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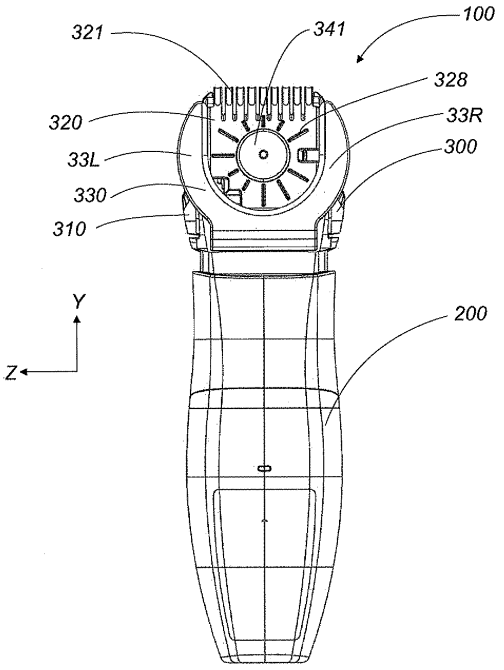
(54) ATTACHMENT FOR HAIR TRIMMER

(57) An attachment of a hair trimmer comprises a holder and a comb unit. The holder is shaped to be attached to the upper end of the housing. The comb unit is held by the holder. The comb unit has a first comb and a second comb each having a shape different from each other. The comb unit is attached to the holder to be movable between the first position where the first comb is aligned with the cutter and the second position where the second comb is aligned with the cutter. The attachment further comprises the fixing means being configured to fix the comb unit to the holder when the comb unit has the first position. The attachment further comprises the fixing means being configured to fix the comb unit to the holder when the comb unit has the second position.

Fig. 1



EP 2 353 804 A1

Description

TECHNICAL FIELD

[0001] This invention relates to an attachment of the hair trimmer, generally. The attachment is, especially, provided with a plurality of combs. One of the combs is located to cover a cutter of the hair trimmer selectively.

BACKGROUND ART

[0002] Japanese patent application publication No. 9-253356 and Japanese utility model application publication No. 6-31661 disclose prior hair trimmer. The prior hair trimmer comprises a housing and a standard attachments. The housing is provided at its upper end with a cutter. The cutter has a width. The standard attachments are shaped to be attached to the upper end of the housing. Each one of the attachment is provided with one comb. The standard attachment is attached to the upper end of the housing, whereby the comb covers the cutter. In addition, the standard attachment is attached to the upper end of the housing such that the width of the standard attachment is aligned with the width of the cutter.

[0003] However, the standard attachment is provided with one comb. The comb is provided with teeth having first lengths. It is impossible to vary the first length. Therefore, when the user uses the hair trimmer with the standard attachment, it is only possible to cut the hair to the first length.

[0004] In addition, when the user cut the hair to the second length, different from the first length, by the hair trimmer, there is a need to attach the optional attachment which has teeth having second lengths to the hair trimmer, instead of the standard attachment. The optional attachment is individual from the standard attachment. Therefore, when the optional attachment is not used, there is a possibility of losing the optional attachment. In addition, there is a need to store the optional attachment in the storage case when the optional attachment is not used.

DISCLOSURE OF THE INVENTION

PROBLEM TO BE RESOLVED BY THE INVENTION

[0005] This invention is produced in order to solve the above problem. An object of this invention is to provide an attachment of the hair trimmer, wherein the attachment comprises a plurality of the combs. In addition, in the attachment of the hair trimmer, one of the combs is selectively aligned with the cutter of the hair trimmer.

MEANS OF SOLVING THE PROBLEM

[0006] In order to solve the above problem, this invention discloses an attachment of a hair trimmer. The attachment is attached to an upper end of a housing of the hair trimmer. The housing is provided at tis upper end with a cutter. The attachment comprises a holder and a comb unit. The holder has a shape to be attached to the upper end of the housing. The comb unit is held by the holder. The comb unit comprises a first comb and a second comb. Each one of the first comb and the second comb is provided with a plurality of the teeth. The first comb is different from the second comb in at least one of "pitches between the teeth" or "sizes of the teeth". The comb unit is attached to the holder to be movable between the first position and the second position. When the comb unit is positioned in the first position, the first comb is aligned with the cutter. When the comb unit is positioned in the second position, the second comb is aligned with the cutter. The attachment of the hair trimmer further comprises a fixing means. When the comb unit is positioned in the first position, the fixing means is configured to fix the comb unit to the holder. When the comb unit is positioned in the second position, the fixing means is configured to fix the comb unit to the holder.

[0007] In this case, the attachment of the hair trimmer has a plurality of the combs. In addition, one of the combs is selectively overlapped with the cutter of the hair trimmer. Therefore, this configuration makes it possible to vary the comb without changing the attachment.

[0008] It is preferred that the comb unit is attached to the holder with a rotation shaft to be rotatable relative to the holder. Consequently, the comb unit is movable between the first position and the second position. The first comb has an angularly displaced relationship with the second comb around the rotation shaft.

[0009] In this case, when the comb unit is rotated, the comb unit is moved to the first position or the second position.

[0010] It is preferred that the comb unit is formed to have a polygonal shape. Consequently, the comb unit has a first side and a second side. The first side is provided with the first comb. The second side is provided with the second comb.

[0011] It is preferred that the holder further comprises a guard. When the comb unit is positioned in the first position, the guard conceals the second comb while the guard exposes the first comb. When the comb unit is positioned in the second position, the guard conceals the first comb while the guard exposes the second comb.

[0012] This configuration makes it possible to prevent the contact between the second comb and hand when the comb unit is positioned in the first position. Similarly, this configuration also makes it possible to prevent the contact between the first comb and the hand when the comb unit is positioned in the second position.

[0013] The comb unit is provided at its outer circumference with a first comb and a second comb. Therefore, it is required to rotate the comb unit without touching the first comb and the second comb in order to prevent the break of the teeth of the first comb and the second comb.

[0014] With regard to this, it is preferred that the guard is formed into U-shape. Consequently, the guard expos-

es the center of the comb unit.

[0015] With this configuration, it is possible to rotate the comb unit by pushing the front surface of the comb unit along the front surface of the holder. Therefore, this configuration makes it possible to easily rotate the comb unit without touching the combs.

[0016] It is preferred that the holder holds at its front surface with a comb unit. The front surface of the holder is faced to the rear surface of the comb unit. The rear surface of the comb is spaced from the front surface of the holder by a predetermined gap.

[0017] In addition, it is preferred that the comb unit is provided with a sleeve bearing which extends backwardly of the comb unit.

[0018] In this case, it is possible to prevent the friction caused by the contact between the comb unit and the holder when the comb unit is rotated. Therefore, this configuration makes is possible to smoothly rotate the comb unit relative to the holder.

[0019] It is preferred that the holder is provided with a projection. The projection is configured to slidably contact with the outer circumference of the rear surface of the comb unit.

[0020] In addition, the projection is shaped to surround the rotation shaft.

[0021] When the user pushes the outer circumference of the front surface of the comb unit along the front surface of the holder to rotate the comb unit, the outer circumference of the comb unit receives the pressure. However, the projection supports the comb unit which receives the pressure at the outer circumference of the front surface. Therefore, this configuration makes it possible to prevent the break of the rotation shaft.

[0022] It is preferred that the bearing is provided with an outer circumference formed with a recess. Corresponding to this, the holder is provided with a nail. The nail is cooperative with the recess to define the fixing means.

BRIEF EXPLANATION OF DRAWINGS

[0023]

Fig. 1 shows a front view of the hair trimmer with an attachment of an embodiment of this invention.

Fig. 2 a shows a perspective view of a housing of the hair trimmer.

Fig. 2b shows a perspective view of the housing with attachment of the embodiment of this invention.

Fig. 3a shows a a perspective view of the attachment of the embodiment of the invention.

Fig. 3b shows a side view of the attachment of the embodiment of this invention.

Fig. 3c shows a side cross sectional view of the attachment of the invention.

Fig. 3d shows a perspective view of the attachment of the embodiment of this invention. The attachment has a condition where the comb of the comb unit is 45 degrees inclined with respect to the cutter.

Fig. 4 shows a perspective view of the holder of the attachment of the embodiment of the invention.

Fig. 5 shows a underside view of the comb unit of the attachment of the embodiment in this invention.

Fig. 6 shows a cross sectional view taken along the B-B line of Fig. 3b.

BEST MODE FOR CARRYING OUT THE INVENTION

[0024] The attachment of the hair trimmer is explained with attached illustrations. Fig. 1 shows a front view of the hair trimmer. In Fig. 1 and Fig. 2, the front direction of the hair trimmer 100 is indicated by X direction. The upper direction of the hair trimmer 100 is indicated by Y direction. The left direction of the hair trimmer 100 is indicated by Z direction.

[0025] As will be understood from Fig. 1, the hair trimmer 100 comprises a housing 200 and the attachment 300. Fig. 2 a shows a perspective view of the housing 200. Fig. 2 b shows a housing 200 with attachment 300. The holder 310 of the attachment 300 is provided at its both lateral inside surfaces with movable clicks which are not shown in the illustration. The movable clicks are moved by a switch 312. Corresponding to this configuration, the upper end of the side surface of the housing has fixed clicks 220. When the movable clicks is locked to the fixed clicks 220, the attachment 300 is attached to the housing 200.

[0026] Fig. 2 shows a housing 200 which is provided at its upper end with a cutter 210. The cutter 210 comprises a fixed blade and a movable blade. The fixed blade and the movable blade are both shaped to have plate shapes. Both of the fixed blade and the movable blade have width which extends along a width of the housing 200. The fixed blade and the movable blade have a plurality of the cutting blades which are arranged in the width directions of the widths of fixed blade and the movable blade, respectively. The movable blade is arranged such that the movable blade has a width direction which extends along the width direction of the fixed blade. The fixed blade is secured to the housing 200. The movable blade is attached to the housing 200 such that the movable blade is movable in the width direction of the fixed blade. The housing 200 houses a motor and a battery. The housing 200 is provided at its outer surface with a switch. The switch is provided for starting and stopping the hair trimmer 100. The switch is disposed on the outer surface of the housing 200 to be movable between an on position and an off position. The battery is housed in a battery room of the housing 200. The motor is coupled to the movable blade such that the motor provides the motion to the movable blade. When the motor receives an electrical power, the motor reciprocates the movable blade in the width direction of the movable blade.

[0027] When the switch is positioned in the on position, the battery starts supplying the electrical power to the motor. When the motor receives the electrical power, the

motor reciprocates the movable blade in the width direction of the movable blade, relative to the fixed blade. When the movable blade is reciprocated, the gaps which are made between the cutting blade of the fixed blade and the cutting blade of the movable blade are opened and closed. When the gap between the cutting blade of the movable blade and the cutting blade of the fixed blade is closed, the hair in the gap between the cutting blade of the movable blade and the cutting blade of the fixed blade is cut. In this manner, the cutter 210 cuts the hair.

[0028] Fig. 3a to Fig. 3d shows the attachments 300. The attachment 300 is configured to adjust the length of the hair that the cutter 210 cuts. Fig. 3 shows a perspective view of the attachment 300. As will be understood from Fig. 3a, the attachment comprises a holder 310, a comb unit 320, and a guard 330. Fig. 3b shows a side view of the attachment 300. Fig. 3c shows a side cross sectional view which is taken along A - A line of Fig. 3 a.

[0029] Fig. 4 shows a perspective view of the holder 310. As will be understood from Fig. 4, the holder 310 is shaped to have a tubular shape. Consequently, the holder 310 has a shape to be attached to the upper end of the housing 200. The holder 310 has a front surface. The holder is provided at a center of the front surface with a rotation shaft 340. The rotation shaft 340 is, as shown in Fig. 3C, projected toward a front direction from the front surface of the holder 310. In addition, although not shown in the illustrations, the rotation shaft 340 is held by the holder 310 to be slidable in the vertical direction. That is, the rotation shaft 340 is held by the holder 310 to be slidable in the front surface of the holder 310. Consequently, the rotation shaft 340 is held by the holder 310 to be located on the front surface of the holder 310, whereby the rotation shaft 340 is movable between a normal position and an upper position which is located in an upper side of the normal position. In addition, the holder 310 is provided at its front surface with a projection 311 which extends toward a front direction. The projection 311 is located on the front surface of the holder 310 such that the projection 311 surrounds the rotation shaft 340. Specifically, as shown in Fig. 4 and Fig. 6, the projection 311 has C-shape and provided to the front surface of the holder such that the projection 311 surrounds the rotation shaft 340. The projection 311 having C-shape is formed with cutouts. The cutouts are located in the left side of the holder 310 and the right side of the holder 310, respectively.

[0030] The holder 310 further holds a plate spring 350. The plate spring 350 is engaged into the cutout of the projection 311 such that the plate spring 350 is positioned on the front surface of the holder 310. The plate spring 350 is provided at its lengthwise center with a nail 351 which is projected toward the upper direction. The nail 351 is shaped to be engaged with a groove 325 which is explained later. That is, the nail 351 is cooperative with the groove 325 to define the fixing means.

[0031] Fig. 5 shows a rear surface of the comb unit 320. The comb unit 320 is held by the holder. The comb unit 320 comprises a main plate 326, a bearing 327, a first comb 321, a second comb 322, a third comb 323, and the fourth comb 324. As will be understood from Fig. 5, the main plate 326 is shaped to have a polygonal shape. Specifically, the main plate 326 is shaped to have a regular tetragon, whereby the main plate 326 has a first side, a second side, a third side, and a fourth side. The first side is provided with a first comb 321. The second side is provided with a second comb 322. The third side is provided with a third comb 323. The fourth side is provided with a fourth comb 324. Therefore, each one of the comb is spaced from the other of the combs in the circumference direction of the main plate 326. In other words, each one of the comb is angularly displaced from the other of the comb around the rotation shaft 340. In addition, the first comb 321, the second comb 322, the third comb 323, and the fourth comb 324 has a width along the first side, a width along the second side, a width along the third side, and a width long the fourth side, respectively.

[0032] The first comb 321 comprises a plurality of teeth 32a. Each one of the teeth 32a of the first comb 321 is spaced from the next tooth 32a by a first pitch. In addition, each one of the teeth 32a of the first comb 321 has a first size.

[0033] The second comb 322 also comprises a plurality of teeth 32b. Each one of the teeth 32b of the second comb 322 is spaced from next teeth 32b by a second pitch. In addition, each one of the teeth 32b of the second comb 322 has a second size. Specifically, the second pitch is different from the first pitch. Specifically, the second pitch is wider than the first pitch. In addition, the second size is different from the first size. Specifically, the second size is greater than the first size.

[0034] As shown in Fig. 5, the first size is different from the second size. Therefore, the first comb 321 has a teeth 32a having the first sizes which are different from the second size. In addition, the first pitch is different from the second pitch. Therefore, the first comb 321 has the teeth 32a which is spaced from the next tooth 32a by the first pitch which is different from the second pitch. In this manner, the first comb 321 is different from the second comb in the size of the teeth 32a and also the pitch between the teeth 32a. However, there is a need for the first comb to have a difference from the second comb of at least one of "the sizes of the teeth" and "the pitches between the teeth".

[0035] The third comb 323 and the fourth comb 324 have one tooth 32c and one tooth 32d, respectively. Specifically, the third comb 323 is spaced from the right end of the third side by a third space. The fourth comb 324 is spaced from the lower end of the fourth side by a fourth space. The third comb 323 is shaped to have a size which is equal to the size of the fourth comb 324.

[0036] The main plate 326 is provided at its center with a through hole which penetrates in the front-rear direction through the comb unit 320. That is, comb unit 320 has the through hole. The through hole is provided for passing

the rotation shaft 340. In addition, the main plate 326 is provided at its center with a bearing 327 which extends in the front-rear direction through the comb unit 320. That is, the comb unit 320 comprises the bearing 327. The bearing 327 has a tubular shape. That is, the bearing 327 having the tubular shape is shaped to have a sleeve bearing. The bearing 327 is shaped to support the rotation shaft 340 which penetrates through the through hole. In addition, the bearing 327 has a rear end which is located behind the rear surface of the main plate 326, whereby the bearing extends toward the rear direction of the comb unit 320. As shown in Fig. 5, the bearing 327 is formed at its rear end of the outer circumference with four grooves 325. The four grooves 325 are defined as recesses. Each one of the recesses extends in the front-rear direction of the comb unit 320.

[0037] The main plate 326 is provided at its front surface with a plurality of knobs 328. Each one of the knobs 328 extends toward the outer circumference of the main plate 326 from the center of the main plate 326.

[0038] The guard 330 is provided with a left guard member 33L and a right guard member 33R. The left guard member 33L extends from the center of the front surface of the holder 310 toward the upper left direction, and is formed to have a plate shape. The right guard member 33R extends from the center of the front surface of the holder 310 toward the upper right direction, and is formed to have a plate shape. The right guard 33R is spaced from the left guard 331 by a predetermined distance in the lateral direction. Consequently, the guard 330 is formed into to have U shape. In addition, the left guard member 33R is spaced from the left guard member 33L by a space.

[0039] The above mentioned comb unit 320 and the guard 330 are attached to the front surface of the holder 310. Specifically, the comb unit 320 is attached to the holder 310 with the rotation shaft 340 such that the front surface of the holder 310 is faced to the rear surface of the comb unit 320. In addition, the cap 341 is attached to the front end of the rotation shaft 340. The rear end of the bearing 327 extends backwardly from the rear end of the main plate 326. Therefore, the rear surface of the comb unit 320 is spaced from the front surface of the holder 310 by a predetermined clearance. In addition, the rotation shaft 340 is supported by the holder 310 to be movable between the normal position and the upper position. Therefore, the comb unit 320 is held by the holder 310 to be slidable between the normal position and the upper position higher than the normal position.

[0040] In addition, when the comb unit 320 has any one of the first position to the fourth position under a condition where the comb unit 320 has the normal position, the nail 351 is engaged with the groove 325. That is, the comb unit 320 is located in any one of the first position to the fourth position, the comb unit 320 is fixed to the holder 310.

[0041] In contrast, when the comb unit 320 is located in the upper position, the front end of the nail 351 is spaced from the bottom of the groove 325. That is, when the comb unit 320 is located in the upper position, the nail 351 is not wholly engaged with the groove 325. Consequently, as shown in Fig. 3d, the comb unit 320 which is located in the upper position is held by the holder 310 to be rotatable relative to the holder 310. Since the comb unit 320 is supported by the holder 310 to be rotatable relative to the holder 310, the comb unit 320 is positioned to one of the first position, the second position, the third position, and the fourth position, selectively. As will be understood from Fig. 3a, when the comb unit 320 has a first position, the first comb 321 is aligned with the cutter 210. Specifically, the comb unit 320 in the first position is aligned to the cutter 210 such that the width of the first comb 321 extends along the width of the cutter 210. When the comb unit 320 has the second position, the second comb 322 is aligned with the cutter 210. Specifically, the comb unit 320 in the second position is aligned with the cutter 210 such that the second comb 322 has a width which extends along the width of the cutter 210. When the comb unit 320 has the third position, the third comb 323 is aligned with the cutter 210. Specifically, the comb unit 320 in the third position is aligned with the cutter 210 such that the third cutter 323 has a width which extends along the width of the cutter 210. When the comb unit has the fourth position, the fourth comb 324 is aligned with the cutter 210. Specifically, the comb unit 320 in the fourth position is aligned with the cutter 210 such that the fourth comb 324 has a width which extends along the width of the cutter 210.

[0042] In addition, the guard 330 is attached to the holder 310 such that the guard 330 is located in a front surface side of the comb unit 320. Consequently, the guard 330 is opposite of the holder 310 from the comb unit 320. In addition, the guard 330 is attached to the holder 310 such that the space between the left guard member 33L and the right guard member 33R is oriented toward the upper direction. Consequently, the guard 330 covers the front surface of the comb unit 320 by the left guard member 33L and the right guard member 33R. Consequently, a part of the comb unit 320 is exposed to the front direction by the space between the left guard member 33L and the right guard member 33R. Specifically, the knob 328 is always exposed to the front direction by the space between the left guard member 33L and the right guard member 33R. In addition, when the comb unit 320 has the first position, the first comb 321 is exposed to the front direction and the upper direction, while the second comb 322, the third comb 323, and the fourth comb 324 are concealed by the guard 330. Similarly, when the comb unit 320 has the second position, the second comb 322 is exposed to the front side and the upper side, while the first comb 321, the third comb 323, and the fourth comb 324 are concealed by the guard 330. Similarly, when the comb unit 320 has the third position, the third comb 323 is exposed to the front direction and the upper direction, while the first comb 321, the second comb 322, and the fourth comb 324 are con-

cealed by the guard 330. In addition, when the comb unit 320 has the fourth position, the fourth comb 324 is exposed to the front direction and the upper direction, while the first comb 321, the second comb 322, and the third comb 323 are concealed by the guard 330.

[0043] The hair trimmer 100 with the attachment 100 mentioned above is used as follows. When the center of the comb unit 320 is pushed toward the upper direction, the comb unit 320 is moved to the upper position from the normal position. When the comb unit 320 is located in the upper position, the comb unit 320 is held by the holder 310 to be rotatable relative to the holder 310. Therefore, when the knob 328 is pushed along the plate surface of the comb unit 320 under the condition where the comb unit 320 is located in the upper position, the comb unit 320 is rotated about the shaft 340. The rear surface of the comb unit 320 is in contact with the projection 311. Therefore, when the pressure is applied to the front surface of the outer circumference of the comb unit from the front side of the comb unit 320, the rear surface of the outer circumference of the comb unit 320 is supported by the projection 311. In addition, the rear surface of the comb unit 320 is in slidable contact with the projection 311. Therefore, the comb unit 320 is smoothly rotated relative to the holder 310. In contrast, the front end of the nail 351 is spaced from the bottom of the groove 325. Therefore, when the comb unit 320 is rotated about the rotation shaft 340, the front end of the nail 351 is in sliding contact with the outer circumference of the bearing 327. Consequently, according to the rotation of the comb unit 320, the comb unit 320 is moved to the first position. When the comb unit 320 is located in the first position, the front end of the nail 351 is free from the friction caused by the contact between the front end of the nail 351 and the outer circumference of the bearing 327. When the friction is reduced, the user is able to surely recognize a condition where the comb unit is located in the first position. When the center of the comb unit 320 is pushed toward the lower direction under a condition where the comb unit 320 has the first position, the comb unit 320 is moved toward the normal position from the upper position. When the comb unit has the normal position and the first position, the front end of the nail 351 comes into contact with the bottom of the groove 325, whereby the nail 351 is engaged with the groove 325. Consequently, the comb unit 320 is surely fixed to the first position. Subsequently, the switch on the housing 200 is moved to the on position. When the switch has the on position, the motor reciprocates the movable blade. Then, under a condition where the cutter 210 is aligned with the first comb 321, the cutter 210 and the first comb 321 is contacted to the hair. Consequently, the hair is combed by the first comb 321. Therefore, the hair is guided into the gap between the teeth 32a according to the pitch of the teeth 32a. In addition, the hair having the length corresponding to the length of the teeth 32a of the first comb is cut by the cutter 210.

[0044] Next, an explanation of a case where the second comb 322 is used subsequent to the usage of the first comb is made. When the center of the comb unit 320 is pushed toward the upper direction, the comb unit 320 is moved toward the upper position from the normal position. When the comb unit 320 is located in the upper position, the comb unit 320 is rotatable held by the holder 310. Therefore, when the knob 328 is pushed along the plate surface of the comb unit 320 under a condition where the comb unit 320 has the upper position, the comb unit 320 is rotated about the shaft 340. The rear surface of the outer circumference of the comb unit 320 is in contact with the projection 311. Therefore, the pressure applied to the comb unit 320 from the front side is supported by the projection 311. In addition, the rear surface of the comb unit 320 is in slidable contact with the projection 311. Therefore, the comb unit 320 is smoothly rotated relative to the holder 310. In this manner, according to the rotation of the comb unit 320, the comb unit 320 is moved to the second position. When the center of the comb unit 320 is moved toward the lower direction under a condition where the comb unit 320 has the second position, the comb unit 320 is moved to the normal position from the upper position. When the comb unit 320 has the normal position and the second position, the nail 31 is engaged with the groove 325. Consequently, the comb unit 320 is surely secured to the second position. Subsequently, the switch on the housing 200 is moved to the on position. When the switch is located in the on position, the motor reciprocates the movable blade. Subsequently, under a condition where the second comb 322 is aligned with the cutter 210, the cutter 210 and the second comb 322 is contacted to the hair. Consequently, the hair is combed by the second comb 322. Then, the hair having the length which corresponds to the length of the teeth 32b is cut by the cutter 210.

[0045] Also in a condition where the third comb 323 and the fourth comb 324 is used, the comb unit 320 is moved similar to the above explanation. In addition, similar to the above explanation, the hair is cut by the cutter 210. Consequently, the hair trimmer having a condition where the cutter 210 is aligned with the third comb 323 and the fourth comb 324 may cut the hair of the hairline.

[0046] As mentioned above, the attachment 300 of the hair trimmer 100 comprises the holder 310 and the comb unit 320. The holder 310 has a shape to be attached to the upper end of the housing 200 of the hair trimmer 100. The comb unit 320 is held by the holder 310. The comb unit 320 comprises the first comb 321, the second comb 322, the third comb 323, and the fourth comb 324. The first comb 321 and the second comb 322 have a plurality of the teeth 32a and a plurality of the teeth 32b, respectively. The first comb 321 is formed to have a difference in at least one of the pitch between the teeth and the size of the teeth from the second comb 322. The comb unit 320 is attached to the holder 310 to selectively have the first position, the second position, the third position, and the fourth position. The comb unit 320 in the first position has the first comb 321 which is aligned with the cutter

210. The comb unit 320 in the second position has the second comb 322 which is aligned with the cutter 210. The comb unit 320 in the third position has the third comb 323 which is aligned with the cutter 210. The comb unit 320 in the fourth position has the fourth comb 324 which is aligned with the cutter 210. The attachment 300 of the hair trimmer 100 further comprises the fixing means. The fixing means is configured to fix the comb unit 320 to the holder 310 when the comb unit 320 has the first position. The fixing means is configured to fix the comb unit 320 to the holder 310 when the comb unit 320 has the second position. The fixing means is configured to fix the comb unit 320 to the holder 310 when the comb unit 320 has the third position. The fixing means is configured to fix the comb unit 320 to the holder 310 when the comb unit 320 has the fourth position. Consequently, the attachment 300 of the hair trimmer 100 comprises a plurality of the combs. In addition, one of a plurality of the combs is overlapped with the cutter 210. Therefore, this configuration makes it possible to selectively use a plurality of the comb s by single hair trimmer 100.

[0047] In addition, the comb unit 320 of this embodiment is rotatably attached to the holder 310 with the rotation shaft 340. Therefore, the comb unit 320 is positioned to be spaced from the front surface of the holder 310 such that the comb unit 320 is smoothly rotated relative to the holder 310. In addition, in order to make a space between the rear surface of the comb unit 320 and the front surface of the holder 310, comb unit 320 is provided with the bearing 327 which extends toward the rear direction of the comb unit 320.

[0048] In addition, the comb unit 320 of this embodiment is provided at its outer circumference with the combs. Therefore, when the comb unit 320 is rotated about the rotation shaft 340, there is a need to push the portion other than the outer circumference of the comb unit 320. That is, when the comb unit 320 is rotated about the rotation shaft 340, there is a need to push the front surface of the comb unit 320. However, the comb unit 320 is spaced from the holder 310. Therefore, when the pressure is applied to the front surface of the comb unit 320, the rotation shaft 340 receives the load. Therefore, the attachment of the hair trimmer in this invention comprises the projection 311 which reduces the load applied to the rotation shaft 340. The projection 311 is projected toward the front direction from the front surface of the holder 310.

[0049] In addition, the guard 330 of this embodiment comprises the left guard member and the right guard member. The left guard member extends toward the upper left from the lower end of the front surface of the comb unit 320, whereby the left guard member is located in the front of the left of the comb unit 320. The right guard member extends toward the upper right from the lower end of the front surface of the comb unit 320, whereby the right guard member is located in the front of the right of the comb unit 320. Consequently, the guard 330 has the U shape. Furthermore, the right guard member is spaced from the left guard member in the lateral direction of the attachment. Therefore, the left guard member is cooperative with the right guard member to form the space between the left guard member and the right guard member. The center of the front surface of the comb unit is exposed to the front direction through the space. Therefore, the guard exposes the center of the front surface of the comb unit. That is, the front surface of the comb unit is exposed to the front direction. Consequently, the user is able to rotate the comb unit by pushing outer circumference of the front surface of the comb unit along the surface of the comb unit.

[0050] In addition, when the guard 330 in this embodiment has the first position, the guard 330 conceals the second comb 322, while the guard 330 exposes the first comb 321 to the front direction and the upper direction. Consequently, when the first comb is overlapped with the cutter 210, it is possible to prevent the second comb from being contacted to the hand. In addition, when the comb unit 320 has the second position, the guard 330 conceals the front surface of the first comb, while the guard 330 exposes the second comb 322 to the front direction and the upper direction of the attachment. Consequently, when the cutter 210 is overlapped with the second comb, it is possible to prevent the first comb from being contact with the hand.

[0051] In addition, the comb unit 320 in this embodiment has a main plate 326 which has the regular tetragon. However, the shape of the main plate is not limited to the regular tetragon. It is possible to employ the plate having a triangle shape and the pentagonal shape as the main plate of the comb unit.

Claims

1. An attachment of a hair trimmer which is attached to an upper end of a housing of the hair trimmer, the housing being provided at the upper end with a cutter,
said attachment comprising:

a holder having a shape to be attached to the upper end of the housing;
a comb unit which is attached to said holder;
said comb unit comprising a first comb and a second comb;
each one of said first comb and said second comb is provided with a plurality of comb teeth,
said first comb being different from said second comb in at least one of pitches between comb teeth or sizes of said comb teeth,
said comb unit being attached to said holder to be movable between a first position where said first comb is aligned with the cutter and a second position where said second comb is aligned with the cutter,
wherein

said attachment of the hair trimmer further comprises a fixing means,
wherein
when said comb unit is located in said first position, said fixing means is configured to fix said comb unit to said holder,
wherein
when said comb unit is located in said second position, said fixing means is configured to fix said comb unit to said holder.

2. The attachment of the hair trimmer as set forth in claim 1, wherein
said comb unit is attached to said hold with a rotation shaft to be rotatable relative to said holder, whereby said comb unit is movable between said first position and said second position,
wherein
said first comb has an angularly displaced relationship to said second comb around said rotation shaft.

3. The attachment of the hair trimmer as set forth in claim 1 or 2, wherein
said comb unit has a polygonal plate shape, whereby said comb unit has a first side and a second side;
said first side is provided with said first comb, and
said second side is provided with said second comb.

4. The attachment of the hair trimmer as set forth in claim 2 or 3, wherein
said holder is provided with a guard,
wherein
when said comb unit is located in the first position, said guard conceals said second comb and expose said first comb,
wherein
when said comb unit is located in the second position, said guard conceals said first comb and expose said second comb.

5. The attachment of the hair trimmer as set forth in claim 4, wherein
said guard is shaped to have U-shape, and
said guard being shaped to expose a center of said comb unit to front side.

6. The attachment of the hair trimmer as set forth in any one of claims 2 to 5, wherein said holder is configured to hold said comb unit at a front surface of said holder,
said front surface of said holder being faced with a rear surface of said comb unit,
said rear surface of said comb unit is spaced from said front surface of said holder by a predetermined gap.

7. The attachment of the hair trimmer as set forth in claim 6, wherein
said comb unit is provided with a bearing which has a cylindrical shape,
said bearing extends toward a rear direction of said comb unit.

8. The attachment of the hair trimmer as set forth in claim 6 or 7, wherein
said holder is provided with a projection,
said projection being configured to slidably contact with an outer circumference of a rear surface of said comb unit.

9. The attachment of the hair trimmer as set forth in claim 8, wherein
said projection has a shape to surround said rotation shaft.

10. The attachment of the hair trimmer as set forth in claim 7, wherein
said bearing is provided at its outer circumference with a recess,
said holder being provided with a nail, and
said nail being cooperative with said recess to define an engagement means.

Fig. 1

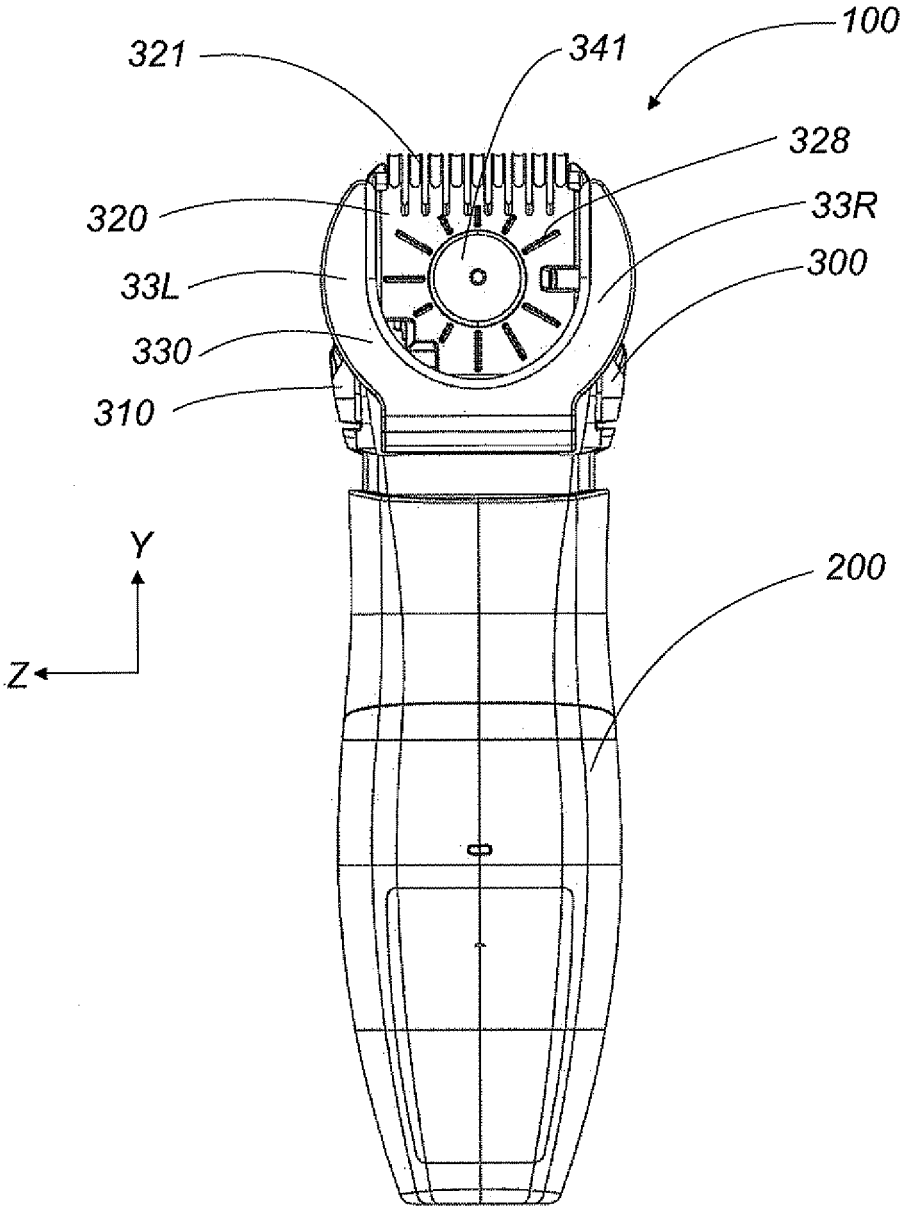


Fig. 2a

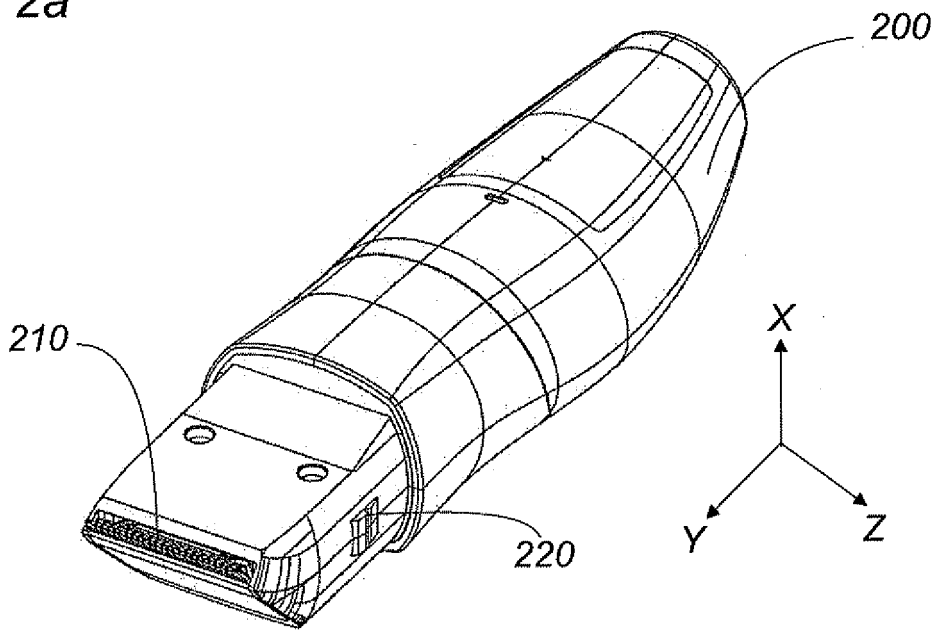


Fig. 2b

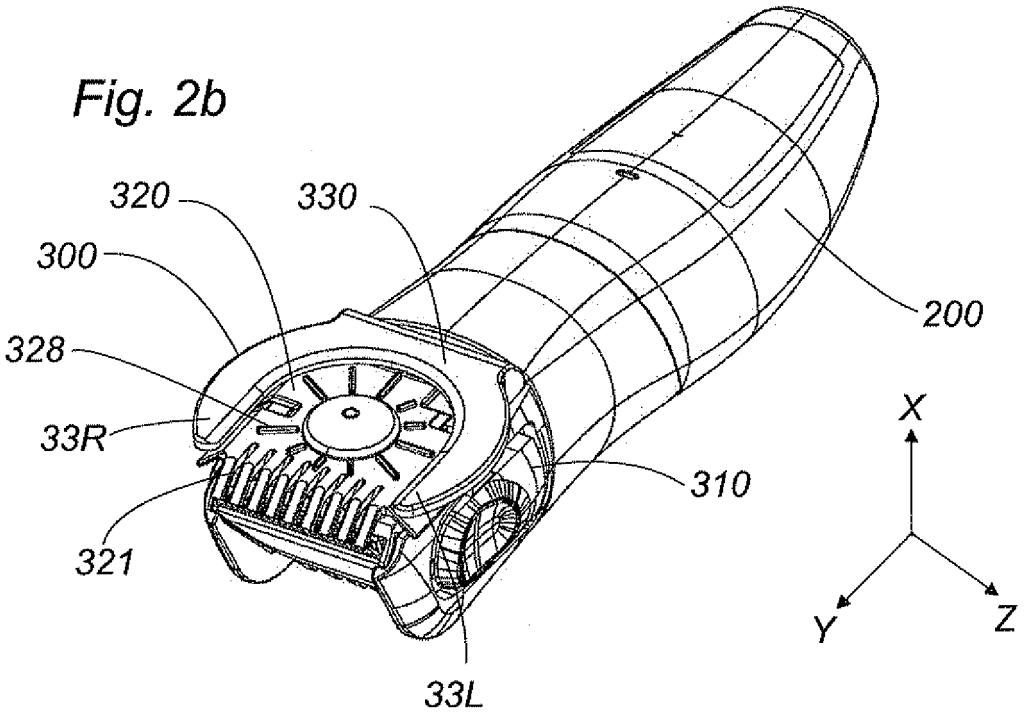


Fig. 3a

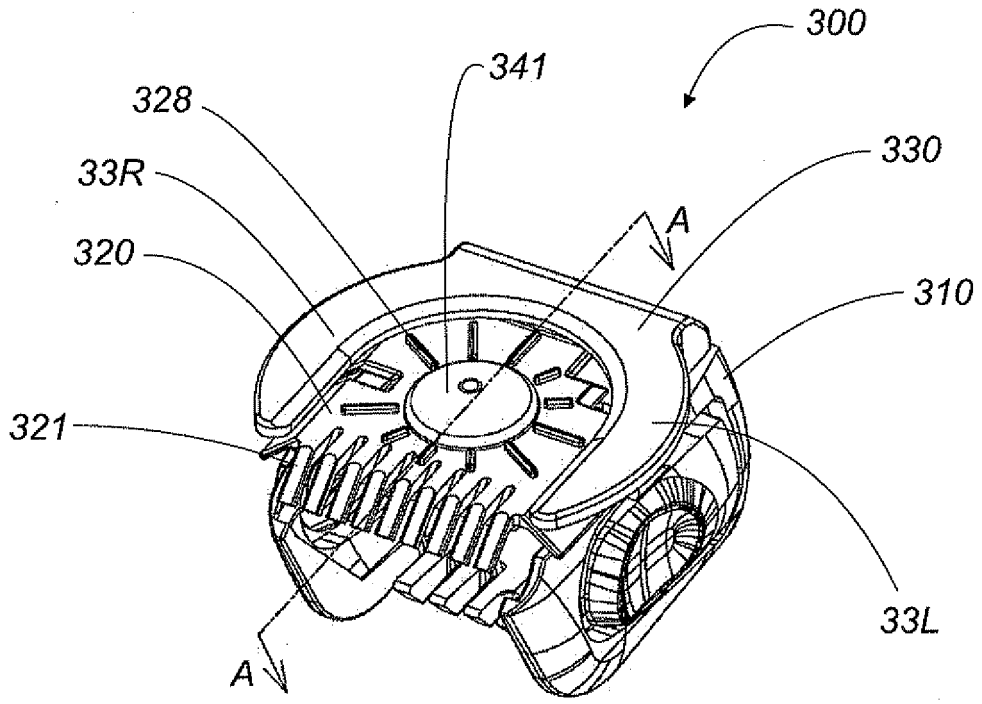


Fig. 3b

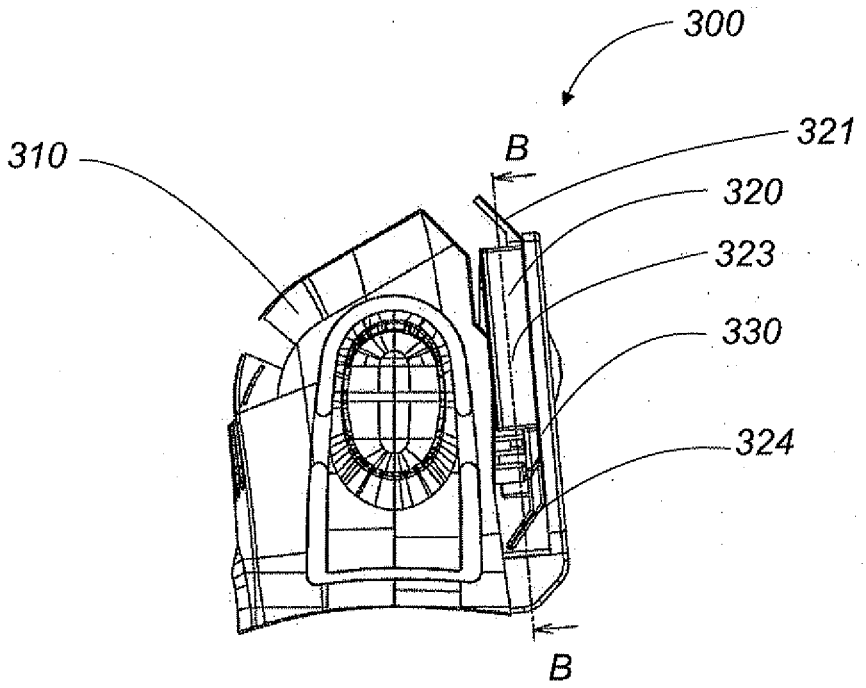


Fig. 3c

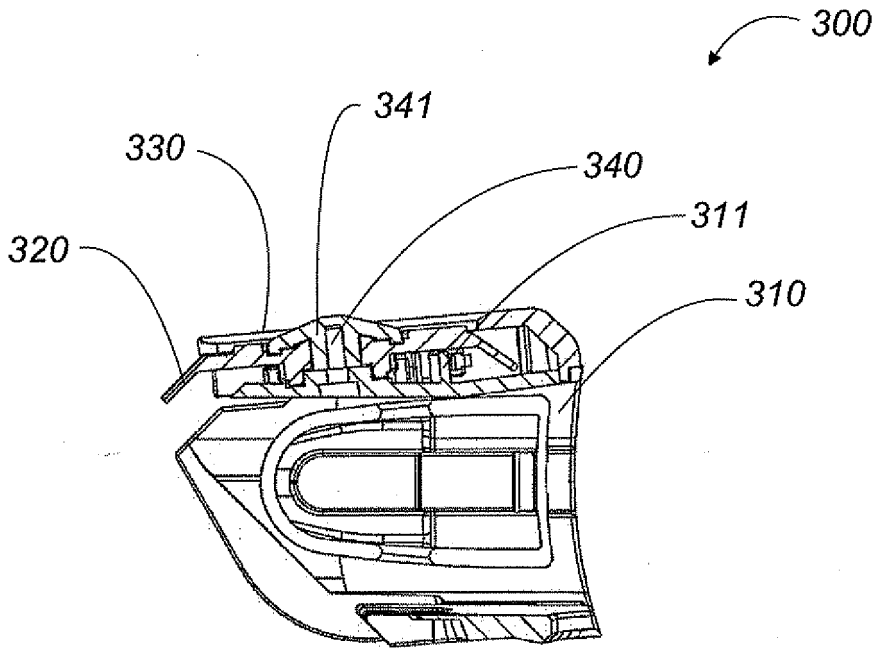


Fig. 3d

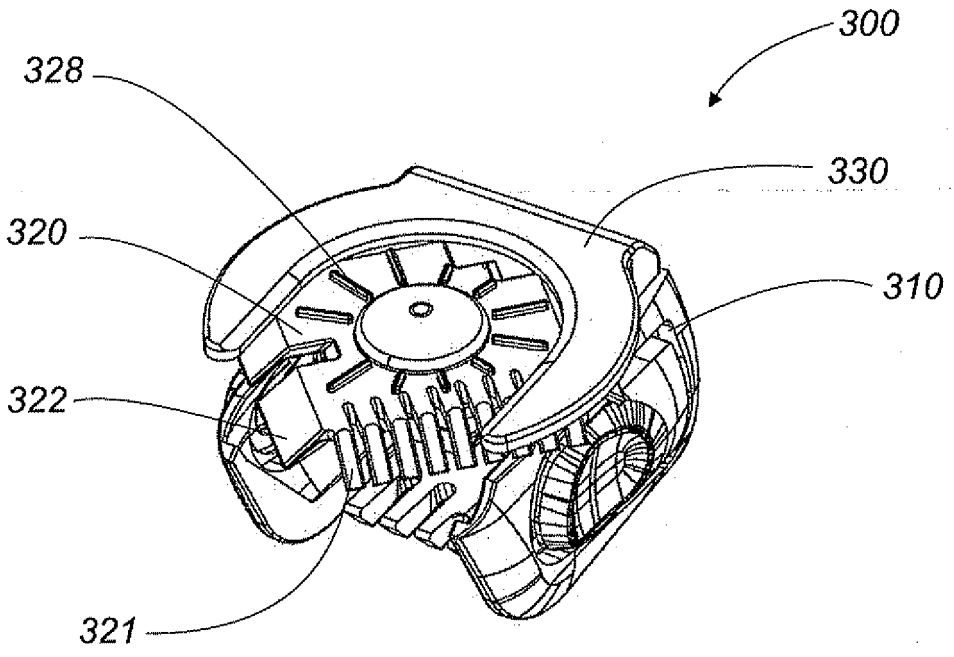


Fig. 4

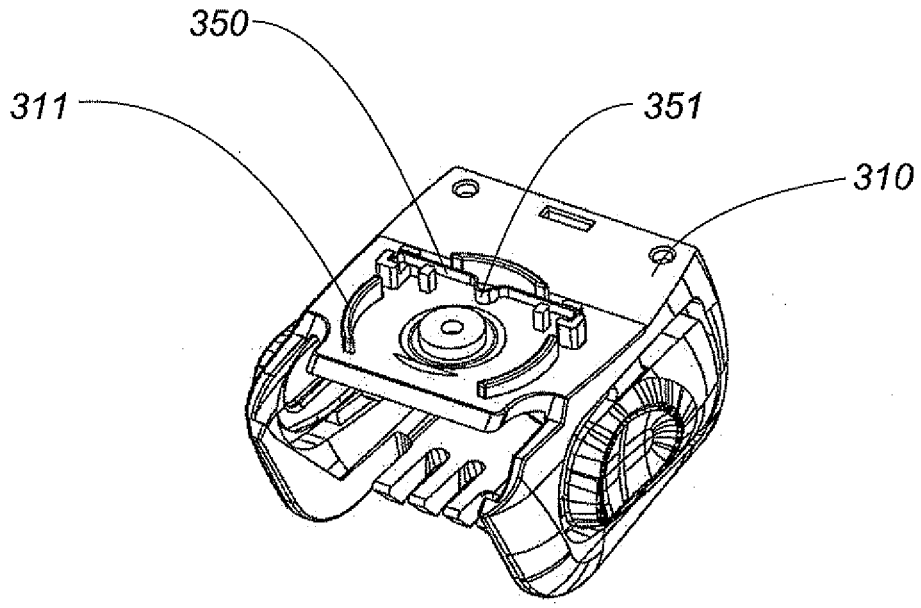


Fig. 5

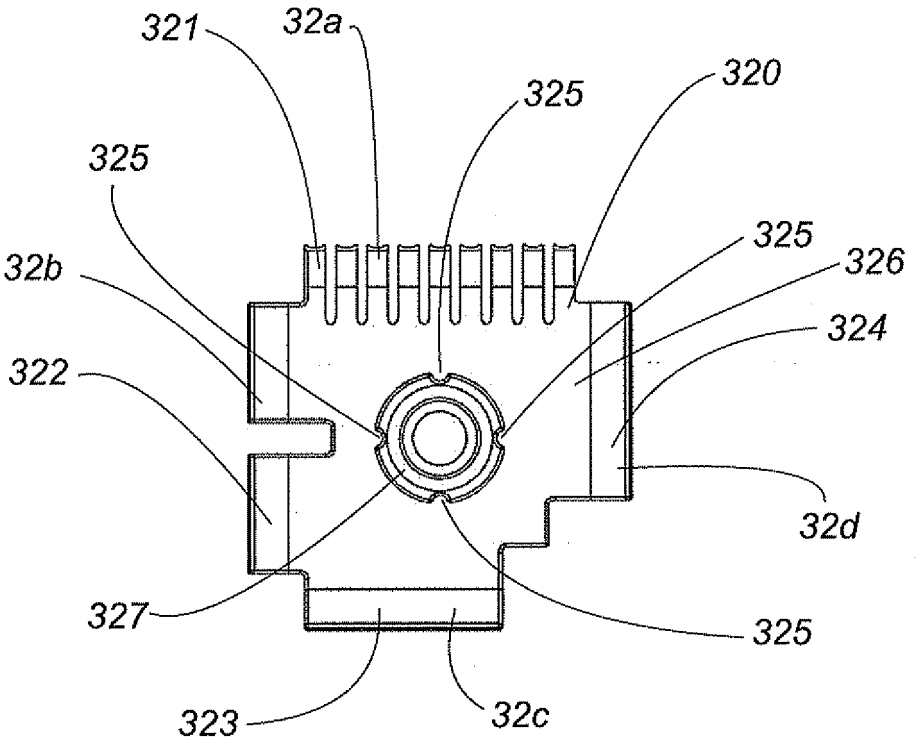
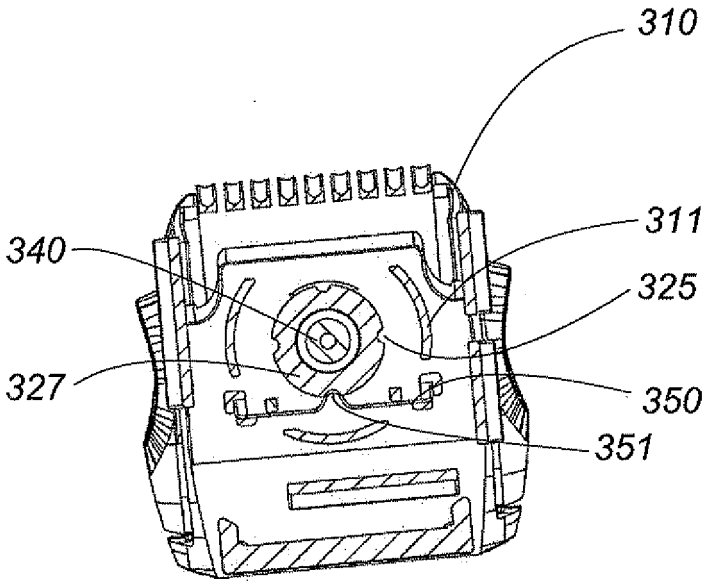


Fig. 6



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2009/070223

A. CLASSIFICATION OF SUBJECT MATTER
B26B19/20(2006.01)i, *B26B19/42*(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)
B26B19/00-19/48

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 1996-2009
Kokai Jitsuyo Shinan Koho 1971-2009 Toroku Jitsuyo Shinan Koho 1994-2009

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.
X Y A	JP 2001-232075 A (Matsushita Electric Works, Ltd.), 28 August 2001 (28.08.2001), paragraphs [0010] to [0012]; fig. 1 to 3 (Family: none)	1,3,6,8 2,7,9-10 4-5
Y	JP 2000-210484 A (Matsushita Electric Works, Ltd.), 02 August 2000 (02.08.2000), paragraphs [0061] to [0063]; fig. 30 to 32 (Family: none)	2,7,9-10

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
18 December, 2009 (18.12.09)	28 December, 2009 (28.12.09)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2009/070223

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. 204004/1983(Laid-open No. 106583/1985) (Matsushita Electric Works, Ltd.), 20 July 1985 (20.07.1985), (Family: none)	1-10
A	JP 2003-154177 A (Matsushita Electric Works, Ltd.), 27 May 2003 (27.05.2003), (Family: none)	1-10

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 9253356 A **[0002]**
- JP 6031661 A **[0002]**