SECTION B — PERFORMING OPERATIONS; TRANSPORTING

B23 MACHINE TOOLS; METAL-WORKING NOT OTHERWISE PROVIDED FOR

B23F **MAKING GEARS OR TOOTHED RACKS** (by stamping B21D; by rolling B21H; by forging or pressing B21K; by casting B22; arrangements for copying or controlling B23Q; machines or devices for grinding or polishing, in general B24B)

Note(s)

1. This subclass covers:
   - the use of methods or apparatus specially designed to produce accurately the shapes of gear teeth which are essential for proper intermeshing of toothed gearing elements to ensure the required relative motions;
   - the use of similar methods or apparatus in the production of other articles of toothed or like form, e.g. dog clutches, splined shafts, milling cutters.
2. This subclass does not cover the production of such other articles of toothed or like form using methods or apparatus other than those mentioned under Note (1) above.
3. In this subclass, the following terms or expressions are used with the meanings indicated:
   - "gear teeth" covers the teeth or lobes of other accurately-intermeshing members having relative movement of a similar kind, such as rotors of rotary pumps and blowers;
   - "profile" may include the outline of both faces or only one face of a tooth, or the opposing faces of adjacent teeth;
   - "straight" means that a tooth as a whole (ignoring any curvature of the tooth-face alone, e.g. crowning) is straight in the direction of its length, for example as seen in the direction of a radius of a spur wheel. It accordingly includes the teeth of helical gears and of the normal type of bevel gear;
   - "broach-milling" means milling with a rotary cutter having a number of teeth of progressively increasing depth or width.

Subclass index

1/00 **Making gear teeth by tools of which the profile matches the profile of the required surface** (special adaptations for making curved teeth B23F 9/00) **[1, 2006.01]**

1/02 • by grinding **[1, 2006.01]**

1/04 • by planing or slotting **[1, 2006.01]**

1/06 • by milling **[1, 2006.01]**

1/08 • by broaching; by broach-milling **[1, 2006.01]**

3/00 **Making gear teeth involving copying operations controlled by templates having a profile which matches that of the required tooth face or part thereof or a copy thereof to a different scale** (copying systems or devices per se B23Q 35/00) **[1, 2006.01]**

5/00 **Making straight gear teeth involving moving a tool relatively to a workpiece with a rolling-off or an enveloping motion with respect to the gear teeth to be made [1, 2006.01]**

5/02 • by grinding **[1, 2006.01]**

5/04 • • the tool being a grinding worm **[1, 2006.01]**

5/06 • • the tool being a grinding disc with a plane front surface **[1, 2006.01]**

5/08 • • the tool being a grinding disc having the same profile as the tooth or teeth of a rack **[1, 2006.01]**

5/10 • • the tool being a grinding disc having the same profile as the tooth or teeth of a crown or bevel wheel **[1, 2006.01]**

5/12 • by planing or slotting **[1, 2006.01]**

5/14 • • the tool having the same profile as a tooth or teeth of a rack **[1, 2006.01]**

5/16 • • the tool having a shape similar to that of a spur wheel or part thereof **[1, 2006.01]**

5/18 • • the tool having the same profile as a tooth of a crown wheel **[1, 2006.01]**

5/20 • by milling **[1, 2006.01]**

5/22 • • the tool being a hob for making spur gears **[1, 2006.01]**

5/24 • • the tool being a hob for making bevel gears **[1, 2006.01]**

5/26 • • the tool having the same profile as a tooth or teeth of a rack, for making spur gears **[1, 2006.01]**

5/27 • • the tool having the same profile as a tooth or teeth of a crown or bevel wheel **[2, 2006.01]**

5/28 • by broaching; by broach-milling **[1, 2006.01]**

7/00 Making herring-bone gear teeth [1, 2006.01]

9/00 Making gears having teeth curved in their longitudinal direction [1, 2006.01]

9/02 • by grinding **[1, 2006.01]**

9/04 • by planing or slotting with reciprocating cutting tools **[1, 2006.01]**

9/06 • • having a shape similar to a spur wheel of part thereof **[1, 2006.01]**

9/07 • • having a shape similar to a crown wheel or a part thereof **[2, 2006.01]**

9/08 • by milling, e.g. with helicoidal hob **[1, 2006.01]**

9/10 • • with a face-mill **[1, 2006.01]**

9/12 • • • for non-continuous generating processes **[2, 2006.01]**

9/14 • • • for continuous generating processes **[2, 2006.01]**

11/00 Making worm wheels, e.g. by hobbing [1, 2006.01]

13/00 Making worms by methods essentially requiring the use of machines of the gear-cutting type (making screw-thread B23G) **[1, 2006.01]**

13/02 • Making worms of cylindrical shape **[1, 2006.01]**

13/04 • • by grinding **[1, 2006.01]**

13/06 • Making worms of globoidal shape **[1, 2006.01]**

13/08 • • by grinding **[1, 2006.01]**

15/00 Methods or machines for making gear wheels of special kinds, not covered by groups B23F 7/00-B23F 13/00 [1, 2006.01]

15/02 • Making gear teeth on wheels of varying radius of operation, e.g. on elliptical wheels **[1, 2006.01]**

15/04 • Making fine-pitch gear teeth on clock wheels or the like by special machining **[1, 2006.01]**

15/06 • Making gear teeth on the front surface of wheels, e.g. for clutches or couplings with toothed faces **[1, 2006.01]**

15/08 • Making intermeshing rotors, e.g. of pumps **[1, 2006.01]**

17/00 Special methods or machines for making gear teeth, not covered by groups B23F 1/00-B23F 15/00 [1, 2006.01]

19/00 Finishing gear teeth by other tools than those used for manufacturing gear teeth [1, 2006.01]

19/02 • Lapping gear teeth **[1, 2006.01]**

19/04 • • Lapping spur gears by making use of a correspondingly shaped counterpart **[1, 2006.01]**

19/05 • Honing gear teeth **[2, 2006.01]**

19/06 • Shaving the faces of gear teeth **[1, 2006.01]**

19/10 • Chamfering the end edges of gear teeth **[1, 2006.01]**

19/12 • • by grinding **[1, 2006.01]**

21/00 Tools specially adapted for use in machines for manufacturing gear teeth [1, 2006.01]

21/02 • Grinding discs; Grinding worms (truing grinding tools B24B; grinding tools in general B24D) **[1, 2006.01]**

21/03 • Honing tools **[2, 2006.01]**

21/04 • Planing or slotting tools **[1, 2006.01]**

21/06 • • having a profile which matches a gear tooth profile **[1, 2006.01]**

21/08 • • having the same profile as a tooth or teeth of a rack **[1, 2006.01]**

21/10 • • Gear-shaper cutters having a shape similar to a spur wheel or part thereof **[1, 2006.01]**

21/12 • Milling tools **[1, 2006.01]**

21/14 • • Profile cutters of disc type **[1, 2006.01]**

21/16 • • Hobs **[1, 2006.01]**

21/18 • • • Taper hobs, e.g. for bevel gears **[1, 2006.01]**

21/20 • • Fly cutters **[1, 2006.01]**

21/22 • • Face-mills for longitudinally-curved gear teeth **[1, 2006.01]**

21/23 • • • with cutter teeth arranged on a spiral curve for continuous generating processes **[2, 2006.01]**

21/24 • Broach-milling tools **[1, 2006.01]**

21/26 • Broaching tools **[1, 2006.01]**

21/28 • Shaving cutters **[1, 2006.01]**

23/00 Accessories or equipment combined with or arranged in, or specially designed to form part of, gear-cutting machines (accessories or equipment not restricted to gear-cutting machines B23Q; tool-guiding mechanisms, see the relevant groups for making gear teeth) **[1, 2006.01]**

23/02 • Loading or chucking arrangements for workpieces **[1, 2006.01]**

23/04 • • Loading arrangements **[1, 2006.01]**

23/06 • • Chucking arrangements **[1, 2006.01]**

23/08 • Index mechanisms **[1, 2006.01]**

23/10 • Arrangements for compensating irregularities in drives or indexing mechanisms **[1, 2006.01]**

23/12 • Other devices, e.g. tool holders; Checking devices for controlling workpieces in machines for manufacturing gear teeth **[1, 2006.01]**