[0063] With reference now to FIG. **7**, another embodiment of the orthosis **100** is shown in which at least one of the proximal cuff **110** or ankle section/footplate **140** comprise a laminate material.

G. Knee Ankle Foot Orthosis

[0064] With reference now to FIGS. **8-9**, an embodiment of the present invention directed to a knee ankle foot orthosis **300** is shown. In one or more embodiments, the knee ankle foot orthosis **300** may comprise a modular removable fabricated version that allows a patient to attach or detach a knee orthosis section **305** to an ankle foot orthosis (AFO) section **310** depending on desired activity and limb stability needs.

[0065] In one or more embodiments, the knee ankle orthosis **300** may comprise a fixed version comprising a connector or hinge **315** (e.g., Tm5 or original TOWNSEND stainless steel knee hinge) in which the upper knee orthosis section **305** is connected or fused to the lower ankle foot orthosis section **310**.

[0066] The knee ankle foot orthosis may be either modular or fixed, and may be used for varying weaknesses, nerve injuries, ligamnentous injuries, proximal knee or femoral fx's histories to allow a patient to walk, run, or perform some level of high impact activity with greater function and increased safety.

[0067] Knee ankle foot orthosis versions, both modular and fixed, may also be used for dynamic exoskeletal orthosis cases deploying and participating in fast rope helicopter jumps, static line parachuting, or standard parachuting maneuvers to prevent potential knee injuries while using the dynamic exoskeletal orthosis for prior injury of the ankle, nerve, and the like.

H. Single Strut Embodiment

[0068] With reference now to FIGS. **10-11**, an exoskeletal orthosis **100** may comprise a proximal cuff **110**, an ankle section/footplate **140**, and a single posterior strut **130** (e.g., MEDI CLEVER STRUT) connecting a rear of the proximal cuff to a rear of the ankle section/footplate. In specific embodiments a top of the single posterior strut may be incorporated into a rear of proximal cuff **110** and a bottom of the single posterior strut may be incorporated into a rear of the ankle section/footplate **140**. As shown in FIGS. **10-11**, the proximal cuff **110** may have at least one strap **120** that at least partially surround two parts of the proximal cuff that are joined by hinge **115** (see also FIG. **2**). The at least one strap **120** may have a buckle, clasp, VELCRO®, snap-fit, or other means for adjusting the at least one strap.

[0069] In specific embodiments, the single posterior strut **130** may have a tubular or cylindrical shape. The length the single posterior strut may be chosen based on the needs of a patient or user. A longer strut may confer addition flexibility, while a shorter strut may give added support to the user's leg depending on the particular injury. In specific embodiments, the single strut may have a length of between about 5 inches to 13 inches (15.2 cm to 33 cm), for example 7 inches to 11 inches (17.8 cm to 28 cm). Likewise, the diameter of the single posterior strut may be based on at least one of a weight of the user, activity level of the user, or the nature of the user's injury. In specific embodiments, the single posterior strut **130** may comprise at least one of a carbon material, reinforced carbon fiber composition, or resin material.

[0070] The single posterior strut embodiment may allow for increased flexibility, for example during walking, and also allows for increased twisting ability, for example during activities requiring rotation (e.g., golf). The single posterior strut embodiment is particularly adaptable to daily use and wear, but not for an extended period of running or strenuous activity. In contrast, a dual strut configuration (e.g., FIG. **3**) may be used for strenuous activities.

I. Modified Knee Ankle Foot Orthosis

[0071] With reference now to FIGS. **12-15**, another embodiment of a knee ankle foot orthosis **300** is shown comprising an upper knee orthosis section or cuff **305** connected to an ankle foot orthosis section **310** (proximal cuff **110**, at least one posterior strut **130**, and ankle section/footplate **140**). In a specific embodiment, the at least one posterior strut may comprise dual posterior struts connecting a rear of the proximal cuff to a rear of the ankle section/footplate.

[0072] In specific embodiments, a modified knee ankle foot orthosis **300** may comprise a modular removable version that allows a patient to attach or detach the knee orthosis section **305** to the ankle foot orthosis (AFO) section **310** depending on desired activity and limb stability needs.

[0073] A fixed version of the knee ankle orthosis may also be provided in which the upper knee ankle orthosis section **305** and ankle foot orthosis section **310** may be monolithic. The fixed version may be appropriate, for example, for a user who has a spinal cord injury of a permanent knee nerve injury. In one or more embodiments, the fixed version of the knee ankle foot orthosis **300** may comprise a connector or hinge **315** (e.g., Tm5 or original TOWNSEND knee hinges) with an upper knee orthosis section or cuff **305** fused to a lower monolithic exoskeletal ankle foot orthosis section **310**.

[0074] The upper knee orthosis section **305** may comprise at least one strap **320** (for example, two straps as shown in FIG. **13**) to at least partially surround both the knee ankle orthosis section **305** and a rear a user's leg above the knee, thereby helping affix the knee orthosis section **305** to the user. The at least one strap **120** may have a buckle, clasp, VELCRO®, snap-fit, or other means for adjusting the at least one strap.

[0075] In FIGS. **12-15**, the upper knee orthosis section **305** comprises at least one stretchable band **325** affixed on each side, for example, two stretchable bands **325** affixed on each side. The at least one stretchable band **325** may be fixed at a proximal attachment or a distal attachment on the upper knee orthosis section **305**. For example, there may be one stretchable band **325** affixed proximally at or near the posterior of the knee orthosis section between lower and upper straps **120** and another stretchable band **325** affixed distally at or near a side of the knee orthosis section on a lower strap (see e.g., FIG. **13**).

[0076] In specific embodiments, the at least one stretchable band **325** may comprise a rubber material, an elastic material, or a bungee cord material. In a specific embodiment, the at least one stretchable band may comprise an elastic band adapted from a PHYSIONETICS® VP2 terminal device.

[0077] The at least one stretchable band **325** may be attached to the knee ankle orthosis section **305** by an appropriate means including, but not limited to, a bolt, rivet, screw, snap-fit, or pivoting clasp. In a specific embodiment, a pivoting clasp may move or pivot when a user's knee moves.

[0078] When in use, the at least one stretchable band **325** from the upper knee orthosis section **305** may be manually