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(54) **GOLF CLUB SHAFT SELECTION DEVICE**

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(57) **ABSTRACT**

A golf club shaft selection device includes: a plurality of synthetic resin or metallic tube members which are adapted to be wound individually around a plurality of areas of a golf club shaft which result when the golf club shaft is so divided along the length thereof, wherein one or two tube members in the plurality of tube members are fixed around the shaft so as to change a stiffness value and kick point of the shaft at the areas around which the tube members are wound.

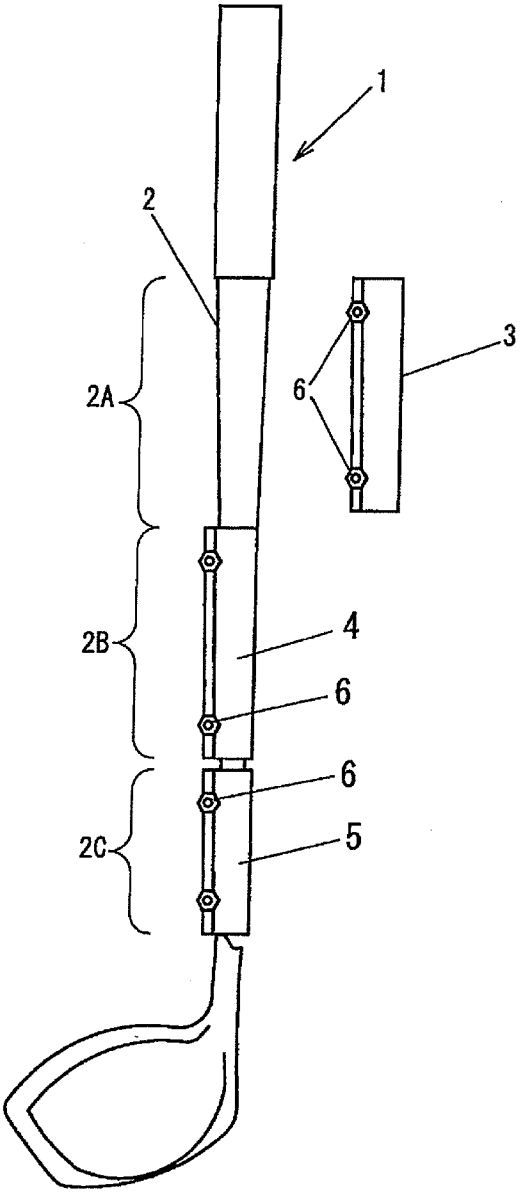


FIG. 1

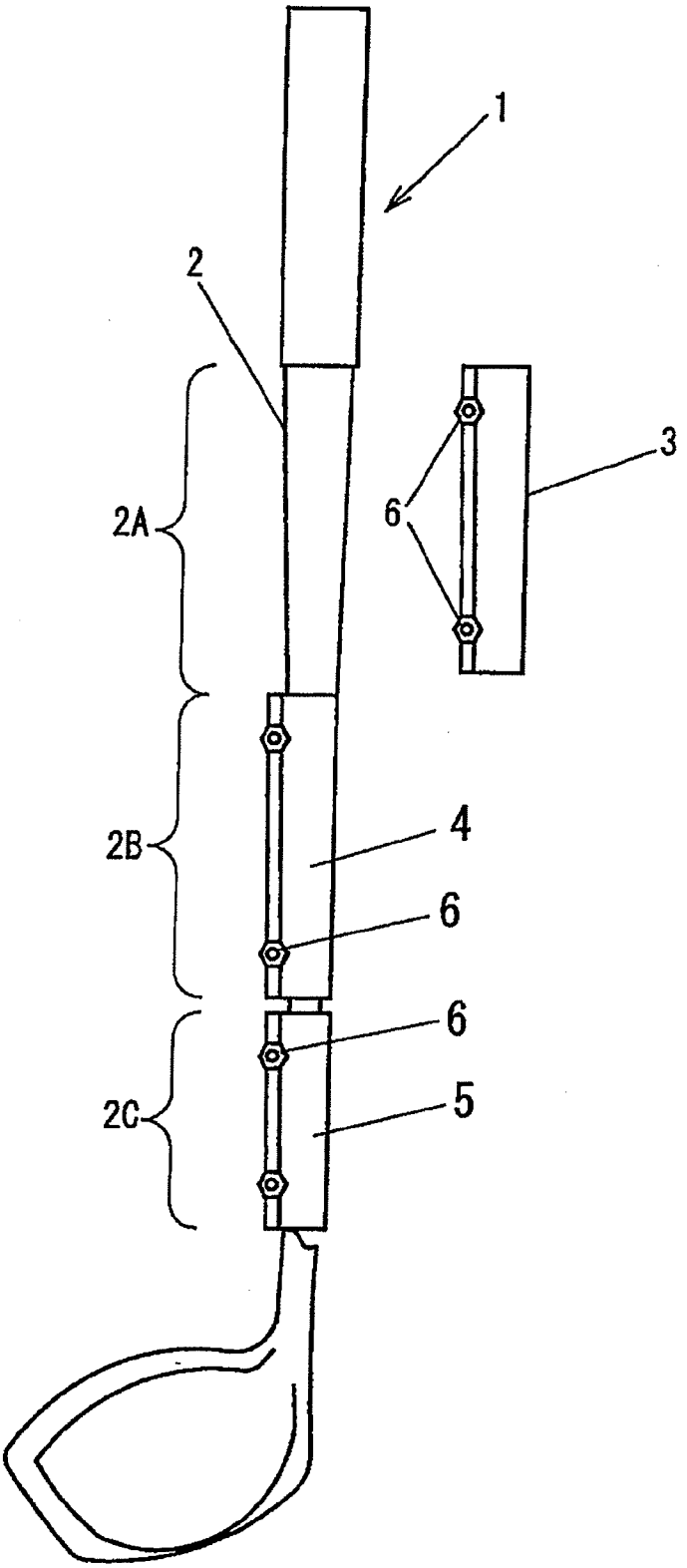


FIG. 2

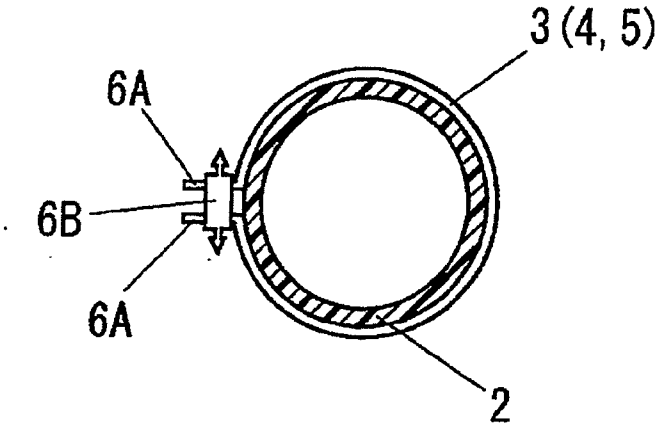

3 (4, 5)
6A
6B
6A
2

FIG. 3

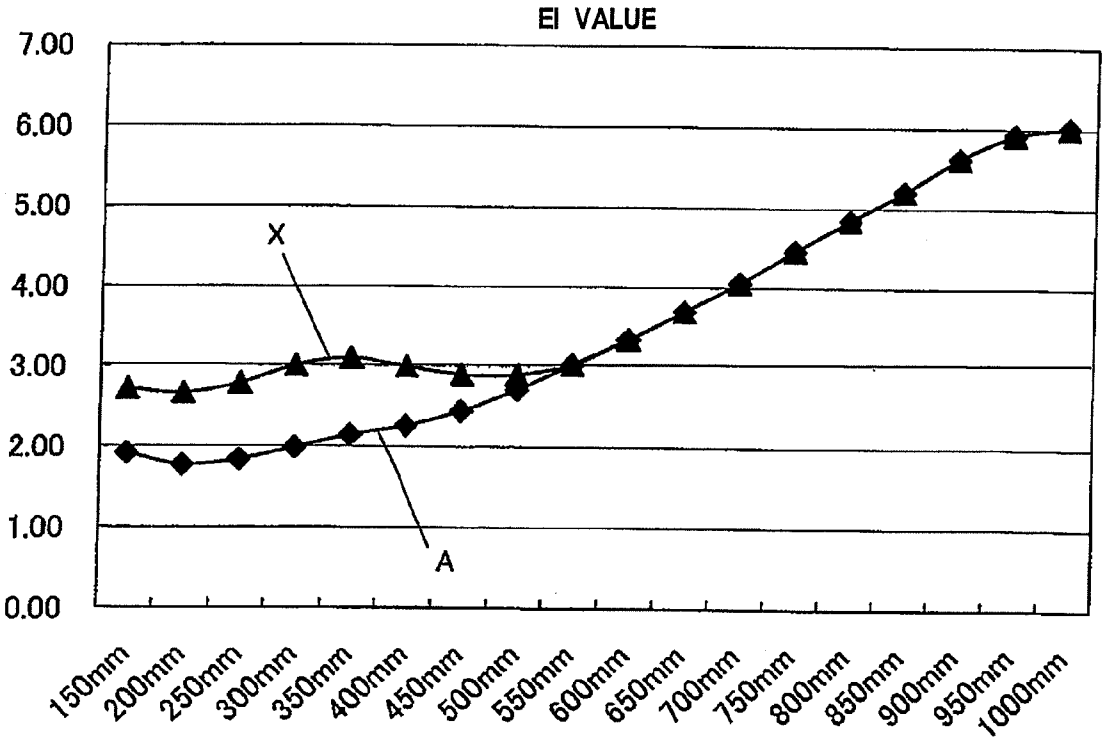
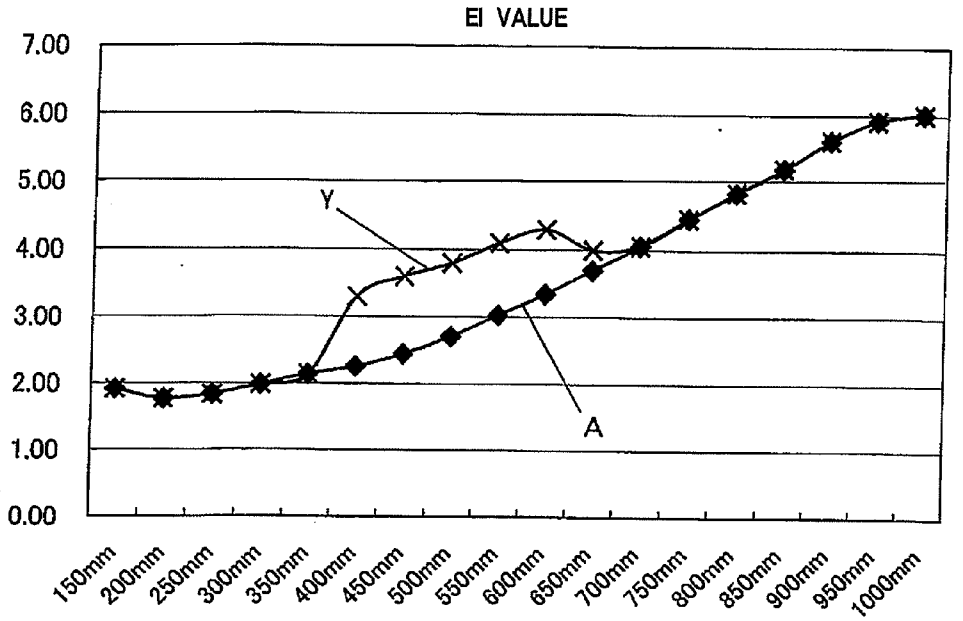

EI VALUE
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
X
A
150mm
200mm
250mm
300mm
350mm
400mm
450mm
500mm
550mm
600mm
650mm
700mm
750mm
800mm
850mm
900mm
950mm
1000mm

FIG. 4


EI VALUE
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
Y
A
150mm
200mm
250mm
300mm
350mm
400mm
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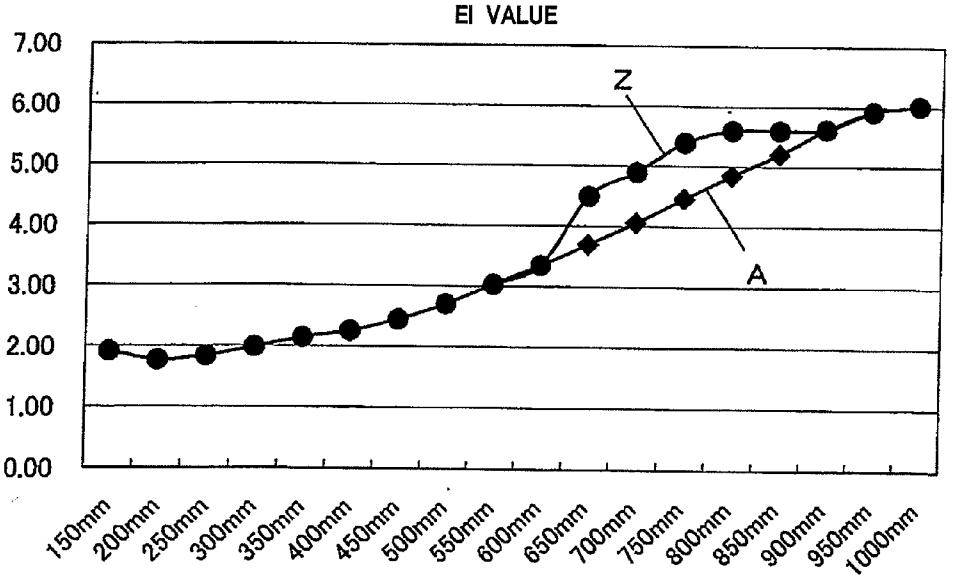
600mm
650mm
700mm
750mm
800mm
850mm
900mm
950mm
1000mm

FIG. 5


EI VALUE
7.00
6.00
5.00
4.00
3.00
2.00
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Z
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200mm
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300mm
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1000mm

GOLF CLUB SHAFT SELECTION DEVICE

BACKGROUND

[0001] 1. Field of the Invention

[0002] The present invention relates to a golf club shaft selection device.

[0003] 2. Description of the Related Art

[0004] When a golfer selects a golf club having a kick point and stiffness which are suitable for himself or herself, conventionally, it is general practice to select a golf club having an optimum kick point and stiffness for himself or herself by doing trial hits with golf clubs with various types of shafts with different properties. However, to make this happen, it is necessary to prepare a plurality of different shafts with the same clubhead attached thereto for trial hits. In addition, with the same shaft, the properties thereof vary depending on the properties of a clubhead attached thereto, and hence, there will be produced a number of combinations of various types of clubheads and a plurality of shafts. Thus, it has been a time and labor hour consuming task to select a golf club which is suitable for himself or herself.

[0005] In recent years, trial hitting golf clubs have been developed in which a shaft is easily attached to and detached from a clubhead, which enables various clubheads and shafts to be combined together easily and quickly, allowing a golfer to easily find a golf club which is more suitable for himself or herself.

[0006] Even so, the golfer is still required to replace a number of shafts to hit trial shots with shafts having different kick points and degrees of stiffness. A device has also been developed with which the stiffness of a purchased golf club can be changed without replacing shafts. This device is not designed to select shafts at the time of purchase but is designed to increase the stiffness (rigidity) of the whole or part of the shaft by affixing a reinforcement tape to the whole or part of an outer circumferential surface of a shaft of a purchased golf club (refer to JP-A-9-225078).

[0007] When the reinforcement material (tape) described in JP-A-9-225078 is applied to a shaft of a trial hitting golf club in which the shaft is easily detached from a clubhead, since the reinforcement material is an adhesive tape made of an aluminum foil and is affixed over a relatively long area of the shaft even when the reinforcement material is affixed to part of the shaft, the weight of the shaft is increased by an amount equal to the tape so affixed, and the feeling felt by the golfer when he or she swings the golf club is changed not only by the stiffness but also by the weight. In addition, the tape has to be affixed to or removed from the shaft repeatedly until the golfer finds out a stiffness of the shaft which is suitable for himself or herself, leading to fears that the adhesion of the tape is reduced. When the golfer hits a trial shot with the tape whose adhesion is reduced affixed to the shaft, there is a risk of the tape being removed from the shaft during the trial shot. In addition, the golfer may make a mistake in selecting a shaft which fits himself or herself depending on the way in which the tape is wound round the shaft.

SUMMARY

[0008] An object of the invention is to provide a golf club shaft selection device with which a golfer can find out a golf club shaft which is suitable for himself or herself by changing easily and quickly the properties of shafts such as kick point and stiffness without using the conventional tape.

[0009] With a view to attaining the object, according to the invention, there is provided a golf club shaft selection device including a plurality of synthetic resin or metallic tube members which are adapted to be wound individually around a plurality of areas of a golf club shaft which result when the golf club shaft is so divided along the length thereof, wherein one or two tube members in the plurality of tube members are fixed around the shaft so as to change a stiffness value and kick point of the shaft at the areas around which the tube members are wound.

[0010] According to the invention, there is provided the golf club shaft selection device including the plurality of synthetic resin or metallic tube members which are adapted to be wound individually around the plurality of areas of the golf club shaft which are so divided along the length of the golf club shaft, wherein one or two tube members in the plurality of tube members are fixed around the shaft so as to change the stiffness values and kick points of the shaft at the areas around which the tube members are wound. Therefore, it is easy to find out a kick point which is suitable for the golfer by combining any two tube members of the plurality of tube members so as to be wound around the shaft, and even when the device is attached to and detached from the shaft repeatedly, there is caused no such situation that the device itself is deteriorated.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The present invention will become more fully understood from the detailed description given hereinbelow and the accompanying drawing which is given by way of illustration only, and thus is not limitative of the present invention and wherein:

[0012] FIG. **1** is a front view of a golf club with two tube members attached to a shaft thereof.

[0013] FIG. **2** is a cross-sectional view of a portion of the shaft around which the tube member is attached.

[0014] FIG. **3** is a graph showing stiffness values (EI values) of the shaft in which a third tube member is attached to a third area.

[0015] FIG. **4** is a graph showing stiffness values (EI values) of the shaft in which a second tube member is attached to a second area.

[0016] FIG. **5** is a graph showing stiffness values (EI values) of the shaft in which a first tube member is attached to a first area.

DETAILED DESCRIPTION OF THE INVENTION

[0017] Hereinafter, a preferred embodiment of the invention will be described by reference to the drawings.

[0018] As is shown in FIG. **1**, a shaft **2** of a trial hitting golf club **1** is divided into three areas, which are referred to as a first area **2**A, a second area **2**B and a third area **2**C. Then, synthetic resin or metallic tube members **3** to **5** are prepared which are adapted to wound around the areas **2**A to **2**C of the shaft **2**, respectively, and the second tube member **4** and the third tube member **5** are fixed to the second area **2**B and the third area **2**C, respectively. In the case of FIG. **1**, the first tube member **3** is not attached to the first area **2**A. There is no limitation on a material for the first to third tube members **3** to **5**, provided that a material used is hard and light in weight. In addition, when the shaft **2** is divided into three areas, those areas are set so that the shaft has a low kick point, a middle kick point and a high kick point. Namely, the shaft has the

high kick point by attaching the second and third tube members **4**, **5** to the second and third areas **2**B, **2**C, respectively. The shaft has the low kick point by attaching the first and second tube members to the first and second areas **2**A, **2**B, respectively. The shaft has the middle kick point by attaching the first and third tube members **3**, **5** to the first and third areas **2**A, **2**C, respectively. The first to third tube members **3** to **5** correspond to the first to third areas **2**A to **2**C, respectively.

[0019] The first to third tube members **3** to **5** are attached to the shaft **2** with attaching devices **6**. An opening is formed in each of the tube members **3** to **5** so as to extend along an axial direction, and extended pieces **6**A, **6**A are formed so as to extend along open edges of each tube member in the axial direction. Then, fasteners **6**B are provided which fasten together the extended pieces **6**A, **6**A. Thus, each attaching device **6** is realized by the extended pieces **6**A, **6**A and the fastener **6**B (refer to FIG. **2**). This attaching device **6** is given the similar construction to that of a band which fastens a gas pipe and a hose together. However, various devices can be adopted, provided that they can exert on the tube member a force which contracts the circumference of each of the tube members **3** to **5** or which causes each of the tube members **3** to **5** to be tightly wound around the shaft **2**. The attaching devices **6** enable an easy and quick attachment/detachment of the tube members **3** to **5** to/from the shaft **2**.

[0020] When any two of the first to third tube members **3** to **5** are used as a set, they are used to find out the suitability of the shaft **2** to the golfer as a result of changing kick points. When any one of the first to third tube members **3** to **5** is used alone, it is used to change the shaft to a shaft in which the stiffness value (EI value) of the portion of the shaft **2** where the tube member is used is increased. Here, the EI value denotes a bending stiffness expressed in $kg \cdot m^2$ as unit.

[0021] Graphs shown in FIGS. **3** to **5** compare stiffness values of a shaft in which the first to third tube members **3** to **5** are individually attached to the first to third areas **2**A to **2**C so that only one of the first to third tube members **3** to **5** exists on the shaft and stiffness values of the shaft in which none of the first to third tube members **3** to **5** is attached to the shaft (a basic shaft). Used as a basic shaft is a shaft whose length is 1169 mm, weight is 50.2 g, torque is 5.7, frequency (CPM) is 208, and flex letter is R2 having a kick point (%) of 42.3. Conditions of the shaft to which none of the tube members **3** to **5** is attached are depicted by a curve denoted by reference character A in the graph. In a graph shown in FIG. **3**, EI values resulting when the third tube member **5** is attached to the third area **2**C which lies in the range of 150 to 350 mm from a distal end (a tip) of the shaft **2** are depicted by a curve denoted by reference character X. When the graph shown in FIG. **3** is tabulated, Table 1 below results.

TABLE 1

	150 mm	200 mm	250 mm	300 mm	350 mm
A	1.92	1.77	1.84	1.99	2.14
X	2.72	2.67	2.78	3.01	3.10

[0022] In a graph shown in FIG. **4**, EI values resulting when the second tube member **4** is attached to the second area **2**B which lies in the range of 400 to 600 mm from the tip of the shaft **2** are depicted by a curve denoted by reference character Y.

TABLE 2

	400 mm	450 mm	500 mm	550 mm	600 mm
A	2.26	2.45	2.71	3.03	3.35
Y	3.30	3.60	3.80	4.10	4.30

[0023] In a graph shown in FIG. **5**, EI values resulting when the first tube member **3** is attached to the first area **2**A which lies in the range of 650 to 800 mm from the tip of the shaft **2** are depicted by a curve denoted by reference character Z.

TABLE 3

	650 mm	700 mm	750 mm	800 mm
A	3.70	4.06	4.46	4.85
Z	4.50	4.90	5.40	5.60

[0024] The experiment was carried out in the way described above to see the difference in stiffness value between the shaft in which the three tube members **3** to **5** are individually attached to the three areas **2**A to **2**C so that only one of the three tube members **3** to **5** exists on the shaft and the basic shaft. However, it is natural that when the specification of the basic shaft changes, the stiffness value changes. The degrees of stiffness (flex) of a shaft are expressed by X, S, SR, R, R2, A, L, R3 in the order in which the stiffness descends. However, different manufactures have different standards, and there is no agreed definition of stiffness. In general, there are two measuring methods of flex. In one method, an average between a butt-end fixed flex and a tip-end fixed flex of a shaft is taken to represent a flex of the shaft. In the other method, a shaft is fixed at a butt end thereof so that a clubhead vibrates. Then, a natural frequency measuring device is used to measure the number of amplitude repetitions per minute so as to measure a dynamic stiffness of the shaft.

[0025] The kick point is set so that the shaft has a low kick point, a middle kick point and a high kick point by changing the position of the portion of the shaft where the shaft easily flexes. The low kick point shaft which is stiff at the grip end and is soft at the tip end is generally said to match a golfer who is physically strong, who swings the shaft at a fast tempo and who has a fast arm speed at which he or she swings the shaft downwards. In addition, the high kick point shaft which is soft at the grip end which flexes in whole like a whip is generally said to match a golfer who is physically weak, who swings the shaft at a slow or moderate tempo and who has a slow arm speed at which he or she swings the shaft downwards. The middle kick point shaft is a shaft having intermediate properties between the two shafts described above.

[0026] With respect to the EI value, as is descried in JP-A-2008-212340 which was also filed by the applicant of this patent application, it is known and accepted that in the case of a shaft for a driver, for example, a shaft having a difference in bending stiffness value of not less than 5 $kg \cdot m^2$ between a position lying 150 mm from the tip and a position lying 950 mm from the tip and a bending stiffness of not more than 5 $kg \cdot m^2$ between a position lying 150 mm from the tip is suitable for golfers who have a head speed in the range of 35 m/s to 40 m/s. Consequently, this golf club shaft selection device can help a specific golfer find easily a way to increase the launch angle and ball flying distance by locating a portion on the shaft where the stiffness value is to be increased.

[0027] In the embodiment that has been described heretofore, while the shaft **2** is divided into the three areas, a configuration may be adopted in which a shaft is divided into two or four or more areas and an equal number of tube members to the number of areas divided are prepared, so that the properties of the shaft at the respective areas can be changed.

What is claimed is:

1. A golf club shaft selection device comprising:

a plurality of synthetic resin or metallic tube members which are adapted to be wound individually around a plurality of areas of a golf club shaft which result when the golf club shaft is so divided along the length thereof, wherein

one or two tube members in the plurality of tube members are fixed around the shaft so as to change a stiffness value and kick point of the shaft at the areas around which the tube members are wound.

2. The golf club shaft selection device according to claim **1**, wherein

an attaching device which can expand and contract a circumference of the tube member is provided on the tube member to facilitate the attachment and detachment of the tube member to and from the shaft.

3. The golf club shaft selection device according to claim **1**, wherein

the plurality of areas are referred to as a first to third areas.

* * * * *