

# CPC COOPERATIVE PATENT CLASSIFICATION

## B PERFORMING OPERATIONS; TRANSPORTING

(NOTES omitted)

### SHAPING

## B23 MACHINE TOOLS; METAL-WORKING NOT OTHERWISE PROVIDED FOR

(NOTES omitted)

## 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"

### WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

<b>1/00</b>	<b>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</b>	5/02	. Electrical discharge machining combined with electrochemical machining
		5/04	. Electrical discharge machining combined with mechanical working
1/02	. Electric circuits specially adapted therefor, e.g. power supply, control, preventing short circuits or other abnormal discharges	5/06	. Electrochemical machining combined with mechanical working, e.g. grinding or honing
1/022	. . {for shaping the discharge pulse train ( <a href="#">B23H 1/024</a> takes precedence)}	5/08	. . Electrolytic grinding
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 <a href="#">B23H 7/16</a> )}	5/10	. Electrodes specially adapted therefor or their manufacture ( <a href="#">B23H 1/04</a> , <a href="#">B23H 3/04</a> take precedence)
1/026	. . {Power supply protection, e.g. detection of power switch breakdown}	5/12	. Working media
1/028	. . {for multiple gap machining}	5/14	. Supply or regeneration of working media
1/04	. Electrodes specially adapted therefor or their manufacture ( <a href="#">B23H 9/00</a> takes precedence)	<b>7/00</b>	<b>Processes or apparatus applicable to both electrical discharge machining and electrochemical machining</b>
1/06	. . Electrode material	7/02	. Wire-cutting
1/08	. Working media	7/04	. . Apparatus for supplying current to working gap; Electric circuits specially adapted therefor
1/10	. Supply or regeneration of working media	7/06	. . Control of the travel curve of the relative movement between electrode and workpiece
<b>3/00</b>	<b>Electrochemical machining, i.e. removing metal by passing current between an electrode and a workpiece in the presence of an electrolyte</b>	7/065	. . . {Electric circuits specially adapted therefor}
3/02	. Electric circuits specially adapted therefor, e.g. power supply, control, preventing short circuits	7/08	. . Wire electrodes
3/04	. Electrodes specially adapted therefor or their manufacture ( <a href="#">B23H 9/00</a> takes precedence)	7/10	. . . Supporting, winding or electrical connection of wire-electrode
3/06	. . Electrode material	7/101	. . . . {Supply of working media}
3/08	. Working media	7/102	. . . . {Automatic wire threading}
3/10	. Supply or regeneration of working media	7/104	. . . . {Wire tension control}
<b>5/00</b>	<b>Combined machining</b>	7/105	. . . . {Wire guides}
		7/107	. . . . {Current pickups}
		7/108	. . . . {Used wire disposal devices}
		7/12	. Rotating-disc electrodes
		7/14	. Electric circuits specially adapted therefor, e.g. power supply {( <a href="#">B23H 3/02</a> takes precedence)}

## B23H

- 7/16 . . for preventing short circuits or other abnormal discharges {by altering machining parameters using adaptive control}
- 7/18 . . for maintaining or controlling the desired spacing between electrode and workpiece
- 7/20 . . for programme-control, e.g. adaptive (programme-control systems in general [G05B 19/00](#))
- 7/22 . Electrodes specially adapted therefor or their manufacture ([B23H 7/08](#), [B23H 7/12](#), [B23H 9/00](#) take precedence)
- 7/24 . . Electrode material
- 7/26 . Apparatus for moving or positioning electrode relatively to workpiece; Mounting of electrode
- 7/265 . . {Mounting of one or more thin electrodes}
- 7/28 . . Moving electrode in a plane normal to the feed direction, e.g. orbiting
- 7/30 . . Moving electrode in the feed direction ([B23H 7/32](#) takes precedence)
- 7/32 . . Maintaining desired spacing between electrode and workpiece {, e.g. by means of particulate material}
- 7/34 . Working media
- 7/36 . Supply or regeneration of working media
- 7/38 . 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

### 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](#))

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

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

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

### 2200/00 Specific machining processes or workpieces

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

### 2300/00 Power source circuits or energization

- 2300/10 . Pulsed electrochemical machining

- 2300/12 . . Positive and negative pulsed electrochemical machining
- 2300/20 . Relaxation circuit power supplies for supplying the machining current, e.g. capacitor or inductance energy storage circuits
- 2300/22 . . Circuits using or taking into account line impedance to shape the discharge pulse
- 2400/00 Moving mechanisms for tool electrodes**
- 2400/10 . for rotating the electrode
- 2500/00 Holding and positioning of tool electrodes**
- 2500/20 . Methods or devices for detecting wire or workpiece position
- 2600/00 Machining conditions**
- 2600/10 . Switching of machining conditions during machining
- 2600/12 . . Switching from rough cutting to finish machining