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<p>(21) International Application Number: PCT/US00/12134 (22) International Filing Date: 4 May 2000 (04.05.00) (30) Priority Data: 09/306,283 6 May 1999 (06.05.99) US (71) Applicant: CONAIR CORPORATION [US/US]; One Cummings Point Road, Stamford, CT 06904 (US). (72) Inventor: LEUNG, Anthony; 2B 41 Braemar Hill Road, North Point, Hong Kong (CN). (74) Agent: RUGGIERO, Charles, N., J.; Ohlandt, Greeley, Ruggiero &amp; Perle, L.L.P., 9th Floor, One Landmark Square, Stamford, CT 06901-2682 (US).</p>	<p>(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p><b>Published</b> <i>With international search report.</i> <i>With amended claims.</i></p>
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<p>(54) Title: HAIR CURLER AND HEATER</p> <p>(57) Abstract</p> <p>A hair curler (1) comprises a pair of substantially semi-cylindrical, metal members (12a, 12b) having opposed side faces. The members (12a, 12b) are joined at one end by a bridge (9) that separates the side faces of the metal members (12a, 12b) by a distance adapted to receive a rail-like heat conductor.</p>	
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## HAIR CURLER AND HEATER

### BACKGROUND OF THE INVENTION

#### 5 1. Field of the Invention

This invention relates generally to personal care devices for grooming hair. More particularly, the invention relates to hair curlers and devices for heating hair curlers.

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#### 2. Description of the Prior Art

Hair setting and curling devices are well known that include means for heating hair rollers to a selected temperature for use in the curling or setting of a woman's hair. These devices usually comprise a casing that has supports for detachably holding and heating hair rollers. When the rollers are heated to a desired temperature, they are removed from the supports. The user winds a cluster of hair around the outer surface of the heated roller and, as a result, the hair is more readily curled. The roller may be removed from the hair after only several minutes.

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An example of a hair roller as described above is shown in U.S. Patent No. 3,600,552 issued to Tolmie for Portable Electric Appliance. The Tolmie patent discloses a hair setting and curling means including hair roller means and heating apparatus therefor. The heating apparatus is provided in a casing and includes a heating plate having a plurality of spaced and parallel rail members. Hair rollers are provided that have grooves in one end adapted to be fitted over the rails thereby enabling heat to be conducted from the rail members to the rollers.

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These known devices present problems and inconveniences in use. The conventional heating apparatus transfers heat from a heating element to a heater case, then from the heater case to heater posts. This method



Fig. 3 is an exterior view of the hair curler of Fig. 1.

Fig. 4 is an exploded view of a preferred embodiment of a heater  
5 assembly for use with the hair curler of Fig. 1.

Fig. 5 is an exterior view of the hair curler of Fig. 1 placed upon the  
heater assembly of Fig. 4.

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### Detailed Description of the Invention

Fig. 1 shows an exterior view of a preferred embodiment of the outer  
body, generally identified as 1, of a hair curler, that incorporates the  
15 present invention. Outer body 1 is divided into members 12a, 12b.  
Members 12a, 12b are preferably aluminum extrusions that have hollow  
regions 18a, 18b (see Fig. 2) defined by inner walls 14a, 14b (also see Fig.  
2) and outer walls 16a, 16b. Members 12a, 12b are spaced apart by an  
integral bridge 9. A slot 7 (see Fig. 3) is thereby formed in hair curler 1  
20 between inner walls 14a, 14b. Additionally, outer body 1 may be covered  
in a material, such as flocking, to enable outer body 1 to more easily grip  
hair wound upon it.

As seen in Fig. 2, an inner member 21 comprises an endpiece 23  
25 having a central opening 23a (see Fig. 3) through which endcap 24  
extends. Endcap 24 may be optionally opaque or translucent. Two,  
preferably hollow, columns 25a, 25b depend from endpiece 23. Columns  
25a, 25b of inner member 21 are positioned within respective hollow  
regions 18a, 18b of respective members 12a, 12b of outer body 1.

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The exploded view of Figure 2 shows how the hair curler is  
preferably assembled. Outer body 1 is manufactured by extrusion as a  
hollow body having inner walls 14a, 14b and outerwalls 16a, 16b. A

portion 26 of outer body 1 is cut between inner walls 14a, 14b to thereby create bridge 9 and slot 7 (see Fig. 3). Optionally, a heat pipe 26 is placed in contact with bridge 9 and a thermochromic plug 28 is placed upon heat pipe 26 so as to be visible through optionally translucent endcap 24.

- 5 Columns 25a, 25b of inner body 21 are inserted into respective hollow regions 18a, 18b of respective members 12a, 12b of outer body 1. Finally, end caps 27a, 27b are connected to respective columns 25a, 25b.

Heater assembly 30 is shown in Figure 4. Heating element 33 is  
10 sandwiched between insulating layers 34a, 34b. Preferably, insulating layers 34a, 34b are mica. Sheath 36 is placed over insulating layers 34a, 34b. Sheath 36 is a heat conducting metal, most preferably, aluminum. Heater assembly 30 is proportioned to create an interference fit with inner walls 14a, 14b of hair curler 1.

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In operation, as shown in Fig. 5, outer body 1 is disposed upon heater assembly 30 by placing slot 7 over sheath 36. Heating element 33 of heater assembly 30 transfers heat energy through insulating boards 34a, 34b into sheath 36. Sheath 36 transfers the heat energy to inner  
20 walls 14a, 14b of hair curler 1 and also heats the air enclosed within hollow regions 18a, 18b. Inner walls 14a, 14b transfer the heat energy to outer walls 16a, 16b. Inner walls 14a, 14b also transfer the heat energy through heat pipe 26 to thermochromic plug 28. Thermochromic plug 28 changes color at a given temperature so as to notify the user that outer body 1 is  
25 ready to be used.

The invention having been thus described with particular reference to the preferred form thereof, it will be obvious that various changes and modifications may be made therein without departing from the spirit and  
30 scope of the invention as defined in the appended claims.

What we claim is:

1. A hair curler comprising:
  - 5 a pair of substantially semi-cylindrical metal members having opposed, substantially planar side faces joined at one end by a bridge, said bridge separating said side faces by a distance  $d$ , said distance  $d$  creating a slot that is adapted to receive a rail-like heat conductor having a width  $w$ .
  - 10
  2. The hair curler according to claim 1 wherein said distance  $d$  is less than said width  $w$  of said rail-like heat conductor, thereby creating a contact fit between said side faces members and said rail-like heat conductor.
  - 15
  3. The hair curler according to claim 1 wherein said metal members are formed by extrusion and said bridge is an integral part thereof.
  4. The hair curler according to claim 1 wherein said metal members are hollow.
  - 20
  5. The hair curler according to claim 1 wherein substantially the entire surface areas of said opposed side faces are adapted to contact said rail-like heat conductor.
  - 25
  6. The hair curler according to claim 1 wherein said slot is of inverted U-shaped configuration and said rail-like heat conductor is similarly configured in cross section.
  - 30
  7. A hair curler comprising:
    - a substantially cylindrical hollow metal body,

said hollow metal body being partitioned into three sections by a pair of inner planar walls;

5           said metal body comprising a pair of substantially semi-cylindrical, hollow, metal members having opposed side faces joined at one end by a bridge integral thereto, said bridge formed by a cut in the material joining said hollow metal members, said cut creating a slot adapted to receive a rail-like heat conductor.

10   8.     The hair curler according to claim 7 wherein said hollow metal body is aluminum.

9.     The hair curler according to claim 7 wherein said hollow metal body is covered with flocking.

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10.    The hair curler according to claim 7 further comprising means for signalling that said hair curler is ready to use.

20   11.   The hair curler according to claim 9, wherein said means for signalling is a thermochromic plug.

## AMENDED CLAIMS

[received by the International Bureau on 18 October 2000 (18.10.00); original claims 2-11 replaced by amended claims 2-11; remaining claim unchanged (2 pages)]

1. A hair curler comprising:

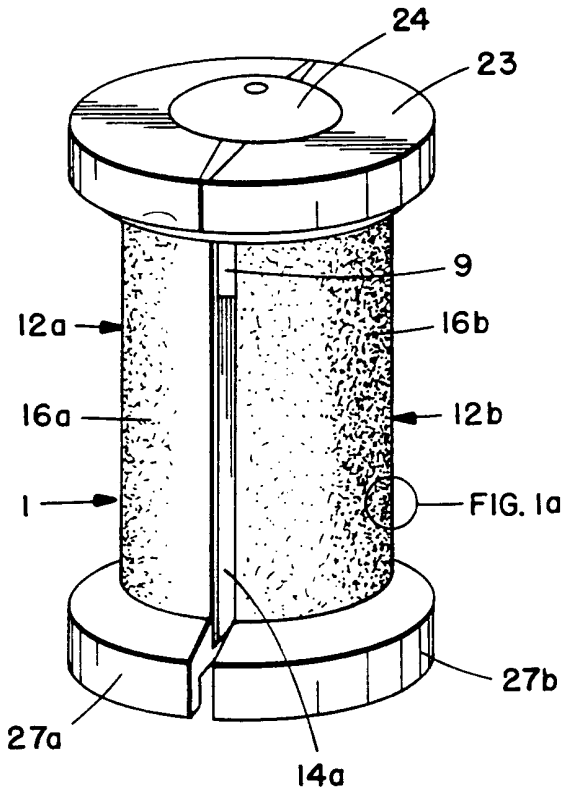
a pair of substantially semi-cylindrical metal members having opposed, substantially planar side faces joined at one end by a bridge, said bridge separating said side faces by a distance  $d$ , said distance  $d$  creating a slot that is adapted to receive a rail-like heat conductor having a width  $w$ .
2. The hair curler according to claim 1, wherein said distance  $d$  is less than said width  $w$  of said rail-like heat conductor, thereby creating an interference fit between said opposed side faces and said rail-like heat conductor.
3. The hair curler according to claim 1, wherein said metal members are formed by extrusion and said bridge is an integral part thereof.
4. The hair curler according to claim 1, wherein said metal members are hollow.
5. The hair curler according to claim 1, wherein substantially the entire surface areas of said opposed side faces are adapted to contact said rail-like heat conductor.
6. The hair curler according to claim 1, wherein said slot has an inverted U-shaped configuration and said rail-like heat conductor is similarly configured in cross section.
7. A hair curler comprising:

a substantially cylindrical hollow metal body, said metal body being partitioned into three sections by a pair of inner planar walls, said metal

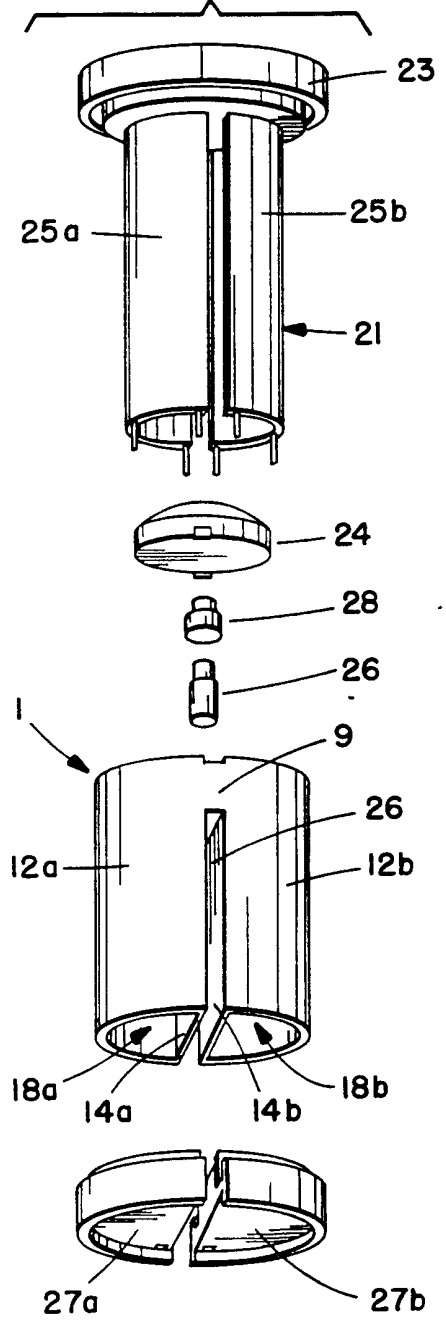
body comprising a pair of substantially semi-cylindrical, hollow, metal members having opposed side faces joined at one end by a bridge integral thereto, said bridge formed by a cut in the material joining said hollow metal members, said cut creating a slot adapted to receive a rail-like heat conductor.

8. The hair curler according to claim 7, wherein said hollow metal body is aluminum.
9. The hair curler according to claim 7, wherein said hollow metal body is covered with flocking.
10. The hair curler according to claim 7, further comprising means for signaling that said hair curler is ready to use.
11. The hair curler according to claim 10, wherein said means for signaling is a thermochromic plug.

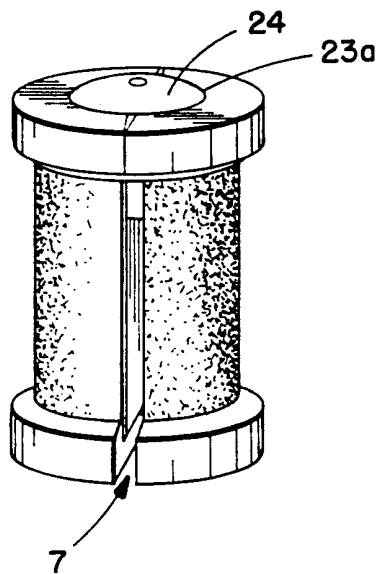
**FIG. 1.**



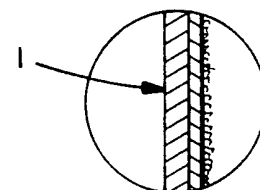
**FIG. 2.**



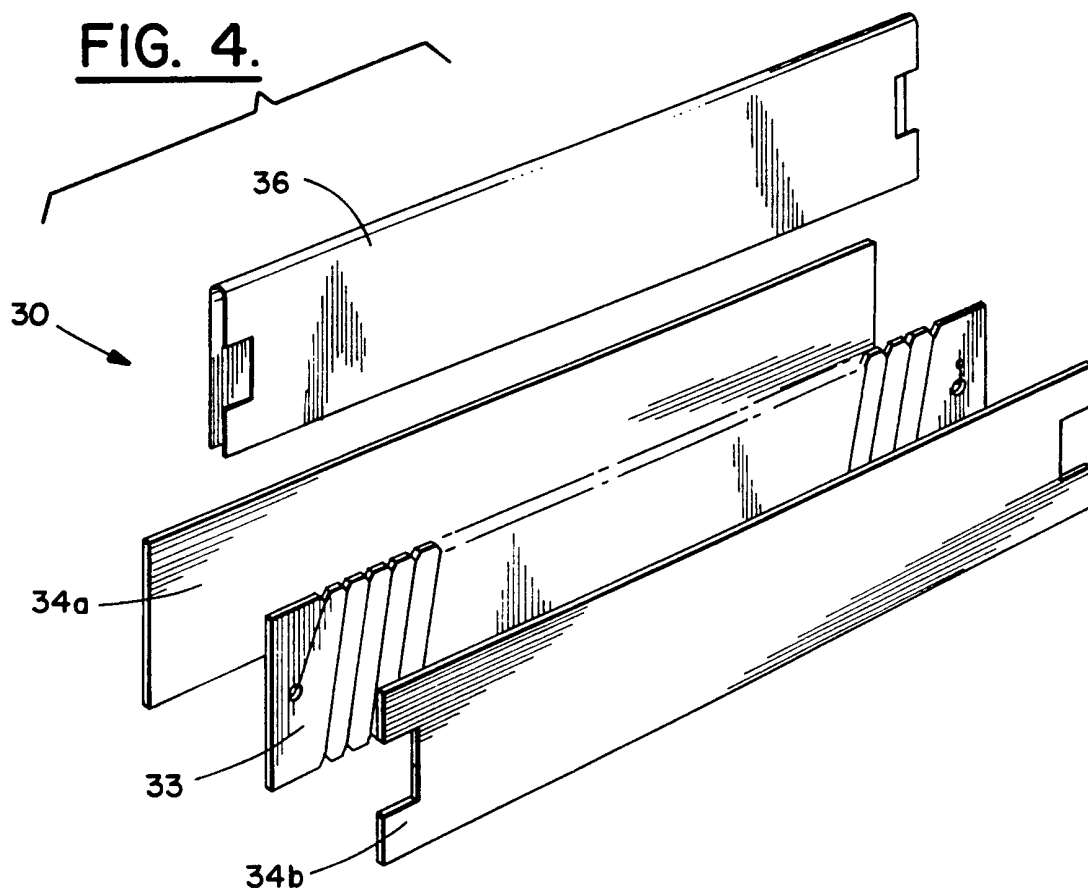
**FIG. 3.**



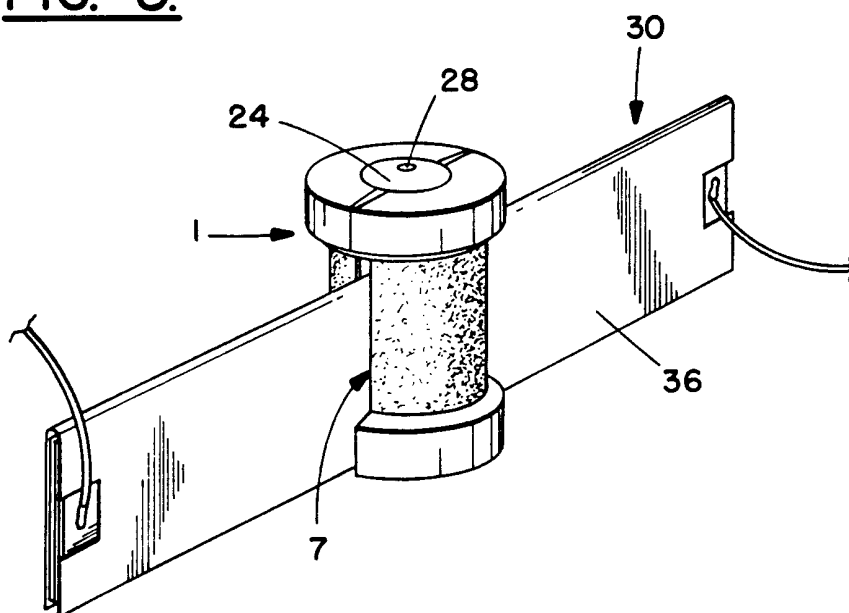
**FIG. 1a.**



**FIG. 4.**



**FIG. 5.**



INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/12134

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) :A45D 6/00  
US CL :219/222; 132/229

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 219/222, 225, 226; 132/229, 226, 233, 245, 234

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 1,972,186 A (DAVIS) 04 September 1934, see Fig. 5.	1, 2, 5, 6
A	US 5,280,795 A (LEVEQUE ET AL) 25 January 1994, see Figs. 1a-3.	1-11
A	US 2,491,939 A (TASHO) 20 December 1949, see Fig. 1 and 2.	1-11
A	US 3,049,131 A (LECLABART) 14 August 1962, Fig. 1.	1-11
A	GB 280,909 A (BJORKMAN) 05 April 1928, Fig. 4.	1-11

Further documents are listed in the continuation of Box C.  See patent family annex.

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