Three-dimensional Form Generation by Dot-matrix Electrical Discharge Machining

URL: http://www.toyota-ti.ac.jp/Lab/Kikai/5k60/

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Background and problem

- Needs for rapid production system for metals
- Difficulty in production of tool electrode to machine small shape

Solution

- Shaping profile of bundled electrodes by controlling their length and scanning them as one electrode

Advantages

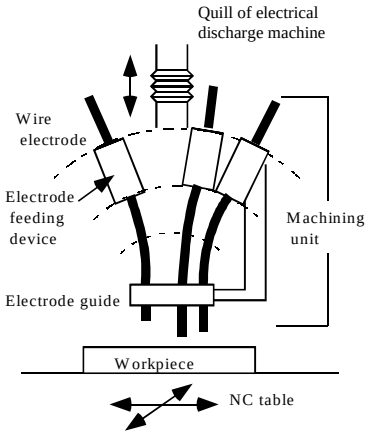
- Enable to skip making process of electrode
- Mechanical strength of electrode
- Enable to compensate electrodes for heavy wear by feeding them
- Use of thin wire for electrodes

Results

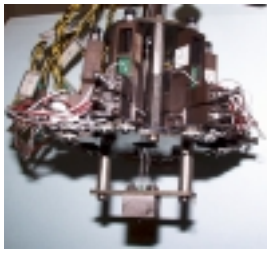
- Machining 3D shape with 6 thin electrodes
- Less cracks by divided power because of discharge dispersion

Applicable fields

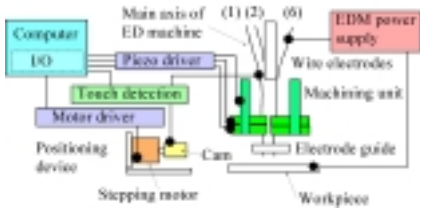
- Micromachining
- Micromold fabrication
- Rapid prototyping for metals



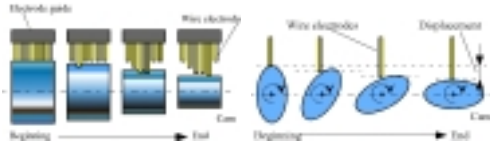
Concept of dot-matrix electrical discharge machining



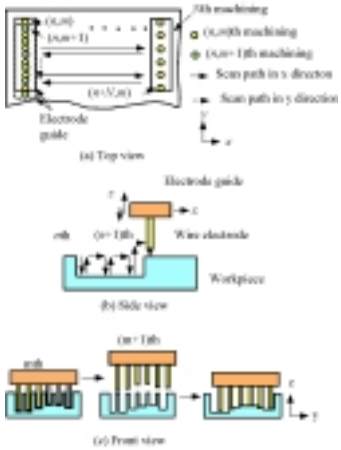
Appearance of machining unit



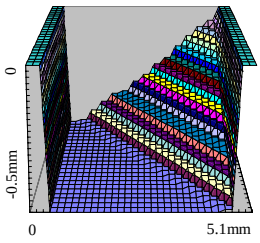
System configuration



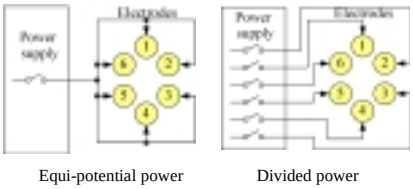
Positioning sequence of electrodes



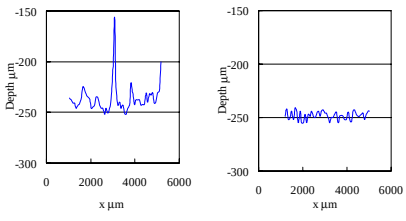
Machining sequence



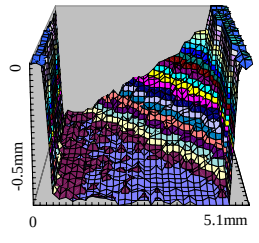
Designed shape



Types of power supply for dot-matrix EDM

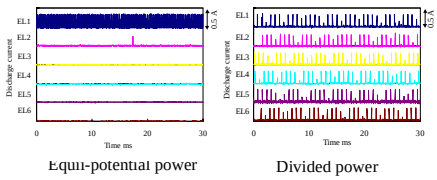


Improvement of waviness



Result of machining

Example of machining



Equi-potential power Divided power

Discharge dispersion