

A Hybrid Walking Cane

Field of the Invention

This invention relates to a hybrid walking cane. More particularly, this invention
5 relates to a hybrid walking cane with an additional support structure. Still more particularly,
this invention relates to a hybrid walking cane with an additional support structure that can
be activated and locked into position when required.

Prior Art

10 It is a problem that many people have ailments or infirmities that hamper movement.
Often, these people require medical aids such as crutches, canes, walkers, and the like for
assistance in walking and other tasks. Such medical aids typically include a single upright
beam or pole with a handle at one end and a stopper at the other end. Although such
medical aids allow one to move with ease, some users may require or prefer an added
15 supporting structure for better balancing support. To address this, those skilled in the art
have designed tripod structures affixed to the bottom end of the upright. The tripod
provides added support and stability. However, the tripod structure obstructs a user and
prevents a user from moving with ease.

20 Thus, those skilled in the art are constantly striving to design an improved walking
cane that allows people with ailments and/or infirmities to handle with ease when walking
and yet provides added support and stability when required.

Summary of the Invention

25 The above and other problems are solved and an advance in the art is made by a
hybrid walking cane in accordance with this invention. A first advantage of a hybrid walking
cane in accordance with this invention is that the hybrid walking cane can be used as a
single-rod walking cane or a multiple support walking cane. A second advantage of a

hybrid walking cane in accordance with this invention is that the added support structure provides added strength to the hybrid walking cane. A third advantage of a hybrid walking cane in accordance with this invention is that the hybrid walking cane can be easily transform between a single-rod walking cane and a multiple support walking cane through a
5 press and push operation. A fourth advantage of a hybrid walking cane in accordance with this invention is that the hybrid walking cane provides a user the option to choose between using the hybrid walking cane with a single upright which allows a user to manoeuvre with ease or with the additional support structure which gives better support and stability.

10 In accordance with embodiments of this invention, a hybrid walking cane is configured in the following manner. The hybrid walking cane includes a tubular member, a rod member, a lever, a number of struts and a number of braces. The tubular member has an open end and an opening defined within a sidewall of the tubular member. The rod member is housed within the tubular member with a portion extending through the open end
15 of the tubular member. The rod member is arranged to be movable within the tubular member between a retracted position and an expanded position. The lever extends out of a side of the rod member and through the opening of the tubular member for moving the rod member between the retracted and expanded positions. The struts are pivotally coupled to the tubular member. The braces connect each of the struts to the rod member. Each of the
20 braces has a first end pivotally connected to one of the struts and a second end pivotally connected to the portion of the rod member extending through the open end of the tubular member. The rod member, struts, braces are arranged such that responsive to the rod member being in the retracted position, the struts are substantially parallel with the rod member and responsive to the rod member being in the expanded position, the braces are
25 substantially perpendicular to the rod member and a bottom tip of each of the struts is level with a bottom end of the rod member. The opening of the tubular member and the lever are being arranged to lock the rod member in one of the retracted and expanded positions.

In accordance with embodiments with this invention, the opening defined within the sidewall of the tubular member has a first end, a second end, and an elongated portion connecting said first end and said second end. In accordance with some of these
5 embodiments, the retracted position is located at the first position and the expanded position is located at the second position.

In accordance with embodiments with this invention, the hybrid walking cane further includes a resilient means for biasing the rod member in the retracted position. In
10 accordance with some of these embodiments, the lever includes a resilient member, a tapered portion, and a base portion between said resilient member and said tapered portion. This assists a user to easily, effortlessly and efficiently retract the rod member from the expanded position to the retracted position by simply applying pressure on the lever. In accordance with some of these embodiments, the base portion includes a pair of obstructs
15 to secure the lever to the rod member.

In accordance with embodiments with this invention, the rod member is unlocked when the tapered portion of the lever aligns with the sidewall of said tubular member. In accordance with some of these embodiments, the rod member is locked when the base
20 portion of the lever aligns with the sidewall of the tubular member.

In accordance with embodiments with this invention, the hybrid walking cane includes a knob connected to the tapered portion of the lever. This is provided as a grip or a handle to allow a user to move the lever. In accordance with some of these embodiments,
25 a handle extending from an end, opposite of the open end, of the tubular member is provided.

In accordance with embodiments with this invention, the hybrid walking cane includes first pivot and attachment members, second pivot and attachment members, and third pivot and attachment members. The first pivot and attachment members are affixed to the rod member. Further, each of the first pivot and attachment members is adapted to
5 pivotally connect the top end of each of the struts to the tubular member. The second pivot and attachment members are affixed to the tubular member. Further, each of the second pivot and attachment members is adapted to pivotally connect the second end of each of the braces to the rod member. The third pivot and attachment members are affixed to each of the struts. Further, each of the third pivot and attachment members is adapted to
10 pivotally connect each of the braces to each of the struts.

In accordance with embodiments with this invention, each of the struts is evenly spaced apart from each other about a common axis of the tubular member. In accordance with some of these embodiments, at least three struts are provided.

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Brief Description of the Drawings

The above and other features and advantages in accordance with this invention are described in the following detailed description and are shown in the following drawings:

Figure 1 illustrating a perspective view of a hybrid walking cane in accordance with
20 an embodiment of this invention;

Figure 2 illustrating an expanded view of a bottom support structure in accordance with an embodiment of this invention;

Figure 3 illustrating a side view of a lever and a front view of an opening on a tubular member in accordance with an embodiment of this invention;

25 Figure 4 illustrating the operation of the lever in accordance with an embodiment of this invention;

Figure 5 illustrating side view of a strut coupled to the tubular member and a rod member in accordance with an embodiment of this invention;

Figure 6 illustrating a front view of the strut in accordance with an embodiment of this invention;

5 Figure 7 illustrating a perspective of the bottom support structure in expanded mode in accordance with an embodiment of this invention;

Figure 8 illustrating a perspective of the bottom support structure changing from the expanded mode to retracted mode in accordance with an embodiment of this invention;

10 Figure 9 illustrating a front view of the hybrid walking cane in unfolded operation in accordance with embodiment of this invention;

Figure 10 illustrating a cross-sectional view across the X-X plan of figure 9 in accordance with an embodiment of this invention;

Figure 11 illustrating a front view of the hybrid walking cane in folded operation in accordance with an embodiment of this invention; and

15 Figure 12 illustrating a cross-sectional view across the Y-Y plan of figure 11 in accordance with an embodiment of this invention.

Detailed Description

20 This invention relates to a hybrid walking cane. More particularly, this invention relates to a hybrid walking cane with an additional support structure. Still more particularly, this invention relates to a hybrid walking cane with an additional support structure that can be activated when required.

25 Figure 1 shows an embodiment of a hybrid walking cane 100 in accordance with an embodiment of this invention. Hybrid walking cane 100 includes a tubular member 120 which serves as a base to connect various parts of the hybrid walking cane, a handle 110, and a bottom support structure 200. Extension rod 115 may be included between the tubular member 120 and handle 110. Extension rod 115 can be inserted through the top

open end 124 of tubular member 120 and may be movable relative to tubular member 120. Extension rod 115 includes protrusion 118 adapted to be inserted into any one of the apertures 117 for adjusting handle 110 to a selected height. This allows a user to adjust the hybrid walking cane 120 to a suitable length. Tubular member 120 also includes a slot 170
5 that allows a lever 260 to move between an extended position and a retracted position. Bottom support structure 200 will be described further below. Although tubular member 120 shown in the figures is circular in cross-section, one skilled in the art will recognize that tubular member 120 can be any hollow structure having any other geometric shape and the exact configuration is left as a design choice for the skilled in the art.

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Figure 2 shows bottom support structure 200 in unfolded operation when lever 260 is in the extended position. As shown in Figure 2, bottom support structure 200 is intended to provide added support and stability for a user. Further, bottom support structure 200 provides added strength to hybrid walking cane 100 and allows hybrid walking cane 100 to
15 freely stand when bottom support structure 200 is in the unfolded operation.

Bottom support structure 200 includes rod member 210, struts 240 and braces 250. Rod member 210 is within tubular member 120 with a portion extending through bottom open end 122 of tubular member 120. Rod member 210 is movable relative to tubular
20 member 120. The movement of rod member 210 inside tubular member 120 changes the amount of the portion of rod member 210 that extends out of bottom open end 122 to change the positions of the struts 240 and braces 250 as described below. To provide better support and strength, rod member 210 is a one piece solid rod made of a metal material. However, one skilled in the art will recognize that rod member 210 may also be
25 made of materials other than metal so long as the material is hard enough to provide support and strength to the hybrid walking cane. Further, instead of a solid rod, rod member 210 may also be hollow in structure without departing from this invention.

Lever 260 is coupled to the rod member 210. Further details of lever 260 and the operations of lever 260 will be described below with reference to figures 3 and 4.

5 Each strut 240 is pivotally connected to a first bracket 230. First bracket 230 is affixed or integral to the sidewall of tubular member 120 proximate bottom open end 122. Struts 240 are preferably equally spaced apart from each other about the tubular member 120. First bracket 230 includes a number of first pivot and attachment member 232 for allowing each strut 240 to be pivotally connected to first bracket 230. One skilled in the art will
10 recognize that instead of providing first pivot and attachment member 232 on first bracket 230, each first pivot and attachment member 232 may also be modified to be affixed directly to tubular member 120 and the exact configuration is left as a design choice for those skilled in the art. Further, first pivot and attachment member 232 may be any configuration adapted to pivotally attach strut 240 to tubular member 120 and the exact configuration is
15 left as a design choice for those skilled in the art.

Braces 250 are provided to connect each strut 240 to a second bracket 220. Second bracket 220 is affixed or integral to the portion of rod member 210 that extends out of bottom end 122 of tubular member 120 regardless of the position of rod member 210 in
20 tubular member 120. Second bracket 220 includes a number of second pivot and attachment member 222 for allowing a brace 250 to be pivotally connected to the second bracket 220. One skilled in the art will recognize that instead of providing second pivot and attachment member 222 on each second bracket 220, each second pivot and attachment member 222 may be modified to be affixed directly to rod member 210 and the exact
25 configuration is left as a design choice for those skilled in the art. Further, second pivot and attachment member 222 may be any configuration adapted to pivotally attach brace 250 to

rod member 210 and the exact configuration is left as a design choice for those skilled in the art.

Each Strut 240 includes a third pivot and attachment member 242 for allowing a brace
5 250 to be pivotally connected to each strut 240. Third pivot and attachment member 242 is arranged on strut 240 such that when hybrid walking cane 100 is in unfolded operation, brace 250 is substantially perpendicular to rod member 210. One skilled in the art will recognize that third pivot and attachment member 242 may be any configuration adapted to pivotally attach strut 240 to brace 250 and the exact configuration is left as a design choice
10 for those skilled in the art.

One skilled in the art will recognize that although four (4) struts are illustrated in figure 2, any number of struts can be used as long as the struts form a structure that allows the hybrid walking cane to free stand when the lever is in the extended position. One skilled in
15 the art will also recognize that support and stability improves as the increase in number of struts used. Further, increase in number of struts use will also increase the strength of the hybrid walking cane. Hence, the exact number of struts used is left as a design choice for those skilled in the art. One skilled in the art will also recognize that similar to extension rod 115, rod member 210 may also be modified to allow rod member 210 to be adjustable and
20 the exact configuration is left as a design choice for those skilled in the art.

Figure 3 shows an exploded view of locking mechanism formed by a combination of lever 260 and slot 170. Slot 170 is an elongated opening formed at the sidewall of the tubular member 120. Slot 170 has a first end 180, a second end 190, and a connecting
25 portion 175. First end 180 and second 190 have a greater dimension than connecting portion 175. Lever 260 has a base portion 262, a tapered portion 264, a knob 266, a pair of obstructs 267, and a resilient member 268. Base portion 262 has a dimension that base

portion 262 to rest at first end 180 or second end 190 but prevents base portion 262 from entering connecting portion 175. Tapered portion 264 has a dimension that allows lever 260 to move freely along connecting portion 175. The proportion of these dimensions allow lever 260 to be moveable between first end 180 and second end 190. Knob 266 is provided
5 as a grip or a handle to allow a user to move lever 260. Obstructs 267 secure lever 260 to an aperture 211 (shown in figure 4) in rod member 210. Lever 260 is configured to be locked at first end 180 or second end 190 and the operations of lever 260 will be described below with reference to figure 4.

10 Figure 4 comprises figure 4a, figure 4b, figure 4c and figure 4d and shows the operation of lever 260. Figure 4a shows lever 260 locked at first end 180 as base portion 262 is aligned to the sidewall 121 of tubular member 120. At this locked position, hybrid walking cane 100 is in unfolded operation.

15 Figure 4b shows a pressure being applied on lever 260 in the direction shown by arrow 410. When a pressure is being applied on lever 260 in the direction shown by arrow 410, resilient member 268 contracts and tapered portion 264 is aligned with the sidewall 121 of tubular member 120. This alignment unlocks lever 260 and allows lever 260 to be movable between first end 180 and second end 190.

20 Figure 4c shows moving lever 260 in the direction shown by arrow 420 and stopping at second end 190. Moving lever 260 in the direction shown by arrow 420 causes rod member 210 to extend further out of bottom end 122 of tubular member 120. At this position, hybrid walking cane is in folded operation.

25 Figure 4d shows lever 260 locked at second end 190 of tubular member 120. The release of the pressure in the direction shown by arrow 410 on lever 260 allows resilient

member 268 to expand and aligns base portion 262 to the sidewall 121 of tubular member 120. Hence, lever 260 is locked at second end 190 of tubular member 120.

Figure 5 shows a side view of strut 240 being coupled to rod member 210 and tubular member 120 when hybrid walking cane 100 is in folded operation. Brace 250 is partially obscured by strut 240. In the folded operation, strut 240 is substantially parallel with rod member 210. Further, second bracket 220 is affixed or integral to the portion of rod member 210 that extends out of bottom end 122 of tubular member 120. Second bracket 220 is positioned on the portion of rod member 210 that extends out of bottom end 122 of tubular member 120 such that when in the folded operation, second bracket 220 is between bottom tip 245 of struts 240 and third pivot and attachment member 242. Strut 240 may be provided with resilient portion 249 that pushes strut 240 apart from rod member 210. This further assist changing the hybrid walking cane from folded operation to unfolded operation.

Figure 6 shows a front view of strut 240 with brace 250. Strut 240 has a longitudinal aperture 241 that allows brace 250 to fit within strut 240 when hybrid walking cane 100 is in the folded operation as shown in figure 6. To ensure struts 240 are substantially parallel to rod member 210 when in the folded operation, second pivot and attachment member 222 are configured such that second pivot and attachment member 222 fit in between longitudinal aperture 241 of strut 240. Figure 6 also shows strut 240 pivotally connected to first pivot and attachment member 232. Further, brace 250 is pivotally connected to second pivot and attachment member 222 and third pivot and attachment member 242. In order assist hybrid walking cane 100 to change from folded operation to unfolded operation, brace 250 cannot be parallel to rod member 210. Therefore, second pivot and attachment member 222 and third pivot and attachment member 242 are arranged such that brace 250 is not parallel to rod member 210 when in folded operation. One skilled in the art will recognize that the configuration of first, second and third pivot attachment members 232,

222 and 242 may be different from the described embodiment. However, first, second and third pivot attachment members 232, 222 and 242 must be configured to allow rotational movement be translated between brace 250 and strut 240 when lever 260 moves between first end 180 and second end 190. One skilled in the art will also recognize that instead of having longitudinal aperture 241, strut 240 may be a solid piece of material with a recess adapted to receive second pivot and attachment member 222, third pivot and attachment member 242, and brace 250 such that strut 240 is substantially parallel to rod member 210 when in the folded operation.

Figures 7 and 8 show the movement of bottom support structure 200 from an extended mode in which lever 260 is at the first end 180 towards a retracted mode in which lever 260 is at the second end 190. When bottom support structure 200 is in the extended mode, bottom tips 245 of struts 240 are levelled with bottom end 215 of rod member 210. Further, braces 250 are substantially perpendicular to rod member 210. When bottom support structure 200 moves toward the retracted mode, rod member 210 extends further out of bottom open end 122 as shown in arrow 810. The movement of rod member 210 as shown by arrow 810 translates to an upward movement of braces 250 as shown in arrow 820 which causes bottom tips 245 of struts 240 to retract towards rod member 210. A more detailed movement of the parts of the hybrid walking cane 100 is described below with reference to figures 9-12.

The movement of the parts of the hybrid walking cane 100 will now be described as follows with reference to figures 9-12. Figure 9 shows the hybrid walking cane 100 in the unfolded operation. In the unfolded operation, lever 260 is at the first end 180 and bottom support structure is in the extended mode. Figure 10 shows a cross sectional view along X-X of figure 9. Figure 11 shows the hybrid walking cane 100 in the folded operation. In the folded operation, lever 260 is at the second end 190 and bottom support structure is in the

retracted mode. Figure 12 shows cross sectional view along Y-Y of figure 11. As shown in figures 10 and 12 resilient member 520 and stopper 510 are provided within tubular member 120. Hybrid walking cane 100 can be changed from the unfolded operation to the folded operation in the following manner. Pressure is applied to lever 260 in the direction as shown in 730. Resilient member 268 contracts in response to the pressure applied to lever 260. The contraction of resilient member 268 unlocks the locking mechanism as the tapered portion 264 is aligned to the sidewall of the tubular member 120. Rod member 210 is forced downwardly in the direction shown by arrow 740 due to resilient member 520. Pressure applied to lever 260 is released and the locking mechanism locks the bottom support structure 200 in the folded operation as shown in figures 11 and 12. The use of resilient member 520 and stopper 510 allows a user to easily, effortlessly and efficiently retract the bottom support structure from the extended mode to the retracted mode through the simple application of pressure to lever 260 in the direction as shown in 730.

The hybrid walking cane 100 can be changed from the folded operation to unfolded operation in the following manner. Pressure is applied to lever 260 in the direction as shown in 710. Resilient member 268 contracts in response to the pressure applied to lever 260. The contraction of resilient member 268 unlocks the locking mechanism as the tapered portion 264 is aligned to the sidewall of the tubular member 120. To retract the rod member upwardly in the direction shown by arrow 720, a force can be applied downwardly on handle 110 as shown by arrow 750. Pressure applied to lever 260 is released and the locking mechanism locks the bottom support structure 200 in extended mode.

Hybrid walking cane 100 is intended for use by people having ailments or infirmities that hamper movement. Typically, these people have the ability to walk for a certain distance with ease taking bigger steps. If the hybrid walking cane is in the unfolded operation, struts 240 may obstruct or hinder the user. Hence, they would use the hybrid

walking cane in the folded operation as it is easier to manoeuvre. However, after certain distance, they may feel tired and would take smaller steps. Hence, they would prefer to use the hybrid walking cane in the unfolded operation as this provides better support and stability. Further, when the user is tired, the user typically asserts more pressure on the handle 110 in the direction shown as 750 to counter the user's weight on his or her legs. Hence, resilient member 520 and stopper 510 are arranged above rod member 210 as shown in figures 10 and 12 to only assist a user to easily, effortlessly and efficiently retract the bottom support structure from the extended mode to the retracted mode by simply applying pressure on the lever as illustrated above.

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The above is a description of exemplary embodiments of a hybrid walking aid in accordance with this invention. It is foreseeable that those skilled in the art can and will design alternative systems based on this disclosure that infringe upon this invention as set forth in the following claims.

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Claims:

1. A hybrid walking cane comprising:

a tubular member having an open end and an opening defined within a sidewall of
5 said tubular member;

a rod member within said tubular member with a portion extending through said
open end of said tubular member wherein said rod member is movable within said tubular
member between a retracted position and an expanded position;

a lever extending out of a side of said rod member and through said opening of said
10 sidewall of said tubular member for moving said rod member between said retracted
position and said expanded position;

a plurality of struts having a top end pivotally coupled to said tubular member; and

a plurality of braces connecting said plurality of struts to said rod member, wherein
each of said plurality of braces has a first end pivotally connected to one of said plurality of
15 struts and a second end pivotally connected to said portion of said rod member extending
through said open end of said tubular member such that responsive to said rod member
being in said retracted position, said plurality of struts are substantially parallel with said rod
member and responsive to said rod member being in said expanded position, said plurality
of braces are substantially perpendicular to said rod member and a bottom tip of each of
20 said plurality of struts is level with a bottom end of said rod member, and wherein said
opening defined within said sidewall of said tubular member and said lever are being
arranged to lock said rod member in one of said retracted and expanded positions.

2. The hybrid walking cane according to claim 1 wherein said opening defined within
25 said sidewall of said tubular member has a first end, a second end, and an elongated
portion connecting said first end and said second end.

3. The hybrid walking cane according to claim 2 wherein said retracted position is located at said first position and said expanded position is located at said second position.

4. The hybrid walking cane according to claim 1 further comprising:

5 a resilient means for biasing said rod member to said retracted position.

5. The hybrid walking cane according to claim 4 wherein said lever comprises:

a resilient member;

a tapered portion; and

10 a base portion between said resilient member and said tapered portion.

6. The hybrid walking cane according to claim 5 wherein said base portion comprises a obstructing means for securing said lever to said rod member.

15 7. The hybrid walking cane according to claim 6 wherein said rod member is allowed to move between the retracted and expanded positions when said tapered portion of said lever aligns with said sidewall of said tubular member.

8. The hybrid walking cane according to claim 6 wherein said rod member is prevented
20 to move between the retracted and expanded positions when said base portion of said lever aligns with said sidewall of said tubular member.

9. The hybrid walking cane according to claim 5 further comprising a knob connected to said tapered portion of said lever.

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10. The hybrid walking cane according to claim 1 further comprising:

a handle extending from an end of said tubular member, said end being opposite of said open end of said tubular member.

11. The hybrid walking cane according to claim 10 further comprising:

5 an extension rod between said handle and said end being opposite of said open end of said tubular member, said extension rod having a protrusion adapted to be inserted into one of a plurality of apertures on said sidewall of said tubular member.

12. The hybrid walking cane according to claim 1 further comprising:

10 a first plurality of pivot and attachment members affixed to said rod member, wherein each of said first plurality of pivot and attachment members is adapted to pivotally connect said top end of each of said plurality of struts to said tubular member.

13. The hybrid walking cane according to claim 12 further comprising:

15 a second plurality of pivot and attachment members affixed to said tubular member, wherein each of said second plurality of pivot and attachment members is adapted to pivotally connect said second end of each of said plurality of braces to said rod member.

14. The hybrid walking cane according to claim 13 further comprising:

20 a third plurality of pivot and attachment members affixed to each of said plurality of struts, wherein each of said third plurality of pivot and attachment members is adapted to pivotally connect each of said braces to said each of said plurality of struts.

15. The hybrid walking cane according to claim 1 wherein each of said plurality of struts

25 is evenly spaced apart from each other about a common axis of said tubular member.

16. The hybrid walking cane according to claim 1 wherein at least three struts are provided and each of said at least three struts is evenly distributed about a common axis of said tubular member.

- 5 17. The hybrid walking cane according to claim 1 wherein said lever comprises:
- a resilient member;
 - a tapered portion; and
 - a base portion between said resilient member and said tapered portion.

- 10 18. The hybrid walking cane according to claim 17 wherein said base portion comprises a obstructing means for securing said lever to said rod member.