BATTERY-GRID MAKING

BIAS (I.E., HELICALLY) CUTTING OF TUBULAR STOCK

Including orbital cutter

Within stock support

With orbiting strip accumulator

Including means to inflate stock

With means to feed stock along support or mandrel

Single means produces compound motion

Endless belt drive means

Axially

Rotatably

With means to rotate and store stock supply

Axis of rotation parallel to support or mandrel

With means for arcuate shift of mandrel

Including means to handle produced strip or web

With common adjustment for cutter

Method

BUCKLE MAKING

BUTTON-FASTENER MAKING

SHREDDING METAL OR METAL WOOL ARTICLE MAKING

Metal wool making

Shaving or longitudinal cutting

Soap-pad making

Metal wool bundling

Soap-pad making

CORD HEDDLE MAKING

COTTER-PIN MAKING

CRANKSHAFT MAKING APPARATUS

EXPANDED METAL MAKING

By use of reciprocating perforator

EYEBOLT OR HOOK MAKING

FENCE BARB MAKING

By use of reciprocating cutter or die

By use of rotary cutter or die

FINGER-RING FORMING OR SIZING

FISHHOOK MAKING

GEM AND JEWEL SETTING

HINGE MAKING OR ASSEMBLING

LACING-STUD MAKING

PAPER-FASTENER MAKING

PLOW OR CULTIVATOR IRON MAKING

PUDDLERS BALLS MAKING

RAILWAY-CHAIR MAKING

FOIL OR OTHER THIN SHEET-METAL MAKING OR TREATING

Method

Clad or other composite foil or thin metal making

With assembling or disassembling of a pack

Using transitory solid cover material

Including bond prevention treatment

Disassembling of a pack

By shaving or longitudinal cutting

Using transitory material

Means for opening or separating a pack

SPECTACLE-FRAME MAKING

SPIRAL CUTTING OF FLAT STOCK

STEREOTYPE-PLATE FINISHING

MEANS FOR FORMING CLENCH-TONGUE (E.G., FOR TIEBAND)

TIRE UPSETTING, WITH CUTTING, PUNCHING, ETC.

TOOTHED-CYLINDER MAKING APPARATUS (E.G., TEXTURE WORKING CYLINDER)

IMPELLER MAKING APPARATUS

TYPE FINISHING AND GROOVING

VENETIAN BLIND ASSEMBLING

UMBRELLA-FRAME MAKING

BARRIER LAYER OR SEMICONDUCTOR DEVICE MAKING

PIEZOELECTRIC DEVICE MAKING

ELECTRIC CONDENSER MAKING

Solid dielectric type

FILING

SCALE REMOVER OR PREVENTOR

For hollow workpiece

Interior surface

Rolling deformation or deflection

For wire or rod

With rotary head

Fluid impingement
29 - 2 CLASS 29 METAL WORKING

81.07 ..With heater
81.08 ..Liquid jet
81.09 ..Airblast
81.1 ..Chainer
81.11 ..Scraper or scalper
81.12 .Brush type
81.13 ..Mechanically powered operator
81.14 ..Tack or needle type
81.15 ..Hammer
81.16 ..Blade or chisel
81.17 ..Hand tool
89.5 BURNING IN, WEARING IN, OR OIL BURNISHING
90.01 BURNISHING
90.1 .Of water laid fibrous article (e.g., paper)
90.2 ..Heated burnishing member
90.3 ...Burnishing tool reciprocates across work surface
90.5 ..Continuous feed
90.6 ..Of gear article
90.7 ..By shot peening or blasting
91 UPHOLSTERED ARTICLE MAKING
91.1 .Method
91.2 ..Tufting
91.3 ..With means to clench fastener
91.4 ..With means to insert guide pin or fastener
91.5 ..Cover stretching
91.6 ..Edge-roll forming
91.7 ..Form or holder
91.8 ..With follower
92 METHOD OF MECHANICAL MANUFACTURE
92.1 ..Electrical device making
93 ..Including measuring or testing of device or component part
94 ..Acoustic transducer
95 ..Indicating transducer
96 ..Dynamoelectric machine
97 ...Commutator or slip ring assembly
98 ...Rotor
99 ..Superconductor
600 ..Antenna or wave energy "plumbing" making
601 ...With other electrical component
602.1 ..Electromagnet, transformer or inductor
603.01 ...Magnetic recording reproducing transducer (e.g., tape head, core, etc.)
603.02 ....Including disassembly step
603.03 ....Making disc drive
603.04 ....Mounting preformed head/core onto other structure
603.05 .....Mounting multitrack head
603.06 .....With bonding
603.07 ....Fabricating head structure or component thereof
603.08 .....Treating to affect magnetic properties
603.09 .....Including measuring or testing
603.1 ......Using reference point/surface to facilitate measuring
603.11 ......With dual gap materials
603.12 ......With significant slider/housing shaping or treating
603.13 ......Deposit magnetic layer or coating
603.14 ......Plural magnetic deposition layers
603.15 ......With etching or machining of magnetic material
603.16 ......Machining magnetic material (e.g., grinding, etching, polishing)
603.17 ......Employing workholding means
603.18 ......By etching
603.19 ......Multitrack heads having integral holding means
603.2 ......With bond/laminating preformed parts, at least two magnetic
603.21 ......Using glass bonding material
603.22 ......With work positioning means
603.23 ......Providing winding
603.24 ......Multilayered winding
603.25 ......By coating
603.26 ......Preformed winding
603.27 ......Specified diverse magnetic materials
604 ...Data storage inductor or core
605 ...By winding or coiling
606 ...By assembling coil and core
607 ...Including permanent magnet or core
608 ...From comminuted material
609 .....Laminated
609.1 ...Acoustic transducer
610.1 .Resistor making
611 ..Heater type
612 ...Thermally variable

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...With envelope or housing
...Filling with powdered insulation
...With direct compression of powdered insulation
...Powdering the insulation
...By oxidation
...With winding
...Applying terminal
...Coating resistive material on a base
...Applying sealing
...Including laminating of indefinite length material
...Including adhesively bonding
...Including coating or impregnating
...Conductor or circuit manufacturing
...Brush
...Beam lead frame or beam lead device
...Co-axial cable
...On flat or curved insulated base, e.g., printed circuit, etc.
...Assembling bases
...Assembling formed circuit to base
...Assembling to base an electrical component, e.g., capacitor, etc.
...By utilizing optical sighting device
...With component orienting
...And shaping, e.g., cutting or bending, etc.
...Different components
...By inserting component lead or terminal into base aperture
...With deforming of lead or terminal
...Including metal fusion
...By metal fusion
...With encapsulating, e.g., potting, etc.
...Assembling terminal to base
...By metal fusion bonding
...By deforming or shaping
...With shaping or forcing terminal into base aperture
...Manufacturing circuit on or in base
...With selective destruction of conductive paths
...With molding of insulated base
...Simultaneous circuit manufacturing
...By using wire as conductive path
...With sintering of base
...By forming conductive walled aperture in base
...With deforming of conductive path
...Assembling electrical component directly to terminal or elongated conductor
...With encapsulating
...By molding of insulating material
...Assembling terminal to elongated conductor
...With molding of electrically insulating material
...By shrinking of cover
...By metal fusion bonding
...By deforming
...Of ferrule about conductor and terminal
...With forming eyelet from elongated conductor
...With penetrating portion
...Through insulation
...With insulation removal
...Assembling elongated conductors, e.g., splicing, etc.
...With end-to-end orienting
...Including fluid evacuating or pressurizing
...Including deforming of joining bridge
...With overlapping orienting
...Including oppositely facing end orienting
...Contact or terminal manufacturing
...By powder metallurgy
...By assembling plural parts
...With bonding
...Of fused material
879 .......Metal
880 .......By impregnating a porous mass
881 ......By elastic joining
882 ......With deforming
883 ......With molding of insulation
884 ......Forming array of contacts or terminals
885 ......With coating
886 ..Electret making
887 ..Insulator making
888 .Prime mover or fluid pump making
888.01 ..I.C. (internal combustion) engine making
888.011 ...Repairing, converting, servicing or salvaging
888.012 ...Rotary or radial engine making
888.02 ..Fluid pump or compressor making
888.021 ...Repairing, converting, servicing or salvaging
888.022 ...Scroll or peristaltic type
888.023 ...Screw or gear type, e.g., Moineau type
888.024 ...Centrifugal type
888.025 ...Vane type or other rotary, e.g., fan
888.03 ..Valve lifter making
888.04 ..Piston making
888.041 ...Repairing, converting, servicing or salvaging
888.042 ...Multi-element piston making
888.043 ...Utilizing a high energy beam, e.g., laser, electron beam
888.044 ...With assembly or composite article making
888.045 ...With thermal barrier or heat flow provision
888.046 ...With fiber reinforced structure
888.047 ...By composite casting or molding
888.048 ...By coating or cladding
888.049 ...Ring groove forming or finishing
888.05 ...Gudgeon pin, wrist pin, piston pin, or boss therefor
888.051 ...With other attaching provision for connecting rod
888.06 ..Cylinder, cylinder head or engine valve sleeve making
888.061 ...With liner, coating, or sleeve
888.07 ..Piston ring or piston packing making
888.071 ...Including forging or hammering
888.072 ...Including casting or molding
888.073 ...Including rolling or die forming, e.g., drawing, punching
888.074 ...Including coating or plating
888.075 ...Including grinding or honing
888.076 ...Including machining or angular cutting
888.08 ..Crankshaft making
888.09 ..Connecting rod making
888.091 ...Including metallurgical bonding
888.092 ...Including metal forging or die shaping
888.1 ..Camshaft making
888.2 ..Push rod or rocker arm making
888.3 ..Seal or packing making
888.4 ..Poppet or I.C. engine valve or valve seat making
888.41 ...Valve guide making
888.42 ...Repairing, converting, servicing or salvaging
888.43 ...Valve tappet making
888.44 ...Valve seat making
888.45 ...Composite or hollow valve stem or head making
888.451 ...Including forging
888.452 ...Including extruding
888.453 ...Including casting
888.46 ...With assembly or composite article making
889 ..Impeller making
889.1 ..Repairing or disassembling
889.2 ..Turbomachine making
889.21 ...Assembling individual fluid flow interacting members, e.g., blades, vanes, buckets, on rotary support member
889.22 ...Assembling fluid flow directing devices, e.g., stators, diaphragms, nozzles
889.23 ...Shaping integrally bladed rotor
889.3 ..Axial blower or fan
889.4 ..Centrifugal blower or fan
889.5 ..Fluid coupling device
889.6 ..Propeller making
889.61 ...Utilizing hollow tube blank
889.7 ..Blade making
889.71 ...Composite blade
889.72 ..Hollow blade
889.721 ...With cooling passage
889.722 ......Passage contains tubular insert
890 ..Catalytic device making

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890.01 .Rocket or jet device making
890.02 .Burner, torch or metallurgical lance making
890.03 .Heat exchanger or boiler making
890.031 ..Repairing, converting, servicing or salvaging
890.032 ..Heat pipe device making
890.033 ..Solar energy device making
890.034 ..Regenerator or recuperator making
890.035 ..Cooling apparatus making, e.g., air conditioner, refrigerator
890.036 ..Tube inside tube
890.037 ..Tube wound about tube
890.038 ..Tube joined to flat sheet longitudinally, i.e., tube sheet
890.039 ..Sheet joined to sheet
890.04 ...With inserted tubes
890.041 ...Utilizing bond inhibiting material
890.042 ...With subsequent fluid expansion
890.043 ..Tube joint and tube plate structure
890.044 ...Including conduit expansion or inflation
890.045 ..Tube with heat transfer means
890.046 ...Finned tube
890.047 ....Common fin traverses plurality of tubes
890.048 ....Helically finned
890.049 ....Internally finned
890.05 ....Made from unitary workpiece, i.e., no assembly
890.051 ..Boiler making
890.052 ..Header or manifold making
890.053 ..Tube making or reforming
890.054 ..With metallurgical bonding
890.06 .Accumulator making
890.07 .Condenser, evaporator or vaporizer making
890.08 .Muffler, manifold or exhaust pipe making
890.09 .Fluidic or fluid actuated device making
890.1 .Fluid pattern dispersing device making, e.g., ink jet
890.11 .Tapping device making
890.12 .Valve or choke making
890.121 ..Repairing, converting, servicing or salvaging
890.122 ..Valve seat forming
890.123 ..Valve stem or tire valve making
890.124 ..With assembly, disassembly or composite article making
890.125 ...Joining plural semi-circular components
890.126 ...With material shaping or cutting
890.127 ....Including molding or casting
890.128 ....Including machining or drilling
890.129 ....Including metallurgical bonding
890.13 ....Including metal deforming
890.131 ...Including metallurgical bonding
890.132 ..Including metal shaping and diverse operation
890.14 .Gas and water specific plumbing component making
890.141 ..Plumbing fixture making
890.142 ..Nozzle making
890.143 ...Sprayer
890.144 ...Flexible conduit or fitting therefore
890.145 ..Flue connector device making
890.146 ..Trap making
890.147 ..Return connector device making
890.148 ..T-shaped fitting making
890.149 ..Elbow or L-shaped fitting making
890.15 ..Ferrule making or reforming
891 .Agricultural device making
891.1 ..Traction apparatus, e.g., for tractor
891.2 ..Harvester guard
892 .Pulley making
892.1 ...Assembly
892.11 ...With shaping
892.2 ..Disc splitting to form pulley rim groove
892.3 ..Groove forming in sheet metal pulley rim
893 .Gear making
893.1 ..Assembling of gear into force transmitting device
893.2 ..Gear mounting
893.3 ..Gear shaping
893.31 ...Worm gear
893.32 ...Roll forming
893.33 ...Punching or stamping
893.34 ...Die-press shaping
893.35 ...Gear tooth cutting
893.36 ...Gear blank making
893.37 ...With specific gear material
894 .Wheel making
894.01  Railway or trolley wheel making
894.011 .Multiple part or composite
894.012  .With axle or hub
894.1  Steering wheel
894.2  Material winding, e.g., reel, spool
894.3  Land wheel
894.31  Assembling tire to wheel body
894.32  Disc type wheel
894.321  Assembling wheel disc to rim and hub
894.322  Assembling wheel disc to rim
894.323  .With disc shaping
894.324  Integral rim and disc making
894.325  Disc shaping
894.33  Tensioned spoke type wheel making
894.331  Tensioning all spokes simultaneously
894.332  Tensioning spokes in series
894.333  Tensioning spokes individually
894.34  Compression, e.g., nontension, spoke type wheel making
894.341  Joining spokes to rim and hub
894.342  Joining spokes to rim
894.343  Joining spokes to hub
894.344  Making plural spokes from a single blank
894.345  Individual spoke making
894.35  Rim making
894.351  With assembling
894.352  Demountable rim making
894.353  Die-press shaping
894.354  Roller forming
894.36  Hub making
894.361  With assembling
894.362  Hub shaping
894.37  Tire making
894.38  Wheel trim making, e.g., wheel cover, hubcap
894.381  With means for retaining trim member on wheel
895  Roller making
895.1  Repairing or servicing
895.2  Assembling preformed components
895.21  Work contacting surface element assembled to core
895.211  Work contacting surface wound about core
895.212  With prestressing of component by heat differential, e.g., shrink, fit
895.22  .Work contacting surface element assembled to end support members
895.23  Includes securing removable cover on roller
895.3  Fabricating and shaping roller work contacting surface element
895.31  Toothed roller
895.32  With coating or casting about a core
895.33  One-piece roller making
896.1  Dental appliance making
896.11  Orthodontic device making
896.2  Sound device making
896.21  Hearing aid component making
896.22  Musical instrument or tuning fork making
896.23  Including diaphragm or support therefor
896.24  Phonograph component making
896.3  Watch or clock making
896.31  Having arbor, pinion, or balance
896.32  Having indicia, face, or dial
896.33  Having case, cover, or back
896.34  Having crown, stem, or pendent
896.4  Jewelry or locket making
896.41  Human adornment device making
896.411  Bracelet making
896.412  Finger ring making
896.42  Latch, clasp, or fastener component making
896.43  Ornamental stock making
896.5  Knob or knob shank making
896.6  Multiperforated metal article making
896.61  Coil wound wall screen
896.62  Filter
896.7  Turnbuckle making
896.8  Spring-head clip making
896.9  Spring making
896.91  For vehicle or clutch
896.92  For human comfort
896.93  Resilient shock or vibration absorber utility
897  Structural member making
897.1  Restoring existing member, e.g., reinforcing, repairing
897.15  Grille making
897.2  Vehicular structural member making

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897.3 Static structure, e.g., a building component
897.31 Openwork, e.g., a truss, joist, frame, lattice-type or box beam
897.312 Frame component
897.32 Panel
897.33 Columnar member
897.34 Metal reinforcement member for nonmetallic, e.g., concrete, structural element
897.35 Beam or girder
898 Process for making bearing or component thereof
898.01 Repairing
898.02 Fluid bearing
898.03 Linear bearing
898.04 Rotary bearing
898.041 Thrust bearing
898.042 Plain bearing
898.043 Self-adjusting or self-aligning, including ball and socket type, bearing and component making
898.044 Deforming socket to secure ball
898.045 Die-press shaping
898.046 Having liner
898.047 Having liner
898.048 Socket making
898.049 By molding or casting
898.05 Nonmetallic socket
898.051 By assembling
898.052 Ball making
898.053 With metallurgical bonding
898.054 Sleeve or bushing making
898.055 Nonmetallic
898.056 Strip or blank material shaping
898.057 Die-press shaping
898.058 Having inner lining layer
898.059 Having liner
898.06 Anti-friction bearing or component thereof
898.061 Assembling of race, cage, and rolling anti-friction members
898.062 Assembling of race and rolling anti-friction members
898.063 With race making
898.064 Assembling of cage and rolling anti-friction members
898.065 With cage making
898.066 Race making
898.067 Cage making
898.068 Roller making
898.069 Ball making
898.07 Mounting
898.08 Demounting
898.09 Pre-usage process, e.g., preloading, aligning
898.1 Lubricating
898.11 Sealing
898.12 Coating or casting
898.13 Bearing surface treatment
898.14 Specific metallic composition
898.15 Nonmetallic bearing element
899 Ball making
899.1 Hollow ball
401.1 Converting
402.01 Repairing
402.02 Seal or element thereof
402.03 With disassembling
402.04 Including reconditioning of part
402.05 By shaping
402.06 Removing material
402.07 And by a metallurgical operation, e.g., welding, diffusion bonding, casting
402.08 Replacing of defective part
402.09 By attaching repair preform, e.g., remaking, restoring, or patching
402.11 And removing damaged material
402.12 Mechanically attaching preform with separate fastener
402.13 Metallurgically attaching preform
402.14 Mechanically attaching preform by separate fastener
402.15 Screw threaded fastener
402.16 Metallurgically attaching preform
402.17 Screw threaded preform
402.18 By applying fluent material, e.g., coating, casting
402.19 By shaping, e.g., bending, extruding, turning, etc.
402.21 Including heating
403.1 Scrap recovering or utilizing
403.2 Metalworking to consolidate scrap
403.3 Separating one material from another
403.4 By burning or heating
404 During simulated operation or operating conditions
405 Temperature
<table>
<thead>
<tr>
<th>Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>406</td>
<td>Center locating and shaping</td>
</tr>
<tr>
<td>407.01</td>
<td>With testing or indicating</td>
</tr>
<tr>
<td>407.02</td>
<td>Torquing threaded assemblage or determining torque herein</td>
</tr>
<tr>
<td>407.03</td>
<td>Determining relative number of threaded member rotations</td>
</tr>
<tr>
<td>407.04</td>
<td>Using optical instrument (excludes mere human eyeballing)</td>
</tr>
<tr>
<td>407.05</td>
<td>Quantitative measuring or gauging</td>
</tr>
<tr>
<td>407.06</td>
<td>By radioactive tracing</td>
</tr>
<tr>
<td>407.07</td>
<td>By vibratory or oscillatory movement</td>
</tr>
<tr>
<td>407.08</td>
<td>Pressure, force, or weight determining</td>
</tr>
<tr>
<td>407.09</td>
<td>With aligning, guiding, or instruction</td>
</tr>
<tr>
<td>407.1</td>
<td>Assisting assembly or disassembly</td>
</tr>
<tr>
<td>408</td>
<td>Of a slide fastener</td>
</tr>
<tr>
<td>409</td>
<td>Of slider</td>
</tr>
<tr>
<td>410</td>
<td>Of interlocking element</td>
</tr>
<tr>
<td>411</td>
<td>Obtaining plural composite product pieces from preassembled workpieces</td>
</tr>
<tr>
<td>412</td>
<td>Obtaining plural product pieces from unitary workpiece</td>
</tr>
<tr>
<td>413</td>
<td>Breaking through weakened portion</td>
</tr>
<tr>
<td>414</td>
<td>Dividing through modified portion</td>
</tr>
<tr>
<td>415</td>
<td>Dividing on common outline</td>
</tr>
<tr>
<td>416</td>
<td>Coacting pieces</td>
</tr>
<tr>
<td>417</td>
<td>Dividing sequentially from leading end, e.g., by cutting or breaking</td>
</tr>
<tr>
<td>418</td>
<td>Providing transitory integral holding or handling portion</td>
</tr>
<tr>
<td>419.1</td>
<td>Shaping fiber or fibered material</td>
</tr>
<tr>
<td>419.2</td>
<td>Magnetically shaping</td>
</tr>
<tr>
<td>421.1</td>
<td>Shaping by direct application of fluent pressure</td>
</tr>
<tr>
<td>421.2</td>
<td>Explosively shaping</td>
</tr>
<tr>
<td>422</td>
<td>Shaping container end to encapsulate material</td>
</tr>
<tr>
<td>423</td>
<td>Utilizing transitory attached element or associated separate material</td>
</tr>
<tr>
<td>424</td>
<td>Temporary protective coating, impregnation, or cast layer</td>
</tr>
<tr>
<td>425</td>
<td>Shaping mating parts for reassembly in different positions</td>
</tr>
<tr>
<td>426.1</td>
<td>Disassembling</td>
</tr>
<tr>
<td>426.2</td>
<td>With other than ancillary treating or assembling</td>
</tr>
<tr>
<td>426.3</td>
<td>With conveying of work or disassembled work part</td>
</tr>
<tr>
<td>426.4</td>
<td>By altering or destroying work part or connector</td>
</tr>
<tr>
<td>426.5</td>
<td>By applying force</td>
</tr>
<tr>
<td>426.6</td>
<td>To elastically deform work part or connector</td>
</tr>
<tr>
<td>428</td>
<td>Assembling or joining</td>
</tr>
<tr>
<td>429</td>
<td>Progressively advancing of work assembly station or assembled portion of work</td>
</tr>
<tr>
<td>430</td>
<td>Advancing work to successive stations (i.e., assembly line)</td>
</tr>
<tr>
<td>431</td>
<td>Advancing station</td>
</tr>
<tr>
<td>432</td>
<td>Punching, piercing or reaming part by surface of second part</td>
</tr>
<tr>
<td>432.1</td>
<td>With shaping</td>
</tr>
<tr>
<td>432.2</td>
<td>Of first part</td>
</tr>
<tr>
<td>433</td>
<td>By stringing</td>
</tr>
<tr>
<td>434</td>
<td>Retaining clearance for motion between assembled parts</td>
</tr>
<tr>
<td>435</td>
<td>Between tube-forming helical coils</td>
</tr>
<tr>
<td>436</td>
<td>Through resilient media</td>
</tr>
<tr>
<td>437</td>
<td>By deforming interlock</td>
</tr>
<tr>
<td>438</td>
<td>By folding part into plural ears</td>
</tr>
<tr>
<td>439</td>
<td>By wrapping around</td>
</tr>
<tr>
<td>440</td>
<td>Of link closure</td>
</tr>
<tr>
<td>441.1</td>
<td>Of sphere, i.e., ball, in socket</td>
</tr>
<tr>
<td>441.2</td>
<td>Ball point pen making</td>
</tr>
<tr>
<td>442</td>
<td>Allowing assembled sphere to move in single plane only</td>
</tr>
<tr>
<td>443</td>
<td>Of flange into tubular socket</td>
</tr>
<tr>
<td>444</td>
<td>Outwardly deforming internally fitted rod</td>
</tr>
<tr>
<td>445</td>
<td>Sizing mating parts during final positional association</td>
</tr>
<tr>
<td>446</td>
<td>With prestressing of part</td>
</tr>
<tr>
<td>447</td>
<td>By temperature differential (e.g., shrink fit)</td>
</tr>
<tr>
<td>448</td>
<td>Of skin on frame member</td>
</tr>
<tr>
<td>449</td>
<td>By flexing</td>
</tr>
<tr>
<td>450</td>
<td>Elastic joining of parts</td>
</tr>
<tr>
<td>451</td>
<td>Confining elastic part in socket</td>
</tr>
<tr>
<td>452</td>
<td>Prestressing rod, filament or strand</td>
</tr>
<tr>
<td>453</td>
<td>By snap fit</td>
</tr>
</tbody>
</table>
..Of flexible wall, expansible
chamber devices (e.g.,
bellows)

..Spaced wall tube or receptacle
..Of separate helix (e.g., screw
thread)

..Ribbing

..With coating before or during
assembling

...To roughen surface

..Subsequently coating

..With spreading of cable strands

..Joining plate edge
perpendicularly to frame

..Peripheral joining of opposed
mirror image parts to form a
hollow body

..Associating parts by use of
aligning means (e.g., use of a
drift pin or a "fixture")

...Registering mating opposed
tool parts (e.g., registering
a punch and a cooperating die)

...By multiple cooperating
aligning means

...Sequentially associating parts
on stationary aligning means

...By manipulating aligning means

...Assembling a subassembly, then
assembling with a second
subassembly

...Metal deforming with
nonmetallic bonding

..Joining by deforming

...Securing cup or tube between
axially extending concentric
annuli

....By expanding inner annulus

....By constricting outer annulus

....Overedge assembling of seated
part

....By necking in cup or tube
wall

....At cup or tube end

....By flaring inserted cup or
tube end

....By bending over projecting
prongs

...Of parallel side-by-side
elongated members

....Inward deformation of aperture
or hollow body wall

....Hollow body is axially joined
cup or tube

....Joined to rod
Successive distinct removal operations

Work holding

CONVERTIBLE METAL WORKING MACHINE

PLURAL DIVERSE MANUFACTURING APPARATUS INCLUDING MEANS FOR METAL SHAPING OR ASSEMBLING

Slide fastener or slide fastener element

Binding or covering and cutting

Cutting covering material only

Type of machine

Drill press

Drilling and other

Portable

Lathe

Grinding attachment

Pulley or wheel

Convertible

Commutator

Lathe and tool

Planer

Forging and bending, cutting or punching

Fastener (zipper)

Riveting

Ball making

Wire working

With means to feed work during tool contact

Including nonrotary flying tool

With means to feed work intermittently from one tool station to another

Stock turret

Swiss type

Blank turret

Rotary work - vertical axis

Rotary work - horizontal axis

Stationary work

Belt drive

Crankshaft

Collapsible tube

Endless belt

Separate tool stations for selective or successive operation on work

Including assembling or disassembling station

And means to machine work part to fit cooperating work part

And means to sever work prior to disassembling

Comprising means to strip insulation from wire

And means to stake electric wire to commutator or armature in assembling of electric motor or generator

And means to sever work from supply

And means to machine product

To sever product to length

Common reciprocating support for spaced tools

Including composite tool

Including severing means

To sever electric terminal from supply strip

To trim electric component

Means comprising hand-manipulatable implement

With turret mechanism

Multiple turret

Tool turret

Rotary tool holder

Sliding tool holder

Fluid operated

Cam operated

Longitudinal turret axis

Transverse turret axis

Lever operated

Rack-and-pinion operated

Screw operated

Including rotating and/or locking means

Frictional and positive

Lock means for tool or work turrets

Multiple-tool holder

Laterally movable stock holder

Axial tool and transversely movable slide rest

Longitudinally and transversely movable

Rotary tool spindle

Rotary tool spindle

Oscillating tool

Including machining means

And work-holder for assembly

Attachment

Speed controller

Carriage stop mechanism

Flash remover

Welding strip ends

Casting and working

Tube making

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33 E  .Covering
33 F  .Wire working
33 G  .Radiator making
33 H  .Printing plate
33 J  .Turret
33 K  .Assembly
33 L  .Armature
33 M  .Electrical connector or terminal
33 N  .Tire valve or spark plug
33 P  .Multiple station with conveyor
33 Q  .Multiple stations working strip material
33 S  .Continuous strip
33 T  .Work on tubes
650  PLURAL DIVERSE MANUFACTURING APPARATUS
700  MEANS TO ASSEMBLE OR DISASSEMBLE
701  .With means to regulate operation by use of templet, tape, card or other replaceable information supply
702  .With comparator
703  ...Computer input
704  ...Web or strand-carried information supply
705  ...With means to test work or product
706  .With randomly actuated stopping or disabling means
707  ...Responsive to condition of work or product
708  ...Responsive to operative (e.g., safety device, etc.)
709  .With control means energized in response to activator stimulated by condition sensor
710  ...Including means to divert defective work part
711  ...Multiple station assembly or disassembly apparatus
712  ...Including position sensor
713  ...Responsive to timer
714  ...Responsive to work or work-related machine element
715  ...With means to fasten by deformation
716  .....Self-piercing work part
717  .....With means to fasten by elastic joining
718  .....With means to fasten by frictional fitting
719  .....Including means to apply magnetic force directly to position or hold work
720  .With signal, scale, illuminator, or optical viewer
721  ..For work-holder for assembly or disassembly
722  .Including means to provide a controlled environment
723  .Nuclear device
724  .Roller or ball bearing
725  ..Including deforming means
726  .Heat exchanger
726.5  ..Including means to manipulate heat exchanger tube bundle
727  ..Including deforming means
728  .Means to place sheath on running-length core
729  .Means to assemble electrical device
730  ..Storage cell or battery
731  ....Including deforming means
732  ..Motor or generator
733  ....Means to assemble commutator
734  ....Means to position insulation
735  ....Means to stake wire to commutator or armature
736  ...Including deforming means
737  ..Magnetic memory device
738  ..Laminated device
739  ..Means to fasten electrical component to wiring board, base, or substrate
740  ...Chip component
741  ....Multilead component
742  ..Multiple station assembly apparatus
743  ..Means to apply vacuum directly to position or hold work part
744  ..Means to apply magnetic force directly to position or hold work part
745  ..Conductor
746  ...Electrode
747  ...Terminal or connector
748  ....Assembled to wire-type conductor
749  ......Means to simultaneously assemble multiple, independent conductors to terminal
750  ......Means comprising hand-manipulatable implement
751  ......Fastening by deformation
752  ......Fastening by elastic joining
753  ......Means to fasten by deformation

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29 - 12 CLASS 29 METAL WORKING

754 .....Means to fasten by elastic joining
755 .....Multiple, independent conductors or fuse
756 .....Switch or fuse
757 .....Means to simultaneously fasten three or more parts
758 .....Means comprising hand-manipulatable implement
759 .....Means to align and advance work part
760 .....With work-holder for assembly
761 .....Means to fasten by deforming
762 .....Means to disassemble electrical device
763 .....Storage cell or battery
764 .....Means comprising hand-manipulatable implement
765 .....Means to place traveler on ring or ring on bobbin of a textile machine
766 .....Slide fastener
767 .....Means to assemble stop onto stringer
768 .....Means to assemble slider onto stringer
769 .....Means to assemble teeth onto stringer
770 .....Disassembly means
771 .....Means to interrelatedly feed plural work parts from plural sources without manual intervention
772 .....Box or pallet assembly means
773 .....Means to assemble container
774 .....Handle to container
775 .....Label to container
776 .....Pressurized dispensing container
777 .....Hypodermic syringe
778 .....Including fluid component
779 .....Running-length work
780 .....Means including orbiting running-length work supply
781 .....Pipe section
782 .....Assembled to article
783 .....Multiple station assembly apparatus
784 .....Including assembly pallet
785 .....Including turret-type conveyer
786 .....Including converging conveyers
787 .....And means to fasten work parts together
788 .....By deforming
789 .....By elastic joining

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215 Engine valve spring compressor (only) 243.522 Including near side fastener shaping tool
216 Plural spring engagement 243.523 Pneumatic- or fluid-actuated tool
217 Screw operated 243.524 Liquid
218 Parallel or tong type, side entrance 243.525 And gas
219 Lever operated 243.526 Having rotary drive mechanism
220 Single jaw or valve engagement 243.527 Having allochiral actuating handles
221 Plier type 243.528 Having repositionable annulus engaging tool
221.5 To or from wheel rim of resilient tire or tube 243.529 Including near side fastener shaping tool
222 Piston ring inserter or remover 243.53 Riveter
223 Plier-type operation 243.54 Single header
224 With ring encirclement 243.55 Pipe joiner
225 Spring applier or remover 243.56 Clip applier
226 Transmission spring 243.57 Binding or covering
227 Helical spring 243.58 Edge binding
228 Flat spiral spring (e.g., watch or clock type) 244 Puller or pusher means, contained force multiplying operator
229 Circular spring 245 Hubcap and hub
230 Leaf spring 246 Battery post and terminal
231 Means to stake watch or clock 247 Cotter pin and cooperating member
232 Plier type 248 Plier type means
233 Brake lining to brake shoe 249 Valve stem pin or key and another member
234 Tube and coextensive core 250 Machine key and another member
235 To apply or remove a resilient article (e.g., tube, sleeve, etc.) 251 Arbor-type press means
235.5 Nipple to nursing bottle 252 Having fluid operator
236 Well protector to sucker rod 253 Having wedge operator
237 Coupling to conduit 254 Having percussion or explosive operator
237.5 Loose-leaf sheet binder 255 Tube, sleeve, or ferrule inserting or removing
238 Compressing parts together face to face 256 Having screw operator
239 Spreading parts apart or separating them from face to face engagement 257 C-frame
240 By rotation of work part 258 Central screw, work-engagers around screw
240.5 Means to insert or remove helix 259 Work-engager arms along or parallel to screw
241 Means to string 260 With arm connecting engaging means
242 Tool handle and tool 261 Pivotal arms
243 Tool chuck and tool 262 Pivotal grippers on screw
243.5 Overedge assembling means 263 Tubular or tube segment forms work-engager
243.51 Annular work 264 Screw threaded work-engager
243.517 Annular work 265 Movable grippers on screw
243.518 With radially acting tool inside annular work 266 Plate or bar forms work-engager
243.519 With second workpiece inside annular work one workpiece moved to shape the other
243.521 Comprising driver for snap-off-mandrel fastener; e.g., Pop (TM) riveter

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267 ..Having lever operator
268 ...Plier type means
269 .Means comprising piston ring group contractor or holder
270 .Means comprising hand manipulatable tool
271 ..Aligner or center
272 ...Tube with tube
273 ...Auto wheel with auto chassis
274 ...Clutch plates
275 ..Means comprising impact receiving tool
276 ...C-frame
277 ...Thread protector (e.g., wheel axle type)
278 ..Hand gripper for direct push or pull
279 ...Centrifugal separator
280 ...Tube sleeve or ferrule applying or removing
281 ....Thread-tapping grip
281.1 .With work-holder for assembly
281.2 ..For assembling a luminescent mantle
281.3 ..And assembling press (e.g., truss assembling means, etc.)
281.4 ..Having means to permit support movement while work is thereon
281.5 .Including means to relatively position plural work parts
281.6 .Work-supported apparatus
282 .Tube, sleeve or ferrule
283 ..Work gripper, anvil, or element
283.5 .By deforming
284 MISCELLANEOUS APPARATUS

CROSS-REFERENCE ART COLLECTIONS

900 METHODS AND APPARATUS FOR ASSEMBLY BY ELECTROSTATIC ATTRACTION
901 BALANCING METHOD
902 FILTER MAKING
903 FIREARM BOLT MAKING
904 LAMINATED METAL ARTICLE MAKING
905 MAKING COIL WOUND WALL SCREEN
906 NUCLEAR DEVICE MAKING

FOREIGN ART COLLECTIONS
DIG 33  SCORING WITH OTHER STEP
DIG 34  SCALING WITH OTHER STEP
DIG 35  SHRINK FITTING WITH OTHER STEP
DIG 36  SHOT BLASTING WITH OTHER STEP
DIG 37  STAMPING WITH OTHER STEP
DIG 38  SPOT WELDING WITH OTHER STEP
DIG 39  SPRAYING WITH OTHER STEP
DIG 40  STRIPS OF REPEATED ARTICLES - CUT UP LATER
DIG 41  TAPER TUBE MAKING
DIG 42  TENSION APPLIED DURING WORKING
DIG 43  UPSETTING AND FLANGING TUBE END
DIG 44  VACUUM
DIG 45  TITANIUM
DIG 46  VIBRATION
DIG 47  EXTRUDING WITH OTHER STEP
DIG 48  WELDING WITH OTHER STEP
DIG 49  WORK HARDENING WITH OTHER STEP
DIG 50  CUTTING FLUID APPLICATION AND DEBRIS CONTROL
DIG 51  POWER STOP CONTROL FOR MOVABLE ELEMENT
DIG 52  CHIP BREAKER
DIG 53  WORKPIECE AND DEBRIS SEPARATOR
DIG 54  FLUID CONTROL INTERRELATED WITH MACHINE TOOL MECHANISM
DIG 55  WITH CUTTER DRIVE
DIG 56  WITH SHIELD OR HOOD MOVEMENTS
DIG 57  WITH CUTTER FEED
DIG 59  HOOD ACTUATED BY TOOL OR WORK APPROACH
DIG 60  PROGRESSIVE DISPLACEMENT OF HOOD
DIG 61  PLURAL-TYPE DEBRIS REMOVERS
DIG 62  RUBBING TRANSFER OF SOLID COATING TO ROTATING ELEMENT
DIG 63  FLUID CONVEYOR OR APPLICATOR
DIG 64  AMBULATORY CUTTER WITH FLUENT CONDUIT
DIG 65  CUTTER CONTAINED SUPPLY RESERVOIR
DIG 66  FLUID FLOW TO CHANNELED CUTTER
DIG 67  ROTATING CUTTER
DIG 68  HOLLOW SPINDLE CONTAINS
DIG 69  FLUID SPREADER CONTACTS CUTTER
DIG 70  ROTARY OR OSCILLATING FLUID APPLICATOR
DIG 71  COMPLETE IMMERSION OF CUTTER
DIG 72  DIP OR SPLASH SUPPLY
DIG 73  CHAIN OR BELT CONVEYOR
DIG 74  PARTIAL IMMERSION OF CUTTER
DIG 75  ADJUSTABLE LIQUID LEVEL
DIG 76  MOVABLE LIQUID-CARRYING TROUGH
DIG 77  WITH SEPARATOR OR FILTER
DIG 78  AIR BLAST AND/OR VACUUM CONVEYOR
DIG 79  REMOVABLE DEBRIS RECEPCTACLE
DIG 81  GAS AS A CONVEYOR
DIG 82  AIR CURRENT GENERATED BY CUTTER
DIG 83  FAN COAXIAL WITH CUTTER
DIG 84  VACUUM EXHAUST TYPE
DIG 85  WITH FLUID CONTROL VALVE
DIG 86  HOOD ENCASED CUTTER
DIG 87  MULTIPLE FLUID PATHS
DIG 88  BY PROJECTING, SQUIRTING OR Drippin
DIG 89  GAS ENTRAINLD LIQUID SUPPLY
DIG 90  ELEVATED TANK SUPPLY
DIG 91  PLURAL DISCHARGE OPENINGS
DIG 92  FLUID CHANNEL IN CUTTER
DIG 93  PLURAL DISCHARGE LOCI
DIG 94  DEBRIS REMOVER, CATCHER, OR DEFLECTOR
DIG 95  MAGNETIC OR ELECTROSTATIC
DIG 96  MECHANICAL REMOVAL ASSISTANT
DIG 97  CUTTER ENGAGING CLEANER
DIG 98  ROTATING, RECIPROCATING OR OSCILLATING CLEANER
DIG 99  FLEXIBLE CONVEYOR
DIG 100  SCREW OR CAM CONVEYOR
DIG 101  PAN, BED, OR TABLE
DIG 102  DEBRIS CHUTE
DIG 104  TOOL OR WORK ATTACHED
DIG 105  ASSEMBLY, MAGNETIC, OR INDICIA TOOL

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