The novel stepper motor using micro patterns

**Background**

The demands to the linear motor for the low cost precision positioning.

- It is the principle structure in which minimized step is possible to be μm and nm order.
- For mass productions and low cost
- It should be the stepper motor that open loop control is feasible.
- There is no vibration during system-halt, and gripping force is large.

**Principle**

Step movement is realized by using of two surfaces with 3-dimensional micro patterns joggling perfectly.

N drive parts with micro patterns
- It shifts and arranges 1/N pitch of phases at one time.
- A time phase is shifted and it pushes out in order.

**Feature**

- A step width: 1/N pattern pitch
- Open loop control
- No backlash
- No vibration during system-halt
- Large gripping force

**Results**

The expected maximum move speed
0.02㎜×4(PZT)×100Hz = 8 mm/sec

Impelling force and gripping force
350gf or more

Positioning accuracy
(20μm / 1 step)
-3μm ~ +8μm

The new principle stepper motor that may satisfy the demands