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(54) **MULTI-ANGLE ADJUSTABLE CURLING IRON**

(52) **U.S. Cl.**
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(57) **ABSTRACT**

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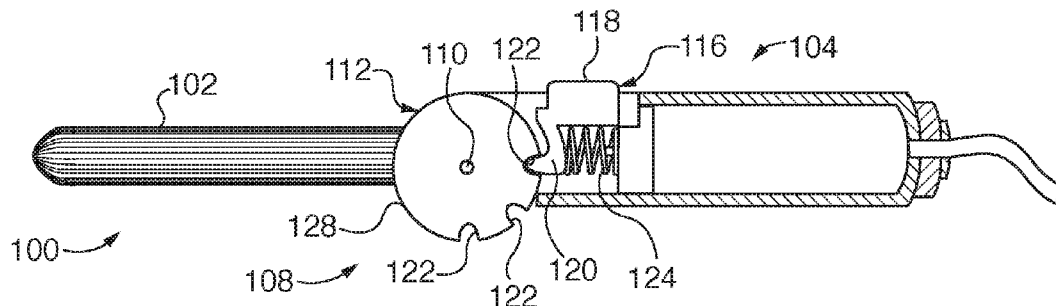
Related U.S. Application Data

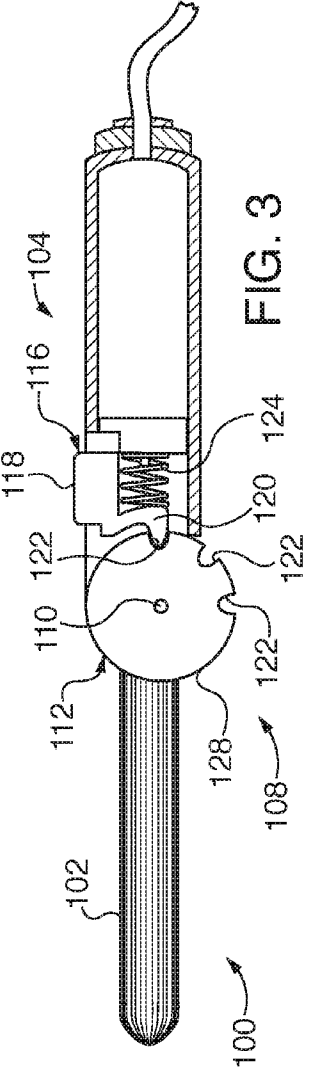
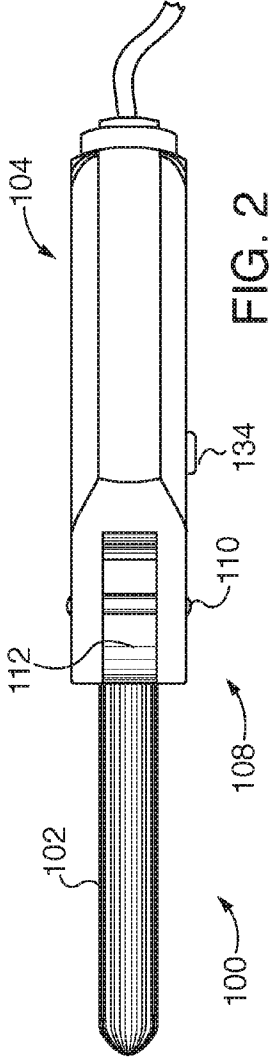
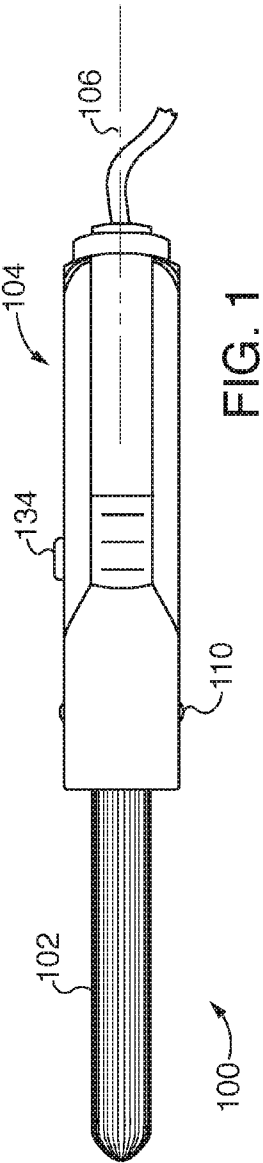
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A curling iron providing angular adjustment of a heatable wand to a handle is disclosed. The curling iron comprises a pivot joint between the elongated handle and the elongated heatable wand. A manual detent is biased to constrain the pivot joint against rotation, thereby locking the elongated heatable wand in a selected position relative to the handle, and to release the wand for adjustment to another position. Release and adjustment may be performed by operating a manual control to release the pivot joint and rotating a wheel of the pivot joint to adjust angle of the wand relative to the handle. Alternatively, a single manual control can be manipulated to both release the pivot joint and also adjust the angle of the wand.





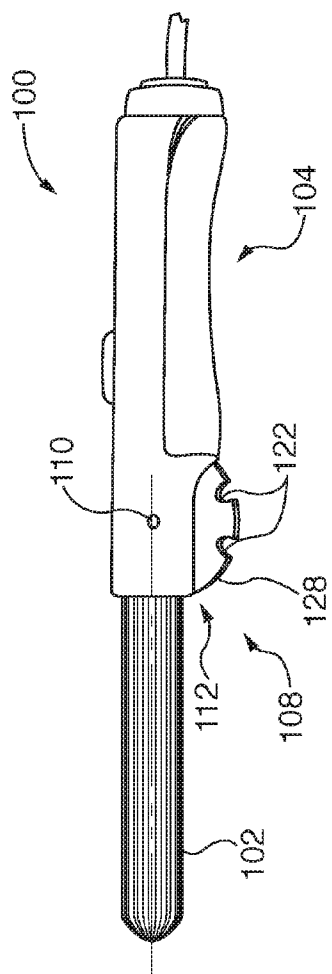


FIG. 4

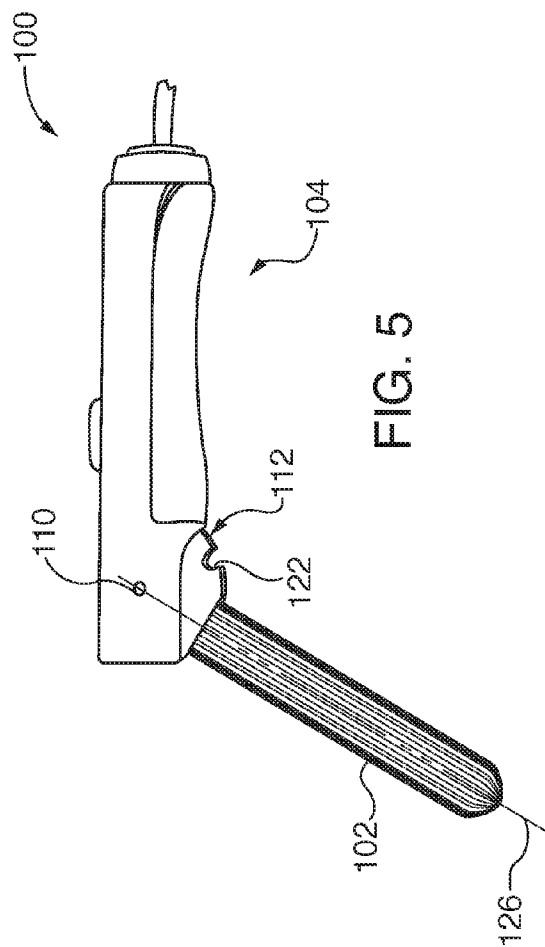


FIG. 5

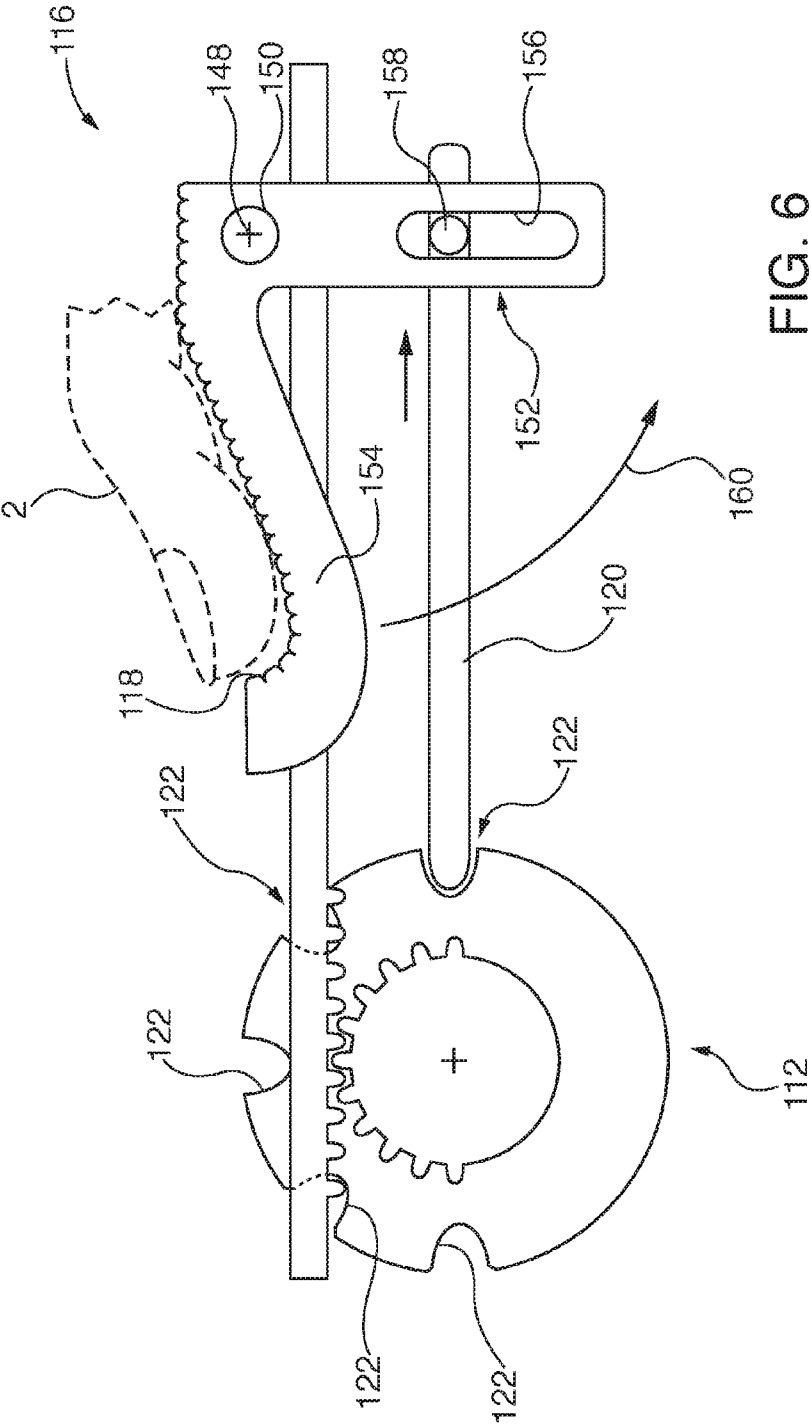


FIG. 6

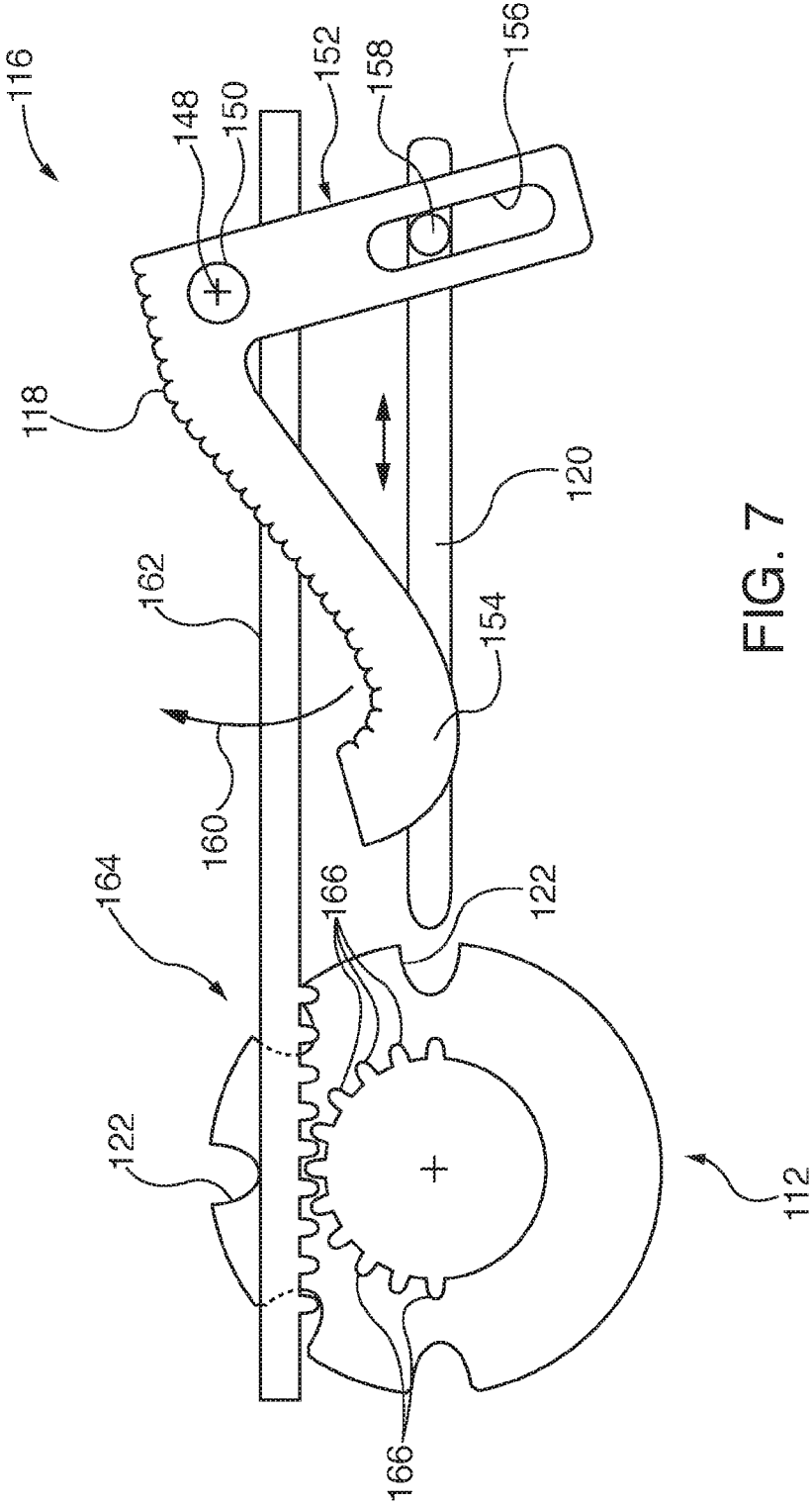


FIG. 7

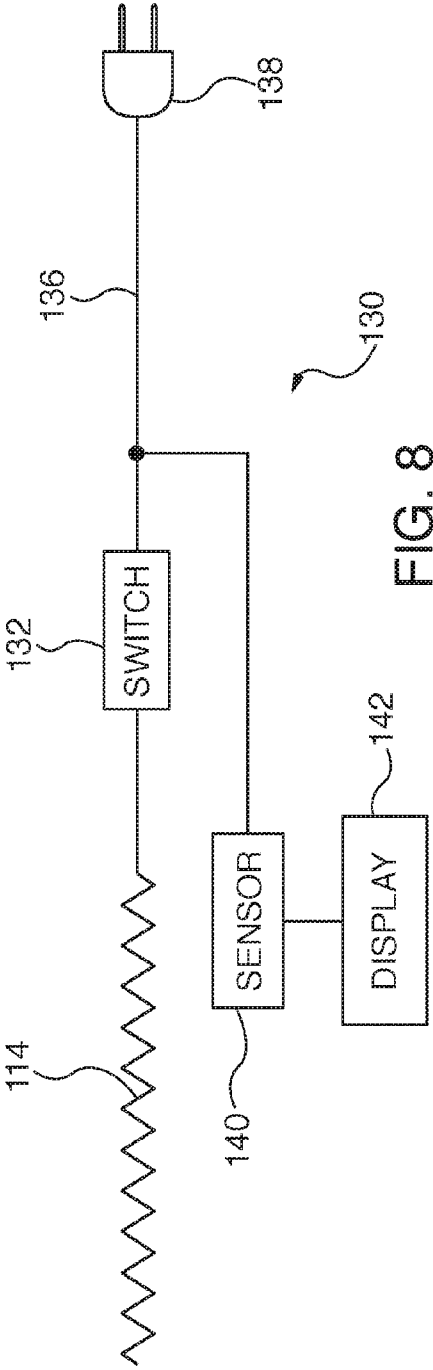


FIG. 8

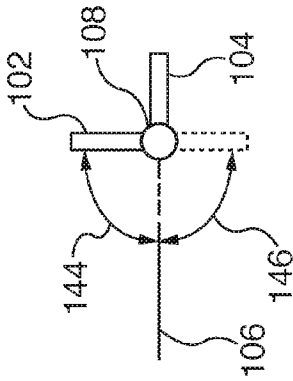


FIG. 9

MULTI-ANGLE ADJUSTABLE CURLING IRON

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims the benefit of priority to U.S. Provisional Application No. 62/147,297, filed on Apr. 14, 2015. The subject matter of the aforementioned application is incorporated herein by reference for all purposes to the extent that such subject matter is not inconsistent herewith or limiting hereof.

FIELD OF THE DISCLOSURE

[0002] The present disclosure relates to curling irons for curling hair, and more particularly, to a curling iron having a heatable wand adjustably positionable relative to a handle thereof.

BACKGROUND

[0003] Curling irons are widely used to curl hair, and are hand wielded. Human physiology mandates that appropriate and ideal angles for the heatable wand of the curling iron be at various orientations relative to the hand of the person wielding the curling iron. In any one session, a number of different orientations may be necessary. Therefore, there exists a need for a curling iron which addresses the need of several positional adjustments in the course of curling the hair.

SUMMARY

[0004] The disclosed concepts address the above stated situation by providing a curling iron which is readily adjustable as to orientation of the heatable wand of the curling iron relative to the handle. A pivot wheel is introduced between the handle and the heatable wand to facilitate mutual rotation therebetween. This pivot wheel is of dimensions such that it protrudes from the handle and the heatable wand, and can be readily rotated by the thumb of the user. With the wand fixed to the pivot wheel, the angle of the heatable wand to the handle is readily adjusted by thumb, which is a very natural and intuitive motion for a user. The pivot wheel not only serves as a pivotal joint between the handle and the heatable wand, but also gives the user structure to move the heatable wand without obliging the user to actually contact the heatable wand, which may be excessively hot for safely contacting the wand during angle adjustments.

[0005] A detent button withdraws a latch from engagement with the pivot wheel to free the wand to rotate with the pivot wheel. The latch is spring biased to engage the pivot wheel and immobilize the pivot wheel, thereby keeping the heatable wand in a selected angle relative to the handle.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] Various objects, features, and attendant advantages of the disclosed concepts will become more fully appreciated as the same becomes better understood when considered in conjunction with the accompanying drawings, in which like reference characters designate the same or similar parts throughout the several views, and wherein:

[0007] FIG. 1 is a top view of a curling iron, according to at least one aspect of the disclosure;

[0008] FIG. 2 is a bottom view of the curling iron of FIG. 1;

[0009] FIG. 3 is a side view of the curling iron of FIG. 1, shown partly in cross section;

[0010] FIG. 4 is a side view of the curling iron of FIG. 1;

[0011] FIG. 5 is similar to FIG. 4, but shows the heatable wand at an angle adjusted from the position shown in FIG. 4;

[0012] FIG. 6 is a side detail view of a curling iron, according to at least one additional aspect of the disclosure;

[0013] FIG. 7 shows the components of FIG. 6, but with some components moved to a new position;

[0014] FIG. 8 is a schematic view of electrical components of the curling iron of FIG. 1; and

[0015] FIG. 9 is a side depiction of the curling iron of FIG. 1, drawn to reduced scale.

DETAILED DESCRIPTION

[0016] In the following description, numerous specific details are set forth in order to provide an understanding of the present invention. It will be apparent, however, to one skilled in the art that the present invention may be practiced without these specific details. In other instances, well known components or methods have not been described in detail but rather in a block diagram in order to avoid unnecessarily obscuring the present invention. Thus, the specific details set forth are merely exemplary. The specific details may be varied from and still be contemplated to be within the spirit and scope of the present invention.

[0017] Referring first to FIGS. 1-5, according to at least one aspect of the disclosure, there is shown a curling iron 100 providing angular adjustment of a heatable wand 102 to a handle 104. Curling iron 100 comprises elongated handle 104 having a longitudinal axis 106 (FIG. 1), elongated heatable wand 102, and a pivot joint 108 between elongated handle 104 and elongated heatable wand 102. Pivot joint 106 comprises an axle pin 110 anchored within elongated handle 104 and a pivot wheel 112 rotatable about axle pin 110. Elongated heatable wand 102 is fixed to pivot wheel 112. Pivot wheel 112 is at least partially exposed to finger contact proximate elongated handle 104. A manual detent is biased to constrain pivot wheel 112 against rotation about axle pin 110 and is manually releasable to permit pivot wheel 112 to rotate about axle pin 110.

[0018] Heatable wand 102, apart from its angular adjustability relative to elongated handle 104, may be of generally conventional construction, having an electric resistance heating element 114 (see FIG. 8) contain within.

[0019] Referring primarily to FIG. 3, the manual detent comprises an actuator 116 slidably coupled to elongated handle 104. Actuator 116 has a finger contact surface 118 engageable by the user's finger or thumb 2 (e.g., as seen in FIG. 6). When curling iron 100 is grasped in one hand by elongated handle 104, it is most ergonomical to engage finger contact surface 118 by the thumb.

[0020] Pivot wheel 112 comprises a circumferential surface 128 and a plurality of recesses 122 in circumferential surface 128. The manual detent comprises a protuberance (seen as a finger 120) configured and dimensioned to partially occupy each one of recesses 122, and a biasing member arranged to bias the protuberance to occupy one of recesses 122. The biasing member comprises a spring 124 seated at one end in elongated handle 106.

[0021] Recesses 122 are similarly configured, to enable close cooperation with finger 120. Spring 124 is a compression spring biases finger 120 into an engaged position (FIG. 3) occupying one recess 122. Rotation of pivot wheel 112 brings other recesses 122 into alignment with finger 120. Rotation of pivot wheel 112 and selection of different recesses 122 alters an angle between longitudinal axis 126 of heatable wand 102 (see FIG. 5) and elongated handle 104. Pivot wheel 112 may be rotated by hand while simultaneously holding actuator 116 out of the engaged position shown in FIG. 3. Illustratively, actuator 116 is moved to the right, as illustrated in FIG. 3.

[0022] In curling iron 100, pivot wheel 112 is exposed to finger contact on one side of elongated handle 104, and the manual detent comprises finger contact surface 118 on another side of elongated handle 104. Pressure against finger contact surface 118 of the manual detent withdraws the protuberance (finger 120) from that one of recesses 122 occupied by the protuberance. The above configuration enables a user, with one hand encircling elongated handle 104, to maintain actuator 116 in a disengaged position with the thumb for example, while manipulating pivot wheel 112 to a new position with the index finger for example.

[0023] Circumferential surface 128 of pivot wheel 112 is configured or textured to enhance engagement by the fingers, thumb, or hand of a user. Recesses 122 may provide ridges enhancing engagement. Alternatively, ridging or other texturing (not shown) may be provided to enhance manual engagement of pivot wheel 112.

[0024] In curling iron 100, the detent responds to finger pressure withdrawing the protuberance from recess 122 in a direction parallel to longitudinal axis 106 of elongated handle 104.

[0025] Referring particularly to FIGS. 3 and 4, in curling iron 100, pivot wheel 112 has diameters greater than any diameter of elongated handle 106. Also, pivot wheel 112 has diameters greater than any diameter of heatable wand 104. These relationships enable pivot wheel 112 to project beyond the bounds of elongated handle 106, thereby being readily exposed to finger or thumb engagement when adjusting angles of heatable wand 102 relative to elongated handle 104. Also, these relationships assure sufficient leverage such that finger pressure will readily rotate heatable wand 104 to a new selected angular position relative to elongated handle 104.

[0026] Referring also to FIG. 8, in curling iron 100, heatable wand 102 includes electrical resistance heating element 114. Curling iron 100 further comprises electrical circuitry 130 connected to electrical resistance heating element 114 and a switch 132 controlling electrical power to electrical resistance heating element 114. Switch 132 has a switch operator 134 accessible from elongated handle 106. Electrical circuitry 130 will be understood to include the number of conductors and electrical insulation necessary for operation, even if these are not shown. Electrical circuitry 130 includes a power cord 136 terminating in a pronged plug 138, so that power cord 136 may be used with ordinary residential power receptacles (not shown).

[0027] Curling iron 100 further comprises a temperature sensor 140 in heat sensing relation to electrical resistance heating element 114, and a temperature indicator (shown as an electronic display 142) visible to view. Temperature sensor 140 and electronic display 142 may be of conventional nature.

[0028] Referring primarily to FIG. 9, in curling iron 100, pivot joint 112 can accommodate angular adjustment of heatable wand 102 within a one hundred eighty degree range relative to longitudinal axis 106 of elongated handle 104. A one hundred eighty degree range satisfies almost all conceivable positions of heatable wand 102 relative to longitudinal axis 106 of elongated handle 104 that would be encountered in ordinary use.

[0029] In one implementation of curling iron 100, the one hundred eighty degree range extends ninety degrees from longitudinal axis 106 of elongated handle 104 in one direction, and ninety degrees from longitudinal axis 106 of elongated handle 104 in an opposed direction. These relationships are indicated by arrows 144 and 146 in FIG. 9. Combination of swing of arrows 144 and 146, each being ninety degrees, provides a total of one hundred eighty degrees.

[0030] In curling iron 100, heatable wand 102 is adjustable to any one of a plurality of discrete selectable positions relative to elongated handle 104. This is a consequence of recesses 122. Although three recesses 122 are shown in FIG. 3, any desired number of recesses 122 may be provided.

[0031] Referring primarily to FIGS. 1-4, it will be noted that in curling iron 100, heatable wand 102 has longitudinal axis 126, and in one of the selectable positions, longitudinal axis 126 of heatable wand 102 is parallel to longitudinal axis 106 of elongated handle 104. This is one of the most convenient orientations of curling iron 100.

[0032] Turning now to FIGS. 6 and 7, but also referring to the other Figures, an example of curling iron 100 providing angular adjustment of heatable wand 102 to elongated handle 104 comprises elongated handle 104 having longitudinal axis 106, elongated heatable wand 102, and pivot joint 112 between elongated handle 104 and heatable wand 102. Pivot joint 112 comprises axle pin 110 anchored within elongated handle 104 and pivot wheel 112 rotatable about axle pin 110. Heatable wand 102 is fixed to pivot wheel 112. A manual detent is biased to constrain pivot wheel 112 against rotation about axle pin 110 and manually releasable to permit pivot wheel 112 to rotate about axle pin 110. The manual detent is connected to pivot wheel 112 to rotate pivot wheel 112 about axle pin 110. A difference between the arrangement of FIGS. 6 and 7, and the arrangement of FIGS. 1-5 is the role of actuator 116. In the arrangement of FIGS. 1-5, actuator 116 functions only to disengage finger 120 from a recess 122. In the arrangement of FIGS. 6 and 7, actuator 116 both disengages finger 120 from a recess 122, and also enables rotation of pivot wheel 112.

[0033] FIG. 6 shows an actuation system combining the functions of the manual detent and of rotating pivot wheel 112. Actuator 116 pivots about an axis 148, supported on a pin 150 anchored to elongated handle 104. An arm 152 projects downwardly from a finger receiving portion 154 of actuator 116.

[0034] It should be noted at this point that orientational terms such as downwardly, right, and left refer to the subject drawing as viewed by an observer. The drawing figures depict their subject matter in orientations of normal use, which could obviously change with changes in body posture and position. Therefore, orientational terms must be understood to provide semantic basis for purposes of description only, and do not imply that their subject matter can be used only in one position.

[0035] Arm 152 includes a slot 156 capturing a trunnion 158 of finger 120. Depressing arm 154 by exerting finger pressure against finger engagement surface 118 rotates actuator 116 in an arcuate path indicated by an arrow 160. The resulting position is shown in FIG. 7, wherein it is seen that finger 120 is displaced to the right, fully withdrawn from recess 122. With this withdrawal, pivot wheel 112 is free to rotate, and in so doing, to establish a new angle between heatable wand 102 and longitudinal axis 106 of elongated handle 104. However, pivot wheel 112 does not rotate merely as a consequence of retracting finger 120.

[0036] Pin 150, actuator 116, and finger 120 are carried on a cartridge 162 (shown only in abbreviated form in FIGS. 6 and 7) horizontally slidably coupled to elongated handle 104. With actuator 116 in the depressed position shown in FIG. 7, finger pressure on finger engagement surface 118 is exerted so as to slide actuator 116 to the left or to the right as seen in FIG. 7. This action also moves cartridge 162, which is coupled to a toothed rack 164 engaging teeth 166 of a pinion integral with pivot wheel 112. Lateral movement of toothed rack 164 to the left or right (in FIGS. 6 and 7) rotates pivot wheel 112, and hence, heatable wand 102 (see FIGS. 1-5). Spring 124 (FIG. 3) may be incorporated into the arrangement of FIGS. 6 and 7 to bias finger 120 into engagement with an aligned recess 122. Spring 124 would also bias actuator 116 to move along an arcuate path indicated by an arrow 160 to return to the position shown in FIG. 6.

[0037] While the disclosed concepts have been described in connection with what is considered the most practical and preferred implementation, it is to be understood that the disclosed concepts are not to be limited to the disclosed arrangements, but are intended to cover various arrangements which are included within the spirit and scope of the broadest possible interpretation of the appended claims so as to encompass all modifications and equivalent arrangements which are possible.

[0038] It should be understood that the various examples of the apparatus(es) disclosed herein may include any of the components, features, and functionalities of any of the other examples of the apparatus(es) disclosed herein in any feasible combination, and all of such possibilities are intended to be within the spirit and scope of the present disclosure. Many modifications of examples set forth herein will come to mind to one skilled in the art to which the present disclosure pertains having the benefit of the teachings presented in the foregoing descriptions and the associated drawings.

[0039] Therefore, it is to be understood that the present disclosure is not to be limited to the specific examples presented and that modifications and other examples are intended to be included within the scope of the appended claims. Moreover, although the foregoing description and the associated drawings describe examples of the present disclosure in the context of certain illustrative combinations of elements and/or functions, it should be appreciated that different combinations of elements and/or functions may be provided by alternative implementations without departing from the scope of the appended claims.

I claim:

1. A curling iron providing angular adjustment of a heatable wand to a handle, the curling iron comprising:
an elongated handle having a longitudinal axis;
an elongated heatable wand;

a pivot joint between the elongated handle and the elongated heatable wand, the pivot joint comprising an axle pin anchored within the elongated handle and a pivot wheel rotatable about the axle pin, wherein
the elongated heatable wand is fixed to the pivot wheel,
and

the pivot wheel is at least partially exposed to finger contact proximate the elongated handle; and

a manual detent biased to constrain the pivot wheel against rotation about the axle pin and manually releasable to permit the pivot wheel to rotate about the axle pin.

2. The curling iron of claim 1, wherein

the pivot wheel comprises a circumferential surface and a plurality of recesses in the circumferential surface, and the manual detent comprises a protuberance configured and dimensioned to partially occupy each one of the recesses, and a biasing member arranged to bias the protuberance to occupy one of the recesses.

3. The curling iron of claim 1, wherein the pivot wheel is exposed to finger contact on one side of the elongated handle, and the manual detent comprises a finger contact surface on another side of the elongated handle, wherein pressure against the finger contact surface of the manual detent withdraws the protuberance from that one of the recesses occupied by the protuberance.

4. The curling iron of claim 3, wherein the detent responds to finger pressure withdrawing the protuberance from the recess in a direction parallel to the longitudinal axis of the elongated handle.

5. The curling iron of claim 3, wherein the biasing member comprises a spring seated at one end in the elongated handle.

6. The curling iron of claim 1, wherein the pivot wheel has diameters greater than any diameter of the elongated handle.

7. The curling iron of claim 6, wherein the pivot wheel has diameters greater than any diameter of the heatable wand.

8. The curling iron of claim 1, wherein the heatable wand includes an electrical resistance heating element, and the curling iron further comprises electrical circuitry connected to the electrical resistance heating element and a switch controlling electrical power to the electrical resistance heating element, the switch having a switch operator accessible from the elongated handle.

9. The curling iron of claim 8, wherein the electrical circuitry includes a power cord terminating in a pronged plug.

10. The curling iron of claim 8, further comprising a temperature sensor in heat sensing relation to the electrical resistance heating element, and a temperature indicator visible to view.

11. The curling iron of claim 1, wherein the pivot joint can accommodate angular adjustment of the heatable wand within a one hundred eighty degree range relative to the longitudinal axis of the elongated handle.

12. The curling iron of claim 11, wherein the one hundred eighty degree range extends ninety degrees from the longitudinal axis of the elongated handle in one direction, and ninety degrees from the longitudinal axis of the elongated handle in an opposed direction.

13. The curling iron of claim 1, wherein the heatable wand is adjustable to any one of a plurality of discrete selectable positions relative to the elongated handle.

14. The curling iron of claim **13**, wherein the heatable wand has a longitudinal axis, and in one of the selectable positions, the longitudinal axis of the heatable wand is parallel to the longitudinal axis of the elongated handle.

15. A curling iron providing angular adjustment of a heatable wand to a elongated handle, the curling iron comprising:

an elongated handle having a longitudinal axis;

a heatable wand;

a pivot joint between the elongated handle and the heatable wand, the pivot joint comprising an axle pin anchored within the elongated handle and a pivot wheel rotatable about the axle pin, wherein the heatable wand is fixed to the pivot wheel; and

a manual detent biased to constrain the pivot wheel against rotation about the axle pin and manually releasable to permit the pivot wheel to rotate about the axle pin, and connected to the pivot wheel to rotate the pivot wheel about the axle pin.

16. The curling iron of claim **15**, wherein the pivot wheel comprises a circumferential surface and a plurality of recesses in the circumferential surface, and

the manual detent comprises a protuberance configured and dimensioned to partially occupy each one of the recesses, and a biasing member arranged to bias the protuberance to occupy one of the recesses.

17. The curling iron of claim **15**, wherein the heatable wand includes an electrical resistance heating element, and the curling iron further comprises electrical circuitry connected to the electrical resistance heating element and a switch controlling electrical power to the electrical resistance heating element, the switch having a switch operator accessible from the elongated handle.

18. The curling iron of claim **17**, further comprising a temperature sensor in heat sensing relation to the electrical resistance heating element, and a temperature indicator visible to view.

19. The curling iron of claim **15**, wherein the pivot joint can accommodate angular adjustment of the heatable wand within a one hundred eighty degree range relative to the longitudinal axis of the elongated handle.

20. The curling iron of claim **19**, wherein the heatable wand is adjustable to any one of a plurality of discrete selectable positions relative to the elongated handle.

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