

United States Patent

[11] 3,570,500

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[21] Appl. No. 773,443
[22] Filed Nov. 5, 1968
[45] Patented Mar. 16, 1971

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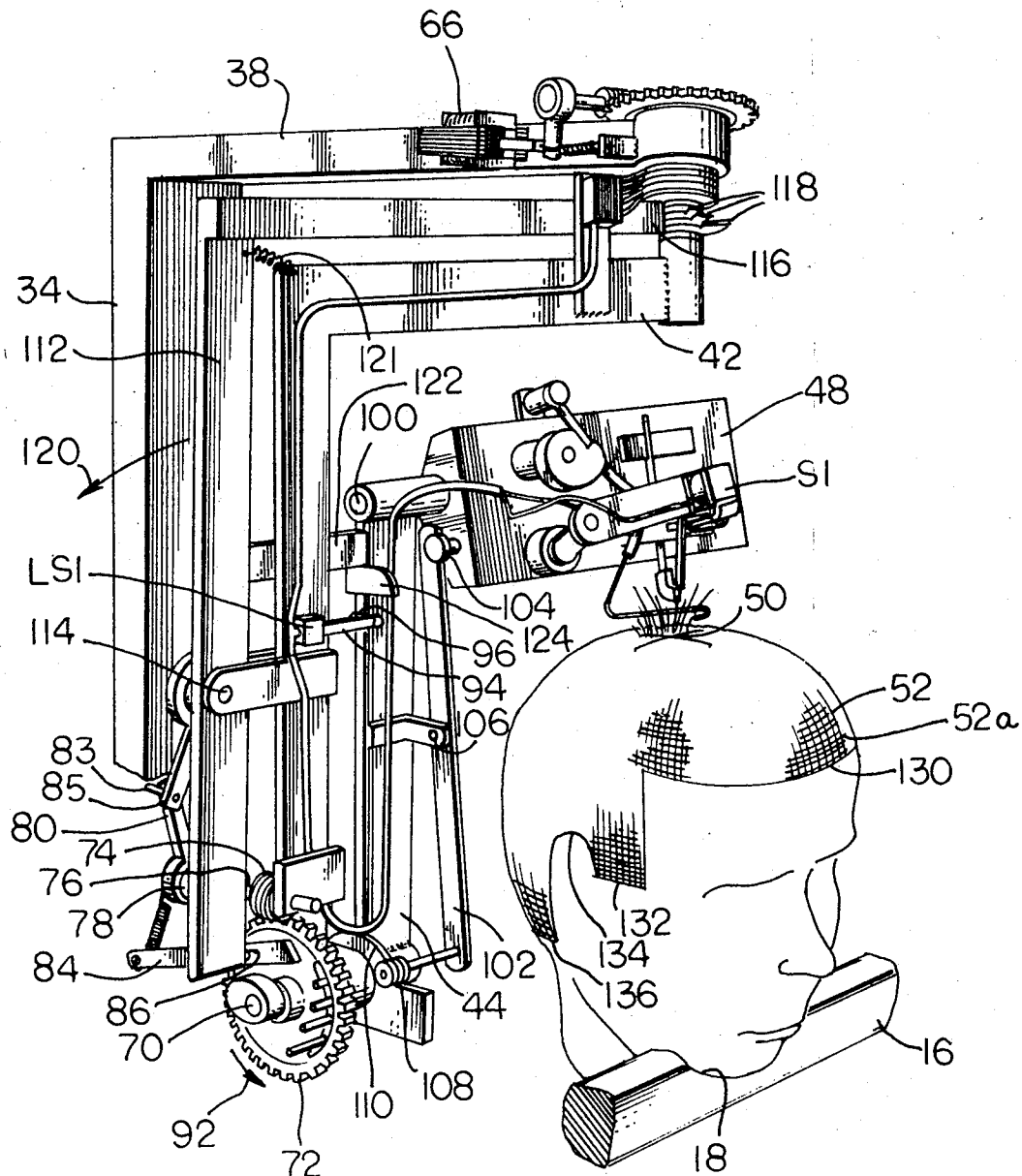
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[54] **METHOD AND APPARATUS FOR TREATING HAIR**
17 Claims, 11 Drawing Figs.

[52] U.S. Cl. 132/45
[51] Int. Cl. A45d 24/36
[50] Field of Search 132/45, 9,
7, 118; 30/30; 83/71, 610—12; 318/162

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ABSTRACT: This invention pertains to an apparatus and a method of using it, in which the hair on an individual's head is measured in a plurality of uniformly distributed regions on the head and a record made of the measurements and thereafter the hair is engaged in the same regions and drawn out to the measured length in conformity with the recording and is cut off at that length.



Patented March 16, 1971

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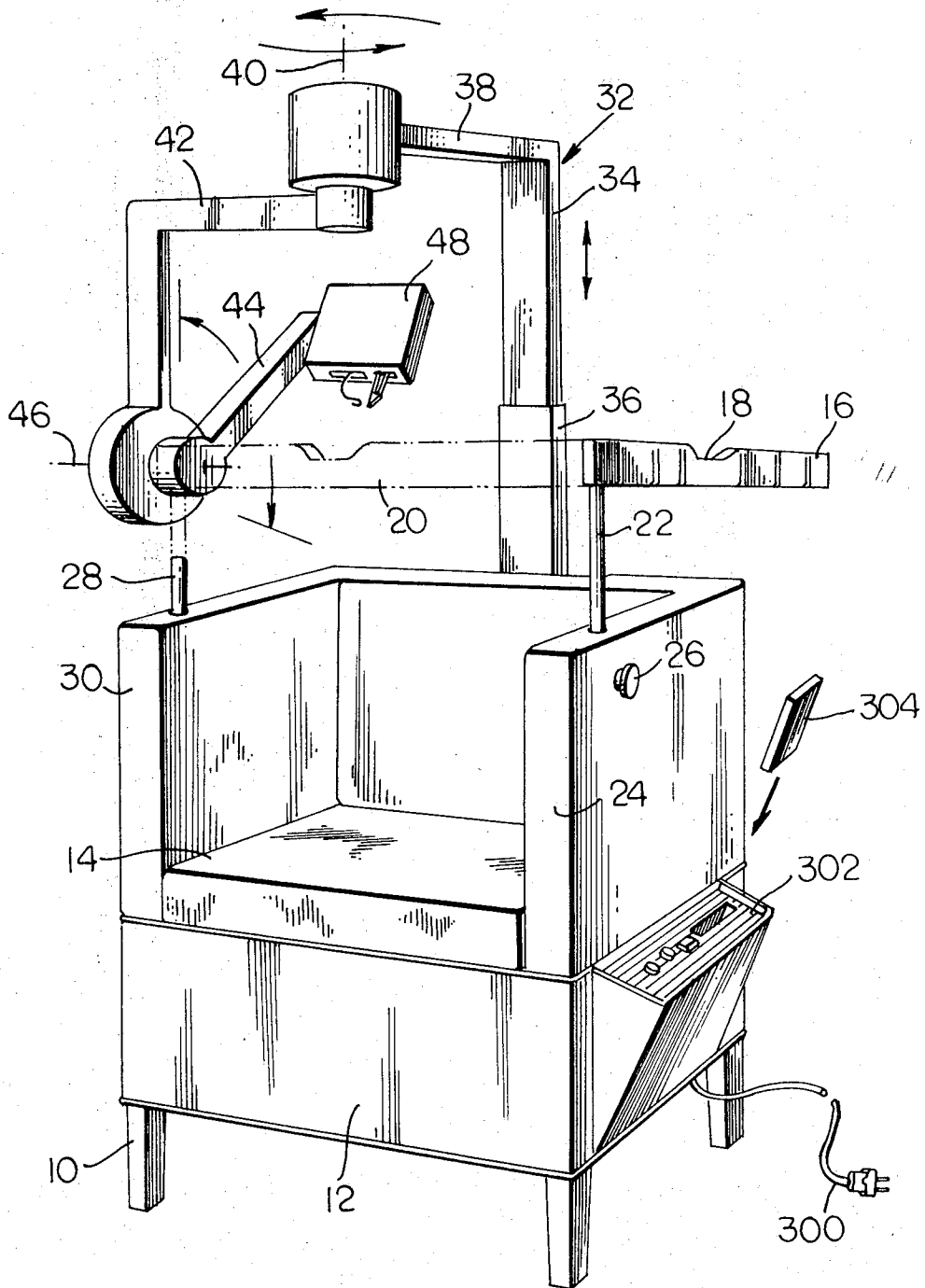
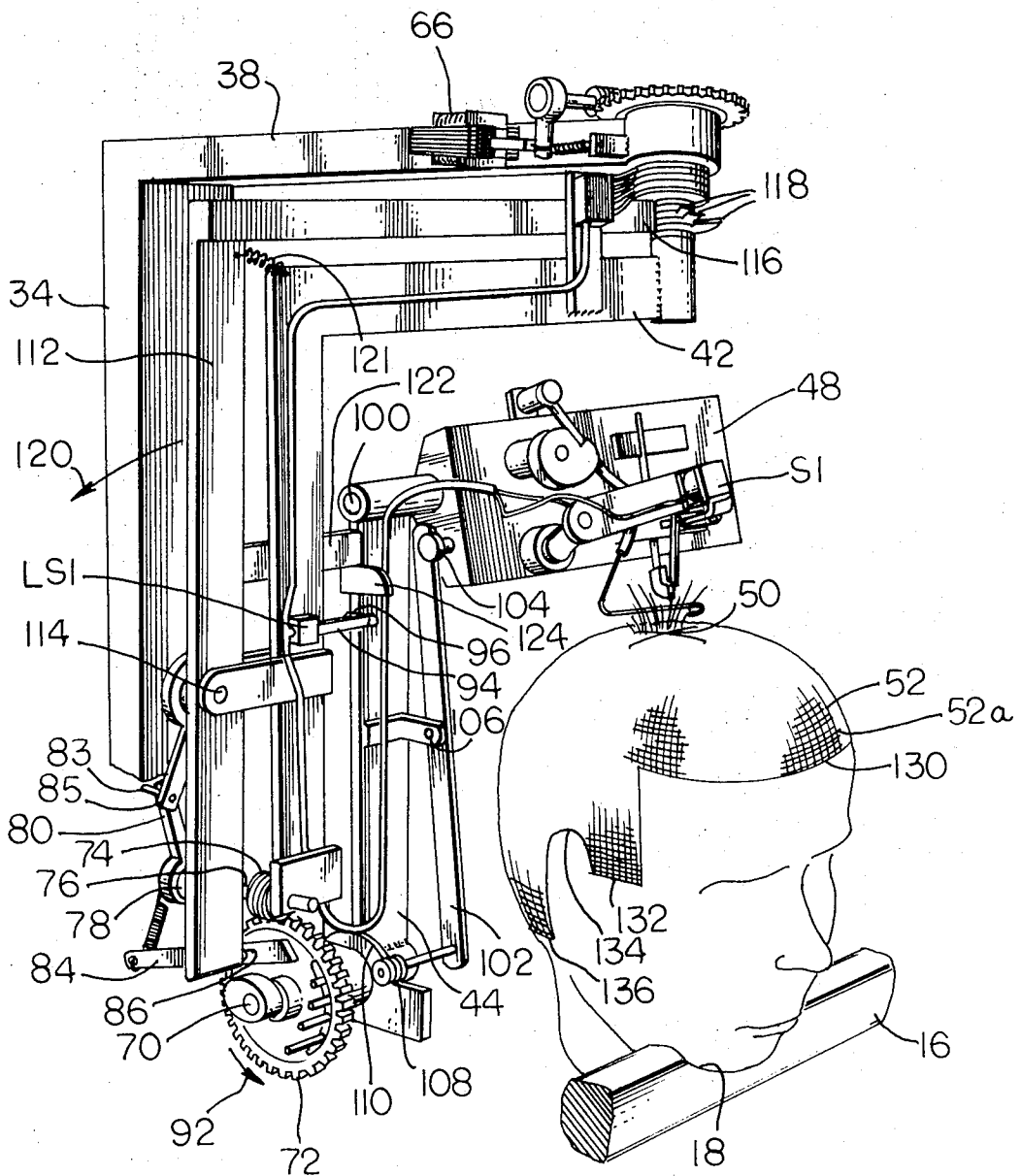


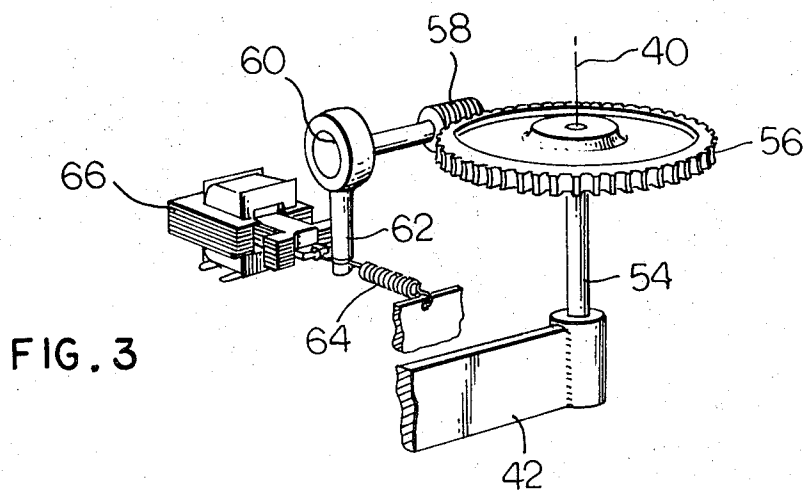
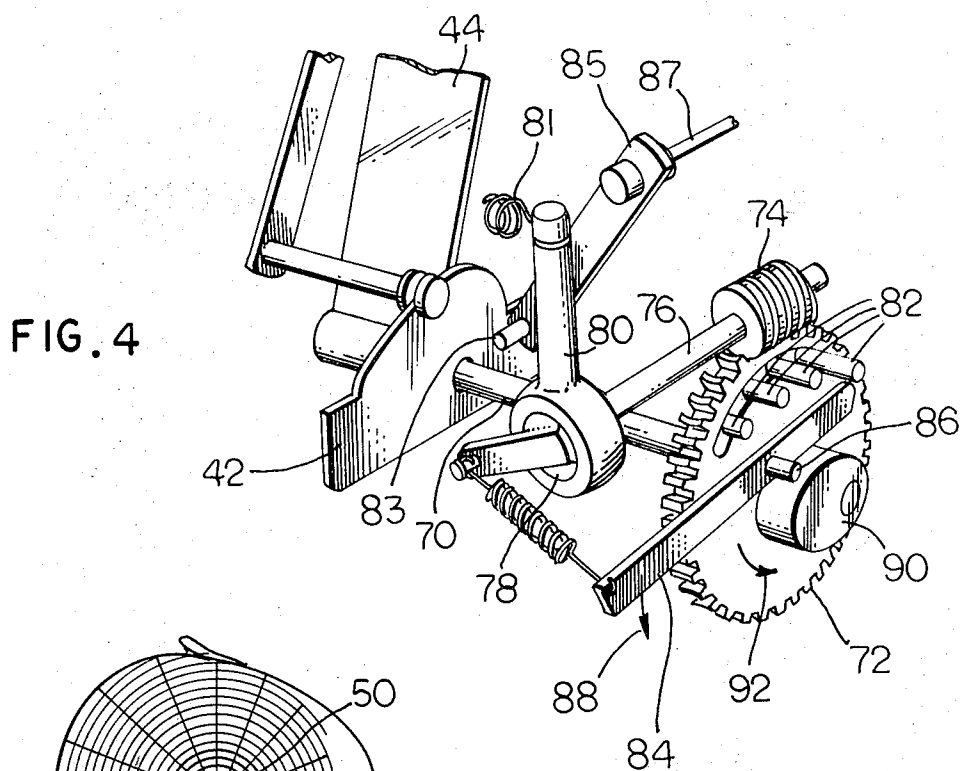
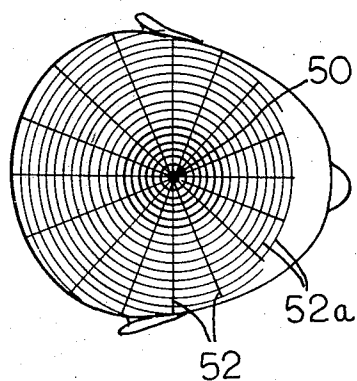
FIG. 1

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FIG. 2



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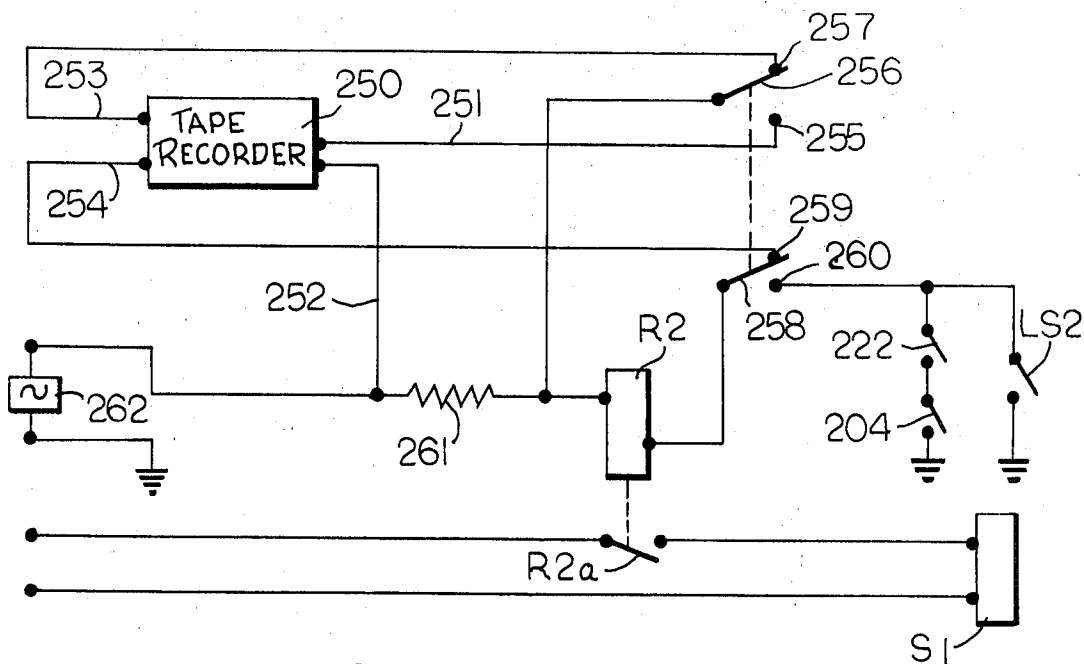


FIG. 9

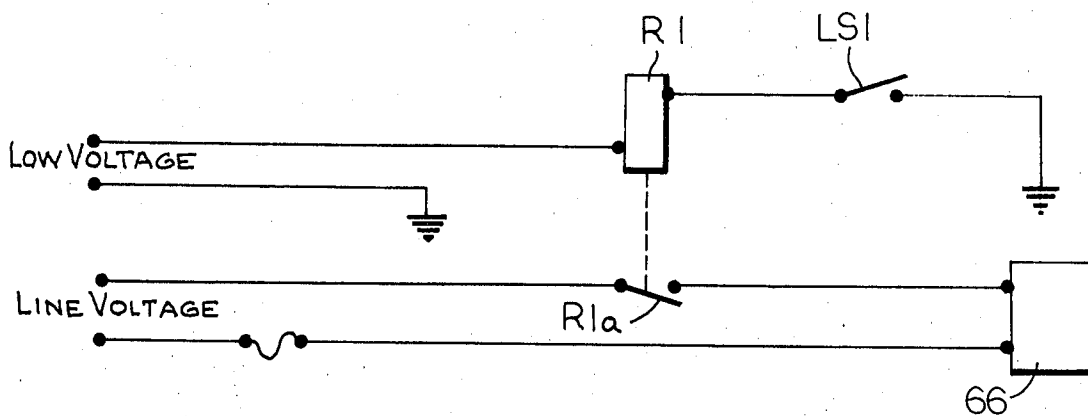


FIG. 10

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METHOD AND APPARATUS FOR TREATING HAIR

This invention relates to a method and apparatus especially adapted for cutting hair.

The cutting of hair is an operation which has heretofore been carried out entirely manually at considerable inconvenience and loss of time and expense to the individual whose hair is being cut.

The present invention has as an objective the provision of an apparatus which operates entirely automatically and which is operable for cutting hair and which will produce results equivalent to that of a skilled barber.

The present invention has as a further objective, the provision of a method and apparatus for cutting hair which is readily adaptable to different head shapes and sizes.

The present invention has as a still further objective the provision of a programmed apparatus for cutting hair in which the program can readily be changed so that one and the same apparatus can be employed for cutting the hair of different individuals or can be employed for imparting different style hair cuts to one and the same individual.

Still another objective of this invention is the provision of an apparatus for cutting hair which is also operable for making its own record of a freshly cut head of hair and which, thereafter, employs the record for reproducing the original hair cut after the hair has grown on the head of the respective individual.

These and other objects and advantages will become more apparent upon reference to the following specification taken in connection with the accompanying drawings, in which:

FIG. 1 is a somewhat schematic general assembly view showing an apparatus according to the present invention;

FIG. 2 is a view showing a portion of the apparatus and illustrating more details thereof;

FIG. 3 is a fragmentary perspective view showing an indexing mechanism for operating a portion of the apparatus;

FIG. 4 is a fragmentary perspective view showing the control arrangement for controlling the movement of the portion of the device that traverses the head being cut;

FIG. 5 is another fragmentary perspective view showing another detail in connection with the portion of the device that traverses the head;

FIG. 6 is a perspective view showing the cutter associated with the apparatus which cuts off the hair;

FIG. 6A is an enlarged view of the cutter shown in FIG. 6.

FIG. 7 is a perspective view showing a clamp device which is employed when a freshly cut head of hair is being measured to make a record thereof for future use;

FIG. 8 is a plan view looking down on top of a head showing the pattern followed by the portion of the device that traverses the head during a hair measuring or hair cutting operation;

FIG. 9 is a diagrammatic view showing the basic electric control circuitry for the machine according to the present invention;

FIG. 10 is a schematic view showing the control circuitry pertaining to the indexing mechanism of FIG. 3.

SUMMARY OF THE INVENTION

The present relates to a method and apparatus for use in the cutting of hair. In the practice of the invention, in one instance, an individual, a man, for example, obtains a hair cut of a desired style. The individual then places himself in position in the apparatus according to the present invention and sets the apparatus in motion to make a record of the length of the hair in different regions of the head. Thereafter, when the individual desires a fresh haircut, the operation is repeated with the record made the first time controlling a cutting device to cut the hair to the proper length.

The apparatus, in order to accomplish both measuring and cutting, includes a measuring and cutting carriage moveably supported in the machine and controlled to traverse the head in a certain manner so as to cover all portions thereof on which the hair is to be cut.

More specifically, in the particular device shown and described herein, the measuring and cutting carriage traces a

pattern from a certain generally centralized position in the top center of the head, and which may be referred to as a zero position; downwardly in one direction about the head to a certain lower limit and then backwardly along the same path to the zero position.

The downward movement of the measuring and cutting carriage is an idle movement and the active movement thereof, for both cutting and recording, is the upward movement back to the zero position. Each time the measuring and cutting carriage reaches the zero position, an indexing mechanism operates and adjusts the support for the measuring and cutting carriage through a given small angle, say 3°, and the measuring and cutting carriage then traces another path from the zero position down one side of the head to the limit position and then back up to the zero position. This cycle is repeated until the support for the measuring and cutting carriage has been rotated through 360°, which would mean that the measuring and cutting carriage has traversed the entire head to be cut.

Assuming, as mentioned, that the individual has just been given a certain desired type of hair cut, the carriage is adjusted for measuring and, when each upward movement of the measuring and cutting carriage occurs, the hair on the individual's head will be grasped or clamped at predetermined intervals along the path of the carriage, and a rake element associated with the carriage will engage the clamped hair between the clamp and the individual's head and withdraw it from the clamp in which the hair is clamped. When the clamp is released, due to the hair clamped therein being pulled therefrom, a bias spring moves the clamp and causes it to close electrical contacts which will supply a signal to a recording member, such as a magnetic tape, or the like.

During one upward movement of the measuring and cutting carriage, the hair will be grasped several times and each time the hair is grasped by the clamp it will be engaged by the rake element and placed in tension so as to turn the clamp away from the electrical contacts. Continued movement of the rake element will again draw the hair from the clamp which will release the clamp and result in the electrical contacts again closing. Thus, during each upward movement of the measuring and cutting carriage during a measuring operation, a plurality of signals will be supplied to the recording element which, as mentioned, could be a magnetic tape.

Subsequently, when the hair is to be cut according to the recorded pattern, the carriage is adjusted for cutting and the apparatus is again set in motion and the carriage will carry out the same pattern of motion in traversing the head. During the cutting operation, however, the hair is introduced into a cutting device on the carriage and then the rake element engages the hair between the cutting device and the head and draws it through the cutting device until the recording element supplies a signal to cause the cutting device to cut the hair off. When the signal is received by the cutting device the length of hair from the head to the cutting device, as determined by the position of the rake element is exactly the same length as the length of hair measured in the same position of the carriage when the carriage was adjusted for measuring and was operated during the measuring cycle.

DETAILED DESCRIPTION

Referring to the drawings somewhat more in detail, a general view of the apparatus is shown in FIG. 1. The apparatus comprises a frame 10 having a base portion 12 on top of which is a seat 14 on which the individual is seated during a measuring or cutting operation. The proper position of the individual is determined by a swingable arm 16 having a chin receiving notch 18 therein.

After the individual is seated, arm 16 is swung to the dotted line 20 position thereof. Arm 16 at one end is supported on a post 22 vertically adjustable in arm 24 of the device and adapted for being clamped in vertically adjusted position by a clamp knob 26. When the arm 16 is swung into operative position, the free end thereof is advantageously engaged by a post

or rod 28 which is vertically adjustable in the other arm 30 of the apparatus. With the individual seated in the seat and the arm 16 in operative position and with the individual's chin engaged in notch 18, the upper portion of the apparatus, generally indicated by arrow 32 in FIG. 1 is adjusted vertically to the proper height. This is accomplished by vertically adjusting support column 34 in a sleeve-like tube 36 which is fixed to the back of the apparatus. Column 34 can be clamped in adjusted position by any suitable clamping device.

The upper portion 32 of the apparatus comprises a horizontal arm 38 extending forwardly from the upper end of column 34 and defining a vertical pivot axis 40 located substantially over the center of the top of the head of the individual seated in the proper position in the apparatus. Carried on the outer end of arm 38 and rotatable about axis 40 is a bracket 42 which extends laterally and then downwardly to a position radially spaced from axis 40 in the region above ear of the head of the individual seated in the apparatus. The lower end of bracket 42 supports an oscillating arm 44 which is pivotal on bracket 42 about a horizontal axis indicated by dashed line 46. At its free end arm 44 carries the measuring and cutting carriage 48 which is caused to traverse the individual's head by oscillation of arm 44 and indexing movement of bracket 42.

Reference to FIG. 8 will show the pattern of movement of the clamp element or cutting element carried by carriage 48. The axis 40 determines a central or zero position indicated by reference numeral 50 in FIG. 8. Radiating from zero point 50 are the angularly related lines 52, each representing the path taken, first downwardly and then upwardly, by the clamping or cutting element mounted in carriage 48. In practice, the lines 52 may be only a few degrees, say 3° apart, but only a few thereof are illustrated in FIG. 8 for the sake of simplicity.

In each angular position of bracket 42, arm 44 swings downwardly and then upwardly, and the carriage makes an idle downward movement along one of lines 52 and then an upward working movement along the same line. Bracket 42 then indexes to its next position so the carriage 48 will traverse the next path as indicated by the next one of the lines 52. As the apparatus is arranged, the carriage 48 progresses in a clockwise direction about the individual head when it is viewed in plan as in FIG. 8.

With regard to the indexing movement of bracket 42, this is illustrated in FIG. 3, wherein it will be seen that the upper end of bracket 42 is connected to a shaft 54 extending vertically on axis 40 and supported on the free end of horizontal arm 38 (not shown in FIG. 3). Shaft 54 carries wormwheel 56 engaged by a worm 58 connected by a one-way ratchet device 60 with an arm 62. An arm 62 is biased in one direction by spring 64 and is moveable in its other direction by energization of a solenoid 66 having an armature connected to arm 62. Each time solenoid 66 is energized, worm 58 will be indexed through a certain angle and this will cause indexing movement of wormwheel 56, shaft 54 and bracket 42 through a certain angle. As will be seen hereinafter, solenoid 66 is arranged to be energized when carriage 48 reaches its zero position.

Turning now to FIGS. 2 and 4, it will be seen that arm 44 at its lower end is connected to a shaft 70 journaled in bracket 42 on axis 46 (FIG. 1). Mounted near the end of shaft 70 opposite arm 44 is a wormwheel 72 which is engaged by a worm 74. Worm 74 is mounted on a shaft 76, which at the other end has connected thereto a reversible ratchet drive 78. A lever 80 connected with the ratchet drive is oscillatable to drive shaft 76 in one direction or the other, depending on the adjustment of the ratchet drive.

Lever 80 is biased on one direction by a spring 81 and is moveable in the other direction by a pin 83 carried on the end of an arm 85 mounted on a drive shaft 87, which continuously drives arm 85 in rotation. Lever 80 is, thus, caused to oscillate to and fro and thereby to drive shaft 76 intermittently.

Wormwheel 72 is provided with a plurality of control pins 82 angularly adjustable thereon and projecting respectively different axial distances outwardly from wormwheel 72. Pins

82 are adapted for engaging a control lever 84 which is pivotally supported on a pin 86. Pins 82 are adapted to move lever 84 in the direction shown by arrow 88, which will effect reversing of the ratchet drive. Lever 84 is also adapted for being actuated by a cam 90 on shaft 70 when the carriage reaches a zero position and, at this time, lever 84 again reverses the ratchet drive.

In operation, the ratchet drive, when the carriage 48 is in its zero or neutral position, is adjusted so that the carriage moves downwardly until a control pin 82 actuates lever 84; whereupon, the ratchet drive is reversed and the carriage moves back up to its zero or neutral position.

During a downward movement of carriage 48, wormwheel 72 rotates in the direction indicated by arrow 92 in FIGS. 2 and 4 so that when the apparatus is in the position shown in FIG. 2, carriage 48 will sweep backwardly and downwardly across the back of the head and then upwardly and forwardly to zero or neutral position 50.

Indexing of bracket 42 is under the control of a switch LS1 which is operated into closed position by an actuating lever 94 thereon which is engaged by an adjustable screw 96 on oscillating arm 44 each time the latter conveys carriage 48 to the zero or neutral position 50. Limit switch LS1 is in circuit with a relay R1 which controls the blade R1a which is normally open and which closes when R1 is energized by closing of LS1 so as to complete the energizing circuit to solenoid 66. Advantageously, as shown in FIG. 10, relay R1 and limit switch LS1 are in a low voltage circuit; whereas, the blade R1a of relay R1 and solenoid 66 are in a higher voltage circuit, such as 115 or 120 volt circuit.

The carriage 48 is pivotally mounted at 100 on the free end of oscillating arm 44 and the tilting thereof about its pivotal connection with the arm is under the control of a lever 102 pivoted at 104 to carriage 48 and at 106 to oscillating arm 44 and having a cam follower 108 on its lower end following a cam path 110 formed on the lower end of bracket 42. By this expedient the carriage 48 can always be held so as to present the clamping or cutting element mounted therein to the head at the proper angle.

Oscillating arm 44 carries out a still further function with respect to control pins 82 and lever 84. Lever 84 is pivoted on Pin 86 carried on the lower end of a support arm 112 pivoted at 114 to bracket 42 and having its upper end at 116 positioned for engagement with cam elements 118 fixedly mounted on horizontal arm 38. Support arm 112, in pivoting about its pivotal support 114, causes its upper end 116 to take such a motion as to move endwise into engagement with cam elements 118. The position of lever 84 in the axial direction of wormwheel 72 can, thus, be controlled by the configuration of the respective cam element 118 which is in position as to be engaged by the end 116 of support arm 112. Support arm 112, which is spring loaded at 121, is adapted for being rocked in the direction of arrow 120 by engagement of finger 122, which is fixed to support arm 112, by cam 124 which is fixed to oscillating arm 44. The engagement of cam 124 with finger 122 occurs as carriage 48 moves upwardly toward its zero position 50 so that at the time the carriage 48 is indexed, and at which time arm 112 will also index, the upper end 116 of support arm 112 is spaced radially from cam elements 118 as shown in FIG. 2.

When oscillating arm 44 again moves away from its FIG. 2, or zero, position, cam 124 will release finger 122 and support arm 112 will move to cause its upper end 116 to engage the cam element 118 disposed in front of upper end 116 and this will determine the axial location of lever 84 relatively to wormwheel 72 and will determine which one of pins 82 will engage lever 84 as wormwheel 72 turns in the direction of arrow 92.

The cam elements 118 are provided for determining certain lowermost positions to which the carriage 48 moves, for example, the position by lines 130, 132, 134, and 136 in FIG. 2.

Turning now to the aforementioned carriage 48, this portion of the apparatus is somewhat schematically illustrated in

FIGS. 2 and 5 through 7. Carriage 48 comprises a supporting frame part 140 and rotatable therein is a shaft 142. The end of shaft 142 carries an arm 144 connected by pin 146 to a slide 148 that reciprocates in frame 140 as shaft 142 rotates. Shaft 142 also has a cam 150 connected thereto which causes a lever 152 to oscillate as shaft 142 rotates. Lever 152 operates through a one-way drive ratchet 154 to cause indexing movement of a shaft 156 supported in the frame and on the outer end of which is a cam member 158 which engages a rake element 160 swivelly mounted in the frame of carriage 48 represented by the swivel connection at 162. A spring 164 holds rake element 160 in engagement with cam 158. Cam 158 has a cam surface 166 therein which causes the rake element to oscillate in the direction indicated by arrow 168 while at the right end of the path of oscillation the rake element is caused to move laterally so that the hook 170 on the end thereof will engage the hair 172 between the individuals head at 174 and a clamp or cutting element 176 carried by carriage 48.

At a certain position in the movement of rake element 160 toward the right as it is viewed in FIG. 5, it engages and closes a switch LS2 to provide a signal for a purpose to be more fully described hereinafter.

The cutting or clamping element, generally indicated at C in FIG. 5 is adapted for slight rotation about the direction of the length thereof in the frame of the carriage. As will be seen in FIGS. 6 and 7, which show a cutting element and a clamping element respectively, each thereof is provided with a shank 180 having a flat portion 181 insertable in a suitable bore in the frame of carriage 48 for rotation about the axis of the shank as shown by arrow 182 in FIG. 7. Each said element is provided with a biasing spring 184 as shown in FIGS. 6 and 7, for biasing the respective element in the clockwise direction, as viewed from the lower end of FIGS. 6 and 7. It will be understood, at this point, that when the cutting element of FIG. 6 is used, the clamping element of FIG. 7 is removed and vice versa.

OPERATION

In operation, assuming carriage 48 is just commencing its upward movement, and carries a clamping element 200 having fingers 196 and 198, when rake 160 reciprocates toward the right solenoid S1 will be energized to move a finger, or armature 202, carried thereby into position to open the clamp 200 so that when the finger or armature 202 retracts the clamp will close and grasp a certain amount of hair therein.

On subsequent reciprocations of slide 148, solenoid S1 is not energized so the clamp remains closed. Each time shaft 142 rotates to effect a reciprocation of slide 148, the rake element 160 is permitted to move further in the leftward direction. When the rake element has moved far enough to pull the hair from the clamp, the clamp will be released and will pivot about its axis on which it is supported in carriage 48 and will close electrical contacts at 204.

The closing of these contacts, together with the closing of a set of contacts 222 which are closed by slide 148, provides a signal which is stored on a magnetic tape or other record member. Subsequently, the rake element is again moved into position to close LS2 which will again cause solenoid S1 to be energized to open the clamp, the carriage 48 will step upwardly so hair is taken in by the clamp, the clamp closes and the cycle is repeated.

The aforementioned measuring cycle is repeated a plurality of times, namely, in each stepped position by carriage 48, while carriage 48 moves upwardly, step by step, to its zero position and then the support bracket 42 indexes to its next position; the carriage swings, step by step, downwardly to its lower position, and then commences a new upward stroke during which the aforementioned measuring operation again takes place.

After bracket 42 has been indexed a full 360° the operation comes to a halt and, at this time, the magnetic tape, or other

record member, is completed and has an entire record of the length of hair over the entire area of the head.

Subsequently, when hair is to be cut, the clamp 200 is replaced by the cutter 206 which consists of blades 208 and 210 with one of the blades having fingers 212 and 214 that define a space 216 for receiving hair to be cut off.

In a cutting operation, the machine is started in the same position in which the measuring cycle is started and the record member is caused to run in the same direction as it ran during the measuring operation and beginning at the same place.

In cutting, instead of clamping the hair and drawing it from the clamp with the rake element, the hair is, instead, received between the blades 208 and 210 and, when the rake element has drawn the hair out from between the said blades to the proper distance, a prerecorded signal from the record member will actuate the cutting device and the blades will carry out a cutting action.

The blades are normally biased into closely spaced relation as by a spring 218 which will permit the blades to be opened to receive hair therebetween or to be actuated in a cutting operation. The same solenoid with its finger or armature 202 is operable for actuating the blades of the cutting device.

When the cutting operation commences, solenoid S1 is energized to cause finger 202 to engage the moveable blade 210 and move it away from blade 208 so that when carriage 48 steps upwardly, hair is received in space 216. The moveable blade is then released so that the hair is trapped in space 216 by fingers 212 and 214 and during continued reciprocations of slide 148 the cutting device remains in this same position while rake element 160 continues to move outwardly. When the rake element reaches such position that the hair between the head and the cutting device is the same length as it was during the measuring operation when carriage 48 occupied the same position, the signal from the record member again actuates solenoid S1 to cause the blades of the cutting device to carry out a cut off operation.

Slide 148 is adapted, by means of a finger 220 thereon, to close a set of contacts at 222 when slide 148 is in its most advanced position so that the energization of solenoid S1 can be synchronized with the reciprocation of slide 148.

As before, the operation continues with the cutting device being operative during upward step by step movement of carriage 48 and with support bracket 42 indexing each time the carriage reaches its uppermost position whereupon the carriage makes an idle downward step by step movement followed by an upward step by step working movement.

As previously explained, the downward movement of carriage 48 in each instance is limited by the stop pins 82 which cooperate with reversing lever 84 which is axially positioned each time carriage 48 reaches its zero position, and is then released to assume a certain axial position, as determined by a respective one of cams 118 as the carriage 48 moves toward its lower position.

Turning to FIGS. 9 and 10, FIG. 9 shows a tape recorder at 250 having input wires 251 and 252 and output wires 253 and 254. Input wire 251 leads to a terminal 255 of a switch having a blade 256 which can close either on terminal 255 pertaining to input wire 251 or on terminal 257 pertaining to output wire 253. Blade 256 is connected for movement with another blade 258 which closes on a terminal 259 pertaining to output wire 254 when blade 256 closes on terminal 257. Blade 258 closes on a terminal 260 when blade 256 closes on terminal 255.

Blade 258 is connected to one side of the coil of a relay R2, the other side of which is connected to blade 256 and to one end of a resistor 261. The other side of resistor 261 is connected to wire 252 and to one side of an alternating current voltage source 262, the other side of which is grounded.

The terminal 260 is connected through the contact pair 222 and contact pair 204 to ground and is also connected through limit switch LS2 to ground. The closing of switches 222 and 204 when blades 256 and 258 are in their lower position will provide for a signal to the input side of the tape recorder by the voltage drop across resistor 261. The closing of limit switch LS2 will, likewise, provide such a signal.

Each time relay R2 is energized its blade R2a closes and energizes solenoid S1. This solenoid is effective when energized, for moving its armature or plunger 202 into position to actuate the one of the clamping and cutting devices which is mounted in carriage 48. When the clamping device is in the carriage, solenoid S1 only opens the clamp when the carriage takes a step upwardly so the device can receive hair and does not thereafter affect the clamping device until the next upward step of the carriage.

When the cutting device is in the carriage, solenoid S1 opens the cutting device to receive hair on each upward step of the carriage and thereafter operates the cutting device for cutting off hair prior to the next upward step of the carriage. The solenoid S1 is actuated when slide 148 is moving in one direction to open the clamping or cutting device and is actuated when moving in the other direction to actuate the cutting device in a cut off operation.

During a cutting operation, blades 256 and 258 are moved to their upper position and at this time switch LS2 and the contact pairs 204 and 222 are ineffective and, instead, the energization of relay R2 is under the control of the signals from the record member as they are supplied to output wires 253 and 254.

FIG. 10, as explained, shows how limit switch LS1, which is actuated by arm 44 when it reaches its uppermost position, is effective for causing energization of relay R1 from a low voltage source so as to close its blade R1a which is connected in circuit with indexing solenoid 66 and a higher voltage source, such as 115 or 120 volts.

It will be understood that slide 148 will reciprocate relatively rapidly, making several strokes in each stepped position of carriage 48, so that fairly accurate measurements of hair length and accurate cutting to length can be accomplished. Normally, the slide will reciprocate several times in a given stepped position of carriage 48 to pull the hair out of the clamp to release the clamp during a measuring operation and for each time the cutter is operated when the carriage is in the same position during a cutting operation.

As will be seen in FIG. 1, power can be supplied to the device by way of a power cord 300 leading into the base and the base may also include the electrical components in cabinet 302 including a slot for receiving a record member such as a tape cartridge 304.

The drive for the device is in the form of flexible shafts leading from a drive motor, which could be in the base, to shaft 142 in carriage 48 and to shaft 87 pertaining to swinging arm 44. All power is derived from these two shafts except for the power to index support bracket 42 and which is taken from solenoid 66. If desired, power could be supplied to levers 80 and 152 by means of a solenoid in place of the motor driven flex shafts.

It will be understood that, in addition to a record tape made from the individual's own freshly cut hair, special record tapes of desired styles of hair cuts could also be provided as desired.

It will be seen that the clamping device and cutting device preferably present their jaws or blades endwise in the direction of upward travel of carriage 48 so the hair will enter therein when the clamping device or cutting device is opened, and the carriage 48 steps upwardly. The rake element, as will be seen, swings laterally to the clamping device or cutting device. The rake element is relatively thin and can readily enter the space between the respective device and the head even when the respective device is closely adjacent the head.

With the axis of indexing of bracket 42 extending vertically from the center of a head positioned by arm 16, and with the horizontal axis of indexing of arm 44 at about the level of the ear, the carriage 48 will follow the contour of the head fairly closely. The cam which controls the tilting movement of carriage 48 on the lower end of the bracket 42 can be changed, if desired, to vary the path of carriage 48 to a considerable degree.

As has been shown in FIG. 8, the carriage 48 moves in steps along the lines 52 and is capable, during upward movement, of effecting a cutting operation at any of the intersections of lines

52 with horizontal lines 52a. In the case of both of lines 52 and 52a, only a few thereof have been shown for the sake of simplicity. In practice, lines 52 may be only about 3° apart and lines 52a may be only about one-sixteenth inch apart. The grid formed by lines 52 and 52a thus provides for points spaced sufficiently closely together to enable accurate measuring and cutting of the device.

Modifications may be made in the invention within the scope of the appended claims.

I claim:

1. In an apparatus for measuring the length of hair of an individual's head in distributed regions and for cutting the hair of an individual's head to a predetermined length in each said region; a frame, a carriage, support means supporting the carriage in the frame for movement along a path following the contour of the head for traversing said regions in succession, said carriage being adapted to support hair engaging means, a rake element on the carriage engageable with the hair between said hair engaging means and the head, means for moving said rake element relative to said hair engaging means to draw the hair from said hair engaging means in each said region, a record member movable in unison with said carriage so each portion of said record member pertains to a predetermined position of said carriage and a predetermined said region, switch means in said carriage responsive to the release of hair from said hair engaging means, solenoid means in said carriage engageable for actuating said hair engaging means, an electric circuit operatively connecting said switch means and solenoid and record member in circuit, and means including said circuit for selectively supplying actuating signals to said solenoid means from said record members and for supplying signals to said record member from said switch means.

2. An apparatus according to claim 1 in which said hair engaging means is a clamp operable to engage the hair, said clamp being biased toward a first position and being moveable away from said first position as the hair is drawn therefrom by movement of said rake element, said switch means including a first switch operated into closed position by movement of said clamp back to its said first position when the hair is drawn completely therefrom by said rake element.

3. An apparatus according to claim 2 in which said switch means comprises a second switch in series with said first switch and periodically operated into closed position.

4. An apparatus according to claim 3 in which said carriage includes a reciprocating slide, said second switch being operated into closed position by said slide at one end of the movement thereof.

5. An apparatus according to claim 4 in which said switch means includes a third switch operated into closed position by said rake element when the latter is retracted into position to engage the hair engaged by said clamp, said third switch being operable to energize said solenoid when closed, said solenoid being mounted on said slide and being operable when energized to open said clamp to receive hair.

6. An apparatus according to claim 1 in which said support means comprises a bracket pivotal on vertical axis, an arm pivoted at one end on a horizontal axis on said bracket, said carriage being mounted on the other end of said arm, the planes of movement of said carriage intersecting on and including said vertical axis, indexing means for indexing said bracket on said vertical axis, means for swinging said arm on said horizontal axis in each indexed position of said bracket to cause said carriage to move to a lower position and then back up to an upper position, and means for actuating said indexing means each time said arm moves said carriage into its said upper position.

7. An apparatus according to claim 6, which includes reversible drive means connected to said arm for oscillating the arm about said horizontal axis, first means for reversing said drive means when said carriage reaches the top of its stroke, and adjustable second means for reversing said drive means when the carriage is moving in the downward direction.

8. An apparatus according to claim 7 which includes a shaft on said horizontal axis connected to said arm, a gear on said shaft, pins distributed circumferentially of said gear and projecting different axial distances therefrom, a reversing lever moveable for reversing said drive means and moveable axially of said gear for engagement by a selected one of said pins, and means for adjusting the axial position of said lever in conformity with the indexed position of said bracket.

9. An apparatus according to claim 8 in which said carriage is pivotally mounted on said arm for tilting movement thereon on an axis parallel to said horizontal axis, a cam on said bracket, and a lever connected at one end to said carriage and engaging said cam at its other end and pivoted intermediate its ends to said arm whereby the tilting of said carriage on said arm is under the control of said cam.

10. An apparatus according to claim 8 in which the last mentioned said means comprises cam means stationarily mounted on said vertical axis, a tiltable arm pivoted to said bracket and having said reversing lever pivoted thereto at the lower end and at the upper end engaging said cam means, and means operated by said carriage supporting arm when it moves into its upper position for tilting said tiltable arm so the said upper end thereof is moved away from said cam means prior to indexing of said bracket.

11. An apparatus according to claim 1 in which said hair engaging means is a cutoff device, said cutoff device being adapted to receive hair therein for engagement by said rake element whereby movement of the rake element will withdraw hair from the cutoff device, and said solenoid means operating the cutoff device to perform a cutoff operation.

12. An apparatus according to claim 1 in which said hair engaging means is in the form of a scissorlike cutoff device, said scissorlike cutoff device being biased toward a partly closed position means for opening said device to receive hair therein, and said solenoid means actuating said device for a cutoff operation after the hair has been withdrawn therefrom a predetermined amount by said rake element.

13. An apparatus according to claim 1 in which said hair engaging means is in the form of a device having two legs pivoted together intermediate their ends and mounted in said carriage so as to present the legs endwise in the direction of movement of the carriage, said support means for the carriage moving the carriage step by step along said path, said hair engaging means opening when the carriage moves upwardly on each step to receive hair therein and then being released to confine the hair therein.

14. An apparatus according to claim 1 in which said hair engaging means is in the form of a scissorlike device comprising two legs pivoted together intermediate their ends and biased

toward a partly closed position, a finger element on at least one of said legs adapted to overlie the other when said legs are partly closed to provide a closed space in which hair can be confined in the device while the hair can be drawn therefrom by operation of said rake element, a reciprocating slide on said carriage, a solenoid actuated plunger carried by said slide, and means for actuating said solenoid plunger during movement of said slide in one direction or the other to cause opening of said device to receive hair therein and closing of said device to cut off said hair.

15. In an apparatus for cutting hair; a carriage, a two-arm scissorlike device carried by the carriage, support means supporting said carriage and operable for successively positioning the carriage in a plurality of predetermined spaced positions which together define a grid approximating the contour of a human head, means for introducing hair into said scissorlike device between the arms thereof as said carriage moves into each said position thereof, a hooklike rake element adjacent said scissorlike device on the head side thereof and movable in a direction transverse to the said arms of said device and while said carriage is stationary in each said position thereof, said rake element being adapted to engage hair in said device between said device and the head whereby movement of the rake element will adjust the length of the hair as measured from the head to said scissorlike device, the arms of said scissorlike device being relatively movable, means on the carriage operable to actuate said scissorlike device to cause said arms to move relative to each other, and means for actuating said rake element and said scissorlike device in timed relation.

16. An apparatus according to claim 15 in which the actuation of said scissorlike device is under the control of a record tape the movement of which is synchronized with the movement of the carriage successively into its several positions.

17. An apparatus according to claim 15 in which said apparatus comprises a frame having a seat and a chin support adjustable relative to said seat for engaging the chin of an individual seated in the seat so as to position the head of the individual in a predetermined position, said support means including a bracket rotatable on a vertical axis above and in substantial registration with the center of the top of a head in said predetermined position and an arm pivoted at one end to said bracket on a horizontal axis at about the level of the ear of a head in said predetermined position and spaced outwardly from the head, said carriage being mounted on the other end of said arm, means for indexing said bracket on said vertical axis, and means for moving said arm in steps in each indexed position of said bracket to carry said carriage first downwardly and then backwardly.

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