Thesis Title A Study on the Design and Construction of the High-Voltage Electrophoretic Apparatus

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ABSTACT

Electrophoresis is a solvent separation process of the substances that solved in a solution by using their electrical characteristic. This process can be applied in a diagnosis and medical research.

In this thesis study, it is a study on the design and construction of a high-voltage electrophoretic apparatus by using a domestic appropriate technology on the design and construction. The prototype uses the switching technique at 40 kHz. This prototype provides small, light and high efficiency. It is able to be used in a voltage control mode or a current control mode and able to adjust voltage from 0 to 2,000 V and current from 0 to 300 mA. At the maximum load, the voltage regulation of this prototype is about 5%, its current regulation is varied between 6 to 8%, its line regulation is about 2% and its ripple is about 2%. From the laboratory testing, at the power load 50 W and

75 W, the testing results are satisfactory.

The construct cost of this prototype is about 12,900 bahts that is about 5 times lower than the imported electrophoretic apparatus.