

**CPC****COOPERATIVE PATENT CLASSIFICATION****B23H**

**WORKING OF METAL BY THE ACTION OF A HIGH CONCENTRATION OF ELECTRIC CURRENT ON A WORKPIECE USING AN ELECTRODE WHICH TAKES THE PLACE OF A TOOL; SUCH WORKING COMBINED WITH OTHER FORMS OF WORKING OF METAL** (processes for the electrolytic or electrophoretic production of coatings, electroforming, or apparatus therefor [C25D](#); processes for the electrolytic removal of material from objects [C25F](#); manufacturing printed circuits using precipitation techniques to apply the conductive material to form the desired conductive pattern [H05K 3/18](#))

**NOTE**

This subclass covers the working of metal described as "electroerosion"

**B23H 1/00**

**Electrical discharge machining, i.e. removing metal with a series of rapidly recurring electrical discharges between an electrode and a workpiece in the presence of a fluid dielectric**

**B23H 1/02**

- Electric circuits specially adapted therefor, e.g. power supply, control, preventing short circuits or other abnormal discharges

**B23H 1/022**

- . {for shaping the discharge pulse train ([B23H 1/024](#) takes precedence)}

**B23H 1/024**

- . {Detection of, and response to, abnormal gap conditions, e.g. short circuits (preventing short circuits or other abnormal discharges by altering machining parameters using adaptive control [B23H 7/16](#))}

**B23H 1/026**

- . {Power supply protection, e.g. detection of power switch breakdown}

**B23H 1/028**

- . {for multiple gap machining}

**B23H 1/04**

- Electrodes specially adapted therefor or their manufacture ([B23H 9/00](#) takes precedence)

**B23H 1/06**

- . Electrode material

**B23H 1/08**

- Working media

**B23H 1/10**

- Supply or regeneration of working media

**B23H 3/00**

**Electrochemical machining, i.e. removing metal by passing current between an electrode and a workpiece in the presence of an electrolyte**

**B23H 3/02**

- Electric circuits specially adapted therefor, e.g. power supply, control, preventing short circuits

**B23H 3/04**

- Electrodes specially adapted therefor or their manufacture ([B23H 9/00](#) takes precedence)

**B23H 3/06**

- . Electrode material

**B23H 3/08**

- Working media

**B23H 3/10**

- Supply or regeneration of working media

**B23H 5/00**

**Combined machining**

**B23H 5/02**

- Electrical discharge machining combined with electrochemical machining

**B23H 5/04**

- Electrical discharge machining combined with mechanical working

- B23H 5/06
  - Electrochemical machining combined with mechanical working, e.g. grinding or honing
- B23H 5/08
  - • Electrolytic grinding
- B23H 5/10
  - Electrodes specially adapted therefor or their manufacture ([B23H 1/04](#), [B23H 3/04](#) take precedence)
- B23H 5/12
  - Working media
- B23H 5/14
  - Supply or regeneration of working media
- B23H 7/00**

**Processes or apparatus applicable to both electrical discharge machining and electrochemical machining**
- B23H 7/02
  - Wire-cutting
- B23H 7/04
  - • Apparatus for supplying current to working gap; Electric circuits specially adapted therefor
- B23H 7/06
  - • Control of the travel curve of the relative movement between electrode and workpiece
- B23H 7/065
  - • • {Electric circuits specially adapted therefor}
- B23H 7/08
  - • Wire electrodes
- B23H 7/10
  - • • Supporting, winding or electrical connection of wire-electrode
- B23H 7/101
  - • • • {Supply of working media}
- B23H 7/102
  - • • • {Automatic wire threading}
- B23H 7/104
  - • • • {Wire tension control}
- B23H 7/105
  - • • • {Wire guides}
- B23H 7/107
  - • • • {Current pickups}
- B23H 7/108
  - • • • {Used wire disposal devices}
- B23H 7/12
  - Rotating-disc electrodes
- B23H 7/14
  - Electric circuits specially adapted therefor, e.g. power supply {([B23H 3/02](#) takes precedence)}
- B23H 7/16
  - • for preventing short circuits or other abnormal discharges {by altering machining parameters using adaptive control}
- B23H 7/18
  - • for maintaining or controlling the desired spacing between electrode and workpiece
- B23H 7/20
  - • for programme-control, e.g. adaptive ([programme-control systems in general G05B 19/00](#))
- B23H 7/22
  - Electrodes specially adapted therefor or their manufacture ([B23H 7/08](#), [B23H 7/12](#), [B23H 9/00](#) take precedence)
- B23H 7/24
  - • Electrode material
- B23H 7/26
  - Apparatus for moving or positioning electrode relatively to workpiece; Mounting of electrode
- B23H 7/265
  - • {Mounting of one or more thin electrodes}
- B23H 7/28
  - • Moving electrode in a plane normal to the feed direction, e.g. orbiting
- B23H 7/30
  - • Moving electrode in the feed direction ([B23H 7/32](#) takes precedence)
- B23H 7/32
  - • Maintaining desired spacing between electrode and workpiece {e.g. by means of particulate material}
- B23H 7/34
  - Working media

- B23H 7/36
- B23H 7/38
- Supply or regeneration of working media
  - Influencing metal working by using specially adapted means not directly involved in the removal of metal, e.g. ultrasonic waves, magnetic fields or laser irradiation

**B23H 9/00**      **Machining specially adapted for treating particular metal objects or for obtaining special effects or results on metal objects (heat treatment by cathodic discharge [C21D 1/38](#))**

- B23H 9/001
- B23H 9/003
- B23H 9/005
- B23H 9/006
- B23H 9/008
- B23H 9/02
- B23H 9/04
- B23H 9/06
- B23H 9/08
- B23H 9/10
- B23H 9/12
- B23H 9/14
- B23H 9/16
- B23H 9/18
- {Disintegrating}
  - {Making screw-threads or gears}
  - {Machining elongated bodies, e.g. rods}
  - {Cavity sinking ([B23H 9/14](#) takes precedence)}
  - {Surface roughening or texturing}
  - Trimming or deburring {([B23H 9/003](#) takes precedence)}
  - Treating surfaces of rolls
  - Marking or engraving
  - Sharpening
  - Working turbine blades or nozzles
  - Forming parts of complementary shape, e.g. punch-and-die
  - Making holes
    - . using an electrolytic jet
  - Producing external conical surfaces or spikes ([B23H 9/08](#) takes precedence)

**B23H 11/00**      **Auxiliary apparatus or details, not otherwise provided for**

- B23H 11/003
- B23H 11/006
- {Mounting of workpieces, e.g. working-tables}
  - {Electrical contacts or wires ([B23H 7/10](#) takes precedence)}

**B23H 2200/00**      **Specific machining processes or workpieces**

- B23H 2200/10
- B23H 2200/20
- B23H 2200/30
- for making bearings
  - for making conical bores
  - for making honeycomb structures

**B23H 2300/00**      **Power source circuits or energization**

- B23H 2300/10
- B23H 2300/12
- B23H 2300/20
- B23H 2300/22
- Pulsed electrochemical machining
    - . Positive and negative pulsed electrochemical machining
  - Relaxation circuit power supplies for supplying the machining current, e.g. capacitor or inductance energy storage circuits
    - . Circuits using or taking into account line impedance to shape the discharge pulse

**B23H 2400/00**      **Moving mechanisms for tool electrodes**

- B23H 2400/10
- for rotating the electrode

**B23H 2500/00**      **Holding and positioning of tool electrodes**

B23H 2500/20

- Methods or devices for detecting wire or workpiece position

**B23H 2600/00**

**Machining conditions**

B23H 2600/10

- Switching of machining conditions during machining

B23H 2600/12

- • Switching from rough cutting to finish machining