

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.

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