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(54) Non-burning roller and curl clips

(57) The disclosure is directed to a hair retaining clip that may include an upper clip member (12) including an upper arm (18) and a grip portion (20), and a lower clip member (14) including a lower arm (26) and a grip portion (28). The upper and lower clip members may be pivotally connected such that the first and second clip members are rotatable between a normal closed position and an open position, and the upper and lower clip members may be biased toward the normal closed position. The upper and low clip members may be fabricated from a material having a thermal conductivity in the range of 0.20-0.35 W/m K so that the material does not retain excessive heat and the temperature of the clip does not rise to an uncomfortable level when the clip is subjected to heat from a hair dryer. The material may also have a static coefficient of friction between opposing surface of the material in the range of 0.15-0.25, and a Rockwell R-scale hardness in the range of 76-118.

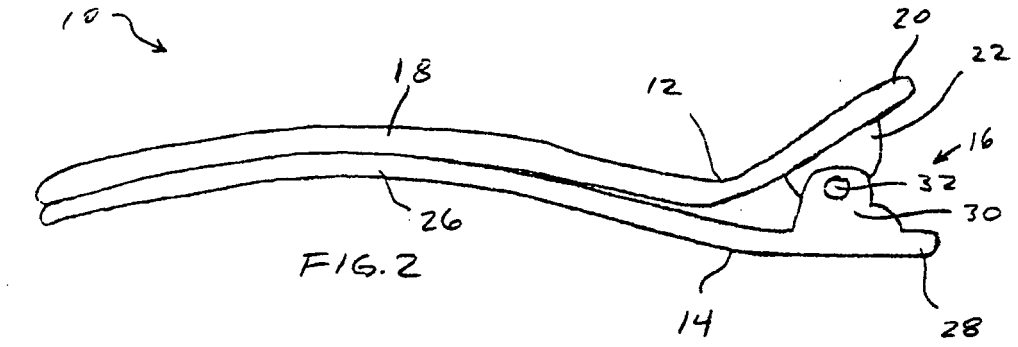

FIG. 2

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Description

Reference to Related Application

[0001] This application claims priority from Provisional Application Serial No. 60/820,200, filed on July 24, 2006, which is expressly incorporated by reference herein.

Field of the Disclosure

[0002] The present disclosure is generally directed to roller and curl clips and, more particularly, to roller and curl clips fabricated from a material that does not hold excessive heat so that the temperature of the clips does not rise to an uncomfortable level when the clips are subjected to heat from a hooded or handheld hair dryer.

Background of the Disclosure

[0003] Many women use various hair care and styling products to set their hair in a desired manner to achieve a desired appearance. Moreover, over 70% of African American women relax their hair. Many of these consumers maintain their styles with roller sets applied at hair salons and/or at home. The roller sets are applied to the hair when the hair is wet so that the hair maintains the desired shape after the hair dries and the rollers are removed. The predominant method for drying hair during a roller set is through the application of heat to the hair by a hooded dryer. Women typically spend at least one hour under a hooded dryer, and often times much longer than one hour, to achieve a roller set. Presently, the clips used to secure the rollers are made of aluminum. The aluminum from which the clips are fabricated absorbs the heat from the dryer and causes the temperature of the clips to rise to levels that are uncomfortable to the person receiving the roller set, even to the point of burning the scalp and the edges around the hair line. This problem has been identified by personal experiences of consumers receiving roller sets and by stylists applying roller sets.

[0004] Previous efforts to address this issue have not eliminated the problem, have created other or additional problems, or both. One approach has been the introduction of curler clips manufactured from plastic. These clips are not typically strong enough for their intended usage, and in some cases the clips are so thin that the plastic clips have broken while still in the packaging. Another approach to reducing the temperate to which the clips are heated has been the application of rubber coating on the previously-known aluminum roller clips. The rubberized roller clips retain the hair and the curlers, but the non-slip feature of the clips is very aggressive and tends to pull the hair, making it difficult to attach and detach the clips without snagging the hair and causing discomfort. Moreover, the exposed portions of the underlying aluminum clips may still be exposed to the heat from the dryer and may present a risk of causing bums.

Summary of the Invention

[0005] In one aspect, the invention is directed to a hair retaining clip that may include an upper clip member including an upper arm and a grip portion, a lower clip member including a lower arm and a grip portion, and a hinge pivotally connecting the first and second clip members such that the first and second clip members are rotatable between a normal closed position and an open position. The hair retaining clip may further include an elastic member engaging the upper and lower clip members to bias the upper and lower arms toward the normal closed position and retain the upper and lower arms in the normal closed position. The upper and low clip members may be fabricated from a material having a thermal conductivity in the range of 0.20-0.35 W/m K.

[0006] In another aspect, the invention is directed to a hair retaining clip that may include an upper clip member including an upper arm and a grip portion, and a lower clip member including a lower arm and a grip portion. The upper and lower clip members may be pivotally connected such that the first and second clip members are rotatable between a normal closed position and an open position, with the upper and lower clip members being biased toward the normal closed position. The upper and low clip members may be fabricated from a material having a thermal conductivity in the range of 0.20-0.35 W/m K.

[0007] In a further aspect, the invention is directed to a hair retaining clip that may include an upper clip member including an upper arm and a grip portion, and a lower clip member including a lower arm and a grip portion. The upper and lower clip members may be pivotally connected such that the first and second clip members are rotatable between a normal closed position and an open position, and the upper and lower clip members may be biased toward the normal closed position. The upper and low clip members may be fabricated from a material having a thermal conductivity in the range of 0.20-0.35 W/m K, a static coefficient of friction between opposing surface of the material in the range of 0.15-0.25, and a Rockwell R-scale hardness in the range of 76-118.

[0008] Additional aspects of the invention are defined by the claims of this patent.

Brief Description of the Drawings

[0009] Objects, features, and advantages of the present device will become apparent upon reading the following description in conjunction with the drawing figures, in which:

[0010] Fig. 1 is a top view of a roller clip in accordance with the present disclosure in a normal closed position;

[0011] Fig. 2 is a side view of the roller clip of Fig. 1;

[0012] Fig. 3 is rear view of the roller clip of Fig. 1;

[0013] Fig. 4 is side view of the roller clip of Fig. 2 in an open position;

[0014] Fig. 5 is a top view of a curl clip in accordance

with the present disclosure in a normal closed position;

[0015] Fig. 6 is a side view of the curl clip of Fig. 5;

[0016] Fig. 7 is rear view of the curl clip of Fig. 5; and

[0017] Fig. 8 is a side view of the curl clip of Fig. 5 in an open position.

[0018] While the method and device described herein are susceptible to various modifications and alternative constructions, certain illustrative embodiments thereof have been shown in the drawings and will be described below in detail. It should be understood, however, that there is no intention to limit the invention to the specific forms disclosed, but on the contrary, the intention is to cover all modifications, alternative constructions, and equivalents falling within the spirit and scope of the disclosure.

Detailed Description of the Disclosure

[0019] Although the following text sets forth a detailed description of numerous different embodiments of the invention, it should be understood that the legal scope of the invention is defined by the words of the claims set forth at the end of this patent. The detailed description is to be construed as exemplary only and does not describe every possible embodiment of the invention since describing every possible embodiment would be impractical, if not impossible. Numerous alternative embodiments could be implemented, using either current technology or technology developed after the filing date of this patent, which would still fall within the scope of the claims defining the invention.

[0020] It should also be understood that, unless a term is expressly defined in this patent using the sentence "As used herein, the term '____' is hereby defined to mean..." or a similar sentence, there is no intent to limit the meaning of that term, either expressly or by implication, beyond its plain or ordinary meaning, and such term should not be interpreted to be limited in scope based on any statement made in any section of this patent (other than the language of the claims). To the extent that any term recited in the claims at the end of this patent is referred to in this patent in a manner consistent with a single meaning, that is done for sake of clarity only so as to not confuse the reader, and it is not intended that such claim term by limited, by implication or otherwise, to that single meaning. Finally, unless a claim element is defined by reciting the word "means" and a function without the recital of any structure, it is not intended that the scope of any claim element be interpreted based on the application of 35 U.S.C. § 112, sixth paragraph.

[0021] The present invention relates to "no burn" roller and curl clips that are fabricated from a nylon material or other material that will not absorb the heat from a hair dryer in the same manner as aluminum clips. Moreover, the material from which the clips are fabricated is strong enough to function in a similar manner as the aluminum clips while not snagging the hair of the user so that the clips may easily slide in and out of position, especially when inserted under the rollers or curls and against the scalp.

[0022] The burn problem may be reduced by having the clips made out of a nylon fiber material. The roller clips and curl clips may be fabricated from any material that and is capable of being formed into the components of the clips, and does not readily absorb heat such that the temperature of the surface of the material will not approach the temperature of the hot air from a blow dryer after being exposed to such heat for an extended period of time. It is also preferable that the material has sufficient strength that the arms of the clips will not break during normal use in securing hair and rollers, and also is sufficiently rigid to retain the shape of the clip such that the hair and rollers are secured by the clips as necessary. One material having particular application in the roller clips and curl clips as described herein is nylon, either alone or reinforced with glass fibers or other appropriate additives. In particular, Nylon 66 and nylon with embedded glass fibers have been used in the fabrication of roller clips and curl clips as described herein.

[0023] Figs. 1-3 illustrate an embodiment of a roller clip 10 that may be typically used to hold two rollers together when they are rolled up into a user's hair. The roller clip 10 has a generally curved shape and includes an upper clip member 12 and a lower clip member 14 connected by a hinge 16. The upper clip member 12 includes an upper arm or jaw 18 and a grip portion 20 having upper hinge plates 22 extending from a surface of the grip portion 20. Openings 24 may be provided through the upper arm 18 to facilitate drying of the portion of the user's hair disposed between the upper arm 18 and the roller. In a similar manner, the lower clip member 14 includes a lower arm or jaw 26 and a grip portion 28 having upper hinge plates 30 extending from a surface of the grip portion 28, and openings (not shown) may also be provided through the lower arm 26 to provide additional air flow over the clipped hair. A hinge pin 32 passes through the hinge plates 22, 30 to form the hinge 16, and an elastic member such as a coil spring 34 encircles the hinge pin 32 with outwardly extending arms 36, 38 engaging the surfaces of the grip portions 20, 28, respectively, to bias the clip members 12, 14 to the normal closed position shown in Figs. 1-3. The grip portions 20, 28 may be pressed together when the roller clip 10 is applied to open the arms 18, 26 to an open position (Fig. 4) for receiving the hair rollers to be clipped. Even though the roller clip 10 is primarily used to hold adjacent rollers together, the roller clip 10 may also be used in the manner described below for the curl clip 40 to hold a roller with the hair wound thereon close to the user's scalp.

[0024] Figs. 5-7 illustrate an embodiment of a curl clip 40 that may be fabricated with nylon or other material that will not absorb and retain sufficient heat to present a burn risk to a stylist or to a user to which the curl clip 40 is applied. As opposed to the roller clip 10, the curl clip 40 is typically used to hold the rolled up curler close to the user's scalp. Consequently, when applied to a roll-

er, the curl clip 40 slides underneath the roller and rolled up hair, with a portion of the curl clip 40 against the user's scalp.

[0025] The illustrated curl clip 40 is generally straight, and includes components similar to those described above for the roller clip 10. The curl clip 40 includes an upper clip member 42 and a lower clip member 44 connected by a hinge 46. The upper clip member 42 includes an upper arm or jaw 48 and a grip portion 50 having upper hinge plates 52 extending from a surface of the grip portion 50. The upper arm 48 may be forked to facilitate drying of the portion of the user's hair disposed between the upper arm 48 and the roller, and may include tines 54 connected proximate the open end of the upper arm 48 by a cross member 56. In a similar manner, the lower clip member 44 includes a lower arm or jaw 58 and a grip portion 60 having upper hinge plates 62 extending from a surface of the grip portion 60, and the lower arm 58 may also be forked to provide additional air flow over the clipped hair. A hinge pin 64 passes through the hinge plates 52, 62 to form the hinge 46, and a coil spring 66 encircles the hinge pin 64 with outwardly extending arms 66, 68 engaging the surfaces of the grip portions 52, 60, respectively, to bias the clip members 42, 44 to the normal closed position shown in Figs. 5-7. The grip portions 52, 60 may be pressed together when the curl clip 40 is applied to open the arms 48, 58 to an open position (Fig. 8) for receiving the hair rollers to be clipped. In order to receive the edge of the roller, the grip portion 60 of the lower clip member 44 defines a loop 72 proximate the hinge 46 and closed end of the curl clip 40 so that the edge of the roller slides into the loop 72 when the curl clip 40 is in the open position and the upper clip member 42 is free to close down on the inner surface of the roller to which the curl clip 40 is applied.

[0026] While the roller clips 10 and curl clips 40 are described herein as being used to secure hair rollers to the hair in which they are applied, those skilled in the art will understand that the roller clips 10 and curl clips 40 may also be used in varying applications that do involve the retention of rollers in the hair. For example, the roller clips 10 and curl clips 40 may be used to section hair, to hold hair during chemical applications, such as the application of hair coloring and hair relaxing products, and to hold hair, and may be worn as a fashion accessory. In each of these applications, the risk of bums due to the heating of the clips and the proximity to the wearer's scalp may be reduced or eliminated by the reduced heat retention of the clips as described herein. Moreover, the clips may be used by men as well as women and children, and may be purchased by stylists for use in salons as well as by everyday consumers for personal use at home.

[0027] Further, those skilled in the art will understand that the roller clips 10 and curl clips 40 are exemplary of clips that may be used during the hair styling process and that are exposed to the heat of hair dryers during the process. Other clips and styling accessories are known and may be developed in the future for the hair styling process, and are contemplated by the inventor as being capable of being fabricated from materials as discussed herein. For example, the upper and lower clip members of the clips 10, 40 may be integrally formed as a single component, with the hinge being a living hinge integrally formed as the connection between the upper and lower clip members. Additionally, other known types of elastic members and/or biasing elements may substituted for the coil spring to provide the force biasing the upper and lower arms toward the normal closed position of the clips. Other variations in the configurations of the clips will be apparent to those skilled in the art and are contemplated by the inventor.

[0028] Roller clips 10 and curl clips 40 fabricated from various nylon materials have been tested with respect to their heat absorption characteristics and potential for burning the scalp when subjected to extended periods of application of heat by hooded and/or handheld dryers. In one heat test, clips were held approximately 1.5" from a hair dryer nozzle for three to five minutes at an average hair dryer temperature of 230° Fahrenheit. After being subjected to the heat for the prescribed amount of time, the clips were placed against a tester's scalp to determine a temperature comfort level experienced by the tester. In a test conducted on clips fabricated from nylon with embedded glass fiber, the surface temperature of the clip after being subjected to the heat increased to approximately 120°-130° Fahrenheit. While the surface temperature of the clips increased, the temperature did not rise enough to born the skin of the test subject. Moreover, the glass fiber-embedded nylon material remained stable and did not become pliable, thereby allowing the clips to maintain their shape. Once the heat source was removed from the clips, the clips displayed a rapid cool down of their surface temperatures.

[0029] Clips fabricated from Nylon 66 were also tested in a similar manner. When the heat source was applied, the surface temperature of the clips increased to approximately 125° Fahrenheit. As with the clips discussed above, the surfaces of the clips would get hot, but not hot enough to burn the skin of the test subjects. Under the heat, the Nylon 66 material would soften and become more flexible, but the clips would still maintain their shape. These clips also displayed a rapid cool down of their surface temperatures once the heat source was removed.

[0030] Additional testing has been performed on the roller clips 10 and the curl clips 40 fabricated from nylon to approximate their performance during their intended use. During these tests, each clip 10, 40 was attached to a roller and hair curl as the clip 10 or 40 would normally be used for curling hair. Using a hand-held hair dryer, each clip 10, 40 was heated for a period of five minutes at a distance of two inches from the roller. After five minutes of heating, the clips 10, 40 were immediately removed from the roller and attached to a temperature probe, and the peak temperature and time were observed and recorded. The temperature was monitored for a pe-

riod of five minutes with temperatures noted at least at ninety seconds, three minutes and five minutes. For the roller clip 10, the temperature of the clip 10 was 102.4°F after ninety seconds, 89.2°F after three minutes, and 79.2°F after five minutes. For the curl clip, the temperature was 99.6°F after sixty seconds, 95.6°F after ninety seconds, 84.8°F after three minutes, and 79.6°F after five minutes.

[0031] The properties of the various nylon materials that may be used in fabricating the clips and which are contemplated by the inventor may allow the surface temperatures of the clips to remain comfortable for the user when the heat of the hair dryer is applied. The materials may also be strong enough so that the clips do break during normal use as has been experienced with previously known plastic clips, while at the same time providing a less aggressive engagement with the hair of the user and reducing the discomfort experienced by users of aluminum clips having a rubber coating. As indicated above, one material contemplated has having use in clips in accordance with the present disclosure is Nylon 66, which has a thermal conductivity of approximately 0.25-0.30 W/m K, a Rockwell R-scale hardness in the range of 76-118, and a Nylon 66-to-Nylon 66 static friction coefficient in the range of 0.15-0.25. Other nylon-based materials that may be used include homogenous nylon resins and nylon resin having glass fibers infused therein. The nylon-based materials may have thermal conductivities of approximately 0.20-0.35 W/m K, Rockwell R-scale hardnesses in the range of 70-120, and nylon-to-nylon static friction coefficients in the range of 0.10-0.30. While the materials discussed above are particular nylon-based materials, those skilled in the art will understand that other nylon-based materials and non-nylon materials having material properties in and around the ranges of the materials discussed above may be implemented to fabricate clips and other accessories in accordance with the present disclosure such that the surfaces of the roller and curl clips do not hold excessive heat and the temperature of the clips does not rise to an uncomfortable level when the clips are subject to heat from a hooded or handheld hair dryer.

[0032] While the preceding text sets forth a detailed description of numerous different embodiments of the invention, it should be understood that the legal scope of the invention is defined by the words of the claims set forth at the end of a subsequent patent claiming priority hereto. The detailed description is to be construed as exemplary only and does not describe every possible embodiment of the invention since describing every possible embodiment would be impractical, if not impossible. Numerous alternative embodiments could be implemented, using either current technology or technology developed after the filing date of this patent, which would still fall within the scope of the claims defining the invention.

Claims

1. A hair retaining clip, comprising:

an upper clip member including an upper arm and a grip portion;
a lower clip member including a lower arm and a grip portion;
a hinge pivotally connecting the first and second clip members such that the first and second clip members are rotatable between a normal closed position and an open position; and
an elastic member engaging the upper and lower clip members to bias the upper and lower arms toward the normal closed position and retain the upper and lower arms in the normal closed position,

wherein the upper and low clip members are fabricated from a material having a thermal conductivity in the range of 0.20-0.35 W/m K.

2. A hair retaining clip in accordance with claim 1, wherein the upper and lower clip members are fabricated from a material having a thermal conductivity in the range of 0.25-0.30 W/m K.

3. A hair retaining clip in accordance with claim 1, wherein the upper and lower clip members are fabricated from a material having a static coefficient of friction between opposing surface of the material in the range of 0.15-0.25.

4. A hair retaining clip in accordance with claim 1, wherein the upper and lower clip members are fabricated from a material having a Rockwell R-scale hardness in the range of 76-118.

5. A hair retaining clip in accordance with claim 1, wherein the material from which the upper and lower clip members are fabricated is a nylon resin.

6. A hair retaining clip in accordance with claim 1, wherein the material from which the upper and lower clip members are fabricated is a nylon resin having glass fibers disposed therein.

7. A hair retaining clip in accordance with claim 1, wherein the material from which the upper and lower clip members are fabricated is Nylon 66.

8. A hair retaining clip, comprising:

an upper clip member including an upper arm and a grip portion; and
a lower clip member including a lower arm and a grip portion, wherein the upper and lower clip members are pivotally connected such that the

first and second clip members are rotatable between a normal closed position and an open position, and wherein the upper and lower clip members are biased toward the normal closed position,

wherein the upper and low clip members are fabricated from a material having a thermal conductivity in the range of 0.20-0.35 W/m K.

9. A hair retaining clip in accordance with claim 8, wherein the upper and lower clip members are fabricated from a material having a thermal conductivity in the range of 0.25-0.30 W/m K.

10. A hair retaining clip in accordance with claim 8, wherein the upper and lower clip members are fabricated from a material having a static coefficient of friction between opposing surface of the material in the range of 0.15-0.25.

11. A hair retaining clip in accordance with claim 8, wherein the upper and lower clip members are fabricated from a material having a Rockwell R-scale hardness in the range of 76-118.

12. A hair retaining clip in accordance with claim 8, wherein the material from which the upper and lower clip members are fabricated is a nylon resin.

13. A hair retaining clip in accordance with claim 8, wherein the material from which the upper and lower clip members are fabricated is a nylon resin having glass fibers disposed therein.

14. A hair retaining clip in accordance with claim 8, wherein the material from which the upper and lower clip members are fabricated is Nylon 66.

15. A hair retaining clip, comprising:

an upper clip member including an upper arm and a grip portion; and
a lower clip member including a lower arm and a grip portion, wherein the upper and lower clip members are pivotally connected such that the first and second clip members are rotatable between a normal closed position and an open position, and wherein the upper and lower clip members are biased toward the normal closed position,

wherein the upper and low clip members are fabricated from a material having a thermal conductivity in the range of 0.20-0.35 W/m K, having a static coefficient of friction between opposing surface of the material in the range of 0.15-0.25, and having a Rockwell R-scale hardness in the range of 76-118.

16. A hair retaining clip in accordance with claim 15, wherein the upper and lower clip members are fabricated from a material having a thermal conductivity in the range of 0.25-0.30 W/m K.

17. A hair retaining clip in accordance with claim 15, wherein the material from which the upper and lower clip members are fabricated is a nylon resin.

18. A hair retaining clip in accordance with claim 15, wherein the material from which the upper and lower clip members are fabricated is a nylon resin having glass fibers disposed therein.

19. A hair retaining clip in accordance with claim 15, wherein the material from which the upper and lower clip members are fabricated is Nylon 66.

20. A hair retaining clip in accordance with claim 15, comprising:

a hinge pivotally connecting the first and second clip members such that the first and second clip members are rotatable between a normal closed position and an open position; and
an elastic member engaging the upper and lower clip members to bias the upper and lower arms toward the normal closed position and retain the upper and lower arms in the normal closed position

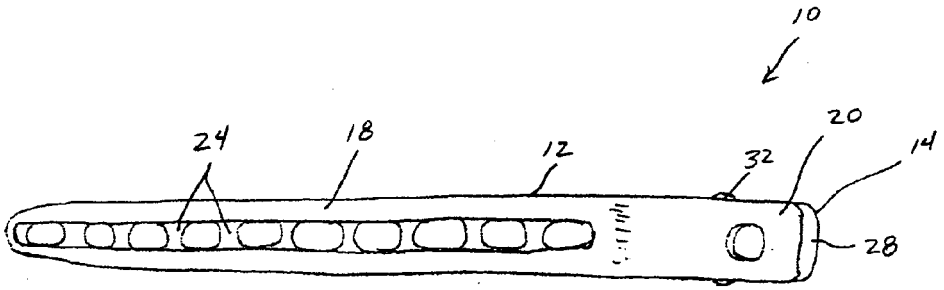

FIG. 1

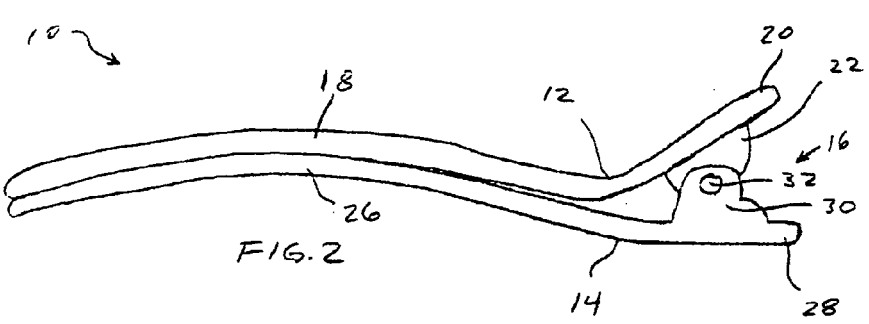

FIG. 2

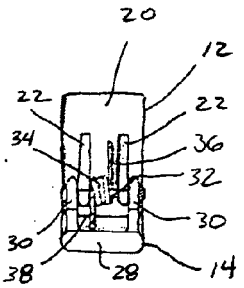

FIG. 3

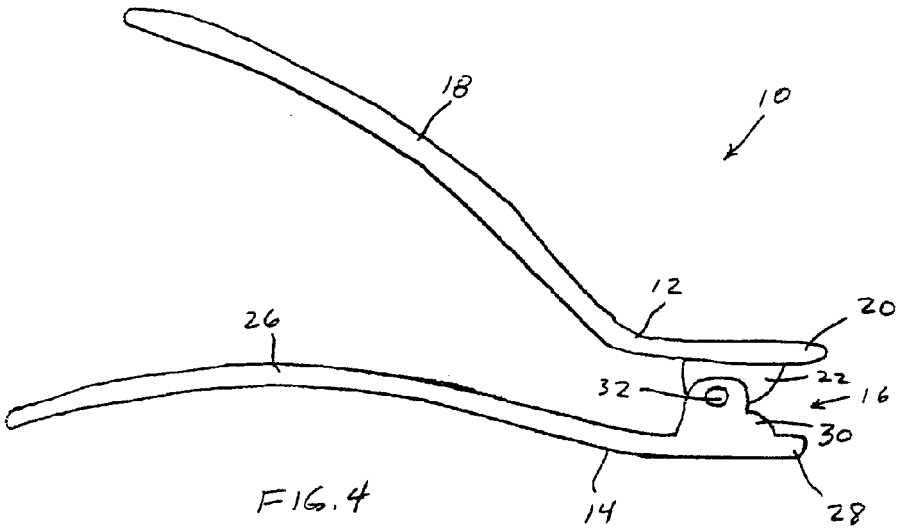

FIG. 4

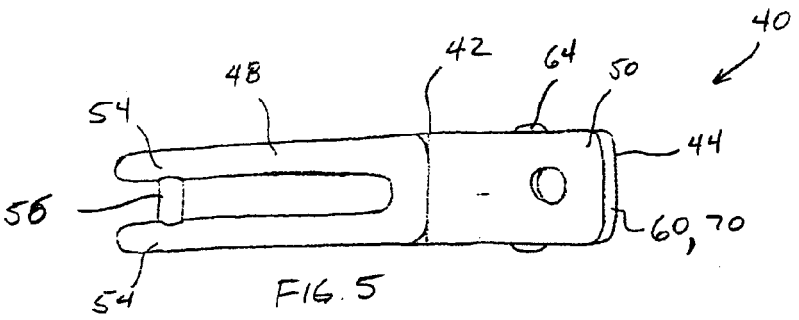

FIG. 5

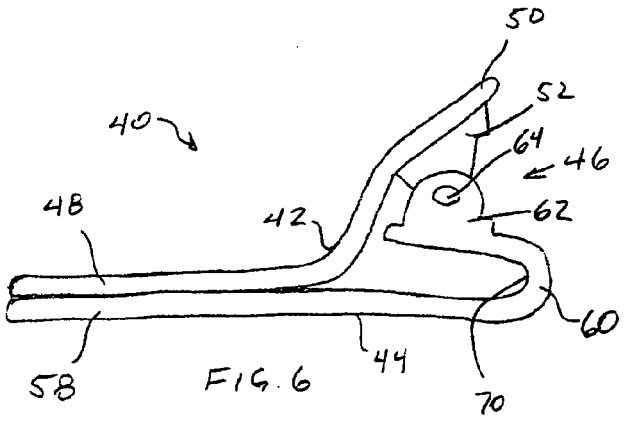

FIG. 6

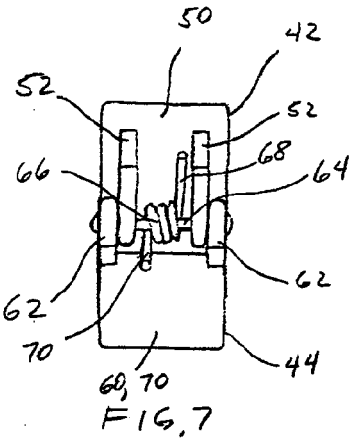

FIG. 7

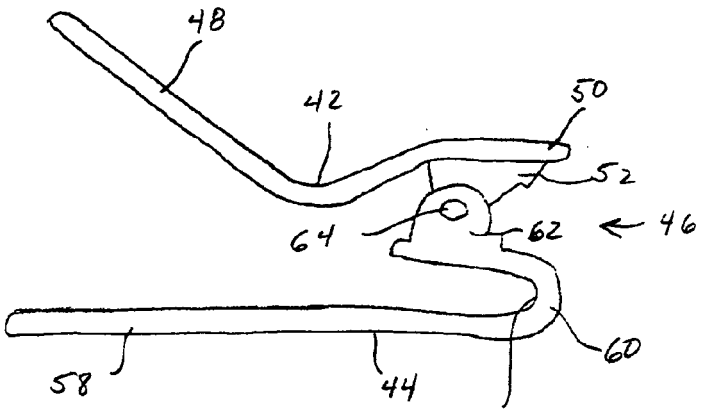

FIG. 8

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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