comprises the combination of WPHF-NMES to the muscle groups and b) a specific physical activity regime in accordance with a protocol.

[0009] The invention is also directed to a system for the rehabilitation, treatment or recovery of a subject afflicted with a neuromuscular injury, disease or disorder. The system includes a plurality of surface electrodes; a stimulator coupled to the plurality of surface electrodes; and a controller coupled to the stimulator, wherein the controller is adapted to control the stimulator to administer simultaneously WPHF-NMES to a plurality of muscle groups in accordance with a protocol. The controller is configured to control the stimulator such that a single session of WPHF-NMES comprises an initial increase in frequency from DC to 150 Hz, remaining at this high frequency to produce a muscle contraction appropriate for a specific physical activity.

Brief Description of the Figure

[0010] Figure 1 depicts an exemplary embodiment of a NMES system in accordance with invention.

Detailed Description of the Invention

[0011] It is to be understood that the figures and descriptions of the present invention have been simplified to illustrate elements that are relevant for a clear understanding of the present invention, while eliminating, for the purpose of clarity, many other elements found in typical systems and arrangements. Those of ordinary skill in the art will recognize that other elements and/or steps are desirable and/or required in implementing the present invention. However, because such elements and steps are well known in the art, and because they do not facilitate a better understanding of the present invention, a discussion of such elements and steps is not provided herein. The disclosure herein is directed to all such variations and modifications to such elements and methods known to those skilled in the art. Furthermore, the embodiments identified and illustrated herein are for exemplary purposes only, and are not meant to be exclusive or limited in their description of the present invention.

[0012] The methods and system of the invention facilitate the modulation of the electrophysiological properties of CNS circuits during a specific task. These enable the activation of CNS circuits by the combination of intentional supraspinal signals from the

participant, afferent signals evoked by the NMES and sensory feedback provided by proprioceptors activated during the task. Together these signals drive plasticity of the nervous system to recover that specific motor function. Also, the consistent activation of CNS circuitry

Claims:

1. A system for rehabilitation, treatment or recovery of a subject afflicted with a neuromuscular injury, disease or disorder that results in paralysis and comprising of:

a) a plurality of surface electrodes;

b) a stimulator coupled to the plurality of surface electrodes; and

c) a controller coupled to the stimulator, wherein the controller is configured to control the stimulator administer simultaneously WPHF-NMES sessions to a plurality of muscle groups in accordance with a protocol, and wherein said controller is configured to control the stimulator such that a single session of WPHF-NMES comprises an initial increase in frequency from DC to 150 Hz, remaining at this high frequency to produce a muscle contraction appropriate for a specific physical activity.

2. The system according to claim 1, wherein the controller is configured to control the stimulator to generate a pulse width of 0.5 to 3 milliseconds or greater for a minimum of one interventional training session of WPHF-NMES to said muscle groups combined with a specific physical activity regime to produce contractions at least in part via pathways through the central nervous system of said subject.

3. The system according to claim 2, wherein said controller is configured to control the stimulator to generate a high frequency on the order of 50-150 Hz.

4. The system according to claim 1, wherein said controller is configured to control the stimulator to administer at least one of the WPHF-NMES while a loading force is applied to said subject.