

DEVELOPMENT OF A REDUCED SCALE PAINTING ROBOT

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ABSTRACT

In this study a reduced scale painting robot is designed for spray painting of flat surfaces. The availability of such low cost reduced scale robot enables better understanding of robot concepts, functions and offers easier manipulation of the robot. Moreover possible future modifications can be introduced easily at low expense. The designed robot incorporates two degrees of freedom system. Each one is realized by a sliding prismatic joint which is activated by double acting compressed air cylinder. Each pneumatic actuator is controlled by a solenoid valve which controls the air flows from the compressor to the actuator. A microprocessor controller is used to control the valves. An interface circuit is designed to join the microprocessor unit to the relays of the solenoid valves. The robot is manipulated by introducing the appropriate sequence of data in the microprocessor memory. A prototype of completely pneumatic and controllable manipulator has now been constructed. The working capabilities of the prototype has now been demonstrated.

KEYWORDS

SPRAY PAINTING - ROBOT TECHNOLOGY - ACTUATOR AND JOINT DESIGN - ROBOT MODELLING - ANALYSIS OF PNEUMATIC CONTROL SYSTEMS - STABILITY ANALYSIS - MICROPROCESSOR - INTERFACING - SIMULATION.