A strut device for an umbrella includes an upper stave, a main stave having an inner end portion pivotally coupled to an outer end portion of the upper stave, a lower stave having an outer end portion pivotally coupled to the upper stave with a stave support, and an outer stave having an inner end portion pivotally coupled to the outer end portion of the main stave, the staves are made of a fiber reinforcing material, a number of couplers are attached onto the end portions of the staves and each has a metal member engaged onto the end portions of the staves, and an outer covering attached onto the metal member for covering and protecting the metal member and for preventing the couplers from scraping or damaging the canopy.
UMBRELLA HAVING PROTECTED STAVE ASSEMBLY

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to an umbrella, and more particularly to an umbrella having reinforced stave end couplers and having coated or covered or protective stave end couplers for preventing the stave end couplers from damaging the canopy or the like.

[0003] 2. Description of the Prior Art

[0004] Typical umbrella devices comprise a runner slidably attached onto a central telescoping post, and a number of whale bones or strut assemblies attached or coupled to the central telescoping post and the runner for stretching or supporting the canopy.

[0005] For example, U.S. Pat. No. 6,206,017 to Johnson et al. discloses one of the typical umbrella devices also comprising a number of strut assemblies attached or coupled to the central telescoping post and the runner for stretching or supporting the canopy, and the strut assemblies each include a number of struts pivotally coupled together and the struts are normally made of metal materials.

[0006] However, the struts that are made of metal materials may greatly increase the weight of the struts and the umbrella that may not be easily carried or operated. In addition, the metal struts may include sharp ends or side portions that may scrape or damage the canopy.

[0007] U.S. Pat. No. 6,230,725 to Ko discloses another typical umbrella device also comprising a number of strut assemblies made of carbon fiber rods and aluminum alloy portions for decreasing the weight and for resisting strong wind.

[0008] However, the aluminum alloy coupling portions of the struts are exposed and may also include sharp ends or side portions that may scrape or damage the canopy.

[0009] U.S. Pat. No. 6,626,198 to Tseng discloses a further typical umbrella device also comprising a number of strut assemblies made of plastic materials, fiber reinforcing materials, composite materials for increasing the bending strength of the strut assemblies and for decreasing the weight of the strut assemblies.

[0010] However, the strut assemblies made of plastic materials, fiber reinforcing materials, composite materials may have a bending strength that is not good for resisting strong wind.

[0011] U.S. Pat. No. 6,655,398 to Huang discloses a still further typical umbrella device also comprising a number of strut assemblies each having a number of struts pivotally coupled together with pivot pins and the struts are also normally made of metal materials.

[0012] However, the struts that are made of metal materials may greatly increase the weight of the struts and the umbrella that may not be easily carried or operated. In addition, the metal struts may include sharp ends or side portions that may scrape or damage the canopy.

[0013] The present invention has arisen to mitigate and/or obviate the afore-described disadvantages of the conventional strut assemblies and couplers or connectors for the struts of the strut assemblies for umbrellas.

SUMMARY OF THE INVENTION

[0014] The primary objective of the present invention is to provide an umbrella including a number of reinforced stave end couplers which are coated or covered or protected with soft or resilient outer coverings for preventing the stave end couplers from scraping or damaging the canopy or the like.

[0015] The other objective of the present invention is to provide an umbrella including a number of reinforced stave end couplers which are coated or covered or protected with soft or resilient outer coverings that have the same or similar color as that of the struts for preventing a difference of the color from being formed between the struts and the reinforced stave end couplers.

[0016] In accordance with one aspect of the invention, there is provided a strut assembly for an umbrella comprising an upper stave including an inner end portion and an outer end portion, the upper stave being made of a fiber reinforcing material, a first coupler and a second coupler attached onto the inner end portion and the outer end portion of the upper stave respectively, the first coupler and the second coupler each including a first metal member engaged onto the inner end portion and the outer end portion of the upper stave, and a first outer covering attached onto an outer peripheral portion of the first metal member for covering and protecting the first metal member, a main stave including an inner end portion pivotally coupled to the outer end portion of the upper stave with a first pivot pin, and including an outer end portion, the main stave being made of a fiber reinforcing material, a third coupler and a fourth coupler attached onto the inner end portion and the outer end portion of the main stave respectively, the third coupler and the fourth coupler each including a second metal member engaged onto the inner end portion and the outer end portion of the main stave, and a second outer covering attached onto an outer peripheral portion of the second metal member for covering and protecting the second metal member, a lower stave including an inner end portion, and an outer end portion pivotally coupled to the upper stave, the lower stave being made of a fiber reinforcing material, a fifth coupler and a sixth coupler attached onto the inner end portion and the outer end portion of the lower stave respectively, the fifth coupler and the sixth coupler each including a third metal member engaged onto the inner end portion and the outer end portion of the lower stave, and a third outer covering attached onto an outer peripheral portion of the third metal member for covering and protecting the third metal member, an outer stave including an inner end portion pivotally coupled to the outer end portion of the main stave with a second pivot pin, and including an outer end portion, the outer stave being made of a fiber reinforcing material, and a seventh coupler attached onto the inner end portion of the outer stave and including a fourth metal member engaged onto the inner end portion of the outer stave, and a fourth outer covering attached onto an outer peripheral portion of the fourth metal member for covering and protecting the fourth metal member.

[0017] The third coupler of the main stave includes an ear pivotally coupled to the second coupler of the upper stave with the first pivot pin. The first and the second and the third
and the fourth and the fifth and the sixth and the seventh couplers each include a flat end portion. The seventh coupler of the outer stave is pivotally coupled to the fourth coupler of the main stave with the second pivot pin.

[0018] A spring rod is coupled between the outer end portion of the upper stave and the inner end portion of the outer stave. The spring rod is coupled between the second coupler of the upper stave and the seventh coupler of the outer stave.

[0019] The outer stave includes an outer end portion, and an eighth coupler attached onto the outer end portion of the outer stave and having a metal member engaged onto the outer end portion of the outer stave, and an outer covering attached onto an outer peripheral portion of the metal member of the eighth coupler for covering and protecting the metal member of the eighth coupler.

[0020] A stave support is slidably attached onto the upper stave and pivotally coupled to the inner end portion of the lower stave with a third pivot pin. The stave support includes an ear pivotally coupled to the sixth coupler of the lower stave with the third pivot pin.

[0021] A spring rod is coupled between the outer end portion of the lower stave and the inner end portion of the main stave. The spring rod is coupled between the sixth coupler of the lower stave and the third coupler of the main stave.

[0022] The stave support includes a metal member slidably attached onto the upper stave and an outer covering attached onto an outer peripheral portion of the metal member of the stave support for covering and protecting the metal member of the stave support.

[0023] The stave support includes at least one notch formed in the metal member of the stave support for allowing the outer covering to be engaged into the notch of the metal member of the stave support.

[0024] The upper stave includes one or more recesses formed therein, and the first coupler and the second coupler each include at least one notch formed in the first metal member and aligned with the recess of the upper stave, and the first outer covering is engaged into the recess of the upper stave.

[0025] The main stave includes one or more recesses formed therein, and the third coupler and the fourth coupler each include at least one notch formed in the second metal member and aligned with the recess of the main stave, and the second outer covering is engaged into the recess of the main stave.

[0026] The lower stave includes one or more recesses formed therein, and the fifth coupler and the sixth coupler each include at least one notch formed in the third metal member and aligned with the recess of the lower stave, and the third outer covering is engaged into the recess of the lower stave.

[0027] Further objectives and advantages of the present invention will become apparent from a careful reading of the detailed description provided hereinbelow, with appropriate reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0028] FIG. 1 is a plan schematic view of a strut assembly for an umbrella in accordance with the present invention;

[0029] FIG. 2 is a partial exploded view of the strut assembly;

[0030] FIGS. 3, 4, 5 are cross sectional views of the strut assembly, taken along lines 3-3, 4-4, and 5-5 of FIG. 2 respectively;

[0031] FIG. 6 is a partial perspective view illustrating a prototype of the stave support for the strut assembly; and

[0032] FIG. 7 is a partial perspective view illustrating a portion of the stave support for the strut assembly.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0033] Referring to the drawings, and initially to FIGS. 1 and 2, an umbrella in accordance with the present invention comprises a whole bone device including a number of strut assemblies 10 to be attached to a central telescoping post (not shown), a stationary hub (not shown) which is provided on top of the central telescoping post, and a barrel or runner (not shown) which is slidably provided and attached onto the central telescoping post and which is slidable or movable or adjustable up and down along the central telescoping post. For clearly illustrating purposes, only one of the strut assemblies 10 is shown in the drawing figures, and the strut assemblies 10 include a number of staves pivotally secured together for supporting a canopy (not shown), and openable to an open and working position, and foldable to a compact folding structure.

[0034] The strut assembly 10 includes an upper stave 11 having an inner end portion 12 for attaching or coupling to the stationary hub (not shown) of the central telescoping post (not shown), and having a coupler 13 attached onto the inner end portion 12 of the upper stave 11 and having a flat end portion 14 for attaching or coupling to the stationary hub. The upper stave 11 further includes an outer end portion 15, and another coupler 20 attached onto the outer end portion 15 of the upper stave 11 and also having a flat end portion 21, and having one or more protrusions or ears 22 extended from the coupler 20. As shown in FIG. 3, the couplers 13, 20 each include a plastic or metal or stronger tubular body or member 23 engaged onto or around the end portions 12, 15 of the upper stave 11, and an outer covering 24 engaged or molded or applied or attached onto the outer peripheral portion of the tubular member 23.

[0035] It is preferable that the upper stave 11 is made of plastic materials, synthetic materials, fiber reinforcing materials, composite materials or the like, and the outer covering 24 may also be made of plastic materials, synthetic materials, fiber reinforcing materials, composite materials or soft or rubber or resilient materials, and may have a color the same as or similar to that of the upper stave 11 for allowing the upper stave 11 and the couplers 13, 20 to have the same or similar color and to prevent a color difference from being formed between the upper stave 11 and the couplers 13, 20. As shown in FIGS. 4, 6, 7, a stave support 25 is slidably provided and attached onto the upper stave 11 and includes one or more protrusions or ears 26 extended therefrom, and also includes a plastic or metal or stronger tubular body or member 27 engaged onto or around the upper stave 11, and an outer covering 28 engaged or molded or applied or attached onto the outer peripheral portion of the tubular member 27.
As shown in FIGS. 4, 6, 7, the tubular members 23, 27 of the couplers 13, 20 and the stave support 25 each include one or more voids or notches 29 formed therein and aligned with the recesses 16, 17, 18 of the upper stave 11 (FIG. 2) respectively for allowing the outer covering 28 to be molded or engaged into the tubular member 27 and also to be molded or engaged into the recesses 16, 17, 18 of the upper stave 11 respectively and thus for allowing the couplers 13, 20 and the stave support 25 to be stably attached or coupled to the upper stave 11, and thus for allowing the couplers 13, 20 and the stave support 25 to have a stronger or reinforced tubular member 23, 27.

In addition, the outer covering 28 may also be made of plastic materials, synthetic materials, fiber reinforcing materials, composite materials or soft or rubber or resilient materials, and may have a color the same as or similar to that of the upper stave 11 for allowing the upper stave 11 and the stave support 25 to have the same or similar color and to prevent a color difference from being formed between the upper stave 11 and the stave support 25, and thus for allowing the upper stave 11 and the couplers 13, 20 and the stave support 25 to have a smooth or beautiful outer appearance or contour.

A main stave 30 may also be made of plastic materials, synthetic materials, fiber reinforcing materials, composite materials or the like, and includes an inner end portion 31 for attaching or coupling to the outer end portion 15 of the upper stave 11 with such as a pivot pin 80 (FIG. 1), and a coupler 32 attached onto the inner end portion 31 of the main stave 30 and having a flat end portion 33 and having one or more protuberances or ears 34 extended from the coupler 32 and having one of the ears 34 coupled to the outer end portion 15 of the upper stave 11 or the coupler 20 with the pivot pin 80. The main stave 30 further includes an outer end portion 35, and another coupler 36 attached onto the outer end portion 35 of the main stave 30 and also having a flat end portion 37.

A lower stave 40 may also be made of plastic materials, synthetic materials, fiber reinforcing materials, composite materials or the like, and includes an inner end portion 41 for attaching or coupling to the barrel or runner (not shown) which is slidably provided and attached onto the central telescoping post, and a coupler 42 attached onto the inner end portion 41 of the lower stave 40 and having a flat end portion 43 for attaching or coupling to the barrel or runner. The lower stave 40 further includes an outer end portion 44 for attaching or coupling to the ears 26 of the stave support 25 with such as a pivot pin 81 (FIG. 1), and another coupler 45 attached onto the outer end portion 44 of the lower stave 40 and also having a flat end portion 46, and having one or more protuberances or ears 47 extended from the coupler 45, and having one of the ears 47 coupled to the ears 26 of the stave support 25 with the pivot pin 81.

As shown in FIGS. 2, 5, the couplers 32, 36, 42, 45 each also include a plastic or metal or stronger tubular body or member 48 engaged onto or around the end portions 31, 35, 41, 44 of the main stave 30 and the lower stave 40, and an outer covering 49 engaged or molded or applied or attached onto the outer peripheral portion of the tubular member 48, the outer coverings 49 may also be made of plastic materials, synthetic materials, fiber reinforcing materials, composite materials or soft or rubber or resilient materials, and may have a color the same as or similar to that of the main stave 30 and the lower stave 40 for allowing the main stave 30 and the lower stave 40 and the couplers 32, 36, 42 to have the same or similar color and to prevent a color difference from being formed between the main stave 30 and the lower stave 40 and the couplers 32, 36, 42, and thus for allowing the main stave 30 and the lower stave 40 and the couplers 32, 36, 42, 45 to have a smooth or beautiful outer appearance or contour.

The tubular members 48 of the couplers 32, 36, 42, 45 each also include one or more voids or notches 29 formed therein (FIG. 6) and aligned with the recesses 38, 39, 410, 440 of the main stave 30 and the lower stave 40 (FIG. 2) respectively for allowing the outer covering 49 to be molded or engaged into the tubular member 48 and also to be molded or engaged into the recesses 38, 39, 410, 440 of the main stave 30 and the lower stave 40 respectively and thus for allowing the couplers 32, 36, 42, 45 to be molded or engaged or anchored or secured onto the main stave 30 and the lower stave 40, and thus for allowing the couplers 32, 36, 42, 45 to have a stronger or reinforced tubular member 48.

An outer stave 50 may also be made of plastic materials, synthetic materials, fiber reinforcing materials, composite materials or the like, and includes an inner end portion 51 for attaching or coupling to the outer end portion 45 of the main stave 30 with such as a pivot pin 82 (FIG. 1), and a coupler 52 attached onto the inner end portion 51 of the outer stave 50 and having a flat end portion 53 and having one or more protrusions or ears 54 extended from the coupler 52 and having one of the ears 54 coupled to the outer end portion 35 of the main stave 30 or the coupler 36 with the pivot pin 82. The outer stave 50 further includes an outer end portion 55, and another coupler 56 attached onto the outer end portion 55 of the outer stave 50 and also having a flat end portion 57 for attaching or coupling to the canopy.

A lever or spring rod 60 is further provided and coupled between the main stave 30 and the lower stave 40, such as coupled between the couplers 32, 45 of the main stave 30 and the lower stave 40, and another lever or spring rod 70 is further provided and coupled between the upper stave 11 and the outer stave 50, such as coupled between the couplers 20, 52 of the upper stave 11 and the outer stave 50, the levers or spring rods 60, 70 may be used for such as stretching or supporting the staves 11, 30, 40, 50 of the strut assembly 10 at the outwardly opened working position or at the inwardly received or folded or storing position, and the levers or spring rods 60, 70 are not related to the present invention and will not be described in further details.

It is to be noted that the prior umbrella apparatuses failed to teach and to provide a coupler 13, 20, 32, 36, 42, 44 on either of the ends of the staves 11, 30, 40, 50 of the strut assembly 10 and having a plastic or metal or stronger tubular body or member 23, 27, 48 engaged onto or around the end portions of the staves 11, 30, 40, 50 and the stave support 25, and an outer covering 24 engaged or molded or applied or attached onto the outer peripheral portion of the tubular members 23, 27, 48 for allowing the stronger tubular members 23, 27, 48 to be suitably coated or covered or protected with the soft or resilient outer coverings 24, 28, 49 and for preventing the staves 11, 30, 40, 50 and the stave support 25 and the couplers 13, 20, 32, 36, 42, 44 from
scraping or damaging the canopy or the like and for preventing a color difference from being formed between the staves 11, 30, 40, 50 and the stave support 25 and the reinforced stave end couplers, 20, 32, 36, 42, 44.

[0045] Accordingly, the umbrella in accordance with the present invention includes a number of reinforced stave end couplers which are coated or covered or protected with soft or resilient outer coverings for preventing the stave end couplers from scraping or damaging the canopy or the like and for preventing a difference of the color from being formed between the staves and the reinforced stave end couplers.

[0046] Although this invention has been described with a certain degree of particularity, it is to be understood that the present disclosure has been made by way of example only and that numerous changes in the detailed construction and the combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as hereinafter claimed.

1 claim:

1. A strut assembly for an umbrella comprising:
an upper stave including an inner end portion and an outer end portion, said upper stave being made of a fiber reinforcing material,
a first coupler and a second coupler attached onto said inner end portion and said outer end portion of said upper stave respectively, said first coupler and said second coupler each including a first metal member engaged onto said inner end portion and said outer end portion of said upper stave, and a first outer covering attached onto an outer peripheral portion of said first metal member for covering and protecting said first metal member,
a main stave including an inner end portion pivotally coupled to said outer end portion of said upper stave with a first pivot pin, and including an outer end portion, said main stave being made of a fiber reinforcing material,
a third coupler and a fourth coupler attached onto said inner end portion and said outer end portion of said main stave respectively, said third coupler and said fourth coupler each including a second metal member engaged onto said inner end portion and said outer end portion of said main stave, and a second outer covering attached onto an outer peripheral portion of said second metal member for covering and protecting said second metal member,
a lower stave including an inner end portion, and an outer end portion pivotally coupled to said upper stave, said lower stave being made of a fiber reinforcing material,
a fifth coupler and a sixth coupler attached onto said inner end portion and said outer end portion of said lower stave respectively, said fifth coupler and said sixth coupler each including a third metal member engaged onto said inner end portion and said outer end portion of said lower stave, and a third outer covering attached onto an outer peripheral portion of said third metal member for covering and protecting said third metal member,
an outer stave including an inner end portion pivotally coupled to said outer end portion of said main stave with a second pivot pin, and including an outer end portion, said outer stave being made of a fiber reinforcing material, and
a seventh coupler attached onto said inner end portion of said outer stave and including a fourth metal member engaged onto said inner end portion of said outer stave, and a fourth outer covering attached onto an outer peripheral portion of said fourth metal member for covering and protecting said fourth metal member.

2. The strut assembly as claimed in claim 1, wherein said third coupler of said main stave includes an ear pivotally coupled to said second coupler of said upper stave with said first pivot pin.

3. The strut assembly as claimed in claim 1, wherein said first and said second and said third and said fourth and said fifth and said sixth and said seventh couplers each include a flat end portion.

4. The strut assembly as claimed in claim 1, wherein said seventh coupler of said outer stave is pivotally coupled to said fourth coupler of said main stave with said second pivot pin.

5. The strut assembly as claimed in claim 1, wherein a spring rod is coupled between said outer end portion of said upper stave and said inner end portion of said outer stave.

6. The strut assembly as claimed in claim 5, wherein said spring rod is coupled between said second coupler of said upper stave and said seventh coupler of said outer stave.

7. The strut assembly as claimed in claim 1, wherein said outer stave includes an outer end portion, and an eighth coupler attached onto said outer end portion of said outer stave and having a metal member engaged onto said outer end portion of said outer stave, and an outer covering attached onto an outer peripheral portion of said metal member of said eighth coupler for covering and protecting said metal member of said eighth coupler.

8. The strut assembly as claimed in claim 1, wherein a stave support is slidably attached onto said upper stave and pivotally coupled to said inner end portion of said lower stave with a third pivot pin.

9. The strut assembly as claimed in claim 8, wherein said stave support includes an ear pivotally coupled to said sixth coupler of said lower stave with said third pivot pin.

10. The strut assembly as claimed in claim 8, wherein a spring rod is coupled between said outer end portion of said lower stave and said inner end portion of said main stave.

11. The strut assembly as claimed in claim 10, wherein said spring rod is coupled between said sixth coupler of said lower stave and said third coupler of said main stave.

12. The strut assembly as claimed in claim 8, wherein said stave support includes a metal member slidably attached onto said upper stave and an outer covering attached onto an outer peripheral portion of said metal member of said stave support for covering and protecting said metal member of said stave support.

13. The strut assembly as claimed in claim 12, wherein said stave support includes at least one notch formed in said metal member of said stave support for allowing said outer covering to be engaged into said at least one notch of said metal member of said stave support.

14. The strut assembly as claimed in claim 1, wherein said upper stave includes a recess formed therein, and said first coupler includes at least one notch formed in said first metal
member of said first coupler and aligned with said recess of said upper stave, and said first outer covering is engaged into said recess of said upper stave.

15. The strut assembly as claimed in claim 1, wherein said upper stave includes a recess formed therein, and said second coupler includes at least one notch formed in said first metal member of said second coupler and aligned with said recess of said upper stave, and said first outer covering is engaged into said recess of said upper stave.

16. The strut assembly as claimed in claim 1, wherein said main stave includes a recess formed therein, and said third coupler includes at least one notch formed in said second metal member of said third coupler and aligned with said recess of said main stave, and said second outer covering is engaged into said recess of said main stave.

17. The strut assembly as claimed in claim 1, wherein said main stave includes a recess formed therein, and said fourth coupler includes at least one notch formed in said second metal member of said fourth coupler and aligned with said recess of said main stave, and said second outer covering is engaged into said recess of said main stave.

18. The strut assembly as claimed in claim 1, wherein said lower stave includes a recess formed therein, and said fifth coupler includes at least one notch formed in said third metal member of said fifth coupler and aligned with said recess of said lower stave, and said third outer covering is engaged into said recess of said lower stave.

19. The strut assembly as claimed in claim 1, wherein said lower stave includes a recess formed therein, and said sixth coupler includes at least one notch formed in said third metal member of said sixth coupler and aligned with said recess of said lower stave, and said third outer covering is engaged into said recess of said lower stave.

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