;

[0085] FIG. **10** is a diagram for describing an example of a use state of an inspection system together with the distribution of gaming chips in the embodiment of the present invention;

[0086] FIG. **11** is a diagram illustrating an example of content of information stored in a use management device according to the embodiment of the present invention;

[0087] FIG. **12** is a diagram illustrating an example of content of read information according to the embodiment of the present invention;

[0088] FIG. **13** is a diagram for describing a first pass/fail determination method according to the embodiment of the present invention;

[0089] FIG. **14** is a diagram for describing a second pass/fail determination method according to the embodiment of the present invention;

[0090] FIG. **15** is a diagram for describing a third pass/fail determination method according to the embodiment of the present invention;

[0091] FIG. **16** is a diagram for describing a fourth pass/fail determination method according to the embodiment of the present invention;

[0092] FIG. **17** is a diagram for describing a fifth pass/fail determination method according to the embodiment of the present invention;

[0093] FIG. **18** is a diagram illustrating an example of a pass/fail result display screen illustrating a pass/fail determination result (pass) according to the embodiment of the present invention;

[0094] FIG. **19** is a diagram illustrating an example of a pass/fail result display screen illustrating a pass/fail determination result (fail) according to the embodiment of the present invention;

[0095] FIG. **20** is a diagram illustrating a modified example of an RFID antenna of the inspecting device according to the embodiment of the present invention;

[0096] FIG. **21** is a side view of a gaming chip according to a modified example of the embodiment of the present invention;

[0097] FIG. **22** is a side sectional view of a gaming chip according to a modified example in the embodiment of the present invention;

[0098] FIG. **23** is a perspective view of a gaming chip according to a modified example of the embodiment of the present invention;

[0099] FIG. **24** is a side view of a gaming chip according to a modified example of the embodiment of the present invention;

[0100] FIG. **25** is a plan view of a gaming chip according to a modified example of the

embodiment of the present invention;

[0101] FIG. **26** is a diagram illustrating an example of an image obtained by photographing stacked gaming chips in the embodiment of the present invention;

[0102] FIG. **27** is a diagram illustrating a configuration of an inspection system according to a modified example of the embodiment of the present invention; and

[0103] FIG. **28** is a diagram illustrating a configuration of an inspection system according to a modified example of the embodiment of the present invention.

DETAILED DESCRIPTION OF EMBODIMENTS

[0104] Hereinafter, embodiments of the present invention will be described with reference to the accompanying drawings. Further, embodiments to be described below are merely examples for carrying out the present invention, and the present invention is not limited to a specific configuration to be described below. When the present invention is carried out, a concrete configuration according to an embodiment may be appropriately employed.

[0105] FIG. **1** is a diagram illustrating a configuration of an inspection system according to an embodiment of the present invention. An inspection system **1** includes a case **100** that contains gaming chips in a stacked state and an inspecting device **200** that inspects a plurality of gaming chips contained in the case **100** in the stacked state in a state where the gaming chips are contained in the case **100**.

[0106] The case **100** has a substantially rectangular parallelepiped shape and is made of transparent resin. The case **100** contains disc shaped gaming chips C in a stacked state. In the case **100**, five columns each containing 20 gaming chips C are formed, and a total of 100 gaming chips C can be contained. The case **100** can be carried (portable) in a state where the gaming chips C are contained. The case **100** includes an upper portion **101** and a lower portion **102** which are separable, and when the upper portion **101** and the lower portion **102** are separated, the gaming chips C can be contained in the case **100**, and the gaming chips C can be withdrawn from the case **100**.

[0107] The inspecting device **200** includes a receiving unit **210** and a main body portion **220**. The inspecting device **200** can receive the case **100** through the receiving unit **210**. The receiving unit **210** has a substantially rectangular parallelepiped shape in which an upper surface and a front surface are opened as a whole, and the receiving unit **210** is formed by left and right side walls **211**, a bottom portion **212**, and an inner wall **213** and has a width, a height, and a depth in which the case **100** can fit exactly.

[0108] The main body portion **220** is installed behind the inner wall **213** of the receiving unit **210** and includes an RFID reader **221**, a computer **222**, and a display unit **223**. The main body portion **220** further includes an infrared camera **225** and a visible light camera **226**. The infrared camera **225** and the visible light camera **226** are attached to the end of an arm **227** to photograph the side surface of the gaming chip C contained in the case **100** from the upper surface side of the case **100** contained in the receiving unit **210**.

[0109] The RFID reader **221**, the display unit **223**, the infrared camera **225**, and the visible light camera **226** are connected to the computer **222**. An RFID antenna **224** is connected to the RFID reader **221**. The RFID antenna **224** extends from the RFID reader **221** and extends spirally in the left and right sidewalls **211**. In other words, a spiral RFID antenna **224** is laid in each of the left and right sidewalls **211**, and each RFID antenna **224** is connected to the RFID reader **221**.

[0110] The display unit **223** includes a liquid crystal panel. A touch sensor may be installed on the liquid crystal panel, and the display unit **223** may be configured as a touch panel.

[0111] FIG. **2** is a perspective view of the gaming chip C according to an embodiment of the present invention, and FIG. **3** is a side view of the gaming chip C according to an embodiment of the present invention. The gaming chip C has a designated color layer **501** which is characterized by a designated color in the middle and a common color layer **502** which is characterized by a common color on both sides of the designated color layer **501** in the middle in a thickness direction

(upper and lower sides in FIG. **3**), and a stripe pattern (in the thickness direction) is formed on the side surface.

[0112] An RFID tag **503** is inserted between the designated color layer **501** and one common color layer **502** of the gaming chip C as a radio tag. For example, individual identification information individually identifying (uniquely specifying) the gaming chip C and value (type) information are stored in the RFID tag **503** as the gaming chip information of the gaming chip C. A transparent layer **504** is formed as the outermost layer of the gaming chip C. In other words, the gaming chip C includes the designated color layer **501** which is an intermediate layer, the common color layers **502** sandwiching the designated color layer **501** from both sides, and the transparent layers **504** which are the outermost layers of both sides.

[0113] The gaming chip C is formed such that five elongated layers of plastic materials (the transparent layer **504**, the common color layer **502**, the designated color layer **501**, the common color layer **502**, and the transparent layer **504**) are stacked, the RFID tag **503** is arranged between the designated color layer **501** and one common color layer **502** at a predetermined interval at that time, and the five layers of plastic materials are thermocompression bonded and then punched into a circular shape, a rectangular shape, or the like through a press so that one RFID tag **503** is included in one gaming chip C. When the punching is performed through the press, dimensions of a die and a punch of a mold for punching are designed, and R treatment (rounded corner) is applied to the end of the transparent layer **504** of the outermost layer.

[0114] The transparent layer **504** may be formed by thermocompression bonding three layers including the designated color layer **501** and the two common color layers **502** and then applying varnish to the surface. Further, the designated color layer **501** and the two common color layers **502** may not be separate members, and the designated color layer **501** and the two common color layers **502** may be formed by applying the designated color (and the common color) to the side surface through inkjet printing or the like after the designated color layer **501** and the two common color layers **502** are integrally formed.

[0115] The designated color layer **501** indicates the value (type) of the gaming chip C using a color (a designated color). In other words, the color of the designated color layer **501** is set to a different color (red, green, yellow, blue, or the like) in accordance with the value of the gaming chip C, and thus it is possible to specify the value of the gaming chip C (10 points, 20 points, 100 points, 1000 points, or the like) by checking the color of the designated color layer **501** optically read from the side surface of the gaming chip C. A color common to the gaming chips C having different values (a common color) is assigned to the common color layer **502**. The common color is preferably a color lighter than any designated color, and the common color is white in the present embodiment.

[0116] Code information **505** indicating the gaming chip information of the gaming chip Cis further inscribed on the side surface of the gaming chip C (specifically, the common color layer **502** of the side surface). The code information **505** indicates information by arranging a plurality of marks (square marks in the present embodiment). Since the designated color layer **501** indicates information (the value of the gaming chip C) with color, whereas the code information **505** indicates information with a mark inscribed on the side surface, the code information **505** can be regarded as notation information. Examples of the notation information include a plurality of character strings, a numeric string, and a bar code.

[0117] The code information **505** of the present embodiment is repeatedly inscribed with a cycle of 60° in a circumferential direction of the gaming chip C. Accordingly, the perfect code information **505** is included within a range of 120° in the circumferential direction regardless of a direction in which the side surface of the gaming chip C is observed in the circumferential direction. A repetition cycle of the gaming chip C is not limited to 60° and may be repeatedly inscribed at equal intervals in the circumferential direction at least three times.

[0118] The code information **505** is inscribed using invisible ink. In the present embodiment, printing is performed by inkjet printing using infrared absorbing ink (specifically, carbon black)

that absorbs infrared rays as the invisible ink. Since only a portion on which the code information **505** is printed does not reflect infrared rays, the code information **505** floats when the side surface of the gaming chip C is photographed by the infrared camera **225**. In order to cause the printed portion to float clearly, the infrared camera **225** may be equipped with an infrared lamp and irradiate the side surface of the gaming chip C to be photographed with infrared rays.

[0119] Further, the invisible ink is not limited to the infrared absorbing ink and may be, for example, infrared reaction ink that emits fluorescence in response to infrared rays or UV ink which emits fluorescence in response to ultraviolet rays. In the case of using the UV ink, the ultraviolet camera is used in place of the infrared camera **225**, and black light which irradiates the side surface of the gaming chip C with ultraviolet rays is used to cause the UV ink to emit fluorescence.

[0120] Further, in the gaming chip C, a mark m′ using the UV ink or the carbon black ink is formed on a surface X of the common color layer **502**. The mark m′ indicates whether the gaming chip **5** is true or false, and the mark m′ becomes visible when irradiated with ultraviolet rays (or infrared rays), and it is indicated whether the gaming chip **5** is true or false in accordance with a combination of shapes of the mark m′ and the number of marks m′. The transparent layer **504** is thermocompression bonded or applied on the outermost layer so as to cover a print **506** (such as 100 points) for specifying the game hall or the mark m′ on the surface, but embossing treatment or vanish treatment is applied to the transparent layer **504**, and thus the gaming chips C are prevented from adhering to each other, and slipping is further improved.

[0121] The R treatment (R) is performed on the end of the transparent layer **504** of the outermost layer which has undergone a print **506** (100 points or the like), and the surface of the common color layer **502** is prevented from being deformed in the process of punching the gaming chip C and appearing on the side surface. Further, a sharp edge of the gaming chip C is prevented from remaining and damaging a hand and other gaming chips C. The designated color layer **501** may be formed by one or a plurality of colored layers. Further, metal or ceramics for increasing the weight of the layer may be formed in the layer of the designated color layer **501**. Further, the RFID tag **503** may be installed in a space which is formed in a part of the designated color layer **501** or between the designated color layer **501** and the common color layer **502**.

[0122] FIG. **4** is a diagram illustrating an example of an image obtained by photographing a plurality of gaming chips C contained in the case **100** through the infrared camera **225** and the visible light camera **226**. In this case, the case **100** may be a two-stage chip float (an upper tray portion which is particularly movable in a two-stage chip tray) or a chip tray which holds the gaming chip C in the game table. Even when the gaming chip C is stacked in the case **100** in the vertical direction as illustrated in FIG. **4**, the infrared camera **225** and the visible light camera **226** can photograph the code information **505**. Further, it is possible to count the number of gaming chips C by counting the designated color layer **501** in the vertical direction. Even with the two-stage tray, when each stage is developed, it is possible to capture the side surfaces of all the gaming chips C contained in the case **100** through the infrared camera **225** and the visible light camera **226**.

[0123] In the present embodiment, the code information **505** is indicated by the marks m arranged in a plurality of rows and a plurality of columns. FIG. **5** is a diagram for describing a configuration of the code information **505**. As illustrated in FIG. **5**, upper and lower marks m are paired to form one code element. In the example of FIG. **5**, one piece of code information **505** is configured with a 10-digit code element. There are four types of patterns of one code element constituted by a pair of upper and lower marks m, four types of information can be indicated by one code element as illustrated in FIG. **5**, and thus the code information **505** configured with the 10-digit code element can indicate 10-th power of 4 types of information. A character Y on the side of the 10-digit code element is a direction determination mark Y for determining the direction of the code information **505**.

[0124] FIG. **6** is a block diagram illustrating a configuration of the inspecting device **200**. The inspecting device **200** includes a bar code reader **228** and a communication unit **229** in addition to

the RFID reader **221**, the computer **222**, the display unit **223**, the RFID antenna **224**, the infrared camera **225**, and the visible light camera **226** illustrated in FIG. **1**. Further, the computer **222** is configured with a processor (not illustrated), a memory, and the like and functions as an identifying unit **230** and a determining unit **231** when the processor executes an inspection program.

[0125] An RFID system is configured with the RFID reader **221**, the RFID antenna **224**, and the RFID tag **503** embedded in the gaming chip C. The gaming chip information of the gaming chip C stored in the RFID tag **503** embedded in the gaming chip C is read out by the RFID reader **221** in a non-contact manner and used for a process in the computer **222**.

[0126] The infrared camera **225** includes an infrared transmission filter that transmits only infrared light and captures an infrared image. The infrared image generated by the photographing of the infrared camera **225** is transmitted to the computer **222** and used for a process of the identifying unit **230**. The visible light camera **226** captures an image of light of a visible region. A visible light image generated by the photographing of the visible light camera **226** is also transmitted to the computer **222** and used for a process of the identifying unit **230**. As illustrated in FIG. **1**, the infrared camera **225** and the visible light camera **226** are directed toward the case **100** above the case **100**, and photograph the side surfaces of a plurality of gaming chips C in the case **100** over the upper portion **101** of the case **100**.

[0127] The bar code reader **228** reads the bar code BC attached to the case **100** and acquires case identification information to be described later. The display unit **223** displays a determination result of the determining unit **231** of the computer **222**. The communication unit **229** communicates data with a manufacturing management device **302** installed in a factory F or a use management device **303** installed in a game hall P.

[0128] FIG. **7** is a perspective view of a case **100**. The case **100** is formed by combining the upper portion **101** and the lower portion **102**. In the present embodiment, the upper portion **101** and the lower portion **102** are made of transparent resin. As described above, since the infrared camera **225** and the visible light camera **226** of the inspecting device **200** of the present embodiment (hereinafter referred to simply as a "camera") installed above the receiving unit **210**, it is necessary for at least the upper surface of the case **100** to transmit light. In other words, in the case **100**, a portion positioned between the receiving unit **210** of the inspecting device **200** and the camera when the case **100** is received by the receiving unit **210** of the inspecting device **200** needs to be a light transmitting portion. In the present embodiment, the case **100** has a sealed structure including the upper portion **101** and the lower portion **102**, but the light transmission portion may be in a perforated state.

[0129] As described above, the case **100** has a shape in which the five columns in which 20 gaming chips C are stacked and contained are formed in parallel, and in the example of FIG. **7**, a cross section of each column is polygonal (octagonal) so that the upper portion **101** and the lower portion **102** substantially follow the shape of the gaming chip C to be contained.

[0130] FIG. **8** is a perspective view of a case **100′** according to a modified example, and FIG. **9** is a plan view of the case **100′**. The case **100′** also includes an upper portion **101′** and a lower portion **102** made of a transparent resin. In the present modified example, the upper surface of the upper portion **101′** facing the camera is formed as a plane surface. Since the surface facing the camera is a plane surface, a linear shadow caused by a corner of a polygon cross section of the case **100′** does not appear on the camera as illustrated in FIG. **9**, and it is possible to accurately identify information of the side surface of the gaming chip C in image analysis on a captured image of the camera.

[0131] FIG. **10** is a diagram for describing an example of a use state of the inspection system **1** together with the distribution of the gaming chips C. The gaming chip C is manufactured by a manufacturing device **301** of a factory F (s1), and 100 gaming chips C are contained in the case **100** (s2). The case **100** is sealed with a seal at the factory F after the gaming chips C are contained. Further, the bar code BC indicating the case identification information uniquely specifying the case

100 is affixed to the side surface of the case **100** (s3).

[0132] At this time, the case identification information of the bar code BC affixed to the case **100** is input to the manufacturing management device **302** in the factory F (s4). Further, the case **100** containing the gaming chips C is transferred to the inspecting device **200**, the gaming chip information (to be described later in detail) assigned to the gaming chip C is read, and the pass/fail inspection is performed. The gaming chip information read from the gaming chip C contained in the case **100** is transferred to the manufacturing management device **302** (s5) and associated with the case identification information through the manufacturing management device **302**. The manufacturing management device **302** may be a personal computer.

[0133] The case **100** determined to be pass in the inspecting device **200** of the factory F is conveyed from the factory F to a game hall P (s6). The case **100** is first stored in a storage R in the game hall P (s7). The inspecting device **200** is installed in the storage R, and the case **100** that arrived from the factory F is inspected through the inspecting device **200**.

[0134] Meanwhile, the case identification information and the gaming chip information associated with the case identification information are transmitted from the manufacturing management device **302** in the factory F to the use management device **303** in the game hall P. The use management device **303** acquires the case identification information and the gaming chip information associated with the case identification information from the manufacturing management device **302** for each of a plurality of cases **100** containing the gaming chip C and includes a storage unit that stores the acquired information for each case **100**. The use management device **303** may be a personal computer.

[0135] In the inspection performed by the inspecting device **200** in the storage R, an inspection is performed using the information stored in the use management device **303**. The case **100** determined to be pass in the inspection in the storage R is carried to a game table T (s9) or carried to a cashier CA (s10). Each of the game table T and the cashier CA includes the inspecting device **200**, and the case **100** containing the gaming chip C is inspected by the inspecting devices **200** in a sealed state. In the game table T and the cashier CA, the case **100** containing used gaming chips C is also inspected, and the inspecting device **200** is also used for the inspection. In the inspection in the three inspecting devices **200** in the game hall P, the case identification information transmitted from the manufacturing management device **302** and stored in the use management device **303** and the gaming chip information associated with the case identification information are referred to.

[0136] FIG. **11** is a diagram illustrating an example of content of information which is generated by the manufacturing management device **302**, transmitted to the use management device **303**, and stored in the use management device **303**. Information is generated for each case **100**, and the gaming chip information of a plurality of gaming chips C (100 gaming chips in the present embodiment) contained in the case **100** is associated with each piece of case identification information (Ca1, Ca2, Ca3, . . .).

[0137] As the gaming chip information, information including a combination of the individual identification information (aa, ab, ac, . . . , du, dv) uniquely specifying the gaming chip C and information (r, r, r, . . . , b, b) specifying the value (type) of the gaming chip C is stored in the RFID tag **503**, information including a combination of individual identification information (00001, 00002, 00003, . . . , 00099, 00100) uniquely specifying the gaming chip C and information (1, 1, 1, . . . , 2, 2) specifying the value (type) of the gaming chip is stored as the notation information of the side surface, and information (red, red, red, . . . , blue, blue) specifying the value (type) of the gaming chip C is stored as the color information of the side surface.

[0138] The information stored in the RFID tag **503** is information which is electromagnetically readable by the RFID reader **221** and corresponds to first gaming chip information of the present invention, and the notation information assigned to the side surface and the color information are optically readable information and correspond to second gaming chip information of the present invention.

[0139] FIG. **12** is a diagram illustrating an example of content of information acquired from one case **100** through the bar code reader **228**, the RFID reader **221**, the infrared camera **225**, and the visible light camera **226** in the inspecting device **200**. An English character string stored in the RFID tag **503** installed in each of a plurality of gaming chips C is read out from the RFID reader **221**. A numeric string which is the notation information inscribed on the side surface is read out from the infrared camera **225**. Further, the color of the side surface is read out from the visible light camera **226**. The identifying unit **230** analyzes (the image of) the numeric string read out from the infrared camera **225**, identifies a number, specifies information including the numeric string, and specifies the designated color from the image of the side surface read out from the visible light camera **226**.

[0140] Here, the notation information and the designated color information of the side surface of a plurality of gaming chips C can be acquired in accordance with an arrangement order of the gaming chips C in the case **100**, but the information acquired from a plurality of RFID tags **503** is unable to be acquired in accordance with the arrangement order of the gaming chips C. In other words, it is difficult to specify a gaming chip C from which the information of the RFID tag **503** is obtained.

[0141] Next, a pass/fail determination method in the computer **222** of the inspecting device **200** will be described. As described above, the identifying unit **230** specifies the gaming chip information stored in the RFID tags **503** of each of a plurality of gaming chips C contained in the case **100** on the basis of a result of reading the RFID reader **221**, analyzes the infrared image obtained by the infrared camera **225**, specifies the gaming chip information indicated by the notation information, analyzes the visible light image obtained by the visible light camera **226**, and specifies the color of the designated color layer **501**. On the basis of the information, the determining unit **231** determines the authenticity/damage of all the gaming chips contained in the case or the number of gaming chips of each value on the basis of the information, and determines whether the case **100** is pass or fail. In the following description, the gaming chip information stored in the RFID tag **503** is referred to as "first gaming chip information", and the notation information assigned to the side surface of the gaming chip C and the color information of the designated color layer **501** are referred to as "second gaming chip information".

[0142] In a first pass/fail determination method, the first gaming chip information and the second gaming chip information in the same gaming chip are the same information as illustrated in FIG. **13**. In an example of FIG. **13**, the first gaming chip information is information including the individual identification information and the value information of each gaming chip C, and the same content as the first gaming chip information is inscribed on the side surface in a form of the notation information as the second gaming chip information.

[0143] The RFID reader **221** reads the first gaming chip information from the RFID tag **503** of the gaming chip C and outputs the first gaming chip information to the identifying unit **230**, the infrared camera **225** photographs the side surface of the gaming chip C, and the identifying unit **230** specifies the second gaming chip information. In this case, in the identifying unit **230**, a correspondence relation between a plurality of pieces of first gaming chip information and a plurality of pieces of second gaming chip information is unclear.

[0144] The determining unit **231** compares a plurality of pieces of first gaming chip information obtained by the identifying unit **230** with a plurality of pieces of second gaming chip information, and when a plurality of pieces of first gaming chip information completely correspond to a plurality of pieces of second gaming chip information in a one-to-one manner, that is, when all pieces of first gaming chip information coincide with any one of second gaming chip information without overlapping, the determining unit **231** determines that a plurality of gaming chips C contained in the case **100** are pass, but when a plurality of pieces of first gaming chip information obtained by the identifying unit **230** do not completely coincide with a plurality of pieces of second gaming chip information, the determining unit **231** determines that a plurality of gaming chips C contained in the case **100** are fail.

[0145] As a case in which a plurality of pieces of first gaming chip information obtained by the identifying unit **230** do not completely coincide with a plurality of pieces of second gaming chip information, there is a case in which any one of the gaming chips C contained in the case **100** is a fake or a case in which the RFID tag **503** or the side surface of the gaming chip C is damaged.

[0146] In other words, the determining unit **231** determines whether a plurality of gaming chips C contained in the case **100** are pass or fail by determining the authenticity/damage of all the gaming chips contained in the case **100**.

[0147] In a second pass/fail determination method, the first gaming chip information and the second gaming chip information in the same gaming chip C are the same information as illustrated in FIG. **14**. In an example of FIG. **14**, the first gaming chip information is the value information of each gaming chip C, and in each gaming chip C, the designated color is assigned to the designated color layer **501** of the side surface as the second gaming chip information.

[0148] The RFID reader **221** reads out the first gaming chip information from the RFID tag **503** of the gaming chip C and outputs the first gaming chip information to the identifying unit **230**, the visible light camera **226** photographs the side surface of the gaming chip C, and the identifying unit **230** analyzes the image and specifies the second gaming chip information (the color of the designated color layer **501**).

[0149] In this case, in the identifying unit **230**, a correspondence relation between a plurality of pieces of first gaming chip information and a plurality of pieces of second gaming chip information is unclear, a plurality of pieces of first gaming chip information may overlap each other, and a plurality of pieces of second gaming chip information may also overlap with each other. In the first gaming chip information and the second gaming chip information of FIG. **14**, "r" indicates red, "b" indicates blue, "y" indicates yellow, and "g" indicates green.

[0150] When the number of each of all the designated colors (red, blue, yellow, and green) in a plurality of pieces of first gaming chip information obtained by the identifying unit **230** coincides with the number of each of all the designated colors (red, blue, yellow, and green) in a plurality of pieces of second gaming chip information, the determining unit **231** determines "pass", and otherwise, the determining unit **231** determines "fail".

[0151] As a case in which the number of each of all the designated colors in the first gaming chip information does not coincide with the number of each of all the designated colors in a plurality of pieces of second gaming chip information, there is a case in which any one of the gaming chips C contained in the case **100** is a fake or a case in which the side surface of any of the gaming chips C is damaged. In other words, the determining unit **231** determines whether a plurality of gaming chips C contained in the case **100** are pass or fail by determining the number of all the gaming chips C contained in the case **100** for each value.

[0152] In a third pass/fail determination method, the first gaming chip information and the second gaming chip information in the same gaming chip C are different information as illustrated in FIG. **15**. In an example of FIG. **15**, information of an English character string is stored in the RFID tag **503** of the gaming chip C as the first gaming chip information, and the notation information of a numeric string is inscribed on the side surface of the gaming chip C as the second gaming chip information.

[0153] The RFID reader **221** reads out the first gaming chip information from the RFID tag **503** of the gaming chip C and outputs the first gaming chip information to the identifying unit **230**, the infrared camera **225** photographs the side surface of the gaming chip C, and the identifying unit **230** specifies the second gaming chip information. In this case, in the identifying unit **230**, a correspondence relation between a plurality of pieces of first gaming chip information and a plurality of pieces of second gaming chip information is unclear.

[0154] The first gaming chip information and the second gaming chip information are stored in the use management device **303** in association with the case identification information of the case **100**. The determining unit **231** compares a plurality of pieces of first gaming chip information obtained

by the identifying unit **230** with a plurality of pieces of first gaming chip information associated with the case identification information of the case **100** stored in the use management device **303**, and determines whether or not they completely correspond to each other in a one-to-one manner. The determining unit **231** compares a plurality of pieces of second gaming chip information obtained by the identifying unit **230** with a plurality of pieces of second gaming chip information associated with the case identification information of the case **100** stored in the use management device **303** and determines whether or not they completely correspond to each other in a one-to-one manner.

[0155] When a plurality of pieces of first gaming chip information obtained by the identifying unit **230** completely correspond to a plurality of pieces of first gaming chip information associated with the case identification information of the case **100** stored in the use management device **303** in a one-to-one manner, that is, a plurality of pieces of first gaming chip information obtained by the identifying unit **230** coincide with any one of a plurality of pieces of first gaming chip information associated with the case identification information of the case **100** stored in the use management device **303** without overlapping, and a plurality of pieces of second gaming chip information obtained by the identifying unit **230** completely correspond to a plurality of pieces of second gaming chip information associated with the case identification information of the case **100** stored in the use management device **303** in a one-to-one manner, that is, a plurality of pieces of second gaming chip information obtained by the identifying unit **230** coincide with any one of a plurality of pieces of second gaming chip information associated with the case identification information of the case **100** stored in the use management device **303** without overlapping, the determining unit **231** determines that a plurality of gaming chips C contained in the case **100** are pass, and when any one of a plurality of pieces of first gaming chip information does not coincide or any one of a plurality of pieces of second gaming chip information does not coincide, the determining unit **231** determines that a plurality of gaming chips C contained in the case **100** are fail.

[0156] As a case in which one of a plurality of pieces of first gaming chip information does not coincide with the stored information or one of a plurality of pieces of second gaming chip information does not coincide with the stored information, there is a case in which any one of gaming chips C contained in the case **100** is a fake or a case in which the RFID tag **503** or the side surface of the gaming chip C is damaged. In other words, the determining unit **231** determines whether or not a plurality of gaming chips C contained in the case **100** are pass or fail by determining the authenticity/damage of all the gaming chips C contained in the case **100**.

[0157] In a fourth pass/fail determination method, the first gaming chip information and the second gaming chip information in the same gaming chip C are different information as illustrated in FIG. **16**. In an example of FIG. **16**, information of an English character string is stored in the RFID tag **503** of the gaming chip C as the first gaming chip information, and the designated color layer **501** of the side surface of the gaming chip Cis colored in the designated color corresponding to the value as the second gaming chip information.

[0158] The RFID reader **221** reads out the first gaming chip information from the RFID tag **503** of the gaming chip C and outputs the first gaming chip information to the identifying unit **230**, the visible light camera **226** photographs the side surface of the gaming chip C and outputs a captured image to the identifying unit **230**, and the identifying unit **230** analyzes the captured image and specifies the designated color which is the second gaming chip information. In this case, in the identifying unit **230**, a correspondence relation between a plurality of pieces of first gaming chip information and a plurality of pieces of second gaming chip information is unclear.

[0159] The first gaming chip information and the second gaming chip information are stored in the use management device **303** in association with the case identification information of the case **100**. The determining unit **231** compares a plurality of pieces of first gaming chip information obtained by the identifying unit **230** with a plurality of pieces of first gaming chip information associated with the case identification information of the case **100** stored in the use management device **303**

and determines whether or not they completely correspond to each other in a one-to-one manner. The determining unit **231** compares the number of each designated color in a plurality of pieces of second gaming chip information obtained by the identifying unit **230** with the number of each designated color in a plurality of pieces of second gaming chip information associated with the case identification information of the case **100** stored in the use management device **303**, and determines whether or not the numbers of designated colors coincide with each other.

[0160] When a plurality of pieces of first gaming chip information obtained by the identifying unit **230** completely correspond to a plurality of pieces of first gaming chip information associated with the case identification information of the case **100** stored in the use management device **303**, and the number of each of all the designated colors in a plurality of pieces of second gaming chip information obtained by the identifying unit **230** coincide with the number of each of all the designated colors in a plurality of pieces of second gaming chip information associated with the case identification information of the case **100** stored in the use management device **303**, the determining unit **231** determines the case **100** to be "pass", and when any one of a plurality of pieces of first gaming chip information does not coincide, and the number of any one of the designated colors in a plurality of pieces of second gaming chip information does not coincide, the determining unit **231** determines the plurality of gaming chips C contained in the case **100** to be "fail".

[0161] As a case in which one of a plurality of pieces of first gaming chip information does not coincide with the stored information or the number of any of the designated colors in a plurality of pieces of second gaming chip information does not coincide, there is a case in which any one of gaming chips C contained in the case **100** is a fake or a case in which the RFID tag **503** or the side surface of the gaming chip C is damaged. In other words, the determining unit **231** determines whether or not a plurality of gaming chips C contained in the case **100** are pass or fail by determining the authenticity/damage of all the gaming chips C contained in the case **100** and the number of gaming chips C for each value.

[0162] In a fifth pass/fail determination method, the first gaming chip information and the second gaming chip information in the same gaming chip C are different information as illustrated in FIG. **17**. In an example of FIG. **17**, the individual identification information including a numeric string is stored in the RFID tag **503** of the gaming chip C as the first gaming chip information, and the value information of the gaming chip C is assigned to the side surface of the gaming chip C as the second gaming chip information in the form of the designated color of the designated color layer **501**.

[0163] The RFID reader **221** reads out the first gaming chip information from the RFID tag **503** of the gaming chip C and outputs the first gaming chip information to the identifying unit **230**, the visible light camera **226** photographs the side surface of the gaming chip C and outputs a captured image to the identifying unit **230**, and the identifying unit **230** analyzes the captured image and specifies the designated color which is the second gaming chip information. In this case, in the identifying unit **230**, a correspondence relation between a plurality of pieces of first gaming chip information and a plurality of pieces of second gaming chip information is unclear.

[0164] The correspondence relation between the first gaming chip information and the second gaming chip information is stored in the use management device **303**. In an example of FIG. **17**, the individual identification information uniquely specifying the gaming chip C is associated with the designated color of the designated color layer **501** of the side surface, that is, the value information of the gaming chip C, and it is possible to understand the value of the gaming chip C when the individual identification information is designated. In the case of the present example, the use management device **303** need not store a combination of the first gaming chip information and the second gaming chip information for each piece of case identification information. In other words, in the present example, the gaming chips C contained in case **100** can be inspected without using the case identification information.

[0165] The determining unit **231** specifies the first gaming chip information corresponding to the

first gaming chip information identified by the identifying unit **230** from the first gaming chip information stored in the use management device **303** and specifies the second gaming chip information associated with the first gaming chip information, that is, the value. The determining unit **231** can obtain the number of each value in a plurality of pieces of second gaming chip information extracted from the use management device **303** for one case by performing the above process on all pieces of the first gaming chip information identified by the identifying unit **230**.

[0166] The determining unit **231** compares the number of each value obtained as described above with the number of each value in the second gaming chip information identified for the case **100** from the identifying unit **230**. When the numbers of each of all the values coincide, the determining unit **231** determines that a plurality of gaming chips C contained in the case **100** are pass, and when the number of any one of the values does not coincide, the determining unit **231** determines that a plurality of gaming chips C contained in the case **100** are fail.

[0167] As a case in which the number of each value in a plurality of pieces of second gaming chip information extracted from the use management device **303** does not coincide with the number of each value in the second gaming chip information identified for the case **100** from the identifying unit **230**, there is a case in which any one of gaming chips C contained in the case **100** is a fake or a case in which the RFID tag **503** or the side surface of the gaming chip Cis damaged. In other words, the determining unit **231** determines whether or not a plurality of gaming chips C contained in the case **100** are pass or fail by determining the authenticity/damage of all the gaming chips C contained in the case **100** and the number of gaming chips C for each value.

[0168] Although not illustrated, even when the value of the gaming chip C is stored as the first gaming chip information, and the individual identification information of the gaming chip C is stored as the second gaming chip information, the pass/fail determination can be performed similarly to the above example.

[0169] The first to fifth pass/fail determination methods have been described above, but the determining unit **231** may employ a combination of the above pass/fail determination methods. In addition to the above pass/fail determination methods, when both the number of pieces of first gaming chip information and the number of pieces of second gaming chip information read from a plurality of gaming chips C contained in the case **100** are not a predetermined number (**100** in the present embodiment), the determining unit **231** may determine that a plurality of gaming chips C contained in the case **100** are fail.

[0170] The first and second pass/fail determination methods are pass/fail determination methods that can be executed without using the information stored in the use management device **303** installed in the game hall P and suitable when executed by the inspecting device **200** in the factory F, the third to fifth pass/fail determination methods are pass/fail determination methods using the information stored in the use management device **303** installed in the game hall P and suitable when executed by the inspecting device **200** in the game hall P, but the inspecting device **200** in the game hall P may employ the first or second pass/fail determination method. When all the inspecting devices **200** in the game hall P employ the pass/fail determination method in which the information stored in the use management device **303** is not used such as the first or second pass/fail determination method, the use management device **303** may be omitted.

[0171] Further, the inspecting device **200** in the game hall P also inspects the case **100** containing the used gaming chips C, but in the case, the first, second, or fifth pass/fail determination method in which information of the gaming chips to be contained in the case need not be stored may be employed.

[0172] Further, in the above embodiment, the gaming chip C includes the individual identification information and/or the value information as the first gaming chip information and/or the second gaming chip information. Here, the individual identification information is information uniquely specifying each gaming chip C, whereas the value information is information that can overlap each other in a plurality of gaming chips C and can be regarded as information (group information)

indicating a group to which each gaming chip belongs. In the present embodiment, as the group information of the associated group, instead of the value or in addition to the value, for example, information of a gaming chip manufacturing time, a manufacturer, and/or a game hall in which a gaming chip is used may be employed.

[0173] In other words, both the first gaming chip information and the second gaming chip information may include the individual identification information identifying the gaming chip, the first gaming chip information and the second gaming chip information may include the group information indicating the group to which the gaming chip belongs, the first gaming chip information may include the individual identification information identifying the gaming chip, and the second gaming chip information may include the group information of the group to which the gaming chip belongs, or, the first gaming chip information may include the group information of the group to which the gaming chip belongs, and the second gaming chip information may include the individual identification information identifying the gaming chip.

[0174] FIGS. **18** and **19** are diagrams illustrating an example of a pass/fail determination result display screen illustrating a pass/fail determination result in the determining unit **231**. These pass/fail result display screens are generated by the computer **222** on the basis of the pass/fail determination result in the determining unit **231** and displayed on the display unit **223**. FIG. **18** illustrates an example of a display screen in the case of "pass", and FIG. **19** illustrates an example of a display screen in the case of "fail".

[0175] As illustrated in FIGS. **18** and **19**, a pass/fail result display screen **800** includes a total of the number of detections **801** which is the number of combinations of the first gaming chip information and the second gaming chip information read out from the gaming chip C by the identifying unit **230**, the number of authorized gaming chips C **802**, and the number of unauthorized gaming chips C **803**.

[0176] The computer **222** sets a larger one of the number of pieces of first gaming chip information and the number of pieces of second gaming chip information as the total of the number of detections **801**. For example, when 100 gaming chips C are contained in the case **100**, and one of the 100 gaming chips C has no RFID tag **503** therein, the identifying unit **230** specifies 100 pieces of second gaming chip information from a plurality of gaming chips C but obtains only 99 pieces of first gaming chip information. In this case, the computer **222** sets **100** which is the larger of the first gaming chip information and the second gaming chip information as the total of the number of detections **801**.

[0177] In the case of the first or second pass/fail determination method, the computer **222** decides the number of combinations of the first gaming chip information and the second gaming chip information that are determined to coincide with each other as the number of authorized gaming chips C **802**, and decides a number obtained by subtracting the number of authorized gaming chips C from the total of the number of detections **801** as the number of unauthorized gaming chips C **803**.

[0178] In the case of the third or fourth pass/fail determination method, the computer **222** decides a smaller one of the number of pieces of first gaming chip information in which the correspondence relation with the first gaming chip information stored in the use management device **303** has been confirmed and the number of pieces of second gaming chip information in which the correspondence relation with the second gaming chip information stored in the use management device **303** has been confirmed as the number of authorized gaming chips C **802**, and decides a number obtained by subtracting the number of authorized gaming chips C from the total of the number of detections **801** as the number of unauthorized gaming chips C **803**.

[0179] In the case of the fifth pass/fail determination method, the computer **222** decides the number of pieces of second gaming chip information in which the correspondence relation with the second gaming chip information stored in the use management device **303** has been confirmed as the number of authorized gaming chips C **802**, and decides a number obtained by subtracting the

number of authorized gaming chips C from the total of the number of detections **801** as the number of unauthorized gaming chips C **803**.

[0180] The pass/fail result display screen **800** includes a gaming chip information display portion **804** that displays the gaming chip information read out from the gaming chip C through the identifying unit **230**. In the gaming chip information display portion **804**, when the gaming chip information stored in the use management device **303** is read or when the first gaming chip information coincides with the second gaming chip information, the gaming chip information is colored and displayed, and the gaming chip information which is stored in the use management device **303** but not read out is displayed in white (see FIG. **19**).

[0181] In the pass/fail result display screen **800**, when the gaming chip information not stored in the use management device **303** is read or when the first gaming chip information does not coincide with the second gaming chip information, the gaming chip information is displayed outside the gaming chip information display portion **804** as unauthorized gaming chip information **805**.

[0182] FIG. **20** is a diagram illustrating an RFID antenna **224** of the inspecting device **200** according to a modified example. In FIG. **20**, the arm **227**, the infrared camera **225**, and the visible light camera **226** are not illustrated. In the above embodiment, the RFID antenna **224** is installed in the left and right sidewalls **211**, but the RFID antenna **224** may be installed in an inner wall **213**. In this case, the RFID antenna **224** is arranged in a spiral shape inside the inner wall **213**.

[0183] FIG. **21** is a side view of a gaming chip C′ according to a modified example. In the gaming chip C of the above embodiment, the designated color layer **501** is sandwiched between the common color layers **502**, but in the example of FIG. **21**, in the gaming chip C′, a common color layer **502** is formed as the center, and the designated color layer **501** is formed as both (upper and lower) sides. In the example of FIG. **21**, individual identification information indicated by a 7-digit numeric string is inscribed (printed) on the side surface of the gaming chip C′ as code information **505′**. In the example of FIG. **21**, the code information **505′** serving as the notation information is inscribed on the common color layer **502** in the middle. In this case, the code information **505′** can indicate 10-th power of 7 types of information.

[0184] Further, both the code information **505** indicated by the presence/absence of the mark m described for the gaming chip C of the above embodiment and the code information **505′** of the numeric string illustrated in FIG. **21** are inscribed on the side surface of the gaming chip C. In this case, the code information **505** of the mark m and the code information **505′** of the numeric string may be printed with different types of ink. For example, the code information **505** of the mark m may be printed with the infrared reaction ink, and the code information **505′** of the numeric string may be printed with the UV reactive ink. In this case, an infrared camera and an ultraviolet camera may be prepared to photograph the side surface of the gaming chip C, the code information **505** of the mark m may be read by the infrared camera, and the code information **505′** of the numeric string may be read by the ultraviolet camera.

[0185] FIG. **22** is a side sectional view of the gaming chip C″ according to another modified example. The gaming chip C″ has a multi-layer structure in which a plurality of plastic layers having different colors are stacked, a designated color layer **501** (a colored layer) is arranged at least in the middle, and a common color layer (a white or light-colored layer) **502** are stacked on both sides of the designated color layer **501** in the middle. It is desirable that the color of the common color layer **502** be thinner than the color of the designated color layer **501**. Since the gaming chip C″ has a multi-layer structure in which the designated color layer **501** is arranged, and the common color layer **502** is stacked on both sides of the designated color layer **501** in the middle as described above, it is possible to specify a type of gaming chip C″ (10 points, 20 points, 100 points, 1,000 points, or the like) by forming a stripe pattern on the side surface in a stack direction and changing the color of the designated color layer **501** (red, green, yellow, blue, or the like) as illustrated in FIG. **23**.

[0186] FIG. **23** is a perspective view of stacked gaming chips C″, FIG. **24** is a side view of the

gaming chip C″, and FIG. **25** is a plan view of the gaming chip C″. As illustrated in FIG. **23**, the gaming chip C″ has a five or more-layer structure in which a print **507** (100 points or the like) indicating a type (value) of gaming chip C″ is performed on the surface (the upper surface and the lower surface) of the common color layer **502**, a transparent layer **504** is formed as the outermost layer, and the respective layers are thermocompression-bonded. The gaming chip C″ is formed using an elongated plastic material such that a state in which the respective layers (the designated color layer **501**, the common color layer **502**, and the transparent layer **504**) are thermocompression-bonded and adhered to each other in an elongated stated (a five-layer structure or the like) is formed and then punched out into a circular shape, a rectangular shape, or the like through a process or the like. When the punching is performed through the press, dimensions of a die and a punch of a mold for punching are designed, and R treatment (rounded corner) is applied to the end of the transparent layer **504** of the outermost layer.

[0187] Further, in the gaming chip C″, the mark m″ is formed on the surface of common color layer **502** using the UV ink or the carbon black ink. The mark m″ indicates whether the gaming chip C″ is true or false, and the mark m″ becomes visible when irradiated with ultraviolet rays (or infrared rays), and it is indicated whether the gaming chip C″ is true or false in accordance with a combination of shapes of the mark m″ and the number of marks m″. The transparent layer **504** is thermocompression bonded or applied on the outermost layer so as to cover the print **507** or the mark m′, but embossing treatment is applied to the transparent layer **504**, and thus the gaming chips C″ are prevented from adhering to each other.

[0188] The R treatment (R) is performed on the end of the transparent layer **504** of the outermost layer which has undergone a print **507** (100 points or the like), and the surface of the common color layer **502** is prevented from being deformed in the process of punching the gaming chip C″ and appearing on the side surface. Further, a sharp edge of the gaming chip C″ is prevented from remaining and damaging a hand and other gaming chips C″.

[0189] As illustrated in FIG. **22**, the designated color layer **501** may be formed by a plurality of layers colored in the designated color (three layers in FIG. **22**). Since a plurality of layers colored in the designated color (three layers in FIG. **22**) are thermocompression bonded to each other, the three-layer structure is not visible as illustrated in FIG. **22**, and FIG. **22** illustrates the three layers of the designated color layer **501** for the sake of description. Further, a partial hollow B is formed in a middle layer among the three layers of the designated color layer **501**, and a RFID tag **503** is installed in the partial hollow B.

[0190] Since the gaming chip C, C′, and C″ have a stacked multi-layer structure, and a stripe pattern in the lamination direction is vividly formed on the side surface as illustrated in FIG. **2**, FIG. **21**, and FIG. **22**, it is possible to easily and accurately measure the color of the designated color layer **501** (the type of gaming chip) and the number of designated color layers **501** through image analysis as compared with a chip of a related art. FIG. **26** is a diagram illustrating an example of an image obtained by photographing the stacked gaming chips. As illustrated in FIG. **26**, it is possible to photograph the side surface of the gaming chip C through the visible light camera **226** and clearly identify the designated color layer **501**. Further, it is possible to accurately analyze and determine an image when an artificial intelligence utilization type computer or control system or a deep learning (structure) technique is used in the image analysis. Since the artificial intelligence utilization type computer or control system or the deep learning (structure) technique is known to those skilled in the art, detailed description thereof is omitted.

[0191] As described above, the case **100** is sealed with a seal after a predetermined number of gaming chips C are contained. The seal is broken when the case is opened to allow the contained gaming chips to be withdrawn. The inspecting device **200** may include a detecting unit that detects an unbroken seal affixed to the case **100**. The detecting unit may detect the seal optically or magnetically. In this case, when an unbroken seal is not detected by the detecting unit, the determining unit **231** determines that a plurality of gaming chips C contained in the case **100** are

fail.

[0192] In the above embodiment, all the components of the inspecting device **200** are arranged in a single device as illustrated in FIG. **6**, but the components may be distributedly arranged. For example, some or all of the computer **222**, the display unit **223**, and the communication unit **229** may be implemented by a personal computer connected to the inspecting device **200**. The distributedly arranged components may be connected to be able to perform wired or wireless communication or may be connected via a network such as the Internet.

[0193] Further, as illustrated in FIGS. **27** and **28**, the infrared camera **225** and/or the visible light camera **226** and the arm **227** may be separated from the inspecting device **200**, and the cameras may be connected to the computer **222**. FIG. **27** illustrates an example in which only one of the infrared camera **225** and the visible light camera **226** is installed separately from the inspecting device **200**, and FIG. **28** illustrates an example in which the infrared camera **225** is installed separately from the inspecting device **200**, and the visible light camera **226** is installed integrally with the inspecting device **200**. Further, in addition to the infrared camera **225** and the visible light camera **226**, an ultraviolet camera may be installed as a third camera together with an ultraviolet lamp, or one of the cameras in FIGS. **27** and **28** may be an ultraviolet camera equipped with an ultraviolet lamp.

[0194] In the above embodiment, in the gaming chip C, the gaming chip information is stored in the RFID tag **503**, the code information **505** serving as the gaming chip information is inscribed on the side surface, the designated color of the designated color layer **501** of the side surface is also dealt as the gaming chip information indicating the value of the gaming chip C, and one gaming chip C has the three pieces of gaming chip information, but the present invention is not limited to this example, and the gaming chip C may has only two of the three pieces of gaming chip information. When the gaming chip C has two pieces of gaming chip information, the first to fifth pass/fail determination methods can be executed.

[0195] In the above first to fifth pass/fail determination methods, two pieces of gaming chip information are used, but when the gaming chip C has three pieces of gaming chip information, the determining unit **231** performs the pass/fail determination using the three pieces of gaming chip information.

[0196] In the above embodiment, the example in which the display unit **223** is configured with a liquid crystal panel has been described, but the display unit **223** may be a lamp that simply indicates only whether it is pass or fail or may be a lamp that performs digital display of the total of the number of detections **801**, the number of authorized gaming chips C **802**, and the number of unauthorized gaming chips C **803**.

[0197] The determining unit **231** of the above embodiment is able to specify the number of each of the values of a plurality of gaming chips C contained in the case **100** as described above. In this regard, the determining unit **231** may further calculate a total amount of the values of a plurality of gaming chips C contained in the case **100** on the basis of the number of each value. The calculated total amount may be displayed on the pass/fail result display screen (see FIGS. **18** and **19**) displayed on the display unit **223**.

Claims

1. An inspection system for inspecting gaming chips having at least first and second chip information, wherein the second chip information is provided on a side surface of the gaming chip in a form that can be optically read, the inspection system comprising: a housing configured to store a plurality of gaming chips stack on top of each other; and an inspection device configured to inspect the gaming chips stored in the housing, wherein the inspection device comprises: a first reader configured to acquire the first chip information of the gaming chips stored in the housing; a second reader configured to optically read the side surface of the gaming chip stored in the housing

to acquire the second chip information; and a determination unit configured to determine whether or not the plurality of gaming chips stored in the housing are acceptable by determining, using the first chip information acquired by the first reader and the second chip information acquired by the second reader, whether or not the gaming chip corresponding to the acquired second chip information does not exist.

2. The inspection system according to claim 1, wherein the determination unit is configured to determine that the plurality of gaming chips stored in the housing are rejected when the number of the first chip information acquired does not match the number of the second chip information acquired.

3. The inspection system according to claim 1, wherein the determination unit is configured to determine that the plurality of gaming chips stored in the housing are rejected when the number of the first chip information acquired for each value does not match the number of the second chip information acquired for each value.

4. The inspection system according to claim 3, wherein the notational information is notated with infrared reactive ink that emits light in response to infrared light or infrared absorbing ink that absorbs infrared light, and the camera is an infrared camera.

5. The inspection system according to claim 3, wherein the notational information is represented by an ink that emits light in response to ultraviolet light, and the inspection device further comprises a UV irradiation unit configured to irradiate UV light to the sides of the plurality of gaming chips stored in the housing.

6. The inspection system according to claim 1, further comprising a display unit configured to display a result of the determination by the determination unit, wherein the display unit is configured to distinguish and display acceptable gaming chips from the non-acceptable gaming chips so that the non-acceptable gaming chips having the second chip information that does not have the corresponding first chip information can be identified.

7. The inspection system according to claim 6, wherein the inspection device is configured to determine a plurality of gaming chips stored in the housing as non-acceptable when both the first and second chip information contain individual identification information, and when the plurality of the first chip information acquired by the first reader does not match the individual identification information of the plurality of the second chip information acquired by the second reader.

8. The inspection system according to claim 1, wherein the first chip information and the second chip information in a common gaming chip include common information, and the determination unit is configured to determine the plurality of gaming chips housed in the housing as non-acceptable when the common information of the plurality of first chip information acquired by the first reader and the plurality of second chip information acquired by the second reader do not match.

9. The inspection system according to claim 1, wherein both or either of the first and second chip information include individual identification information that individually identifies each gaming chip.

10. The inspection system according to claim 1, wherein the second chip information includes information expressed in a designated color that indicates the value of the gaming chip in the designated color.

11. The inspection system according to claim 10, wherein the light transmitting portion comprises a transparent member.

12. The inspection system according to claim 10, wherein the housing is portable.

13. The inspection system according to claim 1, further comprising a display unit configured to display a result of the determination by the determination unit, wherein both the first and second chip information include individual identification information that individually identifies the gaming chips, and the display unit is configured to display a distinction between the acceptable and non-acceptable gaming chips so that the non-acceptable gaming chips can be identified when the

individual identification information of the plurality of the first chip information acquired by the first reader and the plurality of the second chip information acquired by the second reader do not match.

14. The inspection system according to claim 1, further comprising a memory unit configured to store individual identification information of at least the first or second chip information of a plurality of gaming chips that should be stored in the housing, wherein if the individual identification information of the plurality of the first chip information acquired by the first reader or the plurality of the second chip information acquired by the second reader does not match the individual identification information of the first chip information or the second chip information stored in the memory unit, the determination unit is configured to determine as non-acceptable for the plurality of gaming chips stored in the housing.

15. The inspection system according to claim 1, further comprising: a display unit configured to display the determination results in the determination unit; and a memory unit configured to store individual identification information of at least the first or second chip information of a plurality of gaming chips to be stored in the housing, wherein the display unit is configured to distinguish between accepted and rejected gaming chips so that rejected gaming chips can be identified when the individual identification information of the plurality of the first chip information acquired by the first reader or the plurality of the second chip information acquired by the second reader does not match the individual identification information of the first chip information or the second chip information stored in the memory unit.

16. The inspection system according to claim 1, further comprising a memory unit configured to store correspondence between the first and second chip information, wherein the determination unit is configured to determine the plurality of gaming chips stored in the housing as rejected when the plurality of the first chip information acquired by the first reader and the plurality of the second chip information acquired by the second reader do not match the corresponding relationships stored in the memory unit.

17. The inspection system according to claim 1, further comprising: a display unit configured to display the determination results in the determination unit; and a memory unit configured to store a correspondence relationship between the first and second chip information, wherein the display unit is configured to distinguish between accepted and rejected gaming chips so that rejected gaming chips can be identified when a plurality of the first chip information acquired by the first reader and a plurality of the second chip information acquired by the second reader do not match the correspondence relationship stored in the memory unit.

18. The inspection system according to claim 1, wherein the determination unit is configured to determine that the plurality of gaming chips stored in the housing are rejected when the number of the first chip information acquired by the first reader or the number of the second chip information acquired by the second reader are not a predetermined number.

19. The inspection system according to claim 1, wherein the gaming chip includes color information indicating the value of the gaming chip in the second chip information and value information identifying the value of the gaming chip in the first chip information, and the determination unit is configured to determine the plurality of gaming chips stored in the housing as rejected when the color information and the value information of the first chip information do not match.

20. The inspection system according to claim 19, wherein the determination unit is configured to determine the plurality of gaming chips stored in the housing as rejected when the color information does not match at least one of the value information or common information or individual identification information of the first and second chip information.

21. The inspection system according to claim 19, wherein the determination unit is configured to determine the number of pieces per value of the plurality of the gaming chips housed in the housing or the total value of all the gaming chips based on the color information or value information of the

first or second chip information.

22. The inspection system according to claim 19, wherein the second chip information further includes value information of the gaming chip in addition to the color information, and the determination unit is configured to determine the plurality of gaming chips stored in the housing as rejected when the value of the gaming chips according to the color information in the second chip information does not match both or either the value information in the second chip information and the value information in the first chip information.

23. The inspection system according to claim 1, further comprising a display unit configured to display the determination results in the determination unit, wherein the gaming chips include color information indicating the value of the gaming chips in the second chip information and value information identifying the value of the gaming chips in the first chip information, and the display unit is configured to distinguish between the accepted gaming chips and the rejected gaming chips so that the rejected gaming chips can be identified when the color information and the value information of the first chip information do not match.

24. The inspection system according to claim 23, wherein the second chip information further includes value information of the gaming chips in addition to the color information, and the display unit is configured to distinguish between accepted and rejected gaming chips so that rejected gaming chips can be identified when the value of the gaming chip according to the color information in the second chip information does not match both or either the value information in the second chip information and the value information in the first chip information.

25. The inspection system according to claim 1, wherein the gaming chip has a radio tag with the first chip information.

26. The inspection system according to claim 1, wherein at least one or both of the first and second chip information include group information indicating the group to which the gaming chip belongs, the group being a group divided by the value of the gaming chip, the time of manufacture, the manufacturer, and/or the place of use.

27. The inspection system according to claim 1, wherein the second chip information includes information expressed in a designated color that indicates the value of the gaming chips on the side of the gaming chips, with the designated color indicating the value of the gaming chips, and the second reader comprises: a camera configured to photograph the sides of the plurality of gaming chips stored in the housing; and an identification configured to analyze the image captured by the camera to identify the designated color of each of the plurality of gaming chips and identify the value of the plurality of gaming chips according to the identified designated color.

28. The inspection system according to claim 1, wherein the designated colors representing the second chip information are sandwiched in the direction of the thickness of the gaming chips by a common color commonly assigned to gaming chips of different values on a side of the gaming chips.

29. The inspection system according to claim 1, wherein the second chip information is notational information optically readable on the side surface, the second reading device comprises: a camera configured to photograph the sides of a plurality of gaming chips stacked and stored in the housing; and an identification unit that analyzes the image captured by the camera to identify the notation information of each of the plurality of gaming chips and identifies the second chip information of each of the plurality of gaming chips according to the identified notation information.

30. The inspection system according to claim 1, wherein the housing is sealed with a seal that is destroyed when the stored gaming chips are opened for removal, the inspection device further comprises a detection unit configured to detect an unbroken seal, and the determination unit is configured to determine the plurality of gaming chips stored in the housing as rejected when no undestroyed seals are detected by the detecting unit.

31. The inspection system according to claim 1, wherein the housing has a light transmissive portion, and the second reader is configured to optically read the sides of the gaming chips stored in

the housing through the light transmissive portions.

32. The inspection system according to claim 1, wherein the inspection device comprises a housing receiving portion for receiving the housing.

33. The inspection system according to claim 1, wherein the housing is a two-tiered chip float or chip tray configured to hold the gaming chips at the game table.