March 2, 1971 J. A. GENTILUOMO 3,567,223

GOLF RANGE BALL HANDLING MEANS

Filed Jan. 20, 1967 2 Sheets-Sheet 1

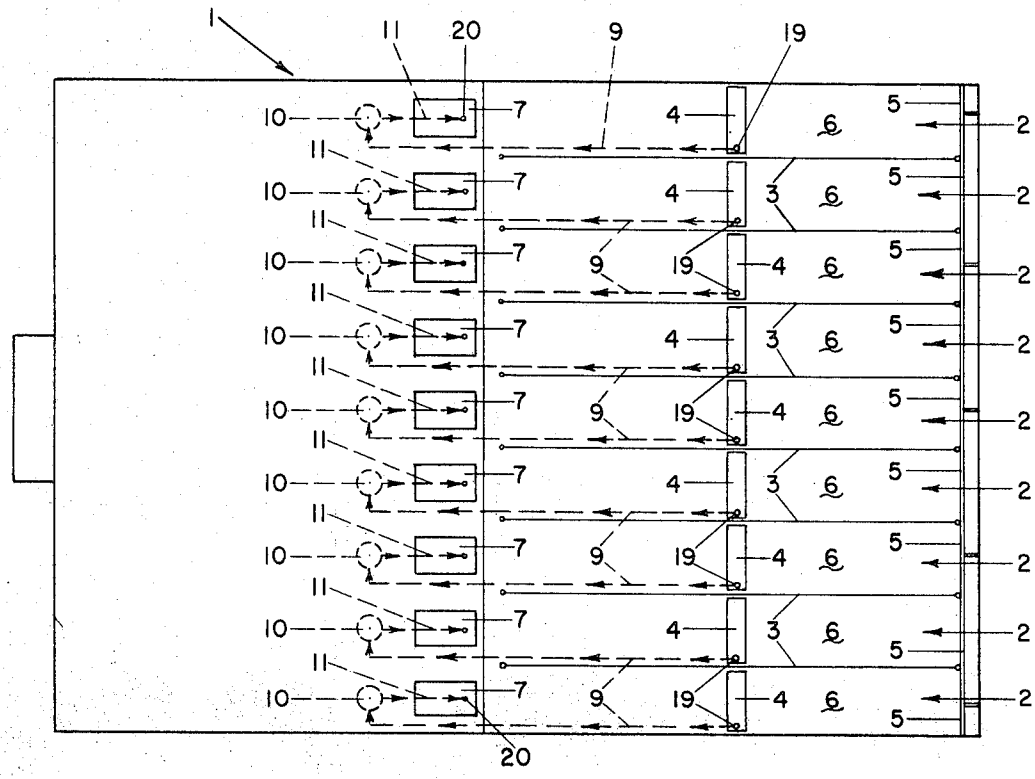

FIG. 1

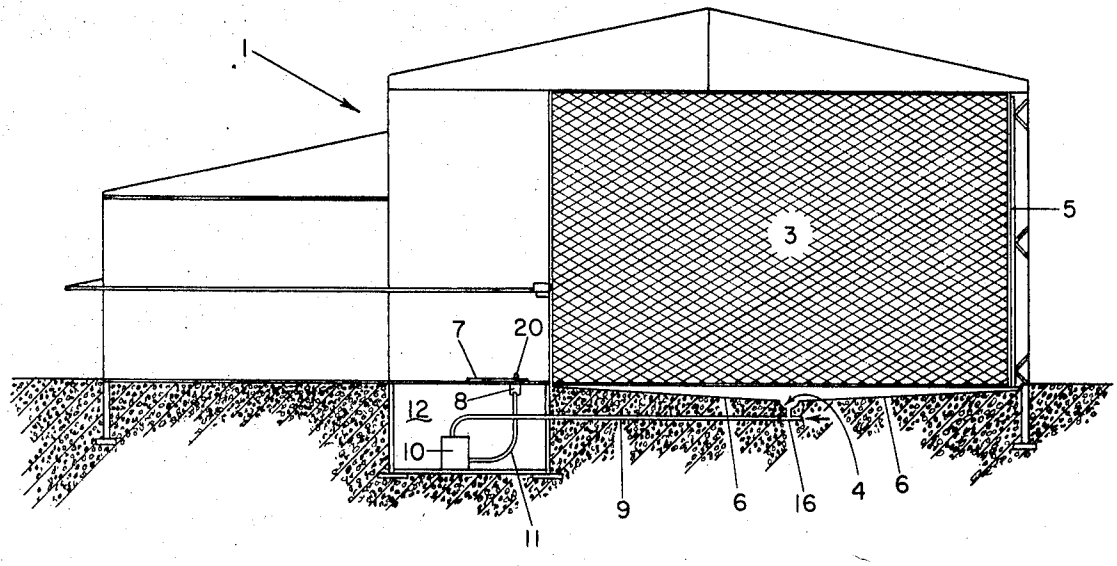

FIG. 2

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GOLF RANGE BALL HANDLING MEANS

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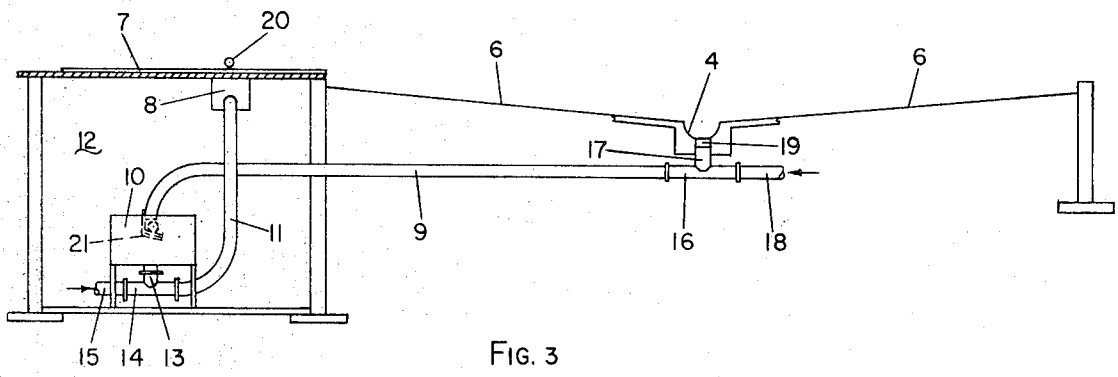

FIG. 3

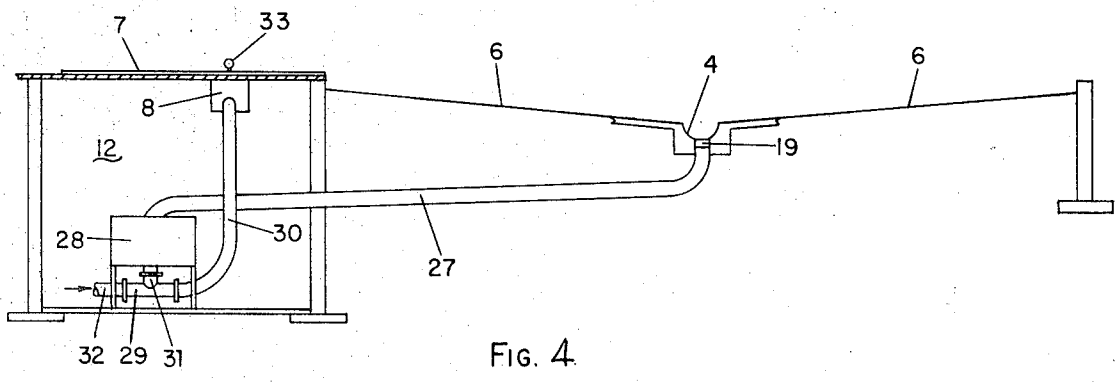

FIG. 4

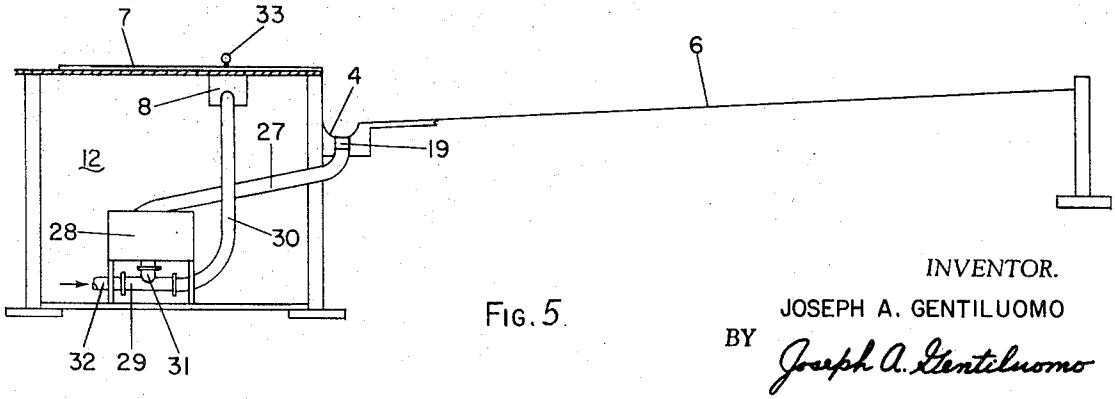

FIG. 5

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GOLF RANGE BALL HANDLING MEANS

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Int. Cl. A63b 69/36
U.S. Cl. 273—35 7 Claims

ABSTRACT OF THE DISCLOSURE

This invention relates to a golf range ball handling means. The novel combination features a discrete ball dispensing means located below golf tee area level so as to yield a neat appearing tee area. The ball dispensing means located in the basement area provides accessibiltiy to said means and allows for balls to be checked and replaced, when necessary, without interrupting range play. The invention in entirety consists of an inclined floor, a ball retreiving gutter, a ball return means to return balls to said ball dispensing means, and a ball elevating means to elevate balls from said ball dispensing means to the ball teeing means for golfers usage.

This invention is intended for use in conjunction with an automated golf range and features new and unique ball handling means adaptable to a range environment such as revealed in the accompanying drawings and by my co-pending patent applications Ser. No. 480,713 filed Aug. 18, 1965, Ser. No. 486,160 filed Sept. 9, 1965, and Ser. No. 566,651 filed July 20, 1966.

The said golf range environment can be provided by a building structure **1** having the following essential elements:

A plurality of discrete golf lanes **2**, **2** adjacently isolated by golf nets **3**, **3** and having discrete ball retrieving gutters **4**, **4** and ball back-stop targets **5**, **5** functionally disposed as shown in FIGS. 1 and 2. The inclined floor **6** can be constructed as shown to enhance the golf balls to enter the plurality of said ball retrieving gutters **4**, **4**. Also, associated with each golf lane **2** will be golf tees **7**, **7** and golf ball teeing means **8**, **8** functional in presenting balls for golfer usage.

When the distance from the golf tee **7** to the down-range target **5** is small, the feasibility of an exclusive gravity type ball handling means to convey balls from the target area back to the tee is debatable. However, when this distance becomes substantial as is the case in preferred golf range installations, the time lag involved in presenting balls for golfer usage becomes significantly great when the said exclusive gravity type systems are utilized. Therefore, means must be devised to provide a more speedy means of presenting balls for golfer usage thus providing for faster range operation which is very essential in rendering a profit-producing recreational facility. This is accomplished by the embodiments shown in FIGS. 3, 4 and 5 which utilize combinations of various means to yield the ultimate in range operation.

Accordingly, objects of my invention are as follows:

To provide simplified, speedy, and trouble-free means of supplying balls for golfer usage.

To provide ball handling means which can be adapted to both indoor and outdoor installations.

To provide ball handling means to accommodate and convey all types of golf balls.

To provide discrete automatic ball handling means associated with each discrete golf lane, thus eliminating the need for manual ball retrieving.

To provide ball handling means necessitating only a minimal of golf balls per golf tee installation for proper operation.

To provide discrete golf lane operation, thus avoiding complete golf range inoperativeness in case of operational difficulties of discrete ball handling means.

To provide ball handling means that can be operated solely by the utilization of the ball dispensing and ball elevating means, should the associated discrete ball return means become inoperative.

To provide ball handling means that can be made functional by the utilizitation of various conveying means such as belt conveyors, gravity conveyors, airstream conveyors, etc.

To provide ball handling means utilizing air as the driving means in the conveying of balls.

To provide ball handling means in which the ball conveying airstream can be induced by either blowers or exhausters.

To provide ball handling means utilizing either gravity or airstream conveying or a combination of both in returning balls to the ball teeing means.

To provide a neat appearing golf range by locating the complete ball transfer means below floor level.

These objects and other objects of this invention should be discerned and appreciated from the description and claims taken in conjunction with the accompanying drawings in which:

FIG. 1 is a schematic interior plan view of a golf range showing the first embodiment of the ball handling means.

FIG. 2 is a schematic interior side elevation view of FIG. 1.

FIG. 3 is an enlarged schematic side elevation view of the first embodiment.

FIGS. 4 and 5 are enlarged schematic side elevation views of a second embodiment of the invention applied to different inclined floor arrengements.

The first embodiment of the ball handling means has an air driving means associated with a ball transfer means which consists essentially of a ball return means having a tubular ball conveying means **9** and a ball propelling means such as injector **16**; a ball elevating means having a tubular ball delivery means **11** and another ball propelling means such as injector **14**; and a conventional type ball dispensing means **10**. All said means being functionally disposed within building structure **1** containing associated elements **2**, **3**, **4**, **5**, **6**, **7**, and **8** so that down-range golf balls can be automatically returned to the ball teeing means **8** for golfer reuse.

A second embodiment of the ball handling means is shown in FIGS. 4 and 5 bearing reference with respect to two inclined floor arrangements. Said ball handling means features both gravity and air dirving means associated with a ball transfer means consisting of a tubular gravitating ball conveying means **27**, a conventional type ball dispensing means **28**, and an elevating means composed of injector **29** and tubular airstream ball delivery means **30**.

It can now be readily discerned that the disclosed second embodiments are direct replacements for the said first embodiment and therefore insertable within said building structure **1**.

In the disclosed embodiments the ball return means can be functionally replaced by conventional belt type conveyors, material flinger type conveyors, flyer carrier type conveyors, tubular mechanical drive type conveyors, etc.

Also, the ball elevating means can be functionally replaced by utilizing vertical lift belt type conveyors and spiral type vibratory conveyors in addition to the other above cited conveyor means.

It is now obvious that many modifications and variations of the cited invention are possible in the light of the

disclosed teachings. Therefore, it should be readily discerned that the invention is not limited in scope to the specific details of construction and arrangements illustrated in the accompanying drawings and herein described.

The first embodiment, although slightly more complex, has many inherent advantages. By utilizing the ball dispensing means **10**, the time lag involved in presenting balls for golfer usage is appreciatively reduced. That is, as soon as the ball is hit from the tee another is immediately released toward the ball teeing means **8** from the said ball dispensing means **10**.

The second embodiment is less complex than the first and presents basically the same advantages. It utilizes the slower gravity ball conveying means **27** to return balls back to the ball dispensing means **28**. This slower ball conveying deficiency is overcome by utilizing a greater number of balls in conjunction with the ball supply within the said ball dispensing means **28**.

Due to the difference in inclined floor constructions shown in FIGS. 4 and 5, the ball conveying means shown in FIG. 4 is substantially longer than the one shown in FIG. 5. Therefore, due to the similarity in construction of the said ball transfer means, both of the said illustrations will be designated by the same reference characters to represent similar elements.

In explaining the invention in detail, it can be discerned that this invention is capable of several embodiments of which three are illustrated in the accompanying drawings and also herein described.

The first embodiment shown in FIGS. 1, 2 and 3, consists of ball handling means functional in providing balls to the plurality of ball teeing means **8, 8** upon demand. The plurality of discrete tubular ball conveying means **9, 9** are fixedly mounted underneath the inclined floor **6** and disposed to enter through the wall of basement **12** as shown in FIG. 3, with their downward discharge ends located above respective ball dispensing means **10, 10**. Fixedly mounted to discharge ends of said ball conveying means **9, 9** are discrete ball decelerating means **21, 21** which are located within the ball dispensing means **10, 10** as shown. Since there will be one ball handling means per golf tee installation, each golf tee **7** will have one ball dispensing means **10** operatively associated with it. Plurality of said ball dispensing means **10, 10** will be located within basement **12** and fixedly positioned underneath the discharge ends of their respective discrete ball conveying means **9,9**.

Inlets **13, 13** of a plurality of ball propelling means such as injectors **14, 14** are fixedly mounted underneath and in alignment with the discharge openings of the said ball dispensing means **10, 10**. Connected to the horizontal inlet end of said plurality of injectors **14, 14** are air supply lines **15, 15** which are associated with air driving means such as commercially available blowers not shown in the drawings. The discharge ends of said injectors **14, 14** are connected to their respective ball teeing means **8, 8** by discrete ball delivery means **11, 11.**

Inlets of ball conveying means **9, 9** have discrete ball propelling means such as injectors **16, 16** fixedly mounted and disposed with respect to the plurality of gutter openings **19, 19** which are respectively associated with discrete ball retrieving gutters **4, 4**. The plurality of injector inlets **17, 17** are positioned underneath and in alignment with the said plurality of gutter openings **19, 19.** Horizontal inlets of said injectors **16, 16** are connected to air supply lines **18, 18** which are supplied with air by driving means such as commercially available blower means not shown in the drawings.

Since the golf lanes **2, 2** are operated discretely, system operation will be described on a per golf lane basis as follow:

After ball **20** is hit toward and into ball back-stop target **5**, it will drop onto inclined floor **6** whence it will roll and gravitate into discrete ball retrieving gutter **4**. The transversely inclined bottom of said retrieving gutter **4** will enhance the said ball **20** to roll toward and enter gutter opening **19**. Upon entrance, the ball **20** will be drawn downwardly into injector **16** whence it is propelled horizontally outward into ball conveying means **9** via airstream action. Said airstream is provided by commercially available blower means which inject air on demand into the air supply line **18** for operation of said injector **16.**

Upon emergence from the said ball conveying means **9**, the said ball **20** will hit the ball decelerating means **21** to release its kinetic energy and effectuate ball deceleration. After the ball **20** has decelerated, it will drop downwardly into the ball dispensing means **10** which acts both as a storage and supply means for the ball teeing means **8.**

The function of the said ball dispensing means **10** is to dispense balls singly into injector **14.** When a ball is hit from the golf tee, the system will function automatically and cause the ball dispensing means **10** to release a ball into injector inlet **13** of the said injector **14** while air is injected into the air supply line **15** on demand. Due to airstream action the ball will be drawn downwardly into the said injector **14** whence it is propelled outwardly through ball delivery means **11.** Upon emergence, the said ball will be decelerated by a conventional ball decelerating means (not shown in drawings) and settle into the confines of the ball teeing means **8** which automatically presents the said ball for golfer usage at golf tee **7.**

The second embodiment shown in FIGS. 4 and 5, consists of a plurality of discrete tubular gravity type ball conveying means **27, 27** fixedly mounted underneath the inclined floor **6** and disposed to enter through wall of basement **12** with downward discharge ends located above respectively associated ball dispensing means **28, 28.** Said plurality of ball dispensing means **28, 28** are located within the said basement **12** and fixedly positioned underneath the said plurality of ball conveying means discharge ends so that balls can readily enter.

Inlets of said plurality of inclined ball conveying means **27, 27** are fixedly mounted and in alignment with respect to the plurality of discrete gutter openings **19, 19** which are respectively associated with discrete ball retrieving gutters **4, 4.**

Inlets **31, 31** of a plurality of ball propelling means sush as injectors **29, 29** are fixedly mounted underneath and in alignment with the discharge openings of the said ball dispensing means **28, 28.** Connected to the horizontal inlet ends of said plurality of injectors **29, 29** are air supply lines **32, 32** which are associated with air driving means such as commercially available blowers not shown in the drawings. The discharge ends of said injectors **29, 29** are connected to their respective ball teeing means **8, 8** by discrete ball delivery means **30, 30.**

In operation, after golf ball **33** is hit toward and into ball back-stop target **5**, it will drop onto inclined floor **6** whence it will roll and gravitate into discrete ball retrieving gutter **4.** The transversely inclined bottom of the said retrieving gutter **4** will enhance the said ball **33** to roll toward and enter gutter opening **19.** Upon entrance, the ball **33** will fall downwardly into curved inlet portion of said inclined call conveying means **27** thence proceed to roll and accelerate under the influence of gravity until it exits from the downwardly curved discharge end into the ball dispensing means **28.**

The function of the said ball dispensing means **28** is to act both as a ball storage and supply means for the ball teeing means **8.** When a ball is hit from the tee, the system will function automatically and cause the ball dispensing means **28** to release a ball into injector inlet **31** while air is injected into the air supply line **32** on demand. Due to airstream action, the ball will be drawn downwardly into the said injector **29** whence it is propelled outwardly through ball delivery means **30.** Upon emergence, the said ball will be decelerated by a conventional ball decelerating means (not shown in drawings) and settle into the confines of the ball teeing

means **8** which automatically presents the ball for golfer usage at golf tee **7**.

Based on the descriptions of the herein cited embodiments, it can be readily discerned that the said invention can be utilized effectively in automatically returning balls to the golf tee **7** according to the continuous repetitive operational sequence revealed, and that the plurality of discrete golf lane systems can be operated concurrnetly without limitations.

Having thusly described my invention, I claim:

1. A golf lane ball handling means functionally associated with golf tee area, comprising, in combination, a discrete ball dispensing means for storing a plurality of balls and dispensing a predetermined number of said plurality of balls on each demand, said dispensing means being disposed below said golf tee area level, a discrete golf ball teeing means, located remote from said dispensing means, disposed at said tee area and functional in presenting balls for golfer usage, and a ball elevating means functional in elevating balls from said ball dispensing means to said ball teeing means.

2. The invention as defined by claim **1**, wherein said ball elevating means is further characterized as a ball delivery means having a pneumatically operated ball propelling means functional in ejecting balls through said ball delivery means to said ball teeing means.

3. The invention as defined in claim **1**, further characterized by an inclined floor adjacent said golf tee area, a ball retrieving gutter disposed with respect to said inclined floor for receiving balls gravitating therefrom, and a ball return means functional in receiving and conveying balls released from said retrieving gutter for conveyance to said ball dispensing means for either storage or utilization.

4. The invention as defined by claim **3**, wherein said ball return means is further characterized as a ball conveying means having a pneumatically operated ball propelling means functional in ejecting balls through said ball conveying means to said ball dispensing means.

5. The invention as defined by claim **3**, wherein said ball return means is further characterized as a gravity type ball conveying means functional in conveying balls from said ball retrieving gutter to said ball dispensing means.

6. The invention as defined by claim **3**, further characterized as a plurality of adjacently disposed golf lane ball handling means each containing discrete ball dispensing means, ball teeing means, ball elevating means, an inclined floor arrangement, a ball retrieving gutter, and a ball return means.

7. The invention as defined in claim **1**, further characterized as a plurality of adjacently disposed golf lane ball handling means each containing discrete ball dispensing means, ball teeing means and ball elevating means.

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U.S. Cl. X.R.

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