BALL COLLECTION SYSTEM

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001]

The present invention relates to a ball collection system.

2. Description of the Related Art

[0002]

As a method of collecting balls scattered on the ground of a golf practice field, there is a method in which an operator pushes a ball collection machine to move it on the ground to pick up and collect the balls with the ball collection machine (see Patent Literature 1, for example).

[0003]

Related Art Document(s)

Patent Literature(s)

Patent Literature 1: JP2012-034884A

SUMMARY OF THE INVENTION

[0004]

In the above conventional ball collection method, the operator moves on the ground. Thus, the balls are collected while golf practice is not performed. The conventional ball collection method therefore has a problem of low ball collection efficiency.

[0005]

To solve the above problem, an object of the present invention is to provide a ball collection system capable of safely and efficiently collecting balls on a ground.

[0006]

An aspect of the present invention to solve the above problem is a plurality of balls collection system including: a

ball collection machine which has a driving device and is capable of picking up and storing a ball on a top surface of a ground while moving on the top surface of the ground; a collection groove which extends in the top surface of the ground; and a collector which causes the ball collection machine to move, and drops the balls discharged from the ball collection machine into the collection groove. The collector includes a controller that controls operation of the ball collection machine. By discharging the balls from the ball collection machine, the balls are dropped into the collection groove directly or by way of the ground.

[0007]

Note that examples of the configuration of the controller include a configuration to control the movement of the ball collection machine based on positional information from a GPS device, a millimeter-wave radar, or the like, and a configuration to control the movement of the ball collection machine based on a signal transmitted from a transmitter for remote operation.

[0008]

In the present invention, only the ball collection machine is caused to move on the ground to store balls in the balls collection machine and the balls are dropped from the ball collection machine into the collection groove in the ground. In this way, the balls on the ground can be safely and efficiently collected.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009]

Fig. 1 is a side view showing a ball collection system according to a first embodiment as an example of the present invention;

Fig. 2 is a plan view showing the ball collection system according to the first embodiment as an example of the present

invention;

Fig. 3 is a side view showing a ball collection system according to a second embodiment as an example of the present invention;

Fig. 4 is a side view showing the ball collection system according to the second embodiment as an example of the present invention;

Fig. 5 is a side view showing the ball collection system according to the second embodiment as an example of the present invention;

Fig. 6 is a side view showing a ball collection system according to a third embodiment as an example of the present invention;

Fig. 7 is a side view showing a ball collection system according to a fourth embodiment as an example of the present invention;

Fig. 8 is a side view showing a ball collection system according to a fifth embodiment as an example of the present invention;

Fig. 9 is a side view showing a ball collection system according to a sixth embodiment as an example of the present invention;

Fig. 10 is a plan view showing a ball collection system according to a seventh embodiment as an example of the present invention;

Fig. 11 is a plan view showing a ball collection system according to an eighth embodiment as an example of the present invention; and

Fig. 12 is a plan view showing a ball collection system according to a ninth embodiment as an example of the present invention.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0010]

Embodiments of the present invention will be described in detail with reference to the drawings as appropriate.

Note that, in the description of each embodiment, identical constituent components are denoted by the same reference sign and overlapping description is omitted.

In each of the following embodiments, a configuration in which a ball collection system of the present invention is applied to a practice field (ball game field) for golf will be described as an example.

[0011]

[First Embodiment]

As shown in Fig. 1, a ball collection system 1A in a first embodiment includes a ball collection machine 10 which is capable of storing a plurality of balls 3 scattered on a ground 2, a collection groove 20 which extends in the top surface of the ground 2, and a collector 30 which causes the ball collection machine 10 to move, and drops the balls 3 into the collection groove 20.

[0012]

The ball collection machine 10 is a vehicle capable of picking up and storing the balls 3 on the top surface of the ground 2 while moving on the top surface of the ground 2. The ball collection machine 10 includes a vehicle body 11, rear wheels 12 provided at the rear of the vehicle body 11 ("first wheels" in the claims), and front wheels 13 provided at the front of the vehicle body 11 ("second wheels" in the claims). Also, the vehicle body 11 accommodates therein a driving device 14, a ball collection drum 15, a ball storage tank 16, a discharge mechanism 17, and a controller 18.

[0013]

As shown in Fig. 2, the ball collection machine 10 includes two rear wheels 12 and 12 disposed at the rear of the vehicle body 11 with a gap therebetween in the left-right direction (vehicle width direction), and includes two front wheels 13 and 13 at the front of the vehicle body 11 with a gap therebetween in the left-right direction (vehicle width direction).

[0014]

The driving device 14 is a driving source that causes mechanisms of the ball collection machine 10 to operate and, in the first embodiment, includes an electric motor and a battery.

Note that in the first embodiment, the driving device 14 used is of an electric type but its configuration is not limited. For example, an internal combustion engine may be used.

[0015]

In the ball collection machine 10 in the first embodiment, the two rear wheels 12 and 12 at the rear are the driving wheels and the two front wheels 13 and 13 at the front are the turning wheels, but the rear wheels 12 may be the turning wheels and the front wheels 13 may be the driving wheels.

[0016]

As shown in Fig. 1, the ball collection drum 15 and the ball storage tank 16 are disposed between the front wheels 13 and the rear wheels 12.

The ball collection drum 15 scoops up the balls 3 on the ground 2 by rotating about an axis in the left-right direction (vehicle width direction). The balls 3 thus taken into the ball collection drum 15 are transferred from the ball collection drum 15 into the ball storage tank 16.

[0017]

The ball storage tank 16 is a container capable of storing a plurality of balls 3. The ball storage tank 16 is provided with the discharge mechanism 17, which discharges the balls 3

toward the rear of the ball collection machine 10. The discharge mechanism 17 includes an openable and closable discharge port, a guide plate, and so on.

[0018]

The controller 18 is a microcomputer including a central processing unit (CPU), a read only memory (ROM), a random access memory (RAM), and so on. The controller 18 in the first embodiment controls the operation of the ball collection machine 10 on the top surface of the ground 2 by driving the driving device 14 based on positional information from a GPS device, a millimeter-wave radar, or the like. The controller 18 also controls the opening and closing of the discharge port of the discharge mechanism 17.

[0019]

As shown in Fig. 2, the collection groove 20 is an elongated recess extending in the top surface of the ground 2. The bottom surface of the collection groove 20 is inclined to be lower and lower toward one end of the collection groove 20. The one end of the collection groove 20 communicates with an accumulation tank (not shown) for the balls 3. Thus, the balls 3 dropped into the collection groove 20 roll on the bottom surface of the collection groove 20 toward the one end and stored in the accumulation tank. Also, the top surface of the ground 2 is gently inclined to be lower and lower toward the collection groove 20.

[0020]

The collector 30 is a unit that causes the ball collection machine 10 to move on the top surface of the ground 2, and smoothly drops the balls 3 from the ball collection machine 10 into the collection groove 20.

The collector 30 in the first embodiment includes the controller 18, a discharge region 4 on the ground 2, and two

bridges 21 and 21 provided at the collection groove 20.

[0021]

The discharge region 4 is a region set on the top surface of the ground 2 in abutment with the collection groove 20. The shape and size of the discharge region 4 are set such that the ball collection machine 10 can be stopped inside the discharge region 4.

As shown in Fig. 1, the configuration is such that, as the balls 3 are discharged from the ball collection machine 10 inside the discharge region 4, each ball 3 drops into the collection groove 20 directly or by way of the top surface of the ground 2.

[0022]

As shown in Fig. 2, the two bridges 21 and 21 are flat plates laid over the collection groove 20. The two bridges 21 and 21 are disposed with a gap therebetween in the direction of extension of the collection groove 20. Between the two bridges 21 and 21 is provided an opening portion 22 through which to drop the balls 3 discharged from the ball collection machine 10 inside the discharge region 4 into the collection groove 20.

[0023]

The two rear wheels 12 and 12 of the ball collection machine 10 can respectively pass the two bridges 21 and 21, and also the two front wheels 13 and 13 of the ball collection machine 10 can respectively pass the two bridges 21 and 21. Thus, the ball collection machine 10 can cross the collection groove 20 by passing the two bridges 21 and 21.

[0024]

Next, a method of collecting balls on the ground 2 using the ball collection system 1A in the first embodiment will be described.

Firstly, as shown in Fig. 1, the ball collection machine 10 is placed on the top surface of the ground 2, and the driving

device 14 is activated. The controller 18 causes the ball collection machine 10 to move on the top surface of the ground 2 based on a pre-stored program.

The controller 18 causes the ball collection machine 10 to move across the entire top surface of the ground 2 while referring to the positional information from the GPS device, the millimeter-wave radar, or the like. In doing so, the ball collection machine 10, while moving on the top surface of the ground 2, picks up the balls 3 on the ground 2 with the ball collection drum 15 and stores them in the ball storage tank 16.

[0025]

After the ball collection machine 10 finishes moving across a predetermined region, the controller 18 causes the ball collection machine 10 to move rearward into the discharge region 4 and temporarily stop inside the discharge region 4.

Then, inside the discharge region 4, the controller 18 discharges the balls 3 from the ball storage tank 16 of the ball collection machine 10 by the discharge mechanism 17. As shown in Fig. 2, each of the balls 3 discharged rearward from the ball collection machine 10 drops into the collection groove 20 from the opening portion 22 directly or by way of the top surface of the ground 2 (see Fig. 1).

[0026]

Thereafter, the controller 18 causes the ball collection machine 10 to move rearward to pass the two bridges 21 and 21. As a result, the ball collection machine 10 crosses the collection groove 20, and then continues collecting balls 3 on the ground 2.

[0027]

As described above, the collector 30 of the ball collection system 1A in the first embodiment is configured to discharge the balls 3 from the ball collection machine 10 and drop them into

the collection groove 20 before causing the ball collection machine 10 to pass the two bridges 21 and 21.

[0028]

As shown in Fig. 1, the ball collection system 1A in the first embodiment includes: the ball collection machine 10, which has the driving device 14 and is capable of picking up and storing the balls on the top surface of the ground 2 while moving on the top surface of the ground 2; the collection groove 20, which extends in the top surface of the ground 2; and the collector 30, which causes the ball collection machine 10 to move, and drops the balls 3 discharged from the ball collection machine 10 into the collection groove 20. The collector 30 includes the controller 18, which controls the operation of the ball collection machine 10. The configuration is such that, by discharging the balls 3 from the ball collection machine 10, the balls 3 are dropped into the collection groove 20 directly or by way of the ground 2.

Incidentally, the collector 30 may discharge the balls 3 toward the rear of the ball collection machine 10. Moreover, the collector 30 may cause the ball collection machine 10 move rearward. Furthermore, in the ball collection system 1A in the first embodiment, the discharge region 4 may be set on the top surface of the ground 2, and the balls 3 may be discharged from the ball collection machine 10 inside the discharge region 4.

[0030]

The collector 30 of the ball collection system 1A in the first embodiment discharges the balls 3 from the ball collection machine 10 before causing the ball collection machine 10 to pass the bridges 21.

[0031]

With the ball collection system 1A in the first embodiment as described above, it is possible to cause only the ball

collection machine 10 to move on the ground 2 via autonomous driving to store balls 3 in the ball collection machine 10 and smoothly drop the balls 3 from the ball collection machine 10 into the collection groove 20 in the ground 2. In this way, the balls 3 on the ground 2 can be safely and efficiently collected.

[0032]

In the case where the ground 2 is provided at a practice field (ball game field) for golf like the ball collection system 1A in the first embodiment, a large number of golf balls scattered on the ground 2 can be efficiently collected.

[0033]

Also, as shown in Fig. 2, the collector 30 of the ball collection system 1A in the first embodiment includes the bridges 21 provided at the collection groove 20, and the rear wheels 12 and the front wheels 13 of the ball collection machine 10 are capable of passing the bridges 21. With this configuration, the ball collection machine 10 can move across a wide range by crossing the collection groove 20 provided in the ground 2. Accordingly, the balls 3 on the ground 2 can be safely and efficiently collected.

[0034]

Also, the collector 30 of the ball collection system 1A in the first embodiment includes the two rear wheels 12 and 12 provided to the ball collection machine 10 and the two bridges 21 and 21. The two rear wheels 12 and 12 are separated in the vehicle width direction of the ball collection machine 10. With this configuration, the two rear wheels 12 and 12 respectively pass the two bridges 21 and 21, thereby enabling the ball collection machine 10 to cross the collection groove 20. In this way, the balls 3 on the ground 2 can be safely and efficiently collected.

[0035]

Also, the collector 30 of the ball collection system 1A in the first embodiment includes the two front wheels 13 and 13 provided to the ball collection machine 10. The front wheels 13 and the rear wheels 12 are disposed with a gap therebetween in the front-rear direction of the ball collection machine 10. The two front wheels 13 and 13 are disposed to be separated in the vehicle width direction of the ball collection machine 10. With this configuration, the two front wheels 13 and 13 respectively pass the two bridges 21 and 21, thereby enabling the ball collection machine 10 to cross the collection groove 20. In this way, the balls 3 on the ground 2 can be safely and efficiently collected.

[0036]

Also, the collector 30 of the ball collection system 1A in the first embodiment includes the bridges 21 having a flat plate shape, and the ball collection machine 10 can smoothly pass the bridges 21. In this way, the balls 3 on the ground 2 can be safely and efficiently collected.

[0037]

Also, in the ball collection system 1A in the first embodiment, the opening portion 22, through which to drop the balls 3 into the collection groove 20, is provided between the two bridges 21 and 21. In this way, it is possible to smoothly drop the balls 3 into the collection groove 20 while also providing the bridges 21 for passing the ball collection machine 10. Thus, the balls 3 on the ground 2 can be safely and efficiently collected.

[0038]

While the first embodiment of the present invention has been described above, the present invention is not limited to the first embodiment, and various changes can be made without departing from the gist of the present invention.

For example, although the controller 18 in the first embodiment is configured to perform autonomous driving of the ball collection machine 10 based on the pre-stored program while referring to the positional information from the GPS device, the millimeter-wave radar, or the like, the controller 18 may cause the ball collection machine 10 to operate based on a signal transmitted from a transmitter for remote operation.

[0039]

[Second Embodiment]

Next, a ball collection system 1B in a second embodiment of the present invention will be described. As shown in Figs. 3, 4, and 5, ball collection systems 1B1, 1B2, and 1B3 in the second embodiment each have substantially the same configuration as that of the ball collection system 1A in the first embodiment (see Fig. 1) but differ in the position where the balls 3 are discharged from the ball collection machine 10.

[0040]

As shown in Fig. 3, in the collector 30 in the second embodiment, the bridges 21 are disposed inside the discharge region 4, and the controller 18 discharges the balls 3 from the ball collection machine 10 inside the discharge region 4 while causing the ball collection machine 10 to pass the bridges 21. As with the collector 30 of the ball collection system 1B1 shown in Fig. 3, the balls 3 may be discharged under the ball collection machine 10. Also, as with the collector 30 of the ball collection system 1B2 shown in Fig. 4, the balls 3 may be discharged toward the front of the ball collection machine 10. Also, as with the collector 30 of the ball collection system 1B3 shown in Fig. 5, the balls 3 may be discharged toward the rear. Also, the balls 3 may be discharged from an intermediate part of the ball collection machine 10 in the front-rear direction. Also, the balls 3 may be discharged with the rear wheels 12 or the front

wheels 13 on the bridges 21.

[0041]

In the ball collection system 1B in the second embodiment as described above, the balls 3 drop directly into the collection groove 20 from the ball collection machine 10. This makes it possible to reliably drop the balls 3 into the collection groove 20 from the ball collection machine 10. Thus, the balls 3 on the ground 2 can be safely and efficiently collected.

[0042]

While the second embodiment of the present invention has been described above, the present invention is not limited to the second embodiment, and, as with the first embodiment, various changes can be made without departing from the gist of the present invention.

[0043]

[Third Embodiment]

Next, a ball collection system 1C in a third embodiment of the present invention will be described. As shown in Fig. 6, a ball collection system 1C in the third embodiment has substantially the same configuration as that of the ball collection system 1A in the first embodiment (see Fig. 1) but differs in the direction of movement of the ball collection machine 10.

[0044]

The controller 18 in the third embodiment causes the ball collection machine 10 to move forward to pass the bridges 21. After passing the bridges 21, the ball collection machine 10 enters the discharge region 4 and temporarily stops inside the discharge region 4.

Inside the discharge region 4, the controller 18 discharges the balls 3 in the ball storage tank 16 of the ball collection machine 10 through the discharge mechanism 17. The balls 3

discharged rearward from the ball collection machine 10 drop into the collection groove 20 directly or by way of the top surface of the ground 2.

[0045]

As described above, in the ball collection system 1C in the third embodiment, the controller 18 of the collector 30 causes the ball collection machine 10 to move by autonomous driving to pass the bridges 21, and then discharges the balls 3 from the ball collection machine 10. With this configuration, the balls 3 on the ground 2 can be safely and efficiently collected. Also, the ball collection machine 10 may be caused to move forward by autonomous driving to pass the bridges 21 to safely and efficiently collect the balls 3 on the ground 2.

[0046]

While the third embodiment of the present invention has been described above, the present invention is not limited to the third embodiment, and, as with the first embodiment, various changes can be made without departing from the gist of the present invention.

[0047]

[Fourth Embodiment]

Next, a ball collection system 1D in a fourth embodiment of the present invention will be described. As shown in Fig. 7, the ball collection system 1D in the fourth embodiment has substantially the same configuration as that of the ball collection system 1A or 1C in the first or third embodiment (see Fig. 1 or 6) but differs in the direction of discharge of the balls 3 from the ball collection machine 10.

[0048]

In the collector 30 in the fourth embodiment, the discharge mechanism 17 discharges the balls 3 toward the front of the ball collection machine 10. In this way, the balls 3 on the ground 2

can be safely and efficiently collected.

[0049]

While the fourth embodiment of the present invention has been described above, the present invention is not limited to the fourth embodiment, and, as with the first and third embodiments, various changes can be made without departing from the gist of the present invention.

[0050]

[Fifth Embodiment]

Next, a ball collection system 1E in a fifth embodiment of the present invention will be described. As shown in Fig. 8, the ball collection system 1E in the fifth embodiment has substantially the same configuration as that of the ball collection system 1A in the first embodiment (see Fig. 1) but differs in the direction of movement of the ball collection machine 10.

[0051]

In the collector 30 of the ball collection system 1E in the fifth embodiment, the controller 18 causes the ball collection machine 10 to move rearward to place itself inside the discharge region 4. The controller 18 then discharges the balls 3 rearward from the ball collection machine 10 to drop the balls 3 into the collection groove 20. The controller 18 thereafter causes the ball collection machine 10 to move forward.

With this configuration, the balls 3 on the ground 2 can be safely and efficiently collected using the ball collection machine 10 without bridges provided at the collection groove 20.

[0052]

While the fifth embodiment of the present invention has been described above, the present invention is not limited to the fifth embodiment, and, as with the first embodiment, various changes can be made without departing from the gist of the present

invention.

[0053]

[Sixth Embodiment]

Next, a ball collection system 1F in a sixth embodiment of the present invention will be described. As shown in Fig. 9, the ball collection system 1F in the sixth embodiment has substantially the same configuration as that of the ball collection system 1A in the first embodiment (see Fig. 1) but differs in the direction of movement of the ball collection machine 10.

[0054]

In the collector 30 of the ball collection system 1F in the sixth embodiment, the controller 18 causes the ball collection machine 10 to move forward to place itself inside the discharge region 4. The controller 18 then discharges the balls 3 forward from the ball collection machine 10 to drop the balls 3 into the collection groove 20. The controller 18 thereafter causes the ball collection machine 10 to move rearward.

With this configuration, the balls 3 on the ground 2 can be safely and efficiently collected using the ball collection machine 10 without bridges provided over the collection groove 20.

[0055]

While the sixth embodiment of the present invention has been described above, the present invention is not limited to the sixth embodiment, and, as with the first embodiment, various changes can be made without departing from the gist of the present invention.

[0056]

[Seventh Embodiment]

Next, a ball collection system 1G in a seventh embodiment of the present invention will be described. As shown in Fig. 10,

the ball collection system 1G in the seventh embodiment has substantially the same configuration as that of the ball collection system 1A in the first embodiment (see Fig. 1) but differs in the wheel configuration of the ball collection machine 10.

[0057]

The ball collection machine 10 in the seventh embodiment is provided with sets of two front wheels 13 and 19 ("third wheels" in the claims) arranged in series in the front-rear direction.

With this configuration, when the ball collection machine 10 passes the collection groove 20 with no bridges installed over it, the two front wheels 13 and 19 do not get stuck in the collection groove 20, thereby enabling the ball collection machine 10 to pass the collection groove 20.

[0058]

While the seventh embodiment of the present invention has been described above, the present invention is not limited to the seventh embodiment, and, as with the first embodiment, various changes can be made without departing from the gist of the present invention.

[0059]

[Eighth Embodiment]

Next, a ball collection system 1H in an eighth embodiment of the present invention will be described. As shown in Fig. 11, the ball collection system 1H in the eighth embodiment has substantially the same configuration as that of the ball collection system 1A in the first embodiment (see Fig. 1) but differs in that a charger 5 is provided.

[0060]

In the ball collection system 1H in the eighth embodiment, the charger 5, which charges a battery 14a of the driving device

14 of the ball collection machine 10, is provided in the discharge region 4.

With this configuration, while the ball collection machine 10 is inside the discharge region 4 dropping the balls 3 into the collection groove 20, the battery 14a of the ball collection machine 10 can be charged. This makes it possible to efficiently continue the collection of the balls 3.

[0061]

While the eighth embodiment of the present invention has been described above, the present invention is not limited to the eighth embodiment, and, as with the first embodiment, various changes can be made without departing from the gist of the present invention.

[0062]

[Ninth Embodiment]

Next, a ball collection system 1I in a ninth embodiment of the present invention will be described. As shown in Fig. 12, the ball collection system 1I in the ninth embodiment has substantially the same configuration as at least one of those in the first to eighth embodiments but differs in that the balls 3 are directed in a certain direction.

[0063]

In the collector 30 of the ball collection system 1I in the ninth embodiment, a bottom surface 16a of the ball storage tank 16 is inclined with a rear portion lower than a front portion, thereby allowing the balls 3 to be discharged toward the rear of the ball collection machine 10. In this way, the balls 3 on the ground 2 can be safely and efficiently collected. In particular, even when the top surface of the ground 2 is a horizontal surface, the balls 3 can be caused to roll toward the collection groove 20.

[0064]

Note that while the bottom surface 16a of the ball storage tank 16 is inclined with a rear portion lower than a front portion in the ninth embodiment, the configuration may be such that the bottom surface 16a of the ball storage tank 16 is inclined with a front portion lower than a rear portion to safely and efficiently collect the balls 3 on the ground 2.

[0065]

While the ninth embodiment of the present invention has been described above, the present invention is not limited to the ninth embodiment, and, as with the first embodiment, various changes can be made without departing from the gist of the present invention.

What is claimed is:

1. A ball collection system comprising:

a ball collection machine which has a driving device and is capable of picking up and storing a plurality of balls on a top surface of a ground while moving on the top surface of the ground;

a collection groove which extends in the top surface of the ground; and

a collector which causes the ball collection machine to move, and drops the balls discharged from the ball collection machine into the collection groove, wherein

the collector includes a controller that controls operation of the ball collection machine, and

by discharging the balls from the ball collection machine, the balls are dropped into the collection groove directly or by way of the ground.

2. The ball collection system according to claim 1, wherein

the collector includes a bridge provided at the collection groove, and

a wheel of the ball collection machine is capable of passing the bridge.

3. The ball collection system according to claim 2, wherein the collector discharges the balls from the ball collection machine before causing the ball collection machine to pass the bridge.

4. The ball collection system according to claim 2, wherein the collector discharges the balls from the ball collection machine while causing the ball collection machine to pass the

bridge.

5. The ball collection system according to claim 2, wherein the collector discharges the balls from the ball collection machine after causing the ball collection machine to pass the bridge.

6. The ball collection system according to claim 2, wherein

the collector includes

two first wheels provided to the ball collection machine, and

two of the bridges,

the two first wheels are separated in a vehicle width direction of the ball collection machine, and

the two first wheels pass the two bridges, respectively.

7. The ball collection system according to claim 6, wherein an opening portion through which to drop the balls into the collection groove is provided between the two bridges.

8. The ball collection system according to claim 6, wherein

the collector includes two second wheels provided to the ball collection machine,

the first wheels and the second wheels are disposed with a gap therebetween in a front-rear direction of the ball collection machine,

the two second wheels are disposed to be separated in the vehicle width direction of the ball collection machine, and

the two second wheels pass the two bridges, respectively.

9. The ball collection system according to claim 2, wherein the collector causes the balls collection machine to move in one

direction, discharges the balls from the ball collection machine, and then causes the ball collection machine to move in a direction different from the one direction.

10. The ball collection system according to claim 1, wherein

the collector includes a discharge mechanism provided to the ball collection machine, and

the discharge mechanism discharges the balls toward a front of the ball collection machine.

11. The ball collection system according to claim 1, wherein

the collector includes a discharge mechanism provided to the ball collection machine, and

the discharge mechanism discharges the balls toward a rear of the ball collection machine.

12. The ball collection system according to claim 2, wherein the collector includes the bridge having a flat plate shape.

13. The ball collection system according to claim 1, wherein the ball collection machine is provided with two third wheels arranged in series in a front-rear direction of the ball collection machine.

14. The ball collection system according to claim 1, wherein the ground is provided at a ball game field for golf.