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METHOD OF SHAVING

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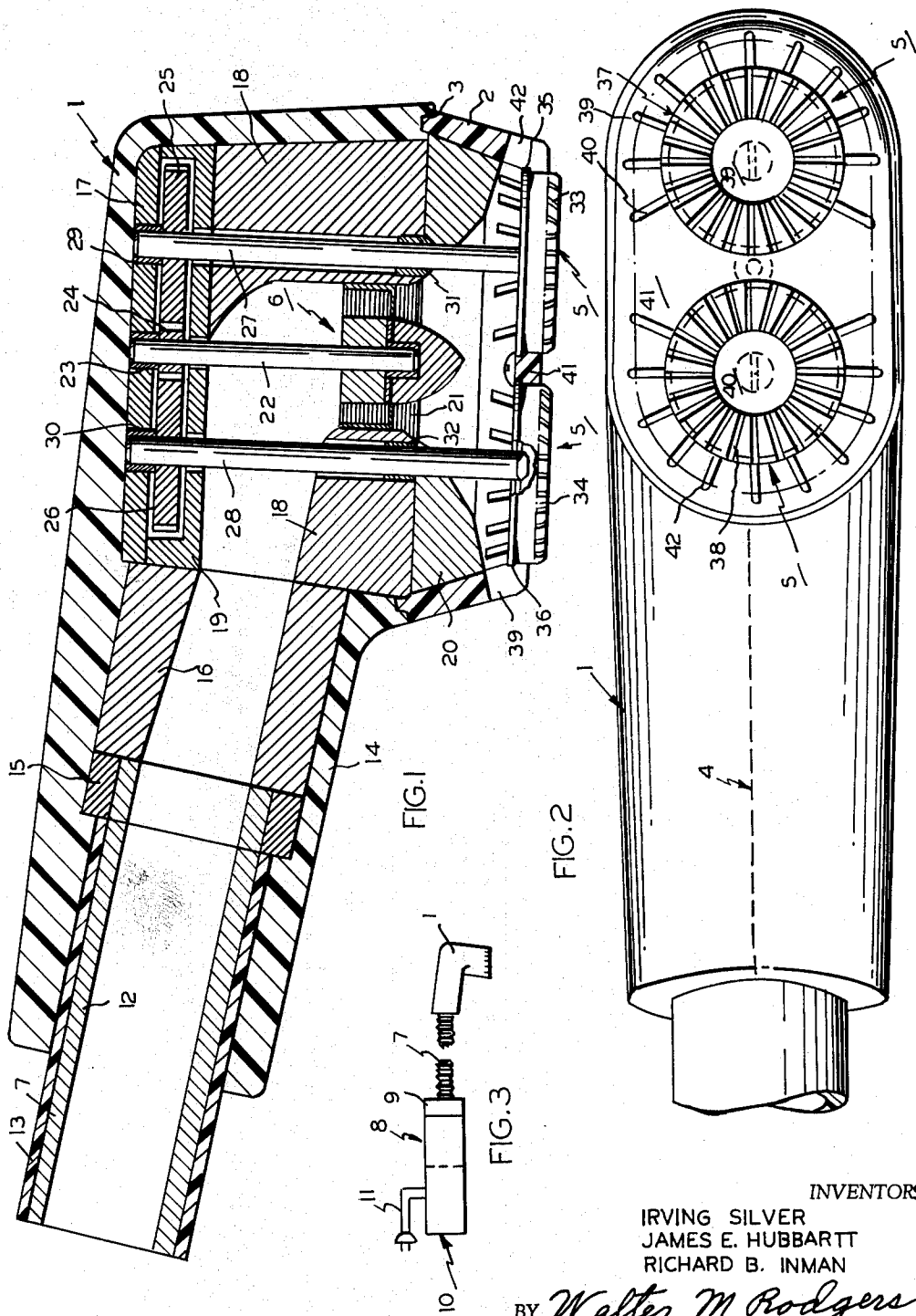


FIG. 1

FIG. 2

FIG. 3

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METHOD OF SHAVING

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This invention relates to a pneumatic shaver and to a method of shaving and more particularly is directed to a shaver having a pair of relatively movable cutting elements and pneumatic system for scavenging the shaved area and which may if desired function to impart operating movement to the cutter elements and wherein shaving lather or other substance normally is applied to the area to be shaved before the commencement of a shaving operation.

One factor which accounts in part at least for the current popularity of the so-called dry shavers is the fact that straight razors and the so-called safety razors are difficult to use even by a skilled person with consistently safe results.

On the other hand, mechanical type dry shavers ordinarily do not provide as close a shave as do straight and safety razors and, of course, in ambient conditions of high humidity, are difficult to use because they do not glide easily over the area to be shaved.

Heretofore it has been assumed that lather could be used only in conjunction with straight and safety razors and that mechanical razors could not be used in conjunction with lather. Indeed such mechanical razors are commonly called "dry shavers." The revolutionary shaving method of this invention is based on the fact that lather is made up largely of air and on the fact that its small residue is not objectionable when a properly constructed razor of the pneumatic type is used. Indeed such residue may even be desirable as a lubricant for movable cutting and motivating elements.

A principal object of this invention is to provide an improved shaving method which is especially adapted to afford a close, clean and comfortable shave with virtually no danger from cuts or abrasions.

Another object of the invention is to combine the advantages of lather shaving customarily utilizing straight and safety razors with the advantages of mechanical dry shavers but without the disadvantages of either method of shaving.

The invention in one form comprises the steps of establishing a region of low pressure which is substantially below atmospheric pressure, applying a substance such as lather to the area to be shaved, moving a pair relatively movable cutting elements over the area to be shaved and in close contact therewith, applying pneumatic suction from the low pressure region through and immediately around the cutting elements for removing the lather along with any hairs that are cut from the shaved area, and accumulating the hairs and any minute residue of the lather.

For a better understanding of the invention, reference may be had to the following detailed description taken in conjunction with the accompanying drawings in which FIG. 1 is a side view in section taken along the center line of the shaving unit, including cutter elements and a driving means therefor; FIG. 2 is a plan view of the arrangement disclosed in FIG. 1 as viewed from the side of the unit on which the cutter elements are disposed; and in which FIG. 3 is a general schematic view of a system utilizing the shaving element depicted in FIGS. 1 and 2.

While the method and apparatus which constitute this invention preferably are utilized in conjunction with a

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pneumatically operated turbine which imparts movement to at least one of the cutter elements, it will be understood that the invention is not limited to such an arrangement and may be used in conjunction with the shaving apparatus, for example, as disclosed and claimed in patent application Serial No. 180,550 filed March 19, 1962 which has matured into Patent No. 3,128,549 granted April 14, 1964, and assigned to the assignee of this invention.

With reference to FIGS. 1 and 2, a housing generally designated by the numeral 1 is provided and preferably is constructed of plastic material. While the housing 1 is shown as having a separate portion 2 secured thereto at what might be called a parting line 3, it will be understood that the housing 1 could constitute a pair of side-by-side elements separated from each other along a longitudinally disposed medial parting line designated in FIG. 2 in dotted form by the numeral 4. As is best shown in FIG. 1, cutter elements generally designated at 5 are mounted along the flat glide area formed in the housing 1 and motivating force is imparted to at least one of the cutter elements by a turbine generally designated by the numeral 6 in FIG. 2. In FIGS. 1 and 2 the rotatable cutter element is not shown, it being understood that such element is of conventional construction.

As is best shown in FIG. 3, the housing 1 is interconnected through flexible hose 7 with a schematically represented structure 8 which constitutes means in which a region of low pressure may be established and in which the left hand part thereof may constitute a vacuum pump or other suitable device for establishing the low pressure region. An accumulator 9 is schematically represented at the extreme right hand end of element 8 and it is to be understood that during a shaving operation air is drawn in from the atmosphere at the cutter elements 5, passes through the turbine 6, the hose 7, and the accumulator 9 and is exhausted for example at the portion 10 of the structure 8. Motive means for the vacuum motor may be energized through electric conductors 11 in known manner if desired.

The hose 7 is best shown in FIG. 1 and may constitute an inner tubular element designated in FIG. 1 by the numeral 12 and an outer tubular covering 13. Of course, both the tubular elements 12 and 13 are formed of flexible material and preferably are of an extensible bellows construction.

For securing the hose elements 12 and 13 into the handle portion 14 of the housing 1, a clamping ring 15 is provided. Clamping ring 15 also serves to position an internal throat element 16 in place. Bearing plate 17 is held in place as shown by the throat element 16 as well as by the spacer blocks 18 and 19.

For the purpose of establishing a rounded contour whereby air drawn in from the region immediately adjacent the cutting elements 5 and into the turbine 6 a throat element 20 is provided.

While two pairs of relatively movable cutter elements are depicted in the drawing, it will be understood that the invention is not limited to the particular arrangement shown and that for certain applications of the invention one pair would suffice and for other applications it might be desirable to use more than two pairs of cutter elements.

For the purpose of imparting motivating force to the rotatable cutter elements forming integral parts of the cutting units 5, a conventional rotor 21 is mounted on a rotatable shaft 22 which in turn is supported in bearing 23 mounted in bearing plate 17. A pinion 24 is securely affixed to shaft 22 and cooperates with driven gears 25 and 26 which are respectively secured by any suitable means to driven shafts 27 and 28 respectively which in turn are rotatably mounted in bearings 29 and 30.

For the purpose of affording additional support for the shafts 27 and 28 supplementary bearings 31 and 32 are mounted in shaft receiving passages in spacer block 18.

While the details of the movable cutter elements are not shown in the drawing, it will be understood that such elements are mounted on the lower ends of the shafts 27 and 28 as viewed for example in FIG. 1.

Cooperating with the rotatable cutter elements which are affixed to the lower ends of shafts 27 and 28 are a pair of cutter combs 33 and 34. These cutter combs are of conventional construction and are provided with annular flanges 35 and 36 as well as a plurality of generally radially disposed hair receiving slits 37 and 38 as well as central recessed portions 39, 40. Thus, as is well known, hairs to be cut extend through the slits 37 and 38 and are severed by the rotating cutter elements inside the cutter combs.

As already pointed out the method and apparatus of this invention are not limited to a pneumatically operated motivating device such as the turbine 6. It is however normally advantageous to utilize a pneumatically driven motivating means for purposes of simplicity. In order to operate a turbine element for example at sufficiently high speed and in order to impart adequate turning moment to the rotatable cutter elements within the cutter combs 33 and 34, it is necessary to force substantial quantities of air through the turbine. Previous attempts to produce a pneumatically operated shaver undoubtedly have failed because sufficient quantities of air could not be drawn through the cutter comb slots such as 37 and 38 which would impart adequate turning moment to the rotor 21 of a turbine such as 6. Thus, in order to provide for an adequate flow of air for operating the turbine 6 and also for scavenging the cut hairs, a plurality of slots 39 are formed in the lower portion of the housing 1 in the region immediately adjacent to and around the cutter combs 33 and 34. From the drawings, it will be understood that the slots 39 are provided with a portion 40 which extends into the flat glide plane 41 formed at the lower portion of housing 1 as well as a portion 42 extending into the side wall of housing 1.

In accordance with an important feature of this invention, the area to be shaved is first covered with a suitable conditioning substance such as lather or liquid shaving lotion or the like. Thereafter, the flat glide surface 41 and the cutter combs 33 and 34 are placed in close contact with the area to be shaved and are moved in conventional fashion. Of course, a low pressure area is established by the vacuum creating element generally designated at 8 so that atmospheric air is drawn from the region immediately adjacent the cutter combs 33 and 34 through the slots 37 and 38 and through the slots 39, 40, 42 into the cavity defined by the throat 20. Of course, such air and other substances flow through the rotatable turbine blades 21 and through the tube 7 and cut hairs are accumulated in the accumulator 9.

In accordance with a feature of the invention lather applied to the area to be shaved is virtually completely dissipated by the turbulent action of the air flowing into the cavity 1 and which is due to the vacuum created in the low pressure region 8. Stated otherwise, after lather is applied and the shaving operation completed, the area shaved is completely free of lather and the cutter combs 33 and 34 and their rotatable elements, the turbine rotor 21 and parts associated therewith, are all virtually free of any objectionable residue of lather. Apparently, the turbulence of the air together with the high air content of the lather itself result in almost complete dissipation of the lather. Any lather residue may even serve as a

sort of lubricant for the moving parts of the cutting elements and of the turbine. The smooth and quiet operation of the movable parts indicates that the lather residue affords a lubricating action which greatly enhances the cutting operation. Since the comb and cutter are arranged in shearing relation, there is a noticeable reduction in friction due apparently to lather residue and in accordance with one aspect of this invention.

While a particular method and apparatus have been shown and described, it will be understood that the invention is not limited thereto and it is intended in the appended claims to cover all such changes and modifications that fall within the true spirit and scope of the invention.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A method of shaving comprising the steps of establishing a region of low pressure substantially lower than atmospheric pressure, applying a skin and hair conditioning substance to the area to be shaved, placing a perforated flat area of one of a pair of relatively movable cutting elements in contact with said area while simultaneously maintaining the other of said cutting elements on the opposite surface of said area of said cutting element, imparting manual movement only to said one cutting element relative to the area to be shaved, applying a pneumatic suction from the low pressure region through and around said perforated cutting elements for removing said conditioning substance along with any hairs that are cut by said cutting element and directly to the area in contact with said one cutting element from the shaved area, and accumulating such hairs and any residue of said conditioning substance in the region intermediate the shaved area and said low pressure region.

2. A shaving method comprising the steps of applying lather to an area to be shaved, establishing a region of low pressure substantially lower than atmospheric pressure, moving a pair of relatively movable shear cutting elements over the area to be shaved, one of said cutting elements having a plurality of slots therein and the other of said cutting elements being in shearing contact with said one cutting element and being disposed to cooperate with the side of the slotted surface thereof which is remote from the area to be shaved, and applying suction from the low pressure region to the area to be shaved simultaneously with the movement of said cutting elements over the area to be shaved, the suction being applied through and immediately adjacent to the cutting elements and being effective to evaporate and dissipate substantially all of the lather and to withdraw the cut hairs past the cutting elements and away from the shaved area.

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