

Feb. 18, 1941.

D. L. MORGAN

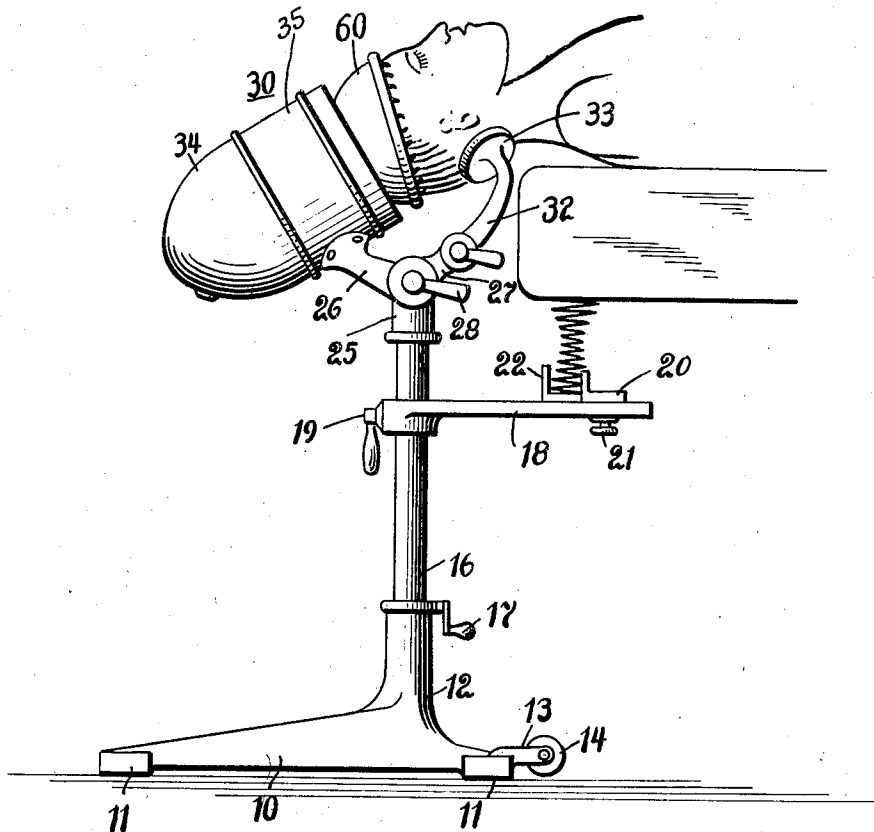
2,232,254

MASSAGE DEVICE

Filed May 26, 1936

4 Sheets-Sheet 1

FIG. 1.



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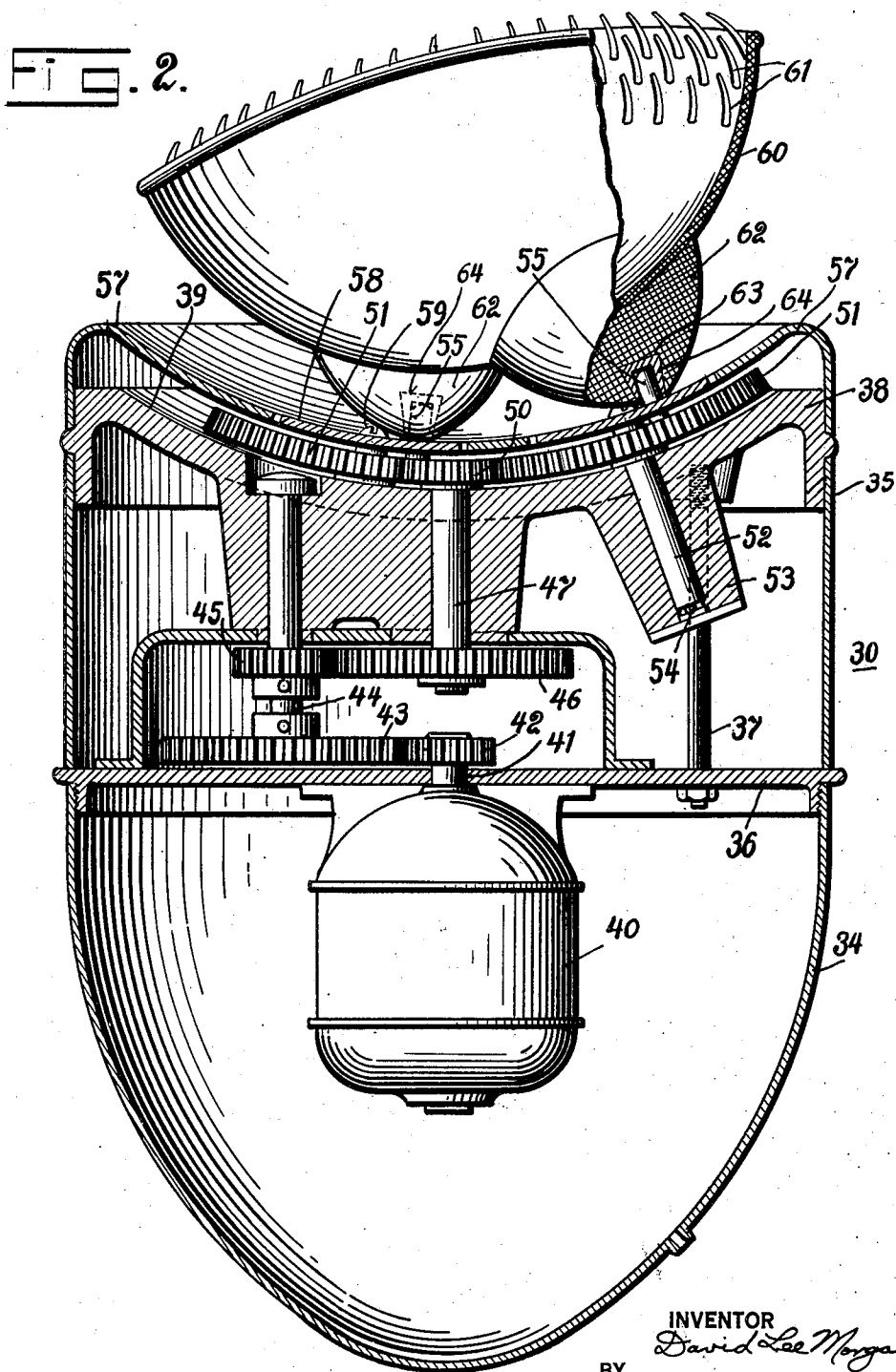
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MASSAGE DEVICE

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4 Sheets-Sheet 2



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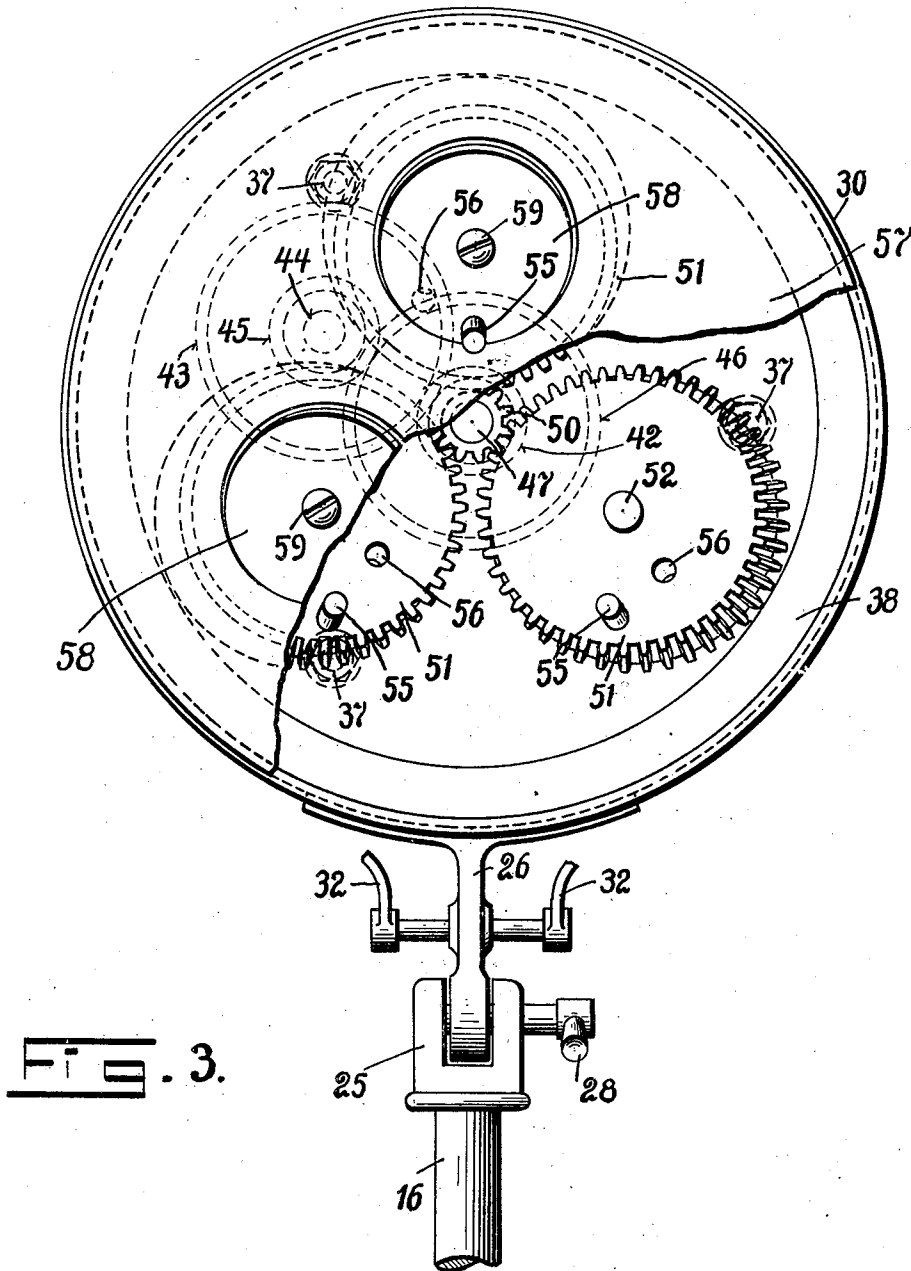
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MESSAGE DEVICE

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4 Sheets-Sheet 3



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MASSAGE DEVICE

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FIG. 5.

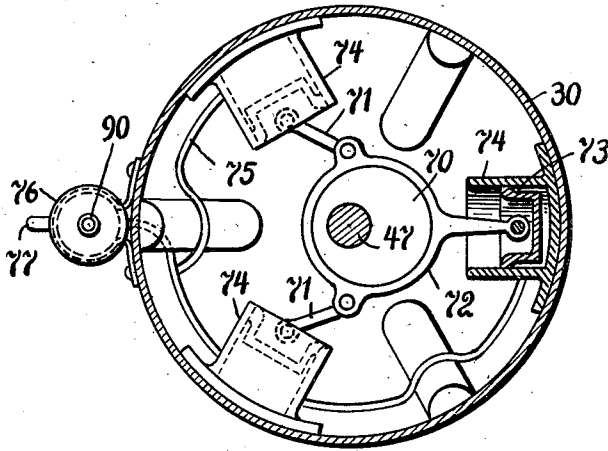


FIG. 6.

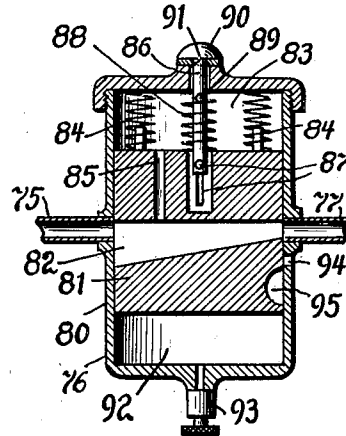
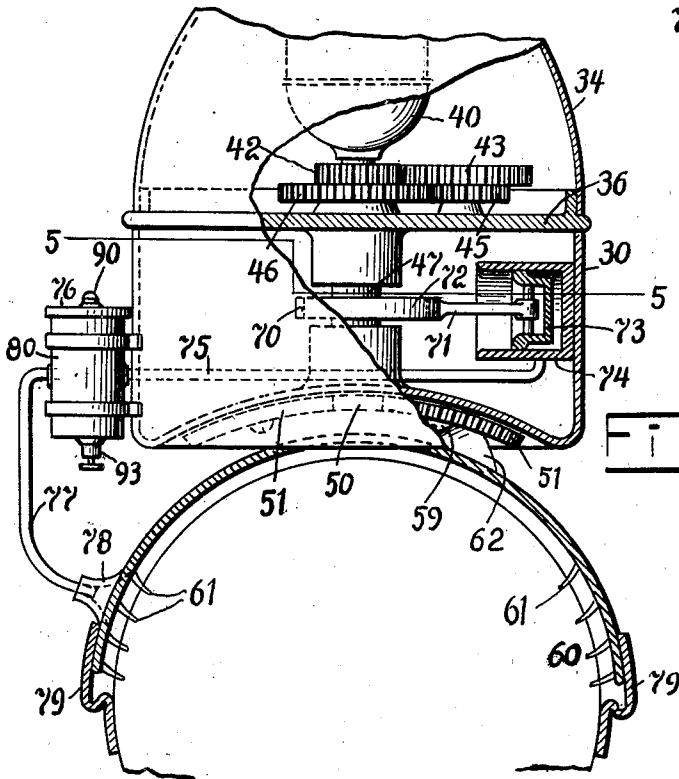


FIG. 4.



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MASSAGE DEVICE

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Application May 26, 1936, Serial No. 81,882

9 Claims. (Cl. 128—45)

This invention relates to massage devices and more particularly to such a device for massaging the scalp to promote the growth of hair.

The principal object of the invention is to provide a simple and compact device adapted to subject the scalp to a massaging action to stimulate the flow of blood thereto and promote the growth of hair.

It is a further object to provide such a device which is portable, simple in construction, and easy to operate so that it can be operated and utilized by the individual person in the home if desired.

It is a still further object to provide a massage device having means for subjecting the scalp to a massaging action together with a controlled air pressure effect in order to promote the circulation of the blood therein.

Other objects and advantages will be apparent from the description, the accompanying drawings, and the appended claims.

In the drawings—

Fig. 1 is an elevational view showing a device constructed in accordance with the present invention and in suitable operative position with a patient;

Fig. 2 is a view partly in elevation and partly in section through the device showing the operating mechanism;

Fig. 3 is an elevational view with parts broken away to show the interior construction thereof;

Fig. 4 is a view partly in vertical section and partly in elevation showing a modified form of construction;

Fig. 5 is a section view on the line 5—5 of Fig. 4; and

Fig. 6 is a section view of a detail of the modified form of construction showing the mechanism for regulating and controlling the air pressure.

Referring to the drawings which disclose a preferred embodiment of the invention, there is shown at 10 a base member having foot portions 11 adapted to rest upon a supporting surface or floor and to support the device in operative position. At one end of the base there is provided an upstanding tubular housing 12, and a projecting portion 13 extends forwardly therefrom providing a support for one or more rollers 14. As shown, when the base is in the normal operative position, the roller is supported out of contact with the floor; when however it is desired to move the device it can be tilted upwardly to lower roller 14 into engagement with the floor and to correspondingly raise feet 11,

and the entire device then moved to a desired location upon the rollers.

Slidably and telescopically received within the housing 12 is a vertical post 16, locking means 17 providing for retaining the post at any predetermined elevation therein. In accordance with the present invention the massage device is preferably so constructed and arranged that a patient may receive massage treatment while in a prone position. And for simplicity of operation and to facilitate the application of the treatment by the patient himself means are provided for associating the device with a bed or like article of furniture upon which the patient may lie. To prevent the movement of the device with respect to the bed or other article of furniture upon which the patient rests, an adjustable clamp arm 18 is slidably positioned upon post 16, the locking means 19 providing for fastening the arm to the post wherever convenient. At its inner end the arm is provided with an interlocking angle member 20 fastened to the arm by means of thumb screw 21 and having an upwardly extending edge adapted to hook under the cross member 22 or other convenient portion of the bed. Thus with this construction regardless of the pressure exerted by the patient upon the device, it is definitely held against longitudinal movement during use. Also the tilting structure previously described permits of the ready interlocking engagement of the crossbar 22, the angle 20 passing underneath the crossbar in the tilted position, and engaging when the device is returned to its normal operative position.

At its upper end, the post 16 is provided with a member 25 bearing the two arms 26, 27. Both arms are pivotally attached to member 25, and may be adjusted to a desired angular position thereon, retaining means 28 holding the same in adjusted position. Arm 26 serves as a support for a casing 30 which houses the operating mechanism. Arm 27 supports a pair of brackets 32, pivotally attached thereto which carry pads 33 adapted to engage and support the neck of the user. The end of the casing 30 may conveniently be grasped and used to effect the tilting of the device as described in moving the same from place to place.

The casing 30 is of generally cylindrical form and may be suitably constructed of light weight sheet metal parts. It is provided with a removable end cover section 34 which is screwed or otherwise fastened in position adjacent the section 35 which has an end wall 36 held in place by means of threaded rods 37. Fastened in the cas-

ing at the opposite end there is located a head member casting 38 having a spherically concave face 39 as shown. The rods 37 are suitably retained in place in this head member thus providing for totally enclosing all operative parts of the device and protecting the same.

Motive means in the form of motor 40 is located within the casing and supported by suitable means therein. The motor has a drive shaft 41 carrying a pinion 42 adapted to mesh with a gear 43 which is mounted upon a shaft 44 rotatably journaled within the head 38. Shaft 44 also carries a pinion 45 meshing with gear 46 which is mounted upon a second shaft 47, also journaled within the head structure 38. The arrangement is preferably such as to provide a reduced speed drive from the motor shaft located substantially centrally of the device to the driven shaft 47 located substantially coaxially with the motor shaft.

Driven shaft 47 extends to the concave side of the head 38, and on its extending end is provided with pinion 50. A plurality of gears 51 mounted respectively upon shafts 52 journaled within extensions 53 formed in the head 38, are positioned at equidistant points around pinion 50 in intermeshing engagement therewith. A thrust bearing 54 provides for taking the axial thrust load. In the embodiment shown three such gears are provided which are spaced with their axes substantially 120° apart and each one having intermeshing and driving engagement with the centrally located pinion 50. Each of these gears 51 is spherically curved to conform to the curvature of head 38, the axis 52 of each said gear and the axis of the central pinion 47 all pointing toward a common point. The toothed surface of each of the gears and of the pinion is therefore formed at an angle to the axis of the gear and points toward the intersection point of the gear axes, as will be understood, to provide for proper intermeshing engagement.

Each of the gears 51 carries upon its face a pin 55, each pin being positioned substantially normal to the face of the gear and hence also directed substantially toward the common junction point heretofore mentioned. The pins are located eccentrically of the respective gear axes, at substantially equal radial distances from the centers of each of the respective gears, and are preferably further positioned in corresponding phase positions of each gear so that upon rotation of the gears the respective pins describe a conical surface of revolution while the distance between respective pairs of pins varies to a limited extent during each cycle of operation. These pins are preferably adjustably positioned within the gears, and can be removed and located in a second series of holes 56 in each of the respective gears, such second series of holes being located a lesser radial distance from the respective gear centers, to provide a smaller travel for the massage device. They also occupy corresponding phase positions so that the distance between all pairs of pins in either position of adjustment is initially the same, and remains substantially the same throughout rotation of the gears. They may be positioned in respective radial alignment with the first series if desired. It will be understood that additional sockets (not shown) are provided in the cap member.

In order to conceal and protect the gears against accidental contact, an enclosing plate

structure 57 is formed extending from the outer housing walls 35, and spherically concave to closely overlie the gear assembly, suitable openings being formed in this cover portion of sufficient diameter to provide for the rotary passage of the respective pins 55 therethrough. The openings are then covered, if desired, by means of disks 58, having openings to allow the pins to be inserted in their two positions, screws 59 providing for fastening the disks to the face of gears 51 to rotate therewith.

A massage cap 60 is provided for the application of the massage action to the head of the patient. The cap is preferably formed of a rubber or other suitably flexible composition material and is formed of concave shape to receive the head and scalp. It preferably has a plurality of upstanding fingers 61 formed therein for additionally engaging the scalp to effect frictional contact therewith in the stimulation of the flow of the blood. The means for attaching the cap to be operated by the massage mechanism comprises a series of projections 62 formed upon the outer periphery of the cap. These projections may be of suitable rubber composition material vulcanized or otherwise secured to the cap itself. Each of the projections is formed with a recess 63 of wedge shape such as shown so that an interlocking action is obtained within which there is positioned a tapered bushing or socket member 64. The socket 64 is of a suitable size to receive the end of the pin 55 in driving engagement therewith, the pin having a rounded end adapted to receive the thrust from the socket. The number of such projections corresponds with the number of pins, three of such sockets being provided in the embodiment shown. The entire cap structure can be readily positioned upon or removed from its operative assembly upon the pins 55 when desired, and when assembled is yieldingly retained in such position as a result of the non-parallel relation of the supporting pins. The flexible nature of the cap structure however allows sufficient deformation to permit the cap to be engaged and disengaged. With the cap in the assembled position it will be obvious that the axes of socket members 64 extend in the direction of the heretofore mentioned junction point.

The operation of this device is as follows. The device is first placed in position with relation to the bed or the like as shown, with the casing suitably tilted to cause the comfortable reception of the head of the patient within the cap. Upon the operation of motor 40, the pinion 50 is driven at a suitably slow speed, and in turn effects the simultaneous rotation of each of the gears 51. As a result of such rotation the several pins 55 are caused to rotate in predetermined paths about the axes of their respective gears, thereby effecting a predetermined circulatory rocking movement of the cap. Thus the cap is caused to move forwardly and backwardly and from side to side, with a circulatory rocking motion for a predetermined distance in all directions in a cycle of operations. Such action effects a very complete massage of the scalp, exercising and stretching the scalp in all directions upon the head, but without rotation of the cap itself with respect to the head and scalp. The cap is caused to move in a predetermined limited degree such as to effect the exercise of the scalp in all directions upon the head without however itself moving with re-

spect to the scalp. Some degree of slipping or frictional movement may occur as between the cap and the scalp, if desired, depending upon the construction and the extent of movement, such limited and controlled friction being sometimes desirable as a further stimulating effect. For initial treatments the pins 55 may be positioned to give a smaller degree, and as the scalp loosens under treatment, they may be changed to afford greater travel and the exercise of the scalp more vigorously.

It is found that the several pins 55, do not at all times occupy the same positions with respect to each other, and that because of their spherical relationship the straight line distances between pairs of such pins varies to a limited extent during each cycle of operation. Similar change in the positioning of the extensions 62 on the cap are thus effected, which minor or secondary movement effects a movement of certain of the fingers 61 with respect to others and this action additionally imparts a desired massaging action to the scalp.

The massaging action afforded by this device is highly effective in facilitating the stimulation of blood flow to the scalp, and thus is highly effective in promoting the rapid and healthy growth of hair upon the head. It is further highly desirable that the operation can be performed with the patient in the prone position, such position further facilitating the flow of blood to the scalp, and the simple and compact mechanism is such that the device can be provided for home use and thus more frequent and extended application thereof can be obtained as required to develop and promote the growth of hair and provide a healthy scalp condition.

Means is also provided in accordance with the modified construction shown in Figs. 4 through 6 for simultaneously subjecting the scalp not only to the massaging action as described above but to controlled air pressure conditions of suction or partial vacuum. It has been found that the application of reduced air pressure of controlled character to the body tends to enlarge the minute capillaries provided for the flow of blood thereto, which facilitates the effective circulation of the blood therethrough. For example, when the air pressure upon the surface of the skin is temporarily reduced, or reduced and restored or increased in a pulsating manner, very satisfactory results have been secured in increased flow of blood to the areas treated. And in accordance with the present invention such controlled application of air pressure to the scalp simultaneously with the massaging thereof further facilitates and improves the results obtained.

Referring to Figs. 4 to 6 the parts which are the same as those described above are similarly numbered, and need not be described in detail. Briefly they comprise the casing 30, the transmission means 41 to 46 and the driven shaft 47. Shaft 47 is provided with the pinion 50 and the meshing gears 51 provide for operation of the cap 60 as described. In addition, shaft 47 at an intermediate point is provided with an eccentric disk 70 to which are connected a series of connecting rods 71 spaced equidistantly about the disk, one connecting rod being formed integrally with the annular eccentric member 72 to prevent rotation thereof. Each connecting rod has operative interconnection with an air pump piston 73 forming the operative member of the air pump 74 which is positioned within

the casing section 35, and the pumps 74 are provided with the usual valve means. In the embodiment shown there are three such air pumps spaced equidistantly about the casing, thereby providing substantially balanced load and operating conditions at all times. If desired a single pump or a pair of pumps may be used, suitably operated from the motive means 40.

Tubes 75 connect with each of the air pumps and the combined output of such pumps is controlled by means of a valve mechanism 76 adapted to effect the desired periodic variation in applied air pressure conditions. Hose line 77 connected with valve 76 leads outwardly through the casing 35 and connects through suitable fitting 78 with the cap structure 60 so as to be effective within the interior of the cap and upon the scalp of the patient. Sealing means comprising a flexible rubber strip 79 fastens to the outer edge of the cap and serves to effectively block off access of outside air when the cap is in place, forming an air-sealed joint about the head of the user.

The valve means 76 is formed to provide for effecting the variations in the degree of pressure or suction applied. For this purpose the valve comprises a casing 80 within which the slidable valve member 81 is positioned. The hose line 77 from the applicator cap leads into the valve casing, on one side thereof, and the supply line 75 to the pump leads into the casing from the opposite side thereof. Valve body 81 has a passage 82 leading from one side to the other formed therein adapted to establish communication between lines 75 and 77 when in open position in alignment therewith. The passage is of greater width on the end adjacent pump line 75. There is also an air chamber 83 formed in the casing above the valve body adapted to contain spring members 84 for yieldably returning the valve to its open position. A branch passage 85 formed in the body establishes the same pressure conditions within the chamber 83 as within the pump line 75.

The valve body also carries a plunger 86 having a pin and slot connection 87 with the valve body to provide for limited movement of one with respect to the other. Spring 88 seats against the valve body at one end and against a pin 89 placed upon plunger 86 at the other, tending normally to move the plunger upwardly with respect to the valve body. Plunger 86 has a head 90 fitting upon and closing an opening 91 to the external air.

A second air chamber 92 is positioned upon the opposite side of the valve body, the introduction of air thereto being controlled by means of needle valve 93. A port 94 is formed in the side of the valve and in line therewith a recess 95 is provided in the valve body. The port is closed when the valve is in the position shown, but when the valve moves to its upper position, passage 95 establishes communication between the port and tube 77.

The operation of this device is as follows. With the valve body in open position to establish communication between the pump line 75 and the hose connection 77, the pumps being placed in operation produce a reduction in air pressure throughout the system, and within the interior of the cap as applied to the head of the patient. This reduction in pressure is also effective within the branch connection 85 and chamber 83, plunger 90 being meanwhile held in closed position as a result of the excess of

atmospheric pressure upon the outside thereof. Outside air pressure being admitted through valve 93 maintains air pressure conditions within chamber 92, and valve body 81 is therefore caused to gradually move upwardly into its closed position against the action of springs 84. As soon as the valve completely closes, communication with tube 77 is cut off and normal pressure is restored in the cap by means of port 94 and passage 95. When communication with the cap is cut off the pressure within chamber 83 is still further reduced, the valve body tending to move upwardly still further until the end of the pin and slot connection 87 is reached. At this point spring 88 has been compressed due to the upward movement of member 81 relative to plunger 86. Furthermore upward movement of member 81 unseats head 90, whereupon plunger 86, by action of compressed spring 88, is quickly thrown into its open position permitting the influx of atmospheric air to the chamber 83. The pressures upon opposite sides of the valve body being then substantially equal springs 84 become effective to urge the valve body in the reverse or toward its open position. This movement of the valve body toward open position is limited by the rate at which the air within chamber 92 is permitted to escape through needle valve 93, the valve gradually moving downwardly at a rate determined by the setting of the needle valve. When the valve has finally moved to open position, the pin and slot connection 87 effects the withdrawal of plunger 90 to closed position. Upon the return of the valve body 81 to its open position and the closing of the plunger 90, the system is again subjected to reduced atmospheric pressure, to repeat the cycle as described above. As will be understood, variation in the setting of valve 93 provides for changing the frequency of the operation of the system.

The above describes a satisfactory form of control mechanism, although it will be readily understood that other types of regulating device can be provided as desired, and in accordance with well understood means the air within the cap can be subjected to controlled air pressure conditions as required.

The combined effect of controlled air pressure conditions upon the scalp coupled with the complete and effective massaging action as already described greatly facilitates the desired improved circulation and provides a highly effective stimulation of the blood flow into the scalp. Furthermore the effect of the reduced air pressure above described when made effective within the cap causes an improved massaging action by causing the cap and the fingers thereof to press against the scalp, independently of the efforts of the patient, thereby affording a more positive massaging action.

While the forms of apparatus herein described constitute preferred embodiments of the invention, it is to be understood that the invention is not limited to these precise forms of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. A massage device of the character described comprising a massage cap adapted to be applied to the scalp of a patient, and means for operatively supporting said cap and for effecting a predetermined circulatory rocking motion of the cap to exercise the scalp in all directions comprising a plurality of spaced non-parallel supports di-

rected along converging lines, said lines extended toward their point of convergence entering the confines of said cap, and means for revolving each said support about a separate axis, the axes of revolution being non-parallel and directed along converging lines, said last-named lines extended toward their point of convergence entering the confines of said cap and converging at substantially the same point as said first mentioned lines.

2. A massage device of the character described comprising a massage cap adapted to be applied to the head of a patient, and means for effecting exercise and stimulation of the scalp by a circulatory rocking motion of the cap with respect to the head, said means comprising a plurality of spaced non-parallel supports directed along converging lines, said lines extended toward their point of convergence entering the confines of said cap, and means for revolving each said support about a separate axis, the axes of revolution being non-parallel and directed along converging lines, said last-named lines extended toward their point of convergence entering the confines of said cap, the point of convergence of said axis lines being substantially coincident with the point of convergence of said supporting lines.

3. A massage device of the character described comprising a massage cap adapted to be applied to the head of a patient, and means for effecting exercise and stimulation of the scalp by a circulatory rocking motion of the cap with respect to the head, said means comprising three spaced interconnecting means for receiving said cap, and means for revolving said interconnecting means individually in circular paths about centers located on a spherical surface and with the axes of revolution thereof meeting at the center of said spherical surface.

4. A massage device of the character described having a massage cap adapted to be applied to a patient, and means for producing a circulatory rocking motion of said cap and preventing rotation thereof comprising a plurality of spaced supports for said cap, means for revolving each said support about a separate axis, the axes of revolution and the axes of said supports being non-parallel and converging toward a common point, and means provided on said cap for rotatably receiving said supports.

5. A massage device of the character described having a massage cap adapted to be applied to a patient, and means for producing a circulatory rocking motion of said cap and preventing rotation thereof comprising a plurality of spaced non-parallel supports converging toward a common point, and means for revolving each said support about a separate axis, the axes of revolution also being non-parallel and converging toward said common point.

6. A massage device of the character described having a massage cap adapted to be applied to a patient, and means for producing a circulatory rocking motion of said cap and preventing rotation thereof comprising a plurality of spaced supports for said cap, means for revolving each said support about a separate axis, the paths of travel of the axes of said supports being conical surfaces of revolution, the axes of revolution being non-parallel and converging toward a common point, and means provided on said cap for removably receiving said supports.

7. A device of the character described for stimulation of the circulation of blood to the scalp comprising an applicator cap adapted to

receive a substantial portion of the patient's scalp, means on said cap and movable therewith for limiting the passage of air between cap and scalp, means for positively imparting an overall 5 bodily massage movement to said cap and said air limiting means to effect the exercise of the scalp, means for reducing the pressure within the cap during massaging movements thereof to promote effective massaging contact of the cap 10 with the scalp, and common drive means for said movement imparting means and said pressure reducing means.

8. A device of the character described for stimulation of the circulation of blood to the 15 scalp comprising an applicator cap adapted to receive a substantial portion of the patient's scalp, means on said cap and movable therewith for limiting the passage of air between cap and scalp, means for positively imparting an overall 20 bodily massage movement to said cap and said air limiting means to effect the exercise of the scalp, means for intermittently reducing the air pressure effective within the cap during massaging movements thereof to promote circulation 25 within the scalp under said reduced air pressure

condition and to simultaneously cause the pressing of said cap against the scalp to facilitate effective massaging thereof, a common housing enclosing said movement imparting means and said pressure reducing means, and common 5 drive means for said movement imparting means and said pressure reducing means.

9. A massage device of the character described comprising a massage cap adapted to be applied to the head of a patient and to receive a substantial portion of the head of the patient therein, and means for effecting exercise and stimulation of the scalp by a combined massaging movement of the entire cap and a suction operation effective substantially coextensively with 15 said massaging movement, and means including means for producing a circulatory rocking motion of the cap with respect to the head, said means also including means for reducing the pressure within the cap throughout the interior 20 thereof during massaging movements to promote effective massaging contact of the scalp with the entire interior of the cap.

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