CLAS S 4 0 8 C U T T I N G B Y U S E O F R O T A T I N G A X I A L L Y M O V I N G T O O L

1 R  PROCESSES
1 BD . Bit detachable
2 WITH MEANS TO WEIGH OR TEST WORK
3 OR PRODUCT
4 WITH MEANS TO REGULATE OPERATION
5 BY USE OF TEMPLET, TAPE, CARD,
6 OR OTHER REPLACEABLE
7 INFORMATION SUPPLY
8 WITH INTERLOCK BETWEEN MACHINE
9 ELEMENTS
10 WITH RANDOMLY-ACTUATED STOPPING
11 MEANS
12 . Responsive to condition of tool
13 or tool-drive
14 . Responsive to condition of work
15 or product
16 WITH CONTROL MEANS ENERGIZED IN
17 RESPONSE TO ACTIVATOR
18 STIMULATED BY CONDITION SENSOR
19 . To control tool rotation
20 . To control infeed
21 . Responsive to tool
22 . Responsive to work
23 . To control relative positioning
24 of tool and work
25 WITH STOPPING UPON COMPLETION OF
26 PRESCRIBED OPERATION
27 . Responsive to condition of work
28 or product
29 WITH SIGNAL, INDICATOR,
30 ILLUMINATOR OR OPTICAL MEANS
31 INCLUDING MEANS TO CAUSE TOOL TO
32 PROGRESSIVELY VIBRATE TOWARD
33 WORK
34 WITH MEANS TO CONDITION TOOL
35 WITH MEANS TO DEFORM WORK
36 TEMPORARILY
37 CONVERTIBLE CUTTING MEANS
38 . Utilizing common cutting tool
39 COMBINED CUTTING MEANS
40 . Including tool operating on
41 rotating work
42 . Plural other type cutting means
43 . Including plural rotating tools
44 . Including rotating cutter other
45 than rotating, axially moving
tool
46 . Crystalline cutter
47 . Utilized in cutting work or
48 product to length
49 ... Adapted to cut entire
50 thickness of work at one pass
51 . Including plunging (single
52 stroke) cutter
53 MACHINE INCLUDING PLURAL TOOLS
54 . Axes of tools moving with work
during operation
55 ... Including means to infeed tool
56 and means to infeed work or
57 including coaxial tools
58 ... Plural work stations
59 . Turret of tools
60 . Coaxial tools
61 ... Coaxial, opposed tools
62 ... With additional, converging
tool
63 ... Plural pairs of coaxial, opposed tools
64 ... With means to sequentially
65 feed tools toward work
66 ... With interconnected means to
67 simultaneously feed tools
68 . Plural, simultaneously
69 operational tools
70 . With plural simultaneously
71 operational work stations
72 ... Successively acting on
73 workpiece
74 ... Pivotedly mounted, work-
75 advancing, work-supporting
76 means, pivot-axis parallel to
77 tool-axis
78 . With provision for adjustment
79 of relationship of axes
80 ... At least one tool driven by
81 orbiting wrist plate
82 ... At least one tool including
83 flexible drive connection
84 . With work-infeed
85 . With means to advance work
86 relative to tool
87 . With presser-foot
88 . With tool-opposing, work-
89 engaging surface
90 . Rotatable about parallel axes
91 WITH RADIIALLY OUTER LIMIT OF
92 CUTTING EDGE MOVING TO DEFINE
93 CYLINDER PARTIALLY, BUT NOT
94 ENTIRELY ENCIRCLED BY WORK
95 AXIS OF TOOL MOVING WITH WORK
96 DURING OPERATION
97 WITH MEANS TO APPLY TRANSIENT,
98 FLUENT MEDIUM TO WORK OR
99 PRODUCT
100 . Including tool with duct
CLASS 408 CUTTING BY USE OF ROTATING AXIALLY MOVING TOOL

58 ..And means to move gaseous fluid by application of vacuum
59 ..Conducting channel extending to end of tool
60 ..Including nozzle
61 ..Including nozzle
62 WITH WORK-INFEED MEANS
63 .Driven by fluid motor
64 .Driven by means having sliding engagement therewith
65 .Driven by lever or connecting link
66 .And gear to drive infeed means
67 WITH PRODUCT HANDLING OR RECEIVING MEANS
68 .Ejector
69 WITH WORK ADVANCING OR GUIDING MEANS
70 .Means to intermittently advance work
71 ..Rotary, work-supporting means
72 R WITH WORK-ENGAGING STRUCTURE OTHER THAN TOOL OR TOOL-SUPPORT
73 .With means actuated by work to release tool from fixed position in tool support
74 ..Adapted to engage work at tool-axis
75 .Centering means adapted to be replaced by tool
76 .Magnetic or suction means
77 .Tool supporting wheel
78 ..Wheel-axis parallel to tool-axis
79 ..Frictionally engaging sides of opening in work
80 ..Opening coaxial with tool
81 ...Engaging sides of opening being enlarged by tool
82 ....Engaging surface axially advanced of tool-action
83 ....Engaging surface subsequent to tool-action on that surface
83.5 ...Valve fitting
84 ..Funnel like work-engaging surface cooperating with protuberance on work
85 ..Adapted to "form" recession in work
86 ..Recession at tool-axis
87 ..Having tool-opposing, work-engaging surface
88 ..Tool having shiftable tool-axis
89 ..Angularly adjustable surface
90 ...Adjustable about axis that is parallel to tool-axis
91 ..Laterally adjustable surface
92 ..Flexible or concatenated member
93 ..Connected to tool through opening being enlarged by tool
94 ...Plural, coaxially opposing, work-engaging means
95 ..With presser foot
96 ...Encompassed by tool during cut
97 ...Including tool-guide (or bushing)
98 ...Base supported machine
99 ..With means to move tool relative to other work-engaging structure along tool-axis
100 ...Having sliding engagement therewith
101 ....Screw coaxial with tool
102 ..Tool having screw-thread engaging frame to cause infeed
103 .Work-gripping clamp
104 ..Adapted to coaxially grip round work
105 ...Oppositely moving lateral clamps
106 ....Three or more moving clamps
107 ...Base supported clamp
108 ...Oppositely moving lateral clamps
109 ..Adjustable relative to tool-axis
110 .Movable relative to tool along tool-axis
111 ..Including means to move tool
112 ..With means to bias tool away from work
113 .Axially fixed to tool
114 ..Work-engaging surface parallel to tool-axis
115 R .Adjustable, tool-guiding jig
115 B ..Guide bushing
72 B ..Bushing
TOOL-SUPPORT WITH MEANS TO RECEIVE TOOL-POSITION INDICATOR
PLURAL TOOL-ASSEMBLAGES
.Coaxial
..Spring biased

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120 TOOL OR TOOL-SUPPORT WITH TORQUE-APPLYING RATCHET
121 .With thrust applying means
122 .Reversible ratchet
122.5 Double-acting ratchet
123 Reversible ratchet
124 MEANS TO DRIVE TOOL
125 With specific tool structure
126 Friction gearing
127 Universal or flexible drive connection to rotate tool
128 Belt and pulley
129 Including means to move tool along tool-axis
130 Fluid means
131 Laterally adjustable tool
132 With clutch means
133 Including plural speed drive
134 Actuated by tool movement
135 Rack and pinion
136 Manually moved lever
137 Screw coaxial with tool
138 TOOL OR TOOL-SUPPORT WITH THRUST-APPLYING MACHINE-ENGAGING SCREW
139 TOOL OR TOOL-SUPPORT WITH TORQUE-APPLYING CLUTCH
140 Friction clutch
141 TOOL OR TOOL-SUPPORT WITH TORQUE-APPLYING SPLINE
142 Relative motion of splined shaft and tool-support causing release of tool from operating position
143 TOOL-CARRIER WITH VIBRATION-DAMPING MEANS
144 TOOL OF SPECIFIC DIVERSE MATERIAL
145 TOOL HAVING CRYSTALLINE CUTTING EDGE
146 TOOL-SUPPORT WITH MEANS TO MOVE TOOL RELATIVE TO TOOL-SUPPORT
147 To move radially
148 .With tool releasing trigger
149 .And separate tool setting means
150 .To move eccentrically mounted tool
151 .Tool-support including plural, adjustable sections
152 Moving means including pinion engaging rack-like surface of tool
153 Moving means including wedge, screw or cam
154 .With resiliently urged tool
155 .With spring retainer
156 .Resilient tool or tool-support
157 Including oppositely moving, diverging tools
158 Axially slidable moving-means
159 Tool pivotally mounted on support
160 Having axially spaced shoulders
161 Screw driven wedge or cam
162 Screw with axis radially spaced from tool-axis
163 Annular wedge-collar
164 Axially spaced tool-retaining collars
165 Tool having axially facing, collar-receiving groove
166 .With travelling wedge
167 Including two-piece collar
168 Traveling wedge
169 Interfitting, tool-retaining wedge
170 Including separable interfitting element
171 Having externally threaded shank connected to tool-support
172 Annular wedge-collar
173 Rotary cam
174 Scroll plate
175 Volute scroll
176 .With means to rotate scroll
177 .With adjustable means to limit scroll movement
178 Coaxial with tool-axis
179 Wedge moving perpendicular to tool-axis
180 .Pivoting tool-support
181 Screw extending perpendicular to tool-axis
182 .Plural tools moved by diametrically opposed screws
183 .Screws mounted on common shaft
184 Tool having pitch-stabilizing ridge
185 With tool-holding clamp and clamp actuator
186 TOOL-SUPPORT WITH MEANS TO PERMIT POSITIONING OF THE TOOL RELATIVE TO SUPPORT
187 Pivoting tool
188 .With multiple cutting positions
CLASS 408 CUTTING BY USE OF ROTATING AXIALLY MOVING TOOL

TOOL HAVING STEPPED CUTTING EDGES
- Axially spaced
- With central lead
- Including means to permit both radial and axial positioning of edge
- Including means to permit relative axial positioning of edges
- With work-engaging structure other than cutting edge
- Including central lead movable relative to support
- Including inverse cutting edge
- Including means to "form" depression in work
- Including central-lead
- Including tool-holding clamp and clamp actuator
- Movable along tool-axis

TOOL OR TOOL WITH SUPPORT
- With work-engaging structure detachable from cutting edge
- Removable central lead
- Depth-limiting member
- Adjustable
- Hollow milling tool
- Having axial, core-receiving central portion
- With lateral outlet
- And having stepped cutting edges
- Having product-receiving chamber
- And central lead-screw
- And central lead
- Helical ribbon tool
- Having inversely angled cutting edge
- And axially extending peripheral cutting spur
- Having axially extending peripheral cutting spur
- Having central lead-screw
- With pitch-stabilizing ridge
- And radially spaced cutting edge
- Including cutting teeth of different width
- And different root circles
- Including tapered section
- And relieved cutting edge
- Including work-embracing cutting edges
- Extending outwardly from tool-axis
- Having stepped cutting edges

MACHINE FRAME
- With counterweight mechanism
- Including pivotally mounted tool-carrier
- Including laterally movable tool-carrier

TOOL-SUPPORT
- With tool-retaining means
- Clamping jaws
- Tool adapter
- MISCELLANEOUS
- Drill bushings
- Drill guide
- Adjustable stop

CROSS-REFERENCE ART COLLECTIONS
- CUTTING BY USE OF ULTRASONIC ENERGY
- CUTTING BY USE OF RADIANT ENERGY (E.G., LASER, MASER)
- CUTTING BY USE OF PENUMATIC DRIVE MEANS
- TREPANNING
- DRILLING SMALL HOLES
- DRILLING DEEP HOLES
- DRILLING BRAKE LINING
- DRILLING OPENING FOR BEARING IN CONNECTING ROD OR PISTON
- DRILLING OPENING FOR BEARING IN ENGINE BLOCK
- REBORING PISTON RECEIVING CYLINDER
- SAFETY DEVICE
- ADAPTER FOR BROKEN TOOL
- DRILL PRESS ADAPTED TO USE PORTABLE HAND DRILL

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713 TOOL HAVING DETACHABLE CUTTING EDGE
714 RESILIENT TOOL OR TOOL-SUPPORT

FOREIGN ART COLLECTIONS
FOR CLASS-RELATED FOREIGN DOCUMENTS

DIGESTS
DIG 1 BOWLING BALL DRILL