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(54) **KENDAMA**

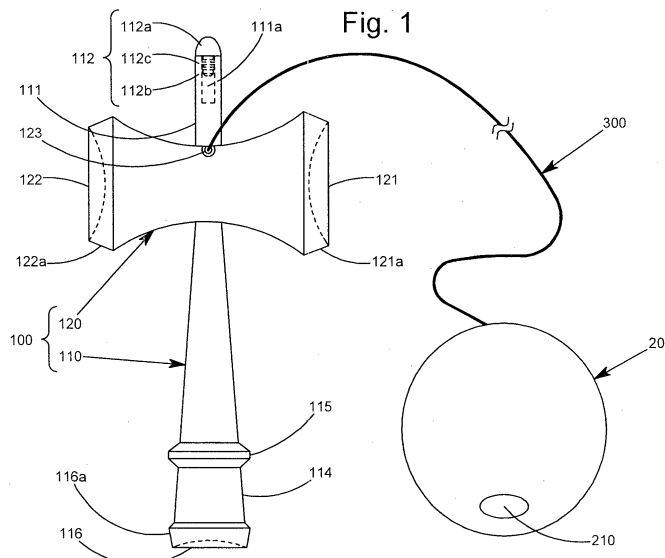
(57) [Problem]

To provide a kendama not only replacing only a kensaki if the kensaki is worn, but also adjusting a balance of weight and others of a sword and developing a novel technique largely different from existing techniques.

[Solution]

A kendama includes a sword 100 having a sword shaft 110 and a cross-piece 120; a ball 200 having a hole 210 of inserting a kensaki 111 protruding to an upper

side than the cross-piece 120 in the sword shaft 110; and a string 300 connecting the sword 100 and the ball 200. A tip portion of the kensaki 111 is configured as an attachable and detachable member 112 which is attachable and detachable with respect to a base end of the kensaki 111. The attachable and detachable member 112 is a plurality of attachable and detachable members 112 replaced each other.



**Description**

## TECHNICAL FIELD

**[0001]** The present invention relates to a kendama.

## BACKGROUND ART

**[0002]** Kendama is a toy enjoyed through the ages. The number of people recently increases who play a kendama as a game. Kendama has various shapes. However, one including a sword 100 (ken), a ball 200 (tama), and a string 300, for example see patent document 1, is common in contemporary Japan. Fig. 17 is a front view illustrating a common kendama existing before. The ken 100 has a shape of a cross in front view configured by a sword shaft 110 (kenjiku) having a shape of a stick and a cross-piece 120 (sarado) having a shape of a tsutsumi (Japanese hand drum). A portion 111 protruding to an upper side than the cross-piece 120 in the sword shaft 110 is referred to as a "kensaki" (tip of sword). The tama 200 is provided with a hole 210 for inserting the kensaki 111. A large cup 121 is provided on a plane of one end of the cross-piece 120. A small cup 122 is provided on a plane of another end of the cross-piece 120. A middle cup 116 is provided on a lower end plane of the sword shaft 110. The large cup 121, the small cup 122, and the middle cup 116 are configured to be able to receive the ball 200. Japanese Kendama Association, which holds lots of kendama contests, certifies the kendama having a shape illustrated in Fig. 17 as an official one.

**[0003]** However, a prior kendama is problematic in that a tip portion of the kensaki 111 is easy to be worn by an impact given by the ball and others. Players who play kendama as a game have to uneconomically buy new kendama as a whole if the kensaki 111 is worn even though other portions are intact. A balance of weight of the sword 110 and others affect a difficulty of techniques, especially a difficulty of swinging type techniques such as a "Hikoki (air plane)" in which the ball 200 is supported and the sword 110 is swung. However, the balance of weight cannot be adjusted in a prior kendama: Difficulty of a specific technique cannot be make high or low. It is impossible to gradually shift to a balance of weight of lower difficulty to a balance of weight of high difficulty in order to master a specific technique. Since many techniques are already existing, developing new techniques is in an extent of minor changing existing techniques. It is difficult to develop a novel techniques with a prior kendama.

**[0004]** Kendama having a configuration that a portion corresponds to the kensaki is attached or detached is proposed before. A set of industrial tools having a shape of kendama in which kinds of bit are attached to a chuck (8) provided on a tip of bit attaching portion (7) is illustrated in Fig. 1 of Patent Document 2. However, the bit attached to the chuck (8) is a cross slot screwdriver, straight slot screw driver or others, which are attached

when it is used as an industrial tool, and which are not used as the kensaki when it is used as a kendama. A toy having a ball is illustrated in Fig. 1 of Patent Document

3, in which a ball receiver ( ) is screwed on an upper end of a shaft ( ). However, a portion corresponding to the kensaki is a pointed shaft ( ). Patent Document 3 is silent about making the pointed shaft ( ) attachable and detachable.

**[0005]** Kendama is illustrated in Fig. 3 of Patent Document 4, in which a horn (7) is fitted into a middle portion of an upper face of a cross-piece. However, if a configuration of fitting the horn (7) into the cross-piece is adapted, the horn is possibly dropped when a ball (1) hits the horn (7). In addition, Patent Document 4 is silent about exchanging horn (7) with another member. A toy having a ball is illustrated in Figs of Patent Document 5, in which a kensaki (6) is screwed into a middle portion of a ball receiver (1) having a shape of a tsutsumi (Japanese hand drum). Patent Document 5 is also silent about exchanging the kensaki (6) with another member. Balance of weight of the sword cannot be adjusted with kendamas disclosed in Patent Documents 2 to 5.

## PRIOR ARTS

Patent Document

**[0006]**

Patent Document 1: Japanese Patent Application Publication No. 2002-346011

Patent Document 2: Japanese Utility Patent Application Publication No. H01-132383

Patent Document 3: Japanese Utility Patent Examined Application Publication No. S03-007398

Patent Document 4: Japanese Patent Application Publication No. 2002-360754

Patent Document 5: Japanese Utility Patent Examined Application Publication No. S12-016699

## DISCLOSURE OF THE INVENTION

45 Problem to be Solved by the Invention

**[0007]** Present invention is to solve the problem described above. The present invention provides a kendama realizing;

50 (1) replacing only a kensaki if the kensaki is worn,  
 (2) adjusting a balance of weight and others of a sword,  
 (3) developing a novel technique largely different from existing techniques.

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### Means to Solve the Problems

**[0008]** The problems are solved by a kendama. The kendama includes a sword having a sword shaft and a cross-piece; a ball having a hole of inserting a kensaki protruding to an upper side than the cross-piece in the sword shaft; a string connecting the sword and the ball. A tip portion of the kensaki is configured as an attachable and detachable member which is attachable and detachable with respect to a base end of the kensaki. The attachable and detachable member is a plurality of attachable and detachable members replaced each other.

**[0009]** Although all of the plurality of attachable and detachable members are the same (members for replacing a first attachable and detachable member is worn), it is preferable that at least two attachable and detachable members out of the plurality of attachable and detachable members differ in at least any one item or more items out of a weight, shape, and color. According to this, difficulty of a technique using the kendama is changed and a novel technique is performed by adjusting a balance of weight, and/or changing the shape and/or color of the sword.

**[0010]** For example, as for the shape, it is preferable that the plurality of attachable and detachable member is configured as follows.

(1) At least one attachable and detachable member is of configuring a shape of the tip portion of the kensaki as a hemisphere or circular cone. The attachable and detachable member having this configuration is sometimes referred to as "standard attachable and detachable member".

(2) At least one attachable and detachable member is of configuring a shape of the tip portion of the kensaki as a circular truncated cone (top portion of the standard attachable and detachable member is truncated). The attachable and detachable member having this configuration is sometimes referred to as "truncated attachable and detachable member".

(3) At least one attachable and detachable member is of providing a slit groove catching the string with the tip portion of the kensaki. The attachable and detachable member having this configuration is sometimes referred to as "attachable and detachable member having slit groove".

(4) At least one attachable and detachable member is of providing a string hole connecting the string to the tip portion of the kensaki. The attachable and detachable member having this configuration is sometimes referred to as "attachable and detachable member having string hole".

(5) At least one attachable and detachable member is of connecting a kensaki of another kendama to the tip portion of the kensaki. The attachable and detachable member having this configuration is sometimes referred to as "connecting type attachable and detachable member".

(6) At least one attachable and detachable member is of attaching a small camera to the tip portion of the kensaki. The attachable and detachable member having this configuration is sometimes referred to as "attachable and detachable member embedded with camera". The standard attachable and detachable member, the truncated attachable and detachable member, the attachable and detachable member having slit groove, the connecting type attachable and detachable member, and the attachable and detachable member embedded with camera are explained in detail later.

**[0011]** As long as the attachable and detachable member is attachably and detachably attached to the base end of the kensaki, specific configurations are not particularly limited in the present invention. However, it is preferable that a fitting and inserting hole is provided on a tip end plane of the base end of the kensaki, and the attachable and detachable member has a shaft portion to be inserted and fitted to the fitting and inserting hole. In this case, it is preferable that a retaining portion is provided on the shaft portion, and the retaining portion is configured by annularly providing an elastic protrusion along an outer peripheral face of the shaft portion. Alternatively, it is preferable that a shaft portion is provided on the tip end plane of the base end of the kensaki, and the attachable and detachable member has a fitting and inserting hole to insert and fit the shaft portion. In this case, it is preferable that a thread groove is provided on an inner peripheral face of the fitting and inserting hole of the attachable and detachable member, the thread groove threadably mounts an outer peripheral face of the shaft portion on the base end of the kensaki. By adapting these configurations, the attachable and detachable member can be securely attached to the base end of the kensaki and be easily attached or detached. Since the structure is simple, a manufacturing cost of the kendama can be reduced. A weight of the attachable and detachable member can be changed by modifying a length of the shaft portion (see reference numeral 112b of Fig. 2 and Fig. 5) without modifying material of the attachable and detachable member and a shape of a portion (head portion) appeared outside when the attachable and detachable member is attached to the kensaki.

**[0012]** In case the fitting and inserting hole is provided on tip end plane of the base end of the kensaki or the fitting and inserting hole is provided on the attachable and detachable member, it is preferable that a weight member (see reference numeral 400 of Fig. 6) is contained in the fitting and inserting hole to adjust a weight of the kensaki. The weight of the kensaki is changed to adjust a balance of weight of the kensaki by selecting an existence or non-existence, or a kind and the number of the weight member. In this case, if the weight member is directly inserted, a trouble possibly occurs such as a rattling sound generated by the weight member vibrating in the fitting and inserting hole, or an instability of the

balance of weight of the sword, it is preferable that a cushioning material (see reference numeral 500 of Fig. 6) is contained at a bottom portion of the fitting and inserting hole.

#### Effects of the Invention

**[0013]** According to the present invention, a kendama realizing following is provided;

- (1) replacing only a kensaki if the kensaki is worn,
- (2) adjusting a balance of weight and others of a sword,
- (3) developing a novel technique largely different from existing techniques.

#### BRIEF DESCRIPTION OF THE DRAWINGS

##### **[0014]**

[Fig. 1] Fig. 1 is a front view illustrating a kedama of a present invention in which a standard attachable and detachable member is attached to a kensaki.

[Fig. 2] Fig. 2 is a magnified view illustrating a flow of attaching a standard attachable and detachable member to a tip portion of a kensaki, according to the present invention.

[Fig. 3] Fig. 3 is a magnified view illustrating a flow of attaching a standard attachable and detachable member having a different color to a tip portion of a kensaki, according to the present invention.

[Fig. 4] Fig. 4 is a magnified view illustrating a flow of attaching a standard attachable and detachable member having a shaft portion provided with a thread ridge to a tip portion of a kensaki, according to the present invention.

[Fig. 5] Fig. 5 is a magnified view illustrating a flow of attaching a standard attachable and detachable member having a shaft portion of a different size to a tip portion of a kensaki, according to the present invention.

[Fig. 6] Fig. 6 is a magnified view illustrating a flow of making a fitting and inserting hole provided on a base end of a kensaki contain a weight member, according to the present invention.

[Fig. 7] Fig. 7 is a drawing explaining a difficulty change brought by a change of balance of weight when performing a technique called "Getsumen Chakuriku (landing on the moon)".

[Fig. 8] Fig. 8 is a drawing explaining a difficulty change brought by a change of balance of weight when performing a technique called "Hikoki (air plane)".

[Fig. 9] Fig. 9 is a drawing explaining a difficulty change brought by a change of balance of weight when performing a technique called "Toudai (beacon)".

[Fig. 10] Fig. 10 is a magnified view illustrating a flow

of attaching a truncated attachable and detachable member to a tip portion of a kensaki, according to the present invention.

[Fig. 11] Fig. 11 is a magnified view illustrating a flow of attaching an attachable and detachable member having slit groove to a tip portion of a kensaki, according to the present invention.

[Fig. 12] Fig. 12 is a drawing illustrating a state in which a technique is performed using a kendama attached with the attachable and detachable member having slit groove.

[Fig. 13] Fig. 13 is a magnified view illustrating a flow of attaching an attachable and detachable member having string hole to a tip portion of a kensaki, according to the present invention.

[Fig. 14] Fig. 14 is a magnified view illustrating a flow of attaching a connecting type attachable and detachable member to a tip portion of a kensaki, according to the present invention.

[Fig. 15] Fig. 15 is a drawing illustrating a state in which the connecting type attachable and detachable member is attached to the kensaki to connect each kensaki of two kendamas.

[Fig. 16] Fig. 16 is a magnified view illustrating a flow of attaching an attachable and detachable member embedded with camera to a tip portion of a kensaki, according to the present invention.

[Fig. 17] Fig. 17 is a front view illustrating a common kendama existing before.

[Fig. 18] Fig. 18 is a magnified view illustrating a flow of attaching a standard attachable and detachable member having a fitting and inserting hole provided with a thread groove to a tip portion of a kensaki, according to the present invention.

#### EMBODIMENTS FOR CARRYING OUT THE INVENTION

**[0015]** Embodiments of kendama of a present invention is more specifically explained below with reference to Figures.

[Outline of an embodiment of kendama]

**[0016]** Fig. 1 is a front view illustrating a kedama of a present invention in which a standard attachable and detachable member 112 is attached to a kensaki 111. The kendama of the present embodiment is configured by a sword 100, a ball 200, and a string 300. The sword 100 is configured by a sword shaft 110, and a cross piece 120. The ball 200 is provided with a hole 210 of inserting a kensaki 111 protruding to an upper side than the cross piece 120 in the sword shaft 110. A tip portion of the kensaki 111 is configured as an attachable and detachable member 112 which is attachable and detachable with respect to a base end of the kensaki 111.

**[0017]** The kendama of the present embodiment is provided with six kinds as the attachable and detachable

members 112, which are a standard attachable and detachable member 112 (Fig. 2), a truncated attachable and detachable member 112 (Fig. 10), an attachable and detachable member 112 having slit groove (Fig. 11), an attachable and detachable member 112 having string hole (Fig. 13), a connecting type attachable and detachable member 112 (Fig. 14), and an attachable and detachable member 112 embedded with camera (Fig. 16). These six attachable and detachable members 112 are interchanged each other. These six attachable and detachable members 112 are specifically explained later. These six attachable and detachable members 112 are an example. Some of these attachable and detachable members 112 may be omitted, or an attachable and detachable member 112 other than the six kinds of attachable and detachable members 112 may be added to.

**[0018]** Although a string hole 123 connecting the string 300 to the sword 100 side is provided on a slight upper side than a center with respect to width and upper and lower direction of the cross piece 120 in a common kendama as illustrated in Fig. 17, it is provided on a position where a base of the kensaki 111 and the cross-piece 120 connect. By providing the string hole 123 on upper side than a common kendama, friction given to the string 300 from the sword is reduced to prevent the string 300 from breaking. It facilitates one to perform techniques called "Hikoki" and "Toudai" explained later because balance of the sword 100 is improved. Difficulty of techniques can also be changed by shifting leftwardly or rightwardly a position of the string hole from the center with respect to width and upper and lower direction of the cross piece 120.

[standard attachable and detachable member]

**[0019]** The six kinds of attachable and detachable members 112 are explained below in sequence. First, the standard attachable and detachable member 112 is explained. The standard attachable and detachable member 112 is provided with a head portion 112a having a hemispheric shape, and a shaft portion 112b extending from the head portion 112a to a lower side as illustrated in Fig. 2. Fig. 2 is a magnified view illustrating a flow of attaching the standard attachable and detachable member 112 to the tip portion of the kensaki 111. In Fig. 2, the kensaki 111 is illustrated as a cross section cut on a plane on which a center axis lies (Figs. 3 to 6, 10, 11, 13, 14, and 16 are illustrated in a same manner). In a common kendama certified by Japanese Kendama Association as a official one, shape of a tip portion of a kensaki 111 is hemispheric (or a circular cone). By attaching the standard attachable and detachable member 112 to the kensaki 111, the tip of the kensaki 111 becomes a hemispheric shape to be used as a common kendama such as one illustrated in Fig. 17. It is preferable that plurality of the standard attachable and detachable member is provided since it is used very often and tend to be worn.

**[0020]** The head portion 112a is exposed outer side

after the attachable and detachable member 112 is attached to the kensaki 111. Although Color of the head portion 112a is normally the same as the kensaki 111, it is preferable that various ones having different colors are provided even though attachable and detachable members 112 belong to the same type, as illustrated in Fig. 3. Fig. 3 is a magnified view illustrating a flow of attaching a standard attachable and detachable member 112 having a different color to a tip portion of a kensaki 111. By changing a color of the head portion 112a, difficulty of techniques can be changed. For example, if an outstanding color such as red is adapted, the head portion 112a becomes more outstanding than other portions to facilitate one to successfully perform a technique in which the kensaki 111 is inserted into the hole 210 of the ball 200.

**[0021]** Material of the head portion 112a is not particularly limited if it has a sufficient strength as the tip portion of the kensaki 111. Plastics, rubbers, metals, woods are exemplified as material of the head portion 112a. It is not particularly problematic if material easy to be worn such as woods is used since the kendama of the present embodiment is maintained by interchanging the attachable and detachable member 112. In the present embodiment, all of the head portions 112a of the attachable and detachable members 112 are made of polyethylene, which is inexpensive and easy to shape. However, if the weight of a tip portion of the kensaki 111 is made adjustable, various ones having different densities are used as for the same type of the attachable and detachable members 112 too, as in an aforementioned shaft portion 112b.

**[0022]** The shaft portion 112b is explained. The shaft portion 112b is a portion to be fitted and inserted to a fitting and inserting hole 111a provided on the kensaki 111 to attach the attachable and detachable member 112 to the kensaki 111. The shaft portion 112b is not particularly limited if it has a structure to be fitted and inserted and fixed to the fitting and inserting hole 111a. For example, the fitting and inserting hole 111a may be a threaded hole and a thread ridge 112d may be provided on an outer peripheral face of the shaft portion 112b to screw the attachable and detachable members 112 to a tip portion of a kensaki 111 as illustrated in Fig. 4. Fig. 4 is a magnified view illustrating a flow of attaching a standard attachable and detachable member 112 having a shaft portion provided with a thread ridge 112d to a tip portion of a kensaki 111. According to a threadably mounting structure of Fig. 4, if a standard attachable and detachable member 122c having a pattern or a standard attachable and detachable member 122c having a head portion 112a whose shape is different depending on a direction is used, the head portion 112a does not come to desired direction when screwing a shaft portion 112b to a fitting and inserting hole 111a, unless the thread groove of the fitting and inserting hole 111 a and the thread ridge 112d of the shaft portion 112b are processed at high accuracy. This is not much problematic if a standard attachable and detachable member having no pattern is used. Considering this, a shaft portion 112b is made

as follows in the kendama of the present embodiment.

**[0023]** The shaft portion 112b is provided with a retaining portion 112c instead of the thread ridge as illustrated in Fig. 2. The inserting and fitting hole 111a is not the threaded hole. The retaining portion 112c is configured by annularly providing an elastic protrusion along an outer peripheral face of the shaft portion 112b, and closely contacts to an inner peripheral face of the fitting and inserting hole 111 a when the shaft portion 112b is fitted and inserted into the fitting and inserting hole 111 a to prevent the shaft portion 112b from being dropped out of the fitting and inserting hole 111 a. The retaining portion 112c is normally made of elastic materials such as rubbers. If the shaft portion 112b and the retaining portion 112c are made of the same material, the retaining portion 112c and the shaft portion 112b may be integrally formed at the same time. If they are formed of different materials, the retaining portion 112c and the shaft portion 112b are formed as separate body. In this case, the retaining portion 112c is provided by externally fitting to the shaft portion 112c or integrally shaping a different material with respect to the shaft portion 112c. In this case, the retaining portion 112c is prevented from being dropped out of the shaft portion 112b by circularly providing a groove on the outer peripheral face of the shaft portion 112b and positioning the retaining portion 112c at this portion.

**[0024]** A cross sectional shape perpendicular to a longitudinal direction of the fitting and inserting hole 111a and the shaft portion 112b is a true circle in the kendama of the present embodiment. However, if it is necessary to prevent an attachable and detachable member 112 from rotating with respect to the kensaki 111 after the attachable and detachable member 112 is attached to the kensaki 111, the cross sectional shape of the shaft portion 112b and the fitting and inserting hole 111a may be a non-circular shape such as a polygonal shape, an oval shape, or others. According to this configuration, a shaft portion 112b of an attachable and detachable member attached to a tip portion of a kensaki 111 is prevented from rotating by engaging a shaft portion 112b to a fitting and inserting hole 111a. This configuration is not adaptable in the threadably mounting structure of Fig. 4, and becomes adaptable with a shaft portion 112b having a fitting and inserting structure as illustrated in Fig. 2. This configuration is preferably adapted if an attachable and detachable member 112 should not be rotated such as when using the attachable and detachable member 112 having slit (Fig. 11) or the connecting type attachable and detachable member 112 (Fig. 15), which are explained later.

**[0025]** Material of the shaft portion 112b is not particularly limited if it has a sufficient strength. Plastics, rubbers, metals, woods are exemplified as materials of the shaft portion 112b. The shaft portion 112b may be made of a material same as the head portion 112b, or may be made of a different material. In the kendama of the present embodiment, as for the standard detachable and detachable members 112, three kinds are provided, one

of which is a light weight type whose shaft portion 112b is made of polyethylene, another is a middle weight type whose shaft portion 112b is made of a plastic of acrylonitrile butadiene styrene (ABS), the other is heavy weight type whose shaft portion 112b is made of a plastic of polyoxymethylene (Duracon, registered trademark). The shaft portion 112b is made heavier by shaping the shaft portion 112b with a metal or embedding a heavy material such as metals to an inside of the shaft portion 112b. Weight of the tip portion of the kensaki 111 can be adjusted by providing various ones having shaft portions 112 differed in a weight even with the same type attachable and detachable members 112.

**[0026]** Weight of the tip portion of the kensaki 111 is also adjusted by providing various ones having a different size such as a length of the shaft portion 112b even with the same type attachable and detachable member 112, as illustrated in Fig. 5. Fig. 5 is a magnified view illustrating a flow of attaching a standard attachable and detachable member 112 having a shaft portion 112b of a different size to a tip portion of a kensaki 111. Weight of a tip portion of a kensaki 111 is also adjusted by containing a weight member 400 in a fitting and inserting hole 111a as illustrated in Fig. 6. Fig. 6 is a magnified view illustrating a flow of making a fitting and inserting hole 111 a provided on a base end of a kensaki 111 contain a weight member 400. In this case, if the weight member 400 is directly inserted, a trouble possibly occurs such as a rattling sound generated by the weight member 400 vibrating in the fitting and inserting hole 111 a, or an instability of the balance of weight of the sword 110, it is preferable that a cushioning material 500 (see reference numeral 500 of Fig. 6) is contained at a bottom portion of the fitting and inserting hole 111 a.

**[0027]** The case is explained so far, in which the shaft portion 112b of the attachable and detachable member 112 is fitted and inserted into the fitting and inserting hole 111 a of the tip portion of the kensaki 111. Relationship between the shaft portion 112b and the fitting and inserting hole 111a is interchanged. A shaft portion 111b is provided on a tip end plane of the base end of a kensaki 111, as illustrated in Fig. 18. An attachable and detachable member 112 is provided with a fitting and inserting hole 112i. By fitting and inserting the shaft portion 111b to the fitting and inserting hole 112i, the attachable and detachable member 112 is attached to the kensaki 111. Fig. 18 is a magnified view illustrating a flow of attaching the standard attachable and detachable member 112 having a fitting and inserting hole 112i provided with a thread groove 112j to a tip portion of a kensaki 111. In this case, if a thread groove 112j is provided on an inner peripheral face of the fitting and inserting hole 112i which threadably mounts an outer peripheral face of the shaft portion 111b, the attachable and detachable member 112 can be screwed on the kensaki 111. In this case, a threaded shaft is used as the shaft portion 111b.

**[0028]** As explained above, balance of weight of the sword 100 is adjusted even with the same type attachable

and detachable member 112 (for example with the same standard attachable and detachable member 112) by selecting a head portion 112a, materials or size of the shaft portion 112b, a kind or existence or non-existence of the weight member 400 to change a weight of the kensaki 111. Difficulty of a specific technique is changed by selecting an attachable and detachable member 112 or a weight member to be used without changing a kendama to be used. Difficulty change of technique brought by change of balance of weight of a sword is explained below raising examples.

**[0029]** For example, there is a technique called "Getsumen Chakuriku (landing on the moon)", which is included in a hundred chosen techniques by Japan Kendama Association. Getsumen Chakuriku is a technique in which the ball 200 is held, a sword 100 is swung to upside, the sword 100 is put on the ball 200 so that a large cup 121 (or a small cup 122) of a cross-piece 120 contacts to the ball 200 as illustrated in Fig. 7. Fig. 7 is a drawing explaining a difficulty change brought by a change of balance of weight when performing Getsumen Chakuriku. If the kensaki 111 is heavy when performing Getsumen Chakuriku, weight of the sword 100 on the ball 200 is balanced at relatively horizontal laid position since a weight center of the sword 100 shifts to the kensaki 111 side, as illustrated in left side of Fig. 7. This facilitates one to successfully perform the technique. In contrast to this, if the kensaki is light, weight of the sword 100 on the ball 200 is balanced at relatively vertical standing position since a weight center of the sword 100 shifts to a kenjiri (base end of a sword) 114 side, as illustrated in right side of Fig. 7. This prevents one from successfully performing the technique.

**[0030]** There is a technique called "Hikoki (air plane)" in the hundred chosen techniques by Japan Kendama Association. Hikoki is a technique in which a ball 200 is held with a hole 210 facing an upper side, a sword 100 is swung up half (or swung plural times) to be inverted by making the ball 200 as a center, its kensaki 111 is inserted into the hole 210, as illustrated with arrow A in Fig. 8. Fig. 8 is a drawing explaining a difficulty change brought by a change of balance of weight when performing a technique called "Hikoki". If the kensaki 111 is heavy when performing Hikoki, an angular velocity of the sword 100 becomes high when swinging up the sword 100 (rotating rate becomes high) since a weight center of the sword 100 becomes close to a rotation center (the ball 200) of the sword 100. This prevents one from successfully performing the technique. In contrast to this, if the kensaki is light, an angular velocity of the sword 100 becomes low when swinging up the sword 100 (rotating rate becomes low) since a weight center of the sword 100 becomes away from a rotation center (the ball 200) of the sword 100. This facilitates one to successfully perform the technique.

**[0031]** There is a technique called "Toudai (beacon)" in the hundred chosen techniques by Japan Kendama Association. Toudai is a technique in which a ball 200 is

held, a sword 100 is lifted up, the sword 100 is put on the ball 200 so that a middle cup 116 contacts to the ball 200 as illustrated with arrow B in Fig. 9. Fig. 9 is a drawing explaining a difficulty change brought by a change of balance of weight when performing a technique called "Toudai". If a kensaki 111 is heavy when performing Toudai, a posture of the pulled up sword 100 becomes unstable since a weight center of the sword 100 comes to high position. This prevents one from successfully performing the technique. In contrast to this, if the kensaki 111 is light, a posture of the pulled up sword 100 becomes stable since a weight center of the sword 100 comes to lower position. This facilitates one to successfully perform the technique.

**[0032]** Of course, according to kendama of the present embodiment, difficulty of techniques other than Getsumen Chakuriku, Hikoki, and Toudai can be changed. As explained, according to the kendama of the present embodiment, difficulty of techniques can be changed to enjoy them. The number of steps modifying weight (total weight of an attachable and detachable member 112 and a weight member 400) of the tip portion of the kensaki 111 is not particularly limited. It is normally two steps or more, and preferably three steps or more, and not more than ten to twenty steps. Adjusting range of a weight of a tip portion (an attachable and detachable member 112) of a kensaki 111 is not particularly limited, either. It is normally 1 to 100g, and is preferably 3 to 50g, and is more preferably 5 to 20g. Weight adjusting width (adjusting weight by how much gram) is not particularly limited, either. It is normally by 0.5g or more, and is preferably 1 g or more, and not more than by 50 to 100g or so.

[truncated attachable and detachable member]

**[0033]** The truncated attachable and detachable member 112 is explained hereafter. Fig. 10 is a magnified view illustrating a flow of attaching the truncated attachable and detachable member 112 to the tip portion of the kensaki 111. The truncated attachable and detachable member 112 configures its head portion 112a as a circular truncated cone as illustrated in Fig. 10. In other words, the head portion 112a of the truncated attachable and detachable member 112 has a shape truncating top portion of the head portion 112b (see Fig. 2) of a standard attachable and detachable member 112. The tip portion of the kensaki 111 becomes a shape of a circular truncated cone by attaching the truncated attachable and detachable member 112. Novel techniques, which cannot be performed with a common kendama, can be performed, such as a technique in which the ball 200 is put on the tip portion of the kensaki 111, a technique making the inverted sword stand on the ball 200 (a technique in which a tip portion of a kensaki 111 is put on a ball 200), or a technique making the inverted sword stand on a hand or a finger (a technique in which the tip portion of the kensaki 111 is put on a hand or a finger). A top portion of the truncated attachable and detachable member 112

spherically concaves at a radius of curvature same as the ball 200 to facilitate to receive the ball 200 with the portion, according to the kendama of the present embodiment. Since configurations, which are not specifically referred here such as a structure of a shaft portion 112b of the truncated attachable and detachable member 112 and materials consisting each portions, is same as those of the standard attachable and detachable member 112 explained above, an explanation is omitted.

[attachable and detachable member having slit groove]

**[0034]** The attachable and detachable member 112 having slit groove is explained hereafter. Fig. 11 is a magnified view illustrating a flow of attaching the attachable and detachable member having slit groove to the tip portion of the kendama. Fig. 12 is a drawing illustrating a state in which a technique is performed using a kendama attached with the attachable and detachable member having slit groove. As illustrated in Fig. 11, in the attachable and detachable member 112 having slit groove, its head portion 112a is provided with a slit groove 112e. The slit groove 112a is provided along an upper face of the head portion 112a from a front side to a rear side of the head portion 112a. As illustrated in Fig. 12, the slit groove 112e makes it possible to catch the string 300 and to performing novel technique applying this. Since configurations, which are not specifically referred with respect to the attachable and detachable member 112 having slit groove such as a structure of a shaft portion 112b of the attachable and detachable member 112 having slit groove and materials consisting each portions, are same as those of the standard attachable and detachable member 112 explained above, an explanation is omitted. The attachable and detachable member 112 having slit groove may be combined with the truncated attachable and detachable member 112 to make a hybrid type.

[attachable and detachable member having string hole]

**[0035]** The attachable and detachable member 112 having string hole is explained hereafter. Fig. 13 is a magnified view illustrating a flow of attaching the attachable and detachable member 112 having string hole to the tip portion of the kendama. As illustrated in Fig. 13, the attachable and detachable member 112 is provided with a string hole 112f perforating a head portion 112a from one side to other side. As illustrated in a drawing on right side, the string 300 is connected to make a loop. By fixing an end portion of the string 300 on the sword 100 side to the string hole 112f provided on the kendama 111, kendama is enjoyed in a feeling different from a common kendama (Fig. 17) in which an end portion of a string 300 on a sword side is fixed to the cross-piece 120. According to this, novel techniques can be performed with the kendama. Since other configurations, which are not specifically referred with respect to the attachable and detachable member 112 having string hole such as a structure

of a shaft portion 112b of the attachable and detachable member 112 having string hole and materials consisting each portions, are same as those of the standard attachable and detachable member 112 explained above, an explanation is omitted. The attachable and detachable member 112 having string hole may be combined with the truncated attachable and detachable member 112 or the attachable and detachable member 122 having slit groove to make a hybrid type.

[connecting type attachable and detachable member]

**[0036]** The connecting type attachable and detachable member 112 is explained hereafter. Fig. 14 is a magnified view illustrating a flow of attaching the connecting type attachable and detachable member 112 to the tip portion of the kendama. Fig. 15 is a drawing illustrating a state in which the connecting type attachable and detachable member 112 is attached to the kendama 111 to connect each kendama. In a portion where the kendama 111 and its vicinity are illustrated as magnified manner in Fig. 15, the kendama 111 is illustrated as a cross section cut on a plane on which a center axis lies. The connecting type attachable and detachable member 112 has a configuration of a shaft portion 112b being extended until a portion corresponding to the head portion 112a of the standard attachable and detachable member 112, an upper half of the shaft portion 112b projecting out of a fitting and inserting hole 111a when the shaft portion 112b being fitted and inserted into the fitting and inserting hole 111a, as illustrated in Fig. 14. The tip portion of the kendama 111 of one kendama can be connected to a tip portion of a kendama 111 of another kendama. According to this, novel techniques, which cannot be performed with a common kendama, can be performed. Since other configurations, which are not specifically referred with respect to the connecting type attachable and detachable member 112 such as a structure of a shaft portion 112b of the connecting type attachable and detachable member 112 and materials consisting each portions, are same as those of the standard attachable and detachable member 112 explained above, an explanation is omitted.

[attachable and detachable member embedded with camera]

**[0037]** Finally, the attachable and detachable member 112 embedded with camera is explained. Fig. 16 is a magnified view illustrating a flow of attaching the attachable and detachable member 112 embedded with camera to a tip portion of a kendama 111. As illustrated in Fig. 16, in the attachable and detachable member 112 embedded with a camera, its head portion 112a is embedded with a small camera 112g to take a movie at an eye point of a top portion of the head portion 112a. This makes it possible to take a movie of a technique of kendama at a novel eye point not existing before. A cable 112h, which

supply a power to the small camera 112g or outputting data of a movie taken with the small camera 112g, is extending from a lower end portion of the small camera 112g. The cable 112h goes through a shaft portion 112b of the attachable and detachable member 112 to be contained in a fitting and inserting hole 111 a. A power source supplying the small camera 112g (not illustrated in Figs.) with a power and a memory (not illustrated in Figs.) storing data of movies taken with the small camera 112g can be contained in a cavity portion of a sword shaft 110 or as a cross-piece 120. Since other configurations, which are not specifically referred with respect to the attachable and detachable member 112 embedded with camera such as a structure of a shaft portion 112b of the attachable and detachable member 112 embedded with camera and materials consisting each portions, are same as those of the standard attachable and detachable member 112 explained above, an explanation is omitted. The attachable and detachable member 112 embedded with camera may be combined with the truncated attachable and detachable member 112, the attachable and detachable member 112 having a slit groove, or the attachable and detachable member 112 having string hole to make a hybrid type.

#### Reference Numerals

#### [0038]

100	sword
110	sword shaft
111	kensaki
111a	fitting and inserting hole
111b	shaft portion
112	attachable and detachable member
112a	head portion
112b	shaft portion
112c	retaining portion
112d	thread ridge
112e	slit groove
112f	string hole
112g	small camera
112h	cable
112i	fitting and inserting hole
112j	thread groove
114	kenjiri
115	slip-stop
116	middle cup
116a	middle cup rim
120	cross-piece
121	large cup
121a	large cup rim
122	small cup
122a	small cup rim
123	string hole
200	ball
210	hole
300	string

400	weight member
500	cushioning material

#### 5 Claims

1. A kendama comprising;
  - a sword having a sword shaft and a cross-piece;
  - a ball having a hole of inserting a kensaki protruding to an upper side than the cross-piece in the sword shaft; and
  - a string connecting the sword and the ball, wherein a tip portion of the kensaki is configured as an attachable and detachable member which is attachable and detachable with respect to a base end of the kensaki, the attachable and detachable member is a plurality of attachable and detachable members replaced each other.
2. The kendama according to Claim 1, wherein at least two attachable and detachable members out of the plurality of attachable and detachable members differ in at least any one item or more items out of a weight, shape, and color.
3. The kendama according to Claim 1 or 2, wherein at least one attachable and detachable member is of configuring a shape of the tip portion of the kensaki as a hemisphere or circular cone.
4. The kendama according to any one of Claims 1 to 3, wherein at least one attachable and detachable member is of configuring a shape of the tip portion of the kensaki as a circular truncated cone.
5. The kendama according to any one of Claims 1 to 4, wherein at least one attachable and detachable member is of providing a slit groove catching the string with the tip portion of the kensaki.
6. The kendama according to any one of Claims 1 to 5, wherein at least one attachable and detachable member is of providing a string hole connecting the string to the tip portion of the kensaki.
7. The kendama according to any one of Claims 1 to 6, wherein at least one attachable and detachable member is of connecting a kensaki of another kendama to the tip portion of the kensaki.
8. The kendama according to any one of Claims 1 to 7, wherein at least one attachable and detachable member is of attaching a small camera to the tip portion of the kensaki.
9. The kendama according to any one of Claims 1 to 8, wherein a fitting and inserting hole is provided on a tip end plane of the base end of the kensaki, the

attachable and detachable member has a shaft portion to be inserted and fitted to the fitting and inserting hole.

10. The kendama according to Claim 9, wherein a retaining portion is provided on the shaft portion, the retaining portion is configured by annularly providing an elastic protrusion along an outer peripheral face of the shaft portion. 5  
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11. The kendama according to any one of Claims 1 to 8, wherein a shaft portion is provided on a tip end plane of the base end of the kensaki, the attachable and detachable member is provided with a fitting and inserting hole to insert and fit the shaft portion. 15
12. The kendama according to Claim 11, wherein a thread groove is provided on an inner peripheral face of the fitting and inserting hole of the attachable and detachable member, the thread groove threadably mounts an outer peripheral face of the shaft portion on the base end of the kensaki. 20
13. The kendama according to any one of Claims 9 to 12, a weight member is contained in the fitting and inserting hole to adjust a weight of the kensaki. 25

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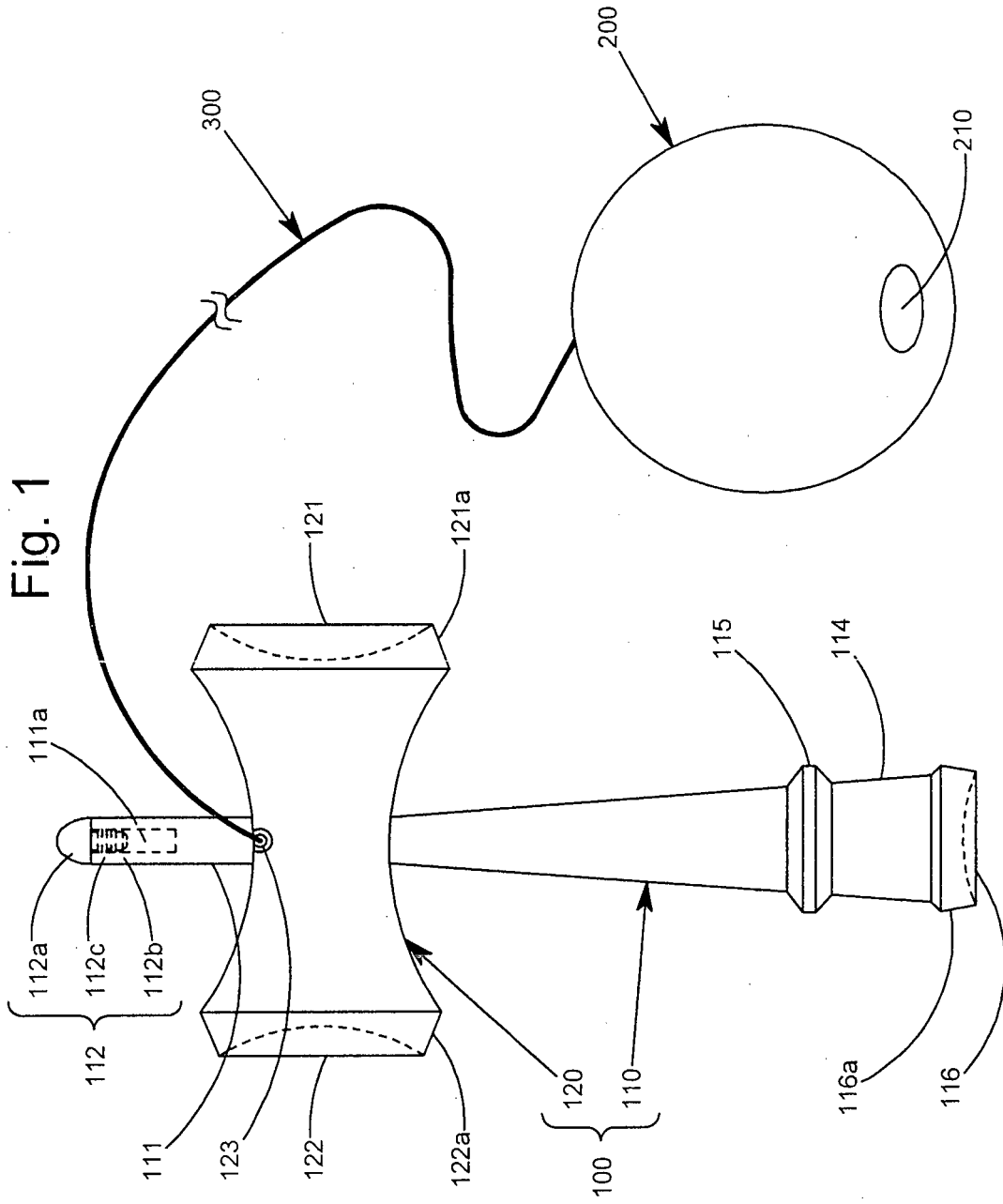


Fig. 2

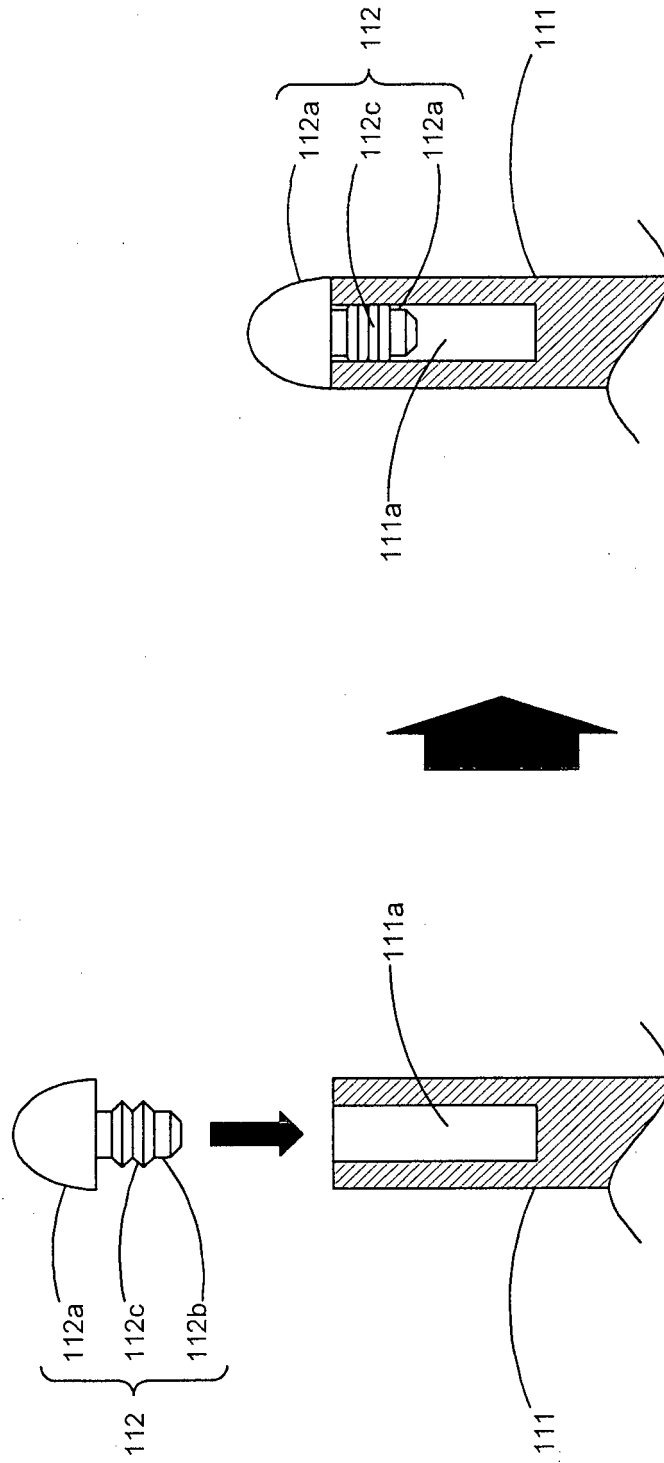


Fig. 3

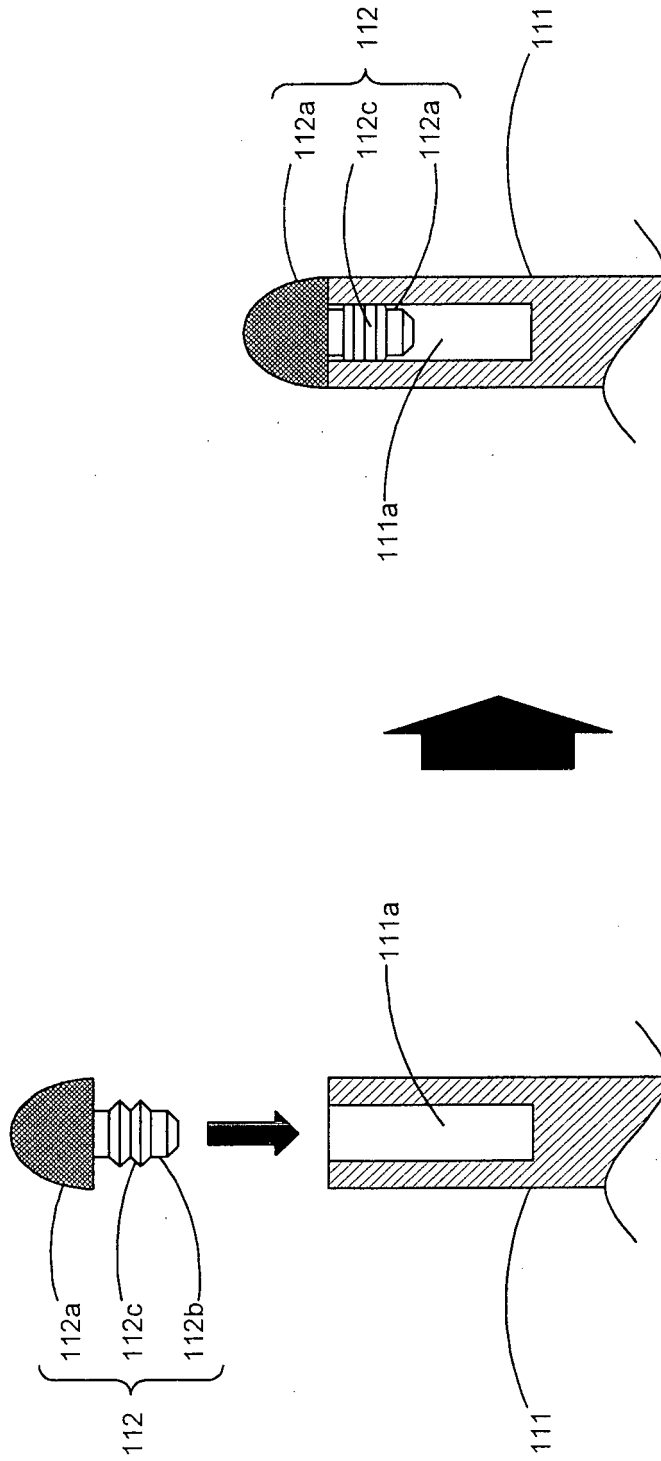


Fig. 4

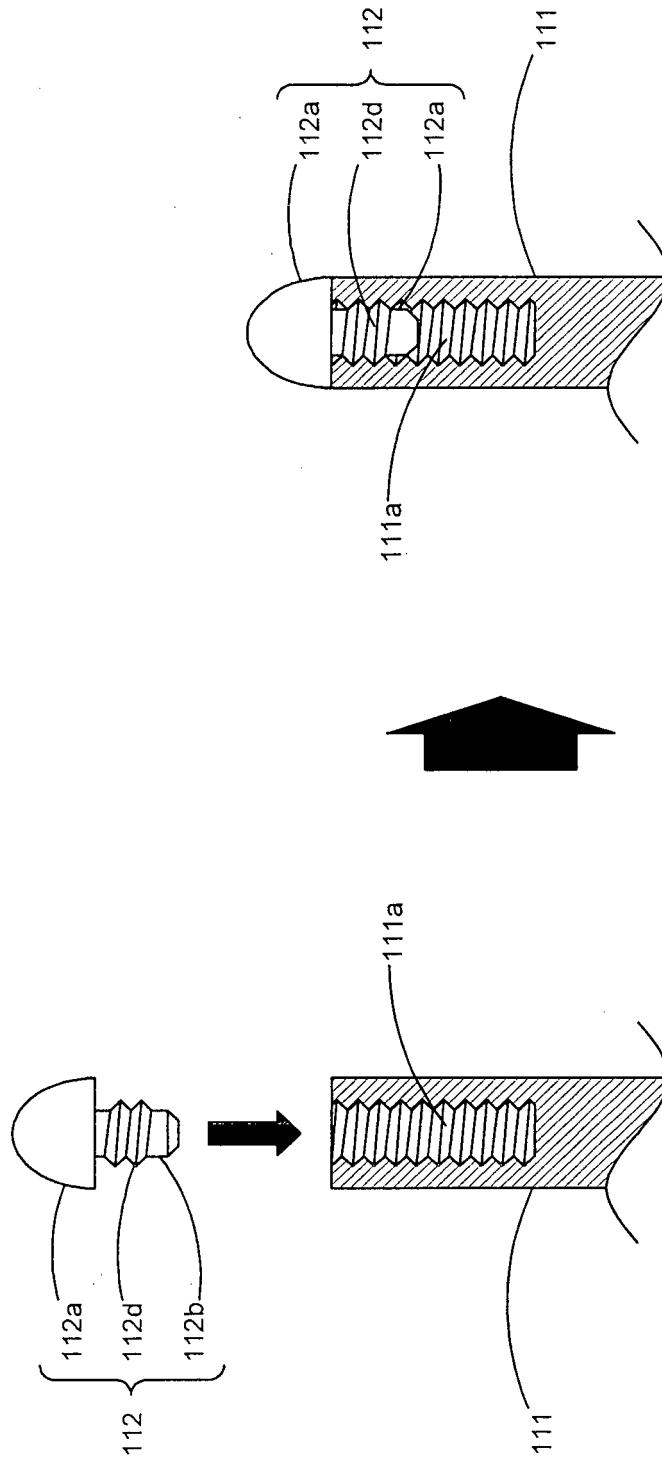


Fig. 5

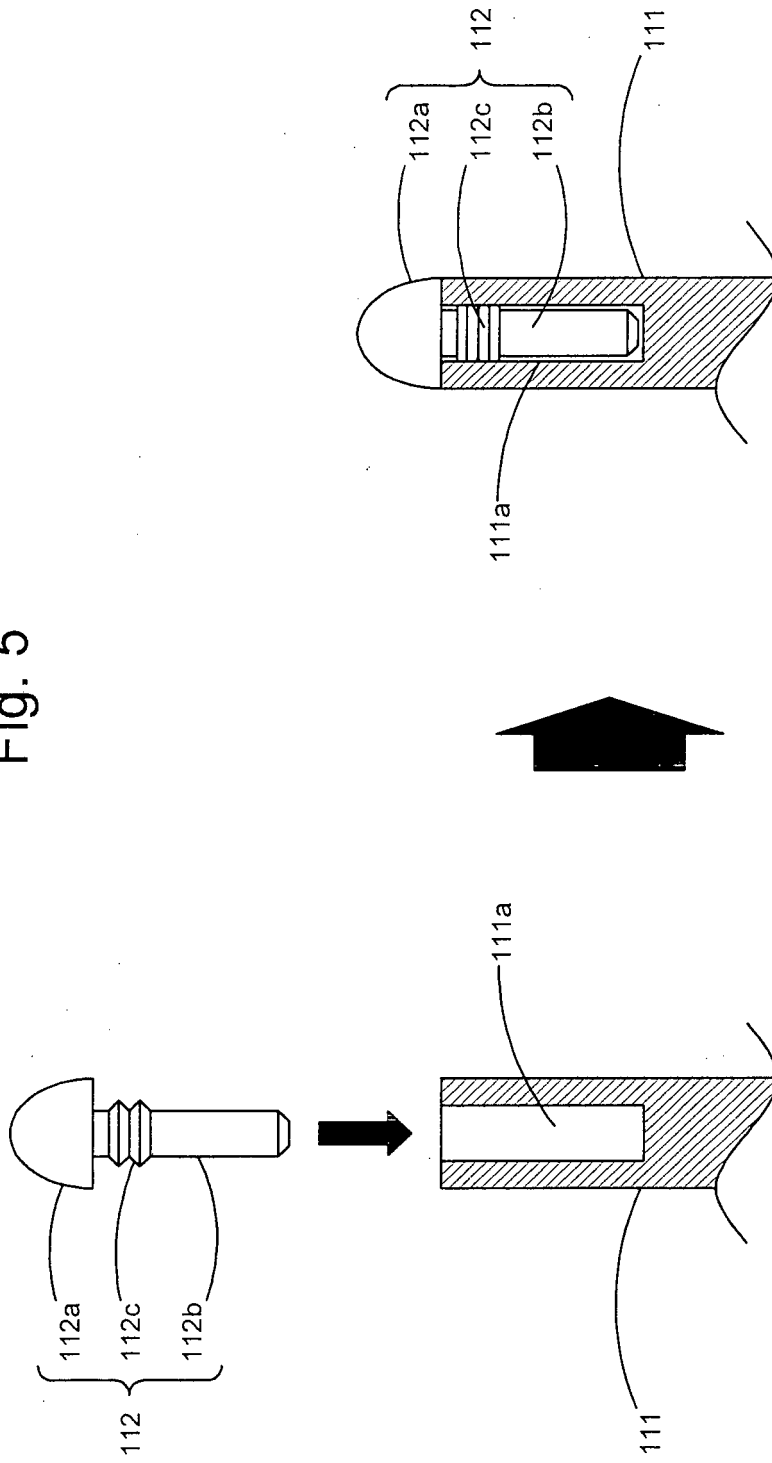


Fig. 6

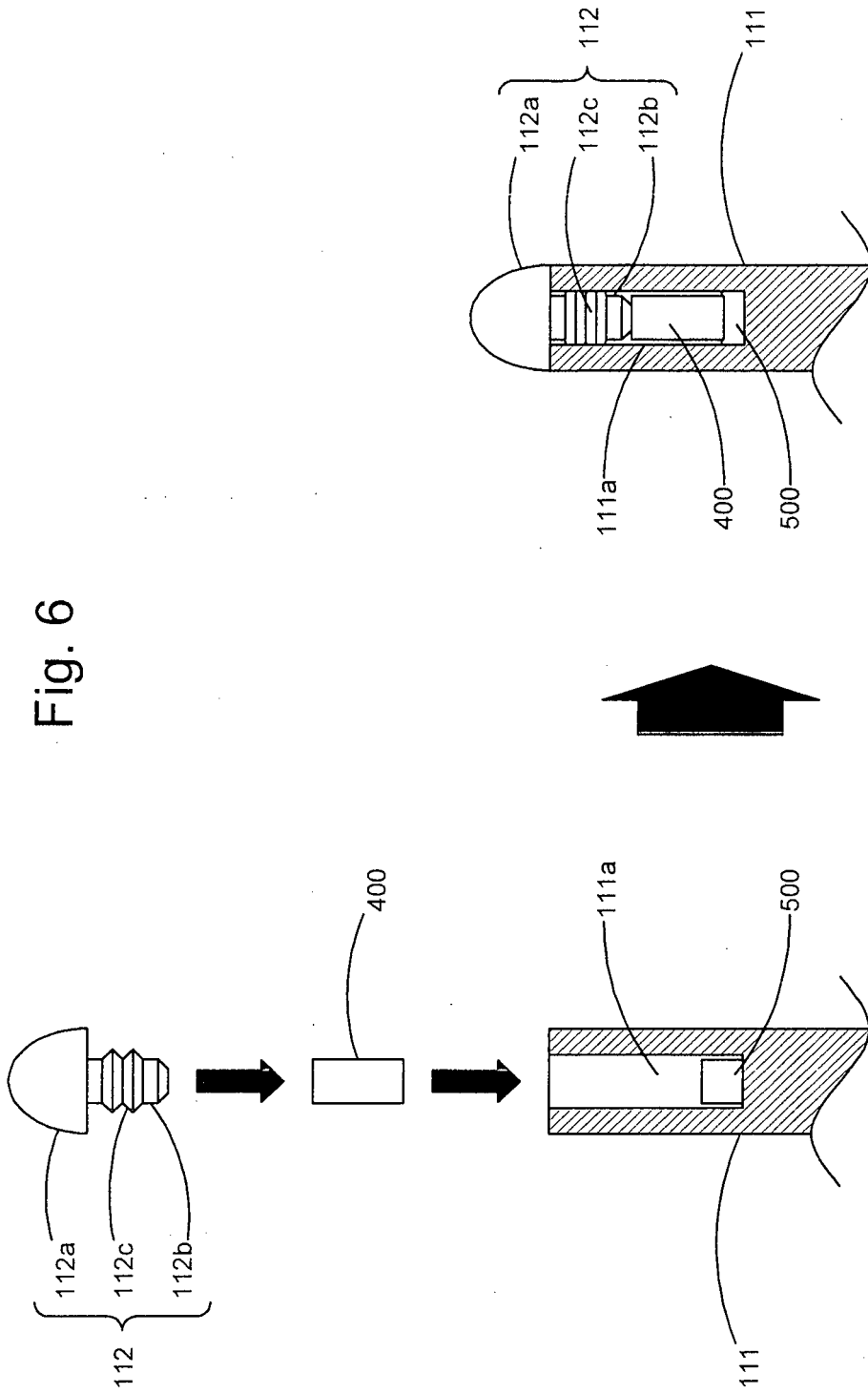


Fig. 7

Kensaki is light

Kensaki is heavy

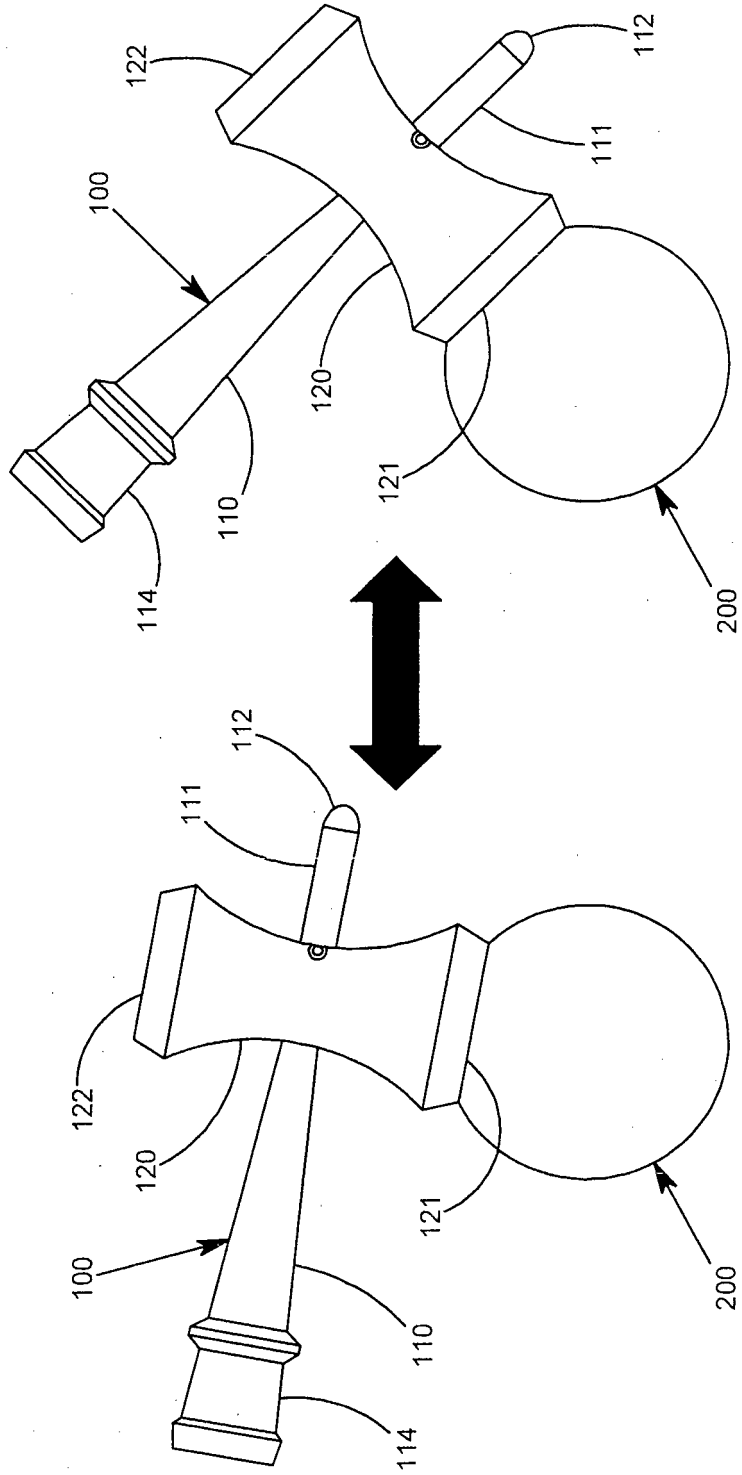
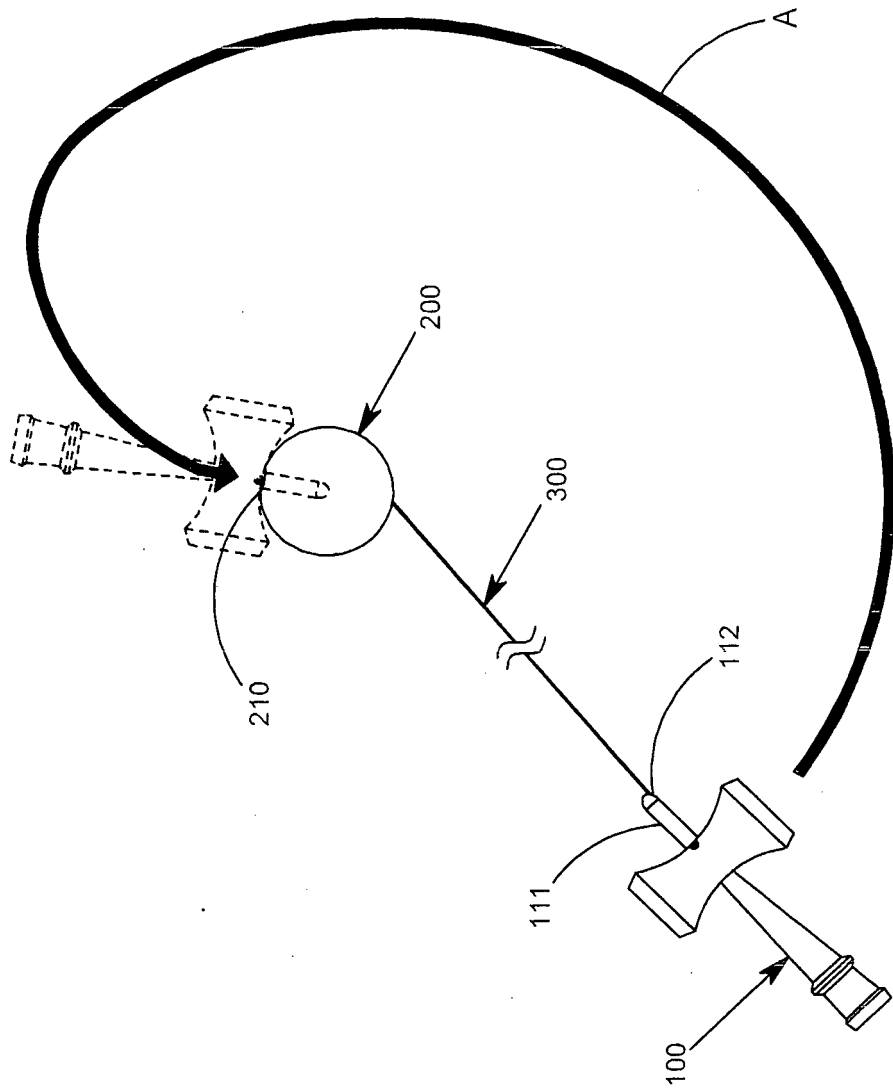


Fig. 8



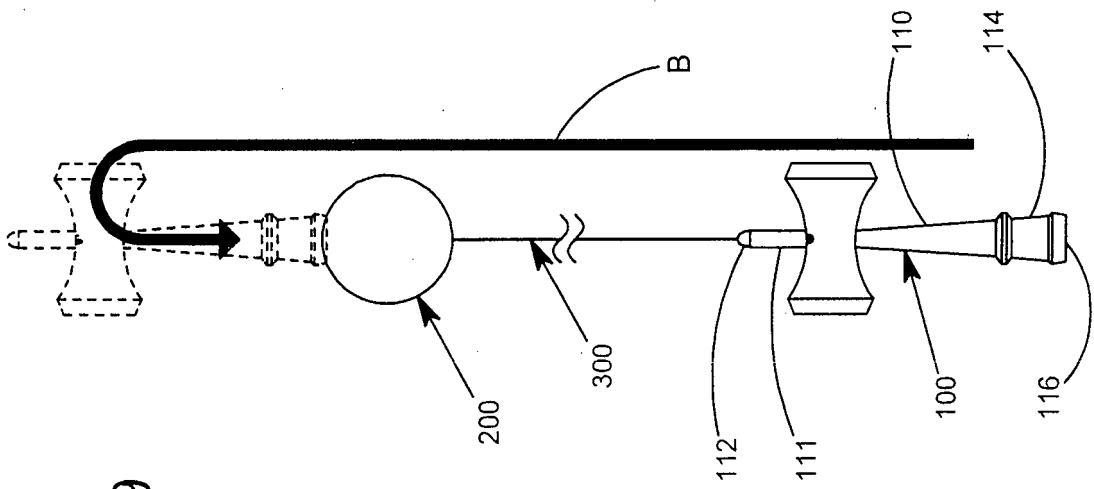


Fig. 9

Fig. 10

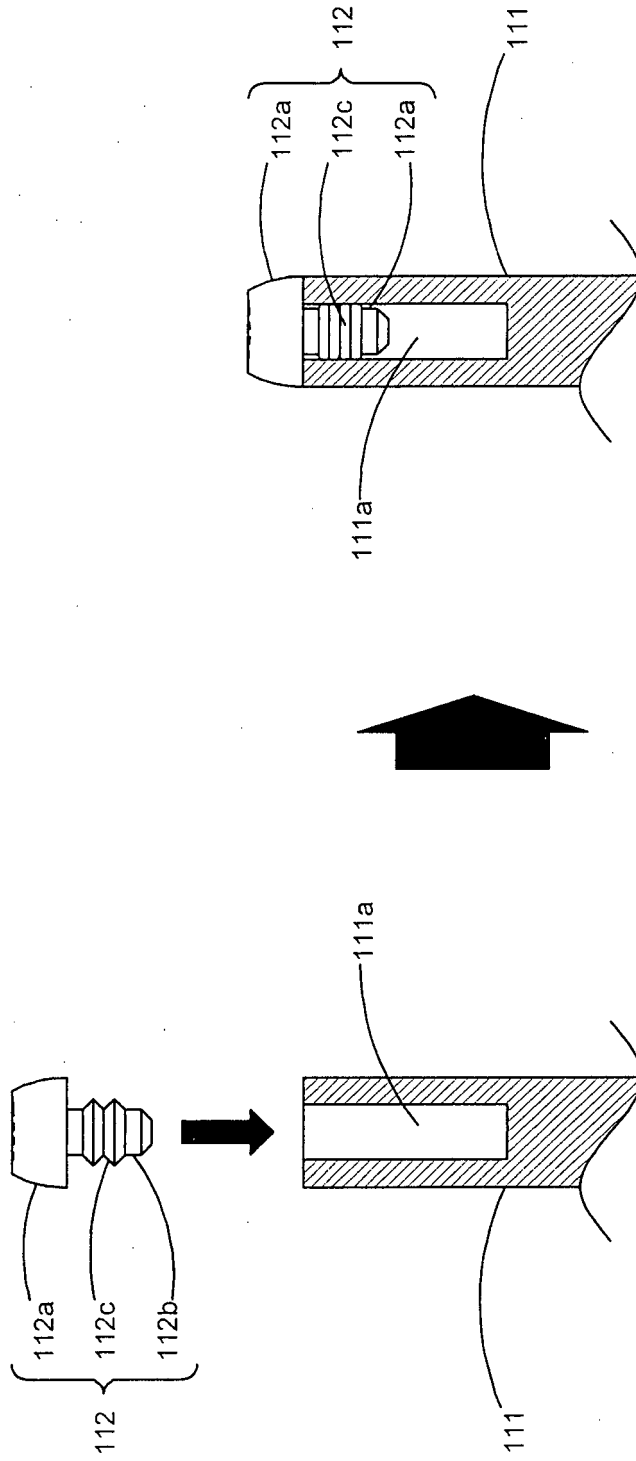
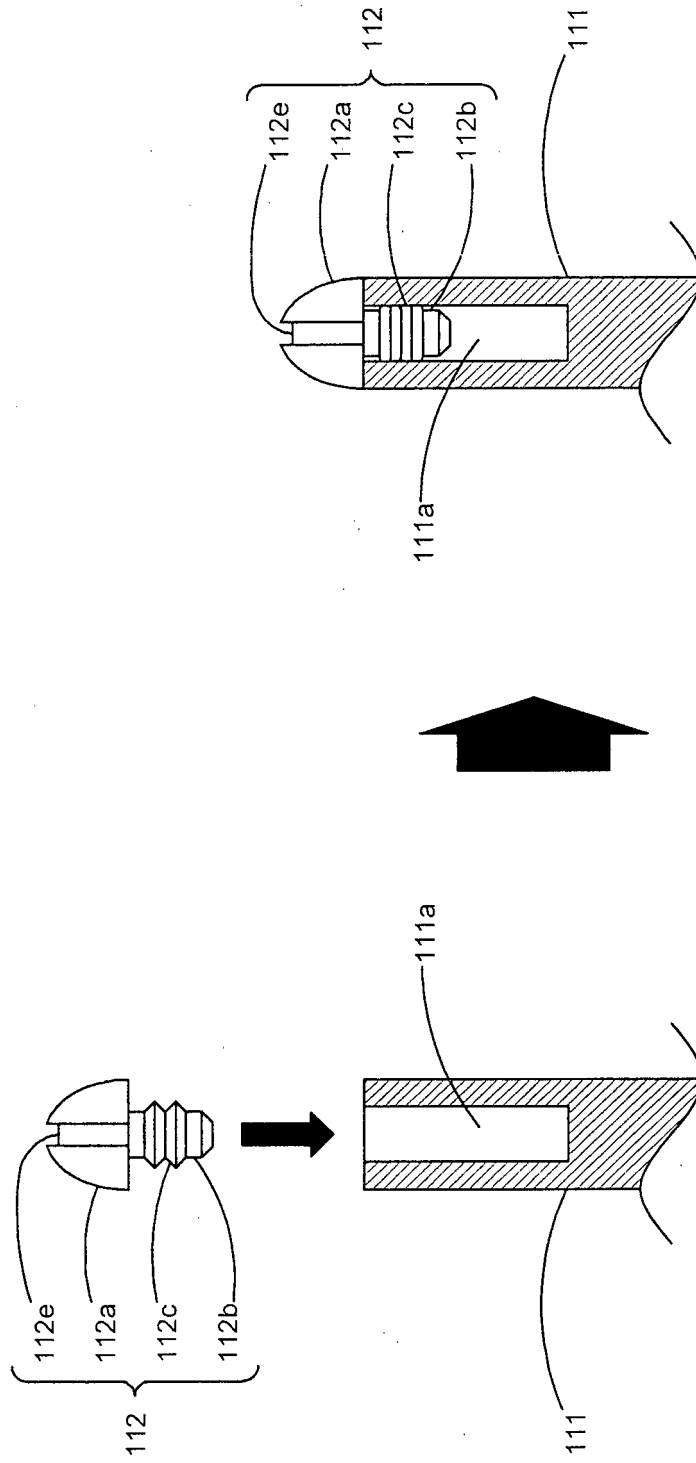
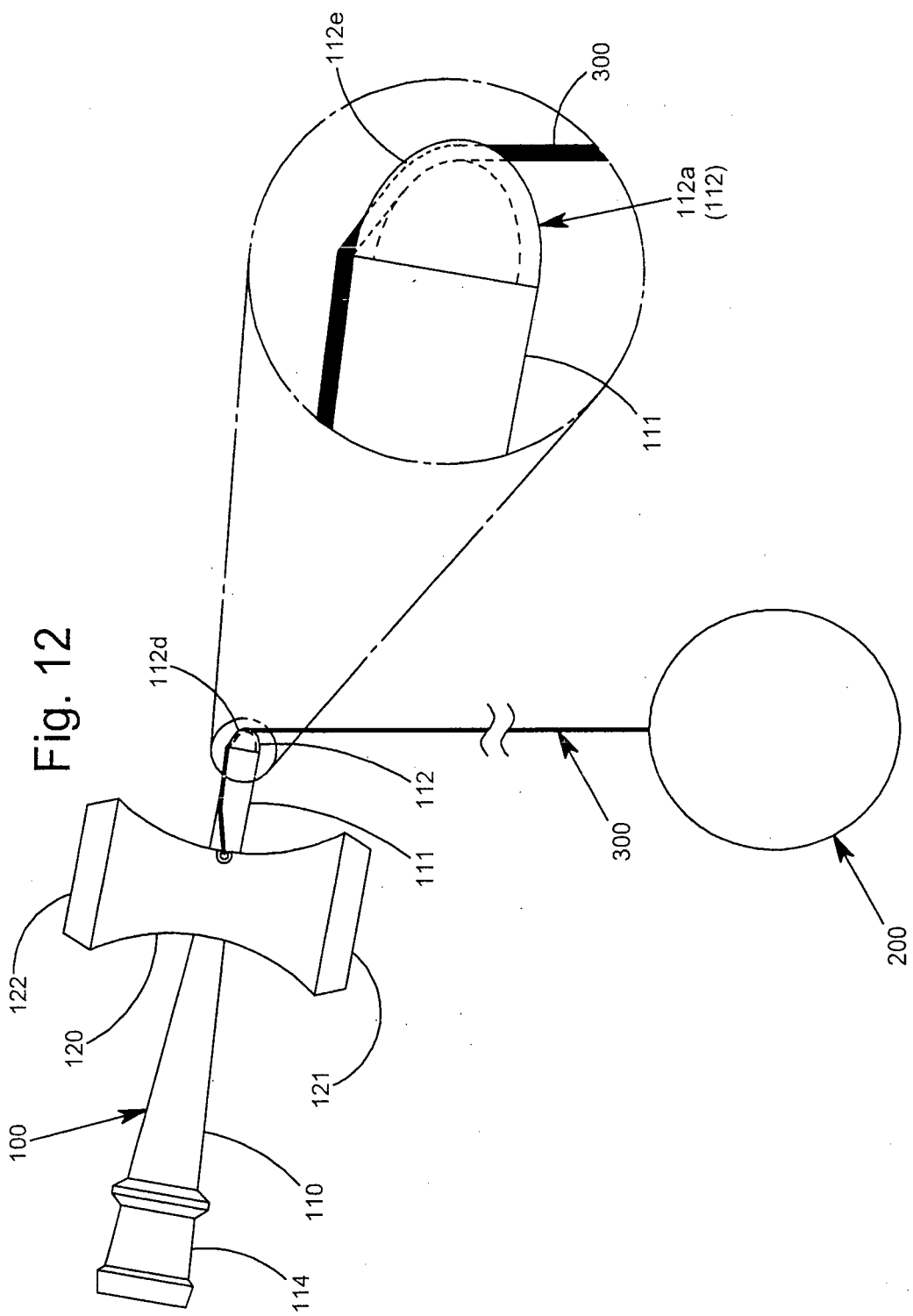


Fig. 11





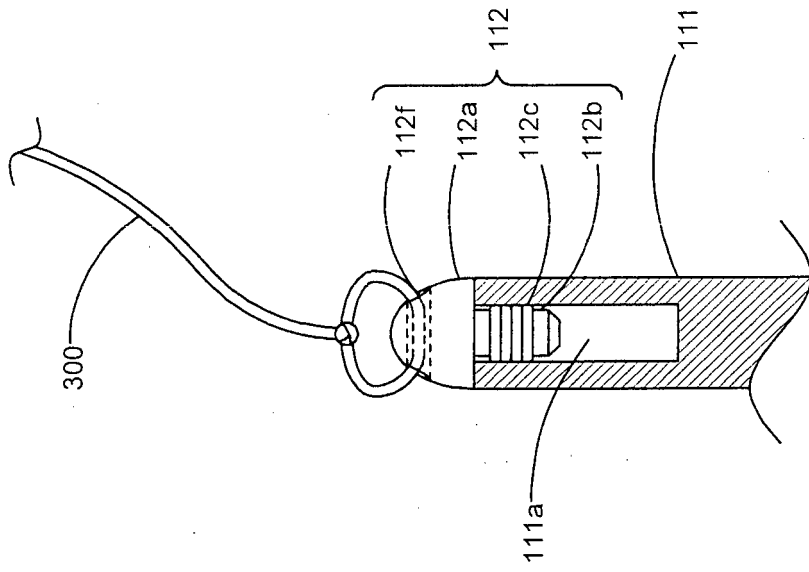
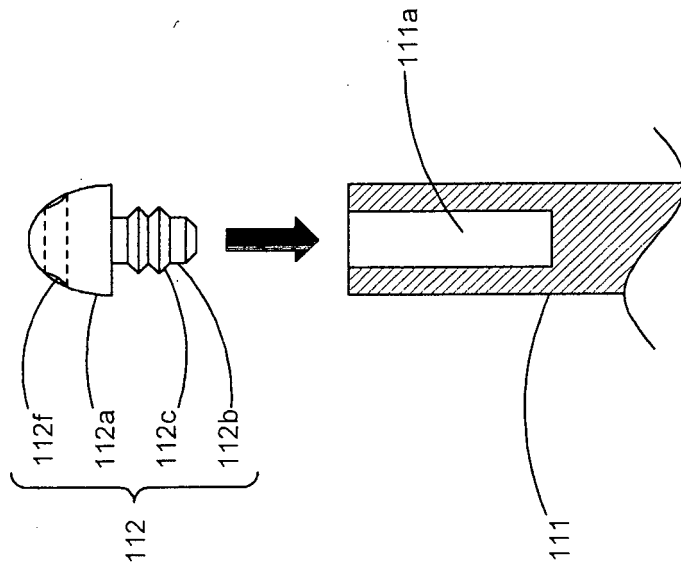


Fig. 13



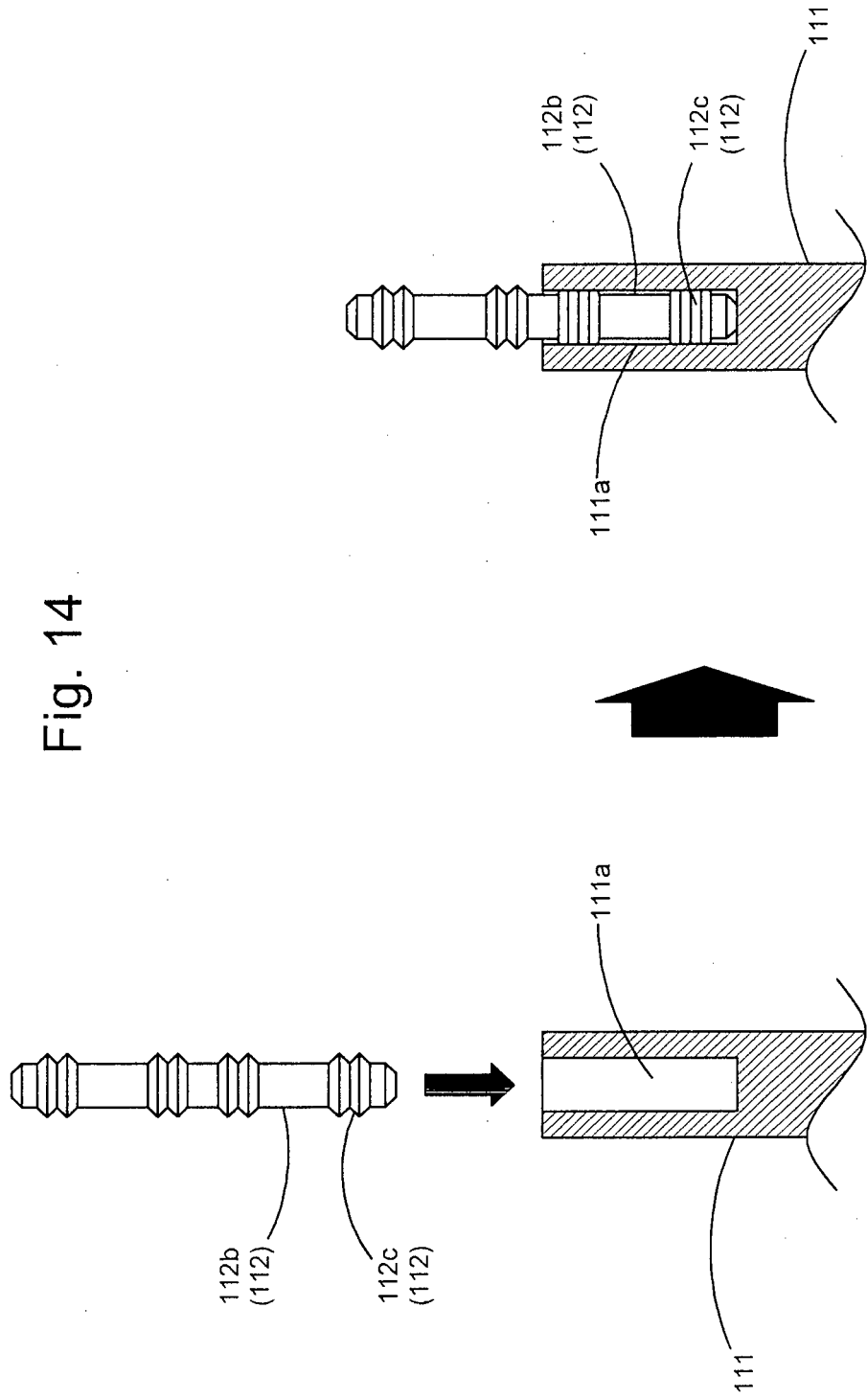


Fig. 14

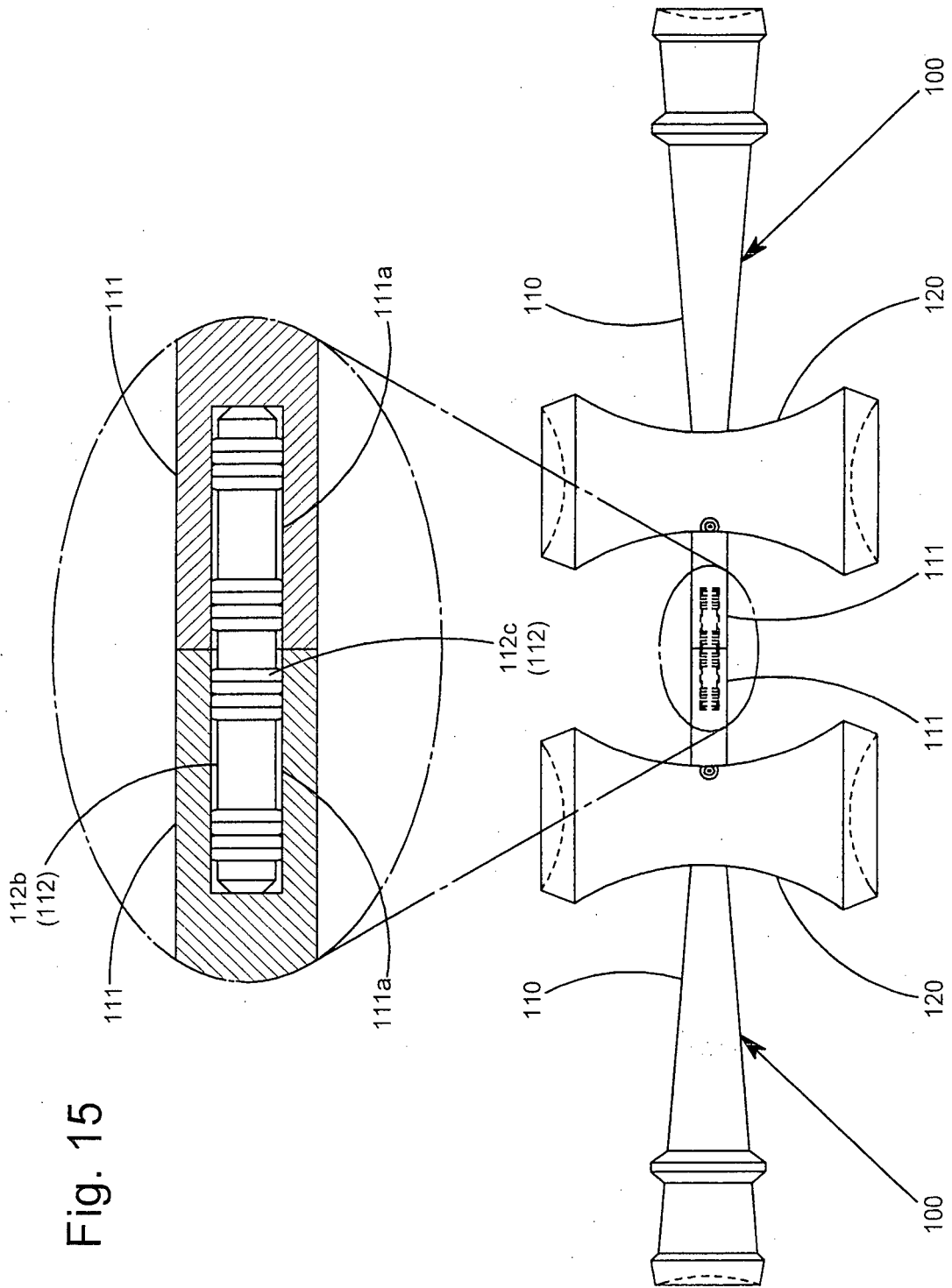


Fig. 15

Fig. 16

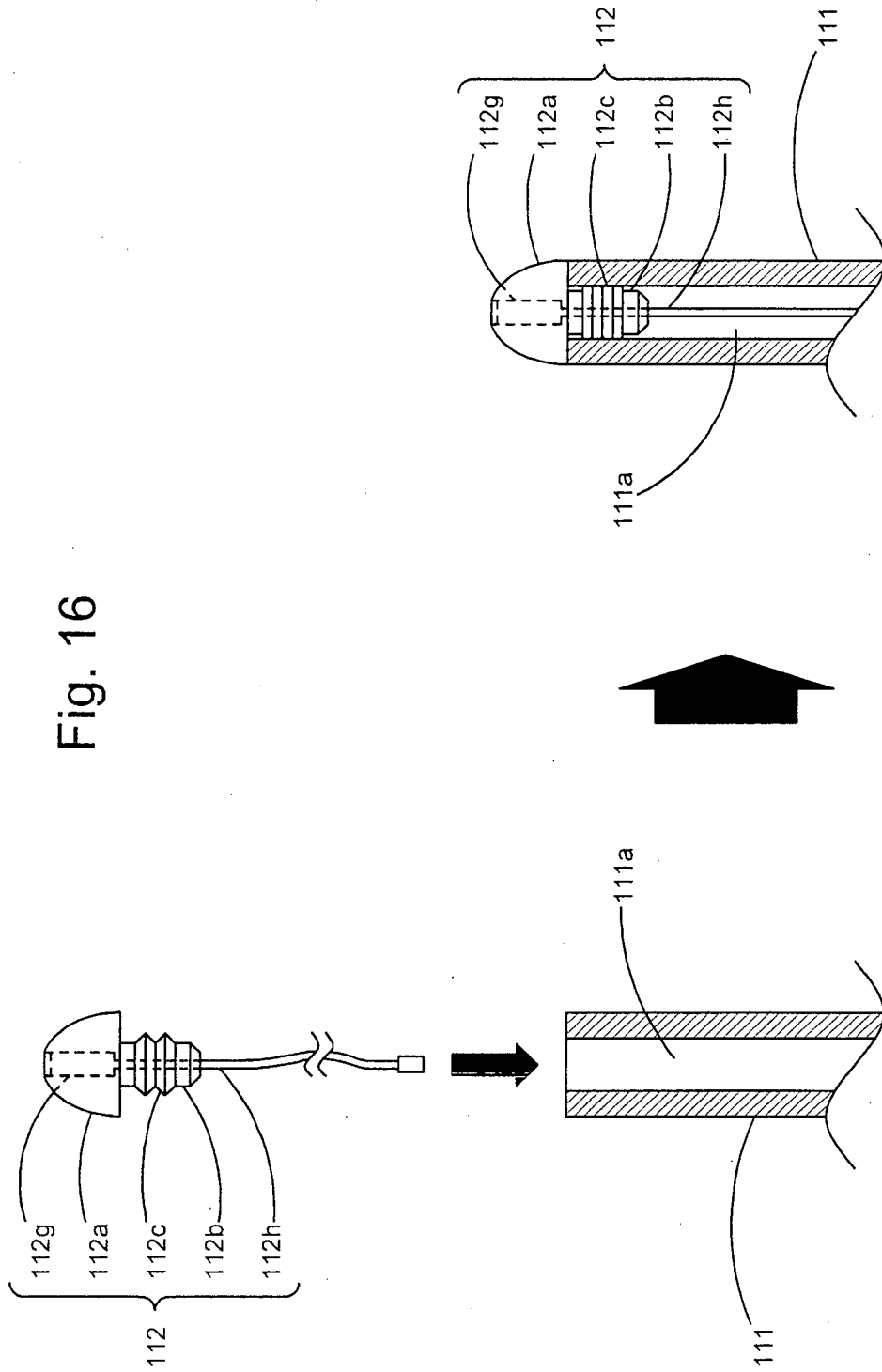


Fig. 17

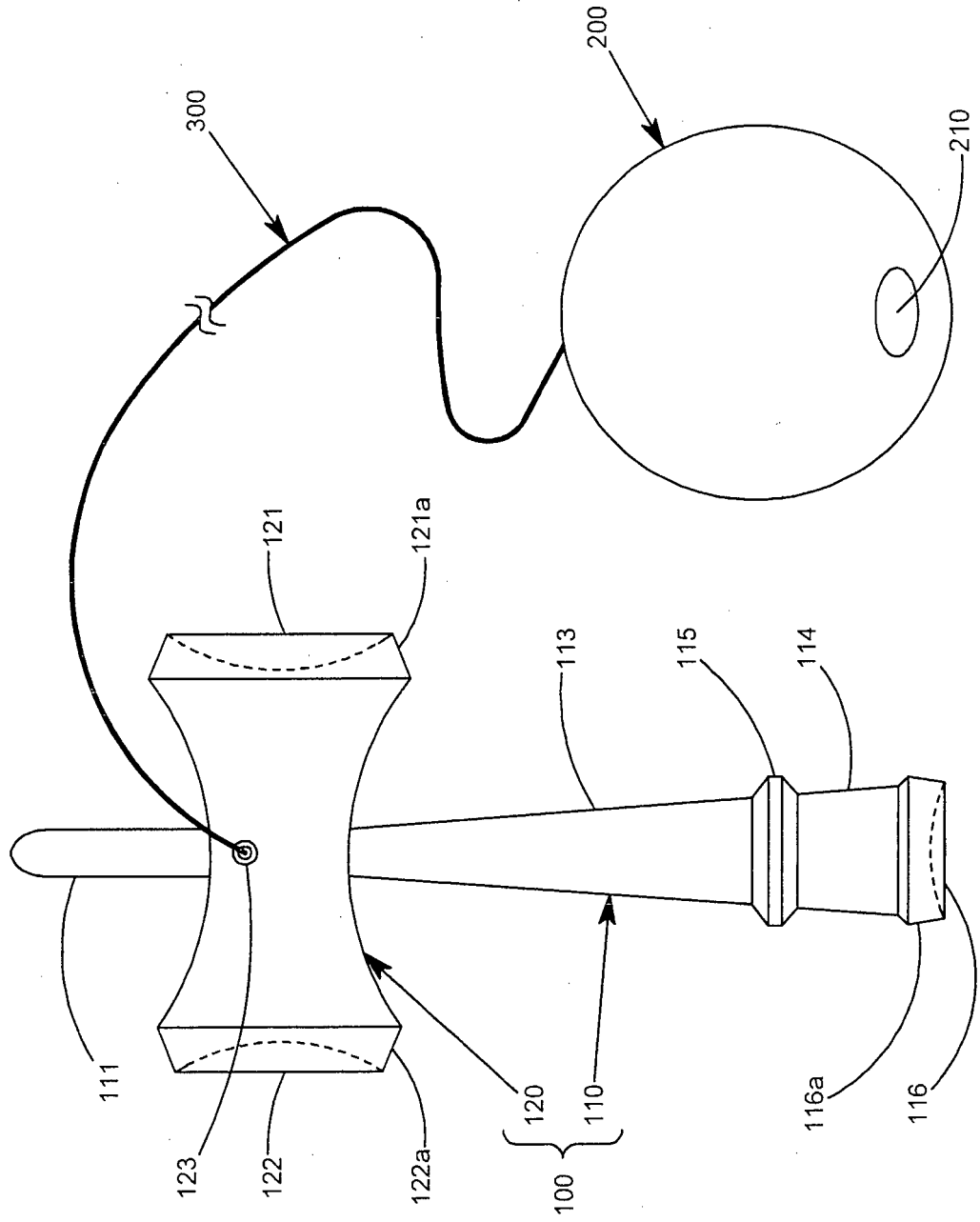
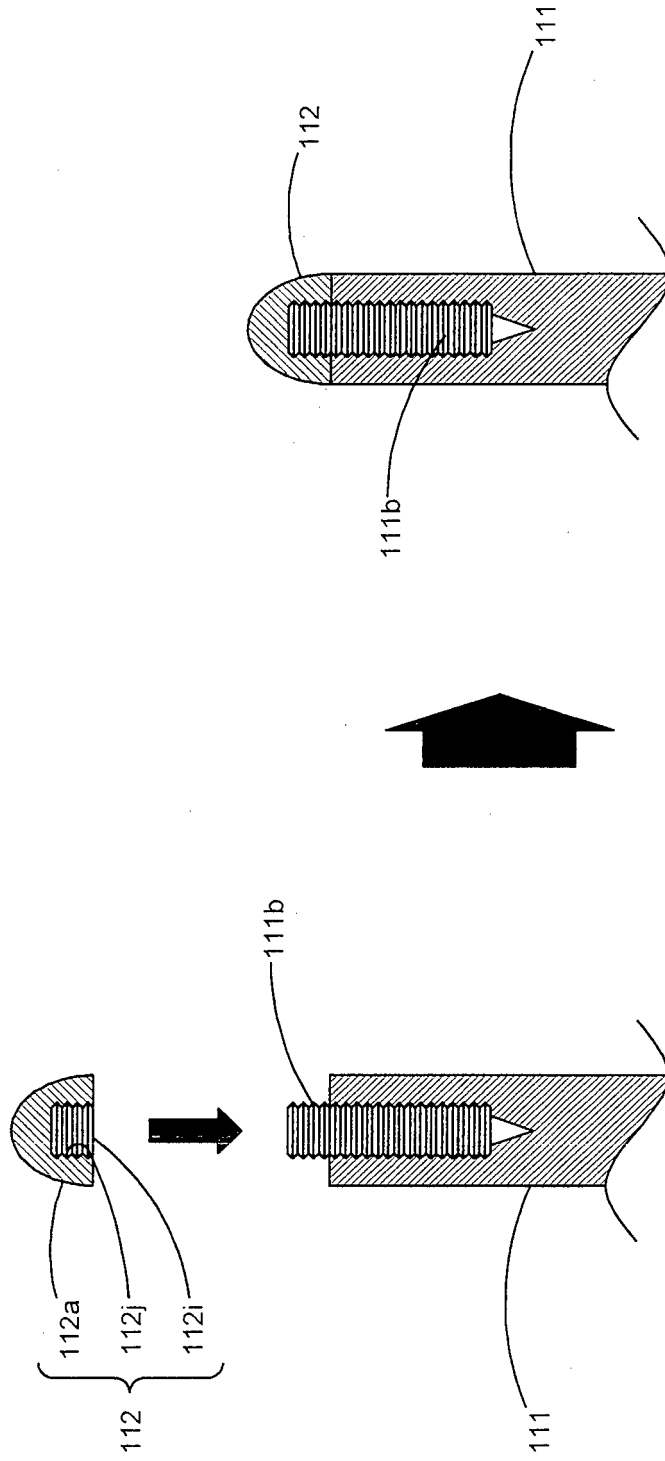


Fig. 18



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2013/074311

A. CLASSIFICATION OF SUBJECT MATTER A63B67/08(2006.01)i		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) A63B67/08		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2013 Kokai Jitsuyo Shinan Koho 1971-2013 Toroku Jitsuyo Shinan Koho 1994-2013		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 12-16699 Y1 (Shuji WAKAGURI), 11 November 1937 (11.11.1937), entire text; all drawings (Family: none)	1-13
A	JP 2002-360754 A (Hitoshi TAKEDA), 17 December 2002 (17.12.2002), entire text; fig. 3 (Family: none)	1-13
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 30 September, 2013 (30.09.13)		Date of mailing of the international search report 15 October, 2013 (15.10.13)
Name and mailing address of the ISA/ Japanese Patent Office		Authorized officer
Facsimile No.		Telephone No.

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.  
PCT/JP2013/074311

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 23077/1982 (Laid-open No. 126866/1983) (Katsuhiko YAMAMOTO), 29 August 1983 (29.08.1983), entire text; fig. 1 (Family: none)	1-13

**REFERENCES CITED IN THE DESCRIPTION**

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- JP S03007398 B [0006]
- JP 2002360754 A [0006]
- JP S12016699 B [0006]