

(19)



(11)

EP 4 501 423 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
05.02.2025 Bulletin 2025/06

(21) Application number: **24183071.0**

(22) Date of filing: **19.06.2024**

(51) International Patent Classification (IPC):
A63F 3/02 ^(2006.01) **A63F 3/00** ^(2006.01)
A63F 11/00 ^(2006.01) **A63F 9/24** ^(2006.01)

(52) Cooperative Patent Classification (CPC):
A63F 3/00895; A63F 3/02; A63F 11/0051;
A63F 2003/00943; A63F 2003/00946;
A63F 2009/2435; A63F 2009/2442;
A63F 2009/2447; A63F 2009/2489;
A63F 2011/0058; A63F 2250/606

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL
NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
GE KH MA MD TN

(30) Priority: **01.08.2023 ES 202331418 U**

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(54) **BOX WITH DIGITAL INFORMATION TECHNOLOGY FOR CHESS GAMES**

(57) Counting device for chess, comprising at least one container with an opening for receiving chess pieces, a system for detecting inserted pieces and means for

indicating pieces inserted into the container and/or a numerical value derived from the pieces inserted into said container.

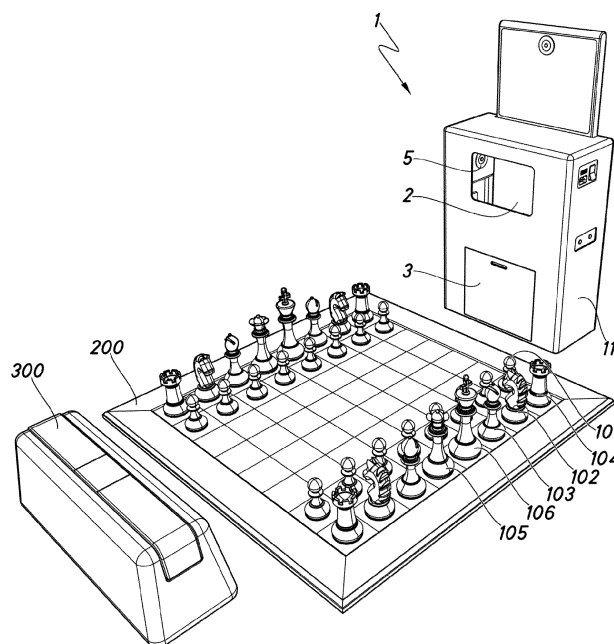


Fig.1

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Description

Box with digital information technology for chess matches

[0001] The present invention relates to a counting device for chess. More specifically, the present invention relates to a digital counter for chess played over the board (OTB).

[0002] Chess is a board game between two opponents which, in its competition version over a board, is considered by the International Olympic Committee to be a sport. Chess is played on a rectangular board with 64 squares. Each opponent begins the match with sixteen pieces: eight pawns, two knights, two bishops, two rooks, one queen and one king. The opponents take turns to make one move each. The goal is to "trap" the king, so that the opponent cannot legally prevent the subsequent capture of their king. The rules of chess are simple, there is no hidden information for either opponent. Furthermore, the rules do not provide for any element of chance.

[0003] In addition to the rules of the game, experts have determined, by trial and error, a series of heuristic evaluation algorithms that have been established for centuries by experts and that make it possible to evaluate whether one of the opponents has any advantage. One of the first heuristic algorithms that beginners learn is the relative value of the pieces. In general, it is accepted as standard that a pawn is worth one point, a knight or bishop three points, a rook five points, and a queen nine points. Application of the value of the pieces enables an evaluation referred to as a "material evaluation". There is considered to be a "material advantage" when one of the opponents has captured pieces of greater material value than their opponent. Regardless of whether or not a material advantage exists, there is considered to be a "material imbalance" when neither opponent has captured the same set of pieces as their opponent.

[0004] As a result of the number of pieces and squares involved, and the different nature of the pieces, many players (especially beginners) and spectators have difficulty understanding what is happening on the board during a match.

[0005] One objective of the present invention is to disclose means making it easier for players and spectators to follow their own match and other matches.

[0006] More particularly, the present invention discloses a digital counting device that displays the captured pieces and/or the value of the pieces captured during a chess match played on a board. This allows players, especially but not exclusively beginners, and spectators to make a quick assessment of which opponent has a material advantage and/or what material imbalance exists on the board.

[0007] According to the simplest version thereof, the present invention discloses a counting device for chess, comprising at least one container with an opening for receiving chess pieces, a system for detecting inserted

pieces and means for indicating pieces inserted into the container and/or a numerical value derived from the pieces inserted into said container.

[0008] In short, the present invention discloses a physical device that indicates the value of the captured pieces and/or the points total corresponding to the pieces captured by each player, said information being shown on the indicator means, for example an electronic screen belonging to the device or to an external communication device connected to the device. During the match, players have to insert the captured pieces into the container or containers provided for this purpose. The sensor system detects the inserted pieces, enabling the device to display the information from the sensor on the indicator means.

[0009] Preferably, the detection system comprises a radio-frequency reader capable of reading information from the pieces inserted into the container. More preferably, the radio-frequency reader is an RFID or NFC reader. Also preferably, the detection system may comprise a camera and an image recognition module for detecting the pieces entering the container. Also preferably, the detection system comprises a presence or motion sensor, which may for example comprise a contact detector arm located in the opening of the container. The detecting system may have a single detection system (for example a vision camera or a radio-frequency reader) or combine multiple detection systems.

[0010] Preferably, the means for indicating inserted pieces comprise an electronic screen, which allows the indicated information obtained from the detections made by the sensor system to be clearly displayed. The indicator means may also comprise, additionally or alternatively, other devices, for example lamps or lights, preferably LED lights, that are illuminated by each captured piece detected by the sensor system.

[0011] The container may for example be the space inside a box. There may be one container or a series of containers. In a particularly preferred embodiment, there is one container for all of the pieces, or there are two containers, one for the pieces of each colour. In an alternative embodiment, it comprises at least one container for pawns, one container for bishops, one container for knights, one container for rooks, and one container for the queen. This embodiment has the advantage of simplifying the requirements of the sensor system. In a preferred embodiment, each of the aforementioned containers has a number of LEDs to indicate the number of pieces inserted into the container. Preferably, each container has its own opening for inserting pieces. The box may be transparent or any colour, and be made of plastic or any material. When there is more than one container, said containers may be split into several boxes, preferably two boxes, one for pieces of each colour (white and black).

[0012] Also preferably, the counting device may comprise an external camera capable of recording a match played in the vicinity of the device. The camera may be a

short-range camera. The device may have a module for recognizing the image captured by the external camera that recognizes the moves made on the board and stores them in memory in the form of standardized notation (for example algebraic notation). As it is able to record the match, the camera obviates the need to write down all of the moves by hand on a piece of paper or a form, which is currently mandatory in most official tournaments.

[0013] The device may also comprise means for fastening to a surface. Preferably, said means comprise a suction cup that is for example located at the base of the device and/or a box comprising the container. The fastening means may also for example comprise a table support which may for example be located at an intermediate height of the device.

[0014] Preferably, the device has electronic communication means. More preferably, said means comprise a port with a connector for communications, for example a multiport for connections.

[0015] The device may also comprise a portable ID, which may be for RFID, NFC or similar. This is useful if the device uses the screen of a mobile communication device that has this feature. This enables the mobile communication device (for example, a mobile phone or a tablet) to detect, by scanning, the information from the sensor system and/or the control device of the counting device, thus allowing the screen of the mobile communication device to display the data from the captured pieces and/or points value of each piece and/or 2D graphics representing each of the captured pieces. To do so, the mobile device preferably has an application for controlling the mobile communication device.

[0016] The container or containers of the device may be used as a box to store the pieces of the chess set, when it is not in use. This enables the set to be sold with pieces especially prepared for easy detection by the counting device, with the pieces stored in the aforementioned container or containers of the counting device. Therefore, the present invention also discloses a chess set comprising at least one set of chess pieces, and a counting device according to the present invention. Preferably, the pieces comprise a radio-frequency identification tag, more preferably an RFID or NFC tag. The tag may for example be located between the main body of the piece and a felt base thereof.

[0017] For a better understanding of the present invention, drawings showing some non-limiting example embodiments thereof are attached.

Figure 1 is a perspective view of a chessboard and a first example embodiment of a device according to the present invention.

Figure 2 is a perspective view of the device shown in the previous figure.

Figure 3 is another perspective view of the device, from the rear.

Figure 4 is the view in Figure 3, with the screen in an intermediate position between its deployed position and its retracted position.

Figure 5 is the view in Figure 4, with the screen fully retracted.

Figure 6 is a perspective view of a device similar to the device in the previous figures, in which a table support has been added, and in which the door is shown lowered to reveal the pieces inside.

Figure 7 is an exploded perspective view of a chess piece from a chess set according to the present invention.

Figure 8 is a perspective view of another embodiment of a counter according to the present invention.

Figure 9 shows the counter from the previous figure, and a piece that has entered through the opening, and some internal elements using dashed lines.

Figure 10 is the view in Figure 9, with the door open.

Figure 11 shows another example embodiment of a counting device according to the present invention.

Figures 1 to 7 show an example embodiment of a chess set and a counting device according to the present invention. More specifically, Figure 1 shows a board 200 and a chess clock 300. The pieces 101, 102, 103, 104, 105, 106 are shown on the board 200 in their starting positions. A counting device 1 is placed to the right of the board 200.

Figures 2 to 6 show details of the illustrated embodiment of the counting device 1. The counter in the example comprises a box 11 with an opening 2 giving access to a single internal space or container 4. Preferably, when there is only one container, the container 4 has space to store all the pieces, black and white. Alternatively, two containers may be provided, one for each colour, or several containers may be provided for each type of piece. A lower door 3 also provides access to the container 4 and the pieces 101, 103, 105 therein. This door 3 facilitates the removal of said pieces once the match is finished. The device also has a sensor 5 for detecting the pieces in the container 4. As in the example, the sensor 5 can be placed in the vicinity of the opening 2, or in any other suitable place to detect the pieces either when they are inserted through the opening 2 or when they are in the container 4. The sensor 5 may be a camera that detects the pieces using an image recognition module. It can also be a wireless reader, for example an RFID or NFC reader. Different types of detection can also be combined. For example, a

camera and an RFID or NFC reader may be combined.

[0018] The device also comprises an electronic screen 6 intended, as shown in Figure 2, to display the pieces captured by each opponent (for example, by means of a 2D representation of each piece) which are inserted into the counting device 1 and detected by the sensor system 5. It can also display a score for each opponent, consisting of the sum of points corresponding to the pieces of each colour detected by the sensor system. The screen 6 is positioned on the top to make it easily visible. In the example shown, the screen 6 is connected to the box 11 by a hinge (not visible in the figures). The hinge enables the screen to rotate and to be stored in a recess 61 in the box 11. The closing process is shown in Figures 3, 4 and 5. Once rotated, the screen is seated and locked in the recess 61. In order to lift the screen 6 back to its operating position (Figure 1), the button 62 must be pressed to unlock the screen 6. Furthermore, Figure 2 illustrates a preferred embodiment of the information displayed on the screen 6 during operation of the device. The screen shows the symbol of each piece, whether white or black, captured and the total value of the pieces captured by each opponent. This information is displayed using the information provided by the sensor system 5 for sensing the pieces inserted into the container 4. The value of each piece may also be displayed next to its symbol (not shown in the figures).

[0019] The device also comprises a camera 7 arranged to capture an image of the board and preferably to film the match. The device 1 also has a memory to store the recording. This may be useful where necessary for resolving disputes between opponents. Also, if an automatic image recognition module is used, the moves made on the board can be stored and, if desired, displayed on the screen 6. The automatic image recognition module may be a module based on artificial intelligence. The automatic recognition module recognizes the moves made, which can be stored using a standard notation, such as algebraic notation, similarly to the manner in which players usually record moves on a form. Said moves, stored and expressed in standard notation, may be displayed on the screen 6 similarly to a chessboard. Similarly, the names of the players, date, tournament, club, etc. may be displayed if they are entered into the device before the match, for example using a specific application. Finally, the camera 7 may be used to remotely broadcast the match. In the example, the camera 7 shown is built into the screen, but it may also be an element separate from the screen. Moreover, placing the camera 7 at the top of the device facilitates image capture.

[0020] Although not shown in the figures, the counting device 1 has automatic/electronic devices to control and power the different components shown, enabling them to work. The control system may for example be implemented using a mini PC, a Raspberry board or any other

control device suitable for the functionalities needed to carry out the invention. The control device (for example, a Raspberry board) may for example be located on, behind or below the screen, or on the base, or in any suitable location.

[0021] A switch 81, a USB connector 83 for data connections, and an electrical connector 82 to connect the device to the mains, if desired, for example for mains operation or to recharge the batteries of the device (not shown in the figures) are provided on a plate 80 on the outside of the box 11.

[0022] In the embodiment shown, the box 11 also has connectors 90 to connect table supports 91 that enable the device to be placed in a hole in a table. The supports are shown in Figure 6. This is entirely optional, and these connectors or supports need not be provided. The device may have suction cups or one or more pieces of felt on its base, or have no supports, suction cups or felt, so that the box rests directly on the table.

[0023] Once a player captures a piece 101, they insert it into the device through the opening 2 (as shown in Figure 6). There, the sensor system 5 detects the piece, either by image or by wireless detection, or by contact with a sensor. If the sensor system 5 comprises a wireless identification system (such as RFID or NFC), all of the pieces will preferably carry an identifier, such as an RFID or NFC tag. Preferably, said tag may contain information on piece type and piece colour. Figure 7 shows an example of how to integrate the RFID or NFC tag 51 into a piece 101, specifically a pawn. To do so, the tag is placed between the base 1011 of the main body of the piece 101 and the base 1012 of the piece, as shown in Figure 7. This embodiment is very convenient, since chess pieces usually already have a felt base 1012. The tag 51 may be joined to the piece and/or to the base 1012 using adhesive. This enables existing chess pieces to be provided with an identification system by simply installing the tag 51 in this manner. The tag 51 could also be stuck directly to the base of the piece. Alternatively, an electronic device with an antenna could also be placed in a hollow inside the pieces.

[0024] With the information obtained from the sensor system 5, the control system of the device generates the information to be displayed on the screen 6, comprising the material value of the captured pieces of each colour and/or an identifier of each captured piece.

[0025] Figures 8 to 10 show another embodiment of a counting device 1 according to the present invention. Elements identical or equivalent to those shown in the previous figures are indicated using the same reference numbers and are therefore not described in detail. The embodiment is very similar to the embodiment set out above, and therefore only the differences are described below. For example and as illustrated, the camera 7 is separate from the screen. Furthermore, in this case, the camera is located on a tower 71 located on the top surface of the box 11. Similarly, the camera is used to record the chess match. On the other hand, the device in this

example does not have its own screen, but uses a mobile communication device 68 connected by cable or wirelessly. To facilitate the placement of the mobile communication device, in this case, the device 1 has a seat 69 with space to receive the mobile communication device 68. The mobile device can be connected completely wirelessly, but it can also have connections (not shown) to the device, for both control and power supply. Thus, for example, it can be physically connected to the control device of the counting device and/or to the sensor 5 (for example, an RFID/NFC reader or similar) and to the camera 7. A connection to a portable ID for RFID or NFC may also be provided. A power connection may also be provided, either to the mains (for example via the connector 82) or to a battery 84 of the device. The physical connections may be implemented in different ways. For example, a multiport adapter with one or more of the aforementioned connections (for example, a camera, RFID reader, portable ID, external battery, etc.) may be provided in the seat 69. The multiport adapter is not shown in the figures, as it is preferably not visible during normal use.

[0026] In this case, the mobile device 68 may preferably have an application ("app") enabling it to be used as a screen for the counting device. It can also function as a wireless communication port for the device (for example, by providing an Internet connection).

[0027] This example also shows a battery 84 used to power the different electronic devices and optionally the mobile communication device 68, and suction cups 119 located at the base of the device and used for fastening to a horizontal surface.

[0028] Figure 11 shows an additional embodiment of a device according to the present invention using simpler technology. Again, elements identical or equivalent to those shown above have been indicated using the same reference numbers. This embodiment is also more suitable for beginners who are getting started in the game. In this case, the device comprises two boxes 11, 11', one for the pieces of each colour, although both boxes could be joined together to form a single box. Each of the boxes has at least one container 4 for each type of piece (pawn, knight, bishop, rook, queen). In the example shown, and for reasons of space, the pawns of each colour have two containers 4. This enables the eight pawns of each colour to be inserted into the device. Preferably, the container for the queen has space for the queen and the king, enabling all of the pieces to be stored in the counting device. The front of the box displays an image of the piece for which each container 4 is intended and the material score of each type of piece (in this case, the standard pawn 1, knight 3, bishop 3, rook 5 and queen 9 is used). A screen 6, 6' at the bottom of each box 11, 11' displays the points total corresponding to the pieces that have been inserted into the different containers. The sensor system (not shown in the figure) may be similar to the previous examples, including one or more wireless readers and/or one camera per container 4. However, this embodiment

may have a presence or contact detector such as a flexible arm that has to be touched to insert the piece into the container. Said arm may for example have a piezoelectric element that generates an electrical signal when a force is applied to it. This enables the device control system (not shown in the figures) to detect a piece entering the container. This enables the control system to determine the amount of material inserted into the different containers by adding together, for each container, the number of pieces inserted into the container (as detected by the piezoelectric sensor) multiplied by the numerical value associated with each container, which corresponds to a material value associated with each piece. Finally, the control system displays the material value on the screen 6, 6'. Each of the containers has a series of LEDs 67. For each container, the control system illuminates a number of LEDs equal to the number of pieces it has detected for each container. This enables checks to be carried out and the existence of a material imbalance to be determined.

[0029] The control system can be distributed, with two entirely separate parts for each box 11, 11', or can be shared. Similarly, the power supply system of each box can be separate or shared.

[0030] Finally, each box 11, 11', has a top cover 21 that enables the boxes 11, 11' to be closed and used to store the pieces.

[0031] Although the invention has been described with reference to examples of preferred embodiments, these should not be considered to limit the invention, which is defined by the broadest interpretation of the following claims.

Claims

1. Counting device for chess, comprising at least one container with an opening for receiving chess pieces, a system for detecting inserted pieces and means for indicating pieces inserted into the container and/or a numerical value derived from the pieces inserted into said container.
2. Device according to the preceding claim, **characterized in that** the detection system comprises a radio-frequency reader capable of reading information from the pieces inserted into the container.
3. Device according to the preceding claim, **characterized in that** the radio-frequency reader is an RFID or NFC reader.
4. Device according to any of the preceding claims, **characterized in that** the detection system comprises a camera and an image recognition module.
5. Device according to any of the preceding claims, **characterized in that** the detection system com-

prises a presence or motion sensor.

6. Device according to the preceding claim, **characterized in that** said sensor is a contact detector arm located in the opening of the container. 5
7. Device according to any of the preceding claims, **characterized in that** the means for indicating inserted pieces comprise an electronic screen. 10
8. Device according to any of the preceding claims, **characterized in that** it comprises an external camera capable of recording a match played in the vicinity of the device. 15
9. Device according to any of the preceding claims, **characterized in that** it comprises means for fastening to a surface.
10. Device according to the preceding claim, **characterized in that** the means for fastening to a surface comprise a suction cup. 20
11. Device according to any of the preceding claims, **characterized in that** it comprises a port with a connector for communications. 25
12. Device according to any of the preceding claims, **characterized in that** it comprises at least one container for pawns, one container for bishops, one container for knights, one container for rooks, and one container for the queen. 30
13. Device according to the preceding claim, **characterized in that** each of the aforementioned containers has a number of LEDs to indicate the number of pieces inserted into the container. 35
14. Device according to any of the preceding claims, **characterized in that** it comprises a door for removing the pieces inserted into the container or containers. 40
15. Chess set comprising a set of chess pieces, **characterized in that** it comprises a counting device according to any of the preceding claims. 45
16. Chess set according to the preceding claim, **characterized in that** the pieces comprise a radio-frequency identification tag. 50
17. Chess set, **characterized in that** the tag in the pieces is an RFID or NFC tag.
18. Set according to Claim 16 or 17, **characterized in that** the tag is located between a main body of the piece and a felt base of the piece. 55

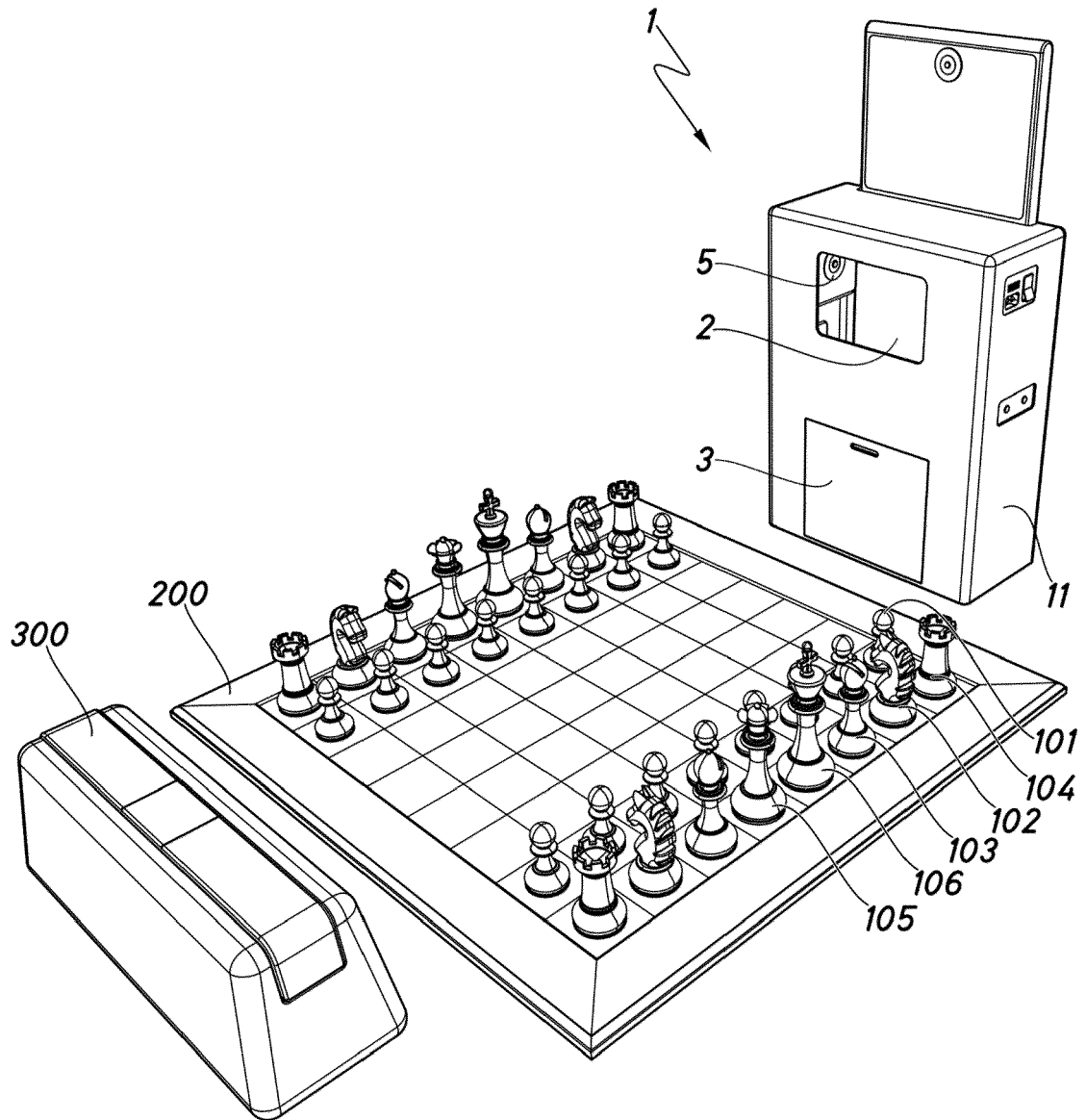


Fig.1

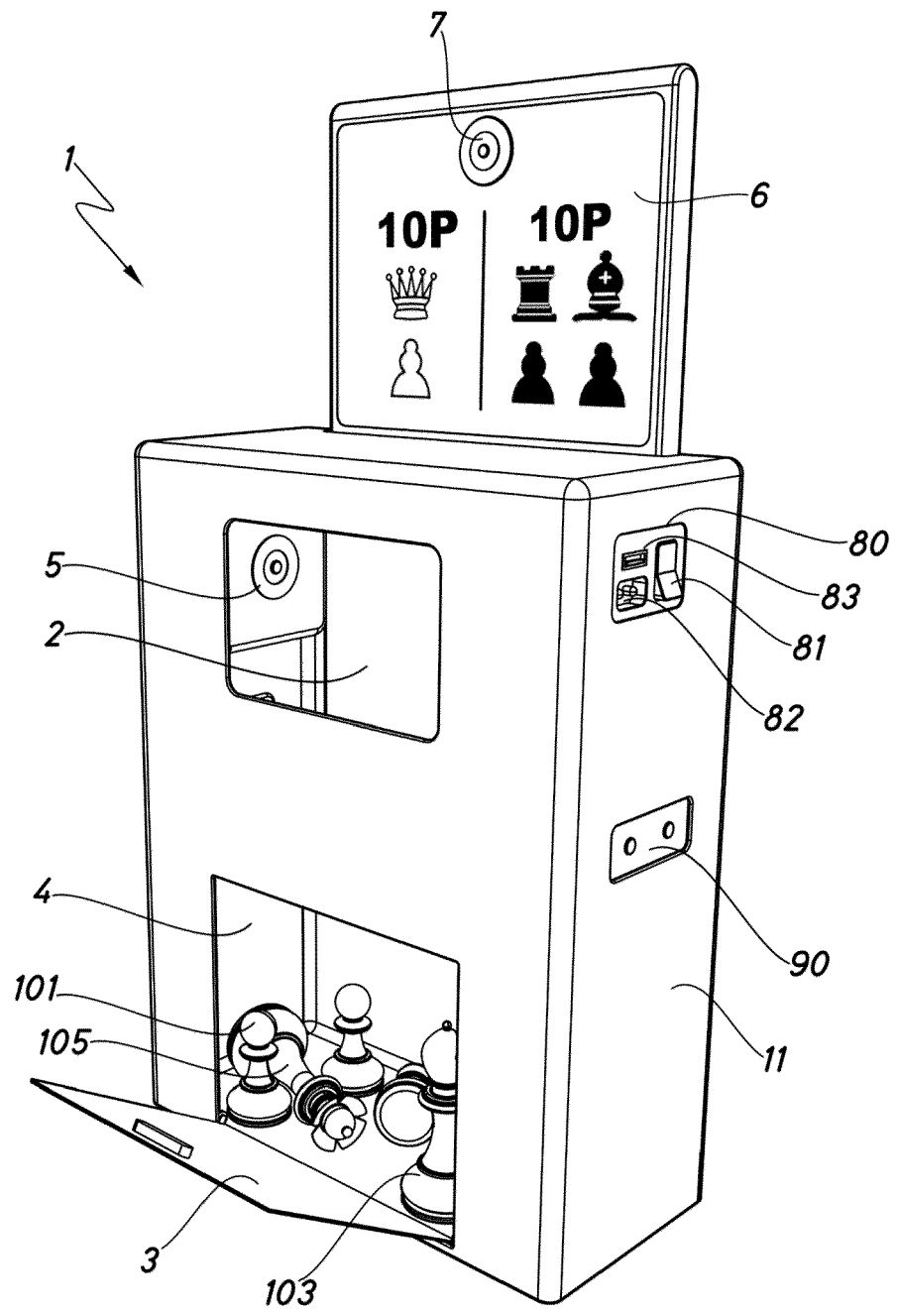


Fig.2

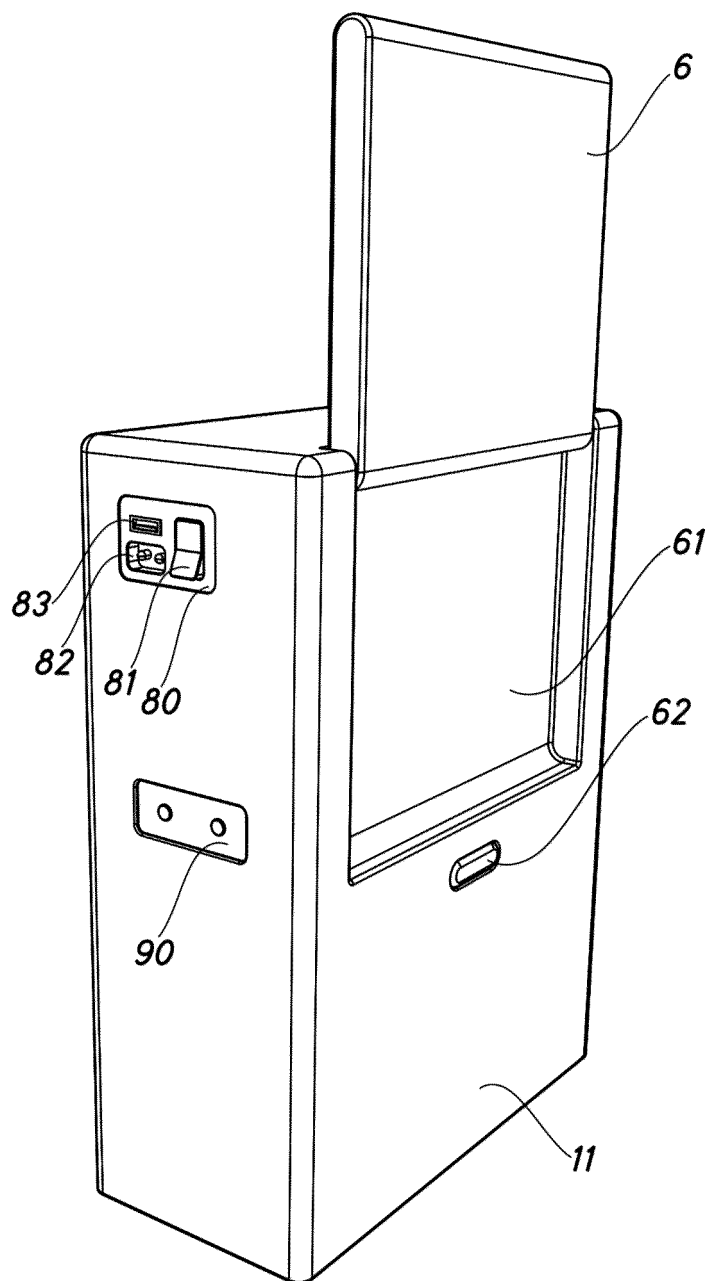


Fig.3

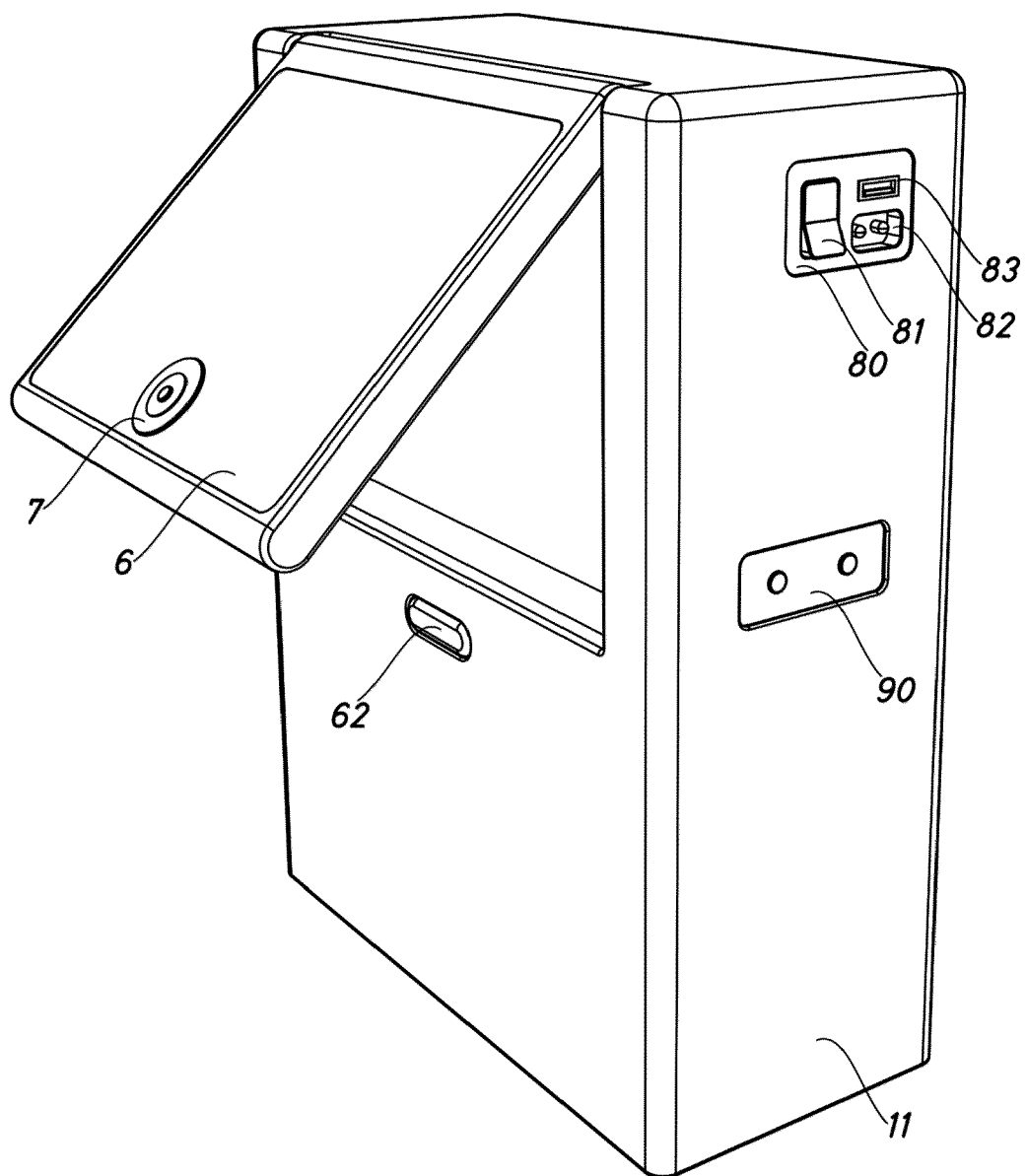


Fig.4

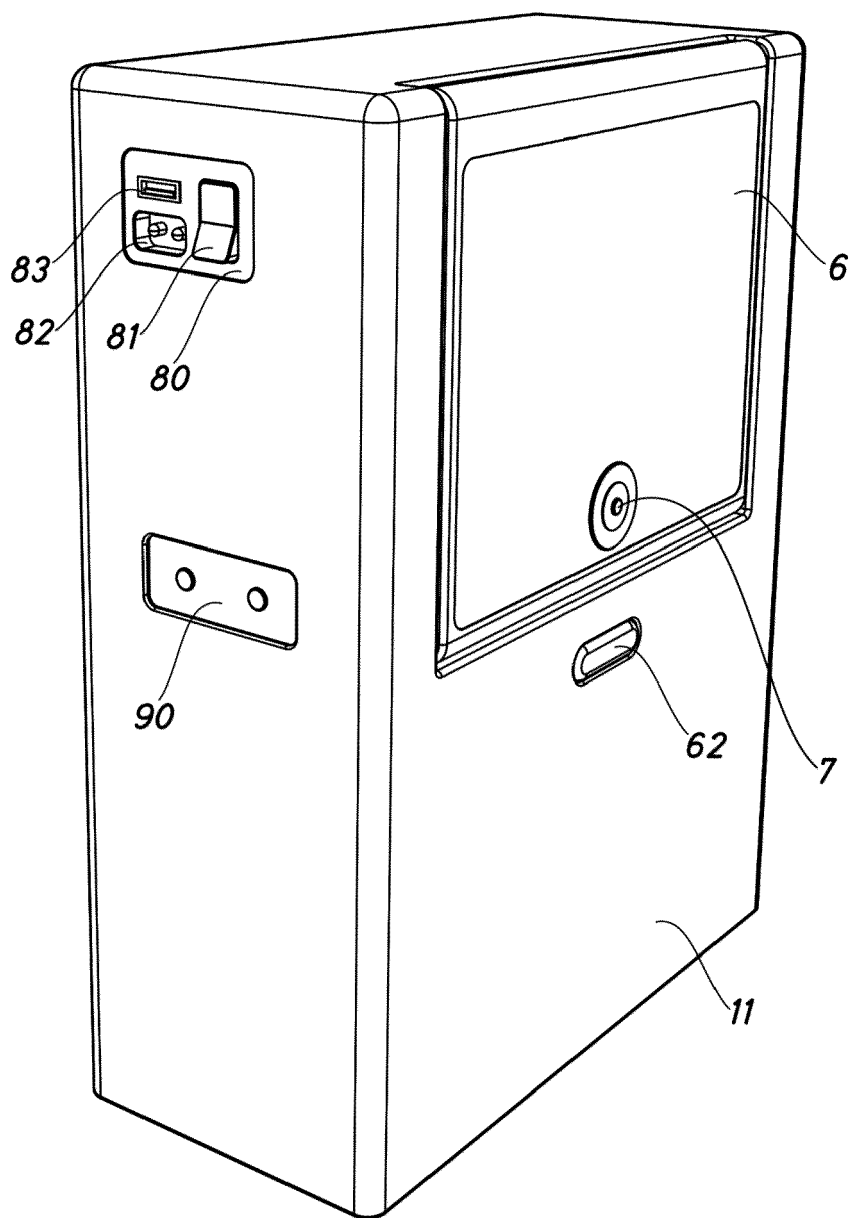


Fig.5

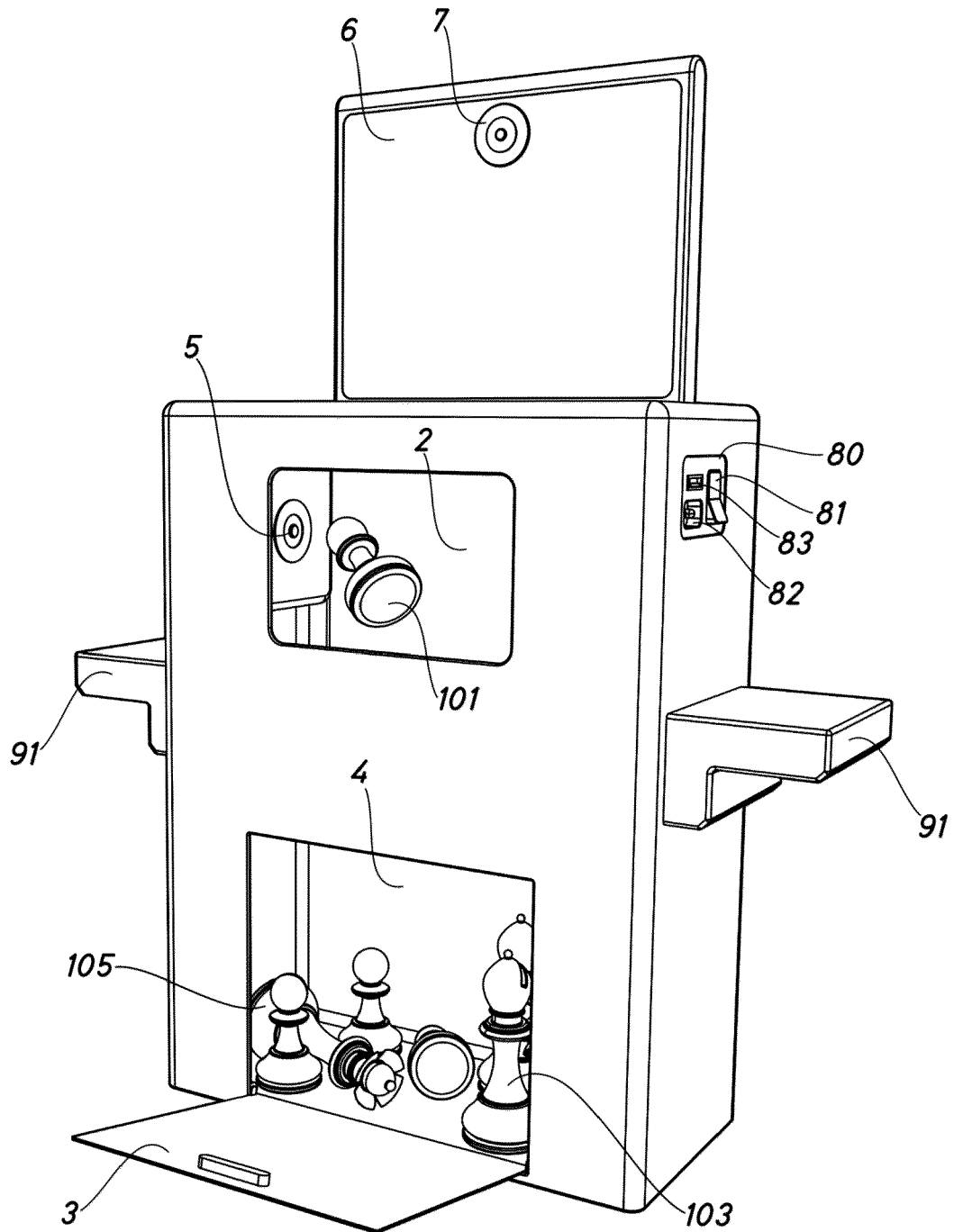


Fig.6

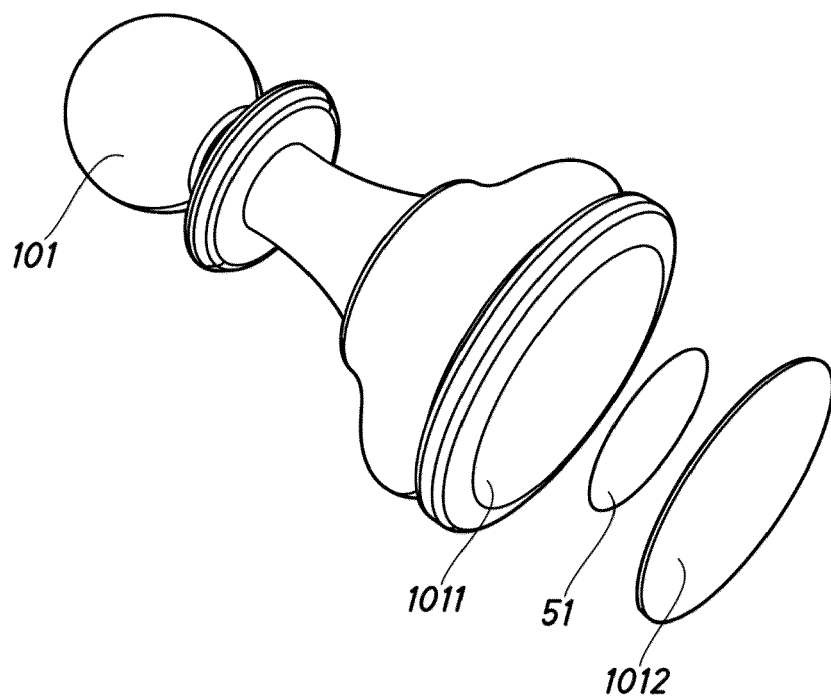


Fig.7

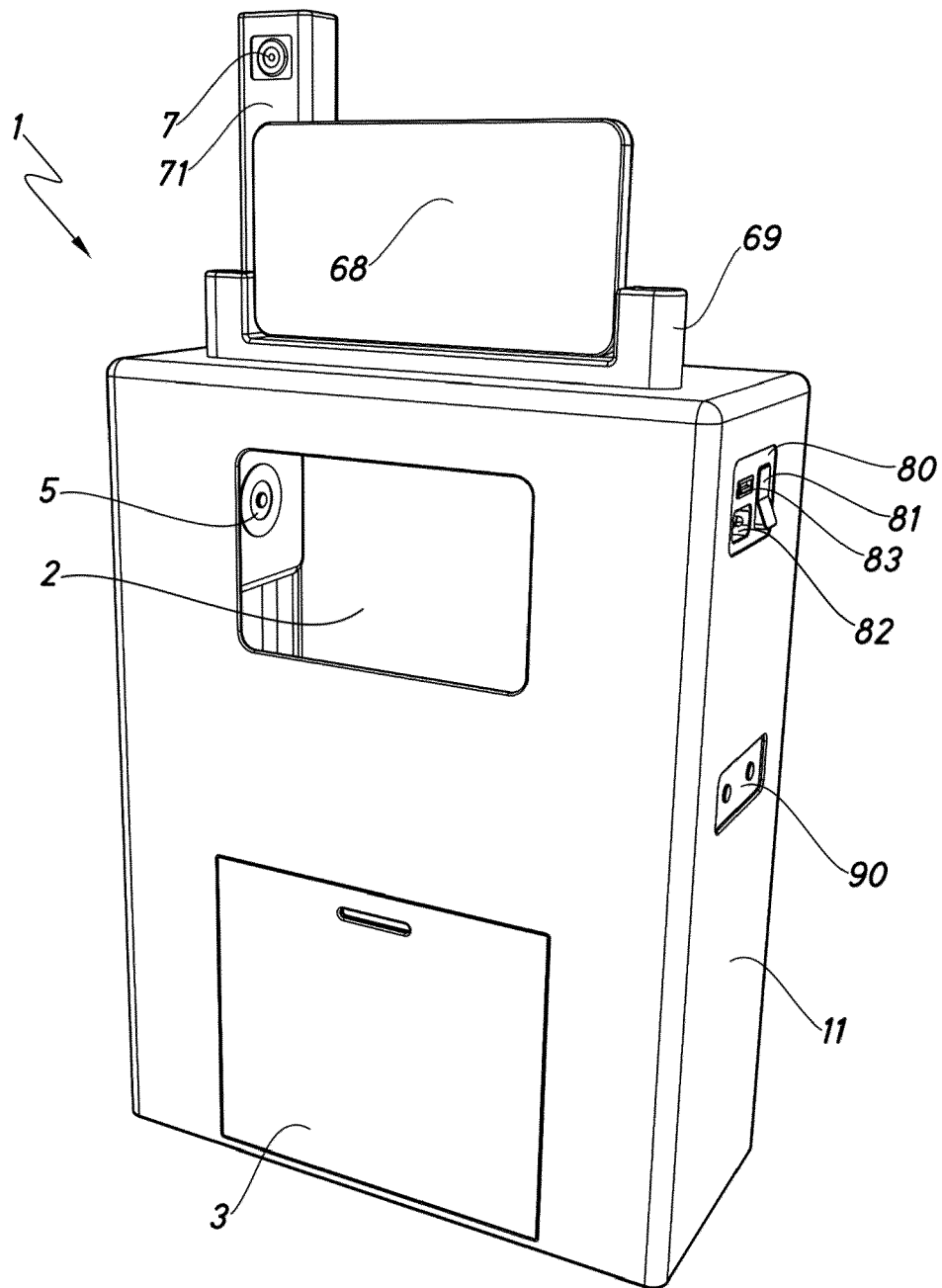


Fig.8

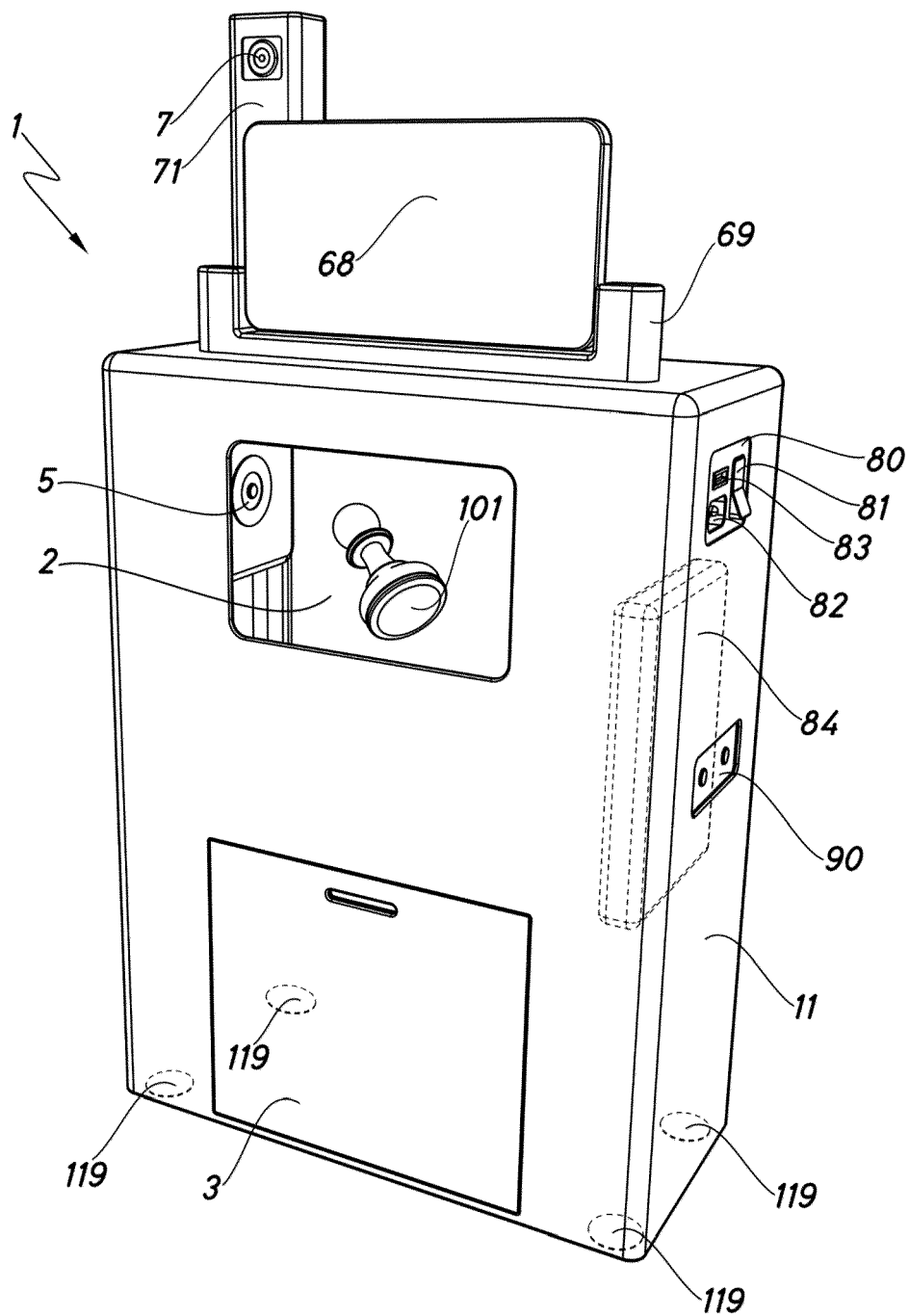


Fig.9

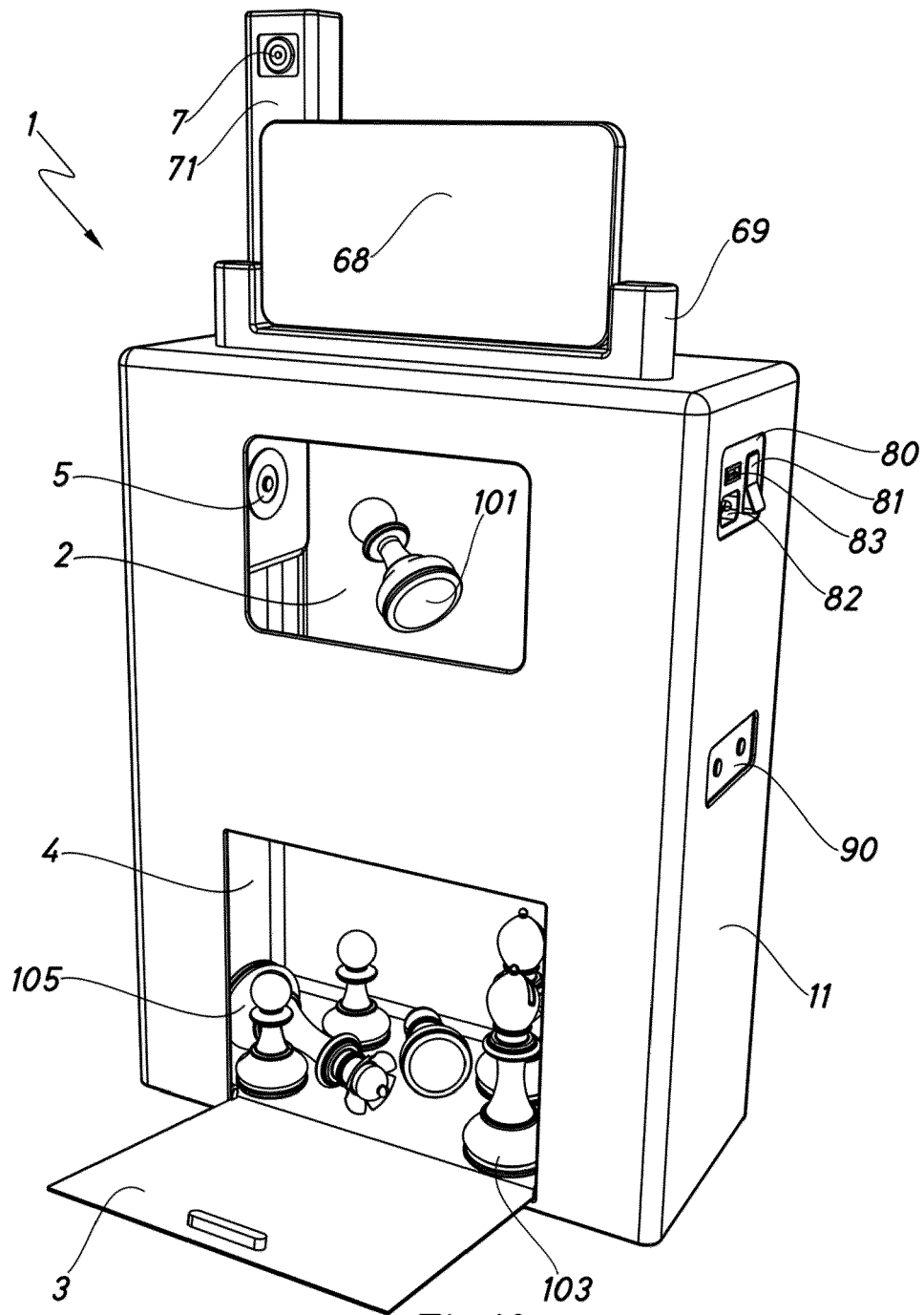


Fig.10

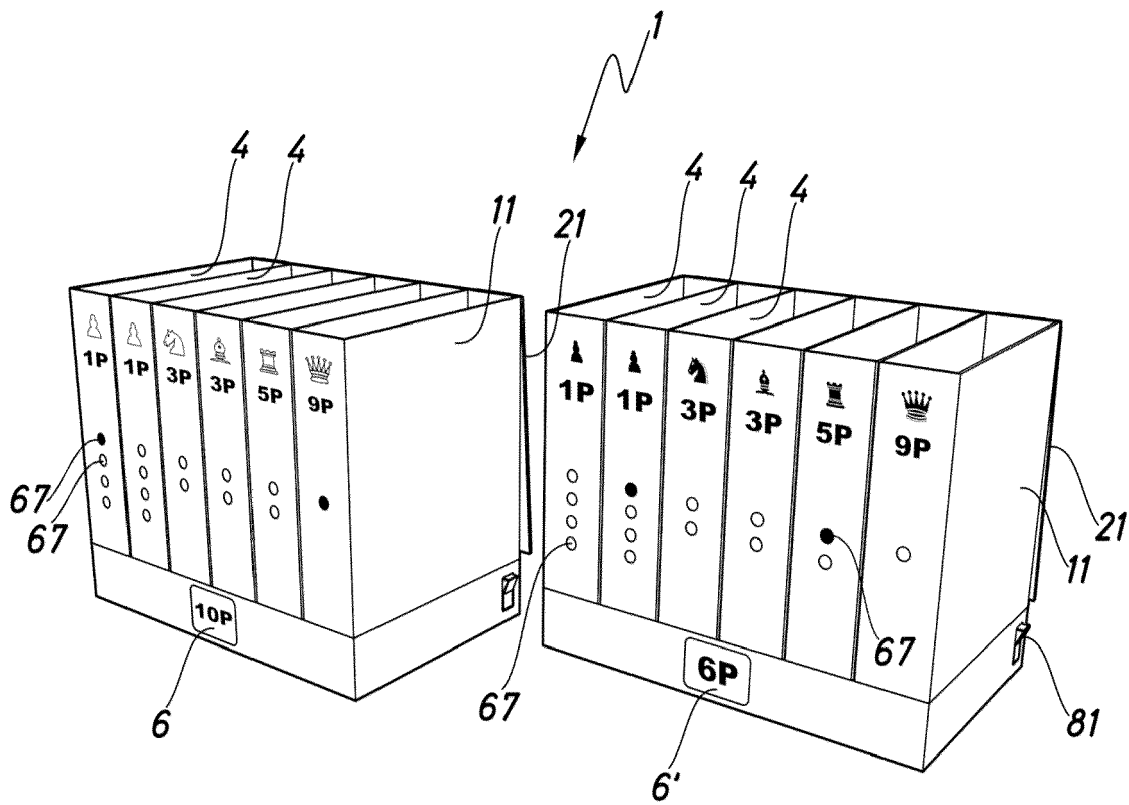


Fig.11



EUROPEAN SEARCH REPORT

Application Number

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		11 November 2024	Turmo, Robert
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