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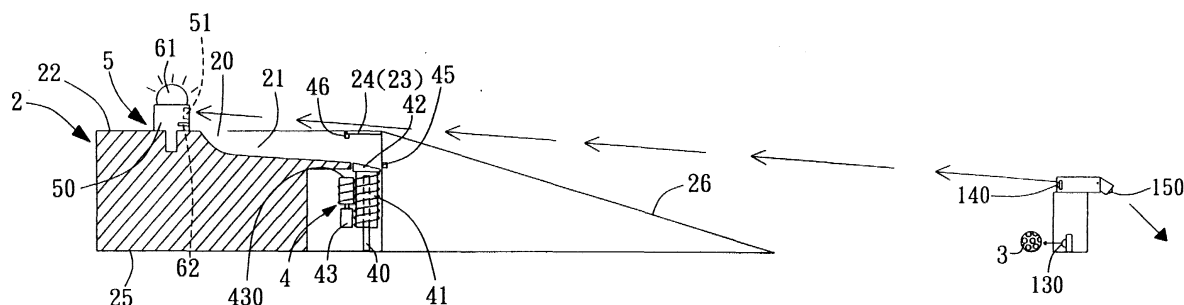
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(54) **Golf training device**

(57) A golf training device includes a golf club, a ball receiving socket, a light emitter, and a light beam receiver. The golf club includes a golf head with a front striking face. The golf ball receiving socket has a slot adapted to receive a golf ball that was struck by the golf head. The light emitter is mounted on the golf head and is aligned vertically with the center of the front striking face

for emitting a light beam substantially parallel to a line passing through the center of the front striking face and perpendicular to the front striking face. The light beam receiver is mounted on the ball receiving socket in the vicinity of the slot for receiving the light beam and for generating a signal when the slot is in alignment with the light beam.



**FIG. 3**

## Description

**[0001]** This invention relates to a golf training device, more particularly to a golf training device that includes a golf club with a light emitter provided thereon, and a ball receiving socket with a light beam receiver provided thereon.

**[0002]** A conventional golf training device, particularly used for short distance shot and indoor practice, normally includes a golf club and a ball receiving socket. However, such training device does not provide any means that can offer the user to analyze his/her swing techniques and to be able to develop his/her skill to correctly and accurately strike a golf ball.

**[0003]** Therefore, the object of the present invention is to provide a golf training device that provides means for enabling the user to analyze his/ her swing technique in order to develop his/ her skill to correctly and accurately strike a golf ball.

**[0004]** According to one aspect of the present invention, a golf training device comprises: a golf club including a golf head with a front striking face having a center; a ball receiving socket to be placed at a location spaced apart from the golf head and having a slot adapted to receive a golf ball that was struck by the golf head; a light emitter mounted on the golf head and aligned substantially vertically with the center of the front striking face for emitting a light beam substantially parallel to a line passing through the center of the front striking face and perpendicular to the front striking face; and a light beam receiver mounted on the golf ball receiving socket in the vicinity of the slot for receiving the light beam and for generating a signal when the slot is in alignment with the light beam.

**[0005]** According to another aspect of the present invention, a golf training device comprises: a golf club including a grip, a golf head with a front striking face having a center, and a power supply unit mounted in the grip; and a light emitter mounted on the golf head and connected to the power supply unit, the light emitter being aligned vertically with the center of the front striking face for emitting a light beam parallel to a line passing through the center of the front striking face and perpendicular to the front striking face.

**[0006]** According to yet another aspect of the present invention, a golf training device comprises: a light emitter adapted to be mounted on a golf club for producing a light beam perpendicular to a front striking face of the golf club; and a ball receiving socket including a slot adapted to receive a golf ball that was struck by the golf club, a light beam receiver mounted thereon in the vicinity of the slot for receiving the light beam and for generating a signal when the slot is in alignment with the light beam, and a motor-driven ball releasing unit mounted therein below the slot.

**[0007]** In drawings which illustrate a preferred embodiment of the invention,

Fig. 1 is a rear perspective view of a golf club of a golf training device embodying this invention;

Fig. 2 is a fragmentary front view of the golf club of Fig. 1;

Fig. 3 is a schematic side view of the golf club of Fig. 1 aligned with a ball receiving socket;

Fig. 4 is a schematic top view of the golf ball receiving socket of Fig. 3;

Figs. 5 and 6 are a side views to illustrate how a golf ball is received by the golf ball receiving socket of Fig. 3; and

Figs. 7 and 8 are a side views to illustrate how the golf ball being is ejected by the golf ball receiving socket of Fig. 3.

**[0008]** Figs. 1 and 4 illustrate a golf training device embodying this invention. The golf training device includes a golf club 1, a ball receiving socket 2, a first light emitter 14, a second light emitter 13, a third light emitter 15, a light beam receiver 5, and a power supply unit 110. The first, second, and third light emitters 14, 13, 15 respectively include first, second, and third laser diodes 140, 130, 150 which are connected to the power supply unit 110 via electrical wiring 113 for producing first, second, and third laser beams.

**[0009]** The golf club 1 includes a golf shaft 10, a grip 11 connected to a top end of the golf shaft 10, and a golf head 12 opposite to the grip 11 and connected to a bottom end of the golf shaft 10. A receiving space is formed in the grip 11 for receiving the power supply unit 110, which is preferably a battery set in the embodiment. The grip 11 has a grip opening formed at the top end thereof with a first cover 111 covering thereon. An ON/OFF switch 112 is mounted on a lower side of the grip 11, and is connected to the power supply unit 110 via the electrical wiring 113.

**[0010]** The golf head 12 has a front striking face 122 that has a center and that is formed with a head opening 120 at the center of the front striking face. The head opening 120 is covered by a transparent protection piece 121. The second light emitter 13 is mounted in the golf head 12 at the center of the front striking face 122, and serves as an indicator that indicates the location of the center of the striking face so that alignment of a golf ball 3, which is placed in front of the front striking face 122, with the center of the front striking face 122 can be assured. The head opening 120 is aligned horizontally with the second laser diode 130 for passage of the second laser beam.

**[0011]** A horizontally extending support body 16 is mounted on a top end of the golf head 12, and has a front end opening substantially flush with the front striking face 122 of the golf head 12. The first light emitter 14 is mounted in the support body 16, and is aligned vertically with the second light emitter 13 such that the first laser beam is parallel to a line passing through the center of the front striking face 122 and is perpendicular to the front striking face 122. The front end opening of

the support body 16 is aligned horizontally with the first laser diode 140 for passage of the first laser beam.

[0012] A rotatable part 161 is mounted rotatably on a rear end of the support 16, and has a rear end opening that opens downwardly. The third light emitter 15 is mounted in the rotatable part 161, and faces downwardly. The rear end opening of the rotatable part 161 is aligned with the third laser diode 150 for passage of the third laser beam. The rotatable part 161 is rotatable relative to the support body 16 such that the third laser beam can be directed to the ground at different angles.

[0013] The golf ball receiving socket 2 is to be placed at a location spaced apart from the golf club 1, and has a horizontally extending top wall 22, a bottom wall 25 opposite to the top wall 22, a sloped side wall 26 facing the golf club 1 and extending inclinedly and downwardly from one end of the top wall 22 to one end of the bottom wall 25, a slot 20 formed in the top wall 22 for receiving the golf ball 3 that was struck by the golf head 12, an exit hole 23 formed in the top wall 22 adjacent to said one end of the top wall 22 for passage of the golf ball 3, a second cover 24 movably closing the exit hole 23, a rail 21 which is formed therein between the slot 20 and the exit hole 23, which has one end connected to the slot 20, and which slopes downwardly and gradually from the slot 20 to a position substantially aligned with the second cover 24.

[0014] Referring now to Figs. 5 to 9, in combination with Figs. 1 to 4, a ball releasing unit 4 is mounted in the golf ball receiving socket 2 adjacent to the other end of the rail 21. The golf ball releasing unit 4 includes a vertical rotary shaft 40 aligned with the exit hole 23 and projecting from the bottom wall 25 to the other end of the rail 21, a screw driven member 41 sleeved around the rotary shaft 40 and provided with a seat 42 at a top end thereof, and a screw driving member 43 driven by a motor 43 and engaging the screw driven member 41 for moving the screw driven member 41 upward and downward along the rotary shaft 40 between a first position, in which the seat 42 is positioned at the other end of the rail 21 for receiving the golf ball 3 from the slot 20 via the rail 21 (see Figs. 5 and 6), and a second position, in which the seat 42 is positioned at the exit hole 23 for ejecting the golf ball 3 out of the rail 21 via the exit hole 23 (see Figs. 7 and 8). A control circuit unit (not shown) is connected to the motor 43. First and second actuators 45, 46, which are preferably in the form of micro-switches, are mounted on the golf ball receiving socket 2 adjacent to the other end of the rail 21 and the exit hole 23, respectively, and are connected to the control circuit unit for actuating the control circuit unit to control the motor 43 when the golf ball 3 reaches and touches the first actuator 45 or when the seat 42 reaches the exit hole 23 and the second cover 24 touches the second actuator 46.

[0015] The light beam receiver 5 is mounted detachably on the top wall 22 of the golf ball receiving socket 2 in the vicinity of the slot 20 for receiving the first laser

beam and for generating a signal when the first laser beam is aligned with the slot 20 upon striking the golf ball 3. The alignment of the slot 20 with the front end opening of the support body 16 gives an indication that the center of the front striking face 122 is substantially aligned with the center of the golf ball 3. The position of reflection of the second laser beam on the golf ball 3 can also be utilized to determine whether or not the center of the front striking face 122 is aligned with the center of the golf ball 3. The aforesaid signal can be generated by a lamp 61, a buzzer 62 or both.

[0016] With the arrangement of the third light emitter 15, the trajectory of the third laser beam reflected on the ground can be analyzed to determine whether or not the swinging of the golf club 1 is deflected.

[0017] With the invention thus explained, it is apparent that various modifications and variations can be made without departing from the spirit of the present invention. It is therefore intended that the invention be limited only as recited in the appended claims.

## Claims

### 1. A golf training device comprising:

a golf club including a golf head with a front striking face having a center;  
a ball receiving socket to be placed at a location spaced apart from said golf head and having a slot adapted to receive a golf ball that was struck by said golf head;  
a first light emitter mounted on said golf head and aligned substantially vertically with the center of said front striking face for emitting a first light beam substantially parallel to a line passing through the center of said front striking face and perpendicular to said front striking face; and  
a light beam receiver mounted on said ball receiving socket in the vicinity of said slot for receiving said first light beam and for generating a signal when said slot is in alignment with said first light beam.

2. The golf training device as claimed in Claim 1, further comprising a second light emitter mounted inside said golf head at the center of said front striking face for producing a second light beam, said golf head further having an opening formed in said front striking face for passage of said second light beam.

3. The golf training device as claimed in Claim 1, further comprising a third light emitter mounted on said golf head for producing a third light beam.

4. The golf training device as claimed in Claim 2, further comprising a third light emitter mounted on said

golf head for producing a third light beam.

5. The golf training device as claimed in Claim 4, wherein said first light emitter is mounted on a top end of said golf head and is directed forwardly of said golf head, said third light emitter being mounted on said top end of said golf head and being directed rearwardly of said golf head. 5
6. The golf training device as claimed in Claim 5, wherein said golf club further includes a grip, and a power supply unit mounted in said grip and connected to said first, second and third light emitters. 10
7. The golf training device as claimed in Claim 6, wherein each of said first, second and third light emitters includes a laser diode. 15
8. The golf training device as claimed in Claim 7, wherein said golf club further includes a support body mounted on said top end of said golf head to hold said first and third light emitters, said support body having a rotatable part to hold said third light emitter, said rotatable part projecting downwardly and inclinedly from said support body and being rotatable relative to said support body. 20 25
9. The golf training device as claimed in any one of the preceding Claims, wherein said light beam receiver includes an alarm for producing an alarm signal upon receipt of said first light beam. 30
10. The golf training device as claimed in any one of the preceding Claims, wherein said light beam receiver includes a lamp for producing a light signal upon receipt of said first light beam. 35
11. The golf training device as claimed in any one of the preceding Claims, wherein said ball receiving socket further includes a rail which has one end connected to said slot and which extends downwardly and inclinedly from said one end of said rail, and a ball releasing unit disposed at another end of said rail which is lower than said one end of said rail. 40 45
12. The golf training device as claimed in Claim 11, wherein said ball receiving socket further includes an exit hole disposed above said ball releasing unit, a cover movably closing said exit hole, a motor mounted below said another end of said rail to drive said ball releasing unit, a control circuit unit connected to said motor, and a first actuator connected to said control circuit unit and disposed adjacent to said another end of said rail to actuate said control circuit unit when the golf ball reaches and touches said first actuator, said ball releasing unit being movable upward to reach said cover, and downward to be disposed below said another end of said rail. 50 55
13. The golf training device as claimed in Claim 12, wherein said ball receiving socket further includes a second actuator connected to said control circuit unit and disposed adjacent to said cover to actuate said control circuit unit when said ball releasing unit reaches said cover.
14. The golf training device as claimed in Claim 13, wherein said ball releasing unit includes a vertical rotary shaft mounted on said ball receiving socket and a screw member mounted on said shaft and connected to said motor, said shaft being turnable in two opposite directions by said motor.
15. The golf training device as claimed in Claim 13 or 14, wherein said first and second actuators are micro-switches.
16. The golf training device as claimed in any one of claims 12 to 15, wherein said ball receiving socket has a top wall formed with said exit hole, said ball receiving socket further including a sloped side wall extending downwardly and inclinedly from said top wall adjacent to said exit hole.
17. A golf training device comprising:  
a golf club including a grip, a golf head with a front striking face having a center, and a power supply unit mounted in said grip; and  
a first light emitter mounted on said golf head and connected to said power supply unit, said first light emitter being aligned vertically with the center of said front striking face for emitting a light beam parallel to a line passing through the center of said front striking face and perpendicular to said front striking face.
18. A golf training device as claimed in Claim 17, further comprising a second light emitter connected to said power supply unit and mounted inside said golf head at the center of said front striking face for producing a second light beam, and a third light emitter mounted on said golf head and connected to said power supply unit.
19. A golf training device as claimed in Claim 18, wherein each of said first, second and third light emitters includes a laser diode.
20. A golf training device comprising:  
a light emitter adapted to be mounted on a golf club for producing a light beam perpendicular to a striking face of the golf club; and  
a ball receiving socket including a slot adapted to receive a golf ball that was struck by the golf club, a light beam receiver mounted thereon in

the vicinity of said slot for receiving said light beam and for generating a signal when said slot is in alignment with said light beam, and a motor-driven ball releasing unit mounted therein below said slot.

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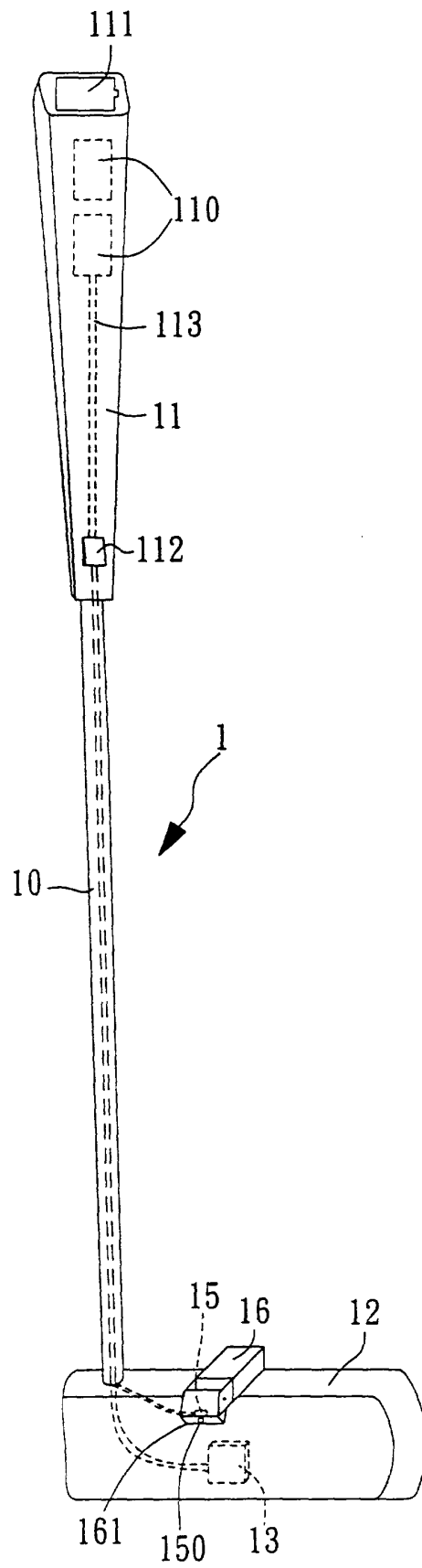


FIG. 1

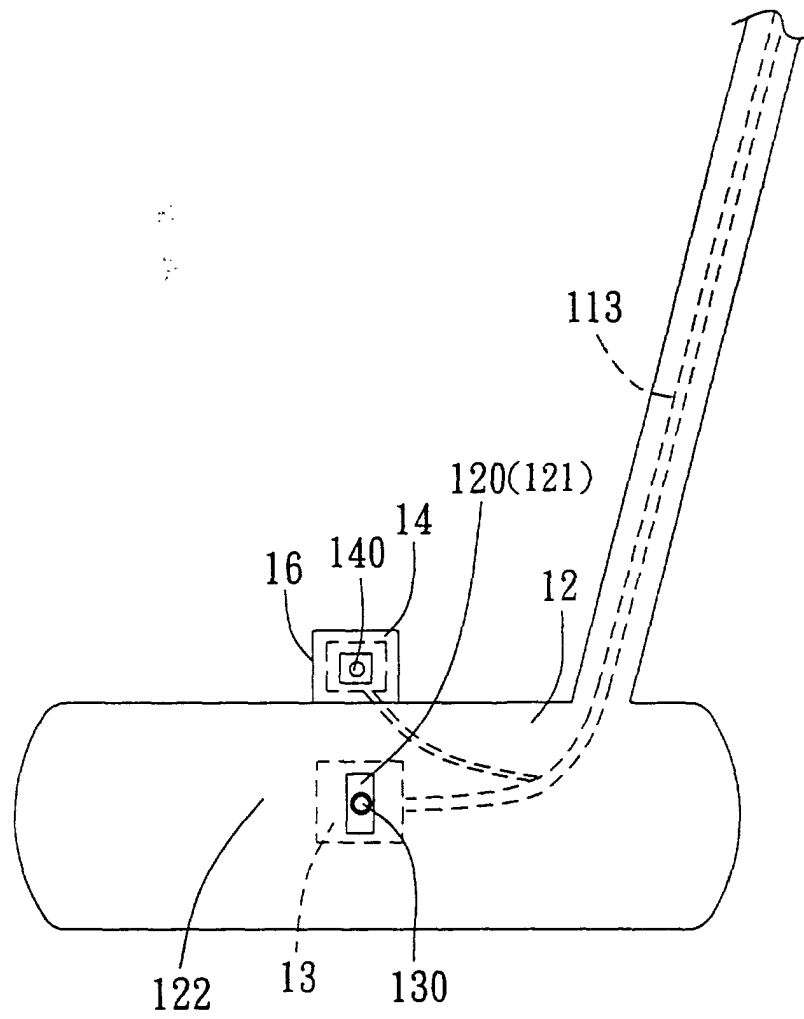


FIG. 2

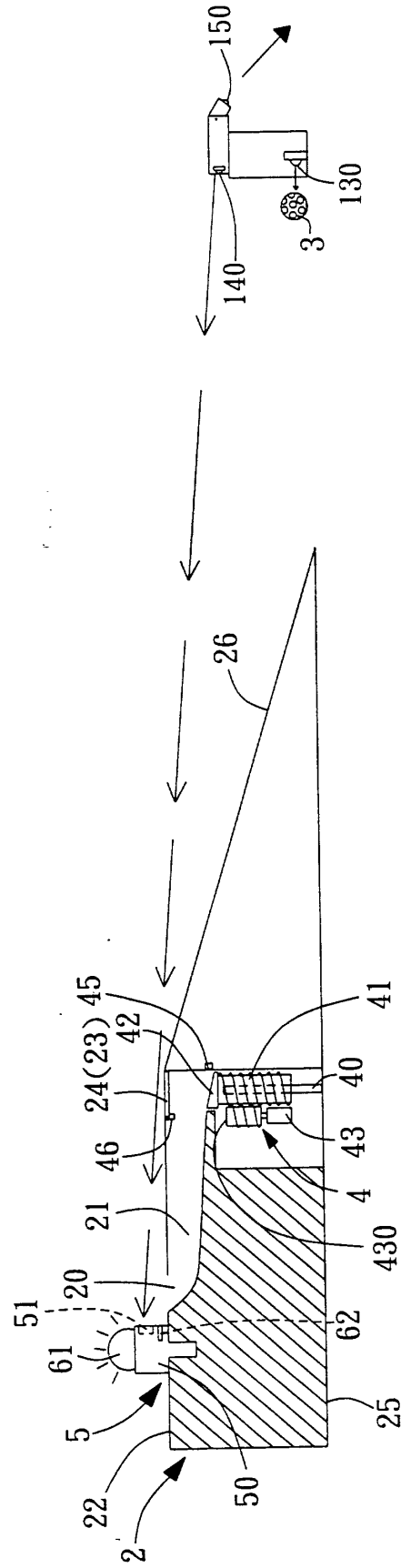


FIG. 3



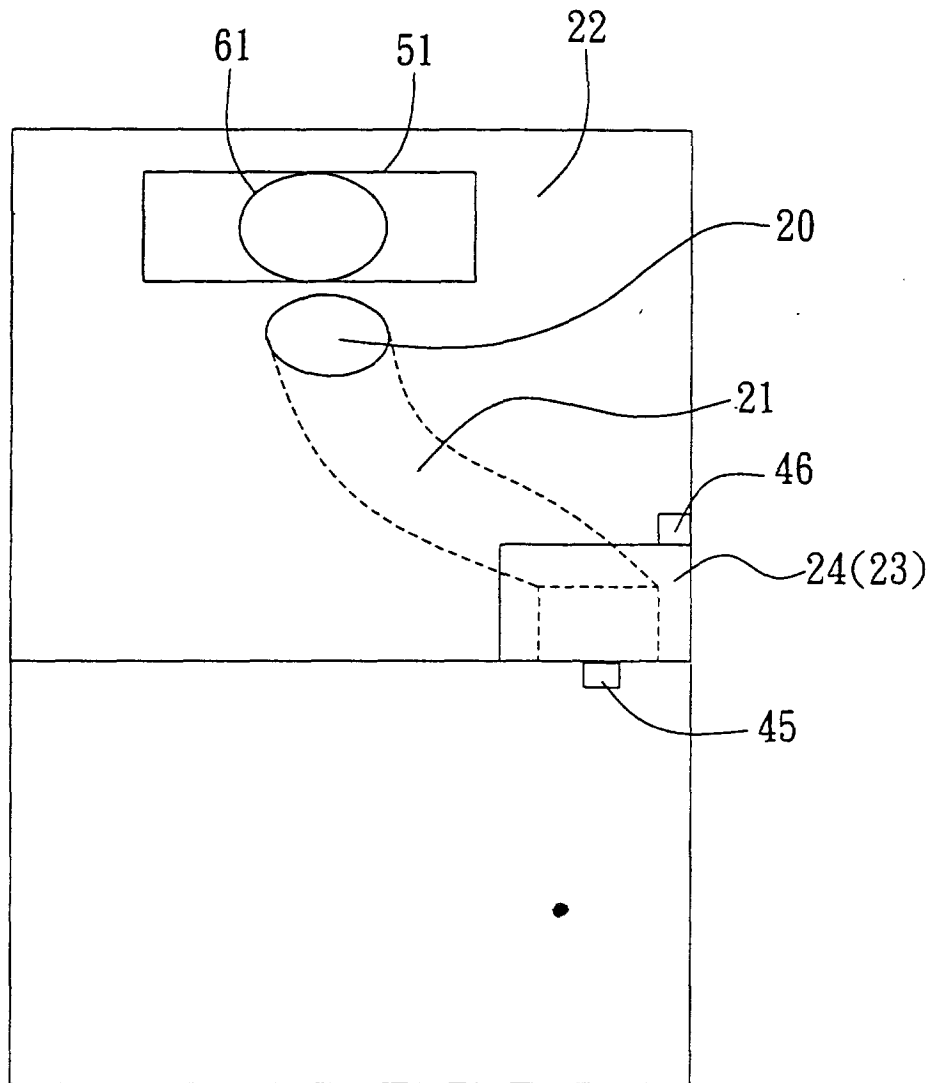


FIG. 4

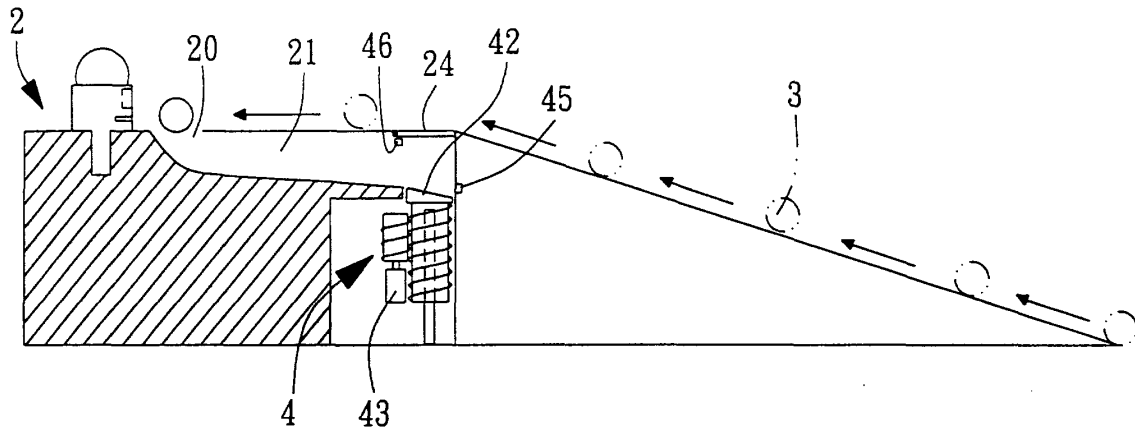


FIG. 5

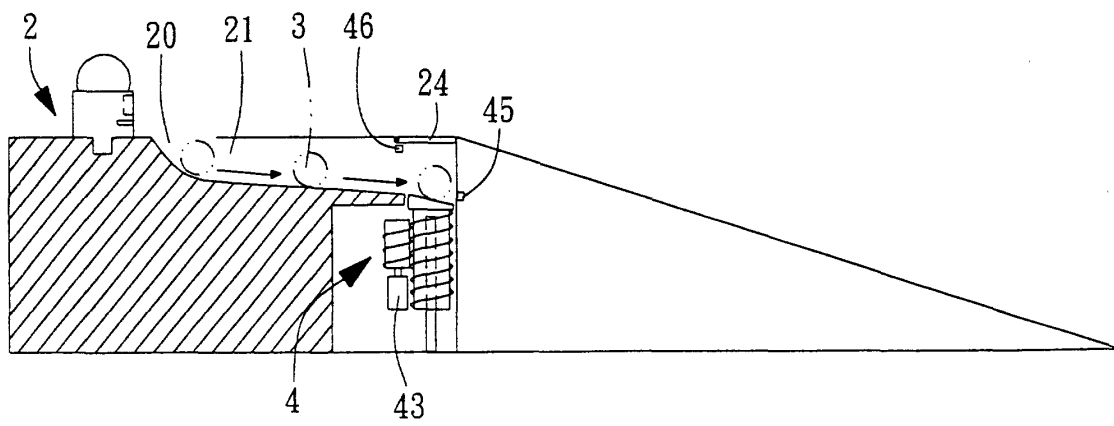


FIG. 6

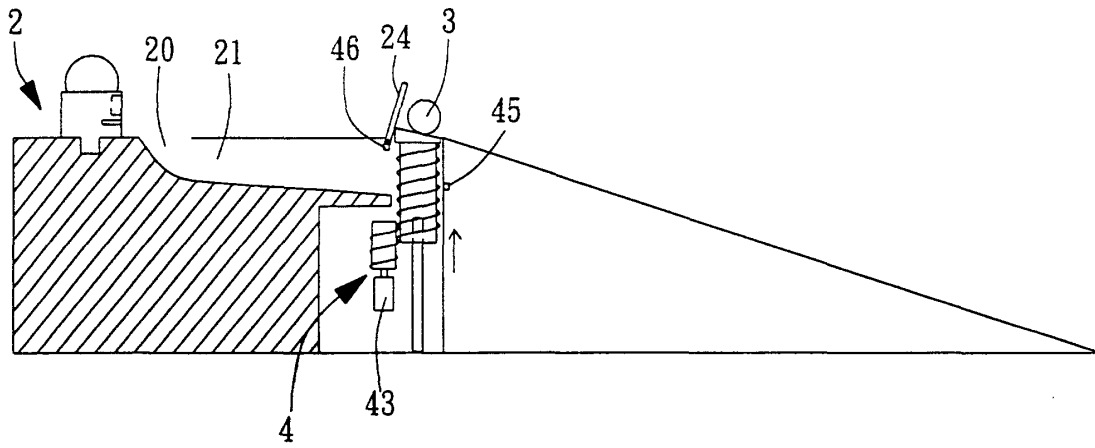


FIG. 7

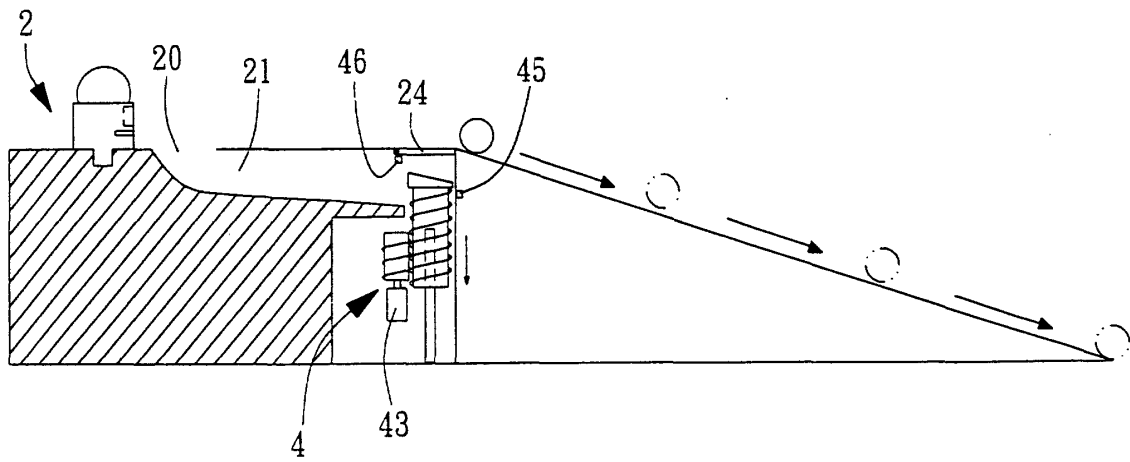


FIG. 8



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# EUROPEAN SEARCH REPORT

Application Number  
EP 00 11 5064

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                      |                                                         |                                              |                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|----------------------------------------------|-----------------------------------------------------|
| Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Citation of document with indication, where appropriate, of relevant passages                                                                                        | Relevant to claim                                       | CLASSIFICATION OF THE APPLICATION (Int.Cl.7) |                                                     |
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| Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | -----<br>PATENT ABSTRACTS OF JAPAN<br>vol. 018, no. 495 (C-1250),<br>16 September 1994 (1994-09-16)<br>-& JP 06 165846 A (TORU YAMADA),<br>14 June 1994 (1994-06-14) | 2                                                       |                                              |                                                     |
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| Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | -----<br>US 3 011 791 A (PAGE)<br>5 December 1961 (1961-12-05)                                                                                                       | 12,13,<br>15,16,20                                      |                                              |                                                     |
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| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | -----<br>US 5 207 429 A (WALMSLEY ET AL.)<br>4 May 1993 (1993-05-04)<br>* column 6, line 3 - column 7, line 2;<br>figures 3-5 *                                      | 1,3-5                                                   |                                              |                                                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                      | -/--                                                    |                                              |                                                     |
| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                      |                                                         |                                              |                                                     |
| Place of search<br><b>THE HAGUE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                      | Date of completion of the search<br><b>20 June 2001</b> | Examiner<br><b>Williams, M</b>               |                                                     |
| CATEGORY OF CITED DOCUMENTS<br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document<br>T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>& : member of the same patent family, corresponding document |                                                                                                                                                                      |                                                         |                                              |                                                     |

EPO FORM 1503 03/82 (P04001)



European Patent  
Office

Application Number  
EP 00 11 5064

**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

**LACK OF UNITY OF INVENTION**

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



European Patent  
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# EUROPEAN SEARCH REPORT

Application Number  
EP 00 11 5064

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                             |                                                         |                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|----------------------------------------------|
| Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Citation of document with indication, where appropriate, of relevant passages                                               | Relevant to claim                                       | CLASSIFICATION OF THE APPLICATION (Int.Cl.7) |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | US 5 873 789 A (TORRIANO)<br>23 February 1999 (1999-02-23)<br>* column 2, line 19 - line 67; figures 1-3 *                  | 2-4, 18, 19                                             |                                              |
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| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                             |                                                         |                                              |
| Place of search<br><b>THE HAGUE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                             | Date of completion of the search<br><b>20 June 2001</b> | Examiner<br><b>Williams, M</b>               |
| <p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone<br/>Y : particularly relevant if combined with another document of the same category<br/>A : technological background<br/>O : non-written disclosure<br/>P : intermediate document</p> <p>T : theory or principle underlying the invention<br/>E : earlier patent document, but published on, or after the filing date<br/>D : document cited in the application<br/>L : document cited for other reasons</p> <p>&amp; : member of the same patent family, corresponding document</p> |                                                                                                                             |                                                         |                                              |

EPO FORM 1503 03/92 (P04C01)



European Patent  
Office

**LACK OF UNITY OF INVENTION**  
**SHEET B**

Application Number  
EP 00 11 5064

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1, 2-10, 17-19

golf training device comprising a golf club with a light beam emitter mounted on golf head, with or without (claim 17) a ball receiving socket with associated light beam receiver, and a second light beam emitter inside said golf head

2. Claims: 1, 11-16, 20

golf training device comprising a golf club with a light beam emitter mounted on golf head, a ball receiving socket with associated light beam receiver, and a ball releasing unit

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 00 11 5064

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

20-06-2001

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s)                                                                                                   | Publication<br>date                                                                                          |
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