

# CPC COOPERATIVE PATENT CLASSIFICATION

## B PERFORMING OPERATIONS; TRANSPORTING

(NOTES omitted)

### SHAPING

**B23 MACHINE TOOLS; METAL-WORKING NOT OTHERWISE PROVIDED FOR**  
(punching, perforating, making articles by processing sheet metal, tubes, or profiles [B21D](#); wire-working [B21F](#); making pins, needles, or nails [B21G](#); making chains [B21L](#); grinding [B24](#))  
(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>	<b>3/10</b>	• Supply or regeneration of working media
<b>1/02</b>	• Electric circuits specially adapted therefor, e.g. power supply, control, preventing short circuits or other abnormal discharges	<b>5/00</b>	<b>Combined machining</b>
<b>1/022</b>	• . {for shaping the discharge pulse train ( <a href="#">B23H 1/024</a> takes precedence)}	<b>5/02</b>	• Electrical discharge machining combined with electrochemical machining
<b>1/024</b>	• . {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> )}	<b>5/04</b>	• Electrical discharge machining combined with mechanical working
<b>1/026</b>	• . {Power supply protection, e.g. detection of power switch breakdown}	<b>5/06</b>	• Electrochemical machining combined with mechanical working, e.g. grinding or honing
<b>1/028</b>	• . {for multiple gap machining}	<b>5/08</b>	• . Electrolytic grinding
<b>1/04</b>	• Electrodes specially adapted therefor or their manufacture ( <a href="#">B23H 9/00</a> takes precedence)	<b>5/10</b>	• Electrodes specially adapted therefor or their manufacture ( <a href="#">B23H 1/04</a> , <a href="#">B23H 3/04</a> take precedence)
<b>1/06</b>	• . Electrode material	<b>5/12</b>	• Working media
<b>1/08</b>	• Working media	<b>5/14</b>	• Supply or regeneration of working media
<b>1/10</b>	• Supply or regeneration of working media	<b>7/00</b>	<b>Processes or apparatus applicable to both electrical discharge machining and electrochemical machining</b>
<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>	<b>7/02</b>	• Wire-cutting
<b>3/02</b>	• Electric circuits specially adapted therefor, e.g. power supply, control, preventing short circuits	<b>7/04</b>	• . Apparatus for supplying current to working gap; Electric circuits specially adapted therefor
<b>3/04</b>	• Electrodes specially adapted therefor or their manufacture ( <a href="#">B23H 9/00</a> takes precedence)	<b>7/06</b>	• . Control of the travel curve of the relative movement between electrode and workpiece
<b>3/06</b>	• . Electrode material	<b>7/065</b>	• . . {Electric circuits specially adapted therefor}
<b>3/08</b>	• Working media	<b>7/08</b>	• . Wire electrodes
		<b>7/10</b>	• . . Supporting, winding or electrical connection of wire-electrode
		<b>7/101</b>	• . . . {Supply of working media}
		<b>7/102</b>	• . . . {Automatic wire threading}
		<b>7/104</b>	• . . . {Wire tension control}
		<b>7/105</b>	• . . . {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 {[\(B23H 3/02 takes precedence\)](#)}
- 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