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

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| 58 | ..And means to move gaseous fluid by application of vacuum | 88 | ..Tool having shiftable tool-axis |
| 59 | ..Conducting channel extending to end of tool | 89 | ..Angularly adjustable surface |
| 60 | ..Including nozzle | 90 | ...Adjustable about axis that is parallel to tool-axis |
| 61 | ..Including nozzle | 91 | ..Laterally adjustable surface |
| 62 | WITH WORK-INFEED MEANS | 92 | ..Flexible or concatenated member |
| 63 | ..Driven by fluid motor | 93 | ..Connected to tool through opening being enlarged by tool |
| 64 | ..Driven by means having sliding engagement therewith | 94 | ...Plural, coaxially opposing, work-engaging means |
| 65 | ..Driven by lever or connecting link | 95 | ..With presser foot |
| 66 | ..And gear to drive infeed means | 96 | ...Encompassed by tool during cut |
| 67 | WITH PRODUCT HANDLING OR RECEIVING MEANS | 97 | ...Including tool-guide (or bushing) |
| 68 | ..Ejector | 98 | ...Base supported machine |
| 69 | WITH WORK ADVANCING OR GUIDING MEANS | 99 | ..With means to move tool relative to other work-engaging structure along tool-axis |
| 70 | ..Means to intermittently advance work | 100 | ...Having sliding engagement therewith |
| 71 | ..Rotary, work-supporting means | 101 | ...Screw coaxial with tool |
| 72 R | WITH WORK-ENGAGING STRUCTURE OTHER THAN TOOL OR TOOL-SUPPORT | 102 | ..Tool having screw-thread engaging frame to cause infeed |
| 73 | ..With means actuated by work to release tool from fixed position in tool support | 103 | ..Work-gripping clamp |
| 74 | ..Adapted to engage work at tool-axis | 104 | ..Adapted to coaxially grip round work |
| 75 | ..Centering means adapted to be replaced by tool | 105 | ...Oppositely moving lateral clamps |
| 76 | ..Magnetic or suction means | 106 | ...Three or more moving clamps |
| 77 | ..Tool supporting wheel | 107 | ...Base supported clamp |
| 78 | ..Wheel-axis parallel to tool-axis | 108 | ..Oppositely moving lateral clamps |
| 79 | ..Frictionally engaging sides of opening in work | 109 | ..Adjustable relative to tool-axis |
| 80 | ..Opening coaxial with tool | 110 | ..Movable relative to tool along tool-axis |
| 81 | ...Engaging sides of opening being enlarged by tool | 111 | ..Including means to move tool |
| 82 | ...Engaging surface axially advanced of tool-action | 112 | ..With means to bias tool away from work |
| 83 | ...Engaging surface subsequent to tool-action on that surface | 113 | ..Axially fixed to tool |
| 83.5 | ...Valve fitting | 114 | ..Work-engaging surface parallel to tool-axis |
| 84 | ..Funnel like work-engaging surface cooperating with protuberance on work | 115 R | ..Adjustable, tool-guiding jig |
| 85 | ..Adapted to "form" recession in work | 115 B | ..Guide bushing |
| 86 | ..Recession at tool-axis | 72 B | ..Bushing |
| 87 | ..Having tool-opposing, work-engaging surface | 116 | TOOL-SUPPORT WITH MEANS TO RECEIVE TOOL-POSITION INDICATOR |
| | | 117 | PLURAL TOOL-ASSEMBLAGES |
| | | 118 | ..Coaxial |
| | | 119 | ..Spring biased |

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

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| 189 | .Tool having stepped cutting edges | 224 | ..Axially spaced |
| 190 | ..Including means to permit both radial and axial positioning of edge | 225 | ...With central lead |
| 191 | ..Including means to permit relative axial positioning of edges | 226 | .Including detailed shank |
| 192 | ...With work-engaging structure other than cutting edge | 227 | .Having peripherally spaced cutting edges |
| 193 | ...Including central tool axially movable relative to support | 228 | ..Each formed by a pair of axially facing facets |
| 194 | ..Including inverse cutting edge | 229 | ..With axially extending relief channel |
| 195 | ..Including means to "form" depression in work | 230 | ...Spiral channel |
| 196 | ..Including central-lead | 231 | ..With means to retain tool to support |
| 197 | ..Including tool-holding clamp and clamp actuator | 232 | ...Wedge means |
| 198 | ..Movable along tool-axis | 233 | ...Screw driven means |
| 199 | TOOL OR TOOL WITH SUPPORT | 234 | MACHINE FRAME |
| 200 | .With work-engaging structure detachable from cutting edge | 235 | .With counterweight mechanism |
| 201 | ..Removable central lead | 236 | .Including pivotally mounted tool-carrier |
| 202 | ..Depth-limiting member | 237 | ..Including laterally movable tool-carrier |
| 203 | ..Adjustable | 238 | TOOL-SUPPORT |
| 203.5 | .Hollow milling tool | 239 R | .With tool-retaining means |
| 204 | .Having axial, core-receiving central portion | 240 | ..Clamping jaws |
| 205 | ..With lateral outlet | 239 A | ..Tool adapter |
| 206 | ..And having stepped cutting edges | 241 R | MISCELLANEOUS |
| 207 | .Having product-receiving chamber | 241 B | .Drill bushings |
| 208 | ..And central lead-screw | 241 G | .Drill guide |
| 209 | ..And central lead | 241 S | .Adjustable stop |
| 210 | .Helical ribbon tool | | |
| 211 | .Having inversely angled cutting edge | | |
| 212 | ..And axially extending peripheral cutting spur | | |
| 213 | .Having axially extending peripheral cutting spur | | |
| 214 | .Having central lead-screw | | |
| 215 | .With pitch-stabilizing ridge | | |
| 216 | ..And radially spaced cutting edge | | |
| 217 | ..Including cutting teeth of different width | | |
| 218 | ...And different root circles | | |
| 219 | ..Including tapered section | | |
| 220 | ...And relieved cutting edge | | |
| 221 | ..Including work-embracing cutting edges | | |
| 222 | ..Extending outwardly from tool-axis | | |
| 223 | .Having stepped cutting edges | | |
| | | | <u>CROSS-REFERENCE ART COLLECTIONS</u> |
| | | 700 | CUTTING BY USE OF ULTRASONIC ENERGY |
| | | 701 | CUTTING BY USE OF RADIANT ENERGY (E.G., LASER, MASER) |
| | | 702 | CUTTING BY USE OF PNEUMATIC DRIVE MEANS |
| | | 703 | TREPPANNING |
| | | 704 | DRILLING SMALL HOLES |
| | | 705 | DRILLING DEEP HOLES |
| | | 706 | DRILLING BRAKE LINING |
| | | 707 | DRILLING OPENING FOR BEARING IN CONNECTING ROD OR PISTON |
| | | 708 | DRILLING OPENING FOR BEARING IN ENGINE BLOCK |
| | | 709 | REBORING PISTON RECEIVING CYLINDER |
| | | 710 | SAFETY DEVICE |
| | | 711 | ADAPTER FOR BROKEN TOOL |
| | | 712 | DRILL PRESS ADAPTED TO USE PORTABLE HAND DRILL |

- 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

