Dec. 15, 1953 C. MYERS 2,662,303

HAIR DRIER

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Fig. 1.

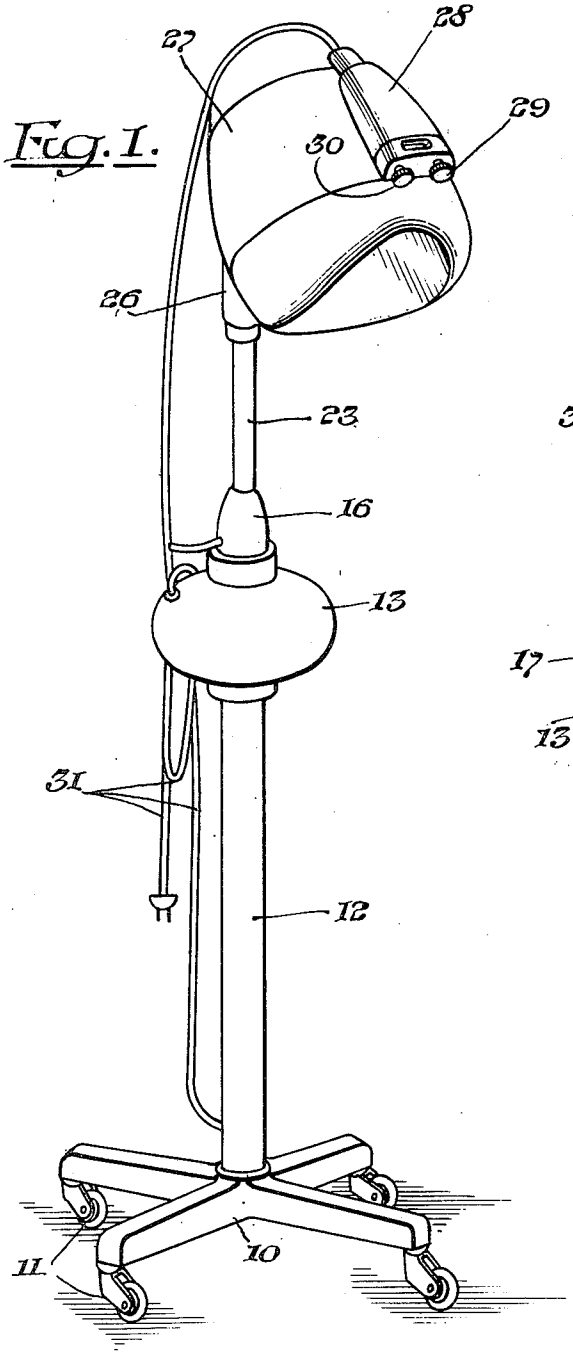
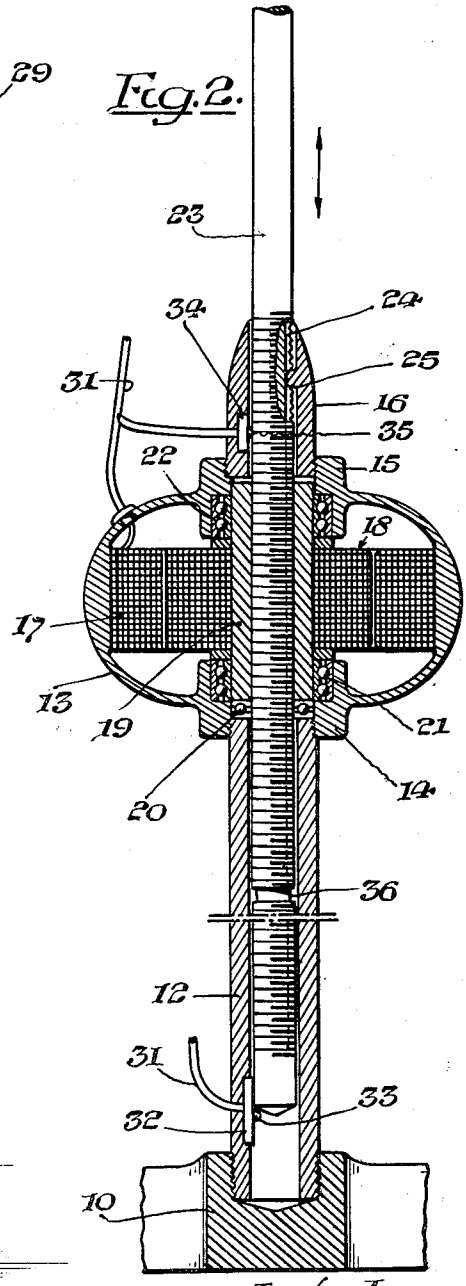


Fig. 2.



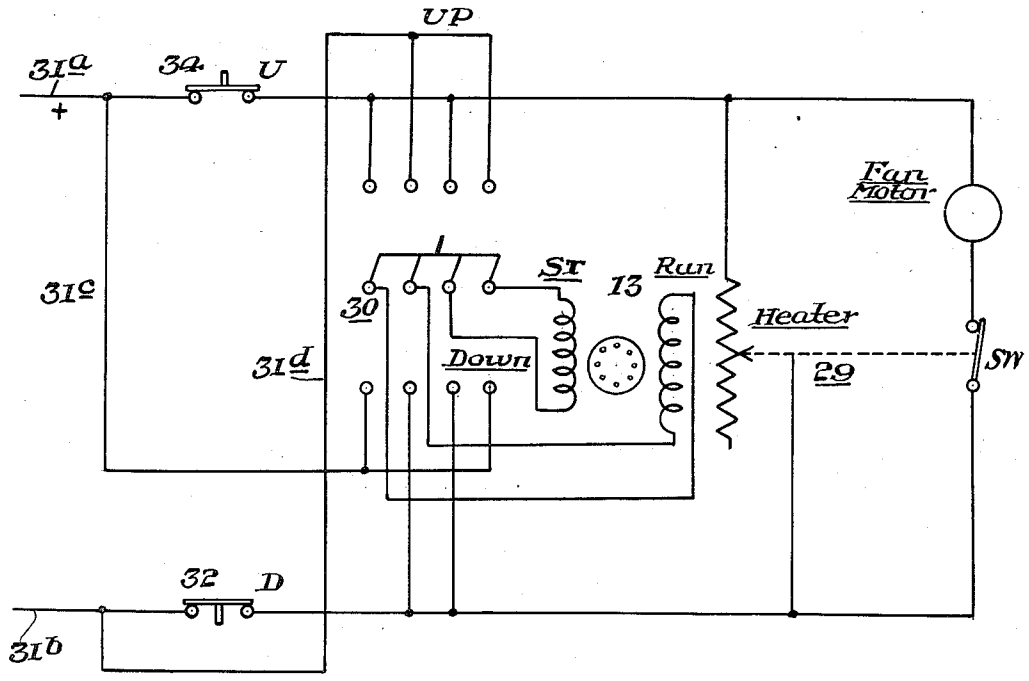
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Fig. 3.



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HAIR DRIER

Carmel Myers, New York, N. Y.

Application February 11, 1952, Serial No. 270,991

6 Claims. (Cl. 34—87)

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This invention relates to improvements in hair dryers of the type commonly used in commercial beauty parlors.

One object of this invention is to provide an electric hair dryer in combination with power operated means for effecting raising and lowering of the drying head thereof to adjust it to persons of different heights and to move it out of active position to facilitate extraction of the user.

Another object of this invention is to provide a power operated raising and lowering drive for electric hair dryer which will be automatically limited in its raising and lowering movements.

Still another object of the invention is to provide in such a combination of a manually controlled heating element active when the drying head is within the highest and lowest position limits of the drying head, but which is automatically cut off when the drying head reaches either of such limits.

Still another object of the invention is to provide in a combination of this type manual control whereby the person using the dryer has full control of it.

Other and more detailed objects of the invention will be apparent from the following description of the embodiment thereof selected for disclosure purposes herein.

In the accompanying drawings,

Figure 1 is a perspective view of an electric hair dryer embodying the subject matter of this invention;

Figure 2 is a vertical cross-sectional view through a portion of the dryer stand and the motor; and

Figure 3 is a diagrammatic circuit illustration showing the connection of the electrical parts involved.

As is well understood in this art, common types of electric hair dryers include a portable stand having an expansible post carrying the drying head. The post is manually adjustable in a vertical direction to accommodate the dryer to persons of different heights. Within the drying head is an electric heating element and a motor driven fan by means of which air is blown over the user's hair to dry it. Mounted on the drying head is a control by means of which the heater and motor may be turned off and on and various degrees of heat can be secured by adjustment of the heater.

This invention is concerned with similar electric dryers having the added capabilities set out in the foregoing objects.

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As illustrated in the drawings a suitable base 10 is provided with wheeled supports or casters 11 by means of which it is rendered mobile. Mounted on the base and extending vertically is a tubular stand 12 within which is telescoped a standard 23 for vertical adjustment. Attached to the upper end of the standard by means of a fixture 26 is a drying head indicated generally by the reference character 27.

In accordance with this invention a motor 13 is mounted on the tubular stand 12. As illustrated, this is accomplished by providing the lower journal housing 14 of the motor with internal threads by means of which it can be mounted thereon. The upper bearing housing 15 is likewise internally threaded to receive a tubular cap 16.

Within the motor housing is a field winding 17 of any suitable form and construction cooperating with the rotor 18, which in this case is mounted upon a tubular shaft 19 which is internally threaded throughout its length. The shaft is journaled at its ends in the bearing housings 14 and 15 by means of anti-friction bearings 21 and 22. To carry the weight of the rotor a thrust anti-friction bearing 20 is interposed between the upper end of the standard 12 and the lower end of the rotor shaft 19.

The standard 23 is of circular cross-section and is provided with an external thread for cooperation with the internal thread of the rotor shaft 19. The standard is also provided with a longitudinal keyway 24 into which projects a key member 25 mounted to project radially inwardly of the bore through the cap 16, as clearly shown in Figure 2. Mounted in the tubular stand near the bottom thereof is a normally closed switch 32 which may be of the micro-switch type, having a projecting button 33 extending radially into the longitudinal passage of the tubular stand 12 in a position to be engaged by the lower end of the standard 23. A similar normally closed micro-switch 34 is mounted in the cap 16 so that its operating button 35 tends to project radially into the passage in the cap. The standard 23 is provided with a suitably positioned depression 36 arranged so that when the depression moves opposite the operating button 35 of the switch 34 the button can move into the depression so that the switch opens. Thus switch 34 is spring biased in a well known manner so as to tend to open but is normally held closed by the standard 23. On the other hand, the switch 32 is normally spring biased closed and is forced open by the standard 23 as will be explained later. At

this point it may be noted that the circumferential extent of the threads on the standard could be interrupted by a longitudinal groove similar to the keyway 24 so as to provide a smooth surface against which the ends of the buttons 33 and 35 have sliding contact.

Within the dryer head 27, as is usual, is a motor driven fan arranged to blow air over an electric heating coil also mounted therein and directed onto the user's head. Mounted on the drying head is a similar housing 28 in which the controls may be mounted, in this case the control knob 24 which controls the temperature of the heater and by which the heater and fan motor can be shut off. Another control 30 is provided for actuating a four-pole double-throw switch to be referred to later, by means of which the elevation of the drying head can be controlled. The power cable for supplying electricity to this equipment is generally indicated at 31.

The manner of interconnection of these parts to effect the objects of this invention will now be explained in connection with Figure 3.

The power cable 31 contains a pair of conductors 31^a and 31^b. The up limit switch 34 and the down limit switch 32 are respectively connected to these circuit conductors on one side of each switch respectively. The other side of switch 34 is connected by a conductor to the first and third contacts of the upper set of the four-pole double-throw switch 30 as shown, and is likewise connected to one terminal of the heater resistance and one terminal of the fan motor, as shown. The other contact of switch 32 is connected to the second and third contacts of the lowermost set of switch 30, to the movable contact 29 of the heater, and one terminal of the switch S^w, which controls the fan motor. The control 29 for adjusting the heater is of the type by means of which the heater can be shut off and is shown by a dotted line to mechanically interconnect to the switch S^w so that when the heater is shut off switch S^w will open and the fan motor will stop. Conductor 31^a is connected by conductor 31^c to the first and fourth contacts of the lowermost set of switch 30. Conductor 31^b is connected to wire 31^d, to the second and fourth contacts of the uppermost set of the switch 30. The motor 13 is a single split phase type of motor having a starting coil ST and a running coil run. A centrifugal switch, not shown, is commonly used in such motors to break the circuit to the starting coil after the motor has come up the speed. The terminals of the running winding are connected to the first and second poles of the switch 30 while the terminals of the starting coil are connected to the third and fourth poles, as clearly shown in Figure 3.

In order to use this mechanism the supply cable 31 is plugged into a suitable outlet. Assuming that switch 30 is in neutral position as shown in Figure 3, motor 13 will not be energized but the heater and fan motor can be energized by manipulating control 29. As soon as the heater is turned on, switch S^w closes and the fan motor runs. If the drying head is too low switch 30 is operated in one direction in the case of Figure 3, to the up position to complete the following circuits. Current flows from the source through conductor 31^a, closed switch 34, to the left-hand pole of switch 30, through which it flows through the running winding and back through the next pole to the right of switch 30 to conductor 31^d, and thence back to the supply conductor 31^b. At the same time the starting winding is energized from conductor 31^a with a return circuit through conductor 31^g. Thus motor 13 will operate in a direction to cause the standard 23 to move upwardly. This occurs by reason of the fact that a rotor shaft 19 acts like a nut which is always revolving. As the standard 23 is held against rotation by operation of the key 25 in the keyway 24, standard 23 will move upwardly carrying the drying head 27 with it. When the drying head is at the proper height for use by a particular person, switch 30 is turned back to neutral position, de-energizing the motor 13. As explained, however, the heater and the fan motor can be operated independently through the control 29, even though switch 30 is open.

Switch 30 is assumed to be the type which will remain in operated position that is either in up or down position or any open position. Assuming that the user forgets to open switch 30 while the drying head is moving upwardly, it will be seen that when standard 23 moves to the point where its depression 36 is aligned with actuating knob 35 of switch 34, switch 34 which is biased to open, will open. This condition may happen when a person using the dryer is called, for example, to the telephone and simply throws the switch 30 to the up direction. Switch 34 serves the function of turning the machine completely off when the drying head reaches the upper limit of travel. This results from the opening of switch 34 which breaks the circuit to the motor 13 as well as to the heater and fan motor. When the user wishes to move the drying head back to operative position, she throws switch 30 to the down position. As switch 34 is open, current may now flow from the supply conductor 31^a through the connection 31^c to the first pole of switch 30 and thence through the running winding back to the second pole of the switch, and from there through switch 32 which is closed, to the other conductor 31^b. The starting coil is now connected to conductor 31^b through closed switch 32, the third pole of switch 30 to the winding and back through the fourth pole to conductor 31^c, and thence to the supply lead 31^a, bypassing open switch 34. It will be noted that the starting coil is reversely connected with respect to the up position so that motor 13 will run in the opposite direction to cause the standard 23 to move downwardly. Of course the heater and the fan motor will be in circuit at the same time.

When the drying head has descended to the proper position, the user moves switch 30 back to neutral position, de-energizing motor 13, but leaving the heater and fan motor in circuit and subject to independent manual control by the control knob 24. If by chance while the drying head is moving downwardly the operator leaves the machine with switch 30 closed in a down direction, no damage can result because when the lower end of the standard 23 engages the button 33 of switch 32, this switch which is spring biased in closed position, will be forced open. The result is that the circuit to the motor 13 will be de-energized, as will the heater and fan motor. Thus, no matter how long switch 30 remains closed, no damage will result. In an obvious manner, when switch 30 is thrown to up position from this lower limit, motor 13 will be energized in the reverse or original direction to raise the drying head.

In resume it will be seen that when the drying head is anywhere between its extreme uppermost and lowermost limits, the heater and fan motor are operative, even though switch 39 is in neutral position. On the other hand, should the drying head be moved to either of these limits, switch 39 of course being closed, motor 13 will stop automatically, and since the drying head is not in usable position at either such limit, the heater and fan motor will also be automatically cut off. Thus no energy is wasted when the machine is not in use and no damage to it can result from careless operation of it.

Thus the above description sets out a mechanism which will accomplish the aforementioned objects of this invention.

Thus, for example, the switch and control 39 could be mounted on any other suitable part of the mechanism or incorporated into the power cable 31, in an obvious manner.

It is appreciated that those skilled in the art will readily recognize minor changes in the details of construction and electrical interconnection of the elements involved, and I do not, therefore, desire to be limited to the embodiment herein illustrated, but to the scope of my invention as defined in the appended claims.

What is claimed is:

1. An electric dryer comprising a portable stand, a standard vertically movable on said stand, an electric motor mounted on said stand for causing such movement, said motor having an internally threaded tubular shaft and said standard being threadedly telescoped therein, a drying head secured to said standard and circuit means including a control for reversely energizing said motor to raise and lower said standard and drying head.

2. In the combination of claim 1, means on said stand and cooperating with said standard to prevent rotation thereof.

3. An electric dryer comprising a portable stand, a standard vertically movable on said stand, an electric motor mounted on said stand for causing such movement, a drying head secured to said standard, circuit means including a control for reversely energizing said motor to raise and lower said standard and drying head, means forming part of said circuit means for automatically deenergizing said motor at the uppermost and lowermost limits of travel on said drying head, an electric heater and fan motor in said drying head, and connections forming part of said circuit means whereby said heater and fan motor are simultaneously deenergized with said first motor at said limits.

4. In the combination of claim 3, said connections being arranged so that said heater and fan motor remain energized between said limits independently of the energization of said first motor.

5. An electric dryer comprising a tubular portable standard, an electric motor mounted on said standard having a tubular internally threaded shaft, a standard threadedly engaging said shaft and lying axially of said tubular stand and shaft, a circuit control device incorporated in said tubular stand cooperating with said standard to automatically deenergize said motor at upper and lower limit positions of said standard, a drying head mounted on the upper end of said standard, a heater and a fan motor in said drying head, circuit means including a control member for reversely energizing said motor to raise and lower said standard and drying head and connections with said circuit means whereby said heater and fan motor are deenergized simultaneously with the deenergization of said first motor at said limits.

6. An electric dryer comprising a tubular portable standard, an electric motor mounted on said standard having a tubular internally threaded shaft, a standard threadedly engaging said shaft and lying axially of said tubular stand and shaft, a circuit control device incorporated in said tubular stand cooperating with said standard to automatically deenergize said motor at upper and lower limit positions of said standard, a drying head mounted on the upper end of said standard, a heater and a fan motor in said drying head, circuit means including a control member for reversely energizing said motor to raise and lower said standard and drying head and connections with said circuit means whereby said heater and fan motor are deenergized simultaneously with the deenergization of said first motor at said limits, said heater and fan motor being operative between said limits independently of the position of said control means.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,887,233	Condos	Nov. 8, 1932
1,987,425	Suter	Jan. 8, 1935
2,038,431	Klages	Apr. 21, 1936