CHAIR-CONVERTIBLE WALKING STICK

Applicant: Chih-Ting Pao, Taichung City (TW)
Inventor: Chih-Ting Pao, Taichung City (TW)

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ABSTRACT

A chair-convertible walking stick includes a stick shank, a collar sleeve movable between distal and proximate positions on the stick shank, a carrier slid able between upper and lower positions on the stick shank, and a seat unit. The seat unit includes a middle portion pivotally connected to the collar sleeve, and left and right wing portions hinged to the middle portion. When the collar sleeve is displaced from the distal position to the proximate position, the seat unit is convertible from a use state, where middle portion is coplanar with the left and right wing portions, to a collapsed state, where the middle portion is at an included angle with each of the left and right wing portions.
CHAIR-CONVERTIBLE WALKING STICK

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority of Taiwanese application no. 102219730, filed on Oct. 23, 2013.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention
[0003] This invention relates to a chair-convertible walking stick.

[0004] 2. Description of the Related Art
[0005] U.S. Pat. No. 2,380,437 discloses a crutch assembly which includes a crutch and a foldable seat. One problem with the crutch assembly is that when the seat is in its folded position, a mechanism for supporting the seat, such as supporting legs, etc., is not compactly folded and is exposed to the user, so that the user may easily get hurt by the folded supporting mechanism. U.S. Pat. No. 3,999,565 discloses a walking stick device in which a support member for supporting the wounded knee or leg is fastened to a standard body in a retractable fashion. The walking stick device may encounter the similar problem.

SUMMARY OF THE INVENTION

[0006] An object of the present invention is to provide a chair-convertible walking stick in which a seat unit can be transformed from a use state to a collapsed state by virtue of a novel conversion mechanism. With the novel conversion mechanism, when a person uses the chair-convertible walking stick of this invention with the seat unit in the collapsed state, he/she is less likely to get hurt by the walking stick.

[0007] According to this invention, a chair-convertible walking stick includes:

[0008] a stick shank extending in a lengthwise direction to terminate at a grip end and a foot end;
[0009] a collar sleeve sleeved on the stick shank and movable between distal and proximate positions relative to the grip end;
[0010] a carrier configured to be slidable on the stick shank and movable between upper and lower positions;
[0011] a seat unit including, a middle portion extending in a longitudinal direction to terminate at a forward edge and a rearward edge which is pivotally connected to the collar sleeve, and left and right wing portions each being juxtaposed with the middle portion along a hinge line, and each being hinged to the middle portion at the respective hinge line such that when the collar sleeve is displaced from the distal position to the proximate position, the seat unit is convertible from a use state, where the middle portion is coplanar with the left and right wing portions, to a collapsed state, where the middle portion is an included angle with each of the left and right wing portions;
[0012] two keyways each being disposed on an under surface of a corresponding one of the left and right wing portions, and each extending along the longitudinal direction to terminate at front and rear keyway ends;
[0013] two bracing bars each having a pivot end pivotally connected to the carrier, and a key end configured to be slidably engaged with a corresponding one of the keyways such that when the key end slides from the front key way end of a respective one of the key ways to the rear keyway end of the respective one of the key ways, the seat unit is converted from the use state to the collapsed state;
[0014] two prop legs each extending to terminate at a bottom end for standing on the ground, and a pivoted end pivotally connected to the carrier, the two prop legs being convertible between a straddling position, where the bottom ends of the prop legs are remote from the stick shank, and an upheld position, where the bottom ends are close to the stick shank such that when the collar sleeve is displaced from the distal position to the proximate position, the prop legs are permitted to move from the straddling position to the upheld position; and
[0015] first and second retaining members respectively disposed to prevent the collar sleeve and the carrier from moving toward the foot end and to permit the collar sleeve and the carrier to be retained at the distal and lower positions, respectively.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiments of the invention, with reference to the accompanying drawings, in which:

[0017] FIG. 1 is a perspective view of a chair-convertible walking stick according to a first preferred embodiment of this invention, where a seat unit of the chair-convertible walking stick is in a use state;
[0018] FIG. 2 is similar to FIG. 1, showing that the seat unit of the chair-convertible walking stick is in a collapsed state;
[0019] FIG. 3 is similar to FIG. 1, showing that the seat unit of the chair-convertible walking stick is in a state between the use state and the collapsed state, some elements in the right side of the walking stick being omitted for clarity;
[0020] FIG. 4 is similar to FIG. 2 but with some elements in the right side of the walking stick omitted;
[0021] FIG. 5 is a bottom view of the seat unit when the seat unit is in the use state;
[0022] FIG. 6 is a side view of the walking stick when the seat unit is in the use state;
[0023] FIG. 7 is similar to FIG. 6, showing that the seat unit is in a state between the use state and the collapsed state;
[0024] FIG. 8 is a fragmentary view of the seat unit when the seat unit is in the use state;
[0025] FIG. 9 is a perspective view of a carrier in the walking stick;
[0026] FIG. 10 is a fragmentary partly sectional view of the walking stick, showing a key assembly and a keyway in an engaged state;
[0027] FIG. 11 is a fragmentary bottom view of the seat unit;
[0028] FIG. 12 is a fragmentary partly sectional view of the walking stick, showing a third retaining member for retaining a collar sleeve in a proximate position;
[0029] FIG. 13 is a side view of a chair-convertible walking stick according to a second preferred embodiment of this invention, where a seat unit is in a state between a use state and a collapsed state;
[0030] FIG. 14 is a fragmentary cross-sectional view of a chair-convertible walking stick according to a third preferred embodiment of this invention; and
[0031] FIG. 15 is an exploded view, showing a fifth biasing member in a chair-convertible walking stick according to a fourth preferred embodiment of this invention.
Before the present invention is described in greater detail, it should be noted herein that same reference numerals are used to denote like elements throughout the specification.

Referring to FIGS. 1 to 7, a chair-convertible walking stick according to a first preferred embodiment of this invention includes a supporting unit 1, a conversion mechanism 2, a seat unit 3, and first and second retaining members 13, 14. The supporting unit 1 includes a stick shank 11, a grip 112, and two prop legs 12. The conversion mechanism 2 includes a collar sleeve 22, a carrier 21, two keyways 33, and two bracing bars 23.

The stick shank 11 extends in a lengthwise direction (X) to terminate at opposite grip and foot ends 113, 114. The grip 112 is connected to the grip end 113.

The collar sleeve 22 is sleeved on the stick shank 11 and is movable between distal and proximate positions, relative to the grip end 113.

The carrier 21 is slidably on the stick shank 11, and is movable between an upper position, where the collar sleeve 22 is moved to the proximate position, and a lower position, where the collar sleeve 22 is moved to the distal position.

The seat unit 3 includes a middle portion 31 and left and right wing portions 32. The middle portion 31 extends in a longitudinal direction (L) to terminate at a forward edge 312 and a rearward edge 311 which is pivotally connected to the collar sleeve 22. Each of the left and right wing portions 32 is blended to the middle portion 31 along a hinge line 313, and is juxtaposed with the middle portion 31 along the respective hinge line 313. When the collar sleeve 22 is displaced from the distal position to the proximate position, the seat unit 3 is convertible from a use state, where the middle portion 31 is coplanar with the left and right wing portions 32 (as best shown in FIGS. 1, 5, and 6), to a collapsed state, where the middle portion 31 is at an angled position with each of the left and right wing portions 32 (as best shown in FIGS. 2 and 4).

Each of the two keyways 33 is disposed on an under surface of a corresponding one of the left and right wing portions 32, and extends along the longitudinal direction (L) to terminate at front and rear keyway ends 331, 332. The front keyway end 331 is disposed remote from the respective hinged line 313, and the rear keyway end 332 is disposed close to the respective hinged line 313 so as to facilitate conversion of the seat unit 3 from the use state to the collapsed state.

Each of the two bracing bars 23 has a pivot end 231 pivotally connected to the carrier 21, and a key end 232 configured to be slidably engaged with a corresponding one of the keyways 33 such that when the key end 232 slides from the respective front keyway end 331 to the respective rear keyway end 332, the seat unit 3 is transformed from the use state to the collapsed state.

Each of the two prop legs 12 has a bottom end 124 for standing on the ground, and a pivoted end 125 pivotally connected to the carrier 21. The prop legs 12 are convertible between a straddling position (FIGS. 1 and 6), where the bottom ends 124 of the prop legs 12 are remote from the stick shank 11, and an upheld position (FIGS. 2 and 4), where the bottom ends 124 are close to the stick shank 11. When the collar sleeve 22 is displaced from the distal position to the proximate position, the prop legs 12 are permitted to move from the straddling position to the upheld position.

As best shown in FIGS. 1 and 6, when the walking stick is used as a chair, i.e., when the seat unit 3 is in the use state, the bracing bars 23 and the prop legs 12 are opposite to each other relative to the stick shank 11.

In this embodiment, each of the prop legs 12 includes upper and lower segments 121, 122 which are linked to each other. The upper segment 121 has the respective pivot end 125, and the lower segment 122 has the respective bottom end 124. When the prop legs 12 are in the distal position, the upper and lower segments 121, 122 are in an unfolded state, and when the prop legs 12 are in the uphill position, the upper and lower segments 121, 122 are in a folded state.

The first and second retaining members 13, 14 are respectively disposed to prevent the collar sleeve 22 and the carrier 21 from moving toward the foot end 114 and to retain the collar sleeve 22 and the carrier 21 at the distal and lower positions, respectively.

The walking stick further includes a third retaining member 28 which is disposed to prevent the collar sleeve 22 from moving toward the foot end 114 and to permit the collar sleeve 22 to be retained at the proximate position.

As shown in FIG. 1, the walking stick further includes first and second biasing members 27, 26. The first biasing member 27 is disposed to bias the collar sleeve 22 toward the first retaining member 13 by virtue of a first biasing force. The second biasing member 26 is disposed to bias the carrier 21 toward the second retaining member 14 by virtue of a second biasing force. When the collar sleeve 22 is subjected to a manual pulling force and is thereby displaced to a first transit position (not shown), where the manual pulling force counteracts the first and second biasing forces and gravity of the carrier 21 and the collar sleeve 22, the seat unit 3 is convertible from the use state to the collapsed state, and such that when the collar sleeve 22 is subsequently displaced to the proximate position and is retained thereat by the third retaining member 28, the carrier 21 is displaced to the upper position.

The stick shank 11 is formed with a lengthwise-extending groove 111. The first biasing member 27 is disposed in the lengthwise-extending groove 111 and has two ends respectively connected to the collar sleeve 22 and a groove-defining wall at a first position that is located between the first and second retaining members 13, 14. The second biasing member 26 is also disposed in the lengthwise-extending groove 111, and has two ends respectively connected to the carrier 21 and the groove-defining wall at a second position that is located between the second retaining member 14 and the foot end 114. In this embodiment, the stick shank 11 is formed with four lengthwise-extending grooves 111 which are angularly displaced apart from each other, and each of which has the first and second biasing members 27, 26.

Referring further to FIG. 1, when the seat unit 3 is in the use state for sitting, the collar sleeve 22 is displaced to the distal position, the carrier 21 is displaced to the lower position, the key end 232 of each bracing bar 23 is slid to the respective front keyway end 331, and the prop legs 12 are displaced to the straddling position.

Referring further to FIGS. 2 and 4, when the seat unit 3 is in the collapsed state for assisting walking, the collar sleeve 22 is displaced to the proximate position, the carrier 21 is displaced to the upper position, the key end 232 of each bracing bar 23 is slid to the respective rear keyway end 332, and the prop legs 12 are displaced to the upheld position.
Referring to FIG. 12, in this preferred embodiment, the collar sleeve 22 is formed with a hole 221, and the third retaining member 28 includes a button 222 and a biasing spring 230 which is disposed to urge the button 222 to extend outwardly of the stick shank 11 such that the button 222 is permitted to extend through the hole 221 of the collar sleeve 22 when the collar sleeve 22 is displaced to the proximate position to thereby retain the collar sleeve 22 thereat. To release the collar sleeve 22, it is simply necessary to press the button 222 to disengage the button 222 from the hole 221.

Referring further to FIG. 1, the walking stick further includes two strut members 24 and two linking members 123.

Each of the strut members 24 has a sleeve-side end 241 pivotally connected to the collar sleeve 22, and a bar-side end 242 pivotally connected to a corresponding one of the bracing bars 23 between the respective pivot end 231 and the respective key end 232 so as to facilitate sliding of the respective key end 232 between the respective front and rear keyway ends 331, 332. Furthermore, a distance between the bar-side end 242 and the respective pivot end 231 is slightly shorter than a distance between the bar-side end 242 and the respective key end 232.

Each linking member 123 has an upper linking end 126 pivotally connected to the collar sleeve 22, and a lower linking end 127 pivotally connected to the respective pivotal end 125 so as to facilitate displacement of each of the prop legs 12 between the straddling position and the upheld position.

Referring back to FIGS. 2 and 4, the seat unit 3 is configured such that, when in the collapsed state, the left and right wing portions 32 are disposed angularly about the stick shank 11 and define a gap 30 therebetween. The gap 30 is opposite to the middle portico 31 relative to the stick shank 11, and is configured to accommodate the prop legs 12 therebetween when the prop legs 12 are displaced to the upheld position. In addition, when the seat unit 3 is converted to the collapsed state, the bracing bars 23 and the strut members 24 are accommodated in a space between the middle portico 31 and the stick shank 11. Hence, when a person uses the walking stick with the seat unit 3 in the collapsed state for assisting walking, he/she is less likely to get hurt by the walking stick.

In this embodiment, referring to FIG. 8, the middle portico 31 extends to terminate at left and right margins 314 (only one is shown) that are adjacent to the left and right wing portions 32 and that are rounded. Each of the left and right porticoes 312 extends to terminate at a connection margin 321 (only one is shown) that is rounded. When a user is going to seat on the seat unit 3 to take the seat unit 3 to be fully transformed into the use state, his/her clothes is less likely to be clamped by a slit among the middle portico 31 and the left and right wing portions 32.

In addition, referring to FIGS. 8, 10 and 11, the chair-convertible walking stick further includes two key assemblies 25, each of which includes an engageable key unit 251 and a pivotable key unit 252. The engageable key unit 251 is configured to be slidably and rotatably engaged with the corresponding one of the keyways 33, and a second key position, where the key head 256 in a low-friction engagement with the corresponding one of the keyways 33, and a second key position, where the key head 256 is in a low-friction engagement with the corresponding one of the keyways 33. The fourth biasing member 250 is inserted between the key head 256 and is disposed between the key seat 254 and said key head 256 to bias the key head 256 to the first key position. Thus, by virtue of the biasing action of the fourth biasing member 250 which urges the key head 256 to abut against the corresponding one of the keyways 33, when the seat unit 3 is converted to the collapsed state, undesired wobbling movement of the key head 256 of each of the key assemblies 25 relative to the corresponding one of the keyways 33 can be prevented.
FIG. 15 illustrates a portion of a chair-convertible walking stick according to a fourth preferred embodiment of this invention. In this preferred embodiment, the walking stick further includes a fifth biasing member 35.

The fifth biasing member 35 is disposed adjacent to the rearward edge 311 of the middle portion 31 of the seat unit 3 to bias the seat unit 3 from the collapsed state to the use state.

While the present invention has been described in connection with what are considered the most practical and preferred embodiments, it is understood that this invention is not limited to the disclosed embodiments but is intended to cover various arrangements included within the spirit and scope of the broadest interpretations and equivalent arrangements.

What is claimed is:

1. A chair-convertible walking stick, comprising:
   a stick shank extending in a lengthwise direction to terminate at a grip end and a foot end;
   a collar sleeve seated on said stick shank and movable between distal and proximate positions relative to said grip end;
   a carrier configured to be slideable on said stick shank and movable between upper and lower positions;
   a seat unit including,
   a middle portion extending in a longitudinal direction to terminate at a forward edge and a rearward edge which is pivotally connected to said collar sleeve, and left and right wing portions each being juxtaposed with said middle portion along a hinge line, and each being hinged to said middle portion at the respective hinge line such that when said collar sleeve is displaced from the distal position to the proximate position, said seat unit is convertible from a use state, where said middle portion is coplanar with said left and right wing portions, to a collapsed state, where said middle portion is at an included angle with each of said left and right wing portions;
   two keyways each being disposed on an under surface of a corresponding one of said left and right wing portions, and each extending along the longitudinal direction to terminate at front and rear keyway ends;
   two bracing bars each baring a pivot end pivotally connected to said carrier, and a key end configured to be slidably engaged with a corresponding one of said keyways such that when said key end slides from said front keyway end of a respective one of said keyways to said rear keyway end of the respective one of said keyways, said seat unit is converted from the use state to the collapsed state; and
   two prop legs each extending to terminate at a bottom end for standing on the ground, and a pivoted end pivotally connected to said carrier, said two prop legs being convertible between a straddling position, where said bottom ends of said prop legs are remote from said stick shank, and an upheld position, where said bottom ends are close to said stick shank such that when said collar sleeve is displaced from the distal position to the proximate position, said prop legs are permitted to move from the straddling position to the upheld position.

2. The chair-convertible walking stick of claim 1, further comprising two strut members each having a sleeve-side end pivotally connected to said collar sleeve, and a bar-side end pivotally connected to a corresponding one of said bracing bars between said pivot end and said key end of the corresponding one of said bracing bars so as to facilitate sliding of said key end between said front and rear keyway ends of the respective one of said key-ways.

3. The chair-convertible walking stick of claim 2, further comprising first and second retaining members respectively disposed to prevent said collar sleeve and said carrier from moving toward said foot end and to permit said collar sleeve and said carrier to be retained at the distal and lower positions, respectively.

4. The chair-convertible walking stick of claim 3, further comprising a third retaining member disposed to prevent said collar sleeve from moving toward said foot end and to permit said collar sleeve to be retained at the proximate position.

5. The chair-convertible walking stick of claim 4, further comprising,
   a third biasing member disposed to bias said collar sleeve toward said carrier with a third biasing force, such that when said collar sleeve is subjected to a manual pulling force to be thereby displaced to a second transit position, where the manual pulling force counteracts the third biasing force, said carrier is displaced to the upper position, and such that when said collar sleeve is subsequently displaced to the proximate position and is retained thereat by said third retaining member, said seat unit is converted from the use state to the collapsed state.

6. The chair-convertible walking stick of claim 2, wherein said front keyway end is disposed remote from the respective hinged line, and said rear keyway end is disposed close to the respective hinged line so as to facilitate conversion of said seat unit from the use state to the collapsed state.

7. The chair-convertible walking stick of claim 2, further comprising two key assemblies each of which includes
   an engageable key unit configured to be slideably and rotatably engaged with the corresponding one of said keyways, and
   a pivotal key unit which is configured to be pivotally connected to said engageable key unit about a pivot axis, and which is configured to be pivotally connected to said key end of the corresponding one of said bracing bars.

8. The chair-convertible walking stick of claim 7, wherein said engageable key unit includes:
   a key seat formed with an insertion hole,
   a key stem extending in a lengthwise axis to terminate at a connected end and a free end, and configured to be inserted in said insertion hole so as to permit said key seat to rotate about the lengthwise axis which is perpendicular to the pivot axis,
   a key head connected, to said connected end of said key stem and displacable between a first key position, where said key head is in a high-friction engagement with the corresponding one of said keyways, and a second key position, where said key head is in a low-friction engagement with the corresponding one of said keyways, and
   a fourth biasing member sleeved on said key stem and disposed between said key seat and said key head to bias said key head to the first key position.

9. The chair-convertible walking stick of claim 2, wherein each of said prop legs includes upper and lower segments which are linked to each other, and which respectively have said pivoted end and said bottom end, such that when said prop legs are in the straddling position, said upper and lower
segments are in an unfolded state, and when said prop legs are in the upheld position, said upper and lower segments are in a folded state.

10. The chair-convertible walking stick of claim 9, further comprising two linking members each having an upper linking end pivotally connected to said collar sleeve, and a lower linking end pivotally connected to said pivot end of a respective one of said prop legs so as to facilitate displacement of each of said prop legs between the straddling position and the upheld position.

11. The chair-convertible waiting stick of claim 9, wherein said seat unit is configured such that when in the collapsed state, said left and right wing portions are disposed angularly about said stick shank and define a gap therebetween, said gap being opposite to said middle portion, relative to said stick shank, and being configured to accommodate said prop legs therein when said prop legs are displaced to the upheld position.

12. The chair-convertible walking stick of claim 2, wherein said carrier includes a hub body having an inner tubular surface slidably engaged with said stick shank, and an outer anchoring surface which is opposite to said inner tubular surface in radial directions, and which is configured to permit said bracing bars and said prop legs to be pivoted connected thereto.

13. The chair-convertible walking stick of claim 12, wherein said bracing bars and said prop legs are opposite to each other relative to said stick shank, when the seat unit is in the use state.

14. The chair-convertible walking stick of claim 12, wherein said inner tubular surface is configured to have a groove region for passage of said first retaining member therethrough and a raised region that abuts against said second retaining member when said carrier is displaced to the lower position.

15. The chair-convertible walking stick of claim 2, wherein said chair-convertible walking stick further comprises a fifth biasing member disposed adjacent to said rearward edge of said middle portion of said seat unit to bias said seat unit from the collapsed state to the use state.

16. A chair-convertible walking stick, comprising:
   - a stick shank extending in a lengthwise direction to terminate at a grip end and a foot end;
   - a collar sleeve sleeved on said stick shank and movable between distal and proximate positions relative to said grip end;
   - a carrier configured to be slidable on said stick shank and movable between upper and lower positions;
   - a seat unit including,
     - a middle portion extending in a longitudinal direction to terminate at a forward edge and a rearward edge which is pivotally connected to said collar sleeve, and left and right wing portions each being juxtaposed with said middle portion along a hinge line, and each being hinged to said middle portion at the respective hinge line such that when said collar sleeve is displaced from the distal position, to the proximate position, said seat unit is convertible from a use state, where said middle portion is coplanar with said left and right wing portions, to a collapsed state, where said middle portion is at an included angle with each of said left and right wing portions;
   - two keyways each being disposed on an under surface of a corresponding one of said left and right wing portions, and each extending along the longitudinal direction to terminate at front and rear keyway ends; and
   - two bracing bars each having a pivot end connected to said carrier, and a key end configured to be slidably engaged with a corresponding one of said keyways such that when said key end slides from said front keyway end of a respective one of said keyways to said rear keyway end of the respective one of said keyways, said seat unit is converted from the use state to the collapsed state.

17. The chair-convertible walking stick of claim 16, further comprising two strut members each having a sleeve-side end pivotally connected to said collar sleeve, and a bar-side end pivotally connected to a corresponding one of said bracing bars between said pivot end and said key end of the corresponding one of said bracing bars so as to facilitate sliding of said key end between said front and rear keyway ends of the respective one of said keyways.

18. The chair-convertible walking stick of claim 17, further comprising two key assemblies each of which includes an engageable key unit configured to be slidably and rotatably engaged with the corresponding one of said keyways, and
   - a pivotable key unit which is configured to be pivotally connected to said engageable key unit about a pivot axis, and which is configured to be pivotally connected to said key end of the corresponding one of said bracing bars.

19. The chair-convertible walking stick of claim 17, wherein said chair-convertible walking stick further comprises a fifth biasing member disposed adjacent to said rearward edge of said middle portion of said seat unit to bias said seat unit from the collapsed state to the use state.

20. The chair-convertible walking stick of claim 17, further comprising,
   - a third biasing member disposed to bias said collar sleeve toward said carrier with a third biasing force, such that when said collar sleeve is subjected to a manual pulling force to be thereby displaced to a second transit position, where the manual pulling force counteracts the third biasing force, said carrier is displaced to the upper position, and such that when, said collar sleeve is subsequently displaced to the proximate position and is retained therein, said seat unit is converted from the use state to the collapsed state.

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