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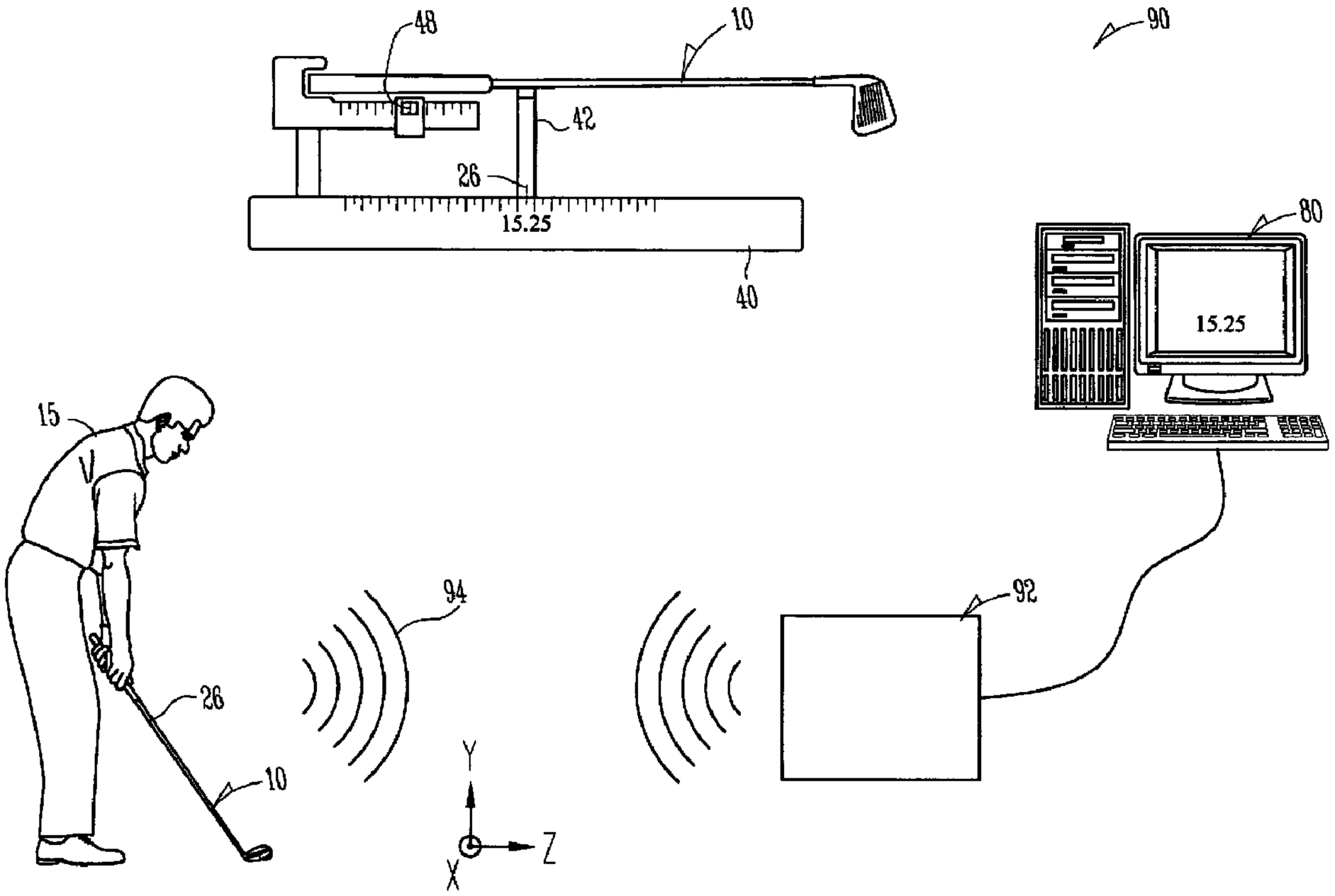
(54) Titre : PROCEDE ET DISPOSITIF DE MISE EN OEUVRE D'UNE NOUVELLE SPECIFICATION POUR BATON DE GOLF APPELEE POIDS D'EQUILIBRE DE WAGGLE

(54) Title: METHOD AND DEVICE TO IMPLEMENT A NEW GOLF CLUB SPECIFICATION NAMED WAGGLE WEIGHT



(57) Abrégé/Abstract:
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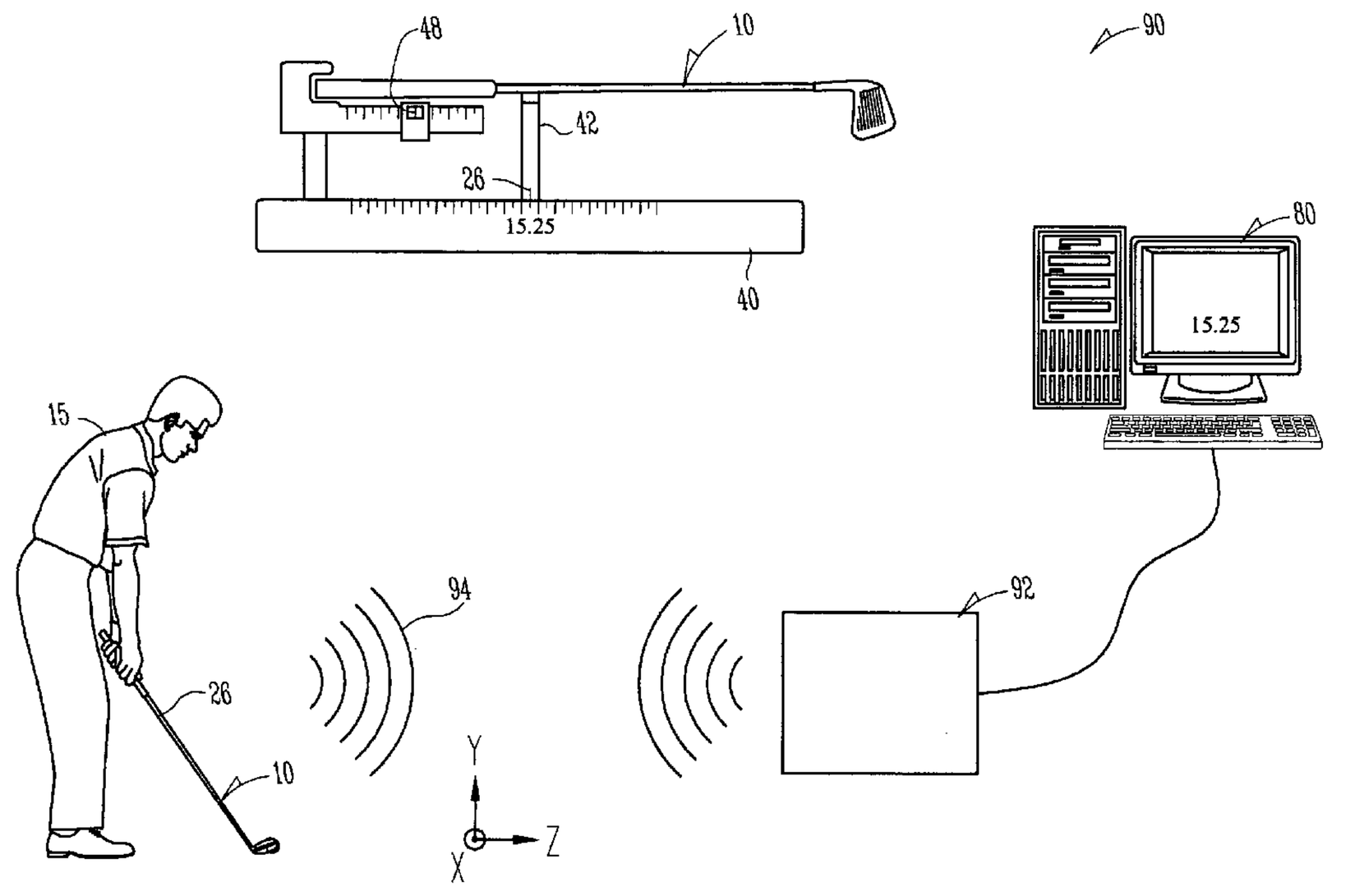
(54) Title: GOLF CLUB WAGGLE SHAKING MOVING VIBRATING WEIGHT MASS COMPUTER PROCESS



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METHOD AND DEVICE TO IMPLEMENT A NEW GOLF CLUB SPECIFICATION NAMED WAGGLE WEIGHT

TECHNICAL FIELD & BACKGROUND

The present invention generally relates to the field of golf clubs. More specifically, the present invention relates to golf clubs with a waggle weight.

There is a constant search in the golfing industry to find new ways to help increase the performance of golfers. The present invention delivers enhanced performance by providing higher quality feedback to golfers from golf clubs.

A swing is any movement begun with the conscious intent of striking a golf ball. A pre-swing starts with any thought or action to prepare for striking the golf ball and ends with the start of the swing. An address is a portion of the pre-swing initiated when taking one's stance over the golf ball and ended with the start of the swing.

A waggle is a motion performed during the pre-swing, address or both that provides feedback to a golfer regarding the golf club about to be swung. A waggle usually produces a rotation point about a golf club, called a waggle weight point. The rotation results in an effective club head weight sensed by the golfer when performing a waggle. This feeling obtained during the pre-swing can have a dramatic impact on the subsequent golf swing.

One area of difficulty preventing the accomplishment of higher quality feedback to make more precise golf clubs is traditional swing weighting. Swing weight scales use a static fulcrum position, almost always fourteen inches, rarely twelve, from the grip end of a golf club, to make golf clubs to

particular swing weights. The problem is swing weighting is a one-size-fits-all attempt to balance and match various golf clubs to different golfers in an effort to improve playability.

For many golfers swing weight does not work effectively. The present invention positions a fulcrum at an established waggle weight point. Golf clubs can now be produced based on waggle weight. Waggle weight is an alterable, measurable golf club value instituted when a golf club is placed against a fulcrum located at a waggle weight point. Using the present invention, golf clubs henceforth can be efficiently scaled for far more golfers than has ever been possible before. Once a waggle weight point is matched to a particular pre-swing style, an assessment to determine a waggle weight value can take place based on the waggle weight point position. Upon finding a preferred waggle weight, golf clubs can be made to the waggle weight in order to improve golfers' consistency of swinging and performance.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be described by way of exemplary embodiments, but not limitations, illustrated in the accompanying drawings in which like references denote similar elements, and in which:

Figure 1A illustrates a drawing of a golf club and a golfer, in accordance with one embodiment of the present invention;

Figure 1B illustrates another drawing of a golf club and a golfer, in accordance with one embodiment of the present invention;

Figure 2 illustrates a drawing of a waggle weight scale with an electronic display, in accordance with one embodiment of the present invention;

Figure 3 illustrates a drawing of a waggle weight scale with a mechanical display, in accordance with one embodiment of the present invention;

Figure 4 illustrates a flow chart of a method, in accordance with one embodiment of the present invention;

Figure 5 illustrates a drawing of a golf club, a golfer, and a computer-implemented process, in accordance with one embodiment of the present invention;

Figure 6 illustrates a system to produce a golf club with a waggle weight, in accordance with one embodiment of the present invention; and

Figure 7 illustrates another system to produce a golf club with a waggle weight, in accordance with one embodiment of the present invention.

DETAILED DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

Embodiments of the present invention include, but are not limited to, a waggle weight point disposed about a golf club and the golf club having a waggle weight, a waggle weight scale with a fulcrum, a method for establishing a waggle weight point, determining a waggle weight, and producing at least one golf club with the waggle weight, a computer-implemented process for locating a waggle weight point, and systems for locating a waggle weight point, determining a waggle weight, and generating golf clubs with the waggle weight.

Various aspects of the illustrative embodiments will be described using terms commonly employed by those skilled in the art to convey the substance of their work to others skilled in the art. However, it will be apparent to those skilled in the art that the present invention may be practiced with only some of the described aspects. For purposes of explanation, specific numbers, materials and configurations are set forth in order to provide a thorough understanding of the illustrative embodiments. However, it will be apparent to one skilled in the art that the present invention may be practiced without the specific details. In other instances, well-known features are omitted or simplified in order not to obscure the illustrative embodiments.

Various operations will be described as multiple discrete operations, in turn, in a manner that is most helpful in understanding the present invention, however, the order of description should not be construed as to imply that these operations are necessarily order dependent. In particular, these operations need not be performed in the order of presentation.

The phrase "in one embodiment" is used repeatedly. The phrase generally does not refer to the same embodiment, however, it may. The terms "comprising," "having," and "including" are synonymous, unless the context dictates otherwise.

Referring now to Figure 1A, in one embodiment, three dimensions X, Y, and Z are shown. Illustrated is a golf club 10 as having a grip end 12 and a club head end 14. Also portrayed are a first force 16 and a second force 18 that are applied to the golf club 10 by a golfer 15, thereby creating one common form of waggle movement. The pre-swing, address and any waggle or waggles occur while preparing to hit a golf ball 20, before the golfer 15 begins a swing. Some golfers might waggle only once prior to starting their swings, while others may repeat the maneuver many times ahead of attempting to strike the golf ball 20. A waggle motion habitually produces a rotation 24 of the golf club 10 about a waggle weight point 26. The waggle weight point location 26 may be specific to each golfer 15 and can vary substantially from golfer to golfer based on individual pre-swing routines. All golfers' waggle weight points will lie within a waggle weight point range 30. The waggle weight point range 30 could be in a range of 0 to 36 inches from the grip end 12 of the golf club.

Referring now to Figure 1B, in one embodiment, three dimensions X, Y, and Z are shown. Illustrated are a golf ball 20 and a golf club 10 having a grip end 12 and a club head end 14. Also portrayed are a third force 17 and a fourth force 19 that are applied to the golf club 10 by a golfer 15, thereby creating another common form of waggle movement. Gravitational energy

about the golf club may be felt by the golfer in the course of such movement. Waggle motions habitually produce a rotation 24 of the golf club 10 about a waggle weight point 26.

While the embodiments portrayed in Figures 1A and 1B could each be the all-inclusive waggle style of two different golfers, the two depictions may also represent individual segments of a more comprehensive waggle of a single golfer, with movements shown in Figures 1A and 1B that could occur during different time frames. Waggles, therefore, can have three-dimensional components, with rotation points (point positions could be in the same place or different locations) that may be observable and analyzable from different planes of view as well as at different times during a golfer's pre-swing waggle or waggles. Waggle movements, including those portrayed in Figures 1A and 1B, can involve the entire body, and may include a temporary lifting of each foot away from the ground and a swaying by the golfer in the course of waggling. Consequently, Figure 1A and 1B golf club motions may also contain other vertical, horizontal, and even circular ingredients.

Referring to Figure 2, in one embodiment, illustrated is one embodiment of a waggle weight scale 40 with a fulcrum 42 and an electronic display 43. The fulcrum 42 may be permanently fixed at one point or may be variable. It is understood that the electronic display 43 could be placed on the waggle weight scale 40 or the electronic display 43 could be in any other location such as remotely connected that would operably couple the electronic display 43 to the waggle weight scale 40 while allowing an operator to view the electronic display 43 conveniently. The fulcrum 42 will be set to the waggle weight point 26 of Figures 1A and 1B, assuming identical locations for the waggle weight point 26 in both figures. For variable fulcrum waggle weight scales, a waggle weight rule 44 may be included. The rule 44 can have increments 46 to allow the fulcrum 42 to be set at a position that corresponds to the waggle weight point 26 location. The waggle weight rule

44 may have increments 46 to each 1/32nd of an inch or 1 millimeter. The electronic display 43 will read out a value that is equal to the waggle weight 48 of the golf club 10. The waggle weight 48 of a golf club 10 can be modified; waggle weight scale pre-programming may be furnished in order to supply varying waggle weight balance readings at each accessible waggle weight point fulcrum location.

Successive values of swing weight on past swing weight scale designs are distinguished by changes of one eighth of an ounce of weight deviation on the very end of a golf club at the grip side for the standard, fourteen-inch, fixed-fulcrum scale model, over a range of generally 11 ½ through 19 ounces. Variations of one tenth of an ounce, usually throughout a range of 0 to 28 ounces, characterize consecutive readings on the twelve-inch, static-fulcrum model, called the Official Scale. The lower numbers on the Official Scale are conventionally used for measuring the gross weights of individual golf club components or assembled golf clubs and are not ordinarily used for swing weighting. The foregoing figures can be considered for a waggle weight scale configuration, or an entirely new format may be developed as desired. Addressing this particular parameter could warrant initially matching a test group of golfers with their respective waggle weight points precisely. Additional research might then be conducted regarding how much a golf club's balance about their waggle weight points needs to be manipulated before the players notice a difference in performance. It may be discovered that weight change statistics surrounding waggle weight do not coincide with values chosen for previous golf club balancing scales, thus promoting design revision in this area.

Referring to Figure 3, in one embodiment, illustrated is a waggle weight scale 40 with a fulcrum 42 and a mechanical balance 52. Again the fulcrum 42 will be set to the waggle weight point 26 of Figure 1A and Figure1B, assumed to be at like positions in both depictions. A waggle weight rule 44

may be included with variable fulcrum waggle weight scales and can include increments 46 to allow the fulcrum 42 to be conveniently and precisely set at a position that corresponds to the waggle weight point 26 location. The mechanical balance 52, which might be alterable in order to provide accurate waggle weight values as the fulcrum position varies, will provide a reading that is equal to the waggle weight 48 of the golf club 10 when the golf club 10 is balanced on the fulcrum 42.

Notwithstanding perhaps the inclusion of waggle weight point location information as part of a waggle weight value, balance-changing unit designations on a waggle weight scale 40 may be formatted to any used for previous swing weight scale designs, such as ounces, grams, or inch-ounce numbers represented by assigned letter-number labels including C-5, D-2, E-0, or a completely new measuring scheme can be devised. Each available waggle weight point position may have its own distinct formulation for defining and designating waggle weights. Consequently, variable-fulcrum waggle weight scales might incorporate appropriate designs to achieve scale recalibrations throughout the accessible waggle weight point range. It may be possible to convert some existing swing weight scale models into waggle weight devices without completely starting from the beginning, depending upon validated waggle weight scale parameters.

The waggle weight of a golf club may be figured by manual calculation in lieu of a waggle weight scale. For each individual golf club, a balance point can be located as a spot where a fulcrum is positioned when the golf club rests perfectly horizontal on the fulcrum. A total weight of the golf club is measured at this center of gravity location, and a distance is determined from this same point to the very end of the golf club at the grip side. From this length is subtracted a decided waggle weight point, which is also a distance from the grip end of the golf club. The difference is multiplied by the above-measured weight in order to obtain a rotational force, or torque, existing at the

waggle weight point. If the lengths are measured in inches and the weight in ounces, the calculation result will be in units of inch-ounces. Inch-ounce numbers can be referenced against designations that may be developed for waggle weight values in order to obtain the waggle weight of the golf club. Dividing an inch-ounce figure by the waggle weight point distance can reveal the exact amount of weight required to be placed on the very end of the golf club at the grip side in order to balance the golf club in equilibrium when the club is resting level on the fulcrum at the waggle weight point, for which reference material may also be made available. This waggle weight calculation, and the scales portrayed in Figures 2 and 3, may indicate the gravity (vertical) force component(s) felt by a golfer when waggling, characterized by a sensation of operative golf club head weight or total weight and more closely depicted by forces 17 and 19 in the movement of Figure 1B. If lateral pre-swing energies (more closely associated with Figure 1A and forces 16 and 18) and/or any other energies developed and felt during waggling are deemed to be as crucial or even more so toward subsequent swing performance, then other apparatus to measure those applied forces around waggle weight points and help make golf clubs accordingly can be devised/utilized as desired.

Referring to Figure 4, in one embodiment, illustrated is providing a method to produce golf clubs with a waggle weight. Shown are analyze at least one movement of at least one golfer 62 and establish a waggle weight point from the at least one movement 64. A waggle weight point location might be positively ascertained through the use of a computer-implemented process. An attempt to locate a waggle weight point position may also be made by human observation. Forasmuch as waggle weight points are found out from information acquired before a swing is begun, the hitting of golf balls and even golf club swinging may not be essential in order to succeed at finding waggle weight point solutions. Establishing the waggle weight point

location might be based on the pre-swing waggling motion of a single player, or the point's position could be an average of multiple findings conducted within appointed golfer categories. In cases where perhaps different planes of analysis, separate waggles, and/or other factors may reveal variant waggle weight points for the same individual, further investigation might be initiated to determine which waggle weight point and its associated pre-swing action is most crucial to the golfer's subsequent swing performance, or selected results could be averaged. Also depicted is determine a waggle weight using the waggle weight point 65. It may be desired to not reevaluate for waggle weight point location each time a waggle weight is determined, in which case the named waggle weight point may be a previously decided value from a former probe. Golfing performance might be evaluated at various golf club waggle weights, which are alterable, about the placed waggle weight point. A preferred waggle weight may be selected. The waggle weight choice could be secured by the analysis of a specific golfer, or the decision might be supported by a larger study. Waggle weight readings can be obtained by using a waggle weight scale. Waggle weight values may also be manually figured. Subsequently shown is produce at least one golf club with the waggle weight 66. In addition to new club construction, the waggle weight method can also be applied on existing golf clubs.

Referring to Figure 5, in one embodiment, is a computer-implemented process for calculating the location of a waggle weight point 26. Illustrated are dimensions X, Y, and Z. Due to the complexities of golfers' waggle motions, computer implementation to authoritatively and consistently locate waggle weight points precisely is significant toward effective golf club waggle weighting for golfers. Provided is collecting golf club motion data and locating a waggle weight point 26 from the data. A waggle weight point 26 may correspond to a fulcrum rotation point developed during pre-swing waggling and can be calculated by a computer 80. Shown is a first waggle position 67

where facts can be collected. Data may also be gathered at a second waggle position 68. In calculating the waggle weight point 26 location, the waggle weight point 26 can be equal to a distance A. Computer-generated vectors may be created to produce a right triangle ABC. Where angle θ may be an angle between the first waggle position 67 and a second waggle position 68. Where B can be a distance between the first waggle position 67 and the second waggle position 68 and is at a right angle to A. Where A may be calculated as $A=B/\tan\theta$. Tangent solutions for angles are widely available from mathematical source material. Automated calculation of waggle weight points can be rendered using a primary computer-implemented process by design. Exceeding that, it may be desirable to compose a more detailed computer-implemented process, which might save and reproduce all relevant golfing action in a manner more understandable and useful than can be realized without a computer-implemented process. One example could be a pre-swing first saved as data and then exhibited in slow motion, whereby with such a tool a waggle weight point might be obtained, studied, and explained more manually if preferred, yet with considerable precision due to the decisive computer-implemented process. Furthermore, the saved data can be referenced against any past/future examination in order to monitor for changes in pre-swing movement and/or waggle weight point. In consequence, a computer-implemented process to locate waggle weight points might also be utilized for perhaps research and teaching purposes.

With scientific means now available to more accurately and authoritatively determine any golfer's waggle weight point than could be accomplished by human observation alone, a computer-implemented process may also be applied to subsequently help determine golfers' waggle weights, based perhaps on the swing timing and/or other determined characteristics of analyzed golfers.

Referring to Figure 6, in one embodiment, a system 70 is illustrated to locate a waggle weight point 26 and derive a waggle weight 48. Three dimensions X, Y and Z are shown. A golf club 10 might be outfitted with at least one transmitter 72 that may be capable of presenting adequate information to position a waggle weight point, whereupon the golf club 10 could be a first test golf club. The transmitter(s) can likewise be placed on the golfer being tested if appropriate. The transmitter(s) 72 may supply at least one signal 78 to track movement of the golf club 10. If the signal(s) 78 from the transmitter(s) 72 cannot be directly analyzed by a computer 80, at least one receiver 76 can be employed that could acquire and format the signal(s) 78 from the transmitter(s) 72. The computer 80 inputs information from the receiver(s) 76 and may utilize a computer-implemented process to decipher the location of a waggle weight point 26 disposed about the golf club 10 during a golfer's pre-swing waggle or waggles. A scale 40 with a fulcrum 42 has its fulcrum 42 set at the waggle weight point 26 location. When the fulcrum 42 is set at a position that corresponds to the waggle weight point 26, a waggle weight 48 can be derived on a golf club 10. Waggle weight 48, which is alterable, may then be analyzed. Given is determining the golfer's waggle weight. This could be accomplished by using a golf club 10, thereupon the golf club 10 might be a second test golf club, and the scale 40 with its fulcrum 42 set at the waggle weight point 26 position. Various waggle weight values can be tried and rated pursuant to the golfer's performance. This would customarily be completed through hitting golf balls and scrutinizing ball travel characteristics following golf club contact and/or information obtained concerning the quality of performed swings. A computer-implemented process may also be designed and utilized for this task in order to obtain more scientific results if desired. A favored waggle weight 48 may be selected. Accordingly provided is at least one golf club produced with the determined waggle weight. Additional golf clubs could also be formed to the

golfer's, or any golfer's, determined waggle weight in order to better fit the specific movement of individual players.

First and second test golf clubs may take on several forms. For example, a first test golf club, which could be used for waggle weight point ascertainment, might be nothing more than a golfer's own personal club temporarily fitted with a portable sensor placed externally upon the golf club for the purpose of detecting the location of a waggle weight point. Alternately, a specialized golf club may be fabricated that can be used for waggle weight point location detection in which at least one sensor could be situated within the golf club along with applicable information pre-programmed into a computer process. Regarding a second test golf club, what might be exploited to determine a waggle weight, a golfer's own personal club may again be used and in fact it could be the identical golf club used as a first test golf club if it is suitable for both assignments. However, typical completed golf clubs do not usually allow for head weights to be adjusted downward enough to enable an acceptable testing range of waggle weight values, and even when possible a common procedure of adding and removing adhesive lead tape to club heads in order to change waggle weights can be awkward and time consuming. Therefore, a distinct golf club may also be designed for determining waggle weights. The club might have variable mass, changeable weights to permit accurate waggle weighting at different waggle weight point locations, as variant waggle weight points could necessitate applying differing weight magnitudes to change the waggle weight an equal amount. Specific weight measures may be tied to particular waggle weight point positions. Weight adjustments to alter waggle weight readings are typically made to the club head of a golf club, though not always. When not engaged in explicit duties, first and second test golf clubs are simply golf clubs. Generally speaking, using golf clubs with overall specifications as close as possible to what is believed best for the golfer or golfers being analyzed, or in place of

that knowledge what might be considered within a normal range, may avoid undesirable imprecision during testing, as well as possible golfer injury.

Referring to Figure 7, in one embodiment, a system 90 to discover the position of a waggle weight point 26 and originate a waggle weight 48 is illustrated. Three dimensions X, Y and Z are shown. At least one sensor 92 is disposed about a golf club 10, at which point the golf club 10 can be a first test golf club. The sensor(s) 92 might be at least a selected one of a camera, an optical sensor, and an infrared sensor focused on the golf club 10. The at least one sensor could also be disposed about a golfer 15 if considered advantageous toward, as examples, establishing a waggle weight point and relating results more decisively. A computer 80 inputs data 94 from the sensor(s) 92 and may employ a computer-implemented process to interpret the data 94 and position a waggle weight point 26 disposed about the golf club 10 during a pre-swing. The procedure for locating a waggle weight point might be repeated multiple times with different golfers if perhaps the goal is to obtain an average waggle weight point position for a more mass-produced golf club operation. A scale 40 with a fulcrum 42 has its fulcrum 42 set to the selected waggle weight point 26 location. When the fulcrum 42 is placed at a position that corresponds with the waggle weight point 26, a waggle weight 48 of a golf club 10 is originated. Provided is determining a waggle weight, which is alterable. This may be achieved by utilizing a golf club 10, which at this stage could be a second test golf club, and the scale 40 with its fulcrum 42 set to the waggle weight point 26 location. Different waggle weights can be tested and ranked for effectiveness based on golfing performance of the player or players being investigated. A preferred waggle weight 48 may be chosen. The waggle weight value might be based on golf ball flight/roll observation after being struck, golfer feedback concerning the feeling(s) sensed in the course of swinging, and/or computer data acquired throughout golfing action. Subsequently given is producing golf clubs to the waggle

weight. A decided waggle weight could be applied to create an open-ended number of golf clubs aimed at benefiting either particular players or general player categories.

In addition to the advancements concerning complete golf clubs and golf club measuring devices covered herein by the present invention, the introduction of the golf club specification named waggle weight can also be responsible for new and improved designs of golf club components including club heads, shafts, grips, and other clubmaking tools.

Thus, it can be seen from the above descriptions, a computer-implemented process for locating a waggle weight point, a novel device having a fulcrum set at a waggle weight point for determining waggle weights and producing golf clubs with waggle weights, a method for generating golf clubs with waggle weights, a golf club with a waggle weight, and systems utilizing said method, process, and devices have been described. While the present invention has been related in terms of the foregoing embodiments, those skilled in the art will recognize that the invention is not limited to the embodiments depicted. The present invention can be practiced with modification and alteration within the spirit and scope of the appended claims. Thus, the description is to be regarded as illustrative instead of restrictive on the present invention.

CLAIMS

What is claimed is:

1. A device, comprising:

A fulcrum, the fulcrum placed at a location corresponding to a determined rotation point location disposed about pre-swing golfer, golf club, or test golf club movement; and

A scale, operably coupled to the fulcrum, or in lieu of said scale using the fulcrum location to calculate a measurement corresponding to said scale's measurement, whereby said device supplies at least one golf club measurement.

2. The device of claim 1, wherein the fulcrum location is variable.

3. The device of claim 1, wherein the fulcrum location is permanently fixed at the determined pre-swing rotation point location.

4. A method of use of the device of claim 1, comprising:

analyzing at least one pre-swing movement of at least one golfer; and

determining a pre-swing rotation point location from the analysis, whereby said determined rotation point location is used to place the fulcrum at a corresponding location on said device or used to calculate a golf club measurement about said determined pre-swing rotation point location.

5. The method of claim 4, comprising determining at least one golf club measurement of at least one force about the determined pre-swing rotation point location.

6. The method of claim 5, wherein said device with the fulcrum placed at a location corresponding to the determined rotation point location or using said determined rotation point location to calculate said at least one golf club measurement of at least one force is used to aid in determining said at least one golf club measurement of at least one force.

7. The method of claim 5, comprising producing at least one completed golf club using the at least one measurement determined or at least one golf club part thereof to achieve said at least one determined measurement on at least one completed golf club.

8. The method of claim 7, wherein said device with the fulcrum placed at a location corresponding to the determined rotation point location or using said determined rotation point location to calculate said at least one golf club measurement of at least one force is used to aid in producing said at least one completed golf club or said at least one golf club part thereof.

9. The method of claim 4, wherein at least one golf club or test golf club is used to aid in determining said pre-swing rotation point location.

10. The method of claim 5, wherein a computer-implemented process is used to aid in determining said pre-swing rotation point location or said at least one golf club measurement of at least one force about the determined pre-swing rotation point location.

11. A device suitable to aid in determining a pre-swing golf club rotation point location, comprising at least one sensor means suitable to aid in the analysis of pre-swing golf club movement, portably or permanently operably disposed about a golf club or test golf club suitable to aid in said analysis of pre-swing golf club movement and determine said pre-swing golf club rotation point location.

12. The device of claim 11, wherein the at least one sensor means is portably disposed about said device.

13. The device of claim 11, wherein the at least one sensor means is permanently disposed about said device.

14. The device of claim 12, wherein said device is a golfer's own golf club with a video sensor portably disposed about said golf club to aid in analyzing the golfer's pre-swing golf club movement.

15. The device of claim 13, wherein said device is a test golf club with the at least one sensor means permanently disposed about said test golf club, said at least one sensor means capturing and sending pre-swing test golf club movement data to a computer processor programmed to determined said pre-swing golf club rotation point location.

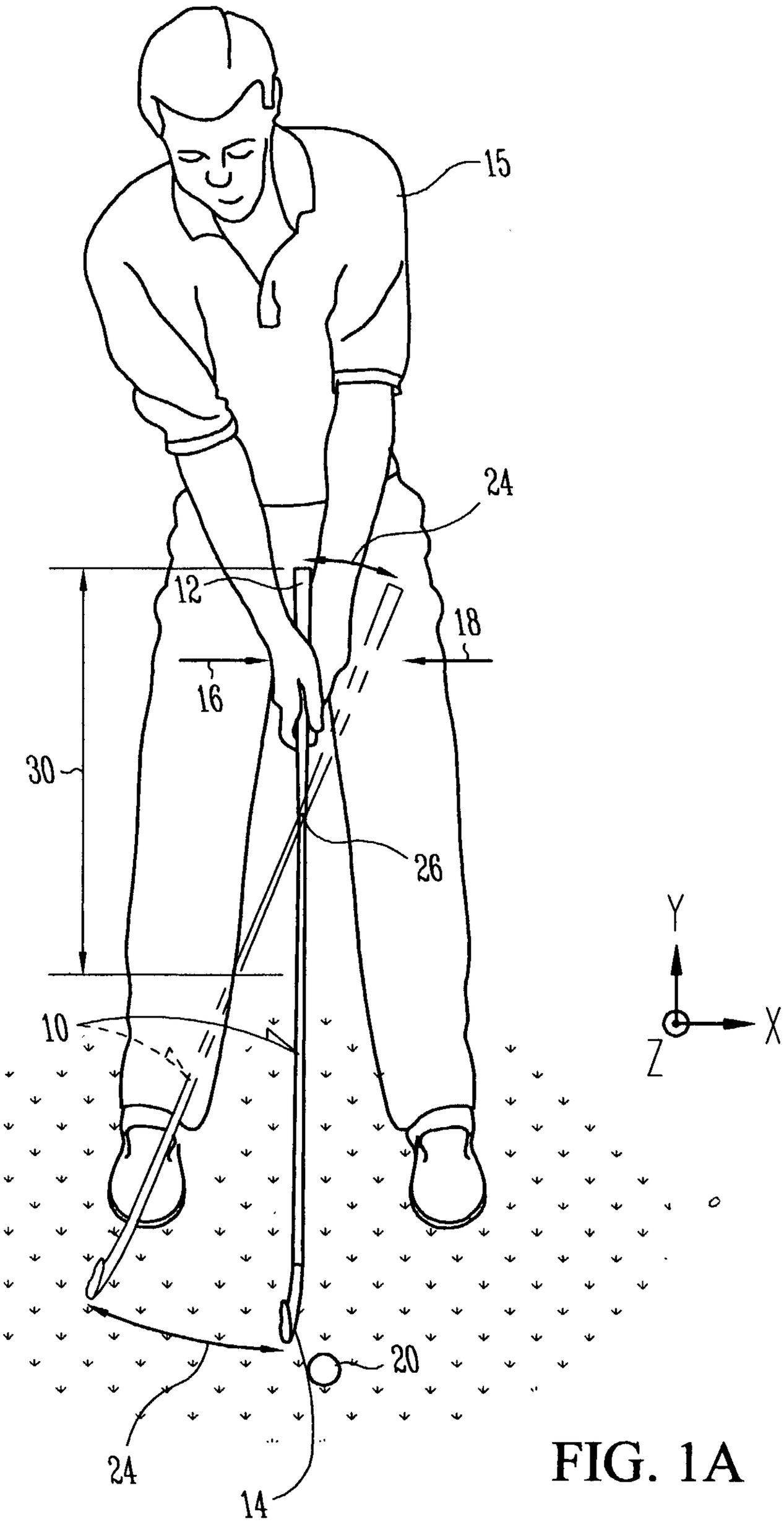


FIG. 1A

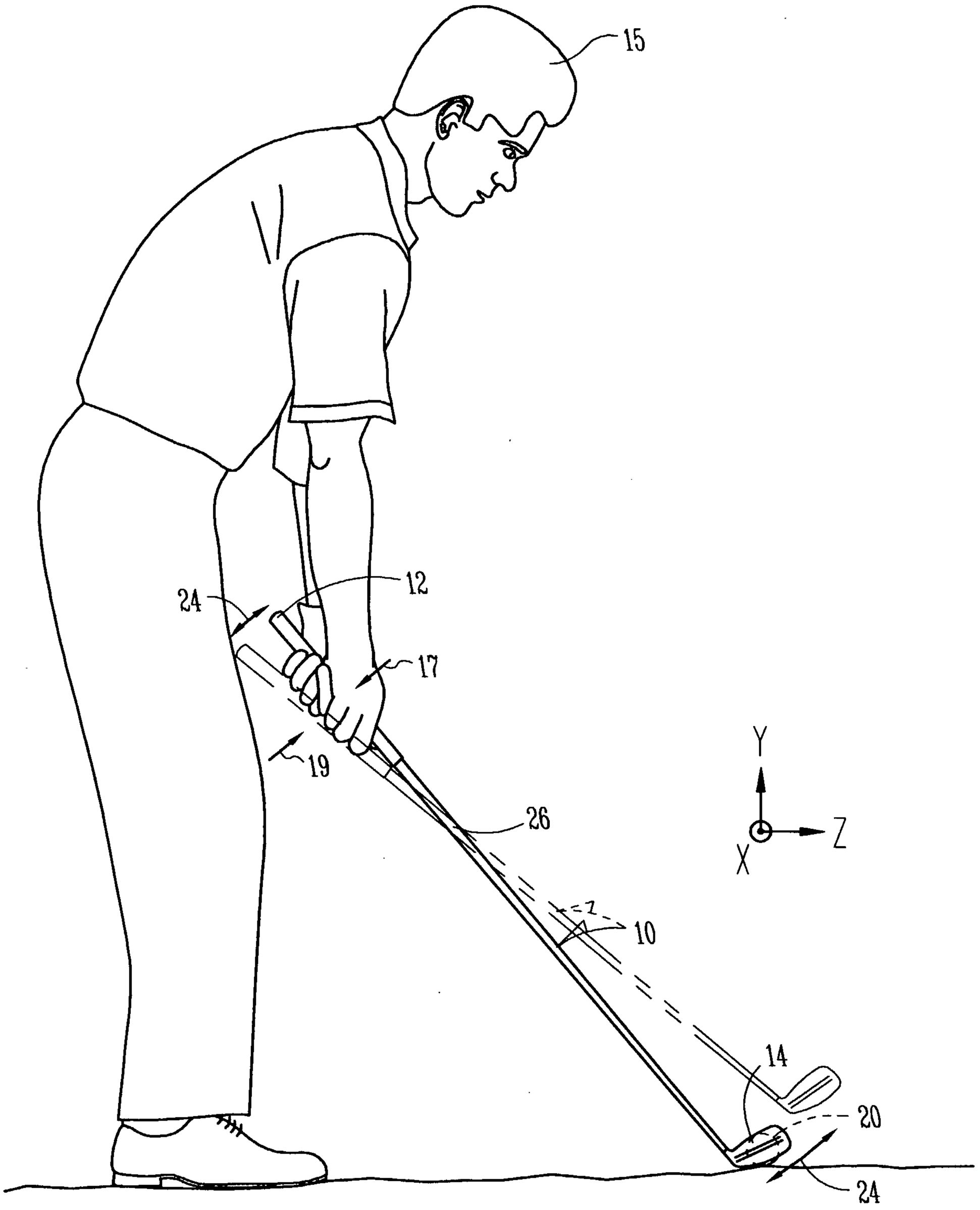


FIG. 1B

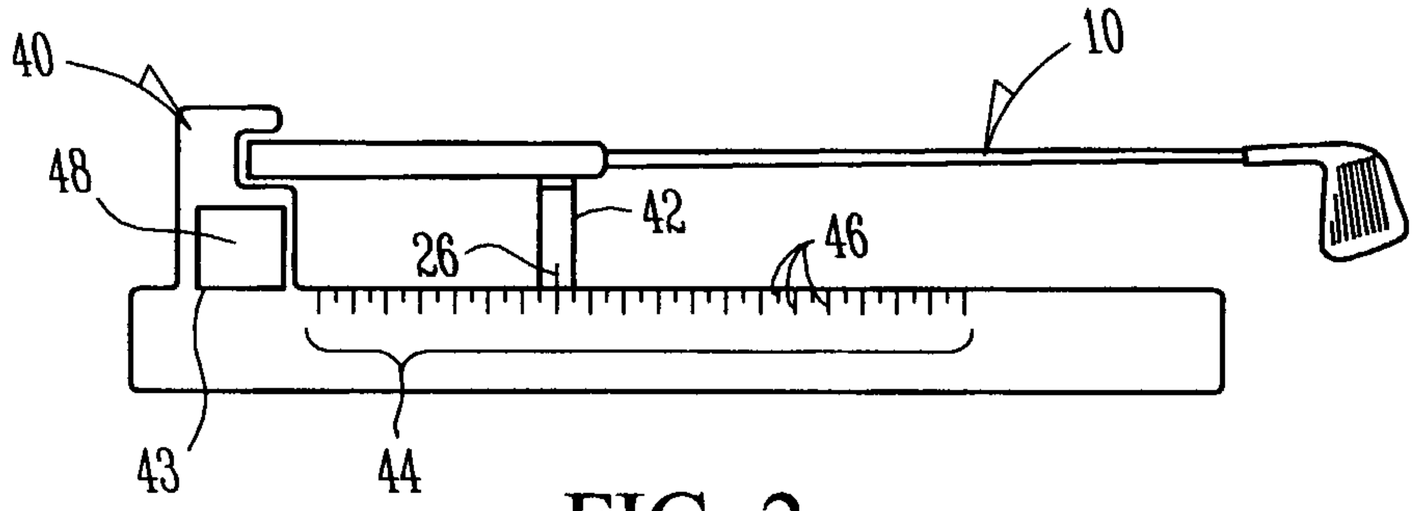


FIG. 2

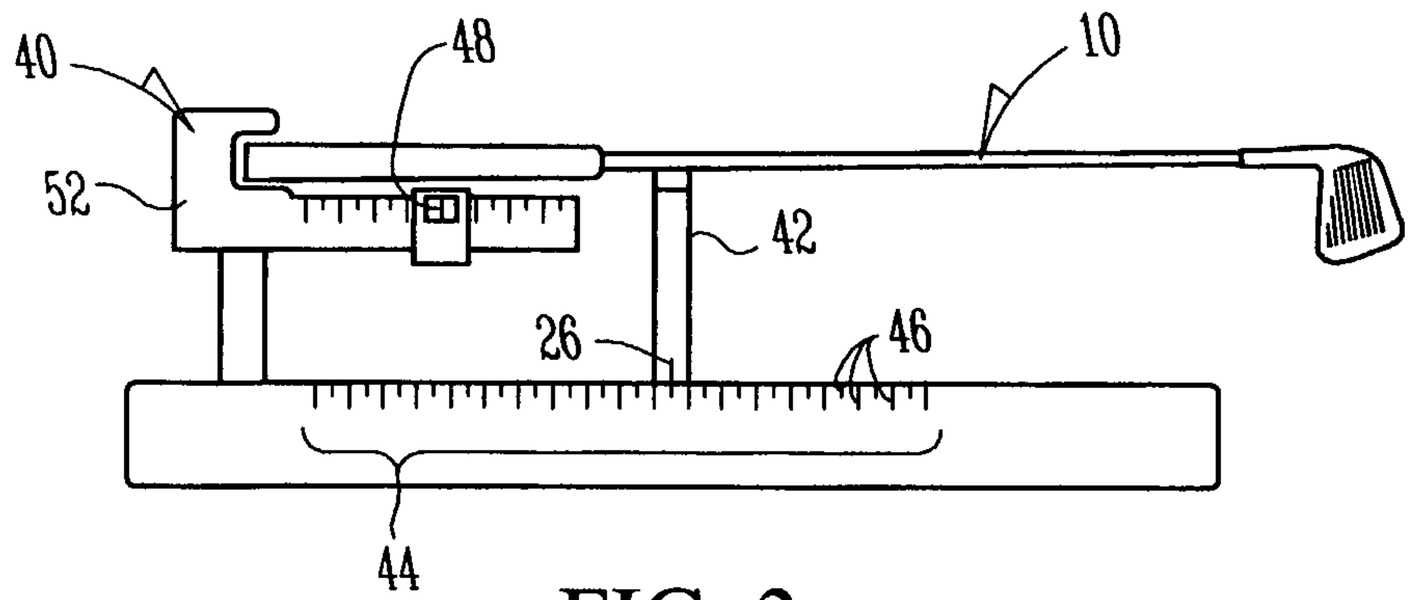


FIG. 3

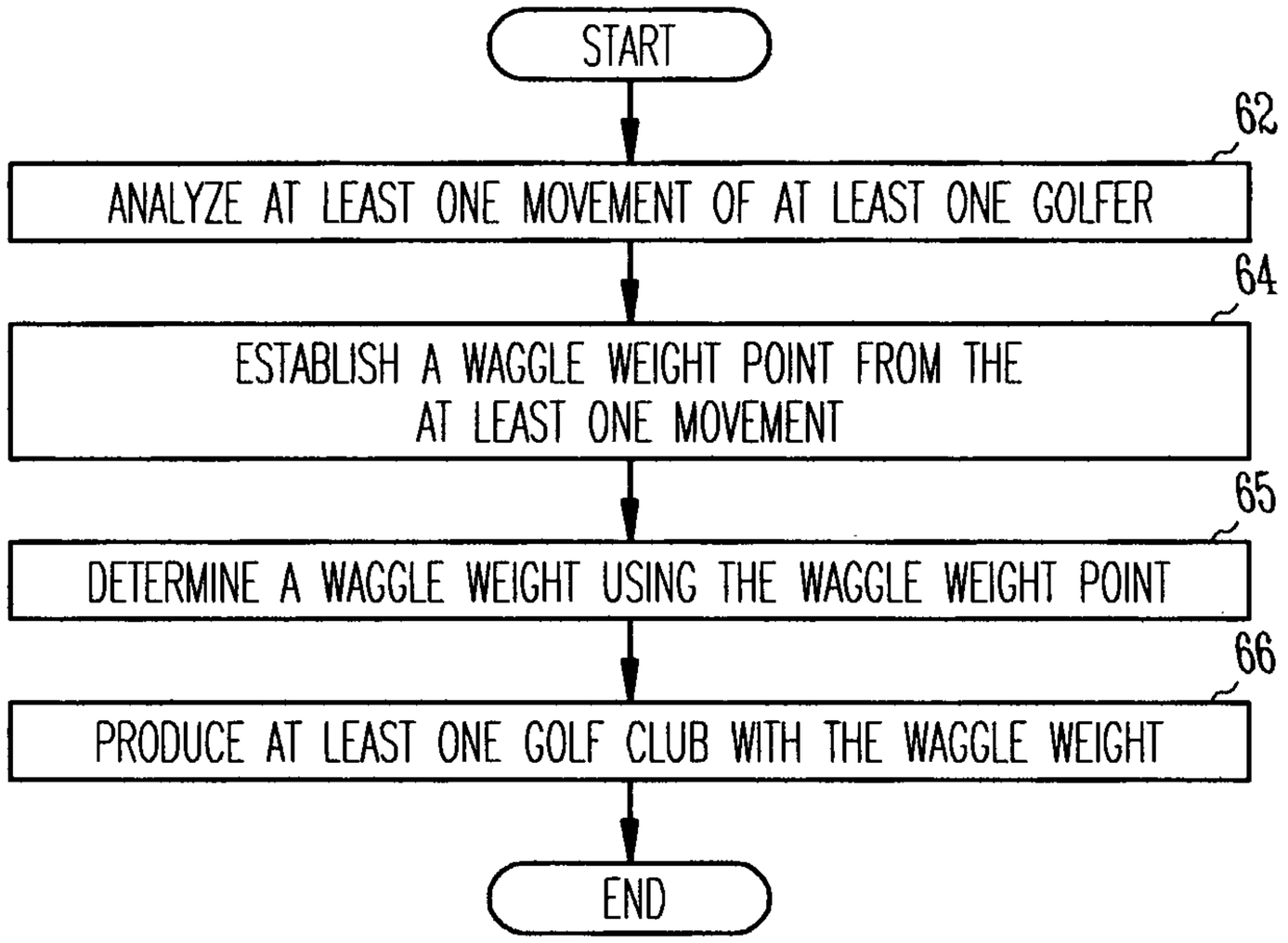

START
62
ANALYZE AT LEAST ONE MOVEMENT OF AT LEAST ONE GOLFER
64
ESTABLISH A WAGGLE WEIGHT POINT FROM THE AT LEAST ONE MOVEMENT
65
DETERMINE A WAGGLE WEIGHT USING THE WAGGLE WEIGHT POINT
66
PRODUCE AT LEAST ONE GOLF CLUB WITH THE WAGGLE WEIGHT
END

FIG. 4

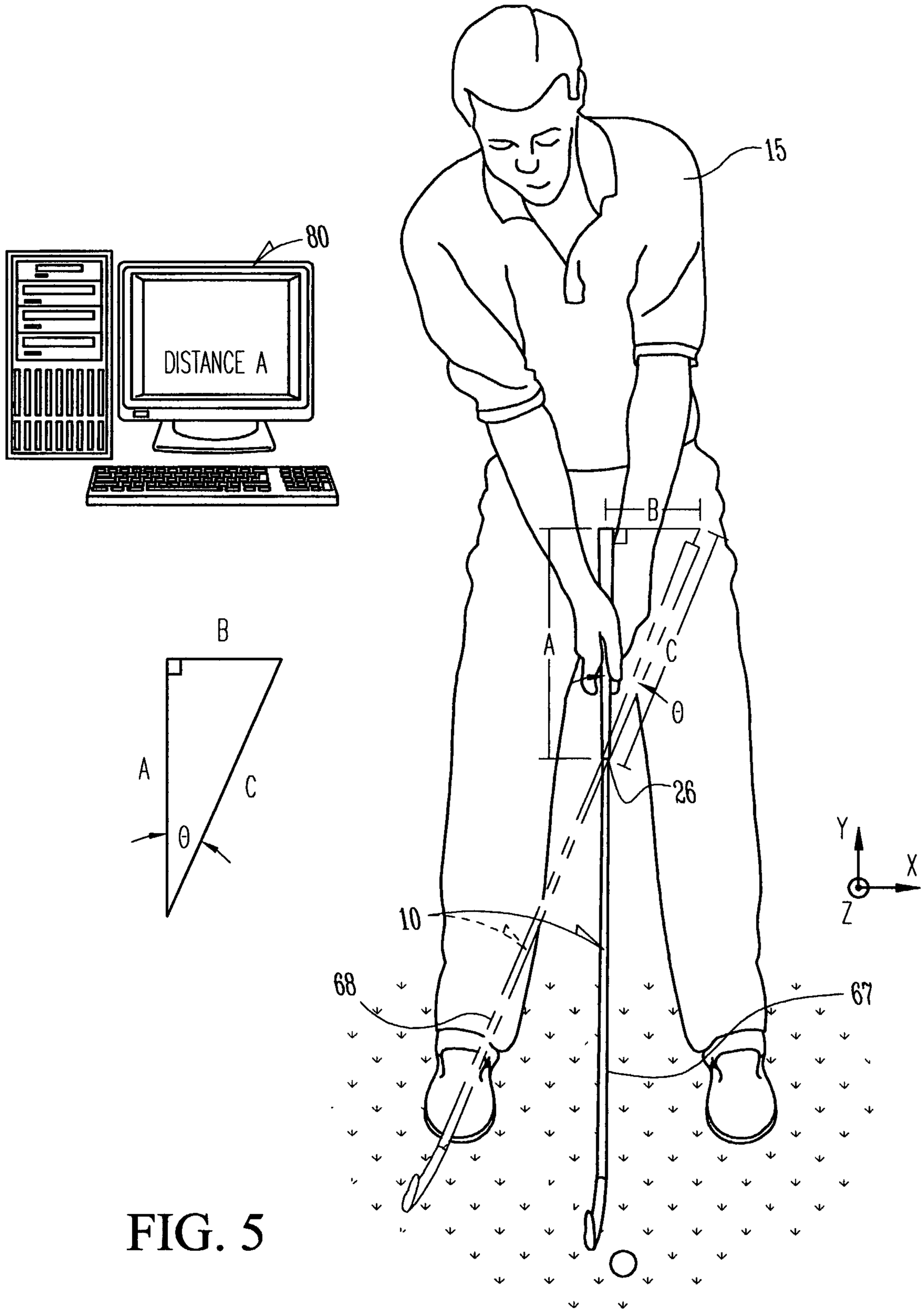


FIG. 5

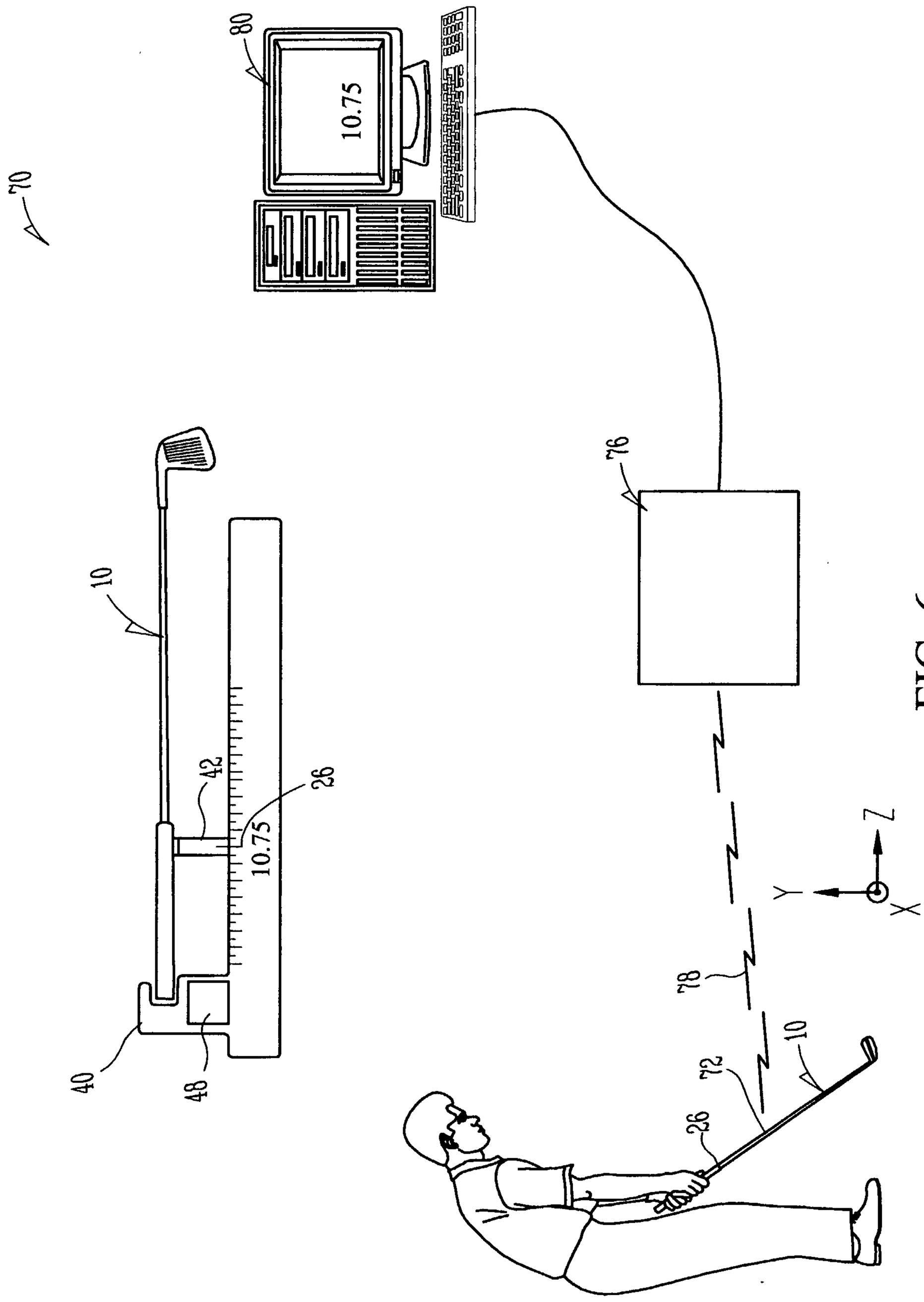


FIG. 6

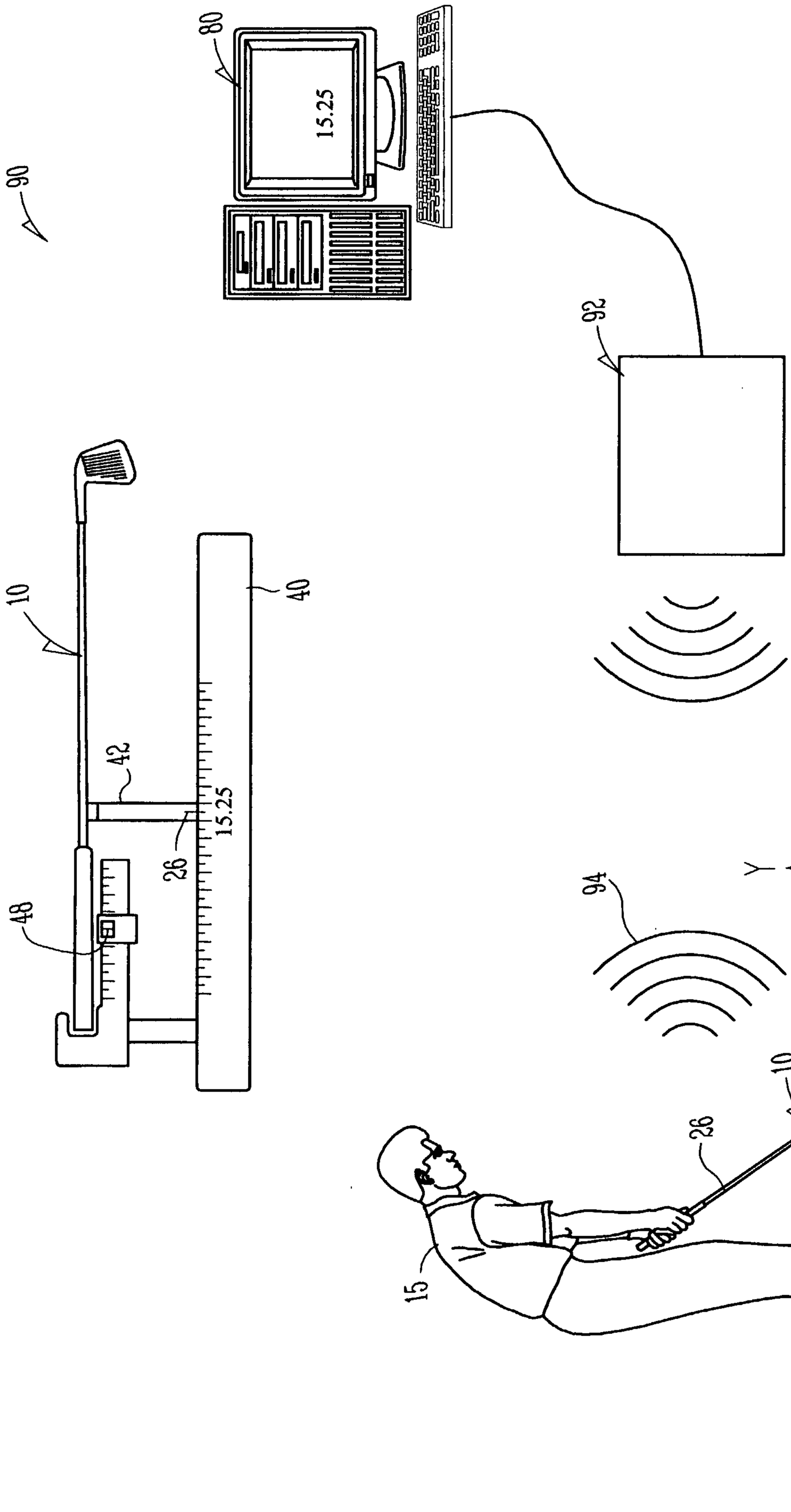
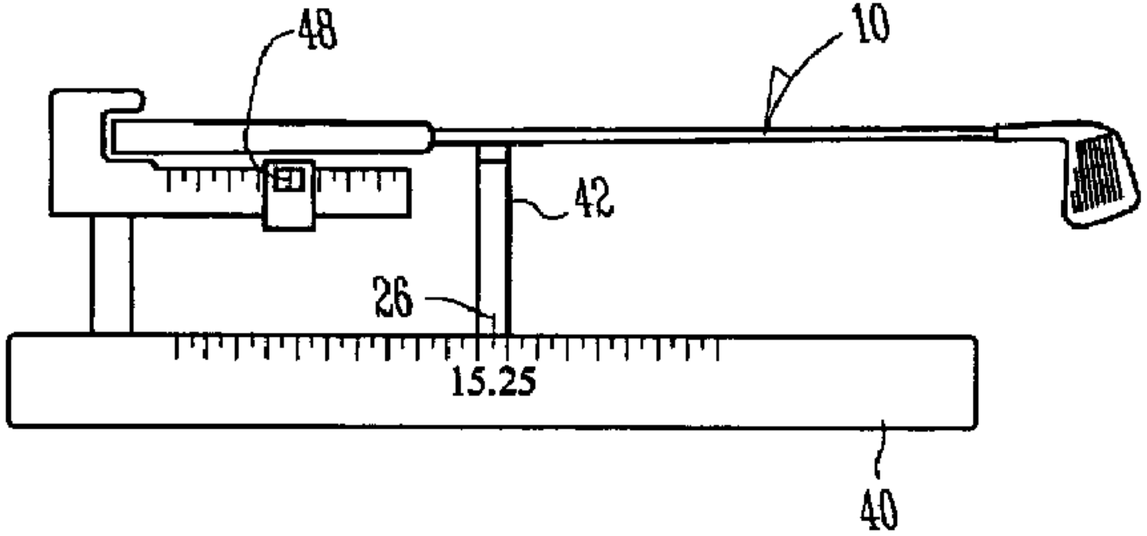
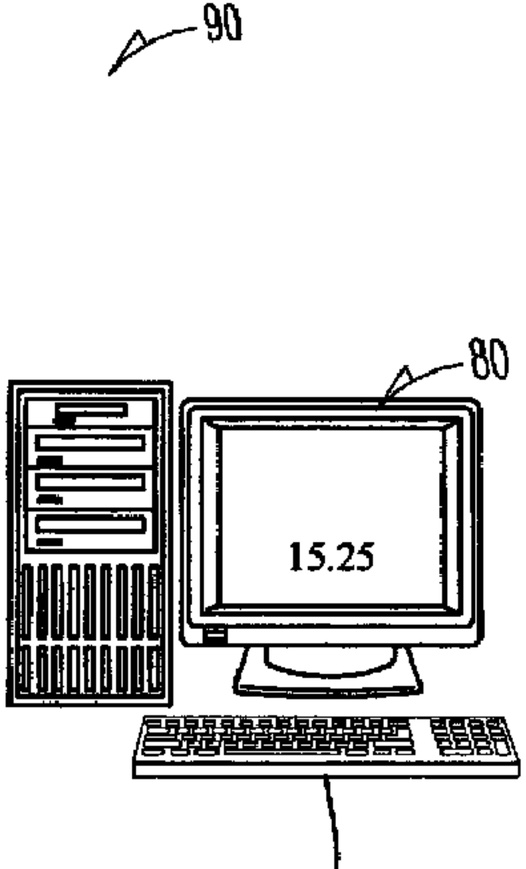


FIG. 7


48
10
42
26
15.25
40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80
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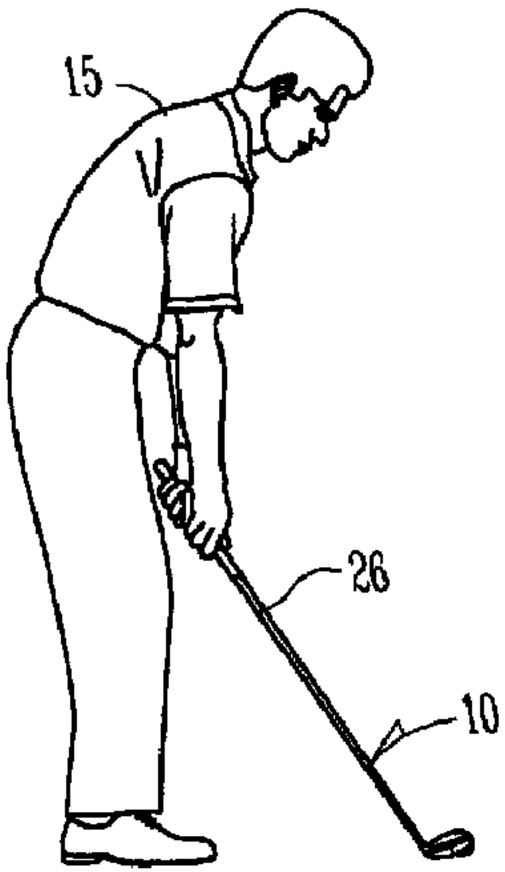
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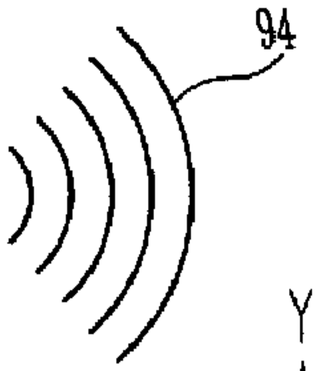
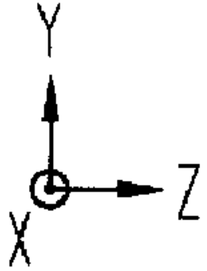
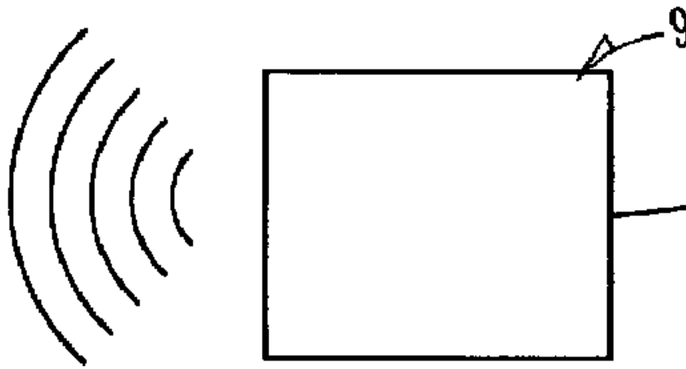
26
10


94


Y
Z
X


92