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(54) **Method for assembling club head and shaft**

(57) Disclosed is a method for assembling a club head and a shaft, comprising: an jointing step of jointing a blank element of club head and a blank element of shaft that are made of different materials to thus construct a blank element of golf club; a wrapping step of wrapping

up the blank element of golf club with powder; and a constructing step of applying an isostatic pressing to the wrapped blank element of golf club to construct the blank element of club head, the blank element of shaft and the powder as a golf club.

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a golf club, and more particularly to a method for assembling a club head and a shaft.

BACKGROUND OF THE INVENTION

[0002] Recently, the sport of golf has become more and more popular in the world, especially for the young generation. The innovation of a golf club is flourishing as all manufacturers are trying their best to pursue a golf club able to hitting longer and swinging smoother.

[0003] A golf club is assembled by a club head and a shaft. A club head is primarily made of a metal an alloy, and a shaft is primarily classified as a carbon fiber shaft and a steel shaft in which there are generally three different hardness of a shaft can be found as a hardness of stiff flex (S), a regular/stiff flex (RS) and a regular flex (R). A stiffer shaft, which is less flexible, provides a more direct impact when a golf head is hitting a golf ball, so it can enhance a control of the ball, while it requires a faster swinging speed. On the contrary, a regular flex (R) shaft is easier to swing since it does not require a swinging speed so fast, but it is more difficult to obtain a long distance as compared with the stiff flex (S) shaft since a club shaft that is flexible will cause a varied swinging path to thus reduce a control of a golf club.

[0004] However, no matter what kinds of material a golf club is, the conventional golf club is assembled by means of sleeve-connecting for adhering a club head and a shaft. Such construction is unable to provide a mechanically perfect assembly due to different materials of the club head and the shaft, which may cause a sound of friction or even a crash in the connection therebetween while a hard swing. In addition that the joint area between the club head and the shaft has a high risk of separation or crash resulted from a stress concentration thereon, the way of jointing the club head and the club shaft may also result in a deviation of a ball path if there is only a small slit existed there between.

SUMMARY OF THE INVENTION

[0005] In view of the above, it is an object of the present invention to provide a method for assembling a club head and a shaft to improve the assembling effect thereof.

[0006] Therefore, the present invention overcomes the technical problems in the conventional art and provides a method for assembling a club head and a shaft, comprising: a step of jointing a blank element of club head with a blank element of shaft that are made of different materials to construct a blank element of golf club; a step of wrapping up the blank element of golf club with powder by used of a wrapping member; and a step of constructing a golf club by applying an isostatic pressing to the

wrapped up blank element of golf club to construct the blank element of club head, the blank element of shaft and the powder as a golf club.

[0007] According to an embodiment of the present invention, the blank element of club head and the blank element of shaft are made of metals with different materials, alloys with different compositions, alloys with the same composition but with different ratios thereof, or metals/alloys made by different processes.

[0008] According to an embodiment of the present invention, in the jointing step, the blank element of club head and the blank element of shaft are jointed by attaching their radial surfaces with each other or fastening with fastening portions with each other.

[0009] According to an embodiment of the present invention, the wrapping step is processed by pre-forming the powder as an wrapped blank element, or by a vibration that fills the powder into the wrapping member.

[0010] According to an embodiment of the present invention, the powder is a metallic powder.

[0011] According to an embodiment of the present invention, the wrapping step further includes a sub-step of sealing that seals the wrapping member.

[0012] According to an embodiment of the present invention, the wrapping member is made of a metallic material or a ceramic material.

[0013] According to an embodiment of the present invention, the isostatic pressing is a hot isostatic pressing with a high temperature and a high pressure.

[0014] With the characteristic features as above, the present invention provides a golf club in which a club head and a shaft made of different materials can be assembled as a strong and hard connected golf club with respect to a mechanical effect to thus reduce a stress concentration and reduce a risk of crash in the joint portion. In addition, a force transmission of the present invention can be smoother so that a precision degree of control with respect to a golf club can be improved.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The structure and the technical means adopted by the present invention to achieve the above and other objects can be best understood by referring to the following detailed description of the preferred embodiments and the accompanied drawings.

Fig. 1 is a flow chart illustrating a method for assembling a club head and a shaft according to one embodiment of the present invention.

Figs. 2a to 2c are schematic diagrams illustrating a jointing step of the method according to the embodiment of the present invention;

Fig. 3 is a schematic diagram illustrating a wrapping step of the method according to the embodiment of the present invention;

Fig. 4 is a schematic diagram illustrating a constructing step of the method according to the embodiment

of the present invention; and

Fig. 5 is a schematic diagram illustrating a golf club constructed by the method according to the embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0016] Embodiments are described in detail as below in reference to Figs. 1 to 5, and the description is used for explaining the embodiments of the present invention only but not for limiting the scope of the present invention.

[0017] As shown in Fig. 1, a method for assembling a club head and a shaft according to one embodiment of the present invention comprises: a jointing step S10, a wrapping step S20 and a constructing step S30. The method of the present invention is mainly used for assembling a club head and a shaft made of different materials that are assembled stably and firmly with a mechanical property of a smooth force transmission.

[0018] Next, the method will be described below in accordance with an embodiment of the present invention with reference to Figs. 2a to 5.

[0019] First, as shown in Figs. 2a to 2c, the jointing step S10 is processed to joint a blank element of club head 1 and a blank element of shaft 2 both of which are made of different materials to thereafter construct a blank element of golf club, wherein the different materials are referred to materials having different properties. For example, in the embodiment, the blank element of club head 1 and the blank element of shaft 2 are made of metals that are with different materials, alloys that are with different compositions, alloys that are with the same composition but are with different ratios thereof, or metals/alloys made by different processes including casting, forging, or drawing, etc..

[0020] The blank element of club head 1 and the blank element of shaft 2 may be jointed by attaching a radial surface of a connecting hole of the blank element of club head 1 with a radial surface of the blank element of shaft 2, or alternatively by fastening with fastening portions of the blank element of club head 1 and the blank element of shaft 2. As shown in Fig. 2a, during the attaching process, a blank element of club head 1 has a connecting portion 11, a blank element of shaft 2 has a receiving portion 21, and the connecting portion 11 is connected to the receiving portion 21. A jointing depth between the blank element of club head 1 and the blank element of shaft 2 is adjustable with respect to the material properties thereof. As shown in Fig. 2b, a jointing depth between a connecting portion 11a of a blank element of club head 1 and a receiving portion 21a of a blank element of shaft 2 may be substantially equal to a length of the blank element of shaft 2. As shown in Fig. 2c, during the fastening process, a blank element of club head 1 is with a fastening portion 12, a blank element of shaft 2 is with a fastened portion 22, and the fastening portion 12 is fastened to the fastened portion 22 to joint the blank element of club

head 1 with the blank element of shaft 2. However, the present invention is not intended to limit these. A blank element of club head 1 and a blank element of shaft 2 can be alternatively jointed by other conventional jointing manners or a novel jointing manner.

[0021] After the jointing step S10, the wrapping step S20 will be processed. In the embodiment, the wrapping step S20 primarily includes: a wrapping sub-step S21 and a filling sub-step S22.

[0022] In the wrapping sub-step S21, a wrapping member 3 is used to wrap the blank element of golf club that is constructed by the blank element of club head 1 and the blank element of shaft 2. The wrapping member 3 may be made of a ceramic material or a metallic material including: a mild steel, a stainless steel, Titanium, etc. A metallic wrapping member is suitable for constructing a golf club with simple shape, and a ceramic wrapping member is suitable for a golf club with a sophisticated or a complicated shape.

[0023] As shown in Fig. 3, the filling sub-step S22 is processed to fill the powder 40 into the wrapping member 3 in order to wrap the blank element of golf club. Optionally, the material of powder 40 can be varied depending on the blank element of club head 1 and the blank element of shaft 2, such as metal or ceramic. In this embodiment, the powder 40 is a metallic powder. There are mainly two ways for filling the powder. One is for pre-forming the powder 40 as a wrapped blank element (not shown), and thereafter the blank element of golf club is wrapped in the wrapped blank element, and accordingly the wrapped blank element is wrapped in the wrapping member 3. The other way is to fill the powder 40 into an interval space between the wrapping member 3 and the blank element of golf club by means of a vibration, and fill in a gap between the blank element of club head 1 and the blank element of shaft 2 as well.

[0024] Preferably, after the filling step S22, a sealing sub-step S23 may be processed. The sealing sub-step S23 is for sealing the wrapping member 3. Sealing is usually processed by means of seal welding. Before processing the sealing step, it requires to vacuum evacuate the wrapping member 3 in a room temperature or in a heating environment to construct a close direct contact among the wrapping member 3, the blank element of golf club and the powder 40 to prevent cavities generated thereamong to improve the quality of a golf club.

[0025] Next, after the wrapping step S20, the constructing step S30 will be processed. The constructing step S30 is to apply an isostatic pressing to the wrapped blank element of golf club to construct an integral structure with the blank element of club head 1, the blank element of shaft 2 and the powder 40. The isostatic pressing referred herein is a hot isostatic pressing with a high temperature and a high pressure. As shown in Fig. 4, an wrapped blank element of golf club is placed into a processing vessel 5 in which a gas is then introduced and is followed by a heating process, in which the powder 40 and the wrapped blank element of golf club is isostat-

ically pressed by a high pressure generated by a thermal expansion of the gas. By means of the isostatic pressing, the powder 40 wrapping up the blank element of golf club will be sintered as a densely sintered body 4 that is densely covering the blank element of club head 1 and the blank element of shaft 2.

[0026] Finally, as shown in Fig. 5, after the constructing step S30, an ejecting step S40 will be processed to eject the densely sintered body 4 and the blank element of golf club from the wrapping member 3 to thus obtain a golf club 100 in which a club head and a shaft made of different materials are assembled.

[0027] In the golf club 100, gaps and cavities between a golf club head and a golf shaft have been eliminated, and an exterior surface at a jointing portion between the golf club head and the golf shaft became an integrated smooth surface. The golf club 100 has mechanical assembling property similar to a single-piece golf club in which it reduces a stress concentration and a risk of crash in the joint portion, and therefore a force can be transmitted smoother so that a precision degree of control with respect to the golf club can be improved.

[0028] The above description should be considered as only the discussion of the preferred embodiments of the present invention. However, a person with an ordinary skill in the art may make various modifications to the present invention, but such modifications should be considered as falling within the spirit and scope defined by the appended claims.

Claims

1. A method for assembling a club head and a shaft, comprising:

a step of jointing a blank element of club head with a blank element of shaft that are made of different materials to construct a blank element of golf club;

a step of wrapping up the blank element of golf club with powder by used of a wrapping member; and

a step of constructing a golf club by applying an isostatic pressing to the wrapped up blank element of golf club to construct the blank element of club head, the blank element of shaft and the powder as a golf club.

2. The method as claimed in claim 1, wherein the blank element of club head and the blank element of shaft are made of metals with different materials, alloys with different compositions, alloys with the same composition but with different ratios thereof, or metals/alloys made by different processes.

3. The method as claimed in claim 1, wherein in the jointing step, the blank element of club head and the

blank element of shaft are jointed by attaching their radial surfaces with each other or fastening with fastening portions with each other.

4. The method as claimed in claim 1, wherein the wrapping step is processed by pre-forming the powder as an wrapped blank element, or by a vibration that fills the powder into the wrapping member.
5. The method as claimed in claim 1, wherein the powder is a metallic powder.
6. The method as claimed in claim 1, wherein the wrapping step further includes a sub-step of sealing that seals the wrapping member.
7. The method as claimed in claim 1, wherein the wrapping member is made of a metallic material or a ceramic material.
8. The method as claimed in claim 1, wherein the isostatic pressing is a hot isostatic pressing with a high temperature and a high pressure.

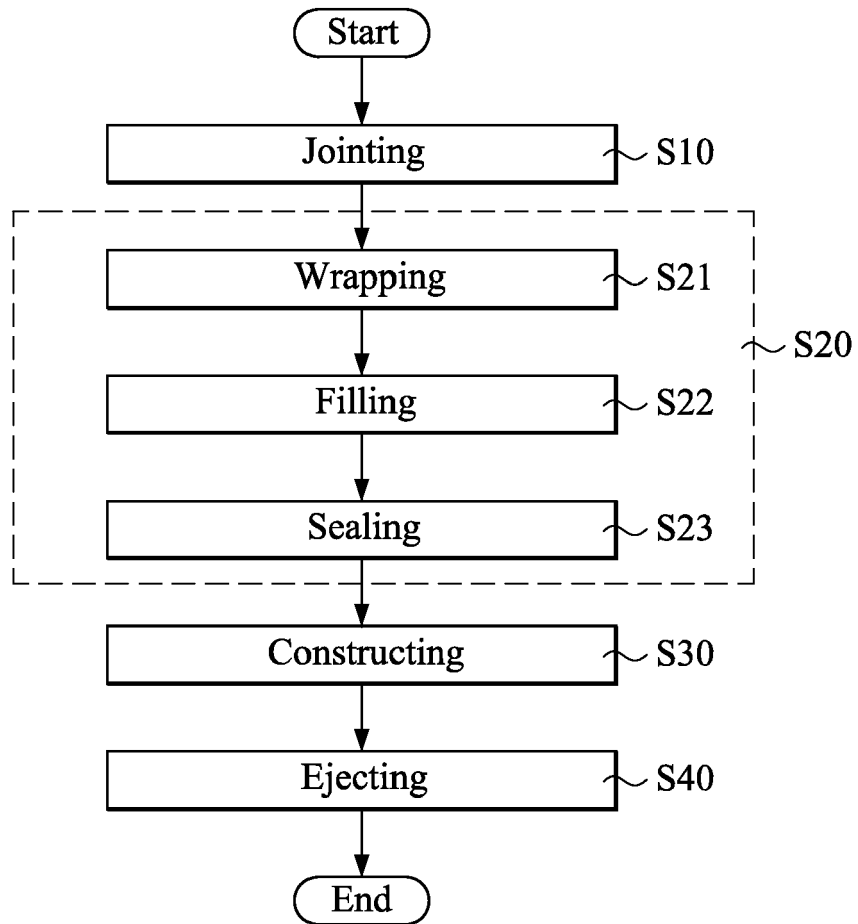


FIG.1

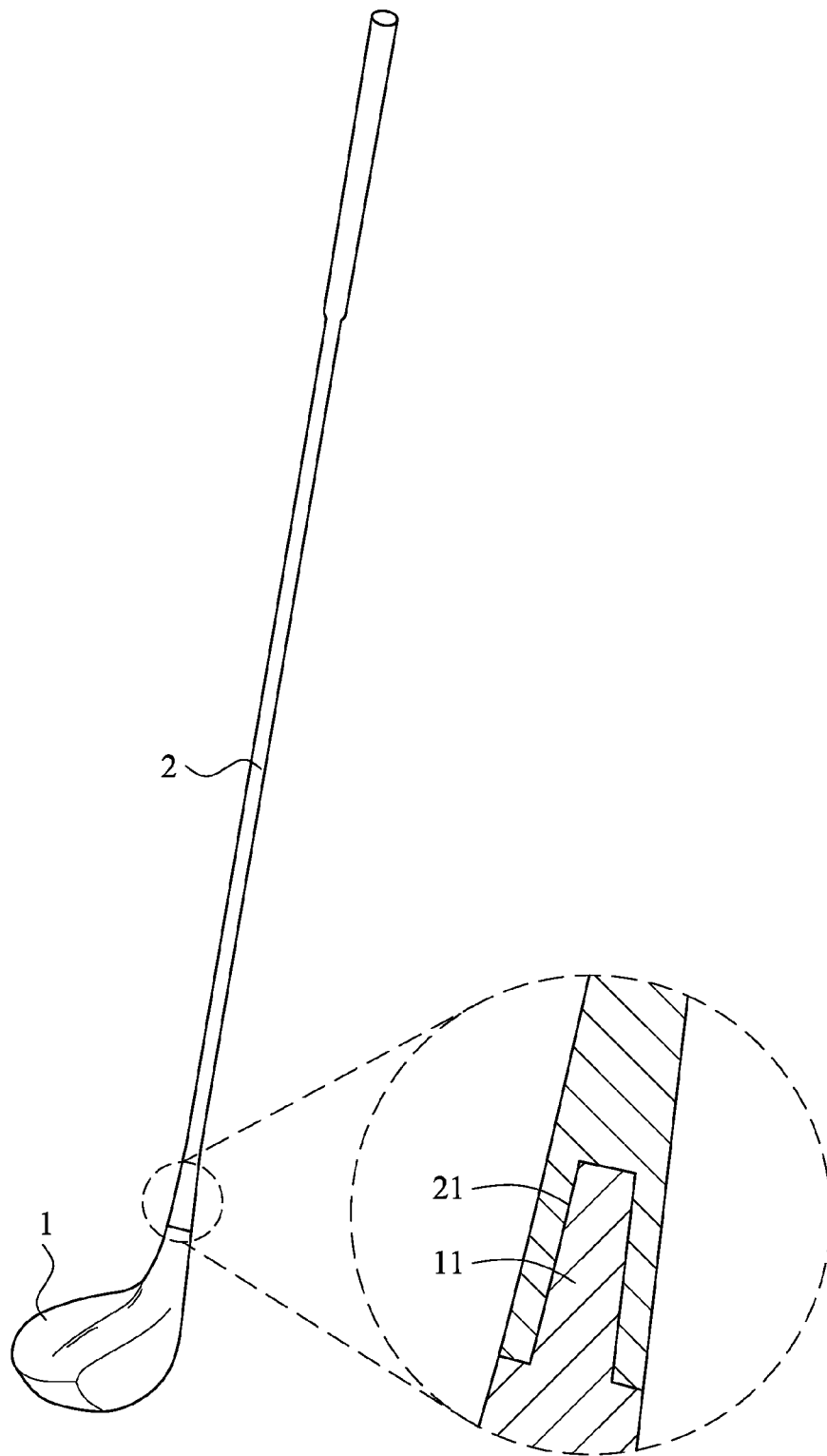


FIG.2a

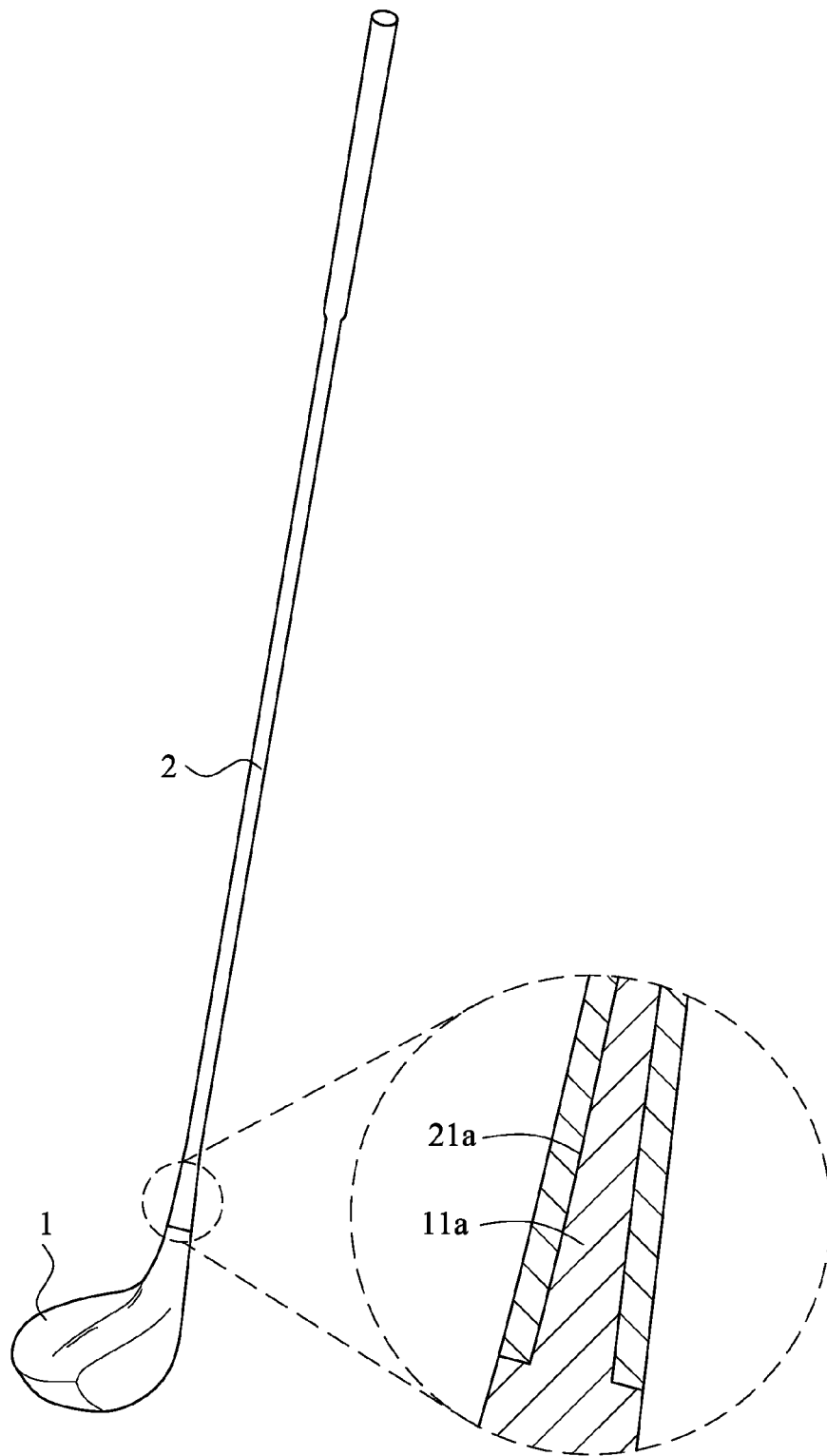


FIG.2b

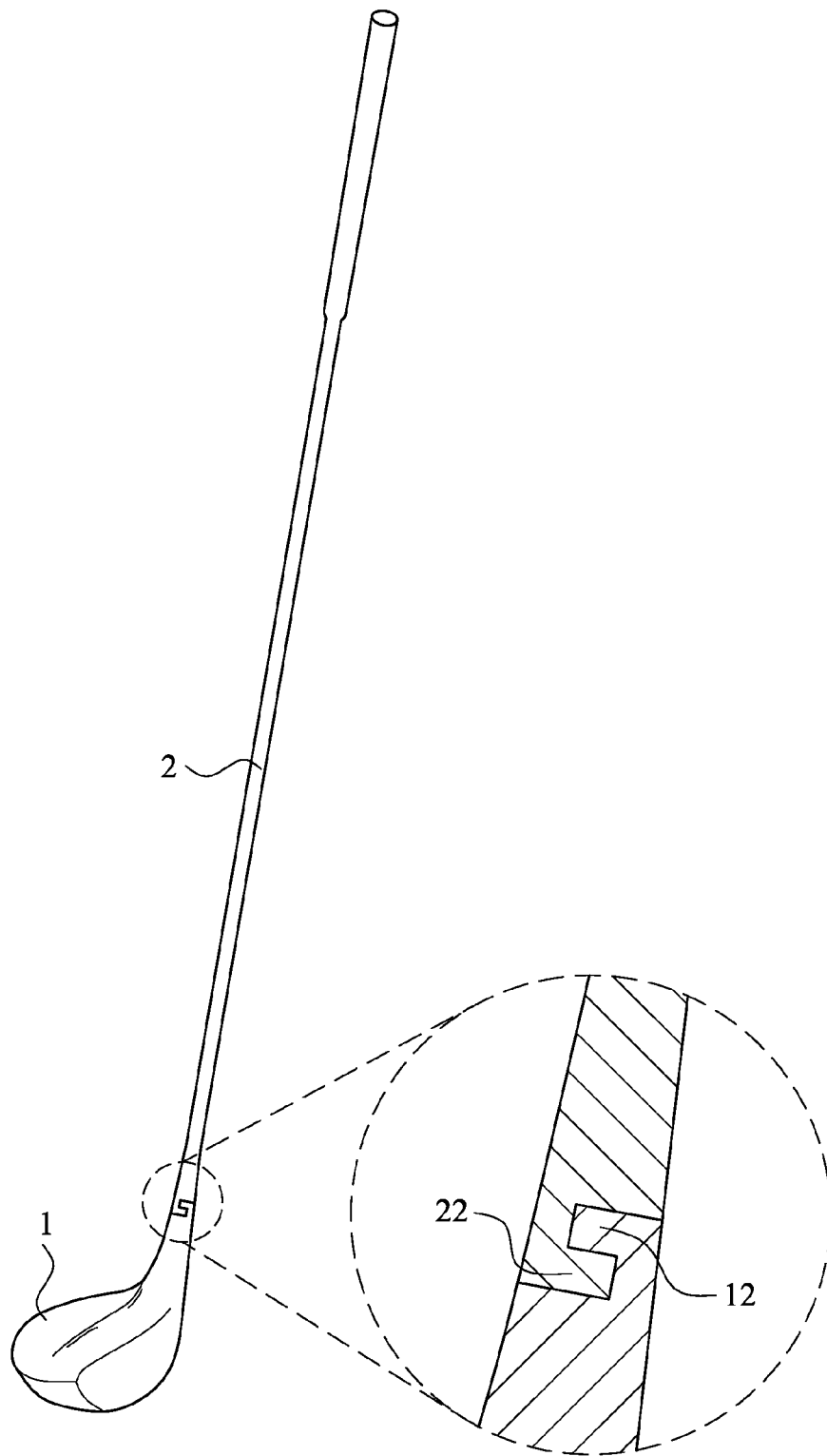


FIG.2c

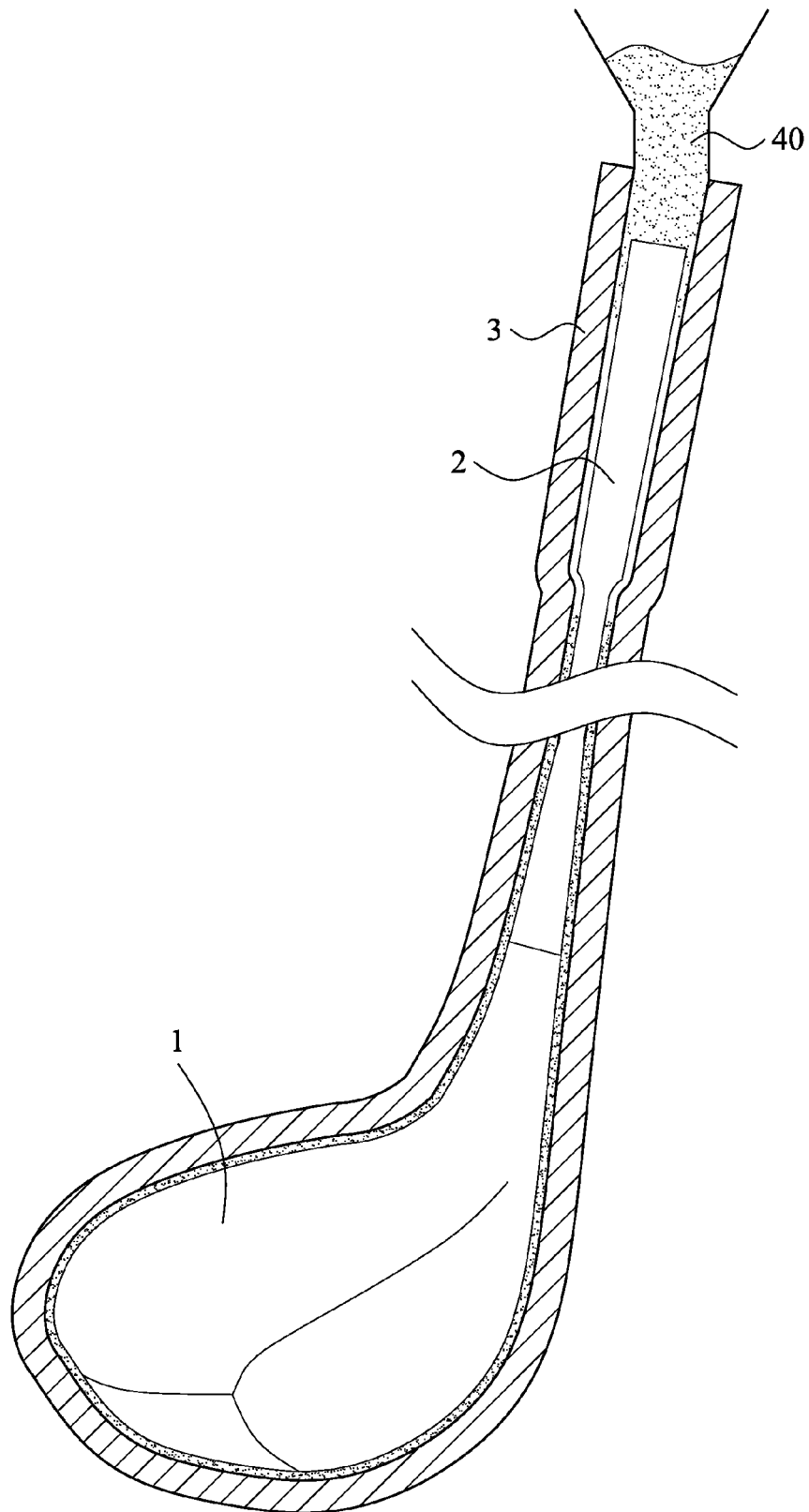


FIG.3

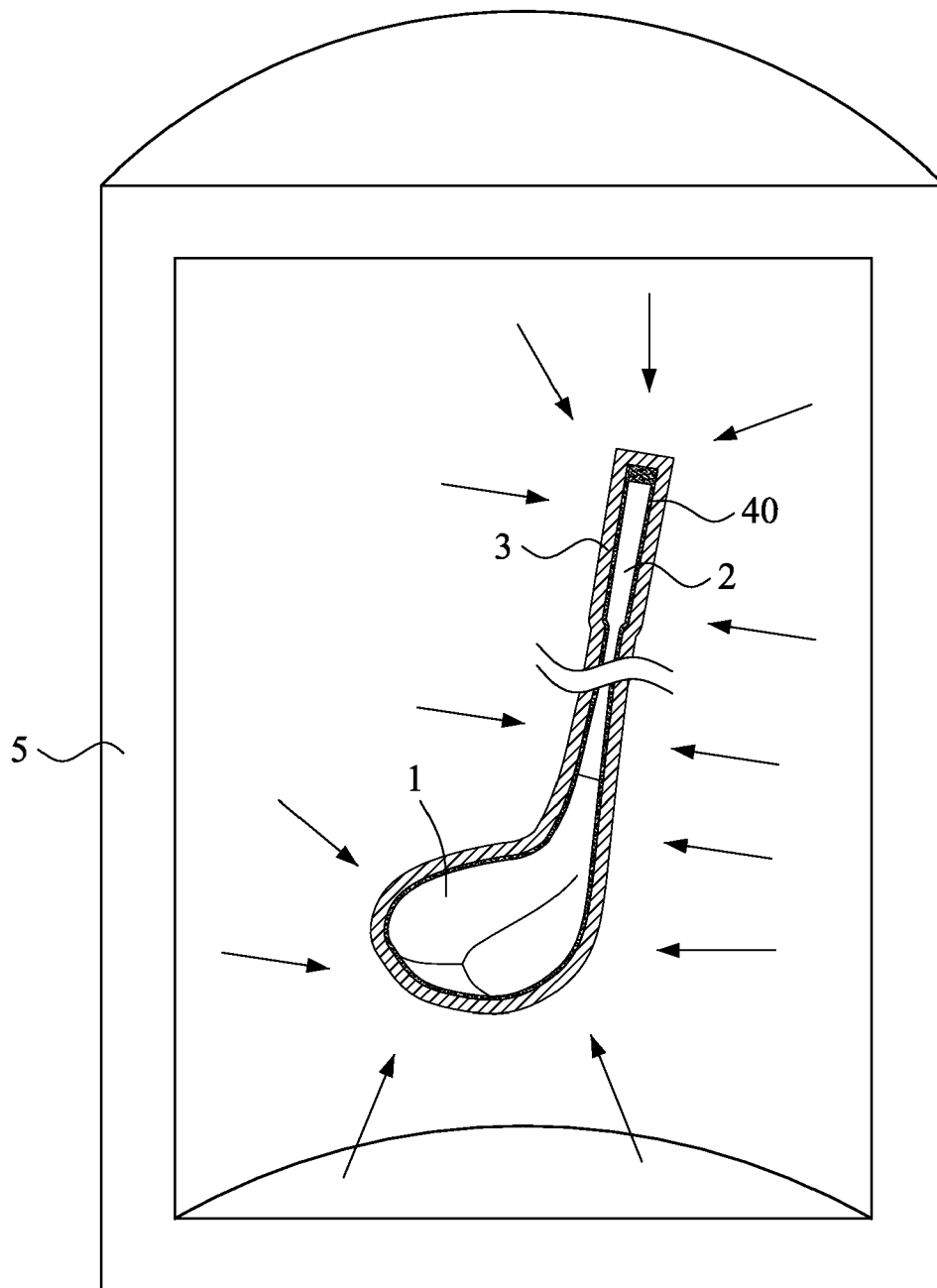


FIG.4

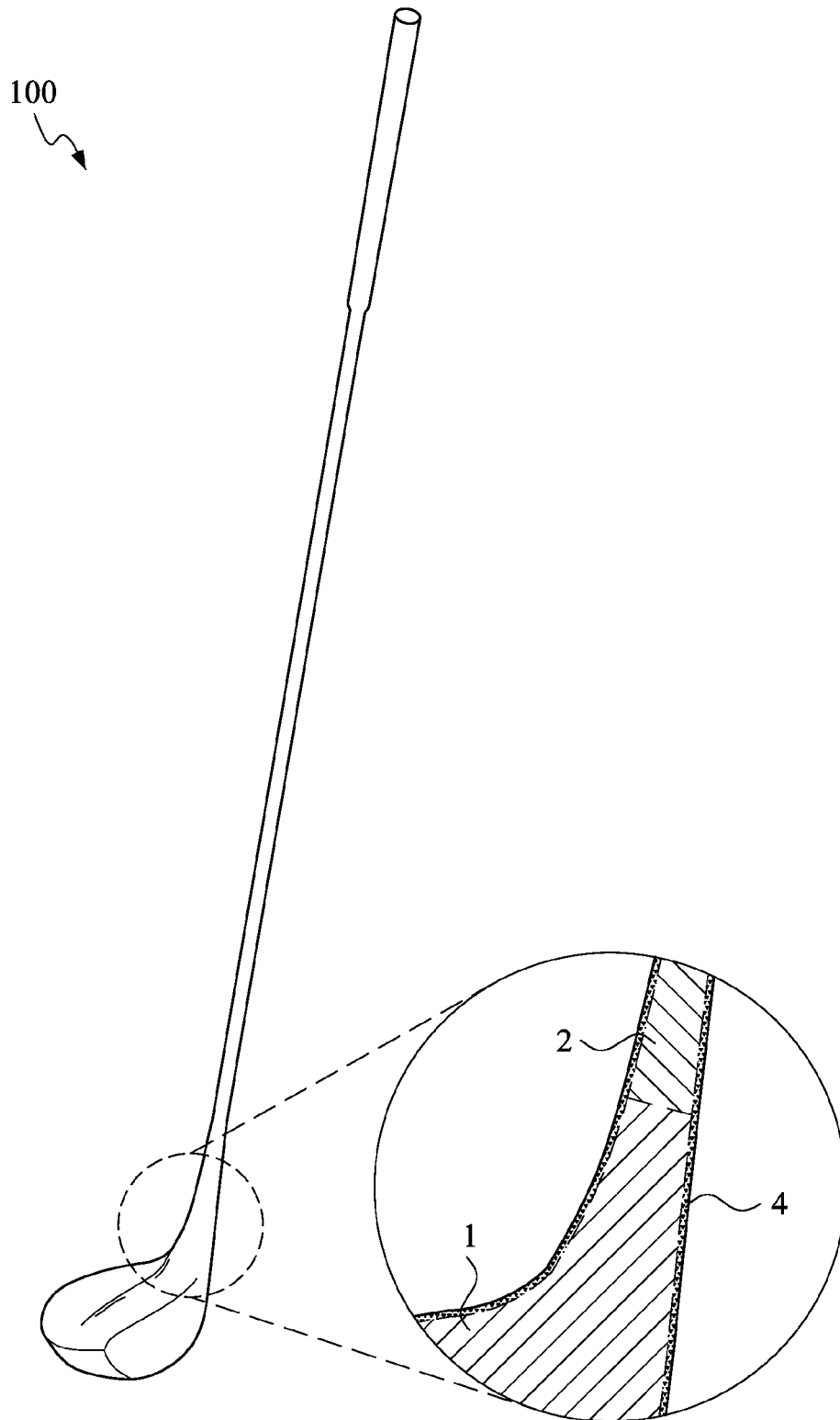


FIG.5



EUROPEAN SEARCH REPORT

Application Number
EP 13 19 9853

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			A63B B21K
Place of search		Date of completion of the search	Examiner
Munich		19 March 2014	Lundblad, Hampus
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 13 19 9853

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19-03-2014

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