



- (51) International Patent Classification: Not classified
- (21) International Application Number: PCT/GB2012/050298
- (22) International Filing Date: 10 February 2012 (10.02.2012)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
1102343.9 10 February 2011 (10.02.2011) GB
1113611.6 5 August 2011 (05.08.2011) GB
- (72) Inventor; and
- (71) Applicant : **MCCAULEY, Edward** [GB/GB]; 58 Alexander Street, Uphall, Broxburn EH52 5DB (GB).
- (74) Agent: **HARRISON GODDARD FOOTE**; Delta House, 50 West Nile Street, Glasgow G1 2NP (GB).
- (81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD,

[Continued on next page]

(54) Title: HAIR STYLING DEVICE

(57) Abstract: A hair styling device comprising: a handle member; and a hair receiving member longitudinally extending from the handle member and adapted to allow hair to be wound around a contact surface of the hair receiving member, wherein the contact surface is substantially non-straight in the longitudinal direction.

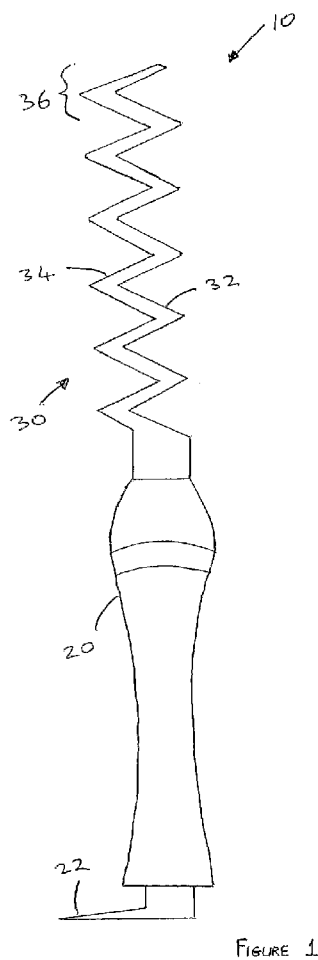


FIGURE 1





SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR,
TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS,
SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT,

Published:

— *without international search report and to be republished upon receipt of that report (Rule 48.2(g))*

Hair Styling Device

The present invention relates to hair styling devices. In particular, but not exclusively, the invention relates to hair waving devices.

5

There are many known devices for creating artificial waves in a person's hair. Examples include curling tongs and curlers, wands, rollers and crimpers. Also, straighteners can be used to curl hair, or to produce the opposite effect - straightening hair which has a natural (or a previously created) waviness - or to
10 remove kinks, frizziness, static, or to produce a sleeker look.

15

Predominately, it is the shape of the hair receiving portions of the device which determine the hair effect produced. A number of existing devices require clip portions to hold the hair in place and avoid slipping during treating. This is less convenient for the user and can increase the time required to style the hair.

20

Hair straighteners comprise two hinged jaws, each jaw having a flat planar surface. The hair is inserted between the jaws but otherwise kept straight and not wrapped around the jaws (which would be ineffective since only the inner
20 surface of each jaw is heated to treat the hair). Hair crimpers are similar but each jaw has a planar but undulating or corrugated surface (and the hair is again inserted between the jaws).

25

Tongs, rollers and the like have a substantially straight cylindrical portion and the
25 hair is wrapped around this cylindrical portion. They may have straight or spiral separating protrusions extending outward from the cylindrical portion. However, these protrusions are for separating the hair and holding the hair in position and the shape of the hair effect produced is substantially determined by the cylindrical portion and not the separating protrusions.

30

There is a widespread and continuing desire to create new and fashionable hairstyles but the styles possible are limited to those which can be produced with existing devices. Tongs and the like produce a circular spiral effect. An example of a new style would be an elliptical spiral but this is not possible using existing
5 devices.

It is desirable to provide a hair styling device which can produce new styles.

It is desirable to provide a hair styling device which naturally holds the hair while
10 it is being treated to produce the effect.

According to the present invention there is provided a hair styling device comprising:

a handle member;
15 a hair receiving member longitudinally extending from the handle member and adapted to allow hair to be wound around a contact surface of the hair receiving member, wherein the contact surface is substantially non-straight in the longitudinal direction.

20 The hair receiving member may be a plate member having two major contact surfaces. The second contact surface may be substantially non-straight in the longitudinal direction.

The hair receiving member may have an undulating or corrugated profile in the
25 longitudinal direction. Alternatively, the hair receiving member may be spiral in the longitudinal direction. The spiral hair receiving member can be considered to be undulating or corrugated in two planes.

The concave portion of each undulation may be adapted to receive a portion of
30 the hair to be styled. When the hair receiving member is a plate member, the

hair receiving member may be adapted to receive hair in the alternating upper and lower concave portions defined by the first and second contact surfaces.

5 The undulations may have a zigzag formation. Alternatively, the undulations may have a box wave profile. Alternatively, the undulations may be substantially sinusoidal. It is not intended that the term "sinusoidal" be interpreted using the strict mathematical definition.

10 At least one of the amplitude and the wavelength of the undulations may vary along the length of the hair receiving member.

The hair receiving member may include a straight section between one, more or each of the undulations.

15 The hair receiving member may be removably attached to the handle member. A plurality of hair receiving members may be provided. Each of the plurality of hair receiving members may vary in at least one of the amplitude and the wavelength of the undulations, the presence and length of straight sections between the undulations, and the width, thickness or length of the contact surface.

20

The hair receiving member may include one or more apertures or slots adapted to receive at least a portion of the hair wound around the contact surface.

25 According to a first embodiment of the invention, the hair styling device may be adapted to apply heat to the hair to at least temporarily maintain the produced wave of the hair.

30 The hair styling device may include heating means for heating at least the first contact surface. The heating means may be electrically powered, such as by main power or a battery.

The heating means may comprise an electrical resistance member. The hair styling device may include a thermostatic control member for varying the operating temperature.

- 5 The hair receiving member may comprise a thermally conductive material, such as aluminium.

The hair receiving member may have a laminated construction. The hair receiving member may include a ply which comprises a silicon material, such as rubber. The hair receiving member may comprise a silicon ply and a thermally
10 conductive ply, the two plies attached together by attachment means. The attachment means may comprise bonding. Alternatively, the attachment means may comprise at least one of compression and fixings.

- 15 The hair receiving member may include a third ply which may be thermally conductive. The two thermally conductive plies may be interposed by the silicon ply. The silicon ply may be encapsulated by the thermally conductive plies.

The hair receiving member may include a coating. The coating may comprise a
20 ceramic material.

Alternatively, the heating means may comprise an electrically resistant wire. The wire may be wound around the hair receiving member.

- 25 The hair receiving member may comprise a frame member. One or more frame portions may be electrically resistant to provide the heating means.

According to a second embodiment of the invention, the hair styling device may be adapted to at least assist the application of a chemical to the hair to at least
30 temporarily maintain the produced wave of the hair.

The hair receiving member may comprise a frame member to assist the flow of the chemical. Alternatively, the hair receiving member may include a plurality of apertures to assist the flow of the chemical.

- 5 Embodiments of the present invention will now be described, by way of example only, with reference to the accompanying drawings in which:

Figure 1 shows a side view of a hair waving device according to a first embodiment of the invention;

10

Figure 2 shows a front view of the device of Figure 1; and

Figure 3 shows a sectional side view of a hair receiving member of a hair waving device.

15

Figures 1 and 2 show a first embodiment of a hair styling device 10 which comprises a handle 20 and a hair receiving member 30 which longitudinally extends from the handle 20. The hair receiving member 30 is formed as a plate and has a first contact surface 32 and a second contact surface 34. As evident in
20 the drawings, the hair receiving member 30 has a zigzag profile which defines a number of undulations 36. Therefore, the contact surfaces are non-straight in the longitudinal direction.

The hair receiving member 30 is formed from a thermally conductive material
25 which can be heated using electrical power supplied from the mains via a cable 22.

In use, a user can wind hair around the hair receiving member 30 and the undulations 36 assist to hold the hair in place. Heat transmitted from the contact
30 surfaces treats the hair to produce a wave effect.

The hair receiving member 30 can include one or more apertures or slots (not shown) to receive a portion of the hair. This can be used to help hold the hair and/or to produce different effects.

- 5 In other embodiments, the amplitude and/or wavelength of the undulations can vary along the length of the hair receiving member 30 to produce different effects. Also, the hair receiving member 30 can include straight sections provided between the undulations 36. Indeed, the hair styling device 10 can be provided as a kit with a number of different hair receiving members 30, each removably
10 attached to the handle 20.

As shown in Figure 3, the hair receiving member 30 has a laminated construction. A heater pad 40 (0.9 mm thick) is bonded onto an aluminium ply 42 (2 mm thick). Since the skin of the heater pad 40 is a silicone based rubber, a
15 ceramic coating (20 microns thick) directly onto the heater pad might not adhere correctly. Consequently, a 0.3 mm thick layer 44 of aluminium is laminated over the heater pad 40 in order for the subsequent ceramic coating process to adhere to the aluminium (top and bottom) and effectively 'sandwich' the heater pad 40 in between the 2mm thick aluminium ply 42 and the 0.3mm thick top coating 44
20 of aluminium with an effective "all over" skin of ceramic 46.

The ceramic coating 46 is for wear resistance and aesthetics. Heat is transferred from the heater pad 40 to the aluminium ply 42 and is drawn out to the outer skin of the ceramic coating 46. The heater pad 40 is applied to the top section only of
25 the aluminium ply 42. If the heat transfer was ineffective in transferring heat to the bottom sections of the aluminium ply 42 (post ceramic coating), then the aluminium ply 42 can continue to cover the bottom wave sections also.

The heater pad 40 is wired to a thermostat (not shown) to vary the operating temperature and to mains cabling 22 in the handle 20 for connection to the main
30 supply. Application of mains current into the heater pad 40 produces the heat for transfer into the aluminium ply 42 and out to the outer skin 46 of ceramic coating.

The aluminium ply 42 is bent to the undulated profile before the heater pad 40 is bonded to the aluminium ply 42.

- 5 In an alternative embodiment (not shown), rather than bonding the heater pad 40 to the aluminium ply 42, the heater pad 40 is compressed against the aluminium ply 42 by a thin gauge stainless steel skin or cladding. This cladding forms two distinct top and bottom sections, and are screwed together using small scale fixings, thereby compressing the heater pad 40 against the aluminium ply 42.
- 10 The screws could be substituted by any permanent joining process such as aluminium welding. The assembly is then ceramic coated all over as in the bonded arrangement.

- In an alternative embodiment (not shown), a heater pad 40 is encapsulated within
- 15 a hollow aluminium extrusion without glue. The extrusion is then compressed until the heater pad 40 is compressed at both sides, without damaging the heater pad 40. The pressure on the heater pad 40 ensures good mechanical contact between heater pad 40 and the aluminium walls and therefore heat transfer. With the heater pad 40 encapsulated inside the aluminium skin, the 'sandwich'
- 20 assembly is then bent into the wave profile required. The bent assembly is then ceramic coated.

- In an alternative embodiment (not shown), the heater pad 40 can be omitted depending on the choice of materials. For instance, the hair receiving member
- 25 30 can be formed from a thermally conductive polymer such as E-Series or D-Series materials provided by Coolpolymers Inc. A current is passed through this material to heat to the temperature required. The hair receiving member 30 would be an injection moulding and this would negate any heater pad, gluing process or encapsulated process. Stiffening members can be included if
- 30 required.

In another alternative embodiment (not shown), a heating element is wrapped around the hair receiving member 30 to supply the required heat. The assembly is then ceramic coated all over as in the previous embodiments. In another alternative embodiment (not shown), the hair receiving member 30 can comprise
5 a frame which is electrically resistant to provide the heating means.

In an alternative embodiment of the invention (not shown), the hair styling device 10 can be non-electrical. The device 10 can be adapted to assist the application of a chemical to the hair to maintain the produced wave of the hair.

10

The hair receiving member 30 can comprise a frame to assist the flow of the chemical or include apertures or the like to assist the flow of the chemical.

Whilst specific embodiments of the present invention have been described
15 above, it will be appreciated that departures from the described embodiments may still fall within the scope of the present invention.

20

25

30

Claims

1. A hair styling device comprising:
a handle member;
5 a hair receiving member longitudinally extending from the handle member and adapted to allow hair to be wound around a contact surface of the hair receiving member, wherein the contact surface is substantially non-straight in the longitudinal direction.
- 10 2. A device as claimed in Claim 1, wherein the hair receiving member is a plate member having two major contact surfaces.
3. A device as claimed in Claim 2, wherein the second contact surface is substantially non-straight in the longitudinal direction.
- 15 4. A device as claimed in any preceding claim, wherein the hair receiving member has an undulating or corrugated profile in the longitudinal direction.
5. A device as claimed in any preceding claim, wherein the hair receiving
20 member is spiral in the longitudinal direction.
6. A device as claimed in Claim 4 or 5, wherein the concave portion of each undulation is adapted to receive a portion of the hair to be styled.
- 25 7. A device as claimed in Claim 4 or 5 when dependent on Claim 2, wherein the hair receiving member is adapted to receive hair in the alternating upper and lower concave portions defined by the first and second contact surfaces.
8. A device as claimed in any of Claims 4 to 7, wherein the undulations have
30 a zigzag formation.

9. A device as claimed in any of claims 1 to 7, wherein the undulations have a box wave profile.

10. A device as claimed in any of claims 4 to 7, wherein the undulations are
5 substantially sinusoidal.

11. A device as claimed in any of Claims 4 to 10, wherein at least one of the amplitude and the wavelength of the undulations vary along the length of the hair receiving member.

10

12. A device as claimed in any of Claims 4 to 11, wherein the hair receiving member includes a straight section between one, more or each of the undulations.

15 13. A device as claimed in any preceding claim, wherein the hair receiving member is removably attached to the handle member.

14. A device as claimed in Claim 13, wherein a plurality of hair receiving members are provided, and each of the plurality of hair receiving members vary
20 in at least one of the amplitude and the wavelength of the undulations, the presence and length of straight sections between the undulations, and the width, thickness or length of the contact surface.

15. A device as claimed in any preceding claim, wherein the hair receiving
25 member includes one or more apertures or slots adapted to receive at least a portion of the hair wound around the contact surface.

16. A device as claimed in any preceding claim, wherein the hair styling device is adapted to apply heat to the hair to at least temporarily maintain the
30 produced wave of the hair.

17. A device as claimed in Claim 16, including heating means for heating at least the first contact surface.

18. A device as claimed in Claim 17, wherein the heating means is electrically
5 powered.

19. A device as claimed in Claim 18, wherein the heating means comprises an electrical resistance member.

10 20. A device as claimed in Claim 18 or 19, including a thermostatic control member for varying the operating temperature.

21. A device as claimed in any preceding claim, wherein the hair receiving member comprises a thermally conductive material.

15

22. A device as claimed in any preceding claim, wherein the hair receiving member has a laminated construction.

23. A device as claimed in Claim 22, wherein the hair receiving member
20 includes a ply which comprises a silicon material.

24. A device as claimed in Claim 23, wherein the hair receiving member comprises a silicon ply and a thermally conductive ply, the two plies attached together by attachment means.

25

25. A device as claimed in Claim 23 or 24, wherein the hair receiving member includes a third ply which is thermally conductive.

26. A device as claimed in Claim 25, wherein the two thermally conductive
30 plies are interposed by the silicon ply.

27. A device as claimed in Claim 26, wherein the silicon ply is encapsulated by the thermally conductive plies.

28. A device as claimed in any preceding claim, wherein the hair receiving
5 member includes a coating.

29. A device as claimed in Claim 28, wherein the coating comprises a ceramic material.

10 30. A device as claimed in Claim 17, wherein the heating means comprises an electrically resistant wire.

31. A device as claimed in Claim 30, wherein the wire is wound around the hair receiving member.

15

32. A device as claimed in Claim 17, wherein the hair receiving member comprises a frame member, and one or more frame portions are electrically resistant to provide the heating means.

20 33. A device as claimed in any of claims 1 to 16, wherein the hair styling device is adapted to at least assist the application of a chemical to the hair to at least temporarily maintain the produced wave of the hair.

34. A device as claimed in Claim 33, wherein the hair receiving member
25 comprises a frame member to assist the flow of the chemical.

35. A device as claimed in Claim 33, wherein the hair receiving member includes a plurality of apertures to assist the flow of the chemical.

30

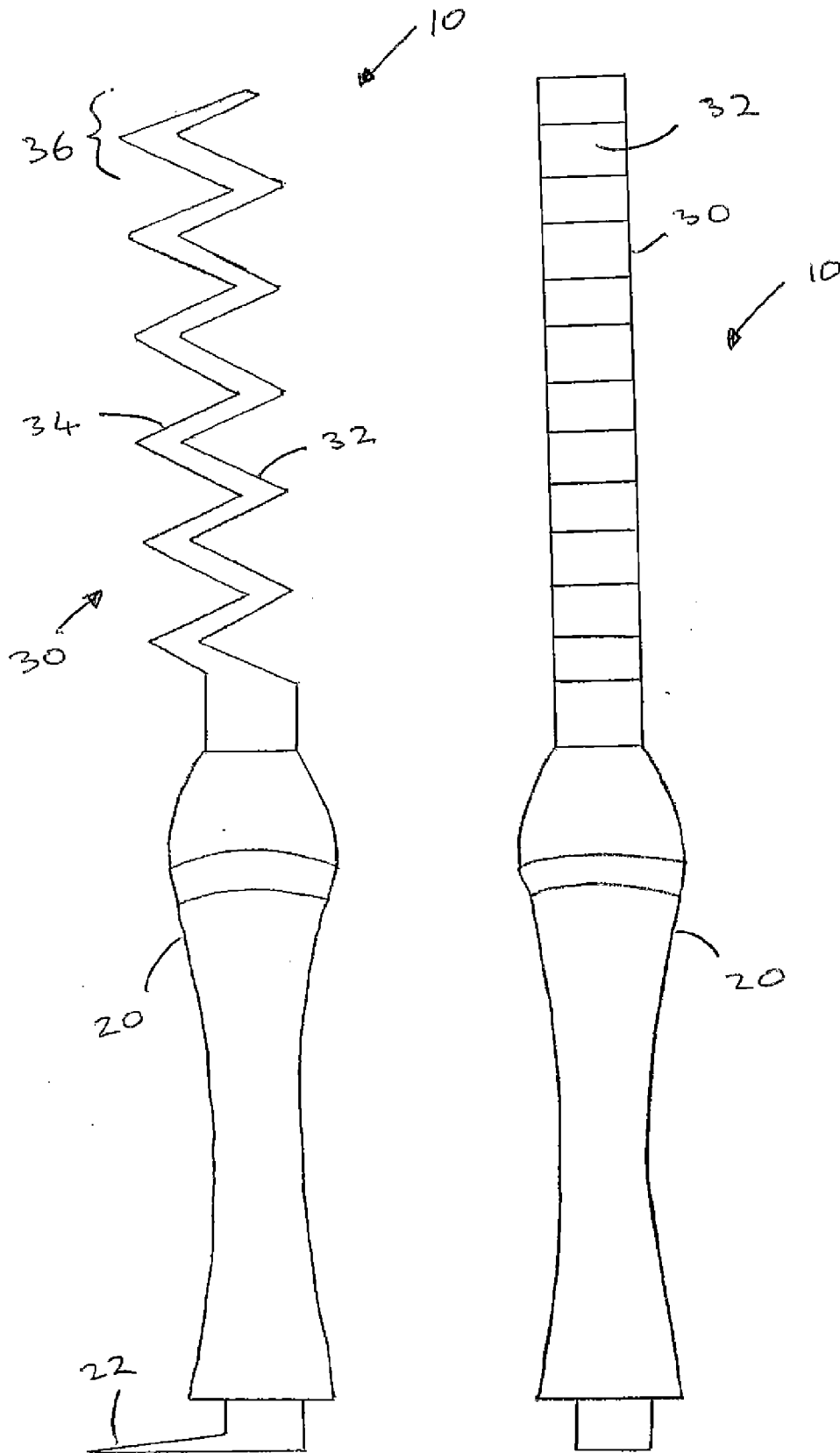


FIGURE 1

Figure 2

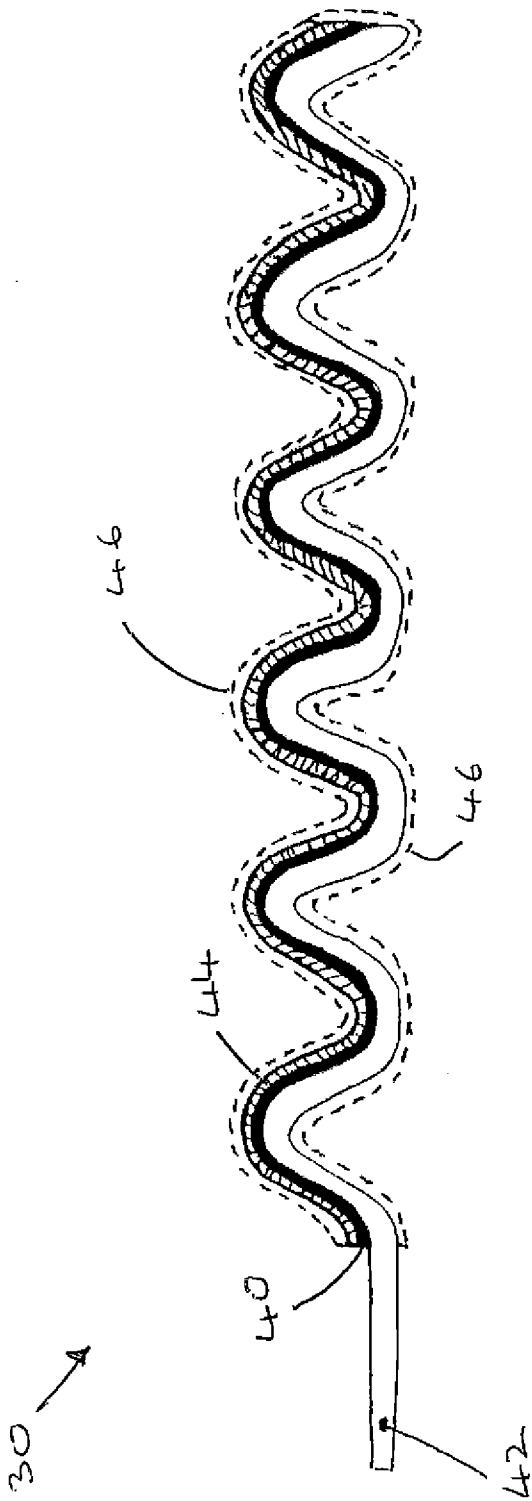


Figure 3