DESIGN CONSTRUCTION UNIT CONTROL OF WHEELCHAIR MOVEMENT THAT ABLE TO MOVING UPWARD

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Abstract

One of the main challenge for wheelchair user is to cross upward street, like high way street, shopping area and mall, even at moving up and down street. Beside that, the result from the distributed questionnaire to wheelchair user in Surabaya city at the end of Year 2005 and the beginning year 2006 shows that 70% of the respondent doesn’t want to be assist by the guide anymore when they are doing indoor and outdoor activities. On the year of 2009 and continue at the year of 2011 had been designed a wheelchair that can be moving on the upward street but the designated wheelchair not yet being realized and still many weakness on the designing. For that purpose it is design a wheelchair that can go on upward street.

On this research will be applied construction design unit on the wheelchair control. This construction design unit control are covering designing unit of wheelchair to move straight, turn and upward. Controller type that being used in the designing of the control unit is PID (Proportional Integral Derivative). The unit control design can be aim also for adjusting the wheelchair seat to be always on horizontal position. This matter can be achieved with adjusting pneumatic cylinder through open close valve. For detecting the track latitude at the time the wheelchair going on upward street is used potential-meter balancer.

The result from this construction design control unit is a prototype of electric wheelchair control unit that able to move on
the flat road without weight and with 5 kilogram weight has resulted “Error Duty Cycle” DC motor on each of it for 25% and 26.57%. At the time it was moving on upward road without weight and with using weight 5 kilogram has resulted “Error Duty Cycle” DC motor on each of it for 35% and 35.90%. By the error occurrence, so RPM that has been resulted by the DC motor will go down so the time that has been needed for the wheelchair to going on 1 meter distance will be higher. Moreover the wheelchair can be turning with radius of 1.384 meter.

**Key words**: Wheelchair, control unit, PID, potentiometer balancer, upward, turn and forward backward