Alternative Design #3

Hand Control Riding Lawn Mower

Team #4
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This design calls for a system of assistant levers and small motors that will mechanically provide the needed force to control the various functions of the lawn mower. The needed power to generate the force controlling these mower functions will be provided by three battery powered motors. Each mower function will be individually operated by its own separate motor and will individually be housed at the original spot of the main lever. The mower will be controlled by a joystick and three switches, which will enable the operator to use all the mower’s functions.

3.1 Seat

First, modifications to the seat will have to be made for safety and to promote ease of use for the client. The end of the seat, which supports the client’s back, will have to be extended and mounted with armrests made of steel, enclosed by a protective foam. The seat will be extended in a bench format to allow him to slide easily up to and down from the mower. In the middle of the seat where the controls are will be two locking armrests with a joystick mounted on the left side. The seat will also be fitted with a standard seat belt to ensure the client’s safety.

Another modification made to make the mower easier to use is the addition of a handle and step located next to the seat. On the base of the mower a small ledge will allow the client to support one of his legs while he transfers from his wheelchair to the mower. Along with the transferring step a handle grip will assist the client into getting into the mower chair. The left side of the mower will act as the loading and unloading area.

3.2 Steering

The joystick will be programmed to understand and equate the force in which the client pushes on it and translate that into a rate of turning by the wheels. Once the mower is in gear the joystick will be able to control the amount of power coming from the engine. The joystick will be integrated in such a way that it will control the amount of force that the brake pads place on the mower’s brake rotors, controlling the speed in which the wheels turn. When the joystick is pushed into a forward position, relative to the driver, the mower will adjust the clutch accordingly to generate more speed. When the joystick is turned to the right or left there will be a translation into the change of direction of the mower’s steering. The joystick will be mounted on top of the left-hand modified armrest.

3.3 Mower Controls

This design will incorporate individual housing units around each of the mower controls. Each housing unit will have its own motor and control switch. The control switch and housing unit will be located directly on top of the original lever. A small assistant lever, inside the housing unit, will engage or disengage the appropriate mower control. A unit to house each individual switch, which controls the motor, will be located directly on top of the built housing unit. Once activated the motor will power the assistant lever, which will operate the main original lever controlling that certain mower function. The operator will be able to easily engage or disengage each mower function as desired. The emergency power off switch, the drive-train gear and the mower’s blade will be controlled in this fashion.