

1	GEAR CUTTING	34	....Using gear shaper-cutter
2	.With regulation of operation by use of templet, card, or other replaceable information supply	35	.....Plural distinct cutting edges
3	..Including follower for templet	36	.....Cutting rotating work, the axis of which lies in a plane intersecting the cutter axis
4	.And burnishing simultaneously		
5	.With compensation for backlash in drive means	37	..Gear shaving
6	.With work or product advancing	38	..Using rotary cutter
7	..Utilizing transfer arm	39	...Having axially directed cutting edge
8	.Gear chamfering or deburring	40	...Plural rotary cutters
9	..Using relatively reciprocating or oscillating cutter	41	...On reciprocating carriage
10	.Gear tooth shape generating	42	..Using reciprocating or oscillating cutter
11	..Hobbing	43	...Bevel gear cutting
12	...Process	44	....Dual cutters
13	....Generating tooth for bevel gear	45	....Double acting cutter
14	...Including means to shift hob between cutting passes	46	...Rectilinearly reciprocating cutter
15	...With control means energized in response to activator stimulated by condition sensor	47	....Cutter comprising a rack
16	...Plural hobs	48	..Making a noncircular gear, worm, rotor, or a planar-faced gear
17	..Including infeed means	49	.Gear shaving
18	....To infeed along axis of work rotation	50	.Using rotary cutter
19	.....Infeed of cutter	51	..Process
20	.....And infeed radially of axis of work rotation	52	..End mill
21	.....Vertically	53	...Radially faced
22	....To infeed radially of axis of work rotation	54	....Using plural, selectively usable tools
23	.....Infeed of cutter	55	..Plural rotary cutters
24	.....And infeed tangentially of work axis	56	..Cutting action along work axis
25	..Milling with radial faced tool	57	...Cutting action intersecting work axis
26	...Process	58	.Using reciprocating or oscillating cutter
27	...Adapted to cut bevel gear	59	..Broach
28	....With means to continuously rotate work and means to conform all teeth of gear	60	..Including circumferentially disposed cutting edges
29	....Bevel gear having nonparallel opposing tooth flanks	61	.Work dividing or checking of work position or division
30	....Including rotary cutter cradle	62	.With work clamping
31	..By relative axial movement between synchronously indexing or rotating work and cutter	63	WITH FURBISHING OF CUTTER
32	...Crowning	64	MILLING
33	...Displacing cutter axially relative to work (e.g., gear shaving, etc.)	65	.Thread or helix generating
		66	..Process
		67	..With means to regulate operation by use of templet, card, or other replaceable information supply
		68	...Complete cycle
		69	...To regulate cutting depth (e.g., relief, taper, etc.)

70	...To regulate rate of motion (e.g., stopping, etc.)	97	....With means to support templet above or under work
71	..With nonthread or nonhelix generating, milling cutter	98	....Including tracer adapted to trigger electrical energy
72	..With means to advance work or product	99	.....To actuate electrically driven work or tool moving means
73	..Plural cutters or work holders	100	.....To actuate fluid driven work or tool moving means
74	..With planetary cutter	101	....Including tracer adapted to trigger fluid energy
75	..Work means to move work axially and means to interrelate work movement with cutter rotation	102	.....To actuate fluid driven work or tool moving means
76	..With means to rotate work and means to interrelatedly infeed the work relative to the cutter	103	.....Including cutter and tracer fixed to move laterally together
77	...Means to infeed the cutter	104	....And provision for circumferential relative movement of cutter and work
78	..With means to circumferentially adjust the position of the cutter with respect to the work	105	.....Including plural cutters
79	..With regulation of operation by templet, card, or other replaceable information supply	106	....Including plural cutters
80	..With sensing of numerical information and regulation without mechanical connection between sensing means and regulated means (i.e., numerical control)	107	....Including cross-slide tool carrier
81	..To cut lock key	108	...Including plural cutters
82	...Using templet other than a key	109	...Including cross-slide tool carrier
83	...Complete cycle	110	...With means to support templet above or under work
84	..Process	111	...With provision for circumferential relative movement of cutter and work
85	..Reproducing means	112	..With provision for circumferential relative movement of cutter and work
86	...Including pantograph cutter- carrier	113	...And means for operation without manual intervention
87	....And means to move work at work station	114	....Including tracer adapted to trigger electrical or fluid energy
88	.....About work axis	115	...For using planar templet in cutting profile (e.g., contour map from planar map, etc.)
89	....Pivotally supported for vertical movement	116	...Including means for operation without manual intervention
90	....And means to counterbalance carrier	117	..Including means for operation without manual intervention
91	....Including plural cutters	118	...Including simultaneously usable plural tracers or including tracer adapted to simultaneously use plural temples
92	..By use of pivotally supported tracer	119	...To make a double curvature foil
93	...Duplicating means		
94	....With means for operation without manual intervention		
95	.....To make a double curvature foil		
96	....Including means to sense optical or magnetic image		

120	...To make a double curvature foil	151	....To control limit of infeed
121	...Including cutter and tracer fixed to move together	152	.....Adapted to hydraulically or pneumatically stimulate control
122	...With provision for circumferential relative movement of cutter and work	153	.....Adapted to electrically stimulate control
123	..And provision for circumferential relative movement of cutter and work	154	...To control rate of infeed or return
124	..Including cutter and tracer fixed to move together	155	...To effect stopping of infeed
125	..Templet, tracer, or cutter	156	..With means to change rate of infeed
126	..Tracer	157	..Means to mill indeterminate length work
127	...Adapted to trigger electrical energy	158	..Multiple work stations
128	....Photocell	159	..With means to advance work or product
129	...Adapted to trigger fluid energy	160	..Vertically
130	..Templet	161	...Endless or orbital work or product advancing means
131	..Process	162	..To reciprocate or oscillate work
132	..Including infeeding	163	..With work holder
133	..With means to weigh or test work or product	164	...And means to selectively position work
134	..With means to protect operative or machine (e.g., guard, safety device, etc.)	165	...Including means to support work for rotation during operation
135	..With means to control temperature or lubricate	166	....And including means to infeed cutter toward work axis
136	..Cutter or work	167	....With linear movement of work
137	..With means to remove chip	168	....With angular movement of work
138	..Means to trim edge	169	..Including friction gearing drive
139	..Means to remove scale or raised surface imperfection	170	..Including fluid drive
140	..Means to remove flash or burr	171	..With means to effect stopping upon completion of operation
141	..With means to dampen vibration	172	..With means to advance work or product
142	..Means to mill epitrochoidal shape	173	..Endless or orbital work or product advancing means
143	..Means for internal milling	174	..With means to precisely reposition work
144	..With detachable or auxiliary cutter support to convert cutting action	175	..Randomly manipulated, work supported, or work following device
145	..Including means to infeed work to cutter	176	..For machining commutator
146	..With compensation for backlash in drive means	177	..For cutting longitudinal groove in shaft (e.g., keyway, etc.)
147	..With control means energized in response to activator stimulated by condition sensor	178	..With work supported guide means
148	...In response to cutter or cutter carriage	179	...To guide tool to move in arcuate path
149	...In response to work or work carriage	180	..With work follower
150	....To control rate of infeed or return	181	..Randomly manipulated
		182	...End mill (e.g., router, etc.)

183	..Including means to infeed rotary cutter toward work	216	..Compound angular adjustment
184	..With means to limit penetration into work	217	..Plural cutters
185	..Axially	218	..With limit means to aid in positioning of cutter bit or work (e.g., gauge, stop, etc.)
186	...With infeed control means energized in response to activator stimulated by condition sensor	219	..Work support
187	...In response to cutter condition	220	..With position indicator or stop
188	...In response to work condition	221	..Indexable
189	..With work holder	222	...Including dividing head
190	..And laterally	223	...Multiple row dividing head
191	...Simultaneously	224	..With angular adjustment
192	...Plural cutters	225	..With work holder or guide
193	..With infeed control means energized in response to activator stimulated by condition sensor	226	...Including cutter limited to rotary motion
194	...In response to cutter condition	227	..With means to adjust work support vertically
195	...In response to work condition	228	..Including cutter limited to rotary motion
196	..With means to change rate of infeed	229	..Cutter turning about vertical axis
197	..With work holder	230	..Detachable or repositionable tool head
198	...Indexable	231	..Cutter spindle or spindle support
199	..Machining arcuate surface	232	..With cutter holder
200	...With means to move cutter eccentrically	233	...And draw bar
201	..Angularly adjustable cutter head	234	..With cutter holder
202	..Including gantry-type cutter-carrier	235	..Machine frame
203	..Plural cutters	236	..Overarm harness structure
204	..Including means to adjustably position cutter	237	..Including counterbalancing means
205	..With work holder or guide	238	..Including means to compensate for deformation
206	..Linear adjustment	239	...Deflection of cutter spindle
207	...With control for adjustment means responsive to activator stimulated by condition sensor	240	..Convertible from lathe
208	...Responsive to position of cutter	241	..Including relatively movable components and means to relatively immobilize these components
209	...And means to clamp cutter support in adjusted position	242	..Tailstock
210	..With position indicator or limit means	243	BROACHING
211	..And angular adjustment	244	..Process
212	..Including gantry-type cutter-carrier	245	..With control means energized in response to activator stimulated by condition sensor
213	...Plural cutters	246	..Responsive to condition of work or product
214	..With position indicator or limit means	247	..With means to distribute cutter infeed force
215	..With right angle cutter drive	248	..With means to select cutter or to select or modify cutter drive
		249	..With means to clean, lubricate, or modify temperature of work or cutter

250	.With product handling means	275	..To infeed work past cutter
251	..Between plural broaching stations	276	.With means to hold work during cutting
252	..Means to eject broached product	277	..Including work clamping means
253	..Chip removal means	278	..With means to adjust or facilitate adjustment of work or work holder
254	.With means to protect operative or machine (e.g., guard, safety device, etc.)	279	..With means on work or work holder to guide cutter during infeed
255	..With safety means for overload or safety interlock	280	.Cutter infeed means
256	.With work immobilizer and means to activate work immobilizer interrelated with cutter infeed, work infeed, or work advance	281	..Imparting rectilinear motion to cutter
257	.With work infeed or advancing means and means to clamp the work thereto, which clamping means is interrelated with work or cutter infeed	282	...And rotary motion to cutter
258	.Means to remove flash or burr	283	...Fluid powered means
259	.Means for cutting groove	284	...Rack means
260	..Arcuate groove in cylindrical surface	285	...Screw means
261	...Rifling	286	.Machine frame
262	.Orbital carrier for cutter	287	.Cutter support or guide
263	.Orbital carrier for work	288	PLANING
264	.With means to cyclically manipulate cutter or cutter support	289	.With regulation of operation by templet, card, or other replaceable information supply
265	..To reorient, introduce, or remove cutter	290	..Including use of tracer adapted to trigger electrical or fluid energy
266	..Cutter released to interim support at termination of cutting stroke	291	...Including provision for circumferential relative movement of cutter and work
267	..To remove and return cutter to cutter support	292	..Including provision for circumferential relative movement of cutter and work
268	.With plural cutters	293	.Process
269	.With means to advance, infeed, or manipulate work	294	.With means to lubricate
270	..Interrelated with cutter infeed	295	.With product handling means
271	...Including means supporting work and additional means opposing infeed force	296	.Randomly manipulated, work supported, or work following device
272	...Including work indexing means for sequential cutting of different surfaces of a single workpiece	297	.Means to remove flash or burr
273	...Including work indexing means for sequential cutting of surfaces of different workpieces	298	..Elongated work
274	..With means to retract work from path of tool's idle return stroke	299	...Flash or burr inside hollow work
		300	...Transverse burr
		301	..Flat work
		302	.Of commutator
		303	.Means for trimming edge (e.g., chamfering, scarfing, etc.)
		304	.Means for cutting groove
		305	..Arcuate groove
		306	...For rifling
		307	..Inside hollow work
		308	.Means for shaving by blade spanning work surface

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| <p>309 ..Concave work surface (e.g., bearing, stereotype printing plate, etc,)</p> <p>310 ..Circumferential surface</p> <p>311 ..Including rack driven infeed means</p> <p>312 ..Including roller infeed means</p> <p>313 ..Means for cutting arcuate surface</p> <p>314 ..Cycloidal surface</p> <p>315 ..With work infeed and means to arcuately reposition the cutter</p> <p>316 ..With work infeed and means to arcuately reposition the work</p> <p>317 ..With means to relatively infeed cutter and work</p> <p>318 ..And means to rotate work and cutter at same rate about converging axes</p> <p>319 ..With plural sequentially acting cutters or with double acting cutter</p> <p>320 ..And means to vary rate of infeed</p> <p>321 ..Reciprocating work infeed means</p> <p>322 ...With fluid-driven bed</p> <p>323 ...With rack-driven bed</p> <p>324 ...With screw-driven bed</p> <p>325 ...And means to permit repositioning of cutter laterally</p> <p>326 ..Reciprocating cutter infeed means</p> <p>327 ...Reciprocating cutter horizontally</p> <p>328 ...With work support and lead screw to reposition work support</p> <p>329 ...With fluid-powered means to drive cutter</p> <p>330 ...With pivoting link to drive cutter</p> <p>331Link driven by crank</p> <p>332 ...With rack to drive cutter</p> <p>333 ...With screw to drive cutter</p> <p>334 ..With link or cam to drive cutter</p> <p>335 ..With rack to drive cutter</p> <p>336 ..Including means causing return stroke</p> <p>337 ..Machine frame</p> <p>338 ..Means to permit repositioning of cutter</p> <p>339 ...Laterally</p> | <p>340Plural independently positioned cutters</p> <p>341Including clutch</p> <p>342Including repositioning means and means to effect stopping thereof</p> <p>343 ..Including relatively movable components and means to relatively immobilize these components</p> <p>344 ..Work table</p> <p>345 ..Tool head</p> <p>346 ..With selectively usable cutting edges</p> <p>347 ..With means to permit repositioning of cutting for idle return stroke</p> <p>348 ...Comprising pivotable cutter or cutter support</p> |
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