CLASS 407, CUTTERS, FOR SHAPING

SECTION I - CLASS DEFINITION

Class 407 is the residual locus of the device to be attached to the driven spindle or to the stationary tool post of a machine intended to shape work by a sharp edge or point cutting that work to remove a chip therefrom; wherein, there is no relative movement between the sharp edge or point and the other claimed structure during cutting.

SCOPE OF THE CLASS

Cutting tools for shaping (as distinguished from subdividing) generally to be used in a "milling, gear cutting, or planing" machine or in a lathe, will be found in this class unless specifically provided for in another class. Included herein is all the structure normally replaced in changing from a first to a second tool, unless there is relative movement between part of the normally replaced structure and the cutting edge.

SECTION II - REFERENCES TO OTHER CLASSES

SEE OR SEARCH CLASS:

29, Metal Working, subclasses 76.1+ for a file or rasp (a file or rasp is a hard, smoothing implement having a cutting face sharply ridged to form cutting edges or teeth); and subclasses 90.01+ for a tool for cutting or burnishing, wherein burnishing is not done in conjunction with cutting.

30, Cutlery, for an implement including a shaping cutting edge and structure to make that implement capable of being work supported, hand held, or randomly manipulated.

56, Harvesters, for a cutter used to sever a vegetable product from a plant.

76, Metal Tools and Implements, Making, for a blank, process, or machine for making a cutter.

82, Turning, for a cutter for cutting rotating work wherein the cutter may be of this class type, combined with means relative to which that cutter moves during operation.

83, Cutting, for a method, machine or cutter for subdividing one workpiece into two distinct products of predetermined configuration.

125, Stone Working, subclass 36 for a cutter intended for the working of naturally occuring crystalline material.

142, Wood Turning, for a cutter intended to be used in cutting of rotating wood stock.

144, Woodworking, for a cutter or machine for shaping or subdividing wood stock.

147, Coopering, for a woodworking cutter to be used in the manufacture of a wood barrel.

279, Chucks or Sockets, for a holder of general utility which may be used to hold a cutter of this class.

408, Cutting by Use of Rotating Axially Moving Tool, subclasses 146 through 240 for a cutter for engaging work in the manner of that class.

409, Gear Cutting, Milling, or Planing, for shaping means utilizing a cutter, including structure relative to which the cutter moves during operation.

433, Dentistry, subclass 165 for a shaping cutter intended to be used in the shaping of human teeth.

451, Abrading, for a tool for cutting by use of a naturally formed crystalline cutting edge.

470, Threaded, Headed Fastener, or Washer Making: Process and Apparatus, subclass 57 for structure for cutting screw threads other than that found in Class 408, Cutting by Use of Rotating Axially Moving Tool, and other than by use of a gear cutting hob found in subclass 24 of this class.

483, Tool Changing, generally for a process or apparatus including a tool transfer means combined with a tool support or storage means.

606, Surgery, subclasses 79+ for orthopedic cutting instruments, subclass 116 for cutting means for marking animals, subclass 131 for cutting of skin by dermatotome, subclass 137 for cutting means used in animal sterilization, 163 for cutting means used in bedeaking or dehorning animals, and subclasses 167+, for cutting instruments in general.

SECTION III - GLOSSARY

Terms in the definition of this class followed by an asterisk (*) will be found to be defined in this section. Terms frequently appearing will be accompanied by an asterisk only where the exact meaning of the term is deemed particularly important.

CUTTER

See Tool*.

TOOL

A distinct unitary piece of material or plurality of unitary pieces of material permanently affixed together having a sharp edge or point for penetrating work and thereby directly effecting the operation of this class either by itself or by cooperation with another tool. A tool may have a plurality of edges or points for penetrating the work either concurrently, sequentially, or selectively and is adapted to be separably attached either directly or via a tool holder* to a machine*.

TOOL HOLDER

A device consisting of a single element or a plurality of elements having means to removably carry a tool* and adapted to be separably attached to a machine* for supporting the tool against gravity and against the reaction of working force.

TOOL SEAT

That part of the tool holder* that is in direct contact with the tool. The tool seat may be integral with the remainder of the support of may be separably carried thereby.

MACHINE

An assembly of components adapted to support work and a tool* and bring them together to perform a shaping operation by piercing the work with the tool and removing a chip therefrom. Specifically, a machine for use with the cutter of this class will be a “milling, gear cutting, or planing” machine or a lathe.

WORK

Material which is intended to be subjected to an operation of this class.

WORKPIECE

An object which is intended to be subjected to an operation of this class.

SUBCLASSES

1 INCLUDING NONCUTTING WORK MODIFYING MEANS:
This subclass is indented under the class definition. Device including means to perform the class type operation; and including means to be attached to the driven spindle or to the stationary tool post of a machine intended to perform a work treating operation not provided for in this class.

SEE OR SEARCH CLASS:
29, Metal Working, subclasses 90.01+ for a tool for burnishing and cutting, wherein burnishing can be performed independently of the cutting (a tool for shaping by cutting and concurrently burnishing is to be found in this subclass); and subclass 566 for a machine for performing a cutting operation and another treating operation.
408, Cutting by Use of Rotating Axially Moving Tool, subclasses 199+ for a reamer having a guiding portion which may burnish, but which has a cutting edge which is necessarily used during such burnishing.

2 INCLUDING CHIP BREAKER, GUIDE OR DEFLECTOR DETACHABLE FROM TOOL AND TOOL HOLDER:
This subclass is indented under the class definition. Device including means to engage and control the movement of portions of material removed from the work during the shaping operation, which means (1) may act to cause the removed material to break apart, (2) may direct the removed portions to move in an intended direction, or (3) may divert the removed material away from an unintended direction; wherein the means to engage and control the portions is constructed to be removable from both the cutter* and the tool holder*.

SEE OR SEARCH THIS CLASS, SUBCLASS:
100, for a chip breaker, guide or deflector that is part of a tool holder and is not removable therefrom.
115, for a chip breaker, guide or deflector that is part of a cutter and is not removable therefrom; and see the search notes thereunder.

3 Adjustable relative to cutting edge:
This subclass is indented under subclass 2. Device wherein the means to engage and control the movement of portions of material is constructed to be placed in different positions with respect to the sharp edge of the cutter.

4 Including adjusting means:
This subclass is indented under subclass 3. Device including active means to force the chip breaking, directing or diverting means to be repositioned relative to either the cutter or the tool holder.

5 Attached to or integral with tool clamping jaw:
This subclass is indented under subclass 2. Device including a tool holder having relatively movable structure to engage the cutter and apply pressure thereagainst to removably secure the cutter to the tool holder; wherein the pressure applying structure includes, as a part thereof, the means to engage and control movement of portions of material removed during the shaping operation.

6 Chip breaker:
This subclass is indented under subclass 2. Device comprising means to cause the removed portions of material to break apart.

7 FREELY MOVABLE CUTTING EDGE:
This subclass is indented under the class definition. Device including a cutter having the sharp edge thereof movable during cutting and with little resistance along its longitudinal extent to thereby present a fresh portion of the sharp edge to cutting position.

(1) Note. The cutter of this subclass is usually circular with a peripheral cutting edge and is rotatable about its central axis, so that the action on the work is the same as if there was no rotation.

8 YIELDABLE TOOL:
This subclass is indented under the class definition. Device having a cutting edge or point supported for operation such that upon a predetermined condition, the apparatus will intentionally allow the cutting edge or point to move away from operational position.

(1) Note. Since any device will yield upon sufficient overloading, this subclass is limited to only those devices having specific structure to allow the yield to take place at a predetermined location according to the design of the device.

9 Resiliently mounted tool:
This subclass is indented under subclass 8. Device including means upon occurence of a predetermined condition, to allow the cutting edge or point to move away from operational position such that the means flexes within the elastic limit thereof and such that the means will restore the cutting edge or point to operational position upon removal of the condition.

(1) Note. Included herein are patents directed to structure having a part that flexes and thereby moves relative to another part, an exception to the general rule is that this class does not include relatively moving parts.

SEE OR SEARCH CLASS:
403, Joints and Connections, subclasses 220+ for a flexible connection, in general.

10 Including yield stress or flexure limit adjusting means:
This subclass is indented under subclass 9. Device including means to vary the amount of force on the cutting edge or point required to initially move the cutting edge or point out of operational position, or including means to vary the distance that the cutting edge or point may move out of operational position.

11 WITH MEANS TO APPLY FLUID TO CUTTING TOOL:
This subclass is indented under the class definition. Device including means to feed, guide or place a liquid or gas into contact with the cutter*.

(1) Note. The fluid may serve to lubricate, or cool the tool or the work, or may serve to remove chips from the cutting zone.

SEE OR SEARCH CLASS:
279, Chucks or Sockets, subclass 20 for a conduit drill socket.
408, Cutting by Use of Rotating Axially Moving Tool, subclass 56 for cutting of that class combined with application of lubricating fluid to the work and/or cutting edge of the tool.

12 ROTARY BROACH:
This subclass is indented under the class definition. Device adapted to turn about an axis and including a plurality of cutting edges positioned peripherally about the axis and being of progressively greater distance from the axis, such that, as the device turns about that axis, a first cutting edge makes a cutting arc, followed by a second cutting edge that makes a cutting arc or larger radius; to shape work by a series of cutting arcs without relative movement between the axis about which it turns and the work.

SEE OR SEARCH THIS CLASS, SUBCLASS:
13, for an elongated broach that moves along a straight line with respect to a workpiece and rotates so that the cutting edges thereof define a helical path.

13 RECTILINEAR BROACH:
This subclass is indented under the class definition. Device including a plurality of sequentially acting protuberances on each of which there is a cutting edge or point, adapted to move in a straight line with respect to the work so that a first protuberance makes a shaping cut into that surface of the work and is followed by a second protuberance which makes a deeper shaping cut into that surface of the work, so that the actions of sequentially acting protuberances is cumulative.

(1) Note. A rod-like cutter which moves along the axis thereof is considered to move in a straight line even if the cutter rotates to cut a helical groove.

(2) Note. The "protuberance" of this subclass may be blade-like extending across the lateral extent of the tool holder, may be ring-like extending entirely about the tool holder, or may be a single tooth, etc.

SEE OR SEARCH CLASS:
409, Gear Cutting, Milling, or Planing, subclasses 243+ for a machine, generally for broaching, and see the notes therein for other broaching.

14 Hollow tool for surrounding workpiece:
This subclass is indented under subclass 13. Device including a central opening through which work is intended to pass during shaping thereof, and into which projects the sequentially acting cutting protuberances.

(1) Note. Included herein is a "pot broach".

15 Including holder having seat for inserted tool:
This subclass is indented under subclass 13. Device wherein the cutter is detachable from the tool holder and wherein the tool holder includes a pocket specifically intended to receive the cutter.

SEE OR SEARCH THIS CLASS, SUBCLASS:
25, for a hob comprised of a tool holder and inserted tool.
33+, for a rotary tool holder having a seat for an inserted tool.
66+, for a general purpose tool holder having a seat for an inserted tool.

16 Annular tool:
This subclass is indented under subclass 15. Device including a cutter comprising a ring-like member adapted to cooperatively fit about a rod-like tool holder during operation thereof.

17 Including single tooth:
This subclass is indented under subclass 15. Device including a cutter having only one protuberance to perform a shaping operation and including another cutter.

(1) Note. Included herein is a cutter including a single tooth even though that tooth may be serrated so that a first tooth-like portion engages the work before another tooth-like portion, provided that all portions of the tooth cooperate to perform as a single tooth, once full penetration into the work has been achieved.

18 Plural tooth groups:
This subclass is indented under subclass 13. Device including a first plurality of cutting protuberances for engaging the work in a first manner and including a second plurality of cut-

ting protuberances for sequentially engaging the work in a second manner.

(1) Note. Included herein is a broach including "roughing teeth" and "finishing teeth", as well as a broach with teeth for cutting progressively deeper into work followed by teeth for cutting a progressively wider groove.

19 Including sequentially acting teeth of stepped cutting width:
This subclass is indented under subclass 13. Device wherein a first protuberance is to cut a groove of a first lateral dimension, and a second protuberance intended to follow the path of the first protuberance is to cut that groove to a greater lateral dimension.

20 GEAR CUTTING TOOL:
This subclass is indented under the class definition. Device particularly adapted to form an element on a body, which element is intended to intermesh with a similar element on another body, whereby motive force may be transmitted from one of the bodies to the other.

(1) Note. A gear pump inner rotor is considered to transmit force to the outer rotor.

SEE OR SEARCH CLASS:
74, Machine Element or Mechanism, subclasses 640+ for a gear formed by the apparatus of this subclass.
409, Gear Cutting, Milling, or Planing, subclasses 1+ for a machine for forming integrating elements on a gear.

21 Face mill gear cutting tool:
This subclass is indented under subclass 20. Device wherein the body on which the intermeshing element is being formed is adapted to turn about an axis; wherein the intermeshing element being formed projects axially outwardly from a plane intersecting the body axis; wherein the cutter* is adapted to rotate about an axis normal to that plane during formation of the intermeshing element; and wherein the cutter includes axially extending cutting teeth.

22 Adjustable teeth:
This subclass is indented under subclass 21. Device including a tool holder* and a plurality of cutting edges mounted thereon wherein the cutting edges are adapted to be positioned at different positions relative to each other on the tool holder.

23 Hob:
This subclass is indented under subclass 20. Device adapted to turn about an axis, including at least three radially outwardly directed teeth positioned spirally about the device, each tooth including a cutting edge formed by intersecting planes one of which is generally parallel to and radiates from the axis and serves to direct a chip formed by the cutting operation, which device is intended to form the integrating elements on a body by "hobbing".

(1) Note. Forming a gear by "hobbing" involves a complex relationship between a workpiece* and a cutter* wherein the cutter is rotated at a first rate and wherein the workpiece is moved to cause the intermeshing elements to traverse the cutter at a second rate; wherein the cutting action of the cutter on the workpiece is such that the entire surface for rolling contact of the intermeshing elements is generated by a series of chip removing actions made by the cutting edges of the cutter; and wherein all the intermeshing elements of the gear body are generated as a continuous operation.

SEE OR SEARCH CLASS:
409, Gear Cutting, Milling, or Planing, subclasses 11+ for a cutter for hobbing combined with drive structure or with work supporting structure.

24 Thread cutting:
This subclass is indented under subclass 23. Device adapted to form an intermeshing element on a body, which intermeshing element extends helically along the body.

25 Including holder having seat for inserted tool:
This subclass is indented under subclass 23. Device wherein the cutter is detachable from the tool holder, and wherein the tool holder includes a pocket specifically intended to receive the cutter.

SEE OR SEARCH THIS CLASS, SUBCLASS:

15+, for a broach comprised of a tool holder and an inserted tool.

33+, for a rotary tool holder and an inserted tool.

66+, for a general purpose tool holder having a seat for an inserted tool.

26 For cutting involute gear tooth:

This subclass is indented under subclass 23. Device wherein the element formed is intended to rollingly intermesh with a similar element, and wherein the element is on a rotary gear and is formed with an imaginary line (root circle) about which the effective drive takes place, wherein the shape of the element is the same as would be generated by a point on a line tangent to the root circle, as the line is unwound from the root circle.

27 Rotary, gear shaving cutting tool:

This subclass is indented under subclass 20. Device including a cutter adapted to intermesh with the teeth of a previously formed rotating gear, to rotate relative to that gear, and to move axially relative thereto so that the axially directed cutting edge engages and cuts away a small amount of material from the surface of the gear.

28 Gear generating, revolving shaper cutting tool:

This subclass is indented under subclass 20. Device including a cutter adapted to be reciprocated to and fro across the work, which cutter is also intended to rotate between passes, for generating a tooth structure generally considered to be a gear.

(1) Note. The cutting action utilized in gear generating is that of a cutter which makes several passes through a workpiece or group of cutters, each of which makes at least one pass through the workpiece, the cutting action of each pass being such that the cumulative total of all the passes cuts out a portion of a gear tooth.

SEE OR SEARCH CLASS:

409, Gear Cutting, Milling, or Planing, subclasses 10+ for a gear-generating machine, generally.

29 Rotary, tooth form cutting tool:

This subclass is indented under subclass 20. Device including a cutter adapted to turn about an axis and including structure for supporting that cutter for rotation, which device is shaped to cut the entire surface of a gear tooth, or is shaped to cut the entire surface of the recession between two gear teeth, at a single cutting pass across the work.

29.1 FILE OR RASP:

This subclass is indented under the class definition. Device having a working surface sharply ridged by cutting edges or teeth, which device is used as a smoothing or forming tool.

SEE OR SEARCH CLASS:

15, Brushing, Scrubbing, and General Cleaning, subclasses 236.01+ for a scraper of general cleaning utility; see the notes thereto for miscellaneous scrapers of more specialized application.

30, Cutlery, subclasses 346+ for a cutting blade, per se, for use with a hand-manipulated implement and subclasses 451+ for a static pencil sharpener.

132, Toilet, subclass 75.6 and 76.4 for a file for use in manicuring.

168, Farriery, subclass 48.1 for a tool such as a file for cleaning or trimming the hoof in fitting it for the shoe.

407, Cutters, for Shaping, subclass 12 and 13+ for a broaching tool.

428, Stock Material or Miscellaneous Articles, subclass 574 for a metallic stock material having a variation in both width and thickness which repeats longitudinally.

433, Dentistry, subclass 144 for a file particularly adapted for cutting tooth structure or bone and gum tissue adjacent to or in the mouth.

29.11 Flexible blade or carrier therefor:
This subclass is indented under subclass 29.1. Device wherein (a) the working surface is attached to a pliable or bendable body or (b) a holder or retainer for (a).

29.12 Tire rasp:
This subclass is indented under subclass 29.1. Device having a rough working surface of small points especially adapted for shaping or smoothing a vehicle tire.

29.13 Rotary file or round disc:
This subclass is indented under subclass 29.1. Device which (a) rotates relative to the workpiece during use or (b) has a circular platelike shape.

29.14 Composite, diverse sector or assembled:
This subclass is indented under subclass 29.1. Device which (a) is made of distinct components or an assemblage of parts or components or (b) includes two or more different and distinct file characteristics or shaping properties.

29.15 Handle or holder, per se:
This subclass is indented under subclass 29.1. Device including (a) manual grasping or operating means, (b) retaining or supports means, or (c) means (a) or (b), per se, especially adapted for use with a file or rasp.

SEE OR SEARCH CLASS:
- 30, Cutlery, subclass 340 for a handle specific to a cutlery implement; see the notes thereto for a tool or implement handle elsewhere classified.
- 76, Metal Tools and Implements, Making, subclass 36 for a file holder for a saw sharpening file, which holder has a guide or indicator attached to and carried by the file in its movement which shows the operator the angle at which the file is being held.
- 279, Chucks or Sockets, subclasses 9.1+ for a socket-type handle which makes a permanent or temporary readily releasable connection between a holder and an object.
- 403, Joints and Connections, for means connecting a handle to a tool wherein only such part of the handle and tool is included as cooperates to effect the connection.

30 ROTARY CUTTING TOOL:
This subclass is indented under the class definition. Device including a cutter adapted to turn about an axis and including structure for supporting that cutter for rotation, wherein the cutter is intended to perform an operation of the class type.

SEE OR SEARCH CLASS:
- 12, Boot and Shoe Making, subclasses 91+ for a rotary cutter head used in a sole and heel edge trimming machine.
- 30, Cutlery, subclass 347 for a blade per se, used in a hand manipulated implement wherein the blade is so constructed as to be rotated during the cutting operation, and see the notes thereto for other rotary implements or machines specialized to art uses.
- 483, Tool Changing, subclasses 31+ for a rotary spindle machine tool combined with a tool transfer means wherein structure of the tool or supporting structure thereof is of particular importance.

31 Gang:
This subclass is indented under subclass 30. Device wherein the cutter adapted to turn about an axis is comprised of two or more generally disc-shaped members adapted to be stacked coaxially one upon the other and turn about the axis to perform a unitary cutting operation.

SEE OR SEARCH CLASS:
- 409, Gear Cutting, Milling, or Planing, subclasses 11+ for means involving the adjustment of several milling cutters along their shaft.

32 Composite body of diverse material:
This subclass is indented under subclass 30. Device comprising a member constructed of a plurality of separate structural materials such that the combined actions of the materials is different than would be the action of a member constructed of a single material.

(1) Note. Included herein is a cutter constructed of a plurality of metals so that

there is less sound generated during the cutting operation.

SEE OR SEARCH THIS CLASS, SUBCLASS:

8, for similar structure wherein a second material is adapted to yield under load as in the case of a resiliently mounted tool.

33 Including holder (i.e., head) having seat for inserted tool:

This subclass is indented under subclass 30. Device wherein the cutter is detachable from the tool holder and wherein the tool holder includes a pocket specifically intended for receiving the cutter.

SEE OR SEARCH THIS CLASS, SUBCLASS:

15+, for a broach comprised of a tool holder and inserted tool.

25, for a hob comprised of a tool holder and inserted tool.

66+, for a general purpose tool holder having a seat for an inserted tool.

SEE OR SEARCH CLASS:

12, Boot and Shoe Making, subclass 94 for a rotary cutter head used in a sole and heel edge trimmer in which the cutter is not integral with the cutter head, but is inserted therein.

83, Cutting, subclasses 838+ for a detachable saw tooth and means to permit insertion or removal of such tooth from a saw.

144, Woodworking, subclass 224 and 235 for a rotary woodworking cutter built up by attaching bits to a head.

408, Cutting by Use of Rotating Axially Moving Tool, subclasses 199+ for a tool of that class type including a removable cutting edge, and subclass 713 for an art digest for a tool having a detachable cutting edge.

470, Threaded, Headed Fastener, or Washer Making: Process and Apparatus, for a threading tap made up of several pieces rigidly secured together instead of a single piece of metal, except such tap which rotates to cut, and see the note to Class 408 above.

34 Face or end mill:

This subclass is indented under subclass 33. Device comprising a cutter having an axially extending, unsupported end adapted to move forwardly into the work along the cutter axis or transversely of the cutter axis such that the unsupported end of the cutter extends through the undisturbed portion of the work.

SEE OR SEARCH THIS CLASS, SUBCLASS:

53+, for a face or end mill, generally.

35 Plural simultaneously usable separable tools in common seat or common clamp actuator for plural simultaneously usable tools:

This subclass is indented under subclass 34. Device wherein the pocket of the tool holder is intended to support more than one distinct cutter, or wherein a single securing means is intended to support a plurality of cutters that are usable at the same time.

SEE OR SEARCH THIS CLASS, SUBCLASS:

43, for a similar seat or clamp arrangement used in a rotary cutter.

70+, for a similar seat or clamp arrangement, generally.

36 Tool adjustable relative to holder:

This subclass is indented under subclass 34. Device wherein the tool holder* is constructed to allow selective positioning of the cutting edge relative to other portions of the tool holder.

SEE OR SEARCH THIS CLASS, SUBCLASS:

44+, for a rotary cutter that is adjustable relative to the tool holder.

77+, for a cutter, generally, that is adjustable relative to the tool holder.

37 Radially:

This subclass is indented under subclass 36. Device wherein the provision to allow adjusting movement of the cutter allows the cutting edge to move toward or away from the axis of the cutter relative to the holder.

38 And axially:
This subclass is indented under subclass 37. Device wherein the provision to allow adjusting movement of the cutter also allows that cutter to move along the axis of the cutter relative to the holder.

39 Selectively:
This subclass is indented under subclass 38. Device including provision to allow movement of the cutter either radially or axially only, as desired.

40 With separate means to fasten tool to holder:
This subclass is indented under subclass 34. Device including detachable means adapted to secure the cutter to the tool holder.

SEE OR SEARCH THIS CLASS, SUBCLASS:
47+, for means to fasten a cutter to a rotary tool holder.
102+, for means to fasten a cutter to a holder, generally.

41 Wedge clamp element:
This subclass is indented under subclass 40. Device wherein the securing means is comprised of a member having a surface adapted to slidably engage a portion of the tool holder and having another surface adapted to bindingly engage the cutter and cause the cutter to be gripped between the sliding member and a reaction surface of the tool holder.

SEE OR SEARCH THIS CLASS, SUBCLASS:
49+, for a wedge clamp element used to secure a cutter to a rotary tool holder.
94+, for a wedge clamp element used to secure an adjustable cutter to a tool holder.
108, for a wedge clamp element used to secure a cutter to a tool holder, generally.

42 Specified tool shape:
This subclass is indented under subclass 34. Device wherein the particular shape of the cutter* is set forth in the claims.

43 Plural simultaneously usable separable tools in common seat or common clamp actuator for plural simultaneously usable tools:
This subclass is indented under subclass 33. Device wherein the pocket of the tool holder is intended to support more than one distinct cutter or wherein a single securing means is intended to support a plurality of cutters that are usable at the same time.

SEE OR SEARCH THIS CLASS, SUBCLASS:
35+, for a similar seat or clamp arrangement used in a face or end mill.
70+, for a similar seat or clamp arrangement, generally.

44 Tool adjustable relative to holder:
This subclass is indented under subclass 33. Device wherein the tool holder* is constructed to allow positioning of the cutting edge relative to other portions of the tool holder.

SEE OR SEARCH THIS CLASS, SUBCLASS:
36+, for an adjustable cutter and tool holder comprising a face or end mill.
77+, for a cutter generally, that is adjustable relative to the tool holder.

45 Radially:
This subclass is indented under subclass 44. Device wherein the provision to allow adjusting movement of the cutter allows the cutting edge to move toward or away from the axis of the cutter.

46 With means to fasten tool seat to holder:
This subclass is indented under subclass 33. Device including structure to secure the cutter receiving pocket to structure supporting that pocket.

47 With separate means to fasten tool to holder:
This subclass is indented under subclass 33. Device including detachable means adapted to secure the cutter to the supporting tool holder structure.

SEE OR SEARCH THIS CLASS, SUBCLASS:

40+, for means to fasten a cutter to a holder comprising a face or end mill.

102+, for means to fasten a cutter to a holder, generally.

48 Apertured tool:

This subclass is indented under subclass 47. Device wherein the cutter includes an opening passing therethrough for use by the securing means.

SEE OR SEARCH THIS CLASS, SUBCLASS:

103+, for means to fasten a nonrotary apertured cutter to a tool holder.

49 Wedge clamp element:

This subclass is indented under subclass 47. Device wherein the securing means is comprised of a member having a surface adapted to slidably engage a portion of the tool holder and having another surface adapted to bindingly engage the cutter and cause the cutter to be gripped between the sliding member and a reaction surface of the tool holder.

SEE OR SEARCH THIS CLASS, SUBCLASS:

41, for a wedge clamp element used to secure a cutter to a face mill tool holder.

94+, for a wedge clamp element used to secure an adjustable cutter to a tool holder.

108, for a wedge clamp element used to secure a cutter to a tool holder, generally.

50 Resilient clamp jaw:

This subclass is indented under subclass 49. Device wherein the means to secure the cutter to the tool holder includes a member adapted to flex within the elastic limit thereof and grip the cutter.

SEE OR SEARCH THIS CLASS, SUBCLASS:

9, for structure wherein a cutter gripping portion is adapted to yield under pressure to allow movement of the cutter away from the work under overload conditions.

51 Peripherally spaced tools:

This subclass is indented under subclass 33. Device wherein the tool holder supports a plurality of independent cutters circularly spaced about the cutter axis.

52 Sectional support:

This subclass is indented under subclass 51. Device wherein the tool holder is comprised of detachable segments adapted to individually support the independent cutters.

53 Face or end mill:

This subclass is indented under subclass 30. Device comprising a cutter having an axially extending unsupported end adapted to move forwardly into the work along the cutter axis or transversely of the cutter axis such that the unsupported end of the cutter extends through the undisturbed portion of the work.

SEE OR SEARCH THIS CLASS, SUBCLASS:

34, for a face or end mill comprised of a holder having a seat for an inserted cutter.

54 With cutting edge entirely across end of tool (e.g., router bit, end mill, etc.):

This subclass is indented under subclass 53. Device including either a sharp edge or a plurality of sharp edges extending diametrically across the unsupported end of the device, so that upon axial advance the entire inscribed area of the work will be cut away.

55 Compound tooth arrangement:

This subclass is indented under subclass 30. Device wherein the device is comprised of a plurality of cutters, each cutter acting in cooperation with an adjacent cutter to present a composite cutting surface that is the resultant of the addition of all the cutting edges.

56 Having peripherally spaced teeth:

This subclass is indented under subclass 30. Device including a plurality of protuberances extending radially outwardly from the device, each protuberance including at least one cutting edge adapted to cuttingly engage the work, wherein the protuberances are spaced circum-

ferentially about the radially outer limit of the device.

57 Axially tapering tool:
This subclass is indented under subclass 56. Device wherein the protuberances extend axially along the device and are constructed such that the cutting edges progressively reach a greater radial distance from the axis at one end of the device than at the other.

58 Circumferentially staggered:
This subclass is indented under subclass 56. Device wherein the protuberances spaced about the periphery of the device are also spaced axially along the device.

59 Plural teeth spaced about a helix:
This subclass is indented under subclass 58. Device including at least three protuberances having sharp cutting edges, which protuberances are spaced about the tool in the form of a screw thread extending there-along.

60 Varying in cutting edge profile:
This subclass is indented under subclass 56. Device wherein the cutting protuberances spaced about the device are of different cutting shape.

61 Specified tooth shape or spacing:
This subclass is indented under subclass 56. Device wherein significance is attributed to the particular configuration of the protuberances or the particular separation or degree of separation of the protuberances.

62 Arcuate cutting edge:
This subclass is indented under subclass 61. Device wherein that particular shape of the protuberances is a continuous curved shape.

63 Helical tooth:
This subclass is indented under subclass 62. Device wherein the arcuate shape of the cutting edge is the shape of a helix or screw thread generated along the device.

64 PROFILED CIRCULAR TOOL:
This subclass is indented under the class definition. Device comprising a cutter of generally circular shape, wherein a cutting edge is provided at the periphery thereof, which cutter is intended to be held at the center of the circular shape in a tool holder such that the cutting edge can be presented to a workpiece.

(1) Note. The device of this subclass is normally intended to be sharpened by grinding away the leading surface forming the cutting edge such that the device can be sharpened through a substantial portion of the circular shape.

SEE OR SEARCH CLASS:
82, Turning, subclass 13 for a cutter of the type found in this subclass, combined with lathe structure.

65 ARC SEGMENT TOOL:
This subclass is indented under the class definition. Device comprising a cutter including a sharp cutting edge and including a body portion which is arcuate in shape such that if the body were extended it would ultimately pass through a circle and back into engagement with itself.

SEE OR SEARCH THIS CLASS, SUBCLASS:
64, for similar structure wherein the cutting element is part of a circular member fastened to a tool holder at the center of the curvature.

66 INCLUDING HOLDER HAVING SEAT FOR INSERTED TOOL:
This subclass is indented under the class definition. Device wherein the cutter* is detachable from the tool holder* and wherein the tool holder includes a pocket specifically intended for receiving the cutter.

SEE OR SEARCH THIS CLASS, SUBCLASS:
15+, for a broach comprised of a tool holder and an inserted tool.
25, for a hob comprised of a tool holder and an inserted tool.
33+, for a rotary tool holder and an inserted tool.

SEE OR SEARCH CLASS:
29, Metal Working, subclass 40 for a rotatable tool holder (turret) comprising a device for securing a tool in the turret upon its carriage or upon a lathe bed.

30, Cutlery, subclass 329 for a device for detachably holding a cutting blade for hand manipulation.

483, Tool Changing, subclass 21 for a work rotating machine tool combined with a means for changing a turning tool insert.

67 Plural spaced seats and common holder:
This subclass is indented under subclass 66. Device including a pocket for receiving a first cutter and including a similar pocket for receiving a second cutter, both cutters being removable and one being located in a position that is spaced away from the pocket for receiving the other cutter.

68 Relatively adjustable seats:
This subclass is indented under subclass 67. Device including provision to allow positioning of one of the cutter receiving pockets relative to the other cutter receiving pocket.

69 Simultaneously usable:
This subclass is indented under subclass 67. Device wherein both of the cutter receiving pockets can be used at the same time.

70 Plural simultaneously usable separable tools in common seat or common clamp actuator for plural simultaneously usable tools:
This subclass is indented under subclass 66. Device wherein the pocket of the tool holder is intended to support more than one distinct cutter or wherein a single securing means is intended to support a plurality of cutters that are to be used at the same time.

SEE OR SEARCH THIS CLASS, SUBCLASS:

35, for a similar seat or clamp arrangement used in a face or end mill.

43, for a similar seat or clamp arrangement used in a rotary cutter.

71 Adjustable tool:
This subclass is indented under subclass 70. Device constructed to allow positioning movement of the cutter relative to the tool holder.

72 With tool ejector:
This subclass is indented under subclass 66. Device including means to expel a cutter from operational position in the cutter receiving pocket.

73 With separate means to adjust tool to and fro relative to holder:
This subclass is indented under subclass 66. Device including means carried by the tool holder to move the cutter either (1) to any one of a plurality of different positions with respect to the tool holder, or (2) about an axis that is fixed with respect to the tool holder wherein a cutter may be moved positively by said means in opposite directions along or about an axis that is fixed relative to the tool holder.

74 With indicator:
This subclass is indented under subclass 73. Device including means to designate the relative position of the cutter with respect to the other structure.

75 Plural provisions for adjustment:
This subclass is indented under subclass 73. Device including a first means to positively move the cutter to and fro relative to the tool holder in a first manner, and a second means to positively move the cutter to and fro relative to the tool holder in a different manner.

SEE OR SEARCH THIS CLASS, SUBCLASS:

79+, for multiple means to permit movement of a tool relative to a tool holder in multiple manners.

76 By moving tool seat:
This subclass is indented under subclass 73. Device wherein movement of the cutter is caused by moving of the pocket into which the cutter is positioned relative to the tool holder.

77 Tool adjustable relative to holder:
This subclass is indented under subclass 66. Device wherein the tool holder is constructed to allow positioning of the cutting edge relative to other portions of the tool holder.

SEE OR SEARCH THIS CLASS, SUBCLASS:

36+, for an adjustable cutter and tool holder comprising a face or end mill.

44+, for a rotary cutter that is adjustable relative to the tool holder.

78 With indicator:

This subclass is indented under subclass 77. Device including means to designate the relative position of the cutter with respect to the other structure.

79 Plural provisions for adjustment:

This subclass is indented under subclass 77. Device including a first means allowing positioning of the cutter relative to the tool holder in a first manner, and a second means allowing positioning of the cutter relative to the tool holder in second manner.

SEE OR SEARCH THIS CLASS, SUBCLASS:

75, for multiple means to move a tool relative to a tool holder in multiple manners.

80 Plural interfering seats:

This subclass is indented under subclass 79. Device including a first cutter receiving pocket and including a second cutter receiving pocket, wherein the pockets are so positioned on the tool holder that a cutter can be positioned in only one of the pockets at any given time.

81 Including pivotable seat or tool:

This subclass is indented under subclass 79. Device wherein at least one of the directions of movement of the cutter relative to the tool holder is about an axis.

82 With detent:

This subclass is indented under subclass 81. Device including physical means projecting from the tool holder in engagement with the cutter for limiting cutter movement relative to the holder.

83 Pivotable seat:

This subclass is indented under subclass 81. Device wherein one manner of movement of the cutter relative to the tool holder is brought about by moving the cutter receiving pocket relative to other portions of the tool holder.

84 And pivotable tool:

This subclass is indented under subclass 83. Device wherein the cutter is secured to the cutter receiving pocket and allowed to pivot relative to that pocket.

85 By adjustable or replaceable stop:

This subclass is indented under subclass 77. Device wherein means is provided in the bottom of the cutter receiving pocket for limiting cutter movement into that pocket, which limiting means may be either intended to be adjusted in size or to be replaced by another limiting means of different size.

86 Adjustable:

This subclass is indented under subclass 85. Device wherein the cutter movement limiting member is adapted to be modified in size.

87 Screw:

This subclass is indented under subclass 86. Device wherein the cutter movement limiting means is adjusted by movement of a helically threaded member directly in engagement therewith.

88 By movement of seat relative to holder:

This subclass is indented under subclass 77. Device wherein movement of the cutter relative to the tool holder is permitted by movement of the cutter receiving pocket relative to other portions of the tool holder.

89 Pivoted seat:

This subclass is indented under subclass 88. Device wherein the cutter receiving pocket is adapted to be moved about an axis in order to relatively position the cutter with respect to the tool holder.

90 Pivoted tool:

This subclass is indented under subclass 77. Device wherein the cutter is adapted to be positioned about an axis in order to relatively position the cutter with respect to the tool holder.

91 Resiliently biased tool clamping jaw:

This subclass is indented under subclass 77. Device including a securing element for grippingly holding the cutter in the pocket, which

securing element is normally urged toward the cutter by the inherent resilience of the securing element, wherein movement of the cutter relative to the tool holder is permitted by release of the securing element.

92 Rectilinearly:
This subclass is indented under subclass 77. Device wherein movement of the cutter relative to the tool holder is permitted only in a straight line.

93 Including rotatable cam clamp element:
This subclass is indented under subclass 92. Device including securing means comprised of a member pivotally secured to the tool holder, and including an eccentric surface adapted to slidably and bindingly engage the cutter and cause the cutter to be gripped between the eccentric surface and a reaction surface of the tool holder.

SEE OR SEARCH THIS CLASS, SUBCLASS:
106, for a rotatable cam clamp element used to secure a cutter that is not adjustable.

94 Including wedge clamp element:
This subclass is indented under subclass 92. Device including securing means comprised of a member having a surface adapted to slidably engage a portion of the tool holder, and having another surface adapted to bindingly engage the cutter and cause the cutter to be gripped between the sliding member and a reaction surface of the tool holder.

SEE OR SEARCH THIS CLASS, SUBCLASS:
41, for a wedge clamp element used to secure a cutter to a face mill tool holder.
49+, for a wedge clamp element for securing a cutter to a rotary tool holder.
108, for a wedge clamp element for securing a nonadjustable cutter to a tool holder.

95 And guide or detent:
This subclass is indented under subclass 94. Device including means to cause the cutter movement relative to the tool holder to be along a fixed path, or including physical means projecting from the tool holder in engagement with the cutter for limiting cutter movement relative to the tool holder.

96 Including detent:
This subclass is indented under subclass 92. Device including means projecting from the tool holder in engagement with the cutter for limiting cutter movement to the tool holder.

97 Tool gripped directly by set screw:
This subclass is indented under subclass 92. Device including securing means comprised of a helically threaded member adapted to rotate and move axially relative to a cooperatively threaded tool holder, such that an axially facing portion thereof engages the cutter to cause the cutter to be gripped between the helical member and a reaction surface of the tool holder.

98 Slidable jaw:
This subclass is indented under subclass 92. Device comprised of a member adapted to frictionally engage and move rectilinearly relative to the tool holder, and to engage the cutter and cause the cutter to be gripped between the moving member and a reaction surface of the tool holder.

SEE OR SEARCH THIS CLASS, SUBCLASS:
94+, for similar structure wherein a sliding member moves to wedgingly bind the cutter to the tool holder.
112, for a sliding jaw tool holder wherein the cutter is not adjustable relative to the tool holder.

99 Holder adapted for tools of different shape:
This subclass is indented under subclass 66. Device wherein the means for receiving the cutter is of such physical configuration to accept a first tool of a first shape or a second tool of a second distinct shape.

100 With chip breaker, guide or deflector:
This subclass is indented under subclass 66. Device with or including means specifically intended to cause the portion of material removed from the work to be subdivided into smaller pieces, with means to cause the material removed to pass in a prescribed path, or with means to divert the material removed away from a prescribed path.

SEE OR SEARCH THIS CLASS, SUBCLASS:

2+, for structure including a chip breaker, guide or deflector that is detachable from the cutter or tool holder.

115+, for a chip breaker, guide or deflector not claimed in combination with a tool holder.

101 With separate means to fasten tool seat to holder:

This subclass is indented under subclass 66. Device including means detachable from the tool holder intended to secure the cutter receiving pocket to the tool holder.

102 With separate means to fasten tool to holder:

This subclass is indented under subclass 66. Device including means detachable from the tool holder, which means is intended to secure the cutter to the tool holder.

SEE OR SEARCH THIS CLASS, SUBCLASS:

40+, for means to fasten a cutter to a tool holder comprising a face or end mill.

47+, for means to fasten a cutter to a rotary holder.

103 Apertured tool:

This subclass is indented under subclass 102. Device wherein the cutter is provided with an opening therethrough for receipt of the detachable structure for securing that cutter to the tool holder.

SEE OR SEARCH THIS CLASS, SUBCLASS:

48, for means to secure a rotary, apertured cutter to a tool holder.

104 With means projecting through aperture to force tool laterally against reaction surface:

This subclass is indented under subclass 103. Device wherein the structure is specifically adapted for the separate fastening means to pass through the opening in the cutter to force the cutter in a direction laterally of the opening through the cutter and into engagement with a reaction surface of the tool holder.

105 Tilting clamp element and separate means to tilt same:

This subclass is indented under subclass 104. Device wherein the means passing through the opening in the cutter is an element adapted to change its axial extent by being leaned against the wall of the opening passing through the cutter, including means specifically intended to act aganist the element to bring about the leaning thereof.

106 Rotatable cam clamp element:

This subclass is indented under subclass 102. Device including securing means comprised of a member pivotally secured to the tool holder and having an eccentric surface adapted to slidable and bindingly engage the cutter and cause the cutter to be gripped between the eccentric surface and a reaction surface of the tool holder.

SEE OR SEARCH THIS CLASS, SUBCLASS:

93, for a rotatable cam clamp element used to secure an adjustable cutter to a tool holder.

107 Including tool holding clamp and clamp actuator:

This subclass is indented under subclass 102. Device including a jaw-like element adapted to grippingly engage the cutter, and including a member to force that member into engagement with the cutter.

108 Wedge clamp element:

This subclass is indented under subclass 107. Device including securing means comprised of a member having a surface adapted to slidably engage a portion of the tool holder and having another surface adapted to bindingly engage the cutter and cause the cutter to be gripped between the surface of the sliding member and a reaction surface of the tool holder.

SEE OR SEARCH THIS CLASS, SUBCLASS:

41, for a wedge clamp element used to secure a cutter to a face mill tool holder.

49+, for a wedge clamp element used to secure a cutter to a rotary tool holder.

94+, for a wedge clamp element used to secure an adjustable cutter to a tool holder.

109 Resiliently biased clamp jaw:
This subclass is indented under subclass 107. Device wherein the member adapted to grippingly engage the cutter is urged by spring pressure either toward or out of engagement with the cutter.

110 Integral with holder:
This subclass is indented under subclass 109. Device wherein the spring urged cutter gripping member is part of the same structure as other portions of the tool holder.

111 Pivoted jaw:
This subclass is indented under subclass 107. Device wherein the member adapted to grippingly engage the cutter is secured to the tool holder to swing about an axis relative thereto.

112 Slidable jaw:
This subclass is indented under subclass 107. Device comprised of a member adapted to frictionally engage and move rectilinearly relative to the tool holder, and to engage the cutter and cause the cutter to be gripped between the moving member and a reaction surface of the tool holder.

SEE OR SEARCH THIS CLASS, SUBCLASS:
98, for a sliding jaw structure wherein the cutter is adjustable relative to the tool holder.
108, for similar structure wherein a sliding member moves to wedgingly bind the cutter to the tool holder.

113 INCLUDING TOOL HAVING PLURAL ALTERNATIVELY USABLE CUTTING EDGES:
This subclass is indented under the class definition. Device including a cutter on which there is a first sharp edge adapted to perform a cutting operation of the class type, and on which there is a second sharp edge adapted to perform a cutting operation of the class type, which cutting edges are intended to be used at different times.

114 With intergral chip breaker, guide or deflector:
This subclass is indented under subclass 113. Device including means intended to subdivide the material cut away from the work member, to direct that material in a certain path, or to divert that material away from a certain path.

SEE OR SEARCH THIS CLASS, SUBCLASS:
115, for a chip breaker, guide or deflector on a cutter having only a single cutting edge, and see the search notes thereunder.

115 WITH CHIP BREAKER, GUIDE OR DEFLECTOR:
This subclass is indented under the class definition. Device including means intended to subdivide the material removed from the work, intended to direct that material in a certain path, or intended to divert that material out of certain path.

SEE OR SEARCH THIS CLASS, SUBCLASS:
2+, for a chip breaker, guide or deflector that is detachable from the cutter and the tool holder.
100, for a chip breaker, guide or deflector claimed in combination with a cutter and tool holder.
114, for a chip breaker, guide or deflector claimed in combination with a cutter having plural alternatively usable cutting edges.

116 Comprising concave surface in cutting face of tool:
This subclass is indented under subclass 115. Device wherein the means to subdivide, direct or divert the material removed from the workpiece comprises a hollowed out shape in that portion of the cutter adjacent to the cutting edge, over which the product of the cutting operation will pass during the cutting operation.

117 INCLUDING CUT OFF TOOL:
This subclass is indented under the class definition. Device including a cutter intended to subdivide a first workpiece from a second workpiece.

SEE OR SEARCH CLASS:

83, Cutting, subclasses 651+ for similar structure wherein the cutting element is intended to subdivide one portion of the work material from another, but wherein there is no machining to shape the work.

118 COMPRISING CUTTING EDGE BONDED TO TOOL SHANK:

This subclass is indented under the class definition. Device including a cutter comprised of a portion including a sharp cutting edge adhesively or metallurgically secured to the adjacent portions of the cutter.

119 COMPRISING TOOL OF SPECIFIC CHEMICAL COMPOSITION:

This subclass is indented under the class definition. Device wherein significance is attributed to the chemical structure of the cutter.

120 MISCELLANEOUS:

This subclass is indented under the class definition. Device not provided for above.

END