including motor driven systems such as screw-thread systems, and pneumatic systems.

SUMMARY OF THE INVENTION

According to the present ~~invention~~disclosure there is provided a remote control unit for controlling a battery-operated power system, the remote control unit comprising:

an actuator command circuit configured for generating a command signal for commanding operation of an actuator of the battery-operated power system;

a battery level control circuit configured for receiving a control signal representing a battery level of a battery, or of a group of batteries, of the battery-operated power system; and

an operator assistance module, operably connected to said battery level control circuit, said operator assistance module configured for generating at least one operator assistance event, detectable or otherwise perceivable by the operator, directly or indirectly.

The operator assistance event is associated to said battery level and can thus inform an operator on the status of the battery, or help the operator to manage the battery level.

There is also provided a remote control unit for controlling a battery-operated hydraulic power system, the remote control unit comprising:

a hydraulic actuator command circuit configured for generating a command signal for commanding operation of an hydraulic actuator of the battery-operated hydraulic power system;

a battery level control circuit configured for receiving a control signal representing a battery level of a battery, or of a group of batteries, of the battery-operated hydraulic power system; and

an operator assistance module, operably connected to said battery level control circuit (30), said operator assistance module configured for generating at least one operator assistance event, said operator assistance event being associated to said battery level,

wherein said operator assistance module comprises a battery cut-out circuit configured for inhibiting generation of the command signal.

According to a preferred aspect of the present invention, there is provided a remote control unit for controlling a battery-operated hydraulic power system, the remote control unit comprising:

a hydraulic actuator command circuit configured for generating a command signal for commanding operation of an hydraulic actuator of the battery-operated hydraulic power system;

a battery level control circuit configured for receiving a control signal representing a battery level of a battery, or of a group of batteries, of the battery-operated hydraulic power system; and

an operator assistance module, operably connected to said battery level control circuit, said operator assistance module configured for generating at least one operator assistance event, ~~detectable or otherwise perceivable by the operator, directly or indirectly~~ said operator assistance event being associated to said battery level.

The remote control unit can be configured for being held by hand by the operator.

The remote control unit can be part of a wired assembly connected to the power system. Such assemblies are sometimes referred to as "wander leads".

Preferably, said actuator command circuit is configured for generating the command signal in response to an action exerted by an operator on the remote control unit, so that the operator is required actively to perform said action if he wishes to operate the actuator. The operator can thus decide whether to perform said action if the operator assistance event has been triggered.

Preferably, said action is a pressure exerted by said operator on a button of the remote control unit.

Said battery level control circuit can be configured for:

a) logically processing said control signal; and

b) generating at least one assistance signal, each assistance signal being generated in response to a respective predetermined logical criterion. Said predetermined logical criterion can simply be a threshold criterion. For example, for a

According to a further aspect of the present invention, there is provided a remote-controlled and battery-operated hydraulic power system comprising at least a battery, a hydraulic actuator and a remote control unit according to any one of the preceding clauses. Said system can be provided e.g. on a vehicle or trailer.

According to a further aspect of the invention, there is provided a method for assisting an operator of a battery-operated power system to gather information on, or to manage, battery level ~~in connection with said system~~, said method comprising the steps of:

providing a remote-controlled and battery-operated hydraulic power system of the above mentioned type, i.e. in accordance with embodiments of the invention;

receiving in or on the remote control unit a control signal representative of the battery level of said at least one battery;

logically processing said control signal in the remote control unit ~~according to a predetermined logic criterion~~;

generating in or on the remote control unit an operator assistance event associated with said battery level.

According to a further aspect of the invention, there is provided a method for assisting an operator of a battery-operated hydraulic power system to gather information on, or to manage, battery levels, said method comprising the steps of: providing a remote-controlled and battery-operated hydraulic power system comprising at least a battery, a hydraulic actuator and a remote control unit or wander lead for controlling a battery-operated hydraulic power system, the remote control unit or wander lead comprising: a hydraulic actuator command circuit configured for generating a command signal for commanding operation of an hydraulic actuator of the battery-operated hydraulic power system; a battery level control circuit configured for receiving a control signal representing a battery level of a battery, or of a group of batteries, of the battery-operated hydraulic power system; and an operator assistance module, operably connected to said battery level control circuit, said operator assistance module configured for generating at least one operator assistance event, said operator assistance event being associated to said battery level; receiving in or on the remote control unit a control signal representative of the battery level of said at least one battery; logically processing said control signal in the remote control unit; and generating in or on the remote control unit an operator assistance event associated with said battery level.

Preferably said predetermined criterion is a criterion related to a condition of low charge of said battery.

Preferably the method further comprises the step of cutting out generation of said command signal in the remote control unit or alternatively activating an external battery cut-out device provided e.g. close to the battery. This may be a first event, or it may be an event subsequent to one or more of an audible, visual or tactile event.

The present invention also provides a remote-controlled and battery-operated hydraulic power system comprising at least a battery, a hydraulic actuator and a remote control unit or wander lead for controlling a battery-operated hydraulic power system, the remote control unit or wander lead comprising:

a hydraulic actuator command circuit configured for generating a command signal for commanding operation of an hydraulic actuator of the battery-operated hydraulic power system;

a battery level control circuit configured for receiving a control signal representing a battery level of a battery, or of a group of batteries, of the battery-operated hydraulic power system; and

an operator assistance module, operably connected to said battery level control circuit, said operator assistance module configured for generating at least one operator assistance event, said operator assistance event being associated to said battery level.

Other preferred features are set out in the preceeding and following passages.

The present invention also provides a method for assisting an operator of a battery-operated hydraulic power system to gather information on, or to manage, battery levels, said method comprising the steps of:

providing a remote-controlled and battery-operated hydraulic power system *comprising at least a battery, a hydraulic actuator and a remote control unit or wander* lead for controlling a battery-operated hydraulic power system, the remote control unit or wander lead comprising:

a hydraulic actuator command circuit configured for generating a command signal for commanding operation of an hydraulic actuator of the battery-operated hydraulic power system;

a battery level control circuit configured for receiving a control signal representing a battery level of a battery, or of a group of batteries, of the battery-operated hydraulic power system; and

an operator assistance module, operably connected to said battery level control circuit, said operator assistance module configured for generating at least one operator assistance event, said operator assistance event being associated to said battery level;

receiving in or on the remote control unit or wander lead a control signal representative of the battery level of said at least one battery;

logically processing said control signal in the remote control unit or wander lead; and

generating in or on the remote control unit or wander lead an operator assistance event associated with said battery level.

Other preferred features are set out in the preceeding and following passages.

Further preferred features are set out below and in the appended claims.

an operator assistance module, operably connected to said battery level control circuit, said operator assistance module configured for generating at least one operator assistance event, said operator assistance event being associated to said battery level.

28. A system according to claim 27, comprising a remote control unit as defined in any one of claims 1 to 25.

29. A method for assisting an operator of a battery-operated hydraulic power system to gather information on, or to manage, battery levels, said method comprising the steps of:

providing a remote-controlled and battery-operated hydraulic power system according to claims 26 or claim 27;

receiving in or on the remote control unit a control signal representative of the battery level of said at least one battery;

logically processing said control signal in the remote control unit;

generating in or on the remote control unit an operator assistance event associated with said battery level.

~~28~~30. A method for assisting an operator of a battery-operated hydraulic power system to gather information on, or to manage, battery levels, said method comprising the steps of:

providing a remote-controlled and battery-operated hydraulic power system comprising at least a battery, a hydraulic actuator and a remote control unit or wander lead for controlling a battery-operated hydraulic power system, the remote control unit or wander lead comprising:

a hydraulic actuator command circuit configured for generating a command signal for commanding operation of an hydraulic actuator of the battery-operated hydraulic power system;

a battery level control circuit configured for receiving a control signal representing a battery level of a battery, or of a group of batteries, of the battery-operated hydraulic power system; and

an operator assistance module, operably connected to said battery level control circuit, said operator assistance module configured for generating at least one operator assistance event, said operator assistance event being associated to said battery level;

receiving in or on the remote control unit a control signal representative of the battery level of said at least one battery;

logically processing said control signal in the remote control unit; and

generating in or on the remote control unit an operator assistance event associated with said battery level.

~~30~~31. A method for assisting an operator of a battery-operated hydraulic power system to gather information on, or to manage, battery levels, said method comprising the steps of:

providing a remote-controlled and battery-operated hydraulic power system comprising at least a battery, a hydraulic actuator and a remote control unit or wander lead for controlling a battery-operated hydraulic power system, the remote control unit or wander lead comprising:

a hydraulic actuator command circuit configured for generating a command signal for commanding operation of an hydraulic actuator of the battery-operated hydraulic power system;

a battery level control circuit configured for receiving a control signal representing a battery level of a battery, or of a group of batteries, of the battery-operated hydraulic power system; and

an operator assistance module, operably connected to said battery level control circuit, said operator assistance module configured for generating at least one operator assistance event, said operator assistance event being associated to said battery level;

receiving in or on the remote control unit or wander lead a control signal representative of the battery level of said at least one battery;

logically processing said control signal in the remote control unit or wander lead; and

generating in or on the remote control unit or wander lead an operator assistance event associated with said battery level.

~~31~~32. A method according to claim ~~30~~31, the system comprising a remote control unit as defined in any one of claims 1 to 25.