

DESCRIPTION

FASTENER

Technical Field

[0001]

The present invention relates to a fastener that pinches and fixes an object, particularly to a fastener applicable for fixing a wig base on which artificial hairs are planted to a user's head.

Background Art

[0002]

A fastener for a wig is sometimes used in order to fix a wig base on which artificial hairs are planted to a user's head. The above fastener for a wig is attached to a back surface of the wig base (a side with which the user's head comes into contact) with sewing threads or the like, so that the fastener for a wig fixes the wig base to the user's head by pinching user's hairs. In the above fasteners for a wig, a structure using an inverting member to which a plurality of comb teeth are attached is proposed (see, for example, Patent Literature 1).

Citation List

Patent Literature

[0003]

Patent Literature 1: WO 2007/129708 A

Summary of Invention

Technical Problem

[0004]

According to an inverting member of a fastener for a wig disclosed in Patent Literature 1, a curved shape that is capable of being inverted is formed with a U-shaped member including a supporting piece to which a plurality of comb teeth are attached and a pair of leg pieces projecting from both end portions of the supporting piece, and a connection piece that pulls the leg pieces of both sides inward. The inverting member is inverted from a close state in which the comb teeth are in contact with the inverting member to an opposite side so that the inverting member warps sufficiently. Therefore, the comb teeth open with respect to the inverting member such that user's hairs are inserted between the opened comb teeth and the inverting member. Then, the comb teeth are inverted again in a direction in which comb teeth are closed, so that the comb teeth and the inverting member pinch the user's hairs to fix the user's hairs.

[0005]

According to the fastener for a wig disclosed in Patent Literature 1, when the leg pieces of the both sides are pulled inward by the connection piece, the leg pieces are respectively twisted to rotate around connection

portions to the supporting piece. In this case, since each of leg pieces is shorter than the supporting piece, moving distance of a tip portion of each of twisted leg pieces is small, so that a deformed amount of the inverting member is limited.

Therefore, when the inverting member deformed by the connection piece is inverted, an angle of opening of the comb teeth with respect to the inverting member is relatively narrow. As a result, when a user wears the wig, it is difficult that the user inserts their own hairs between the opened comb teeth and the inverting member, and the amount of hairs pinched by the comb teeth and the inverting member is limited.

[0006]

It is an object of the present invention to solve the above problem and provide a fastener that can be inverted to switch between a state in which comb teeth are closed and a state in which the comb teeth are opened, that permits hairs to be easily inserted between the opened comb teeth and an inverting member, and that permits more hairs to be inserted.

Solution to Problem

[0007]

To solve the above problem, a fastener of the present invention includes: an inverting member formed of

an elastic plate shape member, the inverting member having, in an initial state that is not deformed, a substantial quadrilateral plane shape composed of a pair of long side portions being opposed to each other and a pair of short side portions being opposed to each other, and an apart region being disposed between the long side portion and the short side portion or on a middle of the short side portion to extend in a longitudinal direction of the short side portion, the inverting member having connection regions respectively disposed on both sides of the apart region; a connection portion that connects the connection regions that are superimposed each other by a deformation of the inverting member; and a plurality of comb teeth whose one ends are fixed to one of the long side portions.

Advantageous Effects of Invention

[0008]

Thus, the present invention can provide the fastener that can be inverted to switch between a state in which the comb teeth are closed and a state in which the comb teeth are opened, that permits hairs to be easily inserted between the opened comb teeth and the inverting member, and that permits more hairs to be inserted.

Brief Description of Drawings

[0009]

FIG. 1 is a schematic plan view illustrating an

inverting member of one embodiment of the present invention.

FIG. 2(a) is a schematic plan view illustrating a fastener of the one embodiment of the present invention; FIG. 2(b) is a schematic side view, seen from arrows B shown in FIG. 2(a), illustrating the fastener in a state in which comb teeth are closed; and FIG. 2(c) is a schematic side view, seen from the arrows B shown in FIG. 2(a), illustrating the fastener in a state in which the comb teeth are opened.

FIG. 3(a) is a plan view (photograph) illustrating an example of a structure like the fastener of the one embodiment of the present invention; FIG. 3(b) is a side view (photograph) (a state in which the comb teeth are closed) seen from arrows B shown in FIG. 3(a); and FIG. 3(c) is a side view (photograph) (a state in which the comb teeth are opened) seen from arrows C shown in FIG. 3(a).

FIG. 4 is a schematic plan view illustrating an inverting member of another embodiment of the present invention.

FIG. 5 is a schematic plan view illustrating an inverting member of further embodiment of the present invention.

FIG. 6 is a view (photograph) illustrating Example 1 of the fastener of the present invention.

FIG. 7 is a view (photograph) illustrating Example 2

of the fastener of the present invention.

FIG. 8 is a view (photograph) illustrating Example 3 of the fastener of the present invention.

FIG. 9 is a view (photograph) illustrating a comparative example 4 of the fastener of the present invention.

FIG. 10 is a schematic plan view illustrating a fastener of a further embodiment including a comb teeth shape different from that shown in FIGS. 2(a), 2(b), and 2(c).

FIG. 11 is a view (photograph) illustrating an example of the fastener of the further embodiment shown in FIG. 10.

FIG. 12 is a graph illustrating a relation between a ratio D/W of a moving amount D when the inverting member is deformed to a length W of one of long side portions (a comb teeth attachment part) and a distance (a maximum distance) H when the comb teeth are opened, in the fastener of the present invention.

FIG. 13 is a graph illustrating a relation between the ratio D/W of the moving amount D when the inverting member is deformed to the length W of the one of the long side portions and an opening angle θ when the comb teeth are opened, in the fastener of the present invention.

FIG. 14 is a plan view schematically illustrating a

wig to which the fastener of the present invention is attached.

Description of Embodiments

[0010]

According to a first aspect of the present invention, a fastener includes an inverting member formed of an elastic plate shape member, the inverting member having, in an initial state that is not deformed, a substantial quadrilateral plane shape composed of a pair of long side portions being opposed to each other and a pair of short side portions being opposed to each other, and an apart region being disposed between the long side portion and the short side portion or on a middle of the short side portion to extend in a longitudinal direction of the short side portion, the inverting member having connection regions respectively disposed on both sides of the apart region; a connection portion that connects the connection regions that are superimposed each other by a deformation of the inverting member; and a plurality of comb teeth whose one ends are fixed to one of the long side portions.

[0011]

In a case in which the apart region is disposed between the long side portion and the short side portion, the apart region may be disposed between one of the long side portions to which the comb teeth are fixed and the

short side portion, and may be disposed between the other of the long side portions to which the comb teeth are not fixed and the short side portion. In a case in which the apart region is disposed on the middle of the short side portion, the apart region may be disposed on any positions of the short side portion.

[0012]

According to the first aspect, the connection regions that are disposed on both sides of the apart region in the initial state, are superimposed each other by deforming the inverting member so that the inverting member curves in a vertical direction with respect to a plane (a wide surface) of the inverting member, the inverting member having the plurality of comb teeth fixed thereto. Then, the superimposed connection regions are connected each other with a connection member to form the fastener. According to the fastener describe above, when a user inverts the inverting member to warp sufficiently to the opposite side, the fastener switches between a close state in which tips of the plurality of comb teeth are in contact with the inverting member and an open state in which the tips of the plurality of comb teeth are apart from the inverting member. When an inverting operation is not performed by the user, each of the states is maintained by an elastic force of the inverting member.

[0013]

Especially, according to the first aspect, the apart region extends in the longitudinal direction of the short side portion. Accordingly, when the inverting member is deformed to superimpose the connection regions disposed on both sides of the apart region, the long side portions whose lengths (dimensions in longitudinal directions) are large are twisted to be rotated around connection portions with the short side portions. Although rotation angles (twist angles) around the connection portions of side portions as rotation centers are same each other, the longer side portion that is rotated (twisted) has the larger moving distance at a tip portion of the rotation. That is, the inverting member 4 is largely deformed as the whole. As a result, in the inverting member whose connection regions are connected in a deformed state, difference of angle of the inverting member that is curved in the opposite direction under an inverted condition relative to a not inverted condition becomes large.

[0014]

Therefore, in a state in which the comb teeth are opened, an opening angle formed with the comb teeth and the inverting member is set to be large. Accordingly, since hairs are inserted to a neighborhood of root portions of the comb teeth fixed to the inverting member, more hairs

are inserted. In the state in which the comb teeth are opened, the opening angle is large, so that a distance between the tips of the comb teeth and the inverting member is set to be large. Accordingly, hairs are easily inserted between the opened comb teeth and the inverting member.

[0015]

According to a fastener of a second aspect of the present invention, in the above first aspect, when, in the initial state, a length of the one of the long side portions is set to be W and a moving amount of the connection regions from the initial state to a superimposed state is set to be D , a relation of $0.15 \leq D/W \leq 0.17$ is established.

[0016]

A ratio D/W of the moving amount D of the connection regions from the initial state to the superimposed state to the length W of the one of the long side portions to which the comb teeth are attached, means that the larger its value is, the larger the inverting member is deformed. Accordingly, in the state in which the comb teeth are opened, an angle formed with the comb teeth and the inverting member is set to be large, and the distance between the tips of the comb teeth and the inverting member is set to be large. Therefore, hairs are easily inserted between the opened comb teeth and the inverting member and

more hairs are inserted between the opened comb teeth and the inverting member.

On the other hand, when a deformed amount becomes larger, durability of the inverting member tends to decrease, and a force required to invert the inverting member tends to increase to deteriorate operability.

[0017]

Taking the above into consideration collectively, D/W is set to be a value within a range of not less than 0.15 and not more than 0.17 as described later, so that a fastener is provided that is preferable in terms of ease of insertion of hairs, amount of hairs that is capable of insertion, durability, and operability.

Incidentally, the moving amount D is expressed as a distance between centers of connection holes that are provided on the connection regions on both sides of the apart region and into which a connection portion is inserted.

[0018]

According to a fastener of a third aspect of the present invention, in the above first or second aspect, each of the comb teeth includes a head portion disposed on a free end of each of the comb teeth, and each of the head portions is positioned in a region in which the other of the long side portions is disposed.

[0019]

According to the third aspect, since a part of each of axis portions and each of the head portions of tips of the comb teeth are positioned in the region in which the other of the long side portions is disposed, hairs are certainly held between the axis portions and the head portions of the comb teeth and the other of the long side portions in a state in which the comb teeth are closed. Since the comb teeth are not extended beyond the other of the long side portions, when a user wears the wig, there is no risk that the comb teeth interfere with a wig net.

[0020]

According to a fastener of a fourth aspect of the present invention, in the above first or second aspect, each of the comb teeth includes a head portion disposed on a free end of each of the comb teeth, at least a part of the head portion is positioned in an outward of the substantial quadrilateral plane shape, and the other part of each of the comb teeth is positioned in a region of the substantial quadrilateral plane shape.

[0021]

According to the fourth aspect, at least a part of the head portion of tip of each of the comb teeth is positioned in the outward of the substantial quadrilateral plane shape, so that, when a user wears the wig, the user

easily scoops their hairs. Further, each of the head portions approaches the other of the long side portions as possible, so that, when a user wears the wig, each of the comb teeth is restrained from interfering with the wig net.

[0022]

According to a fastener of a fifth aspect of the present invention, in the above third or fourth aspect, a friction member is provided on the other of the long side portions.

[0023]

According to the fifth aspect, the friction member is provided on the other of the long side portions. Therefore, in the state in which the comb teeth are closed, a holding force that holds hairs between the comb teeth and the friction member increases, so that hairs are more certainly held. When the friction member is provided on the whole area of the other of the long side portions whose width dimension is set to be large, hairs are held in a wider area between the comb teeth and the friction member with the axis portions as well as the head portions of the comb teeth.

[0024]

According to a fastener of a sixth aspect of the present invention, in any one of the above first to fifth aspects, in the initial state, the apart region is provided

between the other of the long side portions and the short side portion, and the connection region disposed on the other of the long side portions is arranged to be more apart from the one of the long side portions relative to a case in which a longitudinal direction of the other of the long side portions is parallel to a longitudinal direction of the one of the long side portions.

[0025]

According to the sixth aspect, the connection region disposed on the other of the long side portions is arranged to be more apart from the one of the long side portions relative to a case in which the other of the long side portions is parallel to the one of the long side portions. Accordingly, when the inverting member is deformed from the initial state, the inverting member is more largely deformed to connect the connection regions.

Consequently, according to the fastener that is formed, in the state in which the comb teeth are opened, the angle formed with the comb teeth and the inverting member is set to be larger, and a distance between the tips of the comb teeth and the inverting member is set to be large.

[0026]

According to a fastener of a seventh aspect of the present invention, in the above sixth aspect, in the

initial state, a central part of the other of the long side portions is formed to be curved in a direction to approach the one of the long side portions.

[0027]

According to the seventh aspect, since, in the initial state, the central part of the other of the long side portions is formed to be curved in the direction to approach the one of the long side portions, the inverting member is deformed to be more largely and smoothly inverted. Consequently, according to the fastener that is formed, in the state in which the comb teeth are opened, the angle formed with the comb teeth and the inverting member is set to be larger, and a distance between the tips of the comb teeth and the inverting member is set to be large.

[0028]

With reference to the drawings, a detail explanation of a fastener of an embodiment of the present invention will be made hereinafter.

(Explanation of fastener of one embodiment)

With reference to FIGS. 1 to 3, the fastener of the embodiment of the present invention will be explained. In the first place, an inverting member, as a primary member of the fastener, will be explained in detail, later on, the whole fastener will be explained in detail.

[0029]

FIG. 1 is a schematic plan view illustrating an inverting member 4 of one embodiment of the present invention. FIG. 2(a) is a schematic plan view illustrating a fastener 2 of the embodiment of the present invention. FIG. 2(b) is a schematic side view, seen from arrows B shown in FIG. 2(a), illustrating the fastener 2 in a state in which comb teeth 6 are closed. FIG. 2(c) is a schematic side view, seen from the arrows B shown in FIG. 2(a), illustrating the fastener 2 in a state in which comb teeth 6 are opened. FIG. 3(a) is a plan view (photograph) illustrating an example of a structure like the fastener 2 of the one embodiment of the present invention. FIG. 3(b) is a side view (photograph) (a state in which the comb teeth are closed) seen from arrows B shown in FIG. 3(a). FIG. 3(c) is a side view (photograph) (a state in which the comb teeth are opened) seen from arrows C shown in FIG. 3(a).

[0030]

<Explanation of inverting member of one embodiment>

FIG. 1 illustrates a plane shape of the inverting member 4 in an initial state in which the inverting member 4 is not yet deformed. From this initial state, the inverting member 4 is deformed to superimpose connection regions indicated by arrows X, X' and tighten the connection regions with a tightening member, so that the

fastener 2 as shown in FIGS. 2(a), 2(b), and 2(c) is formed.

The inverting member 4 is formed of a metal thin plate as an elastic material. As shown in FIG. 1, the inverting member 4 has, in the initial state, a substantial quadrilateral plane shape composed of a pair of long side portions 4a, 4b being opposed to each other and a pair of short side portions 4c, 4d being opposed to each other. Each of a plurality of comb teeth 6 is fixed in a cantilevered state with respect to the long side portion 4a that is positioned at a lower side in the drawing. The long side portion 4a may be referred to as one of the long side portions 4a or a comb teeth attachment part 4a.

The long side portion 4b that is positioned at a location opposed to the long side portion 4a is referred to as the other of the long side portions 4b. Since a friction member 20 is mounted on the long side portion 4b as described later with reference to FIG. 2(a), the long side portion 4b is also referred to as a friction body mounting part 4b. On the other hand, the short side portion 4c that is connected to an end of a right side of the one of the long side portions (the comb teeth attachment part) 4a in the drawing is referred to as one short side portion 4c, and the short side portion 4d that is connected to an end of a left side of the one of the long side portions (the comb teeth attachment part) 4a in

the drawing is referred to as other short side portion 4d.

[0031]

The one short side portion 4c and the other short side portion 4d extend in the same direction that is approximately perpendicular to a longitudinal direction of the one of the long side portions (the comb teeth attachment part) 4a. Ends of the one of the long side portions (the comb teeth attachment part) 4a, the other of the long side portions (the friction body mounting part) 4b, the one short side portion 4c, and the other short side portion 4d are connected to each other at ends except for between the ends of the other of the long side portions (the friction body mounting part) 4b and the other short side portion 4d. An apart region is provided between the end of the other of the long side portions (the friction body mounting part) 4b and the end of the other short side portion 4d.

[0032]

In other words, the one of the long side portions (the comb teeth attachment part) 4a is respectively connected to the one short side portion 4c and the other short side portion 4d at both ends thereof, and the one short side portion 4c is connected to the other of the long side portions (the friction body mounting part) 4b at an opposite end thereof. The other of the long side portions

(the friction body mounting part) 4b extends from a connection portion (see an arrow Z) with the one short side portion 4c to oppose to the one of the long side portions (the comb teeth attachment part) 4a.

The apart region indicated by an arrow Y is provided between an end of a free end side of the other of the long side portions (the friction body mounting part) 4b and an end of a free end side of the other short side portion 4d. The apart region (see the arrow Y) extends in a longitudinal direction of the other short side portion 4d.

[0033]

The connection regions that are superimposed each other when the inverting member 4 is deformed are provided on both sides of the apart region (see the arrow Y). The connection region indicated by the arrow X is provided on the end of the free end side of the other of the long side portions (the friction body mounting part) 4b, and a connection hole 12 is provided on this connection region (see the arrow X). The connection region indicated by the arrow X' is provided on the end of the free end side of the other short side portion 4d, and a connection hole 14 is provided on this connection region (see the arrow X').

[0034]

According to the embodiment, the connection region (see the arrow X) disposed on the other of the long side

portions (the friction body mounting part) 4b is arranged to be more apart from the one of the long side portions (the comb teeth attachment part) 4a relative to a case in which the longitudinal direction of the other of the long side portions (the friction body mounting part) 4b is parallel to the longitudinal direction of the one of the long side portions (the comb teeth attachment part) 4a. Therefore, the large apart region (see the arrow Y) is obtained without reducing a length of the other short side portion 4d.

A central part of the other of the long side portions (the friction body mounting part) 4b is formed to be curved in a direction to approach the one of the long side portions (the comb teeth attachment part) 4a as indicated by an arrow A. That is, the central part is formed to be curved so as to project inside the substantial quadrilateral.

[0035]

A width dimension of the other of the long side portions (the friction body mounting part) 4b is formed to be larger than that of other side portions 4a, 4c, 4d. On two places of the other of the long side portions (the friction body mounting part) 4b, lightening holes 22 are provided, so that the other of the long side portions (the friction body mounting part) 4b is composed of three areas

indicated by 4b1, 4b2, 4b3. The lightening holes 22 enable weight reduction of the inverting member 4, so that the inverting member 4 is easily deformed.

On the whole inverting member 4, five attachment holes 24 are provided. The fastener 2 is sewed on a wig base, and so on, by passing sewing treads, or the like, through the attachment holes 24.

[0036]

Each of the plurality of metal comb teeth 6 is composed of an axis portion 6a and a head portion 6b whose diameter is larger than that of the axis portion 6a. Each of the axis portions 6a of the comb teeth 6 is fixed to the inverting member 4 at an opposite side end thereof to a side on which the head portion 6b is provided, by welding (for example, brazing). That is, each of the comb teeth 6 is fixed in a cantilevered state with respect to the inverting member 4. A fixing method is not intended to be restricted to welding, so that a tightening member may be used to mechanically tighten, or other arbitrary fixing methods may be adopted.

The comb teeth 6 is fixed to the inverting member 4 that is formed to be capable of being inverted so that a curved shape including a concave and a convex becomes in an opposite direction. Therefore, in a state as a close state of the comb teeth 6, the comb teeth 6, especially the head

portions 6b of the comb teeth 6 are in contact with the inverting member 4. In an open state of the comb teeth 6 that the inverting member 4 is inverted to an opposite side, the comb teeth 6 are lifted at a predetermined angle from the inverting member 4.

[0037]

With reference to FIGS. 2 and 3, an explanation will be made with respect to the above description. FIG. 2(a) is a plan view illustrating a state in which the inverting member 4 shown in FIG. 1 is deformed (curved) to superimpose the connection regions (see the arrows X, X') so that the connection regions are connected to each other with a connection member.

FIGS. 2(b) and 2(c) are schematic side views seen from the arrows B shown in FIG. 2(a). FIG. 2(b) illustrates the close state of the comb teeth 6. FIG. 2(c) illustrates the open state of the comb teeth 6. As shown in FIG. 2(b), a state in which the inverting member 4 is curved to be convex downward in the drawing is the close state of the comb teeth 6 in which the comb teeth 6, especially the head portions 6b of the comb teeth 6 are in contact with the inverting member 4. On the other hand, when the inverting member 4 is inverted in an opposite direction so that the inverting member 4 becomes curved to convex upward in the drawing as shown in FIG. 2(c), the

comb teeth 6 become the open state in which the comb teeth 6 are apart from the inverting member 4. Each state is maintained by an elastic force of the inverting member 4. In the open state of the comb teeth 6, when the comb teeth 6 are closed after hairs are inserted between the comb teeth 6 and the inverting member 4, the close state of the comb teeth 6 is maintained. Therefore, between the comb teeth 6 and the inverting member 4, hairs are certainly held (grasped).

[0038]

According to an example shown in FIGS. 3(a), 3(b), and 3(c), FIG. 3(a) is a plan view like FIG. 2(a), and FIG. 3(b) is also a side view, seen from the arrows B shown in FIG. 3(a), illustrating the close state of the comb teeth 6 like FIG. 2(b).

FIG. 3(c) is a side view, seen from the arrows C shown in FIG. 3(a), illustrating the open state of the comb teeth 6. The state in which the comb teeth 6 are opened is definitely illustrated in FIG. 3(c). In FIG. 3(c), each of the comb teeth 6 with a length L is opened at an opening angle θ with respect to the inverting member 4, so that each of the head portions 6b of the comb teeth 6 is apart from the inverting member 4 with a distance H . The length L of each of the comb teeth 6 is a length except for a fixing portion (a welding part) to the inverting member 4,

so that a relation of $H = L \times \sin \theta$ is established.

[0039]

<Explanation of deformation of inverting member>

In the initial state shown in FIG. 1, the inverting member 4 is deformed (curved) so that the connection hole 12 provided on the other of the long side portions (the friction body mounting part) 4b and the connection hole 14 provided on the other short side portion 4d coincide with each other. In this state, a connection member 10 is inserted into the connection hole 12 and the connection hole 14, so that the superimposed connection regions (see the arrows X, X') are connected to each other. For example, after a metallic rivet as the connection member 10 is inserted into the connection holes 12, 14, a tip portion of the inserted rivet may be plastically deformed to connect the superimposed connection regions. That is, the connection regions are connected to each other by "caulking".

[0040]

A connecting method is not intended to be restricted to the methods described above, that is, the connection regions may be mechanically connected to each other by, for example, a bolt, a nut or other connection members and may be connected to each other by welding. Since each of the superimposed connection regions affords to relatively move

by using the connection member 10, the structure is considered to be more excellent in operability.

[0041]

A more detail description will be made hereinafter with respect to a structure deforming (curving) the inverting member 4 in order to conform positions of the connection holes 12, 14 of the inverting member 4.

In the initial state, the inverting member 4 is deformed so that the inverting member 4 is curved in a direction that is perpendicular to a plane of the inverting member 4 (that is, a vertical direction with respect to a surface of a paper shown in FIG. 1). At this time, the apart region (see the arrow Y) extends in the longitudinal direction of each of the short side portions (especially, the other short side portion 4d). Therefore, when the connection regions (see the arrows X, X') on both sides of the apart region (see the arrow Y) are deformed to be superimposed each other, the long side portions 4a, 4b whose lengths (dimensions in longitudinal directions) are large are respectively twisted to be rotated around connection portions (see the arrows Z, Z') to the one short side portion 4c. This movement is schematically shown by arrows with dotted lines in FIG.1. Although rotation angles (twist angles) around the connection portion between the side portions as a rotation center are the same, the

longer a length of the side portion that is rotated (twisted) is, the larger the moving distance on a tip portion of the rotation becomes. That is, the inverting member 4 is largely deformed as the whole. As a result, in the inverting member 4 whose connection regions are connected in a deformed state, difference of angle of the inverting member that is curved in the opposite direction under an inverted condition relative to a not inverted condition becomes large.

[0042]

Therefore, in a state in which the comb teeth 6 are opened shown in FIG. 3(c), the opening angle θ formed with the comb teeth 6 and the inverting member 4 is set to be large. Since hairs are inserted to a neighborhood of a root portion of each of the comb teeth 6 fixed to the inverting member 4, more hairs are inserted. In the state in which the comb teeth 6 are opened, the opening angle θ is large, so that a distance H between the tips of the comb teeth 6 and the inverting member 4 is set to be large. Accordingly, hairs are easily inserted between the opened comb teeth 6 and the inverting member 4.

[0043]

The inverting member 4 is deformed so that in the initial state shown in FIG. 1, a distance D between a center of the connection hole 12 and a center of the

connection hole 14 becomes 0. That is, a deformed amount of the connection regions (see the arrows X, X') from the initial state to a superimposed state coincides with the distance D. As shown in FIG. 1, when the length of the one of the long side portions (the comb teeth attachment part) 4a is set to be W, a ratio of the moving amount D from the initial state to the superimposed state to a length W of the one of the long side portions (the comb teeth attachment part) 4a is expressed as D/W .

[0044]

A value of D/W is an index indicating degree of a deformation of the inverting member 4, so that basically, the larger the value of D/W is, the larger the degree of the deformation is. Therefore, according to the fastener 2 that is formed, when the value of D/W is large and the comb teeth 6 are opened, the opening angle θ formed with the comb teeth 6 and the inverting member 4 is larger, and the distance H between the tip portions (the head portions 6b) of the comb teeth 6 and the inverting member 4 is set to be large. When the moving amount D becomes larger, durability of the inverting member 4 tends to decrease and a force required to invert the inverting member 4 tends to increase.

Therefore, by setting D/W within an appropriate range, hairs can be inserted between the opened comb teeth 6 and the inverting member 4, and more amount of hairs can

be inserted between the opened comb teeth 6 and the inverting member 4. Therefore, the fastener 2 that is preferable in terms of durability and operability can be provided.

[0045]

Since a moving direction from the initial state to the superimposed state conforms to the longitudinal direction of the other short side portion 4d, the moving direction is approximately perpendicular to the longitudinal direction of the one of the long side portions (the comb teeth attachment part) 4a. However, the moving direction need not be strictly perpendicular to the longitudinal direction of the one of the long side portions 4a. When the inverting member 4 is deformed, the moving directions of the connection regions only have to be within a predetermined angle range with respect to a perpendicular direction to the longitudinal direction of the one of the long side portions (the comb teeth attachment part) 4a as described later.

[0046]

<Explanation of fastener of one embodiment>

As described above, the inverting member 4 whose connection regions are connected to each other in a deformed state is formed into a substantially rectangular shape composed of four sides without the apart region.

As apparent from FIG. 2(a), the head portions 6b of the comb teeth 6 are positioned in a region in which the other of the long side portions (the friction body mounting part) 4b is disposed. Therefore, since a part of each of axis portions 6a and each of the head portions 6b of tips of the comb teeth 6 are positioned in the region in which the other of the long side portions (the friction body mounting part) 4b is disposed, hairs are certainly held between the axis portions 6a and the head portions 6b of the comb teeth 6 and the other of the long side portions (the friction body mounting part) 4b in a state in which the comb teeth 6 are closed. Since the comb teeth are not extended beyond the other of the long side portions, when a user wears the wig, there is no risk that the comb teeth interfere with a wig net.

[0047]

The length of each of the comb teeth 6 and a position of each of the head portions 6b are not restricted to a case shown in FIGS. 2(a), 2(b), and 2(c). FIG. 10 is a schematic plan view illustrating a fastener of further embodiment including a comb teeth shape different from that shown in FIGS. 2(a), 2(b), and 2(c). FIG. 11 is a view (photograph) illustrating an example of the fastener of the further embodiment shown in FIG. 10.

As shown in FIGS. 10 and 11, at least a part of each

of the head portions 6b of the comb teeth 6 may be positioned in an outward of the substantial quadrilateral plane shape that is composed of the pair of opposed long side portions 4a, 4b and the pair of opposed short side portions 4c, 4d (that is, positioned in an outward of the other of the long side portions 4b), and the other part of each of the comb teeth 6 may be positioned in a region of the substantial quadrilateral plane shape. Only each of the head portions 6b of the comb teeth 6 or only a part of each of the head portions 6b of the comb teeth 6 may extend beyond the other of the long side portions 4b.

[0048]

Each of the comb teeth 6 projected out the substantial quadrilateral plane shape allows the user to easily scoop their hairs, when a user wears the wig. On the other hand, when a projecting amount is large, each of the comb teeth 6 sometimes interferes with the wig net. According to the embodiment, at least a part of the head portion 6b of the tip of each of the comb teeth 6 is positioned in the outward of the substantial quadrilateral plane shape, so that, when a user wears the wig, the user easily scoops their hairs. Further, each of the head portions 6b approaches the other of the long side portions (the friction body mounting part) 4b as possible, so that, when a user wears the wig, each of the comb teeth 6 is

restrained from interfering with the wig net.

When also a limited area of the axis portion 6a near the head portion 6b (for example, an area whose length is not more than 1 mm from a border with the head portion 6b) is positioned in the outward of the substantial quadrilateral plane shape as well as the head portion 6b of each of the comb teeth 6, almost the same action and effect as above are generated.

[0049]

When an outer diameter of each of the axis portions 6a of the comb teeth 6 is constant, a bending moment on a base portion of each of the comb teeth 6 (an attachment portion to the inverting member 4) is constant. Therefore, the shorter the length of each of the comb teeth 6 is, the larger a press force of the tip of each of the comb teeth 6 to a side of the inverting member 4 becomes. On the other hand, when the length of each of the comb teeth 6 is large, an installation area of the friction member 20 becomes large. In this regard, a holding force of hairs improves.

According to both the embodiments shown in FIGS. 2 and 10, the balanced length of each of the comb teeth 6 with respect to the press force of the tip of each of the comb teeth 6 and the installation area (length) of the friction member 20 is adopted.

[0050]

The friction member 20 is disposed on the whole surface of the other of the long side portions (the friction body mounting part) 4b of the inverting member 4. For the friction member 20, an elastic material having a high friction coefficient such as a rubber, for example, silicon, elastomer, and urethane, may be used.

For example, in the initial state, the friction member 20 formed into a tube shape is inserted from the apart region (see the arrow Y) and the friction member 20 is put on to cover the other of the long side portions (the friction body mounting part) 4b. After that, the inverting member 4 is deformed to connect the connection regions each other, so that the other of the long side portions (the friction body mounting part) 4b of the inverting member 4 is provided with the friction member 20. An installation method of the friction member 20 is not intended to be restricted to the above case. After the inverting member 4 is deformed to connect the connection regions each other, the friction member 20 may be attached to the other of the long side portions (the friction body mounting part) 4b by adhering or the like.

[0051]

According to the embodiment, since the friction member 20 is provided on the other of the long side portions (the friction body mounting part) 4b, in the state

in which the comb teeth 6 are closed, a holding force that holds hairs between the comb teeth 6 and the friction member 20 increases, so that hairs are more certainly held. As described above, since the width dimension of the other of the long side portions (the friction body mounting part) 4b is set to be large, hairs can be held in a wider area between the comb teeth 6 and the friction member 20 with the axis portions 6a of the comb teeth 6 as well as the head portions 6b of the comb teeth 6 by providing the friction member 20 on the whole area of the other of the long side portions (the friction body mounting part) 4b.

Also, in a case shown in FIGS. 10 and 11, since the friction member 20 exists a little outside the other of the long side portions (the friction body mounting part) 4b, hairs can be held between the head portions 6b of the comb teeth 6 and the friction member 20.

[0052]

According to the inverting member 4 in the initial state shown in FIG. 1, as described above, the connection region (see the arrow X) disposed on the other of the long side portions (the friction body mounting part) 4b is arranged to be more apart from the one of the long side portions (the comb teeth attachment part) 4a relative to a case in which the longitudinal direction of the other of the long side portions (the friction body mounting part) 4b

is parallel to the longitudinal direction of the one of the long side portions (the comb teeth attachment part) 4a. Therefore, the large apart region (see the arrow Y) is obtained without reducing a length of the other short side portion 4d.

The lager apart region (see the arrow Y) is obtained. Accordingly, the inverting member 4 is more greatly deformed to connect the connection regions (see the arrows X, X') when the inverting member 4 is deformed from the initial state. Therefore, according to the fastener 2 that is formed, in the state in which the comb teeth 6 are opened, the opening angle θ formed with the comb teeth 6 and the inverting member 4 is set to be larger, and the distance H between the tips of the comb teeth 6 (the head portions 6b) and the inverting member 4 is set to be large.

[0053]

According to the inverting member 4, in the initial state shown in FIG. 1, as described above, the central part of the other of the long side portions (the friction body mounting part) 4b is formed to be curved in a direction to approach the one of the long side portions (the comb teeth attachment part) 4a (see the arrow A). Accordingly, the inverting member 4 is deformed to be more largely and smoothly inverted. Therefore, according to the fastener 2

that is formed, in the state in which the comb teeth 6 are opened, the opening angle θ formed with the comb teeth 6 and the inverting member 4 is set to be larger, and the distance H between the tips of the comb teeth 6 (the head portions 6b) and the inverting member 4 is set to be large.

[0054]

Metallic material such as stainless steel, carbon steel, aluminum, copper, and titanium may be used as metallic material that constitutes the inverting member 4 and the comb teeth 6. Coating treatment may be performed on a surface of a metallic thin plate. Coating on the surface of metal is particularly effective in order to counter a metal allergy. In order to improve a feel on wearing, for example, rubber touch coating may be performed and coating with other arbitrary material may be performed for different purposes.

[0055]

Describing a dimension of the inverting member 4, 0.5 to 2 mm is exemplified as a thickness, 20 to 50 mm is exemplified as the length of the long side portion side corresponding to W, and 15 to 30 mm is exemplified as the length of the short side portion side. Further, 10 to 30 mm is exemplified as the length of each of the comb teeth 6 and 0.3 to 2 mm is exemplified as the outer diameter of the axis portion 6a of each of the comb teeth 6. The

dimensions described above are exemplified in a case for applying to the wig and other arbitrary dimensions may be adopted according to purposes.

[0056]

(Explanation of inverting member of other embodiments>

With reference to FIGS. 4 and 5, inverting members 4 of other embodiments of the present invention will be explained. FIGS. 4 and 5 are schematic plan views each illustrating an inverting member 4 of another embodiment of the present invention.

[0057]

<Explanation of embodiment shown in FIG. 4>

An inverting member 4 of the other embodiment shown in FIG. 4 is formed into a shape similar to that of the inverting member 4 of the one embodiment shown in FIG. 1. The inverting member 4 shown in FIG. 1 includes the apart region (see the arrow Y) between the end (see the arrow X) of the other of the long side portions (the friction body mounting part) 4b disposed on an upper side in the drawing and the end (see the arrow X') of the other short side portion 4d. On the other hand, the inverting member 4 shown in FIG. 4 is different from the inverting member 4 shown in FIG. 1 in that the inverting member 4 shown in FIG. 4 has the apart region (see the arrow Y) between the end (see the arrow X') of the one of the long side portions

(the friction body mounting part) 4a disposed on a lower side in the drawing and the end (see the arrow X) of the other short side portion 4d. Therefore, the inverting member 4 of the other embodiment shown in FIG.4 is provided with a structure of connection of the other of the long side portions (the friction body mounting part) 4b and the other short side portion 4d.

[0058]

When the inverting member 4 is deformed (curved), basically like the inverting member 4 of the one embodiment shown in FIG. 1, the long side portions 4a, 4b whose lengths (the dimensions in longitudinal directions) are large are respectively twisted to be rotated (see arrows with dotted lines) around connection portions (see the arrows Z, Z') with the one short side portion 4c to more greatly deform the inverting member 4.

Since other shapes are similar to that of the inverting member 4 of the one embodiment shown in FIG. 1, a more detail explanation will be omitted.

[0059]

<Explanation of embodiment shown in FIG. 5>

An inverting member 4 of the other embodiment shown in FIG.5 is similar to the inverting members 4 of the embodiments shown in FIGS. 1 and 4 in that the inverting member 4 has the substantial quadrilateral plane shape

composed of the pair of long side portions 4a, 4b being opposed to each other and the pair of short side portions 4c, 4d being opposed to each other in the initial state, and the plurality of comb teeth 6 are fixed to the one of the long side portions 4a that is positioned at a lower side in the drawing. However, the inverting member 4 of the other embodiment shown in FIG.5 is different from the inverting members 4 of the embodiments shown in FIGS. 1 and 4 in that the inverting member 4 of the other embodiment shown in FIG.5 has an apart region (see arrow Y) extending in the longitudinal direction of the other short side portion 4d disposed on a middle of the other short side portion 4d. Therefore, all the long side portions 4a, 4b and the short side portions 4c, 4d are connected to at the ends.

[0060]

When the inverting member 4 is deformed (curved), basically like the inverting member 4 of the one embodiment shown in FIG. 1, the long side portions 4a, 4b whose lengths (the dimensions in longitudinal directions) are large are respectively twisted to be rotated (see arrows with dotted lines) around connection portions (see the arrows Z, Z') with the one short side portion 4c to more greatly deform the inverting member 4.

Since other shapes, and the like, are approximately

similar to that of the inverting members 4 of the embodiments shown in FIGS. 1 and 4, a more detail explanation will be omitted.

[0061]

(Explanation of relation between ratio D/W and distance H when comb teeth are opened)

With reference to FIGS. 6 to 9, an appropriate range of the ratio D/W described above will be explained hereinafter. FIG. 6 is a view (photograph) illustrating Example 1 of the fastener including the inverting member according to the one embodiment of the present invention shown in FIG. 1. FIG. 7 is a view (photograph) illustrating Example 2 of the fastener including the inverting member according to another embodiment of the present invention shown in FIG. 5. FIG. 8 is a view (photograph) illustrating Example 3 of the fastener including the inverting member according to another embodiment of the present invention shown in FIG. 5. FIG. 9 is a view (photograph) illustrating Example 4 of the fastener including the inverting member according to the one embodiment of the present invention shown in FIG. 1.

[0062]

In Example 1 shown in FIG. 6, the length W of the one of the long side portions (the comb teeth attachment part) of the inverting member in the initial state is 40.5

mm and a value of the moving amount D , when the inverting member is deformed, is 6.85 mm. Accordingly, a value of D/W , as a ratio of the moving amount D to the length W of the long side portion (the comb teeth attachment part), is 0.169. At this situation, a distance (a maximum distance) H (the maximum distance is formed between a central one of the comb teeth and the inverting member) between a tip portion of one of the comb teeth that are opened and the inverting member is 9.3 mm. Since the length L of each of the comb teeth except for a welding part is 11 mm, the opening angle θ formed with the axis portions of the comb teeth and the inverting member is 58 degrees.

[0063]

That is, according to Example 1 shown in FIG. 6, an opening height H of the comb teeth that are opened to insert hairs thereinto is 9.3 mm and the opening angle θ is 58 degrees. When a hairs insertion test has been actually performed by a user, a preferable determination result has been obtained that the fastener has the opening height H capable of easy insertion of hairs and the opening angle θ capable of sufficient amount of insertion of hairs. Also, in an inverting repetition test on the inverting member, a preferable determination result in terms of durability and operability has been obtained.

[0064]

In Example 2 shown in FIG. 7, the length W of the one of the long side portions (the comb teeth attachment part) of the inverting member in the initial state is 35.5 mm and the value of the moving amount D , when the inverting member is deformed, is 4.9 mm. Accordingly, the value of D/W , as the ratio of the moving amount D to the length W of the long side portion (the comb teeth attachment part), is 0.138. At this situation, the distance (the maximum distance) H between the tip portion of one of the comb teeth that are opened and the inverting member is 4.9 mm. Since the length L of each of the comb teeth except for the welding part is 16 mm, the opening angle θ formed with the axis portions of the comb teeth and the inverting member is 18 degrees.

[0065]

That is, according to Example 2 shown in FIG. 7, the opening height H of the comb teeth that are opened to insert hairs thereinto is 4.9 mm and the opening angle θ is 18 degrees. When the hairs insertion test has been actually performed by the user, it has turned out that hairs can be inserted, but ease of hairs insertion fails to reach a level of Example 1, and the amount of hairs capable of insertion does not also reach a level of Example 1.

That is, according to Example 2, the fastener is practically usable. However, with respect to ease of hairs

insertion and the amount of hairs insertable, the preferable determination result like that of Example 1 has not been obtained. Also, in the inverting repetition test on the inverting member, a preferable determination result like that of Example 1 in terms of durability and operability has been obtained.

[0066]

In Example 3 shown in FIG. 8, the length W of the one of the long side portions (the comb teeth attachment part) in the initial state is 48.5 mm and the value of the moving amount D , when the inverting member is deformed, is 5.55 mm. Accordingly, the value of D/W , as the ratio of the moving amount D to the length W of the long side portion (the comb teeth attachment part), is 0.114. At this situation, the distance (the maximum distance) H between the tip portion of one of the comb teeth that are opened and the inverting member is 4.7 mm. Since the length L of each of the comb teeth except for the welding part is 16 mm, the opening angle θ formed with the axis portions of the comb teeth and the inverting member is 17 degrees.

[0067]

That is, according to Example 3 shown in FIG. 8, the opening height H of the comb teeth that are opened to insert hairs thereinto is 4.7 mm and the opening angle θ is

17 degrees. When the hairs insertion test has been actually performed by the user, it has turned out that hairs can be inserted, but ease of hairs insertion fails to reach the level of Example 1, and the amount of hairs capable of insertion does not also reach the level of Example 1.

That is, according to Example 3, the fastener is practically usable. However, with respect to ease of hairs insertion and the amount of hairs insertable, the preferable determination result like that of Example 1 has not been obtained. Also, in the inverting repetition test on the inverting member, a preferable determination result like that of Example 1 in terms of durability and operability has been obtained.

[0068]

In the example 4 shown in FIG. 9, the length W of the one of the long side portions (the comb teeth attachment part) in the initial state is 40.5 mm and the value of the moving amount D, when the inverting member is deformed, is 7.0 mm. Accordingly, the value of D/W , as the ratio of the moving amount D to the length W of the long side portion (the comb teeth attachment part), is 0.173. At this situation, the distance (the maximum distance) H between the tip portion of one of the comb teeth that are

opened and the inverting member is 10.3 mm. Since the length L of each of the comb teeth except for the welding part is 11 mm, the opening angle θ formed with the axis portions of the comb teeth and the inverting member is 69 degrees.

[0069]

That is, according to the example 4 shown in FIG. 9, the opening height H of the comb teeth that are opened to insert hairs thereinto is 10.3 mm and the opening angle θ is 69 degrees. When the hairs insertion test has been actually performed by the user, it has turned out that the fastener has the opening height H capable of easy insertion of hairs and the opening angle θ capable of sufficient amount of insertion of hairs like Example 1. However, when the inverting repetition test on the inverting member has been performed, it has turned out that durability and operability does not reach the level of Example 1.

That is, with respect to ease of hairs insertion and the amount of hairs insertable, the preferable determination result like that of Example 1 has been obtained. However, the preferable determination result like that of Example 1 in terms of durability and operability has not been obtained.

[0070]

The above results are summarized in a table below.

	W [mm]	D [mm]	D/W	H [mm]	θ [degrees]	INSERTABILITY	DURABILITY
EXAMPLE 1	40.5	6.85	0.169	9.3	58	PREFERABLE	PREFERABLE
EXAMPLE 2	35.5	4.9	0.138	4.9	18	-	PREFERABLE
EXAMPLE 3	48.5	5.55	0.114	4.7	17	-	PREFERABLE
EXAMPLE 4	40.5	7.0	0.173	10.3	69	PREFERABLE	-

That is, the preferable determination result has been obtained from only Example 1 of $D/W = 1.169$ with respect to all of ease of hairs insertion, the amount of hairs insertable, durability, and operability.

[0071]

<Relation between D/W and H >

A relation between the value of D/W and the distance (the maximum distance) H from tip portions of the comb teeth to the inverting member is expressed by a following approximate equation (a cubic equation) on the basis of data obtained from the above.

$$H = 11,160 * (D/W)^3 - 2,269 * (D/W)^2 + 4,760 * (D/W) + 12.3$$

The relation between D/W and H expressed by the above equation will be illustrated in a graph shown in FIG. 12 with the above four-measured values. FIG. 12 is the graph illustrating a relation between the ratio D/W of the moving amount D deforming the inverting member to the length W of the one of the long side portions and the distance (the maximum distance) H when the comb teeth are opened, according to the fastener of the present invention.

[0072]

<Relation between D/W and θ >

Similarly, a relation between the value of D/W and the opening angle θ from the opened comb teeth to the inverting member is expressed by a following approximate equation (a cubic equation) on the basis of the data obtained from the above.

$$\theta = 322,072 * (D/W)^3 - 11,289 * (D/W)^2 + 13,103 * (D/W) + 487$$

The relation between D/W and θ expressed by the above equation will be illustrated in a graph shown in FIG. 13 with the above four-measured values. FIG. 13 is the graph illustrating the relation between the ratio D/W of the moving amount D deforming the inverting member to the length W of the one of the long side portions and the opening angle θ when the comb teeth are opened, according to the fastener of the present invention.

[0073]

Since the distance H depends on a length of the axis portion of each of the comb teeth as well as open conditions of the comb teeth, it can be said that the opening angle θ more objectively indicates the open conditions of the comb teeth. When a test in which hairs are inserted between the comb teeth and the inverting member has been performed with several sets of the comb teeth of various opening angles assuming scene where a wig

is actually put on a head, it has turned out that the opening angle θ of 25 degrees or more is preferable in terms of ease of hairs insertion and the amount of hairs insertable between the comb teeth and the inverting member. This also agrees with the four-test data described above.

Further, it has turned out that the opening angle θ of 35 degrees or more, particularly 40 degrees or more is further preferable in terms of ease of hairs insertion and the amount of hairs insertable between the comb teeth and the inverting member.

[0074]

On the other hand, it has turned out that the opening angle θ over 60 degrees does not affect much in terms of practical ease of hairs insertion and the amount of hairs insertable. Further, as shown Example 4 above, it has turned out that the opening angle θ over 60 degrees tends to deteriorate durability and operability of the inverting member.

[0075]

Therefore, according to the fastener for a wig of the present invention, it has turned out that as the value of the ratio D/W of the moving amount D deforming the inverting member to the length W of the one of the long side portions, it is preferable to have a relation $0.15 \leq D/W \leq 0.17$ (Equation 1) corresponding to the opening angle

θ of 25 degrees or more and 60 degrees or less, on the basis of the graph of FIG. 13.

[0076]

It has turned out that it is more preferable to have a relation 0.16 (corresponding to $\theta = 39$ degrees) $\leq D/W \leq 0.17$ (Equation 2) corresponding to the opening angle θ of 40 degrees or more and 60 degrees or less, on the basis of the graph of FIG. 13.

[0077]

As described above, it has turned out that it is preferable to have the relation $0.15 \leq D/W \leq 0.17$ (Equation 1) in terms of ease of hairs insertion, the amount of hairs insertable, durability, and operability. It has turned out that it is more preferable to have the relation $0.16 \leq D/W \leq 0.17$ (Equation 2) in terms of ease of hairs insertion and the amount of hairs insertable, and preferable in terms of durability and operability.

[0078]

In the example shown in FIG. 11, the value of D/W is 0.169 like that of Example 1. Further, the distance (the maximum distance) H between the tip portion of one of the comb teeth that are opened and the inverting member is 13 mm. Since the length L of each of the comb teeth except for the welding part is 16 mm, and the opening angle θ formed with the axis portions of the comb teeth and the

inverting member is 54 degrees. That is, the opening angle θ of 40 degrees or more and 60 degrees or less, and D/W has the relation $0.16 \leq D/W \leq 0.17$. Accordingly, it has turned out that the example shown in FIG. 11 is also excellent in terms of ease of hairs insertion, the amount of hairs insertable, durability, and operability like Example 1.

[0079]

The connection regions move by the moving amount D from the initial state to the superimposed state. Since moving directions of the connection regions are along the longitudinal direction of the short side portion, the moving directions of the connection regions are approximately perpendicular to the longitudinal direction of the long side portion. The moving directions of the connection regions need not be restricted to be strictly perpendicular to the longitudinal direction of the long side portion. For example, when the moving amount is set 100 % ($\sin 90$ degrees) in a case in which the moving direction is 90 degrees to be strictly perpendicular to the longitudinal direction of the long side portion, the moving amount becomes 98 % ($\sin 80$ degrees) in a case in which the moving direction is 80 degrees with respect to the longitudinal direction of the long side portion, and the moving amount becomes 94 % ($\sin 70$ degrees) in a case in which the moving direction is 70 degrees with respect to

the longitudinal direction of the long side portion. It is considered that the conditional expression 1 and the conditional expression 2 may be substantially applied to within the above ranges. Therefore, it is considered that when the moving directions of the connection regions indicated by the moving distance D have 70 degrees or more with respect to the longitudinal direction of the long side portion, the above conditional expression 1 and conditional expression 2 may be applied to.

[0080]

(Explanation of wig with fastener)

With reference to FIG. 14, a wig to which one of the fasteners of the various examples described above is attached will be described. FIG. 14 is a plan view schematically illustrating a wig 40 to which the fastener 2 of the present invention is attached.

[0081]

FIG. 14 illustrates a pair of the fasteners 2 that are attached to a back-surface side (a side to be in contact with a head of a user) of a wig base 30. Specifically, the fasteners 2 are attached to front regions of user's ears (temples) as neighborhoods of edge portions of the wig base 30. The number of the fasteners 2 that are attached to the wig base 30 is not restricted to two, and arbitrary number of fasteners 2 may be attached to the wig

base 30 for different purposes.

As a method for attaching the fastener 2 to the wig base 30, it is considered to pass sewing threads through a plurality of the attachment holes 24 that are provided on the fastener 2 and to sew the fastener 2 on the wig base 30. The method for attaching the fastener 2 to the wig base 30 is not intended to be restricted to the above method. Another connection member may be used and the fastener 2 may be attached to the wig base 30 by a known arbitrary method.

[0082]

Artificial hairs 32 are planted to the above wig base 30 to form the wig 40. When a user wears the wig 40, the comb teeth of each of the fasteners 2 that is disposed on each of the front regions of ears (temples) become the open state to insert user's hairs between the comb teeth and the inverting member after the wig base 30 is put on the head. After that, the inverting member is inverted, so that hairs are pinched between the comb teeth and the inverting member to hold hairs. Accordingly, the wig 40 is stationarily fixed to the head.

[0083]

As well as the use for fixing the wig base described above, the fastener of the present invention may be applied to other arbitrary fields as long as the inverting member

is inverted to pinch and fix an object by an elastic force of the inverting member in a state in which the object to be fixed is inserted into the comb teeth and the inverting member.

Although the embodiment of the present invention has been described, the contents of disclosure in the embodiment can obviously change in detailed structures, and changes in combination and order of components in the embodiment can be achieved without departing from the scope and spirit of the appended claims of the present invention.

Reference Signs List

[0084]

- 2 fastener
- 4 inverting member
- 4a one of the long side portions (the comb teeth attachment part)
- 4b the other of the long side portions (the friction body mounting part)
- 4c one short side portion
- 4d the other short side portion
- 6 comb teeth
- 6a axis portion
- 6b head portion
- 10 connection member
- 12 connection hole

14	connection hole
20	friction member
22	lightening hole
24	attachment hole
30	wig base
32	artificial hairs
40	wig
X, X'	connection region
Y	apart region
Z, Z'	connection portion

CLAIMS

1. A fastener comprising:

an inverting member formed of an elastic plate shape member,

the inverting member having, in an initial state that is not deformed, a substantial quadrilateral plane shape composed of a pair of long side portions being opposed to each other and a pair of short side portions being opposed to each other, and an apart region being disposed between the long side portion and the short side portion or on a middle of the short side portion to extend in a longitudinal direction of the short side portion, the inverting member having connection regions respectively disposed on both sides of the apart region;

a connection portion that connects the connection regions that are superimposed each other by a deformation of the inverting member; and

a plurality of comb teeth whose one ends are fixed to one of the long side portions,

wherein

when, in the initial state, a length of the one of the long side portions is set to be W and a moving amount of the connection regions from the initial state to a superimposed state is set to be D , a relation of $0.15 \leq D/W \leq 0.17$ is established.

2. A fastener according to claim 1, wherein
each of the comb teeth includes a head portion
disposed on a free end of each of the comb teeth, and
each of the head portions is positioned in a region
in which the other of the long side portions is disposed.
3. A fastener according to claim 1, wherein
each of the comb teeth includes a head portion
disposed on a free end of each of the comb teeth,
at least a part of each of the head portions is
positioned in an outward of the substantial quadrilateral
plane shape, and
the other part of each of the comb teeth is
positioned in a region of the substantial quadrilateral
plane shape.
4. A fastener according to claim 2 or 3, wherein a
friction member is provided on the other of the long side
portions.
5. A fastener according to any one of claims 1 to 4,
wherein
in the initial state, the apart region is provided
between the other of the long side portions and the short
side portion, and
the connection region disposed on the other of the
long side portions is arranged to be more apart from the
one of the long side portions relative to a case in which a

longitudinal direction of the other of the long side portions is parallel to a longitudinal direction of the one of the long side portions.

6. A fastener according to claim 5, wherein, in the initial state, a central part of the other of the long side portions is formed to be curved in a direction to approach the one of the long side portions.