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(54) **BALL PICKING MACHINE**

(57) A ball picking machine (200) is adapted for picking ball bodies (901) by remote control, and includes a moving unit (31), a suction device (42), a ball overflow sensor (51), a controller (8), and a collection box unit (32) that defines a ball collecting space (323). The ball overflow sensor (51) generates a full-ball signal when a height of the ball bodies 901 that accumulate in the ball collecting space (323) is greater than a predetermined height. The controller (8) is signally connected to the moving unit (31), the suction device (42), and the ball overflow sensor (51), and includes a communication module (81) and a control module (82). The control module (82) turns off the suction device (42) and sends a full-ball message outwardly through the communication module (81) when triggered by the full-ball signal.

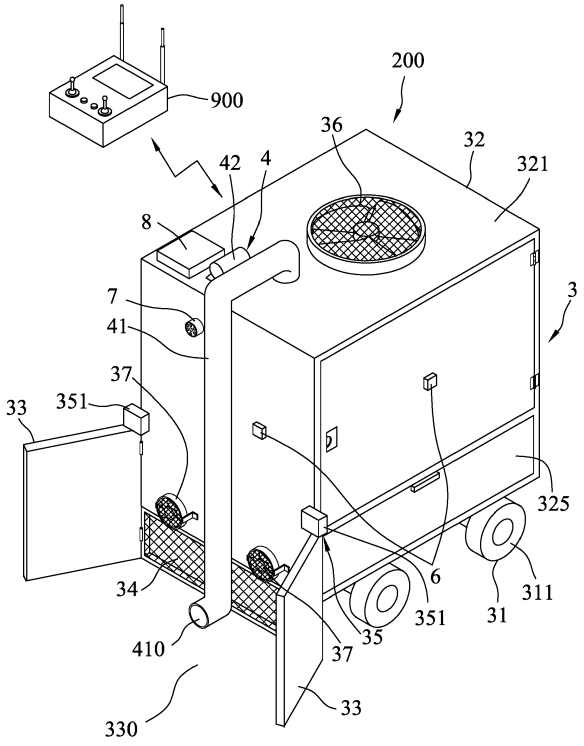

FIG. 1

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Description

[0001] The present disclosure relates to a device that is used in a sport court, and more particularly to a ball picking machine that is for picking up balls.

[0002] Table tennis is one of Taiwanese people's favorite sports, is also the most popular and the most convenient sport, and has a large sports population. Thus, table tennis playgrounds are everywhere from home, communities, companies, agencies, schools, to sports fields. In recent years, as professionalization of table tennis, as well as increasing frequency of games, based on needs for training and games, various dedicated venues increase greatly in numbers and gradually in sizes, which causes picking up ping-pong balls that are used in practice or the games to become a laborious burden. Even though a relatively formal, slightly larger, or resource-sufficient venue has already been provided with simple pick-up appliances such as press type ball pickers, rolling ball pickers, telescopic ball pick-up nets, magnetic ball pickers, etc., basically all manners of picking balls require manpower to carry the pick-up appliances and move to positions where ping-pong balls stay to pick up the balls, thereby limiting an improving effect. The above-mentioned problem of manual ball collection also occurs in tennis stadiums, baseball stadiums, golf stadiums, etc., and also in ball pools.

[0003] Therefore, an object of the disclosure is to provide a ball picking machine that can alleviate at least one of the drawbacks of the prior art.

[0004] According to an aspect of the disclosure, there is provided a ball picking machine according to claim 1.

[0005] Other features and advantages of the disclosure will become apparent in the following detailed description of the embodiment(s) with reference to the accompanying drawings. It is noted that various features may not be drawn to scale.

FIG. 1 is a perspective view of an embodiment of a ball picking machine according to the disclosure.

FIG. 2 is a sectional view of the embodiment.

FIG. 3 is a functional block diagram of the embodiment.

FIG. 4 is a partly exploded perspective view of the embodiment.

FIG. 5 is a top view of the embodiment, illustrating two baffles of the embodiment in an open position.

FIG. 6 is a view similar to FIG. 5, but illustrating the baffles in a gathering position.

FIG. 7 is a view similar to FIG. 5, but illustrating the baffles in a storage position.

[0006] It should be noted herein that for clarity of description, spatially relative terms such as "top," "bottom," "upper," "lower," "on," "above," "over," "downwardly," "upwardly" and the like may be used throughout the disclosure while making reference to the features as illustrated in the drawings. The features may be oriented differently (e.g., rotated 90 degrees or at other orientations) and the spatially relative terms used herein may be interpreted accordingly.

[0007] Referring to FIGS. 1, 2, and 3, an embodiment of a ball picking machine 200 according to the present disclosure is adapted to be remotely controlled by a remote control device 900 (e.g., a radio control device) for picking ball bodies 901. The remote control device 900 may be a remote control device of a common remote controlled vehicle, a smartphone, a tablet computer, a notebook computer, a personal computer and the like. The ball bodies 901 may be, for example, but are not limited to, ping-pong balls, tennis balls, baseballs, golf balls, etc.

[0008] The ball picking machine 200 includes a frame mechanism 3 that is for moving on a ground, a suction mechanism 4 that is mounted to the frame mechanism 3, a ball overflow sensor 51, a foreign object overflow sensor 52, a plurality of obstacle sensors 6, an image capture device 7, and a controller 8. The controller 8 is mounted to the frame mechanism 3, is signally connected to the frame mechanism 3, the suction mechanism 4, the ball overflow sensor 51, the foreign object overflow sensor 52, the obstacle sensors 6, and the image capture device 7, and is adapted to be in wireless communication with the remote control device 900.

[0009] Referring to FIGS. 1, 2, and 4, the frame mechanism 3 includes a moving unit 31 that is controllable to move, a collection box unit 32 that is mounted to the moving unit 31, two baffles 33 that are spaced apart from each other in a left-right direction, that are mounted to a front side of the collection box unit 32, and that are adjacent to the ground, a net body 34 that is mounted to the front side of the collection box unit 32 and that is located between the baffles 33, a swing unit 35 that is mounted to the collection box unit 32 and that is connected to the baffles 33, a first fan 36 that is mounted to a top side of the collection box unit 32, and two second fans 37 that are spaced apart from each other in the left-right direction, that are arranged in the left-right direction, and that are mounted to the front side of the collection box unit 32.

[0010] The moving unit 31 is signally connected to the controller 8, and is provided with a wheel module 311 that is controlled by the controller 8 to move and turn. Since the moving unit 31 that is controllable to move and turn is an existing technology and may have a large number of types, details thereof are omitted, and a configuration thereof is not limited to the drawings.

[0011] The collection box unit 32 includes a main box body 321 that is fixedly mounted to the moving unit 31, and a ball collecting box 322 and a foreign object collecting box 325 that are detachably mounted to the main box body 321, that are located in the main box body 321, and that are spaced apart from each other in an up-down direction. The ball collecting box 322 defines a ball collecting space 323 that opens upwardly, and includes a filter screen portion 324 that has a plurality of openings

and that is located above the foreign object collecting box 325. The filter screen portion 324 allows passage of foreign objects 902 that are located in the ball collecting space 323 and that have volumes smaller than volumes of the ball bodies 901 such that the foreign objects 902 fall into the foreign object collecting box 325. The foreign object collecting box 325 defines a foreign object collecting space 326 that opens upwardly toward the filter screen portion 324 and that receives the foreign objects 902 which fall through the filter screen portion 324. That is to say, the ball collecting space 323 and the foreign object collecting space 326 are spaced apart from each other in the up-down direction, and the filter screen portion 324 is disposed between the ball collecting space 323 and the foreign object collecting space 326. The filter screen portion 324 is adapted for the foreign objects 902 that are smaller than the ball bodies 901 to pass therethrough downwardly and fall into the foreign object collecting space 326. The foreign objects 902 may be, for example, but are not limited to, sand, dust, scraps of paper, etc.

[0012] Referring to FIGS. 1, 5, 6, and 7, the baffles 33 are swingably mounted to a front side of the main box body 321, extend in front of the main box body 321, and are swingable in the left-right direction. When the moving unit 31 moves, the baffles 33 are urged to move in a same direction in which the moving unit 31 moves so that the baffles 33 may push the ball bodies 901 on the ground. The net body 34 extends downwardly from the front side of the main box body 321 toward the ground, is adjacent to the ground, and cooperates with the baffles 33 to define a ball collecting zone 330 that opens forwardly.

[0013] The swing unit 35 includes two swing drivers 351 that are spaced apart from each other in the left-right direction, that are mounted to the front side of the main box body 321, and that are respectively connected to the baffles 33. The swing drivers 351 are controllable by the controller 8 to drive the baffles 33 to swing relative to the main box body 321 among an open position (as shown in FIG. 5), in which a distance between the baffles 33 in the left-right direction increases forwardly, a gathering position (as shown in FIG. 6), in which the distance between the baffles 33 in the left-right direction decreases forwardly, and a storage position (as shown in FIG. 7), in which a distance between the front side of the main box body 321 and a free end of each of the baffles 33 is the shortest. When the baffles 33 are in the open position, an opening of the ball collecting zone 330 is large, thereby facilitating entry of the ball bodies 901 into the ball collecting zone 330. When the baffles 33 are in the gathering position, the opening of the ball collecting zone 330 is narrowed, thereby gathering the ball bodies 901.

[0014] Referring to FIGS. 1, 2, and 5, the first fan 36 is mounted to a top side of the main box body 321, is located above the ball collecting box 322, and is operable to be activated to generate air current that flows downwardly into the ball collecting space 323 and that is strong enough to blow the ball bodies 901 which are located within the ball collecting space 323.

[0015] The second fans 37 are spaced apart from each other in the left-right direction, are mounted to the front side of the main box body 321, and are located between the baffles 33. Each of the second fans 37 is operable to be activated by the controller 8 to generate air current that flows toward front of the main box body 321. A direction in which the air current flows may, but not limited to, slope forwardly and downwardly at a predetermined angle. The air current is strong enough to blow the ball bodies 901 that are on the ground and that are located in a predetermined range of the front of the main box body 321.

[0016] The suction mechanism 4 includes a suction tube 41 that is mounted on the main box body 321 and that communicates with the ball collecting space 323, and a suction device 42 that is mounted to the main box body 321 and that communicates with the suction tube 41. A bottom end of the suction tube 41 is located in the ball collecting zone 330, and has a suction opening 410 that is adjacent to the ground and that communicates with the ball collecting zone 330. The suction device 42 is signally connected to the controller 8, and is operable to be activated by the controller 8 to generate a suction air current in the suction tube 41 that flows from the suction opening 410 to the ball collecting space 323 such that the suction device 42 urges the suction tube 41 to suck the ball bodies 901 into the suction tube 41 through the suction opening 410 and convey the ball bodies 901 to the ball collecting space 323.

[0017] The ball overflow sensor 51 is mounted to an inner surface of a top wall of the main box body 321, and is located above the ball collecting space 323 to downwardly sense a height of the ball bodies 901 that accumulate in the ball collecting space 323. When the ball overflow sensor 51 senses that the height of the ball bodies 901 accumulating in the ball collecting space 323 is greater than a predetermined height, that is, when the ball overflow sensor 51 senses that a distance between itself and a topmost one of the ball bodies 901 is less than a predetermined distance, the ball overflow sensor 51 generates a full-ball signal.

[0018] The foreign object overflow sensor 52 is mounted to an inner surface of a sidewall of the main box body 321, and is located above the foreign object collecting space 326 to downwardly sense a height of the foreign objects 902 that accumulate in the foreign object collecting space 326. When the foreign object overflow sensor 52 senses that the height of the foreign objects 902 accumulating in the foreign object collecting space 326 is greater than a predetermined height, that is, when the foreign object overflow sensor 52 senses that a distance between itself and a topmost one of the foreign objects 902 is less than a predetermined distance, the foreign object overflow sensor 52 generates a foreign object cleaning signal.

[0019] In the present embodiment, the ball overflow sensor 51 and the foreign object overflow sensor 52 are both reflective optical sensors. However, in one embodiment, the ball overflow sensor 51 and the foreign object

overflow sensor 52 may be ultrasonic sensors or other types of proximity sensors.

[0020] The obstacle sensors 6 are spacedly arranged around the main box body 321. In this embodiment, the obstacle sensors 6 are respectively disposed on the front side, a rear side, a left side, and a right side of the main box body 321, but are not limited thereto in practice. Each of the obstacle sensors 6 performs obstacle detection in a horizontal sensing direction, and correspondingly generates an obstacle signal when an obstacle is sensed in the sensing direction. In this embodiment, the obstacle sensors 6 are all ultrasonic sensors. However, in one embodiment, the obstacle sensors 6 may be radar sensors, reflective optical sensors, or other types of proximity sensors.

[0021] The image capture device 7 is mounted to the front side of the main box body 321, and is operable to capture an image of the front of the main box body 321 to gain image data.

[0022] Referring to FIGS. 1, 2, and 3, the controller 8 includes a communication module 81 that is adapted to be in wireless communication with the remote control device 900, and a control module 82. The communication module 81 is adapted for wirelessly receiving a remote control signal (e.g., a radio control signal) from the remote control device 900.

[0023] The control module 82 is signally connected to the swing unit 35, the image capture device 7, the foreign object overflow sensors 52, the obstacle sensors 6, and the second fans 37. The control module 82 may wirelessly transmit the image data that is from the image capture device 7 outwardly to the remote control device 900 via the communication module 81, may wirelessly transmit a full-ball message outwardly to the remote control device 900 through the communication module 81 when triggered by the full-ball signal (i.e., when receiving the full-ball signal), and may wirelessly transmit a foreign object cleaning message outwardly to the remote control device 900 through the communication module 81 when triggered by the foreign object cleaning signal (i.e., when receiving the foreign object cleaning signal). The control module 82 is adapted to be controlled by the remote control signal to control movement of the moving unit 31 and activation of each of the suction device 42, the first fan 36, and the second fans 37, and is adapted to be controlled by the remote control signal that corresponds to the swing unit 35 to control the swing unit 35 to urge the baffles 33 to swing in the left-right direction. In addition, when one of the obstacle sensors 6 generates the obstacle signal and when the control module 82 receives the obstacle signal from the one of the obstacle sensors 6, the control module 82 restrains movement of the moving unit 31 in the sensing direction of the one of the obstacle sensors 6. Specifically, the control module 82 may urge the moving unit 31 to stop moving, or just not to move in the sensing direction of the one of the obstacle sensors 6, so as to avoid the obstacle that the one of the obstacle sensors 6 senses, or prevent the ball picking machine 200 from hitting the obstacle that the one of the obstacle sensors 6 senses.

[0024] When the ball picking machine 200 is activated for use, a user may operate the remote control device 900 to activate the suction device 42 and the first fan 36, and to control the swing unit 35 to urge the baffles 33 to swing to the open position. Then, the moving unit 31 is controlled to move toward locations of the ball bodies 901 such that the ball bodies 901 are relatively moved into the ball collecting zone 330 and are adjacent to the suction opening 410 of the suction tube 41, and the ball bodies 901 are sucked by the suction tube 41 and transferred to the ball collecting box 322. The first fan 36 blows and disperses the ball bodies 901 that fall within the ball collecting space 323, thereby preventing the ball bodies 901 from accumulating only in a certain area. The foreign objects 902 that are sucked into the ball collecting space 323 along with the ball bodies 901 move downwardly and pass through the filter screen portion 324 of the ball collecting box 322, and fall into the foreign object collecting box 325.

[0025] At the same time, the ball overflow sensor 51 senses the height of the ball bodies 901 that accumulate in the ball collecting space 323, and the foreign object overflow sensor 52 senses the height of the foreign objects 902 that accumulate in the foreign object collecting space 326. The control module 82 turns off the suction device 42 when receiving the full-ball signal or the foreign object cleaning signal, and correspondingly sends the full-ball message or the foreign object cleaning message to the remote control device 900 through the communication module 81 so as to notify the user. The user may draw the ball collecting box 322 or the foreign object collecting box 325 from the main box body 321, and after the ball bodies 901 or the foreign objects 902 are cleared, the ball collecting box 322 or the foreign object collecting box 325 may be returned to the main box body 321.

[0026] When the moving unit 31 is urged to move, the image capture device 7 captures the image of the front of the main box body 321 to gain the image data, and the control module 82 transmits the image data to the remote control device 900 in real time via the communication module 81 so that the user may know a scene in an advancing direction of the moving unit 31 that the user remotely controls. In addition, the obstacle sensors 6 perform the obstacle detection at the same time, and output the obstacle signals when the obstacles are detected. When the control module 82 is triggered by the obstacle signal that is generated by any one of the obstacle sensors 6, the control module 82 controls the moving unit 31 to stop or not to advance in the sensing direction of the any one of the obstacle sensors 6 that detects the obstacle, and meanwhile the control module 82 sends an obstacle message to the remote control device 900 through the communication module 81, thereby allowing the user to know that there is the obstacle in the advancing direction of the moving unit 31 that the user remotely controls.

[0027] Referring to FIGS. 4, 5, and 6, in order to prevent the ball bodies 901 that are in the ball collecting zone 330 from running away from the ball collecting zone 330, the user may operate the remote control device 900 to remotely control the swing unit 35 so that the swing unit 35 may urge the baffles 33 to swing to the gathering position. Therefore, the ball bodies 901 that are located in the ball collecting zone 330 are concentrated so that ball suction efficiency may be improved.

[0028] When the user views the image that is displayed in real time by the remote control device 900 and finds that the ball bodies 901 stay at a location where the suction tube 41 of the ball picking machine 200 is unable to suck the ball bodies 901, e.g., at a corner, the user may operate the remote control device 900 to send the remote control signal for controlling operation of the second fans 37. The control module 82 is adapted to be triggered by the remote control signal that corresponds to the second fans 37 to control the operation of each of the second fans 37. The operations of the second fans 37 are independently controlled by the control module 82. For example, the control module 82 may activate the second fans 37 simultaneously, or may activate only one of the second fans 37, to produce air current that blows toward the corner at which the ball bodies 901 are located, thereby blowing the ball bodies 901 away from the corner, which is convenient.

[0029] When use of the ball picking machine 200 is finished, the user may operate the remote control device 900 to remotely control the swing unit 35 so that the swing unit 35 may urge the baffles 33 to swing to the storage position (as shown in FIG. 7), thereby saving storage space.

[0030] In summary, through a design of the remotely controllable frame mechanism 3, and a structural design of the suction mechanism 4, the ball overflow sensor 51, and the controller 8 that are mounted to the frame mechanism 3, the ball picking machine 200 may facilitate ball-picking work for the user because the user may control the ball picking machine 200 to pick up balls via remote control and no longer need to walk around to pick up the balls. When the height of the ball bodies 901 that accumulate in the ball collecting space 323 has reached the predetermined height, the suction mechanism 4 is automatically turned off, and the full-ball message is transmitted to the remote control device 900 through the communication module 81, which is relatively convenient for the user to collect the ball bodies 901 that have been collected in the ball collecting space 323.

[0031] In addition, through a design of the foreign object collecting space 326 and the foreign object overflow sensor 52, the foreign objects 902 that are sucked into the ball collecting space 323 may be conveniently collected, and the height of the foreign objects 902 that accumulate in the foreign object collecting space 326 may be conveniently measured. Moreover, through configurations of the second fans 37 that blow the ball bodies 901 on the ground, and through the baffles 33 that are controllable to swing between the open position and the gathering position, ball picking performance of the ball picking machine 200 is enhanced. By virtue of structural design of the obstacle sensors 6 that are disposed around the frame mechanism 3, damage to the frame mechanism 3 that is caused by hitting the obstacles may be effectively avoided, and the ball picking machine 200 may be prevented from crashing into sports facilities.

[0032] Therefore, the ball picking machine 200 is indeed an innovative and practical creation, which may indeed achieve the purpose of the present disclosure.

[0033] In the description above, for the purposes of explanation, numerous specific details have been set forth in order to provide a thorough understanding of the embodiment(s). It will be apparent, however, to one skilled in the art, that one or more other embodiments may be practiced without some of these specific details. It should also be appreciated that reference throughout this specification to "one embodiment," "an embodiment," an embodiment with an indication of an ordinal number and so forth means that a particular feature, structure, or characteristic may be included in the practice of the disclosure. It should be further appreciated that in the description, various features are sometimes grouped together in a single embodiment, figure, or description thereof for the purpose of streamlining the disclosure and aiding in the understanding of various inventive aspects; such does not mean that every one of these features needs to be practiced with the presence of all the other features. In other words, in any described embodiment, when implementation of one or more features or specific details does not affect implementation of another one or more features or specific details, said one or more features may be singled out and practiced alone without said another one or more features or specific details. It should be further noted that one or more features or specific details from one embodiment may be practiced together with one or more features or specific details from another embodiment, where appropriate, in the practice of the disclosure.

Claims

1. A ball picking machine (200) adapted for picking ball bodies (901) by remote control, comprising:

a frame mechanism (3);
a suction mechanism (4);
a ball overflow sensor (51); and
a controller (8);
characterized in that:

the frame mechanism (3) includes a moving unit (31), and a collection box unit (32) that is disposed on the moving unit (31), the collection box unit (32) defining a ball collecting space (323) and a foreign object collecting

space (326) that are spaced apart from each other in an up-down direction, and including a filter screen portion (324) that is disposed between the ball collecting space (323) and the foreign object collecting space (326), the filter screen portion (324) being adapted for foreign objects (902) that are smaller than the ball bodies (901) to pass therethrough downwardly and fall into the foreign object collecting space (326);

the suction mechanism (4) is mounted to the frame mechanism (3), and includes a suction tube (41) that communicates with the ball collecting space (323), and a suction device (42) that communicates with the suction tube (41), the suction tube (41) having a suction opening (410) that is adjacent to a ground, the suction device (42) being operable to be activated to urge the suction tube (41) to suck the ball bodies (901) into the suction tube (41) through the suction opening (410) and convey the ball bodies (901) to the ball collecting space (323);

the ball overflow sensor (51) is mounted to the collection box unit (32), and generates a full-ball signal when a height of the ball bodies 901 that accumulate in the ball collecting space (323) is greater than a predetermined height;

the controller (8) is mounted to the frame mechanism (3), is signally connected to the moving unit (31), the suction device (42), and the ball overflow sensor (51), and includes a communication module (81) that is adapted for receiving a remote control signal, and a control module (82), the control module (82) being adapted to be controlled by the remote control signal to control movement of the moving unit (31) and activation of the suction device (42), the control module (82) turning off the suction device (42) and sending a full-ball message outwardly through the communication module (81) when triggered by the full-ball signal; and

the frame mechanism (3) further includes two baffles (33) that are spaced apart from each other in a left-right direction, that are mounted to a front side of the collection box unit (32), and that are adjacent to the ground, the baffles (33) being swingably mounted to the collection box unit (32) and swingable in the left-right direction, the frame mechanism (3) further including a swing unit (35) that is mounted to the collection box unit (32) and that is connected to the baffles (33), the control module (82) being signally connected to the swing unit (35), and being adapted to be controlled by the remote control signal that corresponds to the swing unit (35) to control the swing unit (35) to urge the baffles (33) to swing in the left-right direction.

2. The ball picking machine (200) as claimed in claim 1, further comprising an image capture device (7) that is disposed on the frame mechanism (3), and that is operable to capture an image of front of the collection box unit (32) to gain image data, the control module (82) being signally connected to the image capture device (7), and sending the image data that is from the image capture device (7) outwardly via the communication module (81).

3. The ball picking machine (200) as claimed in any one of claims 1 and 2, wherein the frame mechanism (3) further includes a first fan (36) that is mounted to the collection box unit (32), the first fan (36) being operable to be activated to generate air current that flows downwardly into the ball collecting space (323).

4. The ball picking machine (200) as claimed in any one of claims 1 to 3, further comprising a foreign object overflow sensor (52) that is disposed on the collection box unit (32), the foreign object overflow sensor (52) being capable of generating a foreign object cleaning signal when a height of the foreign objects (902) that accumulate in the foreign object collecting space (326) is greater than a predetermined height, the control module (82) being signally connected to the foreign object overflow sensor (52), the control module (82) turning off the suction device (42) and sending a foreign object cleaning message outwardly through the communication module (81) when triggered by the foreign object cleaning signal.

5. The ball picking machine (200) as claimed in any one of claims 1 to 4, further comprising a plurality of obstacle sensors (6) that are disposed around the collection box unit (32), each of the obstacle sensors (6) generating an obstacle signal when an obstacle is sensed in a specific sensing direction, the control module (82) being signally connected to the obstacle sensors (6), and restraining movement of the moving unit (31) in the sensing direction of one of the obstacle sensors (6) when the one of the obstacle sensors (6) generates the obstacle signal.

6. The ball picking machine (200) as claimed in any one of claims 1 to 5, wherein the frame mechanism (3) further includes at least one second fan (37) that is mounted to the collection box unit (32), the at least one second fan (37) being operable to be activated to generate air current that flows toward front of the collection box unit (32), the control module (82) being

signally connected to the at least one second fan (37), and being adapted to be triggered by the remote control signal that corresponds to the at least one second fan (37) to control operation of the at least one second fan (37).

7. The ball picking machine (200) as claimed in claim 6, wherein the at least one second fan (37) of the frame mechanism (3) includes two second fans (37) that are mounted to the collection box unit (32) and that are arranged in the left-right direction, the control module (82) being signally connected to the second fans (37), and being adapted to be triggered by the remote control signal to control the operation of each of the second fans (37), the operations of the second fans (37) being independently controlled by the control module (82).

8. The ball picking machine (200) as claimed in any one of claims 1 to 7, wherein the collection box unit (32) includes a main box body (321) that is mounted to the moving unit (31), and a ball collecting box (322) and a foreign object collecting box (325) that are detachably mounted to the main box body (321) and that are spaced apart from each other in the up-down direction, the ball collecting box (322) defining the ball collecting space (323) and including the filter screen portion (324) that is located above the foreign object collecting box (325), the foreign object collecting box (325) defining the foreign object collecting space (326) that opens upwardly.

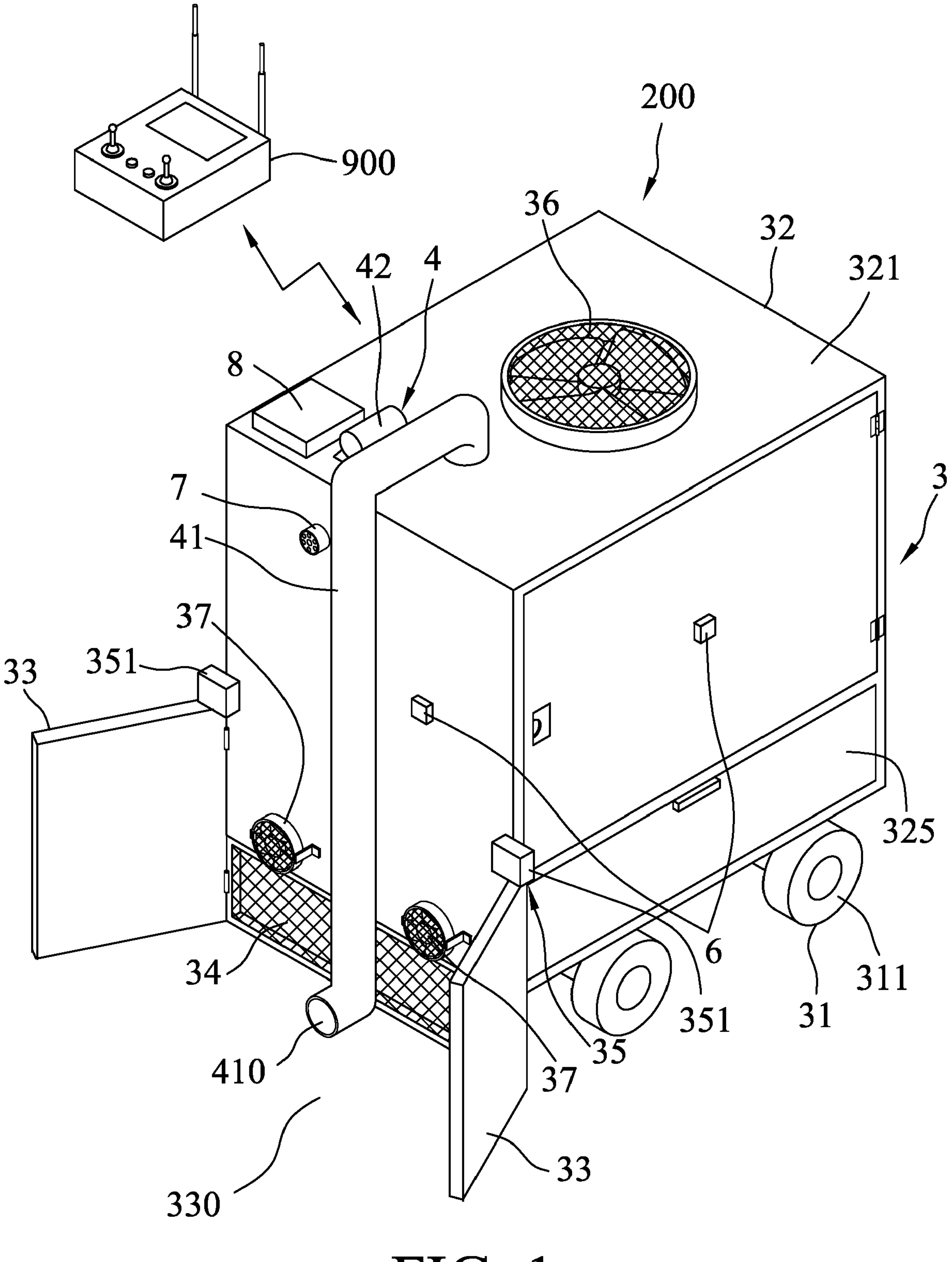
200
900
36
32
321
42
4
8
7
41
3
37
351
33
325
6
34
351
311
31
35
37
410
330
33

FIG. 1

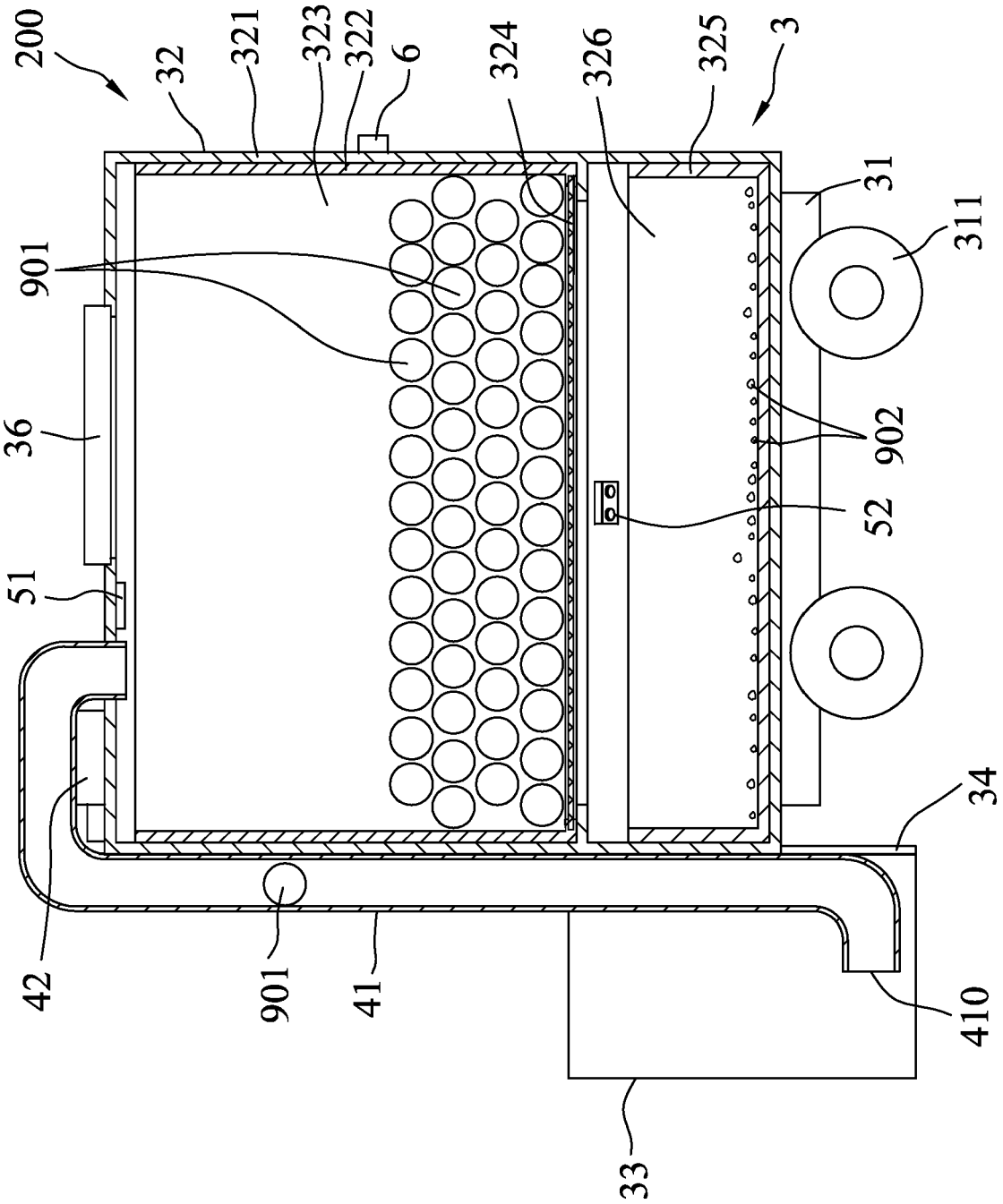
200
32
321
323
322
6
324
326
325
3
31
311
901
36
902
52
51
42
901
41
34
410
33

FIG. 2

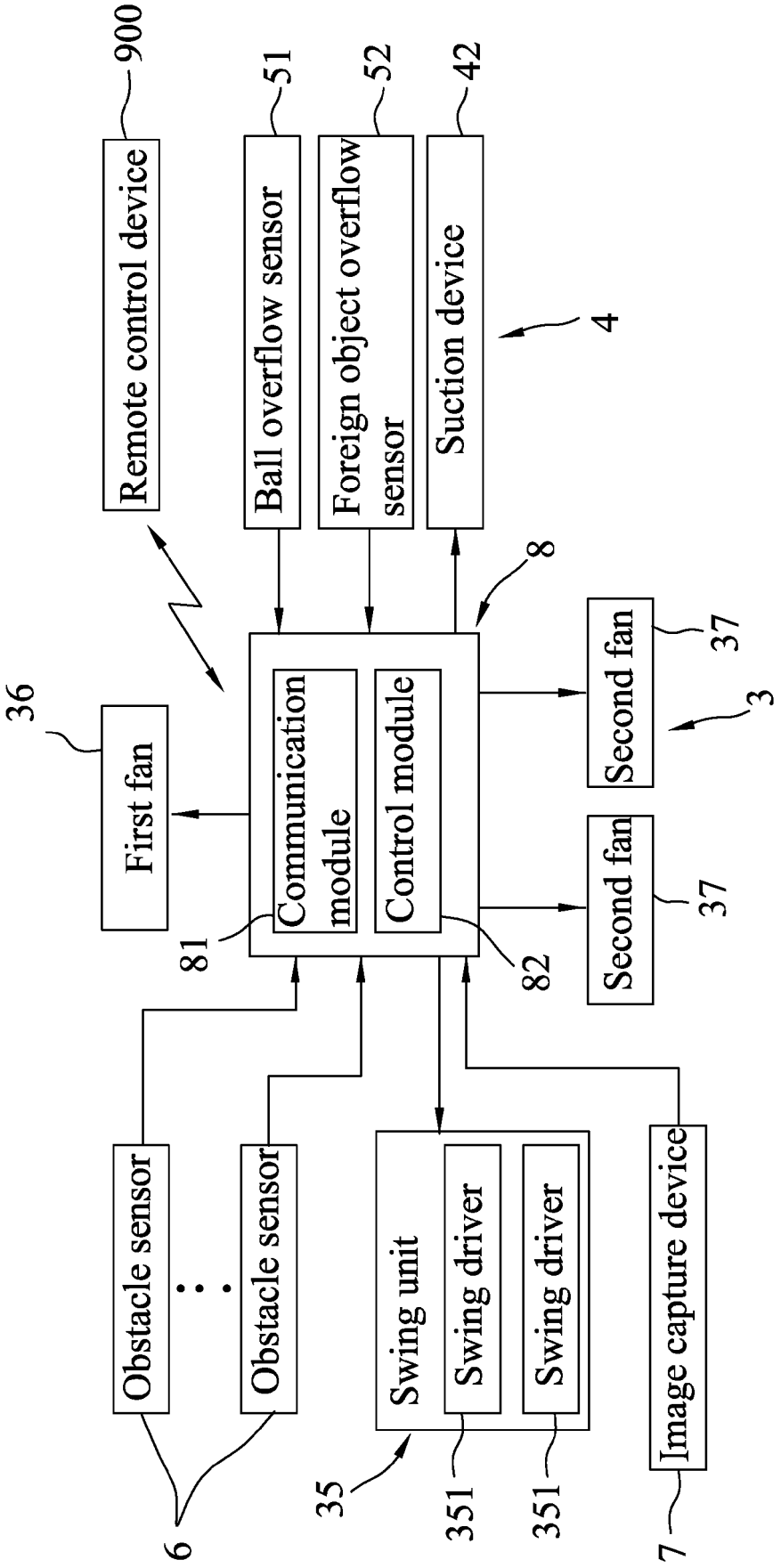
900
Remote control device
51
Ball overflow sensor
52
Foreign object overflow sensor
42
Suction device
4
8
36
First fan
Communication module
Control module
81
82
Second fan
37
3
Second fan
37
Obstacle sensor
Obstacle sensor
6
35
Swing unit
Swing driver
Swing driver
351
351
Image capture device
7

FIG. 3

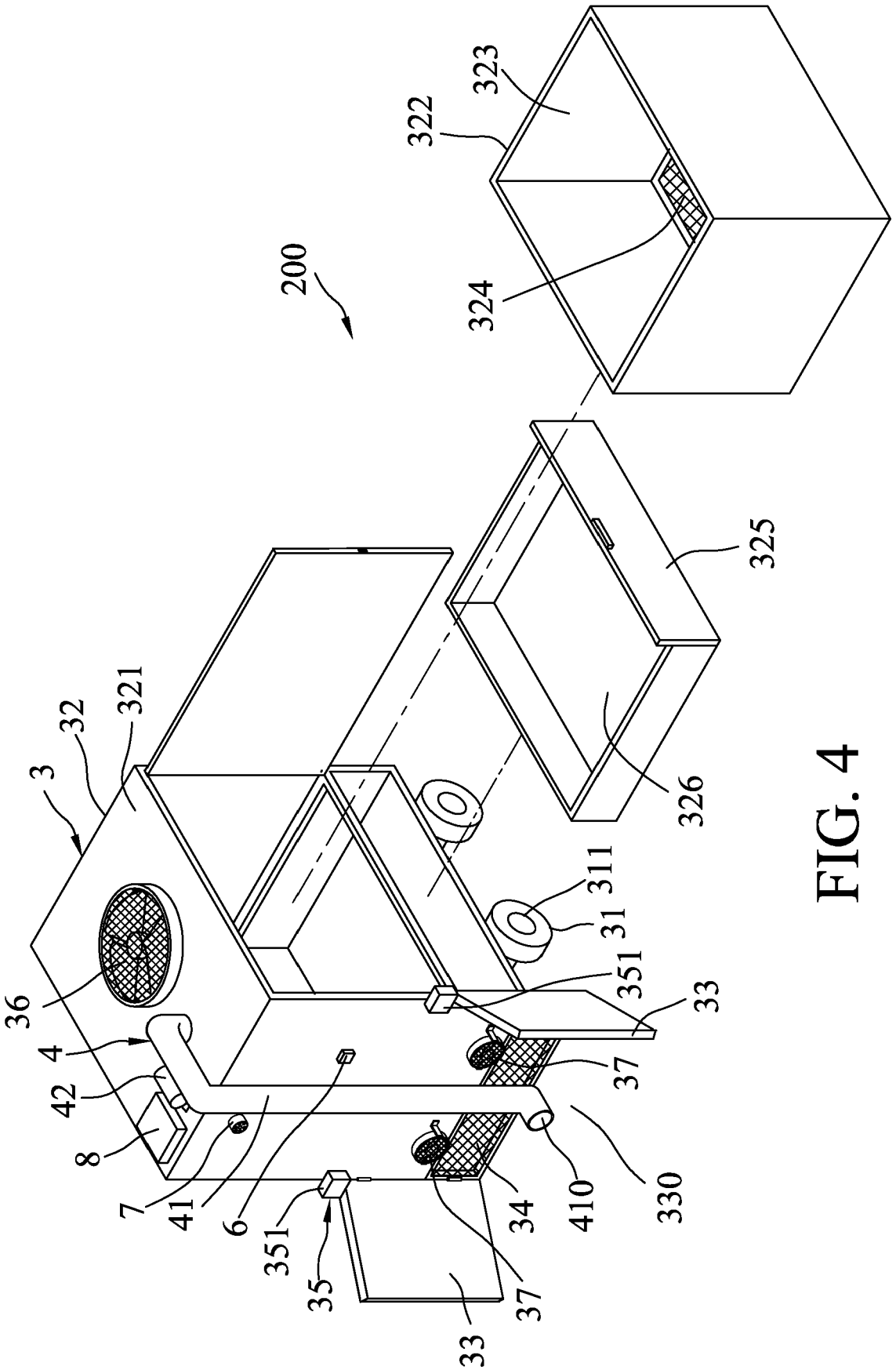
200
322
323
324
325
326
3
32
321
36
4
42
8
7
41
6
351
35
37
33
34
410
330
311
31
351
33
37

FIG. 4

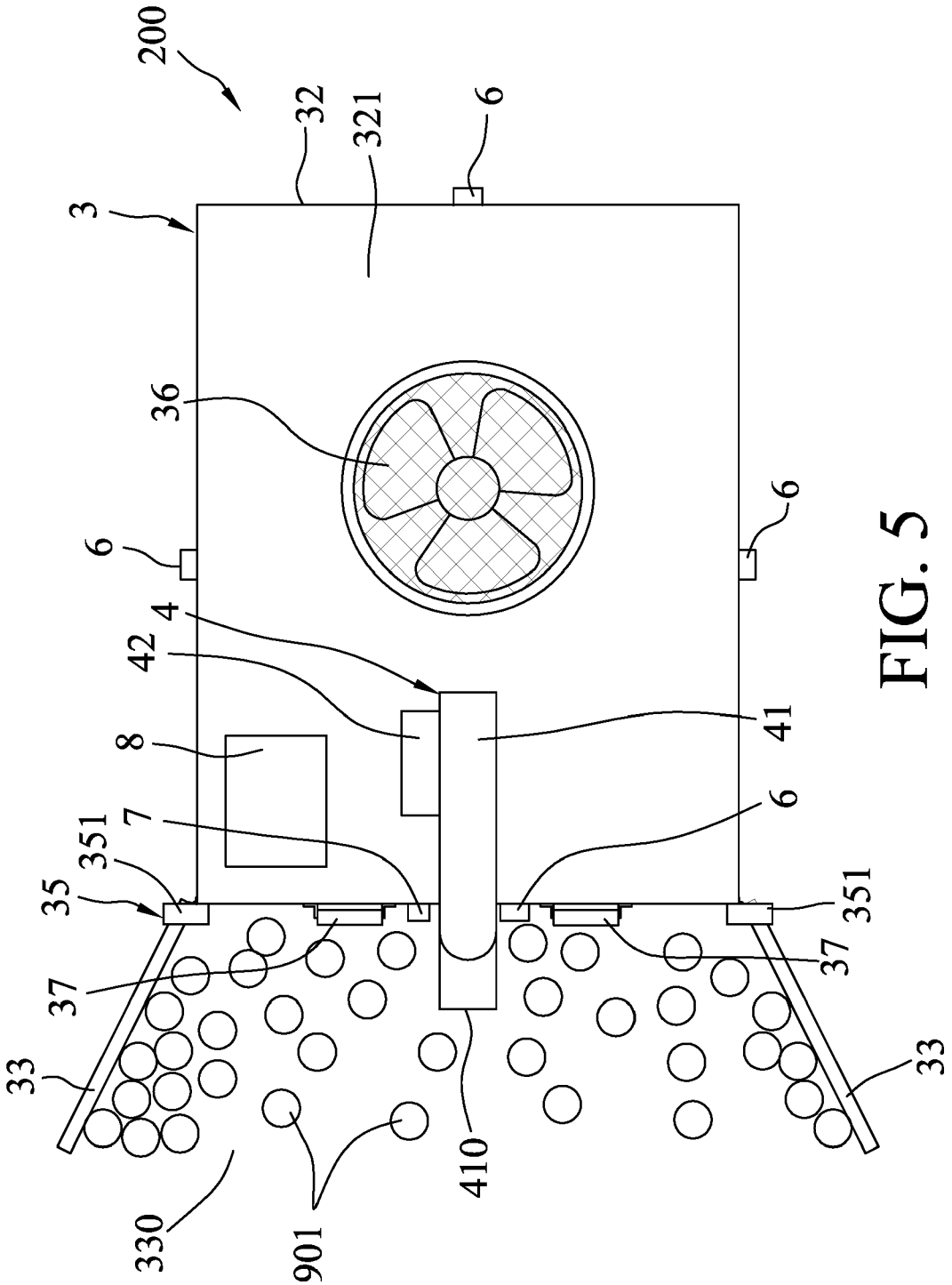

FIG. 5

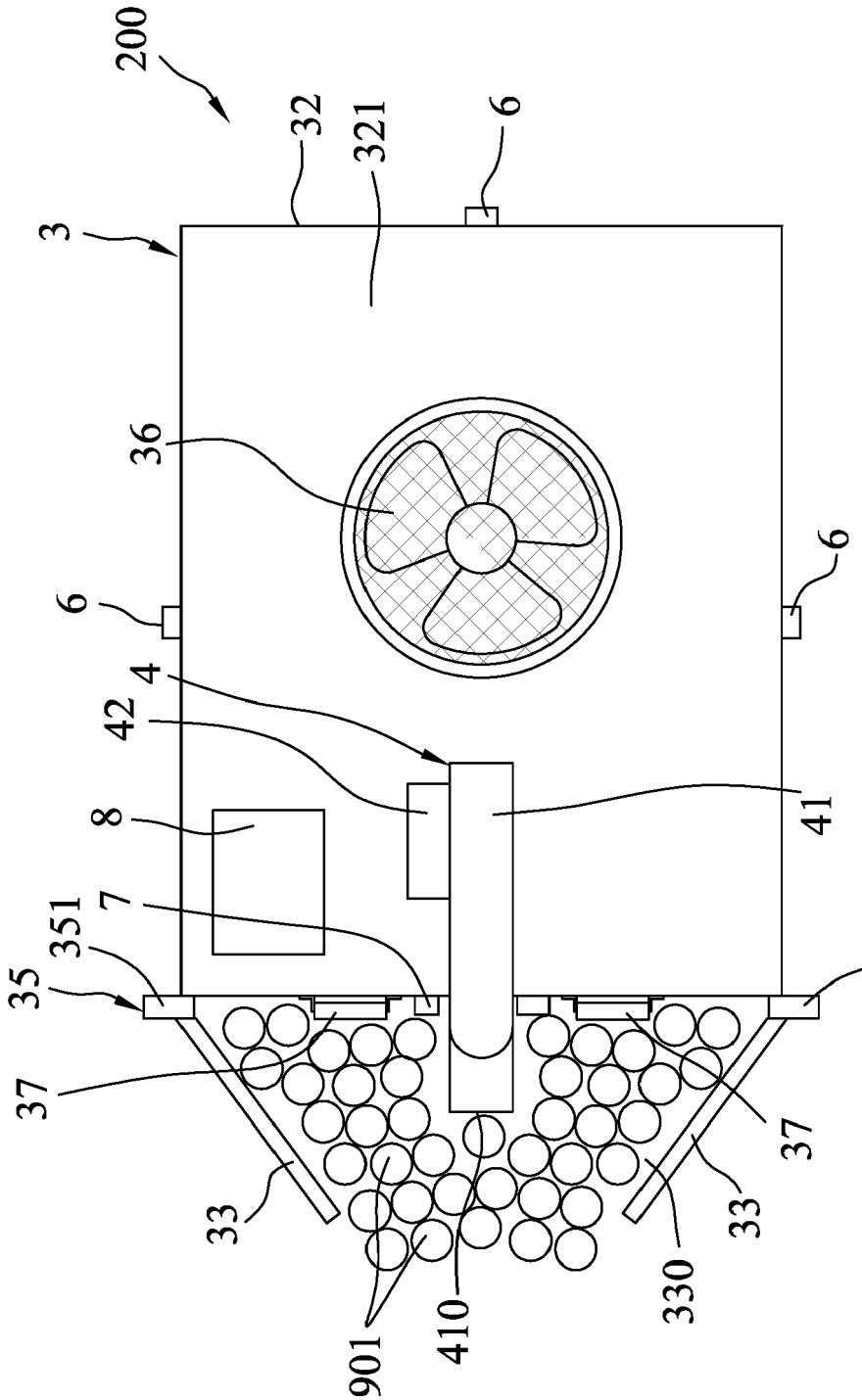

FIG. 6

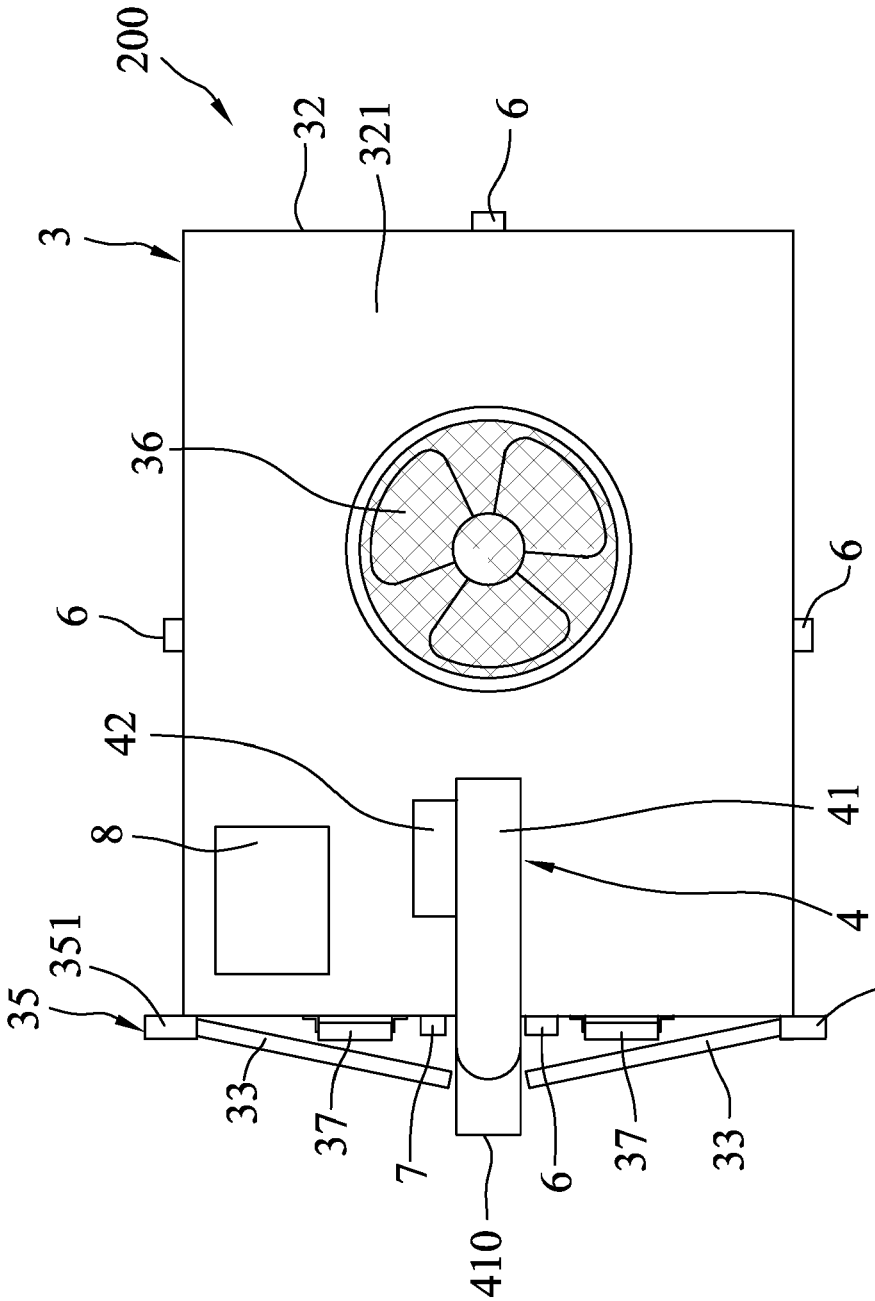

FIG. 7

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EUROPEAN SEARCH REPORT

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DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	US 8 313 396 B1 (MAILMAN CHARLES J [US]) 20 November 2012 (2012-11-20) * the whole document *	1-8	INV. A63B47/02 ADD. A63B47/00 A63B71/06 A63B71/02 A63B102/16
Y	US 2021/128989 A1 (LEGG LAWRENCE GEORGE [US] ET AL) 6 May 2021 (2021-05-06) * paragraph [0101] * * claim 11 *	1,4	
Y	CN 216 092 142 U (GUANGDONG ADMINISTRATIVE PROFESSIONAL COLLEGE) 22 March 2022 (2022-03-22) * paragraph [n0013] * * paragraph [n0040] * * paragraph [n0049] * * paragraph [n0058] * * paragraph [n0060] * * paragraph [n0062] *	2,3,5	
Y	CN 212 090 781 U (UNIV NANJING INFORMATION SCIENCE & TECH) 8 December 2020 (2020-12-08) * paragraph [0023] - paragraph [0024] * * claim 1 *	3,6,7	TECHNICAL FIELDS SEARCHED (IPC) A63B
Y	CN 108 744 438 A (HENAN VOCATIONAL & TECHNICAL COLLEGE COMMUNICATIONS) 6 November 2018 (2018-11-06) * claim 1 * * paragraph [0021] * * paragraph [0023] - paragraph [0026] * * paragraph [0031] *	3,8	
A	DE 10 2016 110358 A1 (STÖSS LUTZ [DE]) 7 December 2017 (2017-12-07) * paragraphs [0039], [0040] *	1	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	4 November 2024	Tejada Biarge, Diego

CATEGORY OF CITED DOCUMENTS

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04-11-2024

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 8313396 B1	20-11-2012	NONE	
US 2021128989 A1	06-05-2021	NONE	
CN 216092142 U	22-03-2022	NONE	
CN 212090781 U	08-12-2020	NONE	
CN 108744438 A	06-11-2018	NONE	
DE 102016110358 A1	07-12-2017	DE 102016110358 A1	07-12-2017
		WO 2017206997 A2	07-12-2017

EPO FORM P0459

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