Nov. 21, 1967 S. S. MENDOZA 3,353,265

VACUUM HAIR CUTTING DEVICE

Filed May 26, 1966 2 Sheets-Sheet 1

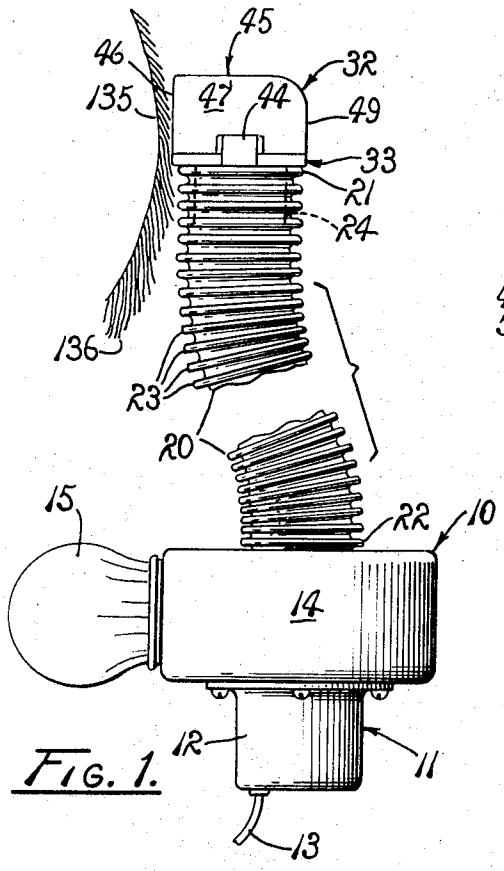



FIG. 1.

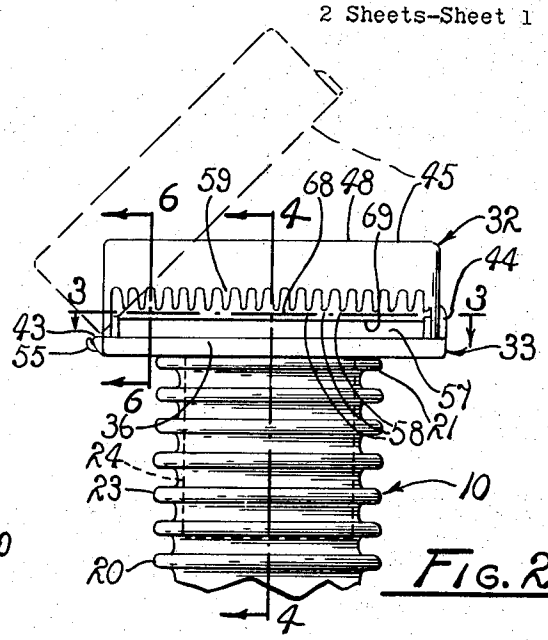



FIG. 2.

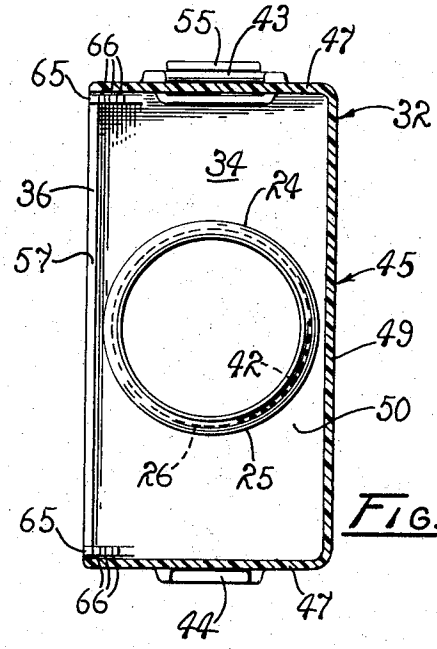



FIG. 3.

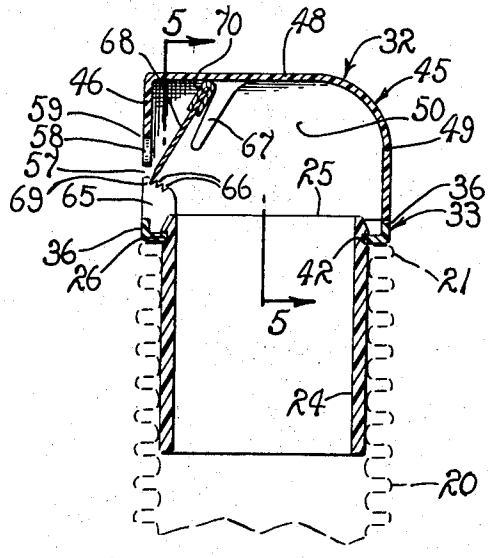



FIG. 4.

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Filed May 26, 1966 2 Sheets-Sheet 2

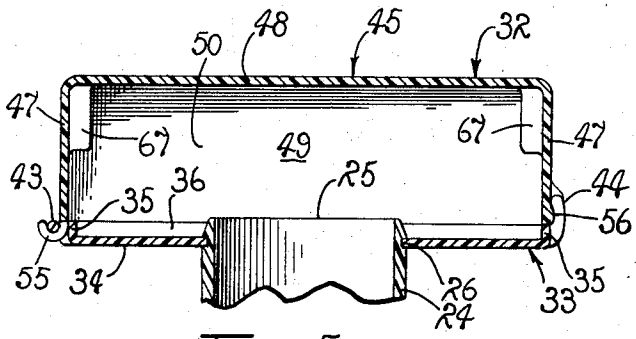


FIG. 5.

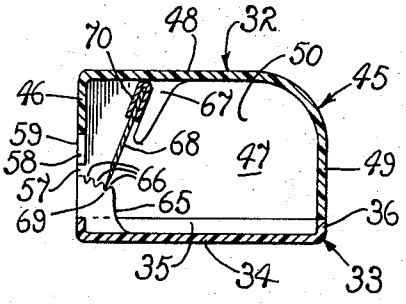


FIG. 6.

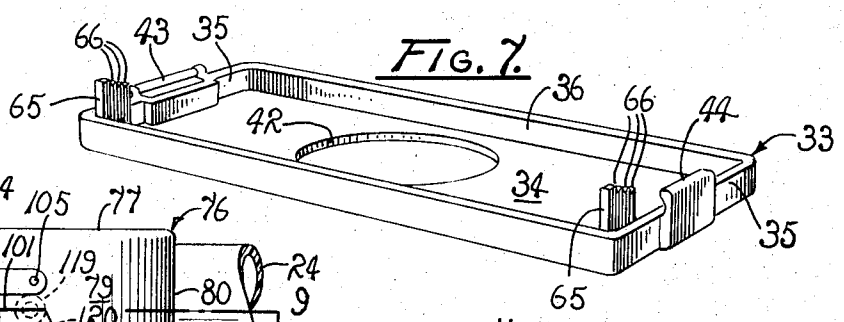


FIG. 7.

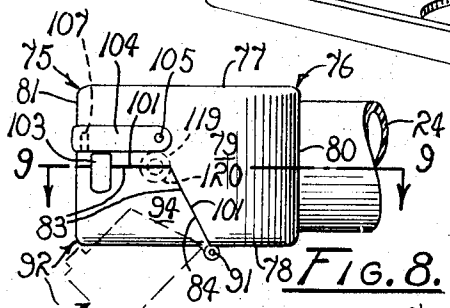


FIG. 8.

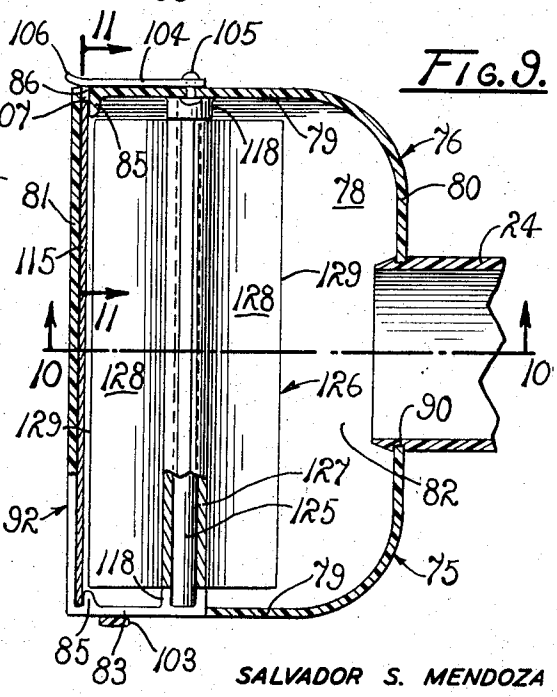


FIG. 9.

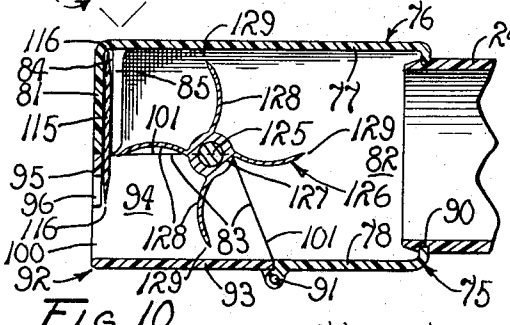


FIG. 10.

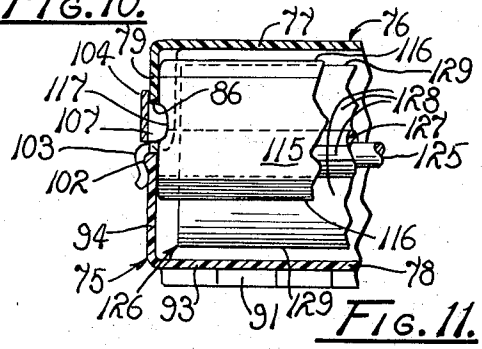


FIG. 11.

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3,353,265

# VACUUM HAIR CUTTING DEVICE

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Filed May 26, 1966, Ser. No. 553,092
1 Claim. (Cl. 30—133)

## ABSTRACT OF THE DISCLOSURE

The invention relates to a device for cutting hair which incorporates means creating a vacuum to draw hair against a cutting member, and which subsequently carries the freshly cut hair away for disposal. Intake and discharge openings define and provide an air path through the head. A razor blade is mounted in the head of the mechanism adjacent to the intake opening obliquely to the air path. The cutting head includes blade mounts within the head at opposite sides of the intake opening, and a series of notches selectively accommodate ends of the razor blade to permit angular disposition of the blade with respect to the air stream and its spacing from the intake opening.

The present invention relates to a device for cutting hair and more particularly to such a device which utilizes a vacuum to draw hair against a cutting member and which subsequently carries the freshly cut hair away for disposal.

In barbering, a new technique of cutting hair has been developed which is being increasingly used, particularly in the expanding business of men's hair styling. This is the technique of employing a straight razor blade to cut hair. There are a number of advantages to this technique as compared with the utilization of conventional hair clippers or scissors. First, it enables the barber to shave off small quantities of hair in a combining motion while the hair is in the style desired. Thus, the barber can "shape" the hair style precisely as desired without having to guess at the extent of hair to remove. This is usually impossible with conventional hair clippers since the hair is disarranged during cutting making it impossible continuously to observe the results of the cutting in relation to the overall hair style. With conventional hair clippers or scissors, the barber must rely solely on his experience of where and how much hair to cut in creating a hair style. Second, the razor can be employed by the barber to thin out the hair when necessary without having to resort to the use of special clippers. Third, the razor is obviously an easy to handle and inexpensive tool which requires no repairs or adjustments, other than sharpening, as compared with the attention required by conventional hair clippers.

However, prior to the present invention there have been a number of disadvantages to the use of this razor trimming technique. Perhaps the most obvious disadvantage is that the barber must be careful that he does not cut himself or the customer. Since he must be more careful than with clippers, the straight razor is somewhat slower to use. Furthermore, it is difficult to cut off relatively large quantities of hair in a few cuts because there is nothing which traps or draws hair toward the blade for cutting as in conventional clippers. Consequently, many barbers use both a hair clipper and a razor in cutting hair or use just the hair clippers and scissors in order to accelerate the hair cutting operations.

There is another problem present in all barbering which has not been entirely satisfactorily solved. This is the problem of efficiently disposing of the freshly cut hair. Ordinarily, most of the newly cut hair falls to the floor making an unsightly, as well as unsanitary pile of hair, which must continually be collected and removed. Even



more objectionable, some of the freshly cut hair usually falls on the person whose hair is being cut collecting on his clothing, falling down the neck of his shirt, or remaining in his hair. Consequently, the barber usually must either vacuum or brush away as much of the cut hair as he can. Effective removal is difficult and as a consequence cut hair frequently remains as an unsightly irritant.

Therefore, it is an object of the present invention to provide an improved hair cutting device.

Another object is to provide a hair cutting razor blade that is safe to employ.

Another object is to provide such a hair cutting device which utilizes a vacuum to draw hair against a razor blade.

Another object is to provide such a device which by utilizing a stream of air moving over a razor blade can cut hair in any direction.

Another object is to provide such a hair cutting device which is easily manipulatable and suitable for continual use.

Another object is to provide a hair cutting device which carries the freshly cut hair away for effective disposal.

Another object is to provide such a hair cutting device which can be used selectively to cut large or small quantities of hair with each cutting motion.

A further object is to provide such a hair cutting device which is of relatively simple uncomplicated construction requiring little or no adjustment or repair.

Another object is to provide such an improved hair cutting device having a stationary replaceable razor blade therein which can be positioned in the most advantageous cutting angle in the device, and which device possesses all of the advantages of cutting hair with a straight razor.

Another object is to provide a second form of such a hair cutting device which employs a rotary razor blade.

Still further objects of the present invention are to provide improved elements and arrangements thereof in an apparatus for the purposes set forth which is fully effective in achieving its intended purposes.

These, together with other objects and advantages of the present invention, will become more fully apparent upon reference to the following description in the specification and accompanying drawings.

In the drawings:

FIG. 1 is a side elevation of a device embodying the principles of the present invention shown being used to cut hair.

FIG. 2 is a somewhat enlarged fragmentary front elevation of the cutting head and hose of the device of the present invention showing a housing cover thereof in dashed lines in pivotally retracted position.

FIG. 3 is a somewhat further enlarged horizontal section of the cutting head of the device of the present invention taken on line 3—3 of FIG. 2 and with a razor blade thereof removed for illustrative convenience.

FIG. 4 is a somewhat enlarged fragmentary transverse vertical section of the cutting head taken on line 4—4 of FIG. 2 and showing the hose in dashed lines.

FIG. 5 is a somewhat enlarged fragmentary longitudinal vertical section of the cutting head with the razor blade removed therefrom.

FIG. 6 is a somewhat enlarged transverse vertical section of the cutting head taken on line 6—6 of FIG. 2.

FIG. 7 is a somewhat enlarged perspective view of the base plate of the cutting head with the razor blade removed therefrom.

FIG. 8 is a fragmentary side elevation of the cutting head and coupling nipple of a second form of the invention with the hose removed therefrom and showing a mounting door in dashed lines in an open position.

FIG. 9 is a somewhat enlarged fragmentary horizontal section of the cutting head and coupling nipple of the sec-

ond form of the invention taken on line 9—9 of FIG. 8 showing a rotary cutting wheel disposed therein.

FIG. 10 is a somewhat enlarged fragmentary transverse vertical section of the cutting head and coupling nipple of the second form of the invention taken on line 10—10 of FIG. 9 showing the rotary cutting wheel in cross section.

FIG. 11 is a somewhat enlarged fragmentary longitudinal vertical section of the cutting head of the second form of the invention taken on line 11—11 of FIG. 9 showing a razor blade locked in position by a spring clip.

*First form*

Referring in greater particularity to FIGS. 1 through 7 of the drawings, a first form of the vacuum hair cutting device of the present invention is generally indicated by the numeral **10**. The device includes an electrically powered vacuum producing unit **11** which can be mounted in any convenient position, such as on a barber chair or on a counter adjacent to the barber chair. The vacuum producing unit provides an electric motor **12** which has an electric cord **13** by which the motor can be operably connected to a source of power, not shown. A fan unit **14** is driven by the electric motor. A hair collection bag **15** which is constructed of a rather porous material is attached in receiving relation to the fan unit, as shown in FIG. 1.

A rubber or plastic hose **20** of any suitable length, having a head end **21** and an opposite discharge end **22**, is operably connected at its discharge end to the fan unit **14**. A plurality of annular rings **23** are provided integral with and throughout the entire length of the hose, as shown in FIGS. 1, 2 and 4. The rings serve to prevent the hose from collapsing. A substantially cylindrical coupling nipple **24** having end **25** is connected to the head end of the hose with the end **25** protruding a short distance therefrom. The end preferably has an annular groove **26** circumferentially thereabout.

The device **10** provides a substantially rectangular cutting head **32**, constructed of metal or sturdy plastic, which is releasably connected to the end **25** of the coupling nipple **24**, as will subsequently be described. The cutting head has a base plate **33** having a bottom wall **34** and opposite ends **35**. An integral peripheral wall **36** is provided about the bottom wall and extends a short distance upwardly therefrom and normal thereto, as shown best in FIG. 7. A circular mounting hole **42** is centrally positioned in the bottom wall. A pivot mount **43** is integrally provided centrally of one of the opposite ends of the base plate. A snap latch **44** is integrally located centrally of the other of the opposite ends of the base plate. The base plate and thus the cutting head is mounted on the end **25** of the coupling nipple **24** with the end extending into the mounting hole **42** and with the portion of the bottom wall which describes the mounting hole fitted into and completely filling the annular groove **26**. Thus, the mounting head is fully rotatable about the coupling nipple through the plane of the annular groove. Furthermore, the cutting head may be removed from or remounted on the coupling nipple simply by respectively pulling it from or forcing it into the position as described above and as best shown in FIG. 4.

The cutting head **32** also provides a housing cover **45** of unitary construction. The housing cover has a flat front wall **46**, a pair of parallel end walls **47**, and a top wall **48** which arcuately curves to form a back wall **49**. The base plate and the housing cover define a chamber **50** of the cutting head. An arcuately curved pivot cam **55** is located on one of the end walls. A male detent **56** is provided on the other of the end walls. The pivot cam and male detent are best shown in FIG. 5. The housing cover is pivotally mounted on the base plate **33** with the pivot cam received in the pivot mount **43**. The housing cover is secured from pivotal movement by the male detent being received in the snap latch **44**.



A hair receiving opening **57** is provided in the front wall **46** of the housing cover **45**. Integral projections or fingers **58** are provided on the front wall which extend partially across the hair receiving opening toward the base plate **33** in the same plane as the front wall. The fingers form a comb **59**. A pair of blade mounts **65** are individually affixed to the bottom wall **34** in the interior **50** of the cutting head **32** in the corners formed by each of the end walls **47** and the front wall of the housing cover, as best shown in FIG. 7. Each of the blade mounts has several adjustment notches **66** therein, as best shown in FIGS. 4 and 6. A pair of blade rests **67** are individually affixed to the top wall **48** and individually to opposite end walls of the housing cover so that they extend into the interior of the cutting head at a slight angle toward the hair receiving opening, as shown best in FIGS. 4, 5, and 6.

A razor blade **68**, having a cutting edge **69** and an upper end **70**, and of a length slightly shorter than that of the cutting head **32**, is removably mounted in the interior **50** of the cutting head. The razor blade is mounted with the cutting edge resting in corresponding adjustment notches **66** of the blade mounts **65** and with the upper end resting against the blade rests **67**. With the housing cover **45** firmly held in place by the snap latch **44**, the razor blade is immovably locked in position in the interior of the cutting head with the cutting edge held in the adjustment notches by the pressure of the top wall **48** and blade rests against the upper end of the razor blade, as shown in FIGS. 4 and 6.

*Second form*

The second form of the invention has all of the elements of the first form of the invention except that it provides a different form of cutting head **75** which is constructed of metal or sturdy plastic and is shown in FIGS. 8 through 11. The cutting head **75** provides a blade housing **76** of unitary construction. The blade housing has a flat top wall **77**, and a parallel flat bottom wall **78**. A pair of opposite end walls **79** are provided by the blade housing and arcuately curve towards each other to form a back wall **80**. The blade housing also has a flat front wall **81** which extends between and normal to the end walls. The top wall, bottom wall, end walls, back wall, and front wall define a chamber **82**. The end walls, front wall, and bottom wall have abutment edges **83**. A downwardly and forwardly exending blade mounting opening **84** is described by the abutment edges.

A pair of blade guides **85** are individually provided on each of the end walls **79** within the interior **82** of the cutting head **75** and are extended from the top wall **77** to the blade mounting opening **84** a predetermined relatively short distance from the front wall **81**. Corresponding lock holes **86** are individually provided in the end walls of the blade housing so that they communicate with the space between the front wall and the blade guides a predetermined distance from the top wall. The back wall **80** has a centrally positioned mounting hole **90** having a diameter equal to the mounting hole **42** of the cutting head **32** of the first form of the invention. The cutting head **75** is pivotally mounted on the coupling nipple **24** of the hose **20** as in the first form of the invention and as best shown in FIGS. 9 and 10. A pivot **91** is mounted adjacent to the abutment of the bottom wall **78**, as shown in FIGS. 10 and 11.

A door **92** is pivotally mounted on the blade housing **76** in the blade mounting opening **84** by being fastened to the pivot **91**, as best shown in FIGS. 8 and 10. The door has a bottom wall **93** which has parallel side walls **94** normal to it. A comb **95**, having fingers **96**, similar to comb **59** of the first form of the invention is provided between and normal to the side walls a predetermined distance from the bottom wall of the door. The comb, side walls, and bottom wall of the door define a hair receiving opening **100**. The comb, side walls, and bottom

wall have upwardly and rearwardly facing contacting edges **101** which rest against the abutment edges **83** of the front wall **81**, end walls **79**, and bottom wall **78** respectively of the blade housing and in substantially the same planes therewith when the door is in the closed position shown in FIG. 10.

A pair of integral male detents **102** are individually provided in corresponding positions on side walls **94** of the door **92** adjacent to and extending slightly outwardly from their contacting edges. A pair of tensioned snap fasteners **103** are integrally provided individually on each end wall **79** of the blade housing **76** in alignment with their respective male detents so that when the door is in the closed position as shown best in FIG. 11, each snap fastener extends over its respective male detent thus retaining the door in position. A pair of tension spring clips **104** are individually mounted at one of their ends exteriorly of the blade housing on each of the end walls thereof by rivets **105** and individually extend across the lock holes **86**. Each of the spring clips has a slightly bent end **106** opposite to that which is mounted on its respective end wall. Each of the spring clips also has a projection **107** near its bent end which is slidably received in the lock hole of its respective end wall and which extends a predetermined relatively short distance into the chamber **82** of the cutting head **75** between its respective adjacent blade guide **85** and the front wall **81**.

A razor blade **115** of a slightly shorter length than that of the front wall **81** of the blade housing **76** and having opposite cutting edges **116** and notches **117** at each end, is releasably mounted between the front wall and the blade guides **85** by the projections **107** extending into each of its notches. A pair of bearings **118**, having upper halves **119** and lower halves **120**, are individually mounted in predetermined positions in the interior **82** of the cutting head **75** with an upper half on each end wall **79** of the blade housing adjacent its respective abutment edge **83** and the lower half on its respective side wall **94** of the door **92** adjacent to its contacting edge **101**. When the door is in the closed position, the upper and lower halves of each bearing contact each other to form cylindrical bearings, as best shown in dashed lines in FIG. 8. When the door is in the closed position, the bearings define an axis which is parallel to, and a predetermined distance from, the front wall of the blade housing.

A shaft **125** is rotatably mounted in the bearings **118**. A rotary cutting wheel **126** is mounted on the shaft for rotation. The cutting wheel has a bearing tube **127** having an inside diameter slightly greater than the diameter of the shaft and a length slightly shorter than the distance between the two bearings. It is the bearing tube which is rotatably received about the shaft thereby rotatably mounting the cutting wheel. Four cutting blades **128**, which are arcuately curved in cross section in the direction of intended rotation of the cutting wheel and which have distally positioned cutting edges **129**, are mounted, as by welding, longitudinally of and on the bearing tube approximately 90° apart about the periphery thereof, as best shown in FIG. 10. The cutting blades are of the same length as the bearing tube and have widths of sufficient distance so that the cutting edges **129** thereof pass quite closely to the lower cutting edge **116** of the razor blade **115** when the cutting wheel is rotated about the shaft.

*Operation*

The operations of the described embodiments of the subject invention are substantially the same and attention is first invited to the operation of the first form.

The vacuum hair cutting device **10** is designed either for use in a barber shop or private home primarily to cut hair, but also to be used as a blower to dry hair. When used to cut hair, the vacuum hair cutting device is made operable by "plugging" the electric cord **13** into a suitable source of electrical energy. Thus, air is drawn through the hair receiving opening **57**, the interior **50** of the cutting head **32**, the coupling nipple **24**, the hose **20**, through the fan unit **14**, and finally is forced into the hair collection bag **15** through which the air is dispersed. Consequently, a low pressure area or partial vacuum is created within the cutting head of the device. The cutting head is subsequently drawn with a combing motion over the head **135**, of a person whose hair **136** is to be cut, in any direction as determined by his hair style. The partial vacuum created in the interior of the cutting head draws the hair through the hair receiving opening as the comb **59** guides the hair evenly therethrough. Consequently, as the cutting head is moved along, the hair is cut by the edge **69** of the razor blade **68**. This freshly cut hair then travels through the hose and into the hair collection bag where the hair is retained as the air is exhausted through the porous material of the bag. The hair collection bag can be removed from the fan unit at any time and the hair conveniently disposed. The amount of hair cut is determined by how close the cutting head is held to the person's head. In other words, the closer the hair receiving opening **57** is held to the person's head, the longer the length of hair that is drawn into the cutting head and consequently the longer the length of hair that is cut. However, this is true only to the extent that the hair receiving opening is not entirely obstructed. If complete obstruction occurs, the flow of air through the device is disrupted and thus it does not function properly.

In order to replace or reposition the razor blade **68**, the operator need only unsnap the housing cover **45** from its locked position with the snap latch **44** of the base plate **33** and pivot it back to disclose the interior **50** of the cutting head **32**, as shown in dashed lines in FIG. 2. The razor blade can then be replaced with a new razor blade, if the old one is worn out, or readjusted to a more advantageous cutting position with respect to the hair receiving opening **57** with its cutting edge **69** in any of the desired adjustment notches **66** of the blade mounts **65**. In order to lock the razor blade in position, the operator merely holds the upper end **70** of the razor blade with his finger with the razor blade positioned in the desired adjustment notches. As he swings the housing cover to the closed position, he leans the upper edge of the razor blade against the blade rests **67**. After removing his finger, the housing cover can be again locked in position with the male detent **56** received in the snap latch and thus the razor blade also is locked in position.

The hair cutting device **10** may also be used as a blower to dry hair. In order to do this the hair collection bag **15** is removed from the fan unit **14**. The razor blade **68**, however, need not be removed from the cutting head **32**. With the electric cord **13** "plugged in" as described, the electric motor is reversed to force air upwardly out of the fan unit as viewed in FIG. 1. The air is thus forced out of the fan unit, through the hose **20**, the coupling nipple **24**, the chamber **50** of the cutting head, and subsequently out of the hair receiving opening **57**. The cutting head is then held adjacent to the hair **76** which is to be dried and is manipulated in the conventional manner to dry the hair.

Cleaning of the cutting head **32** of the hair cutting device **10** is a simple operation. Either the cutting head can be opened as described and a brush used to clean residue from the chamber **50**, or the cutting head can be pulled free from the coupling nipple **24** and submersed in a sterilizing solution for as long as is necessary to provide proper sterilization.

As previously discussed, the second form of the invention differs from the first only in the design of the cutting head **75**. Consequently, the second form of the invention is easily converted for use as a hair dryer and the cutting head can be cleaned in precisely the same manner as the first form of the invention.

When the vacuum hair cutting device of the second

form of the invention is operated, air is drawn through the hair receiving opening **100** and the chamber **82** of the cutting head **75**, through the coupling nipple **24**, the hose **20**, through the fan unit **14**, and finally is forced into the hair collection bag **15**. Since the path of air moving through the interior of the cutting head is oblique to the cutting wheel **126**, the cutting wheel is caused to rotate in a counterclockwise direction at a relatively rapid speed, as viewed in FIG. 10. The cutting edges **129** of the cutting blades **128** are thus drawn rapidly past the lower cutting edge **116** of the razor blade **115**.

The cutting head **75** is, then, drawn over the head **135** of the person whose hair **136** is to be cut in precisely the same manner as the first form of the invention. The hair is similarly drawn through the hair receiving opening **100** between the fingers **96** of the comb **95** and inwardly past the lower cutting edge **116** of the razor blade **115**. The hair is, then, severed either by the downward movement of the cutting head causing the lower cutting edge of the razor blade to cut the hair, or by the cutting edges **129** of the cutting wheel **126** slicing through the hair. Anadvantage of this form of the invention is that the the cutting head need not be moved to cut hair since the cutting wheel can cut hair when the cutting head is stationary. However, as before, the hair receiving opening cannot be positioned tightly against the head since this cuts off the flow of air. Without proper air movement through the head, no hair is drawn in and the cutting wheel does not turn.

In order to gain access to the interior **82** of the cutting head **75** for replacement of the razor blade **115** or the cutting wheel **126**, the door **92** is merely pivoted about its pivot **91** away from the snap fasteners **103**. Thus, the blade mounting opening **84** is exposed. The razor blade can be removed by positioning the cutting head so that the pivot is facing downwardly and the door is open. The bent ends **106** of the spring clips **104** are then pulled away from the end walls **79** so that their projections **107** are drawn out of their respective notches **117** of the razor blade. Consequently, the razor blade falls by gravity from the interior of the cutting head through the blade mounting opening. A new razor blade can be mounted by inverting the cutting head, pulling the bend ends of the spring clips away from their respective end walls, sliding a new razor blade into place between the front wall **81** and the blade guides **85**, and finally releasing the spring clips so that their projections are seated in their respective notches of the new razor blade. Thus, the new razor blade is held firmly in position.

When the door **92** is pivoted away to expose the blade mounting opening **84** the lower half **120** of each bearing **118**, being mounted on the door, of course is separated from its respective upper half **119** of its bearing. The cutting wheel **126** and shaft **125**, then, can easily be pulled from the interior **82** of the cutting head **75**. Thus, a new



cutting wheel or a cutting wheel which has had its cutting edges **129** resharpened can be rotatably received on the shaft when the old cutting wheel has been removed therefrom. The cutting wheel and shaft, then, can be replaced in the upper halves of the bearings and the door closed so that the bearings again securely hold the shaft rotatably in the desired position.

Thus, the hair cutting device **10** of both forms of the present invention can be used in a barber shop or a private home to cut hair with all of the previously described advantages of cutting hair with a straight razor. However, the operator experiences none of the described disadvantages of using a straight razor. Furthermore, the freshly cut hair is automatically collected for convenient disposal thus maintaining proper sanitary conditions.

Although the invention has been herein shown and described in what are conceived to be the most practical and preferred embodiments, it is recognized that departures may be made therefrom within the scope of the invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claim so as to embrace any and all equivalent devices and apparatus.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

A hair cutting device comprising a cutting head having an intake opening and a discharge opening defining an air path through the head, a razor blade mounted in the head adjacent to the opening obliquely to said air path, means for applying a vacuum to the discharge opening of the head whereby hair may be drawn inwardly of the intake opening along said path of air and severed by movement of the head in a direction bringing the blade into severing engagement with such hair, said cutting head including blade mounts within said head at opposite sides of the intake opening, each providing a series of notches selectively accommodating opposite ends of the razor blade whereby the angular disposition of the blade with respect to the air stream and its spacing from the intake opening can be selectively adjusted.


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