

[72] Inventor **Tomio Makino**
Tokyo, Japan
[21] Appl. No. **734,095**
[22] Filed **June 3, 1968**
[45] Patented **May 25, 1971**
[73] Assignee **Nichiei Denki Sangyo K.K.**

[54] **CURLING BOBBIN AND HEATER**
8 Claims, 8 Drawing Figs.

[52] U.S. Cl. **219/222,**
132/33, 219/242, 219/521
[51] Int. Cl. **A45d 4/12,**
A45d 2/36, H05b 1/00
[50] Field of Search **219/222-**
—226, 241, 242, 523, 521, 520; 132/32, 33, 34,
36, 37, 38, 39, 40

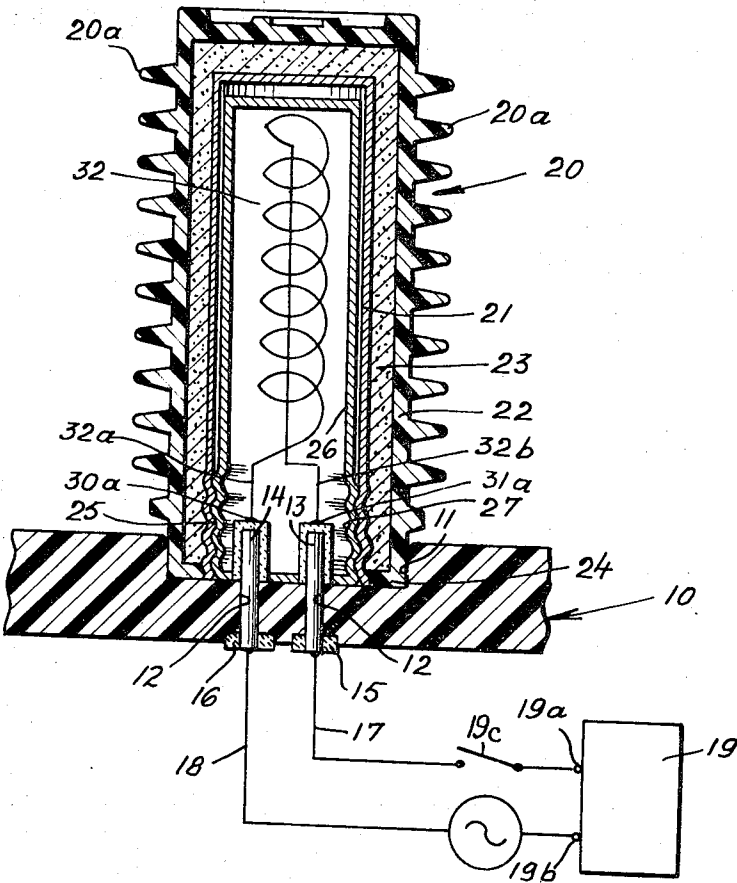
[56] **References Cited**

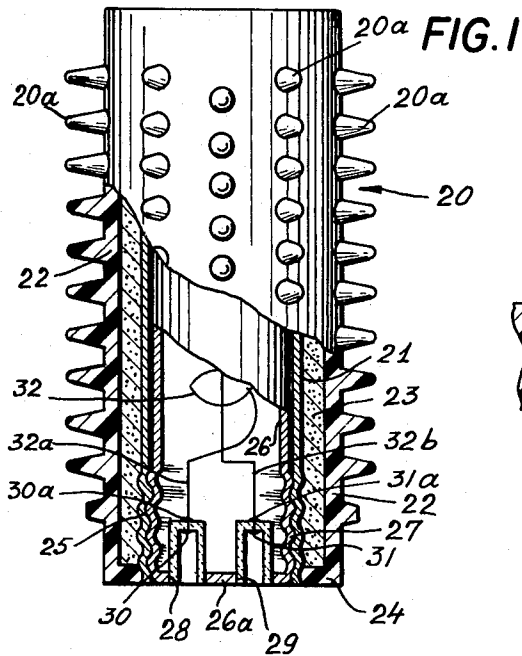
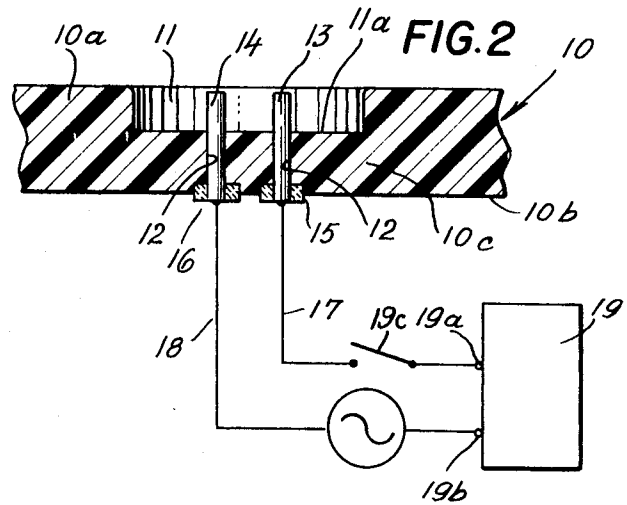
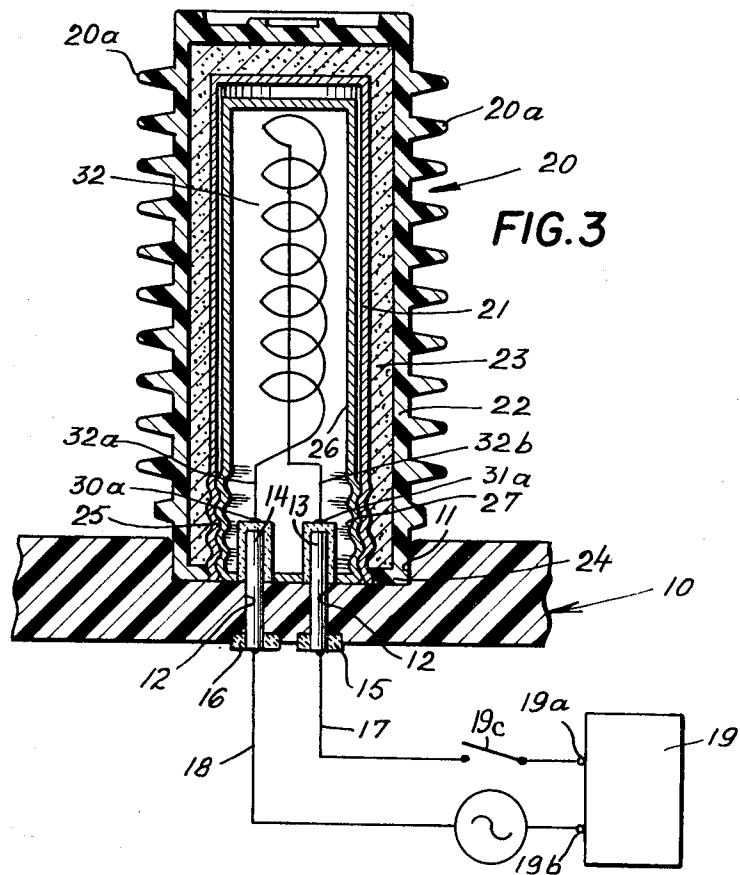
UNITED STATES PATENTS			
1,942,972	1/1934	Moseley	219/222(UX)
2,126,170	8/1938	Calvete	219/222(UX)
3,415,254	12/1968	Brock et al.	219/222X
3,472,245	10/1969	Abe	219/222(UX)
3,473,005	10/1969	Grandinetti	219/222
re.18,088	6/1931	Boyden	219/222(UX)
2,166,810	7/1939	Gammeter	219/242(UX)

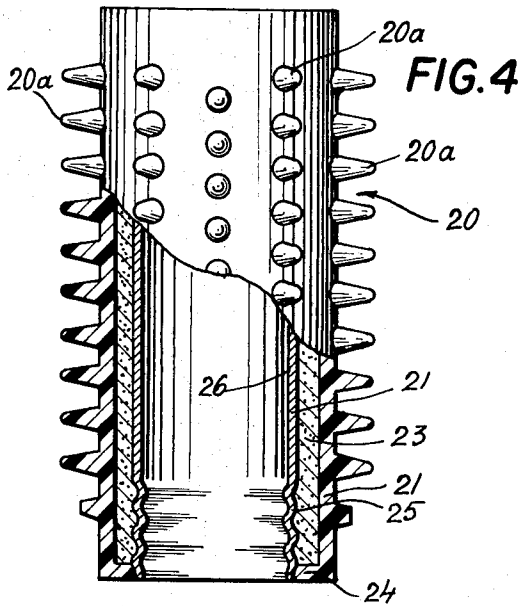
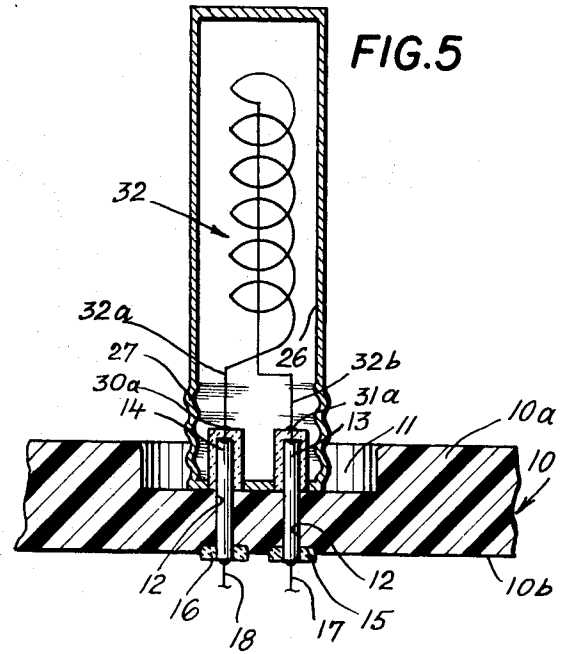
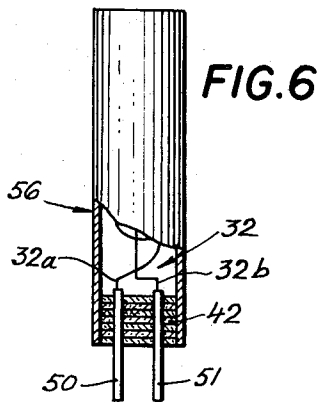
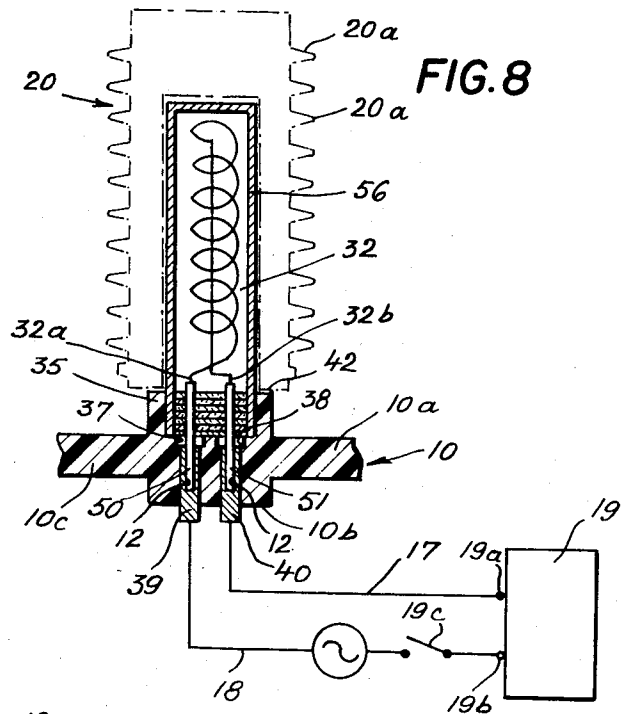
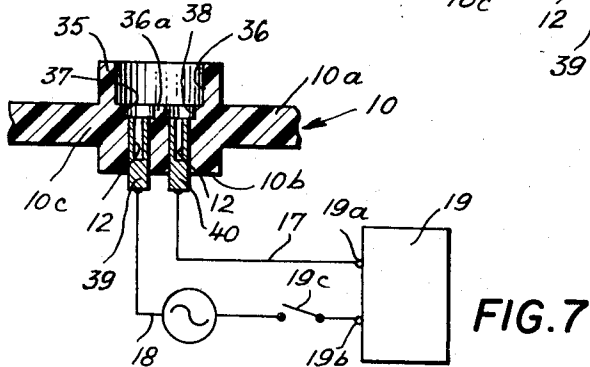
2,467,447	4/1949	Strezoff	219/313
2,708,796	5/1955	Adamy	219/521X
3,257,541	6/1966	Jorgensen	219/222
3,410,985	11/1968	Giacchero	219/521X
FOREIGN PATENTS			
808,747	11/1936	France	219/242
679,332	1/1930	France	219/222
908,197	8/1945	France	219/242
619,628	3/1949	Great Britain	132/36
333,569	1/1935	Italy	219/222

Primary Examiner—A. Bartis
Attorneys—Robert E. Burns and Emmanuel J. Lobato

ABSTRACT: A curling bobbin and heater assembly includes a bobbin having an outer cylinder with a plurality of radial projections for twining hair, an intermediate cylinder formed of heat storing material, such as paraffin or polycarbonate, and an inner cylinder formed of a material of high thermal conductivity. The inner and outer cylinders are attached by means of an inwardly directed flanged portion on the outer cylinder. The inner cylinder closely fits around and receives a cylindrical electric-heating element is detachable from a base member which includes terminal pins which are received in corresponding sockets on the heating element. The heating element is detachably secured to the inner shell of the bobbin so that, is desired, the heating element and bobbin can be removed from the base member as a unit.







CURLING BOBBIN AND HEATER

DESCRIPTION OF THE INVENTION

The invention relates in general to hair curling bobbins and more particularly to bobbins having heated and heat transfer devices.

An object of this invention is to provide a curling bobbin with a detachable internal heating device.

Another object of this invention is to provide a curling bobbin having a highly efficient heat transmission path from the heater to the heat-storing material.

Another object of this invention is to provide a curling bobbin, having a heater, that is easily mounted on a base.

In accordance with the invention, a heating element is inserted in a bobbin comprising an outer cylinder having projections, an inner cylinder closely fitting the heating element and an intermediate cylinder of heat-storing material between the inner and outer cylinders. The heating element is detachably secured in the bobbin so that, if desired, the heating element and bobbin can be removed from the base as a unit.

Other objects and a fuller understanding of the invention may be had by referring to the following description taken in conjunction with the accompanying drawing in which:

FIG. 1 is a partial longitudinal sectional view of the curling bobbin in accordance with the invention,

FIG. 2 is a partial cross-sectional view of the base,

FIG. 3 is a longitudinal sectional view showing the bobbin mounted on the base,

FIG. 4 is a partial longitudinal sectional view of the curling bobbin with the heater removed,

FIG. 5 is a longitudinal sectional view of the heater mounted on the base,

FIG. 6 is a partial longitudinal sectional view of an alternative construction of the heater,

FIG. 7 is a cross-sectional view of an alternative construction of the base, and

FIG. 8 is a longitudinal sectional view showing the bobbin mounted on the alternative construction heater and on the alternative construction base.

With reference to the drawing a connector base 10 which is approximately rectangular in plan view is made of insulating material, such as ebonite. Only a portion of the connector base is represented for the purpose of avoiding repetition. The base 10 has a guide recess 11 with a suitable depth and shape (square, round or other) to accommodate the end of a bobbin 20. In the portion of the base 10c between the bottom of the recess 11 and the bottom surface 10b of the base 10, a pair of holes 12 are located. Contact plugs 13 and 14 are inserted in holes 12 and caps 15 and 16 fix the plugs to the base 10.

The bottom end of plugs 13 and 14 are connected with ends of lead wires 17 and 18 respectively. The other ends of said lead wires 17 and 18 are connected to terminals 19a and 19b respectively of an AC power supply 19.

A suitable switch 19c is provided in the power supply or in one of the lead wires so that the power may be turned on and off.

The bobbin 20 has an inner cylinder 21 and an outer cylinder 22 spaced from the inner cylinder. The annular space between the cylinders is filled with heat accumulating material 23, such as paraffin or polycarbonate.

The inner cylinder 21 is made of high thermal conductivity material, for example, brass, copper and aluminum and is formed as illustrated in FIG. 4 with its bottom end open. The outer cylinder made of hard synthetic resin is formed somewhat larger than the inner cylinder 21 and has a plurality of slip-stop projections 20a or conical projections with rounded vertexes on its entire outside surface. An annular flange 24 is formed at the open end of the outer cylinder by turning the edge thereof inwardly. The intumed flange of the portion 24 is firmly fixed to the outer surface of the bottom of the inner cylinder 21 by fusion bonding or other suitable fixing means so as to assure a fluidtight joint.

The lower end of the bobbin is of a size to fit in the recess 11 in the base 10.

The bottom end of the said inner cylinder 21 is provided with a threaded part 25 obtained by rolling a thread in said bottom end.

A heating unit 26 fits inside the inner cylinder 21. The heating unit has a shell made of heat conductive material which is preferably the same material as that of the inner cylinder 21 and its size is proportioned somewhat smaller than that of the inner cylinder 21 so as to fit snugly yet freely in the inner cylinder.

The shell of the heating unit is shaped in the form of a cylinder with its both ends totally closed but with the bottom end perforated by holes 28 and 29 in which conventional sockets 30 and 31 are engaged and fixed. A threaded portion 25 on the inner cylinder 20 is engaged with threaded portion 27 on the shell of the heating unit.

The sockets 30 and 31 are connected electrically with both ends 32a and 32b of an electric-heating element, for instance, of Nichrome wire in an approximate spiral form, through the means of electric conductive materials 30a and 31a.

Since the bottom surfaces of the said bobbin 20 and heating unit 26 arranged as above are flush, the above two components if inserted into the guide recess 11 of the aforementioned base 11 come in close contact with the bottom 11a of the said recess 11.

The operation of the device is as follows.

The heating unit 26 is inserted in the recess 11 of the base and its sockets 30 and 31 are fitted onto the plugs 14 and 13 provided on the base 10 (see FIG. 5). The inner cylinder 21 of the bobbin 20 is then fitted over the heating unit 26, and the threaded part 25 of the inner cylinder 21 is engaged with the threaded part 27 of the heating unit 26 (see FIG. 3). Under these conditions, the bottom surface of the bobbin 20 and the heating unit 26 come in close contact with the bottom part 11a of the guide recess 11 (see FIG. 3). The bobbin is thus securely positioned on the base. It is also possible to first insert the cylinder 26 into the bobbin and then insert the assembly into the guide recess of the base.

When the bobbin 20 is set in the guide recess 11 of the base 10, the power supply 19 is turned on and current will be supplied to the electric-heating element 32 through terminals 19a and 19b, lead wires 17 and 18 and plugs 14 and 13. This current passes further through the electric-heating element 32, whereby the electric-heating element 32 is made red-hot.

When the electric heating element 32 gets red-hot, its radiant heat is communicated directly to the heat conductive material of the heating unit 26 which in turn transmits its heat to the heat accumulating material 23 through the inner cylinder 21 of the bobbin 20.

Thus, the said heat provided by the heat source 32 warms up the outer cylinder 22, while being accumulated inside the said heat storing material 23.

When the bobbin 20 is sufficiently hot, the power supply 19 is shut off and the bobbin 20 is removed from cylinder 26 and hair is twined on the projections 20a in the usual way. The heat accumulating material 23 results in a continuing release of heat from the bobbin. The closed end of the outer cylinder is preferably coated with paint which changes color when desired temperature is reached.

A second embodiment of the invention is illustrated in FIGS. 6 to 8.

On the top surface 10a of the connector base 10, a ring-shaped projection 35 forms a guide recess 36 to guide the heating unit 56. The bottom 36a of said recess 36 is provided with two small recesses 37 and 38 opening into holes 12 in the base between the bottom surface 10b of the base 10 and the bottom surfaces of said recesses 37 and 38. Sockets 39 and 40 made of electrically conductive materials are fitted firmly into the holes 12. The plugs 50 and 51 fitting the sockets 39 and 40 are arranged on the bottom end of the heating unit 56 through the medium of a plug base 42.

The major portions of plugs 50 and 51 project beyond the lower end of the heating unit 56 and the bottom end of the heating unit 56 is finished smoothly rather than threaded as in the first embodiment. The bobbin 20, though illustrated sche-

matically, has the same construction as in the first embodiment except that it is not threaded. Moreover, as seen in FIG. 8, the lower end of the heating unit 56 is not flush with the lower end of the bobbin but projects downwardly so as to be received in the recess formed by the annular projection 35 on the base.

Although I have described my invention with a certain degree of particularity, it is understood that the present disclosure has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as herein after claimed.

I claim:

1. A curling bobbin and heater comprising an integral outer hollow cylinder having an open end and a closed end with the outside surface having a plurality of projections and having an inwardly directed portion disposed at the open end, an intermediate hollow cylinder having an open end and a closed end disposed within said outer cylinder, with said open end corresponding to said open end of said outer cylinder, said intermediate cylinder being formed of heat storing material, an integral inner hollow cylinder disposed within said intermediate cylinder and formed of thermally conductive material with said inner cylinder having a closed end and an open end and with the portion forming said open end attached to said inwardly directed portion of said outer cylinder, a hollow heater cylinder having closed ends and fitting endwise into said inner cylinder, an electrical-heating element disposed within said heater cylinder, electrical connector means mounted in a base portion of said heater cylinder, a base having a recessed portion and electrical connector means detachably receiving said means on said heater cylinder mounted within said recessed

portion, a power supply, and circuit connections and switch means for connecting said base to said power supply so that when the end of the heater is placed within said recessed portion and connected electrically to said power supply heat is generated within said heater cylinder and when said bobbin is placed endwise over said heater cylinder the heat generated is transmitted to said bobbin, said heater cylinder and said inner cylinder of said bobbin being provided with interfitting retaining portions detachably securing said heater cylinder to said inner cylinder whereby said bobbin and heating element may be detached from said base as a unit if desired.

2. A curling bobbin and heater as in claim 1 wherein said intermediate cylinder is formed of parafin.

3. A curling bobbin and heater as in claim 1 wherein said intermediate cylinder is formed of polycarbonate.

4. A curling bobbin and heater as in claim 1 wherein said heating element comprises Nichrome wire formed into a spiral.

5. A curling bobbin and heater as in claim 1 wherein said recessed portion in said base is proportioned so as to guide the outer surface of said outer cylinder.

6. A curling bobbin and heater as in claim 1 wherein the outer diameter of said heater cylinder closely approaches the inner diameter of the inner cylinder of the bobbin so as to minimize heat transmission losses.

7. A curling bobbin and heater as in claim 1 wherein the lower end of the heater cylinder and the lower end of the bobbin are flush with one another.

8. A curling bobbin and heater as in claim 1 wherein said inner cylinder is of heat conductive metal and said outer cylinder is of molded plastic material.

35

40

45

50

55

60

65

70

75