

B23B

TURNING; BORING (arrangements for copying or controlling [B23Q](#))

Definition statement

This place covers:

Turning, lathes and related equipment, turning tools, tool holding systems, chucks, boring, boring tools, drilling machines and equipment, drilling tools.

Turning and boring are taken as being the removal of chips by the relative rotation of tool and workpiece wherein the cutting edge describes a substantially continuous spiral or helical path with respect to the workpiece.

Relationships with other classification places

[B23B](#) covers features of the machine/tool/process specifically related to turning or boring of metal or metal-like materials. Features not relating to the specific process of turning or boring but applicable to more general machines/processes will be classified elsewhere. Features relating to the turning and boring of materials other than metal will only be classified in [B23B](#) if the content of such documents renders them applicable to metal cutting (i.e. where the intrinsic properties of the non-metallic material are not important).

References

Limiting references

This place does not cover:

Drills bits and machines for surgery, chucks and guiding devices therefor	A61B 17/16
Tools for dentistry	A61C 1/00
Drilling machines combined with arrangements for riveting	B21J 15/10
Orbital drilling by milling	B23C 3/02
Multi stage processes involving turning & boring and other operations such as making particular items by multistage processes, once of which is turning/boring or drilling.	B23P 13/00 , B23P 15/00 , B23P 23/00
Making turning, drilling or boring tools	B23P 15/28
Details of machine tools and accessories not related to the operation being performed including:	B23Q
Clamping systems for workpiece tables	B23Q 3/00 , B25B
- tool changing	B23Q 3/155
- conveying workpiece into and from machine	B23Q 7/00
- evacuation of swarf,	B23Q 11/0042
- guarding & protective coverings	B23Q 11/08
Adaptive control and/or computer controls for turning, boring or drilling processes	B23Q 15/00 , G05B 15/02
- measuring or sensing	B23Q 17/00
Control systems and devices for copying from a master template or patterns	B23Q 35/00
Details of powered hand tools not related to the drilling operation	B25F
Drill stands	B25H

Turning, boring or drilling of wood	B27
Turning, boring or drilling of stone and glass	B28D 1/14 , B28D 1/16
Cutting inserts characterised only by the composition of the hard metal material	C22C
Cutting inserts characterised only by the composition of the diamond cutting material	C23C 16/00
Cutting insert characterised only by the composition of the coating	C23C 30/00
Drilling of earth or rock	E21B

Informative references

Attention is drawn to the following places, which may be of interest for search:

Cleaning	B08B
Production by reshaping	B21J
Sintering	B22F
Shearing of metals	B23D
Sawing	B23D
Making gears	B23F
Grinding and production of lenses.	B24
Drill stands	B25H
Cutting of non-metals by severing	B26
Working of plastics	B29
Ceramic products	C04B
Hard metal, composition of CBN compacts	C22C
Diamonds	C23C 16/00
Coatings	C23C 30/00
Connections of hubs and shafts	F16D
Supports for workpieces	F16M 11/00
Numerical control	G05B
Motors	H02K

Special rules of classification

A 2000-series Indexing Code system exists within [B23B](#) for deep indexing of tool characteristics and classification of useful information. The use of Indexing Codes from the 2000-series is widespread in the subclass and these Indexing Codes should be allocated at every opportunity. When classifying, the Indexing Codes relating to a particular group or subgroup should be consulted and allocated if appropriate, taking precedence over similar Indexing Codes present within the whole subclass. For example, if classifying in [B23B 31/20](#) or subgroups, the Indexing Codes relating to the details of collet chucks should be consulted and allocated to provide additional information. If classifying in the group [B23B 31/00](#), the Indexing Codes relating to details of chucks should be consulted and these Indexing Codes allocated to provide additional information. The number of Indexing Codes is too high to list individually. Where the allocation of Indexing Code-codes is mandatory (most notably within the subgroups containing cutting inserts, [B23B 27/14](#) and [B23B 27/16](#)), this is indicated in the templates for the main-group at the sub-group level.

Special rules of classification

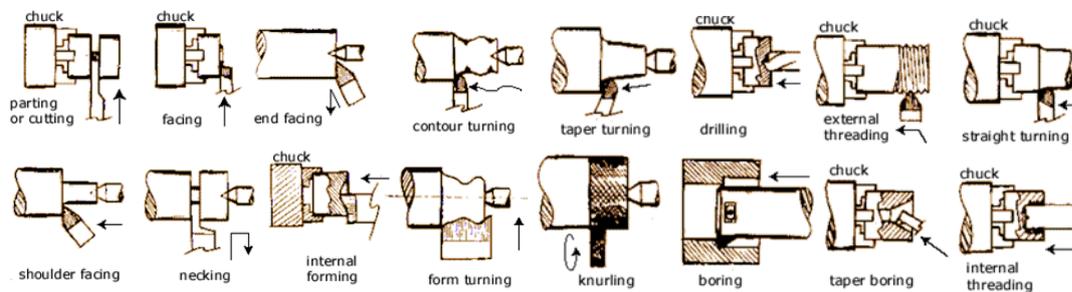
In the Indexing Code system the term "discontinuous" is used to mean containing points or lines of inflection or gaps.

Pictorial examples of the content of the most widely used subgroups have been provided within this FCR. Each of the drawings is taken from a document classified in the subgroup, for which it serves as an example. No copyright is claimed.

B23B 1/00**Methods for turning or working essentially requiring the use of turning-machines; Use of auxiliary equipment in connection with such methods****Definition statement**

This place covers:

Methods of turning, wherein the method relates to the actual process of turning. Illustrative examples:



Turning types (Source: DeGarmo, P. et. al, "Materials & Processes in Manufacturing", Macmillan, New York, 1984).

Special rules of classification

If a document relates simply to the production of an item by turning and the turning process per se is known, the document will not be classified in [B23B 1/00](#) but instead be classified with the product itself.

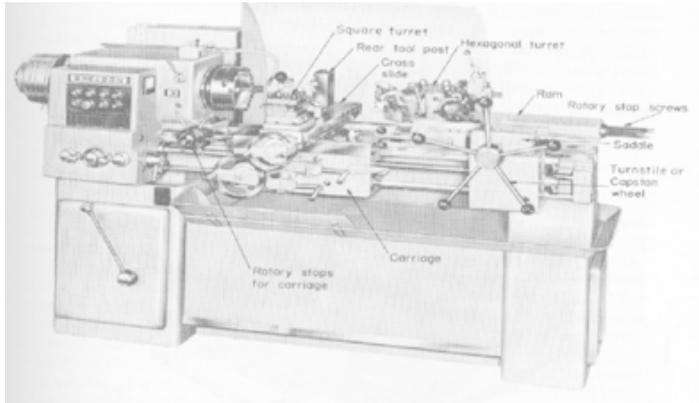
B23B 3/00**General-purpose turning-machines or devices, e.g. centre lathes with feed rod and lead screw; Sets of turning-machines****Definition statement**

This place covers:

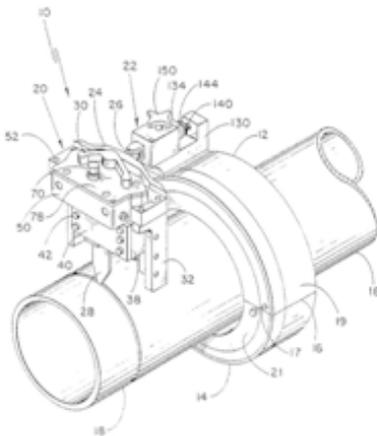
General-purpose turning-machines or devices and sets of turning-machines.

Definition statement

Illustrative examples:



[B23B 3/00](#) - General purpose turret lathe ([B23B 3/161](#)) (Source: DeGarmo, P. et. al, "Materials & Processes in Manufacturing", Macmillan, New York, 1984).



[B23B 3/22](#) and subgroups. Lathe with rotary head (clamshell lathe) (Source: US 4 944 205).

Relationships with other classification places

Most documents relating to turning machines are classed in [B23Q](#) for features relating to the construction of the machine and its components e.g. beds in [B23Q 1/015](#). Documents pertaining to lathes should therefore be routinely circulated to [B23Q](#) as well as being classed in these groups. Searches in [B23B 3/00](#) - [B23B 11/00](#) cannot be considered exhaustive without search in [B23Q](#).

Special rules of classification

Important classes are [B23B 3/065](#) for special arrangement of units on lathes in general and [B23B 3/161](#), [B23B 3/162](#), [B23B 3/164](#), [B23B 3/165](#), [B23B 3/167](#) & [B23B 3/168](#) for arrangements of turret lathes. The turret here refers to a turret for holding tools (see notes on [B23B 3/30](#) for workpiece turrets).

Clamshell lathes (one part fixed to cylindrical workpiece and another part with tool orbits the workpiece) are classed in [B23B 3/22](#) and subgroups. The rotary tool heads of [B23B 3/22](#) should be considered as a head that rotates to provide the main cutting motion in the turning process. The term "radial" in the titles of [B23B 3/24](#) and [B23B 3/26](#) refers to the radial direction with respect to the rotational axis of the tool head.

[B23B 3/30](#) is not much used as multi-spindle lathes are systematically classed in [B23Q 39/042](#) (drum arrangement) and [B23B 39/22](#) (opposed headstock arrangement).

Note for groups [B23B 3/00](#) - [B23B 11/00](#):

There is no systematic classification in most of these groups just for the fact that the machine is a lathe. That is to say, not every lathe is classed in the groups by virtue of just being a lathe. For instance if the inventive features relate to general constructional elements of the lathe and the fact that these features are present on a lathe is of secondary importance, the document will only receive a class in the appropriate sub-group(s) of [B23Q](#). If the control is of particular importance, the document will only receive a class in [G05B](#). If the document relates to copying arrangements on lathes it will only receive a class in [B23Q 35/00](#), unless a particular feature of the lathe itself is of interest.

Classification in these groups is per literal interpretation of the title of the group and sub-group headings.

B23B 5/00

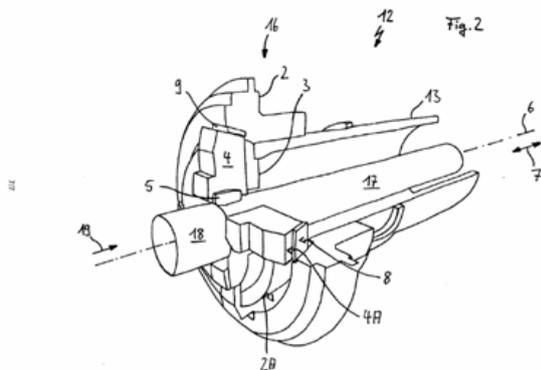
Turning-machines or devices specially adapted for particular work; Accessories specially adapted therefor

Definition statement

This place covers:

Turning machines or devices that are specially adapted for particular work and accessories specially adapted for particular turning work, including:

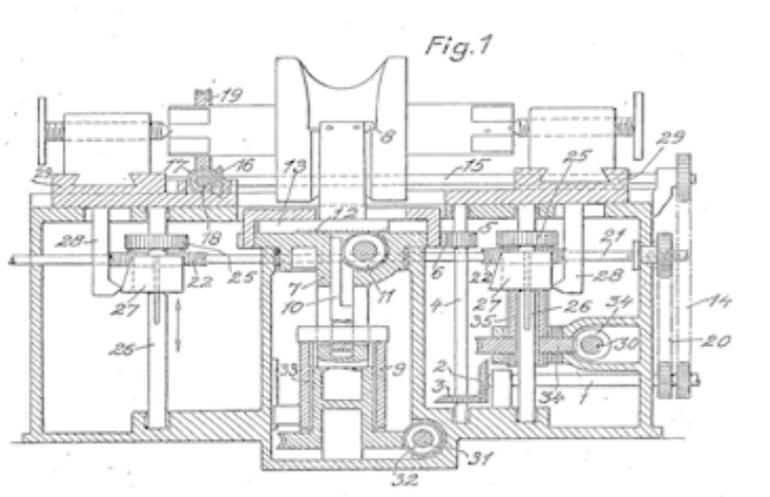
- lathes for machining vehicle brake discs ([B23B 5/02](#) & [B23B 5/04](#)).
- lathes for working Pilgrim (Pilger) rolls ([B23B 5/10](#))
- peeling machines ([B23B 5/12](#)).
- hand-held, bench mounted or workpiece mounted devices for working the ends of bars tubes and electrodes ([B23B 5/16](#)). If such a tool is combined with a severing tool [B23D 21/006](#). If milling is performed classification in [B23C 3/007](#) and/or [B23C 3/122](#) may be appropriate.
- machines for turning wheel-sets on trains ([B23B 5/28](#)).
- devices to turn specially shaped surfaces ([B23B 5/36](#)) through geometrical mechanisms, especially the surfaces mentioned in the subgroups. Note turning of polygonal surfaces is usually classed in [B23Q 27/00](#).
- machines for turning cam shafts or crankshafts ([B23B 5/18](#)). Note [B23C 3/06](#) & [B23C 3/08](#) and [B23D 37/005](#) for milling and broaching of crankshafts and camshafts. Illustrative examples:



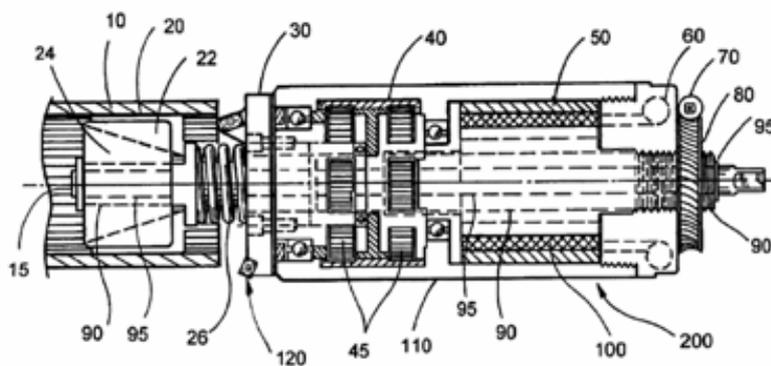
[B23B 5/12](#) Peeling machine (Source: US 2006/0266172).



[B23B 5/04](#) Brake lathe for vehicles (Source: www.efi.com.au/hunter/brake_lathe_on_car.html).



[B23B 5/10](#) Pilgrim (Pilger) roll lathe Note: Pilger rolling mills are classed in [B21B 21/00](#) (Source:FR40388E).



Special rules of classification

Systematic classification required in [B23B 5/00](#).

Classification in these groups is per literal interpretation of the title of the group and sub-group headings.

B23B 7/00

Automatic or semi-automatic turning-machines with a single working-spindle, e.g. controlled by cams; Equipment therefor; Features common to automatic and semi-automatic turning-machines with one or more working-spindles {(arrangements or accessories for enabling machine tools not specially designed only for thread cutting to be used for this purpose [B23G 3/00](#))}

Definition statement

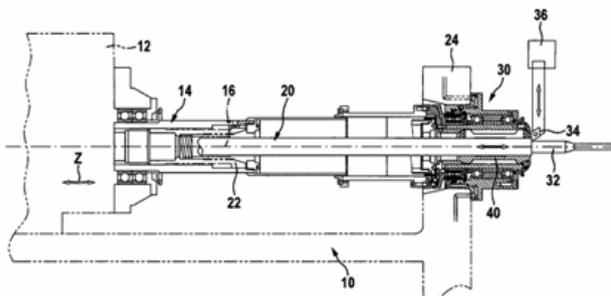
This place covers:

automatic or semi-automatic turning-machines with a single working-spindle; equipment therefor; features common to automatic and semi-automatic turning-machines with one or more working-spindles, including

- lathes for turning of stock ([B23B 7/02](#)). Stock is to be interpreted as "bar stock", i.e. an elongate piece, from which a multiplicity of components are produced.
- lathes for turning of stock with tool turrets ([B23B 7/04](#)). Note that lathes with workpiece turrets will be classified in [B23Q 39/042](#).
- lathes for turning of stock with a sliding headstocks ([B23B 7/06](#))
- lathes for turning individual workpieces ([B23B 7/12](#)). The term "for turning individual workpieces" is to be interpreted as in which a piece of material is used to produce a single component.

In this case "automatic" is not to be interpreted as limited to NC.

Illustrative example:



[B23B 7/06](#) Sliding headstock lathe (Source: EP 2030707).

Further details of subgroups

[B23B 7/06](#) is important as this group covers sliding headstock machines.

Special rules of classification

There is no systematic classification in [B23B 7/00](#) just for the fact that the machine is a lathe. That is to say, not every lathe is classed in the groups by virtue of just being a lathe. For instance, if the document mainly relates to a general constructional element applicable to many types of a machine tool, but is shown on a lathe, the document may only be classed in [B23Q](#). See notes to [B23B 3/00](#).

Classification in these groups is per literal interpretation of the title of the group and sub-group headings.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Stock	bars from which multiple workpieces are made
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B23B 9/00

Automatic or semi-automatic turning-machines with a plurality of working-spindles, e.g. automatic multiple-spindle machines with spindles arranged in a drum carrier able to be moved into predetermined positions; Equipment therefor (equipment applicable to single-spindle machines [B23B 7/00](#))

Definition statement

This place covers:

Automatic multi-spindle machines.

Relationships with other classification places

Refer to [B23Q 39/042](#) for multi-spindle machines with spindles arranged parallel to each other in a drum and [B23B 39/22](#) for machines where the headstock and tailstock both have spindles.

Special rules of classification

This group is hardly used as the systematic classification of multiple spindle lathes has traditionally been done in [B23Q 39/00](#).

There is no systematic classification in [B23B 9/00](#) just for the fact that the machine is a lathe. That is to say, not every lathe is classed in the groups by virtue of just being a lathe. Please refer to notes on group [B23B 3/00](#).

Classification in these groups is per literal interpretation of the title of the group and sub-group headings.

B23B 11/00

Automatic or semi-automatic turning-machines incorporating equipment for performing other working procedures, e.g. slotting, milling, rolling ([B23B 3/065](#) and [B23B 3/16](#) take precedence; machines incorporating a plurality of sub-assemblies, each capable of performing a metal-working operation, the sub-assemblies being arranged to operate simultaneously at different stations [B23Q 39/04](#))}

Relationships with other classification places

Usually lathes with live tooling will be classified in [B23B 3/065](#), [B23B 3/162](#), [B23B 3/165](#) or [B23B 3/168](#).

References

Limiting references

This place does not cover:

Arrangements for performing other machining operations, e.g. milling, drilling	B23B 3/065
Turret lathes for turning individually-chucked workpieces	B23B 3/16

Special rules of classification

This group is hardly used as this is now commonplace.

There is no systematic classification in [B23B 11/00](#) just for the fact that the machine is a lathe. That is to say, not every lathe is classed in the groups by virtue of just being a lathe. See notes under [B23B 3/00](#).

Classification in these groups is per literal interpretation of the title of the group and sub-group headings.

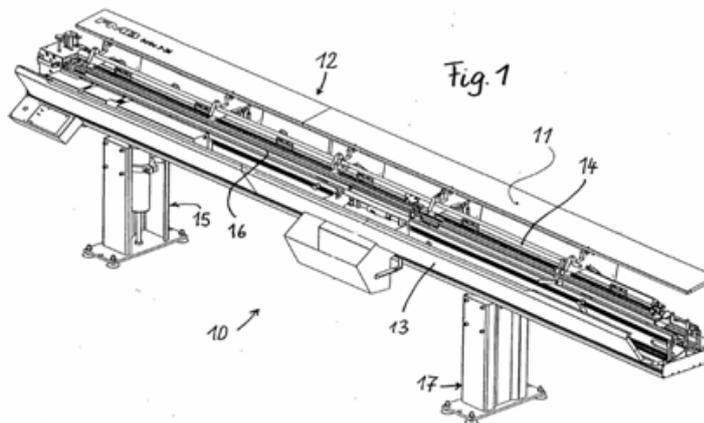
B23B 13/00

Arrangements for automatically conveying or chucking or guiding stock

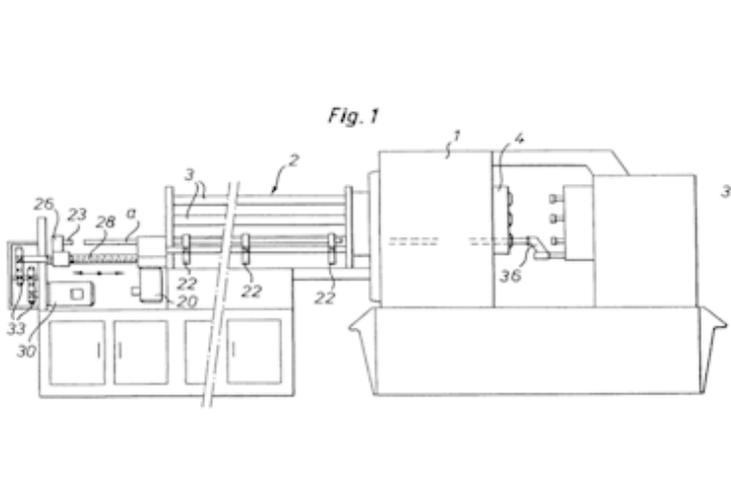
Definition statement

This place covers:

Arrangements for conveying and feeding stock (bar feeders). Illustrative examples:



[B23B 13/02](#) Single spindle lathe bar feeder (Source: DE 102004043797).



[B23B 13/04](#) Multi-spindle lathe bar feeder (Source: GB 1358424).

Relationships with other classification places

This group relates to mechanism for feeding and conveying bars. [B23Q 7/00](#) deals with supply of individual workpieces to a machine. [B23Q 7/00](#) also deals with supplies of non-rotating bars to other

Relationships with other classification places

types of machine. In lathes (and therefore to qualify for classification in [B23B 13/00](#)) the feeding mechanism must allow the bar to be driven in rotation.

Special rules of classification

Classification is defined by the literal interpretation of the groups.

[B23B 13/022](#) "being placed in the spindle" should be interpreted as being part of the machine tool spindle.

[B23B 13/024](#) is used for devices with a feeding device that is located in the machine tool spindle with two collets, wherein usually one collet is movable longitudinally. The other collet grips the stock whilst the first collet is moving away from the machine headstock. When the movable collet has gripped the stock, the second collet opens two allow the stock to be advanced.

Collets for bar pushers are classed in [B23B 13/123](#), collets in general are classed in [B23B 31/20](#).

B23B 23/00

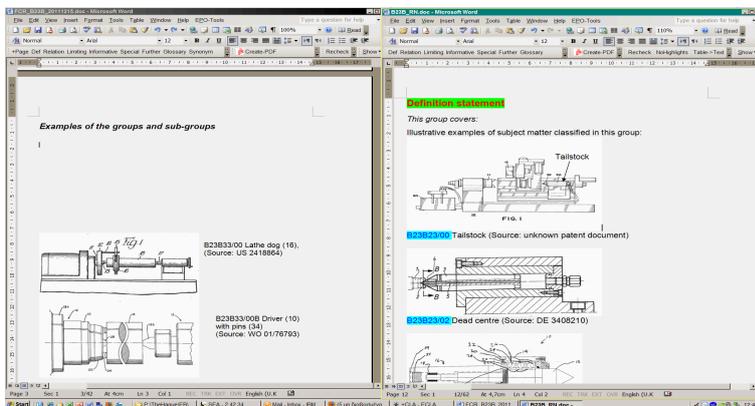
Tailstocks; Centres {(for grinding machines [B24B 41/062](#))}

Definition statement

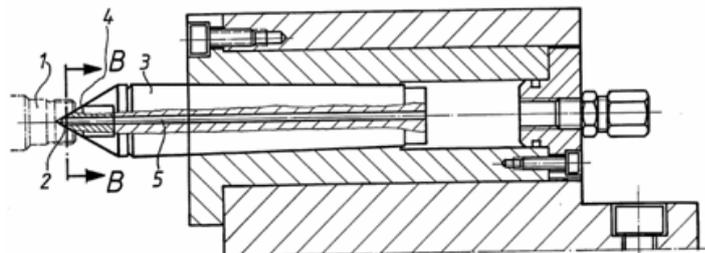
This place covers:

Tailstocks and centres for turning machines

Illustrative examples of subject matter classified in this group:

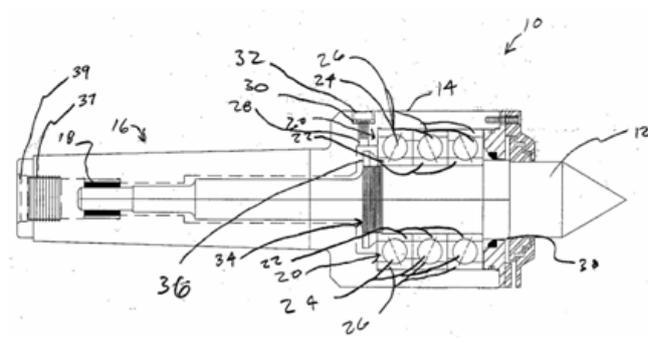


[B23B 23/00](#) Tailstock (Source: unknown patent document).



Definition statement

[B23B 23/02](#) Dead centre (Source: DE 3408210).



[B23B 23/04](#) Live centre (Source: US 2006/0037444).

Special rules of classification

Classification is generally per literal interpretation of the group and subgroup headings.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Live centre	one that rotates with the work
Dead centre	one that supports the work and allows the workpiece to rotate relative to it

B23B 25/00

Accessories or auxiliary equipment for turning-machines (for machine tools in general [B23Q](#); cooling or lubricating [B23Q 11/12](#))

Definition statement

This place covers:

Accessories or auxiliary equipment specially designed for use on turning-machines.

Relationships with other classification places

[B23Q 11/08](#) takes priority for protective covers and so documents for [B23B 25/04](#) should be routinely offered to [B23Q](#) as they are usually classified there, rather than in [B23B 25/04](#).

Special rules of classification within this group

In order to classify in [B23B 25/06](#) the measuring system should be applicable only to turning machines. [B23Q 17/00](#) relates to measuring on machine tools in general and takes preference over [B23B 25/06](#). Since problem of setting tool height relates only to turning machines, class [B23B 25/065](#) is used.

As chip-breaking is usually done by insert (e.g. [B23B 27/143](#)), by tool holder clamp (e.g. [B23B 27/1629](#)) or by tool holder itself ([B23B 27/22](#)) chip-breaking equipment classed in [B23B 25/02](#) is rare.

B23B 27/00

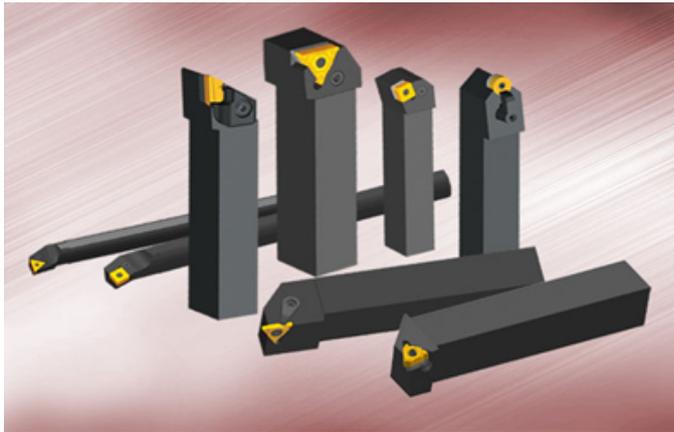
Tools for turning or boring machines (for drilling machines [B23B 51/00](#)); Tools of a similar kind in general; Accessories therefor

Definition statement

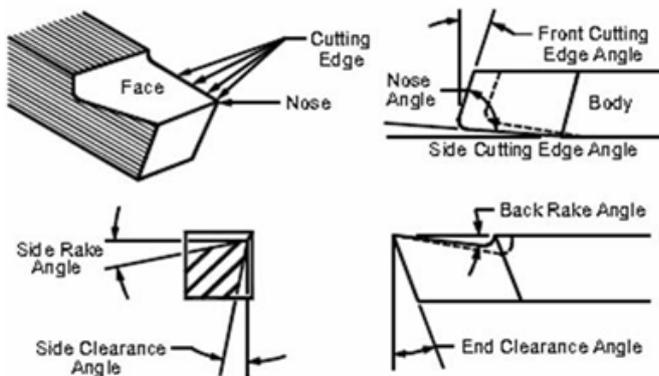
This place covers:

Tools for turning. The tool is interpreted to be the component containing the cutting edge.

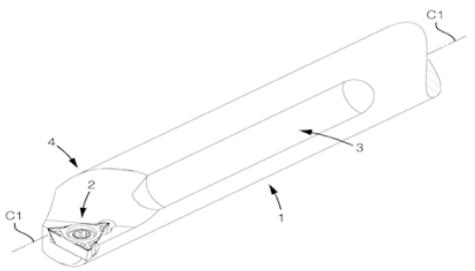
Illustrative examples:



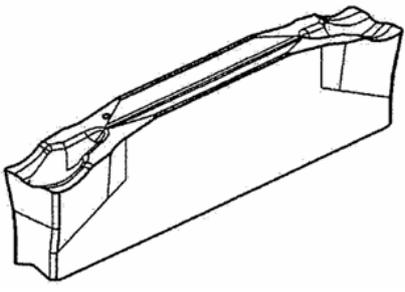
[B23B 27/00](#) and [B23B 29/00](#) tools and tool holders (Source: unknown book or catalogue).



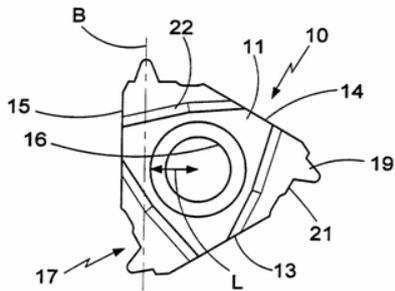
[B23B 27/00](#) tool surface nomenclature (Source: unknown book).



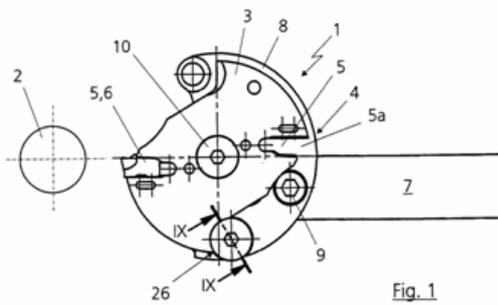
[B23B 27/007](#) Tool for internal turning (Source: EP 1806191).



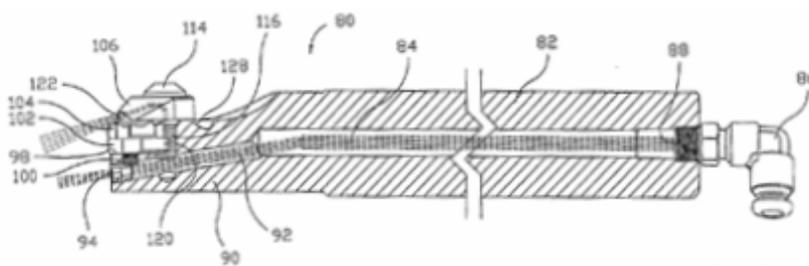
[B23B 27/045](#) Parting off tool with chipbreaking features (Source: EP 2060347).



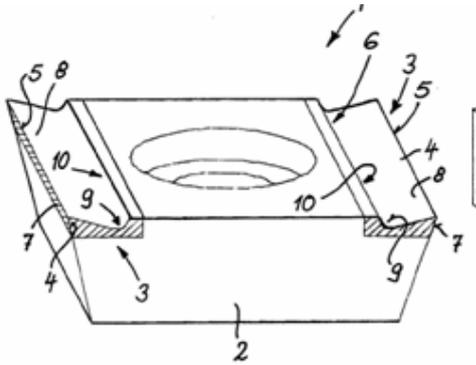
[B23B 27/065](#) Thread cutting turning insert (Source: EP 0804313).



[B23B 27/083](#) Tool with disc-like main part fitted with parting off insert (ref 5,6 see [B23B 27/04](#)) (Source: EP 2082820).



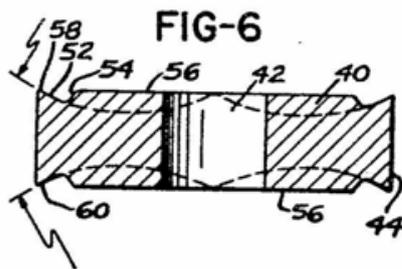
[B23B 27/10](#) Turning tool with cooling (Source: WO 2007/145649).



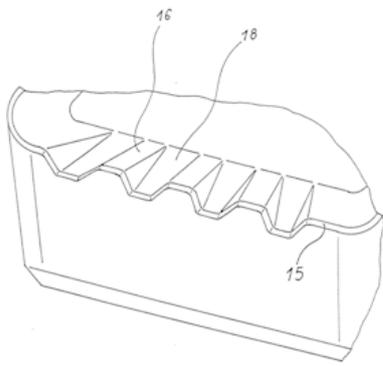
[B23B 27/141](#) (and [B23B 2226/315](#)) Cutting insert with PCD cutting edge (Source: DE 10216408).



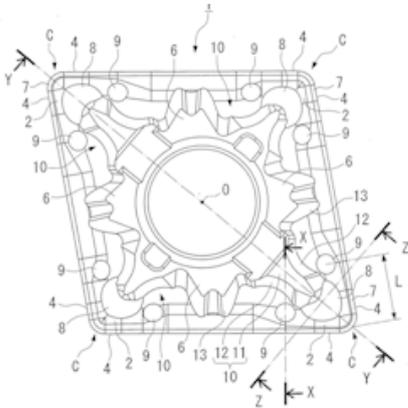
[B23B 27/141](#) Cutting inserts (Source: <http://0086exporter.en.made-in-china.com/product/gonEdzACYShQ/China-Carbide-Indexable-Insert.html>).



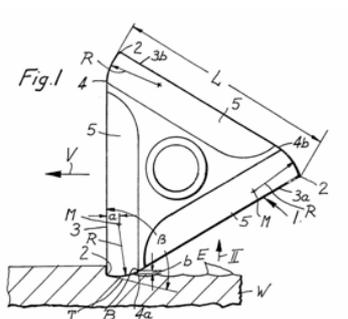
[B23B 27/141](#) Double sided cutting insert (Source: BE 716819).



[B23B 27/141](#) (and [B23B 2200/205](#)) Cutting insert with wave-form cutting edge (Source: WO 93/11898).

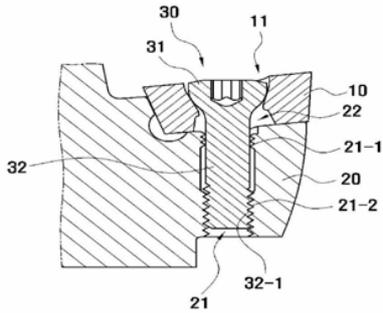


[B23B 27/141](#) (and [B23B 2200/0447](#), [B23B 2200/081](#)) Parallelogram insert with chip-breakers (Source: EP 1454690).

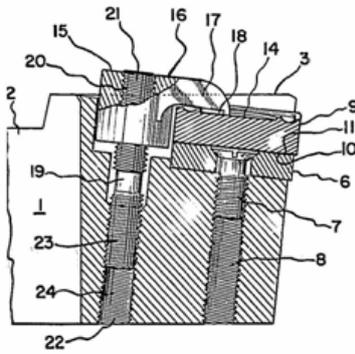


Definition statement

[B23B 27/141](#) (and [B23B 2200/208](#)) Triangular insert with wiper (corner geometry) (Source: GB 2104421).



[B23B 27/1614](#) (for special shaped) or [B23B 27/1662](#) (for standard shaped) (and [B23B 2200/3618](#) for special fixation hole) Insert clamped by member acting on hole wall (Source: WO 2009/028744).



[B23B 27/1625](#) (for special shaped) or [B23B 27/1666](#) (for standard shaped). Insert clamped by member acting on top face (Source: DE 7614471U).

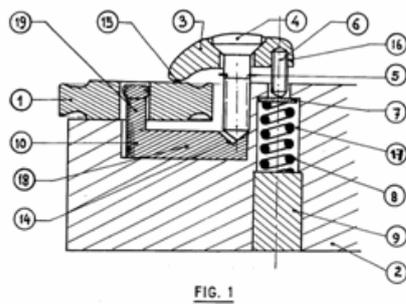
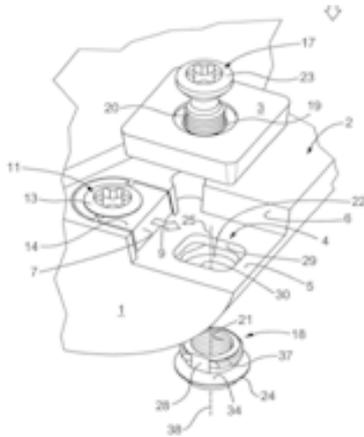


FIG. 1

Definition statement

[B23B 27/1644](#) (for special shaped) or [B23B 27/1677](#) (for standard shaped). Insert simultaneously clamped by hole and top clamps (Source: GB 1395578).



[B23B 27/1655](#) (for special form) or [B23B 27/1681](#) (for standard form). Adjustable position of the insert (Source: WO 02/24387).

Further details of subgroups

[B23B 27/04](#);

This sub-group includes grooving tools.

See also [B23B 27/08](#) when tools have a blade-like main part.

[B23B 27/06](#);

Limited use with the introduction of NC.

[B23B 27/10](#);

Cooling arrangements. Cooling arrangements in drilling tools [B23B 51/06](#), in milling tools [B23B 5/28](#) and in reaming tools [B23D 77/006](#). Cooling arrangements in machine tools [B23Q 11/10](#). To be classed in [B23B 27/10](#) the cooling arrangement must be present in the tool (including the toolholder) itself.

[B23B 27/12](#);

Tools with continuously rotating cutting edge.

Some milling tools with circular cutting edges that rotate during use are classed here too.

[B23B 27/14](#), [B23B 27/16](#);

Allocation of Indexing Codes from the 2000-series section relating to "details of cutting inserts" is mandatory in [B23B 27/14](#) and [B23B 27/16](#).

2000-series Indexing Codes should be allocated only for special features of the insert.

[B23B 27/141](#);

Cutting tools where the cutting insert is of special importance.

Inserts in this subgroup are not classed for composition of inserts ([C22C](#) or [C04B](#)) or for the composition of the coating (see [C23C](#)) despite the class [B23B 27/148](#).

Definition statement

[B23B 27/141](#) has inserts having a special shape and chip-breakers. Inserts having a special shape but not chip-breaker details are classed in [B23B 27/145](#). Inserts having a special shape by virtue only of the chip-breakers are classed in [B23B 27/143](#). Thus search in at least two of these sub-groups is always necessary.

[B23C 5/202](#) is the equivalent group for milling inserts.

If insert can be used for turning and milling only a class in [B23B 27/141](#) is given.

If method of clamping the insert in the tool-holder is also important, no class is given in [B23B 27/141](#), only in [B23B 27/16](#).

[B23B 27/16](#);

Securing arrangements for inserts.

If insert is also special shape, it will be classed in [B23B 27/1603](#) and subgroups, [B23B 27/1614](#) and subgroups, [B23B 27/1625](#) and subgroups, [B23B 27/1644](#) and subgroups or [B23B 27/1655](#) (e.g. [B23B 27/1614](#) contains inserts of special shape having chip-breakers that are clamped against the walls of the pocket of the holder by something acting on the wall of a hole in the insert, [B23B 27/1618](#) contains inserts where the special shape concerns the chip-breakers but where the clamping is still important). If the special clamping system does not fall under [B23B 27/1614](#), [B23B 27/1625](#), [B23B 27/1644](#) or [B23B 27/1655](#), the document should be classed in [B23B 27/1603](#).

Special Clamping of known shaped cutting inserts is in [B23B 27/1659](#) - [B23B 27/1685](#).

[B23B 27/18](#);

Permanently fixed bits or tips including [B23B 27/20](#) (solid) diamond tools, which does not relate to PCD coated tooling.

[B23B 27/22](#);

Knurling tools

Note [B23P 9/02](#) - finishing by knurling.

Special rules of classification

What are commonly called "boring bars" in tool catalogues are classified in [B23B 27/007](#) as tools for internal turning (tools usually not used when placed coaxially with central axis of the hole being produced but parallel to it).

Classification is per literal interpretation of the groups.

Classification is generally per literal interpretation of the group and subgroup headings.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Boring bars	bars that are aligned on the axis of the hole being produced whilst either the work or the bar itself is rotated.
Tool	the component containing the cutting edge

B23B 29/00

HOLDERS for non-rotary cutting tools ([B23B 27/12](#) takes precedence); Boring bars or boring heads; Accessories for tool holders

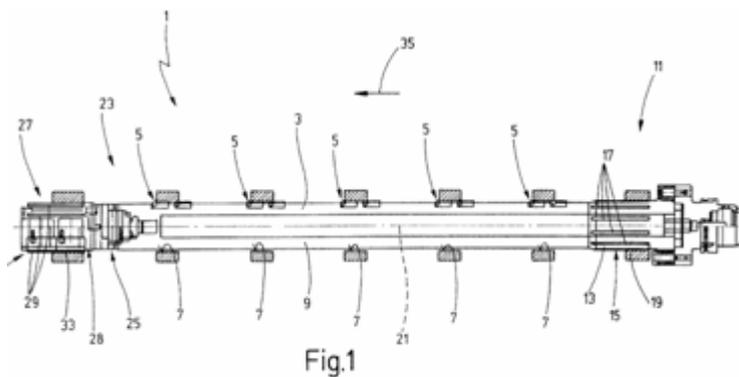
Definition statement

This place covers:

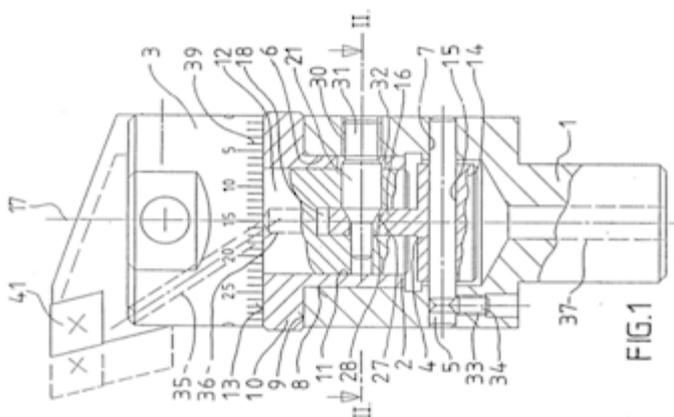
Holders for turning tools.

The tool is generally interpreted to be component containing the cutting edge. A strict literal interpretation of this statement would mean that in a cutting tool with an indexable insert, the insert is considered as the tool per se and the insert holder (shank) is considered as the holder. In the case of holders for single tool this is generally the case. However the consideration of the insert and shank should not be precluded from being considered as the tool, i.e. a holder (especially in [B23B 29/046](#) and [B23B 29/24](#)) can be a holder for holding a combination of a cutting insert and a shank. Thus turning tool holders for multiple tools can be considered as including non-rotating holders for more than one cutting insert and holders to retain multiple instances of insert holder combinations.

Illustrative examples of subject matter classified in this group:

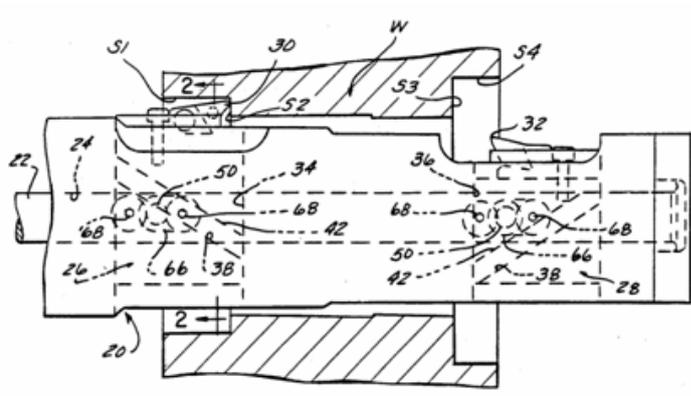


[B23B 29/02](#) Boring bar for boring bearing surfaces in internal combustion engine ([B23B 41/12](#)) (Source: EP 1084783).

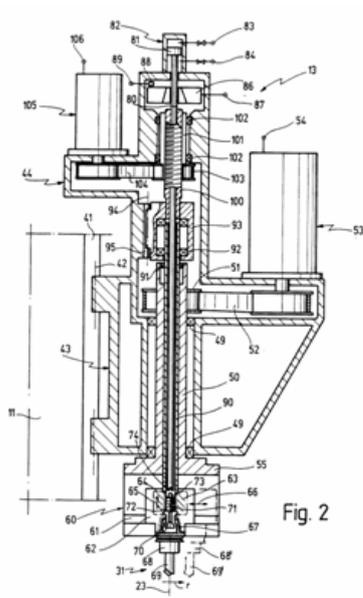


Definition statement

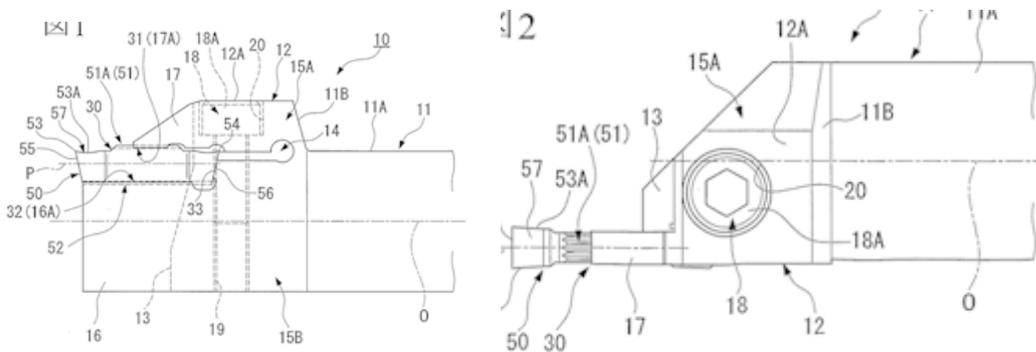
[B23B 29/03428](#) Boring head radially adjustable by an eccentric prior to work (Source: WO9402275). The term "radially" should be interpreted as relative to the rotation axis, which will normally be for the purpose of altering the size of the diameter to be machined.



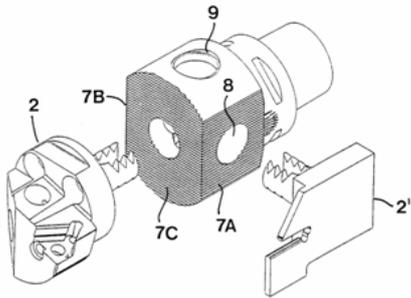
[B23B 29/0345](#) Boring head adjustable during operation (outfeeding bar) by means of inclined planes (42) (Source: US 5211088).



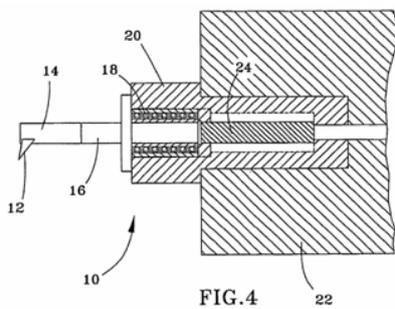
[B23B 29/0345](#) Facing head adjustable radially during manufacture by means of inclined planes (Source: US 5795114).



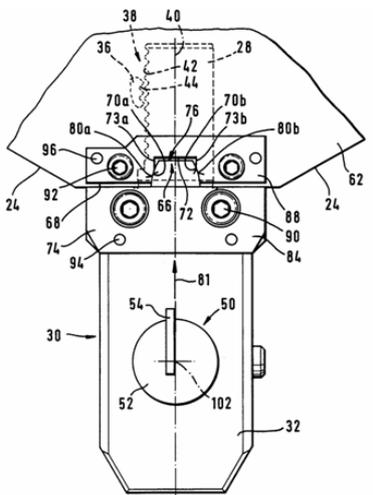
[B23B 29/043](#) (and [B23B 2205/02](#)) Parting off toolholder with elastic clamping member. (Note: cutting insert classed in [B23B 27/04](#) or [B23B 27/045](#)) (Source: WO 2004/062839).



[B23B 29/046](#) Modular tool system with two alternative intermediary toolholders (2,2') (Source: WO 9911411).



[B23B 29/125](#) Toolholder (20) including vibratory mechanism (24). (Source: US 2006/051480).



Definition statement

Boring or facing heads, grooving tools or other tools that can be set to machine a certain diameter or that can be adjusted to different cutting diameters during machining. The term "radially" should be interpreted as relative to the rotation axis, which will normally be for the purpose of altering the size of the diameter to be machined. Facing heads are widely used.

Note boring of valve seats [B23C 3/05](#).

[B23B 29/043](#);

Holders for parting off and grooving tools.

[B23B 29/046](#);

Holders including details of modular systems (e.g. Capto, block tooling) that allow one piece of tool assembly only to be exchanged.

[B23B 29/12](#);

Special arrangements on turning tools e.g. vibratory tool-holders, support for workpiece, location of tool in a turret.

[B23B 29/24](#);

Toolholders for a plurality of tools. The indexing mechanisms and drives for rotating tooling for turrets are classified in [B23Q](#).

Where features relate to retention of tools, turrets are classed in [B23B 29/24](#).

Tool posts are used on more old style lathes and are (usually vertical) posts with (usually) 4 stations which index into position.

Also includes turrets where the details of the location or clamping of holders for rotary tools is important.

References

Limiting references

This place does not cover:

Cutting tools with special provision for cooling with a continuously-rotated circular cutting edge; holders therefor	B23B 27/12
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Special rules of classification

Within the context of [B23B 27/00](#) and [B23B 29/00](#), the term "boring bar" is taken to mean a bar that is aligned on the axis of the hole being produced, whilst either the work or the bar itself is rotated.

Classification is per literal interpretation of the group and sub-group headings.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Boring bars	bars that are aligned on the axis of the hole being produced whilst either the work or the bar itself is rotated.
Tool	component containing the cutting edge

B23B 31/00

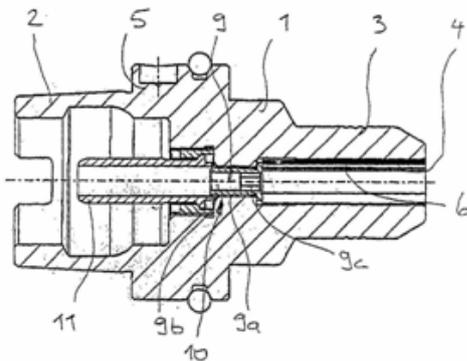
Chucks {(allowing axial oscillation of percussion tool bits [B25D 17/08](#))};
Expansion mandrels; Adaptations thereof for remote control (faceplates [B23Q 1/50](#); rotary devices holding by magnetic and/or electrical force acting directly on work [B23Q 3/152](#))

Definition statement

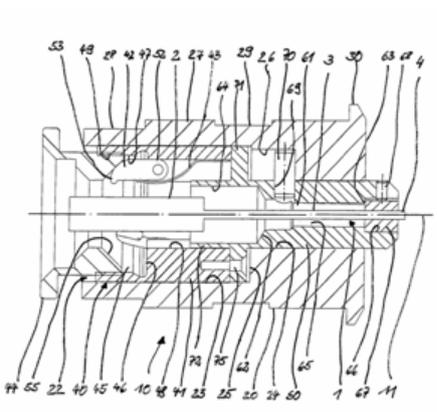
This place covers:

Chucks, expansion mandrels, adaptations of chucking arrangements for remote control, details of shanks of tools insofar as they are not related to the operation being performed but to the clamping of the tool. Chucks are devices for holding tools or workpieces suitable for use on machine tools. Note [B23Q 3/00](#) contains work holding devices for mounting workpieces to a workpiece table.

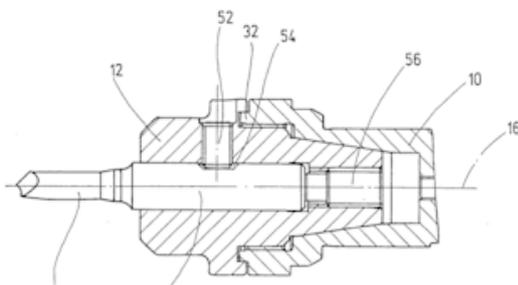
Illustrative examples of subject matter classified in this group:



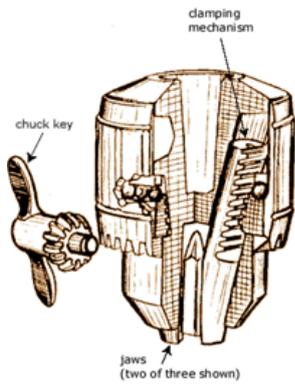
[B23B 31/028](#) Chuck with axially movable stop (9) to set tool length.



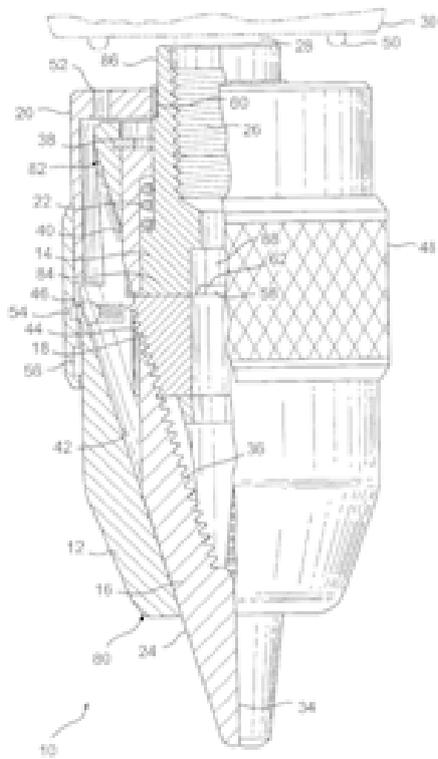
[B23B 31/103](#) Chuck with pivotal element (42).



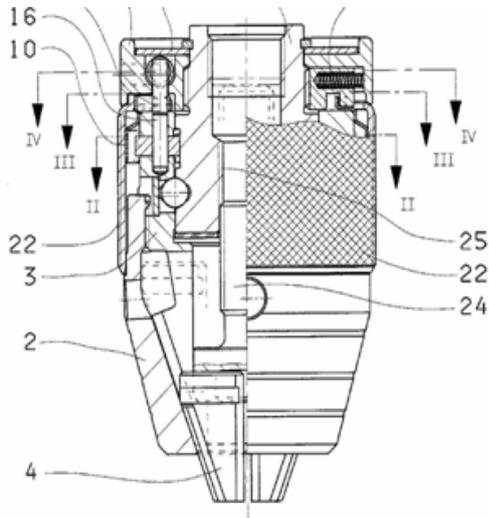
[B23B 31/1179](#) Chuck for tools using heat shrink technique.



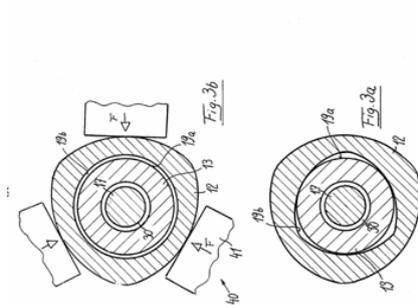
[B23B 31/1238](#) Chuck with inclined jaws actuated by nut operated by a key.



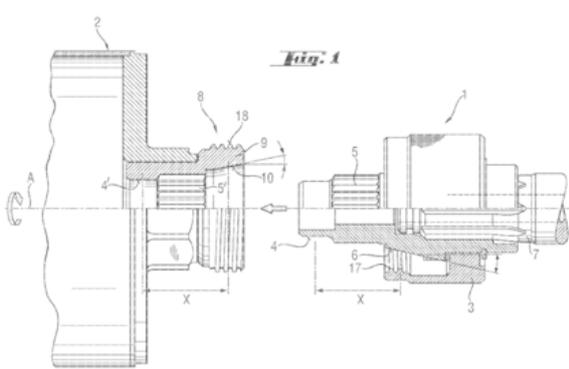
[B23B 31/1246](#) and [B23B 2231/38](#) Keyless chuck with inclined jaws activated by central bolt (18) with conical screw thread.



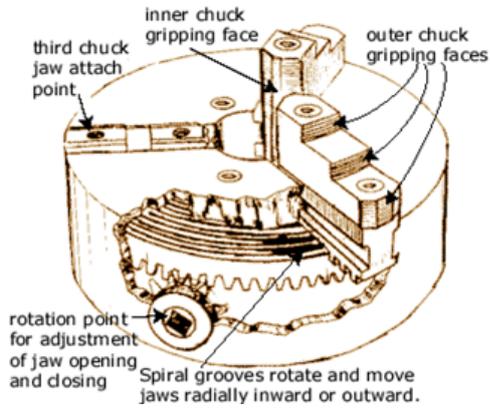
[B23B 31/1253](#) and [B23B 2231/38](#) chuck with inclined jaws (4) operated by an axially movable member (24).



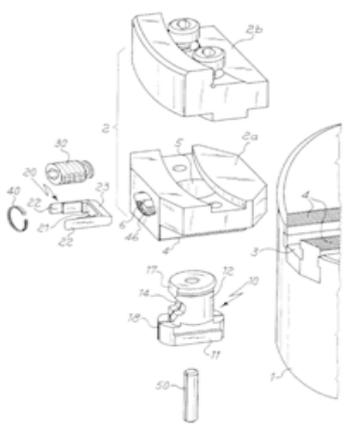
[B23B 31/117](#) Chuck with retention by friction only.



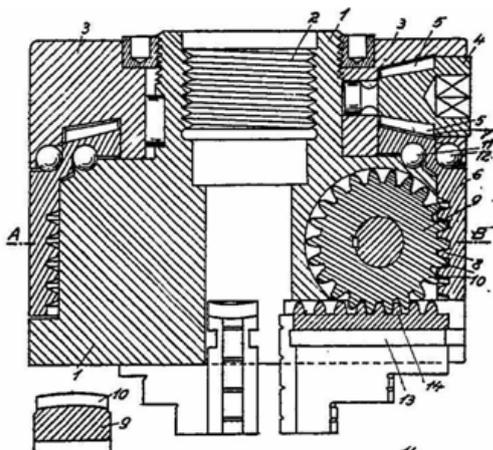
[B23B 31/1107](#) Chuck with threaded connection for conical parts.



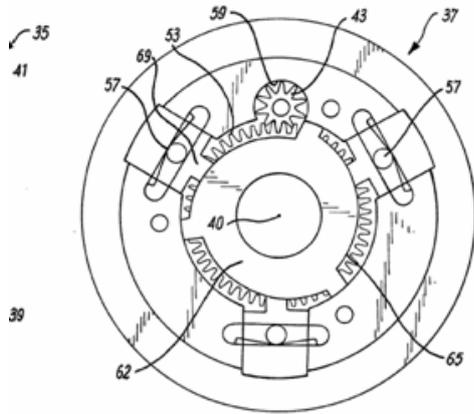
[B23B 31/16004](#) Chuck with simultaneous radially acting jaws actuated by spiral groove.



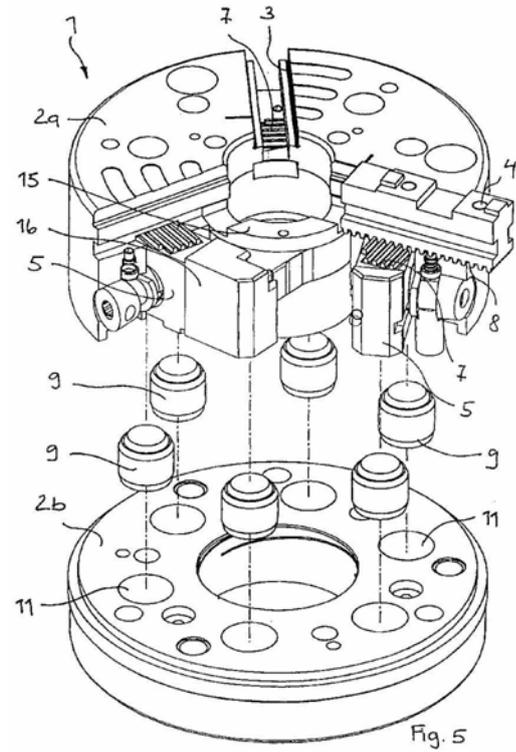
[B23B 31/16016](#) or [B23B 31/16058](#) or [B23B 31/16095](#) or [B23B 31/16133](#) or [B23B 31/1617](#) or [B23B 31/16208](#) or [B23B 31/16245](#) or [B23B 31/16279](#) Chuck with radially acting jaws including special fixation of top jaws (2) onto master jaw (4).



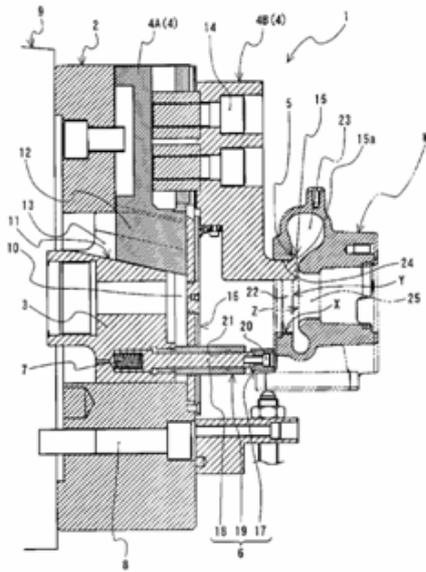
[B23B 31/16083](#) Chuck with radial jaws actuated simultaneously by gears and racks.



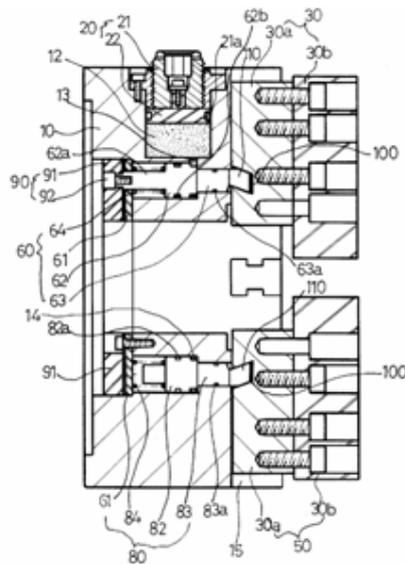
[B23B 31/1612](#) External chuck with radially acting jaws (69) actuated by cam (65) in radial plane.
[B23B 31/4093](#).



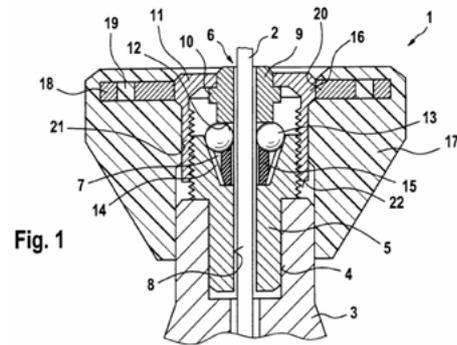
[B23B 31/16045](#) Chuck with simultaneous radially acting jaws (5) actuated by screws and nuts.



[B23B 31/16241](#) Chuck with jaws (4) actuated by oblique surfaces (11, 12) on coaxial control rod (3) with top jaws (4B) of special form.



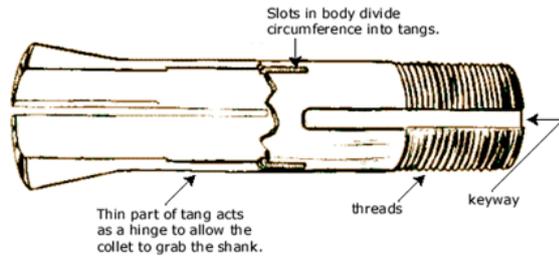
[B23B 31/201](#) Collet chuck characterised by its operating mechanism.



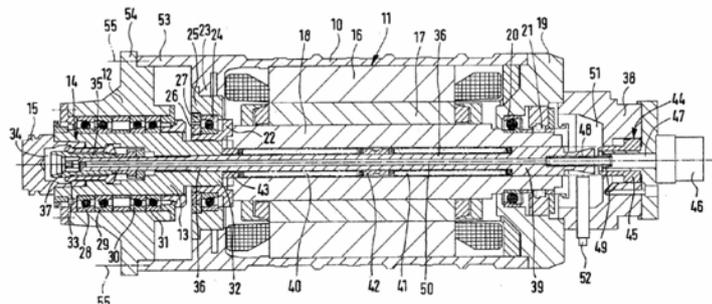
[B23B 31/22](#) Chuck with balls acting as jaws (not as detents

[B23B 31/1071](#)).

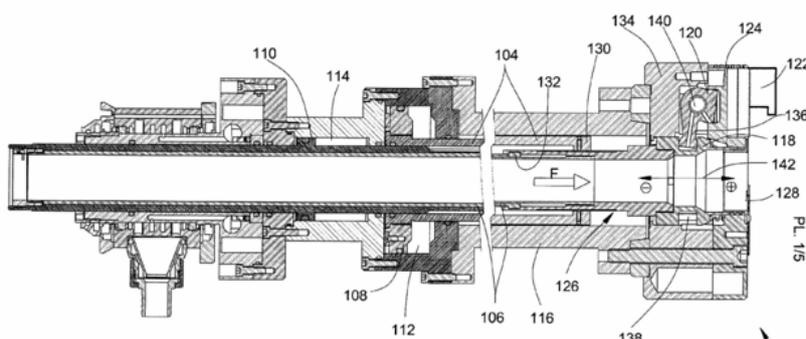
(Source: DE 102007060084).



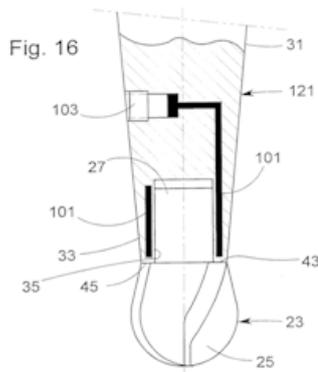
[B23B 31/202](#) Collet chuck (Source: unknown book or internet).



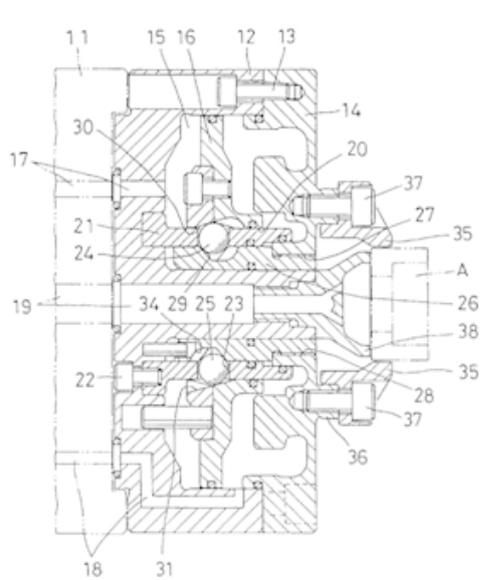
[B23B 31/261](#) Chuck using mechanical transmission through spindle (18) to grip end of toolholder shank (15).



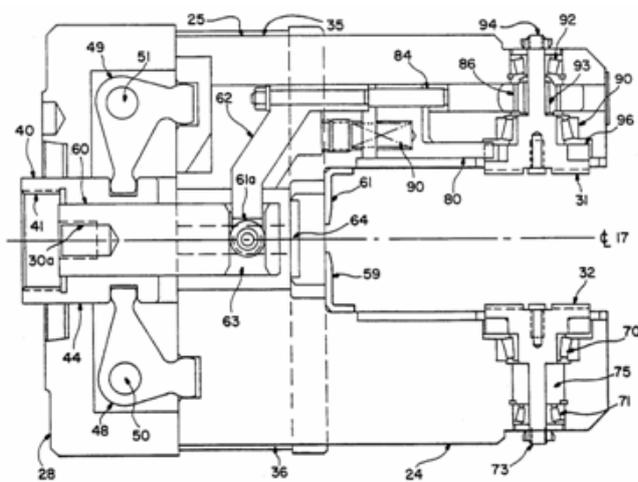
[B23B 31/302](#) Hydraulic equipment (110) for chucks.



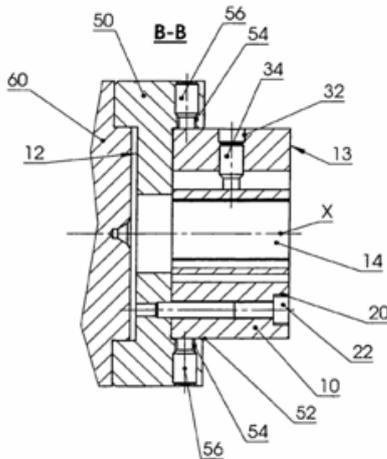
[B23B 31/305](#) Chuck with hydraulic clamping by deformable sleeve.



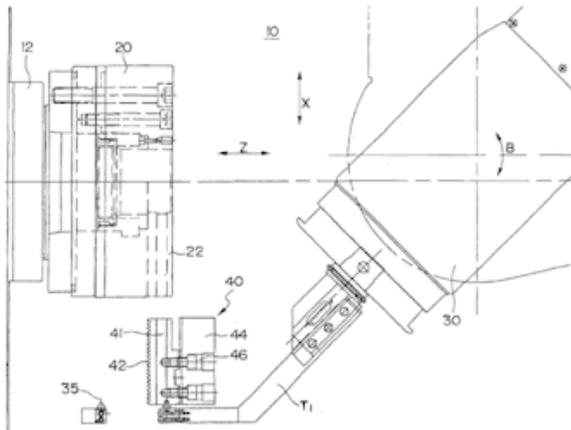
[B23B 31/32](#) Chuck with diaphragm (14).



[B23B 31/34](#) Chuck enabling workpiece to be reversed.



[B23B 31/36](#) Chuck (13) with means (56, 66) to offset the chuck with respect to the working spindle.



[B23B 31/39](#) Chuck jaw changer.

Further details of subgroups

[B23B 31/02](#);

See notes to [B23B 31/117](#).

Includes chucks for shanks of tools.

Chucks using heat shrinking technology to hold the tool shank are classed in [B23B 31/1179](#) . The machine used to assemble tools by heat shrinkage is classified in [B23P](#).

Equipment for setting tools to a pre-set length (pre-setters and tool measuring devices) are classified in [B23Q 17/24](#).

[B23B 31/06](#);

Features relating to removal of tool or work. See also [B23B 31/003](#).

[B23B 31/08](#);

Yielding holders. Includes tapping holders in [B23B 31/083](#).

[B23B 31/101](#);

Definition statement

Independent jaws (e.g. 4-jaw chucks).

[B23B 31/102](#);

Details of jaws but note that documents relating to details of jaws of chucks with simultaneously acting jaws are classed in [B23B 31/16](#), which takes precedence.

[B23B 31/103](#);

Pivoting catches or pawls. Note pivotally movable jaws in plane containing the axis of the chuck is [B23B 31/18](#).

[B23B 31/107](#);

Retention by lateral elements not acting as jaws (i.e. not providing a radial clamping force as the sole means of retaining the work or tool in the chuck).

In this subgroup pins are radially disposed, whereas cylindrical elements are circumferentially disposed.

Note difference between retention by screw [B23B 31/1075](#) with radial screws and [B23B 31/11](#) threaded connection, usually with axially aligned thread).

Note [B23B 31/22](#) is when balls act as jaws.

[B23B 31/1107](#) ;

Covers threaded connections with conical parts. The threads on these connections can be cylindrical or conical. The Indexing Codes for cylindrical and conical threads must be allocated where appropriate.

[B23B 31/117](#);

Clamping by friction only. Note heat shrink toolholders are classed in [B23B 31/1179](#) . Chucks with deformable sleeve operated by hydraulics are classed in [B23B 31/305](#).

[B23B 31/1207](#);

"Jacobs" type chuck found on portable drills either keyless or not. If chuck is keyless, allocate [B23B 2231/38](#). If details of chuck key are given allocate [B23B 2260/078](#).

[B23B 31/16](#);

Chucks with radial jaws acting simultaneously.

[B23B 31/16004](#);

Actuated by spiral groove.

[B23B 31/16045](#);

Actuated by oblique rack.

Actuated by screws and nuts.

[B23B 27/1625](#);

Actuated by gears and racks.

[B23B 31/1612](#);

Actuated by cam in plane perpendicular to chuck axis

Definition statement

[B23B 31/16158](#);

Actuated by coaxial conical surfaces.

[B23B 31/16195](#);

Actuated by pivoting levers (bellcranks).

[B23B 31/16233](#);

Actuated by oblique surfaces of coaxial rod (usually T-slots).

[B23B 31/1627](#);

Jaw details important.

Note also [B23B 31/16008](#), [B23B 31/1605](#), [B23B 31/16087](#), [B23B 31/16125](#), [B23B 31/16162](#) and [B23B 31/162](#) where actuation mechanism is also known or important.

[B23B 31/16287](#);

using fluid. Note also [B23B 31/16025](#), [B23B 31/16066](#), [B23B 31/16104](#), [B23B 31/16141](#), [B23B 31/16179](#) and [B23B 31/16216](#) where actuation mechanism is also known or important.

[B23B 31/16291](#);

with a centre. Note also [B23B 31/16033](#), [B23B 31/16075](#), [B23B 31/16112](#), [B23B 31/1615](#), [B23B 31/16187](#) and [B23B 31/16225](#) where actuation mechanism is also known or important.

[B23B 31/16295](#);

Means preventing the ejection of jaws.

[B23B 31/20](#);

Collet chucks

Allocation of Indexing Codes from the section "details of collect chucks" is mandatory.

Collet chucks in devices designed to be attached to a machine tool table are classified in [B23Q 3/067](#).

Collet chucks for bar pushers [B23B 13/123](#).

[B23B 31/26](#);

Tool clamping mechanisms in machine tool spindles. Details of the spindle not concerning the clamping mechanism are classed in [B23Q 1/70](#).

[B23B 31/30](#);

Hydraulic means.

[B23B 31/302](#);

Actuating cylinders for lathe chucks.

[B23B 31/305](#);

Chucks with deformable sleeve operated by hydraulics.

[B23B 31/36](#);

Adjusting chucks relative to working spindle. Adjustment of work/tool relative to chuck [B23B 31/026](#).

Definition statement

[B23B 31/40](#);

Expansion mandrels. Note similarity in this group to externally acting 3-jaw self-centring chucks of [B23B 31/16](#).

[B23B 31/4006](#);

External collets.

[B23B 31/4073](#);

Clamping between two plane surfaces. Documents showing an arbour type arrangement in which clamping is between two plane surfaces should be classed here, even if the arrangement does not have an expansion mandrel.

Relationships with other classification places

Where the area of interest is how to fix a chuck unit to a spindle, documents are classed in [B23Q 3/12](#). It is foreseen that the pertinent documents will be placed in a new subgroup of [B23B 31/00](#) shortly.

References

Limiting references

This place does not cover:

faceplates	B23Q 1/50
Rotary devices holding by magnetic and/or electrical force acting directly on work	B23Q 3/152
Allowing axial oscillation of percussion tool bits	B25D 17/08

Special rules of classification

Where the important features of a tool relate to the shank (i.e. when it is unimportant what type of tool it is but more important how the tool is to be clamped) a class will be given in [B23B 31/005](#) or [B23B 31/006](#).

Allocation of 2000-series Indexing Codes from the section "details of chucks", [B23B 2231/00](#), including "collet chucks" [B23B 2231/20](#), is mandatory in [B23B 31/00](#).

Classification is per literal interpretation of the group or sub-group.

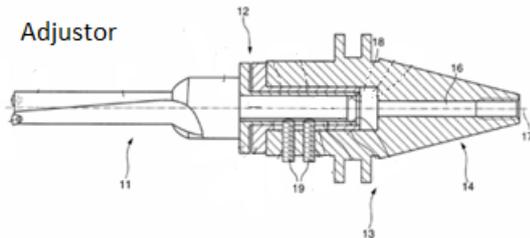
B23B 31/026

{the radial or angular position of the tool being adjustable (boring heads with tools moving radially [B23B 29/034](#); holding tools yieldably [B23B 31/08](#); with means for adjusting the chuck with respect to the working spindle [B23B 31/36](#))}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



Adjustor for setting diameter of bore with rotary cutting tools. Cutting tool 11; tool holder 13; adjusting device 12; Steep taper shank 16; axis of rotation 17; receiving section 18; fastening screws 19.

References

Limiting references

This place does not cover:

Boring heads with tools moving radially	B23B 29/034
Holding tools yieldably	B23B 31/08
With means for adjusting the chuck with respect to the working spindle	B23B 31/36

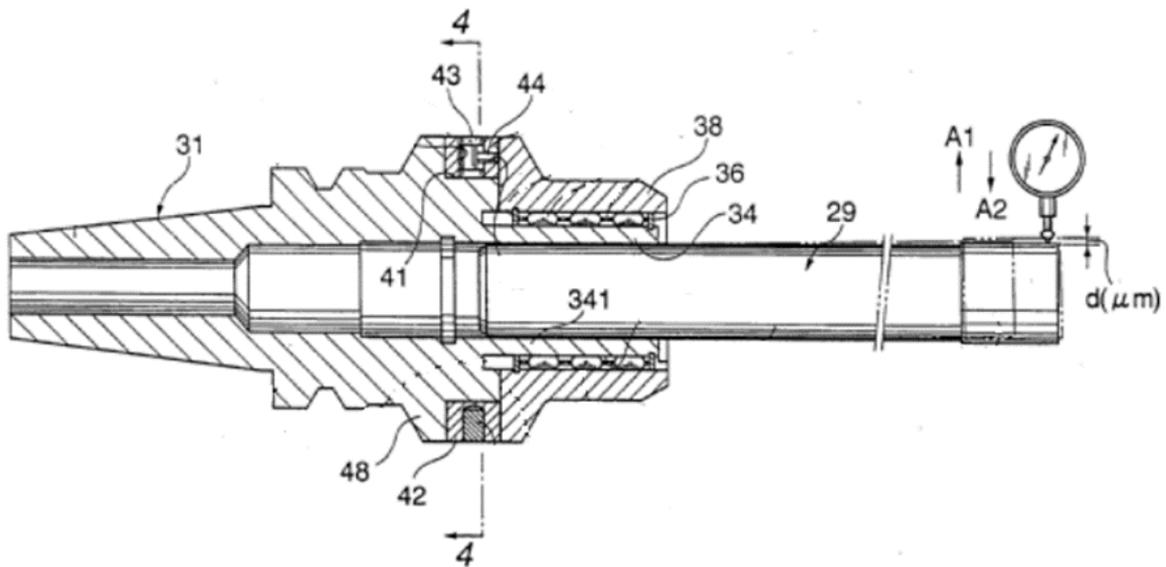
Informative references

Attention is drawn to the following places, which may be of interest for search:

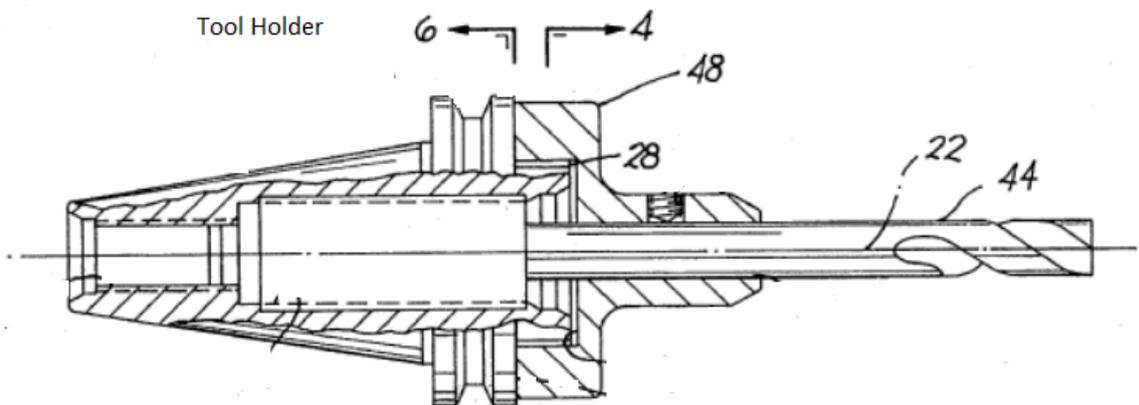
Devices for securing work or tools to spindles	B23Q 3/12
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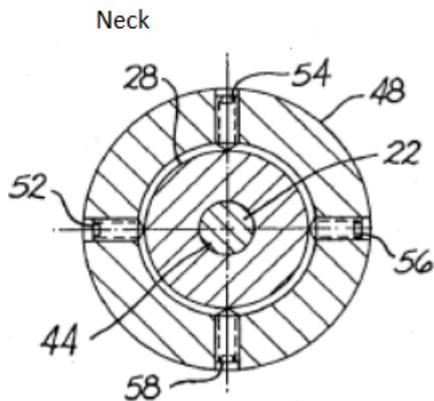
B23B 31/0261**{for centering the tool}****Definition statement***This place covers:*

Illustrative examples of subject matter classified in this group.



Cutting tool 29; holder body 31; base end portion 341 of the chuck sleeve 34, which is continuous with the cylindrical support portion 48; tip run-out of the cutting tool 29; rotating the eccentric cam 43 provided in the ring member 42; cylindrical support portion 48; the holder body 31; pin 44; clamp sleeve 38.





Chuck with means (52/54/56/58) for centering a tool or workpiece.

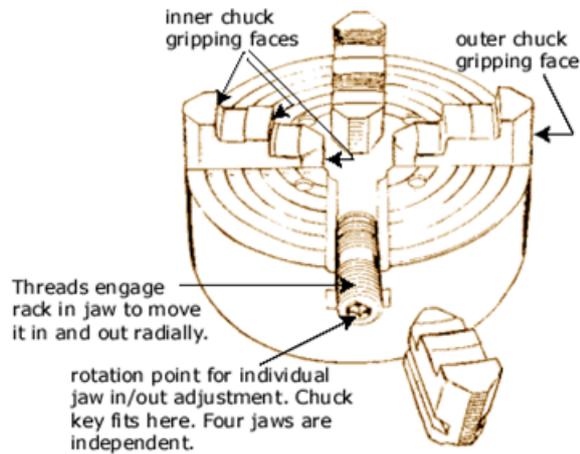
B23B 31/101

{Chucks with separately-acting jaws movable radially ([B23B 31/1602](#), [B23B 31/16062](#), [B23B 31/161](#), [B23B 31/16137](#), [B23B 31/16175](#), [B23B 31/16212](#), [B23B 31/1625](#) and [B23B 31/16283](#) take precedence; Chucks with simultaneously acting jaws moving radially [B23B 31/16](#))}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



Chuck with separately acting jaws movable radially.

References

Limiting references

This place does not cover:

Chucks with simultaneously acting jaws moving radially	B23B 31/16
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Individually adjustable jaws	B23B 31/1602 , B23B 31/16062 , B23B 31/161 , B23B 31/16137 , B23B 31/16175 , B23B 31/16212 , B23B 31/1625 , B23B 31/16283
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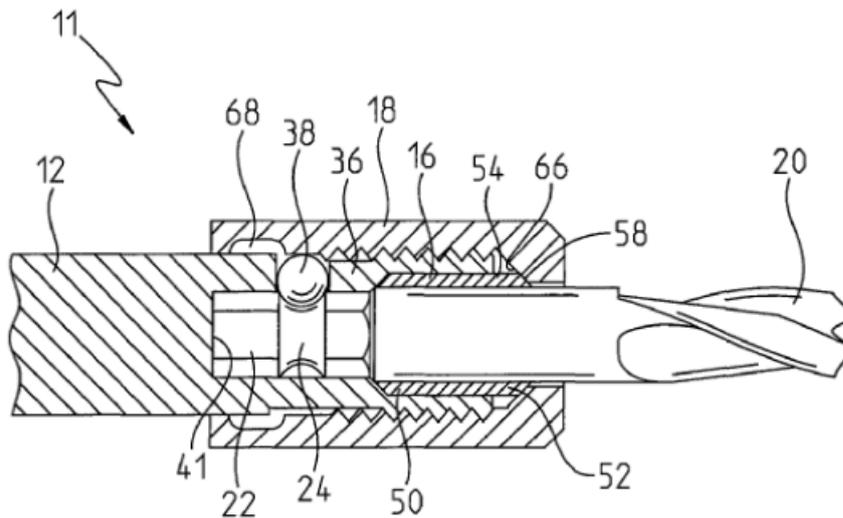
B23B 31/1071

{Retention by balls (balls acting as jaws [B23B 31/22](#))}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



Chuck with ball detents (38). To be classified in this group, the balls should enter a groove or recess in the shank being held.

Relationships with other classification places

[B23B 31/1071](#) is used for retention balls to hold the shank of the tool where the shank has a depression or groove to receive the ball.

[B23B 31/22](#) is used for balls which form jaws in which the shank is solid and the balls that form jaws about the outer circumference of the shank.

References

Limiting references

This place does not cover:

Balls acting as jaws	B23B 31/22
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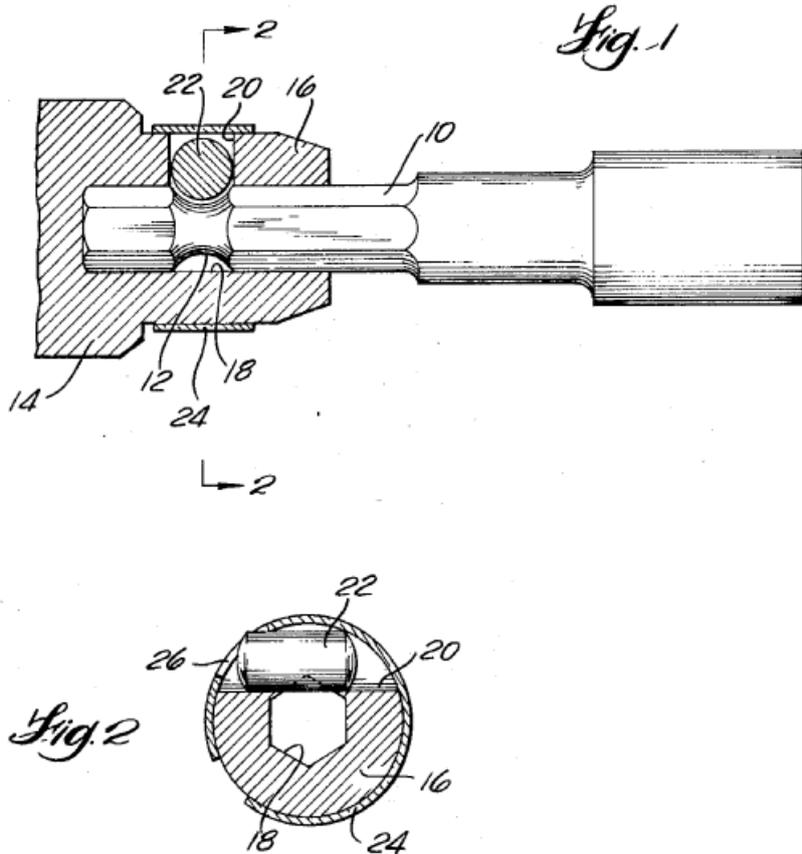
B23B 31/1072

{Retention by axially or circumferentially oriented cylindrical elements
(cylindrical elements acting as jaws [B23B 31/223](#))}

Definition statement

This place covers:

Illustrative examples of subject matter classified in this group.



Chuck with axial or circumferential cylindrical detents. To be classified in this group, the cylindrical detents should enter a groove or recess in the shank being held.

Relationships with other classification places

[B23B 31/1072](#) is used for cylindrical elements to hold the shank of the tool where the shank has a depression or groove to receive the cylindrical elements.

[B23B 31/223](#) is used for cylindrical elements which form jaws in which the shank is solid and the cylindrical elements that form jaws about the outer circumference of the shank.

References**Limiting references**

This place does not cover:

Cylindrical elements acting as jaws	B23B 31/22
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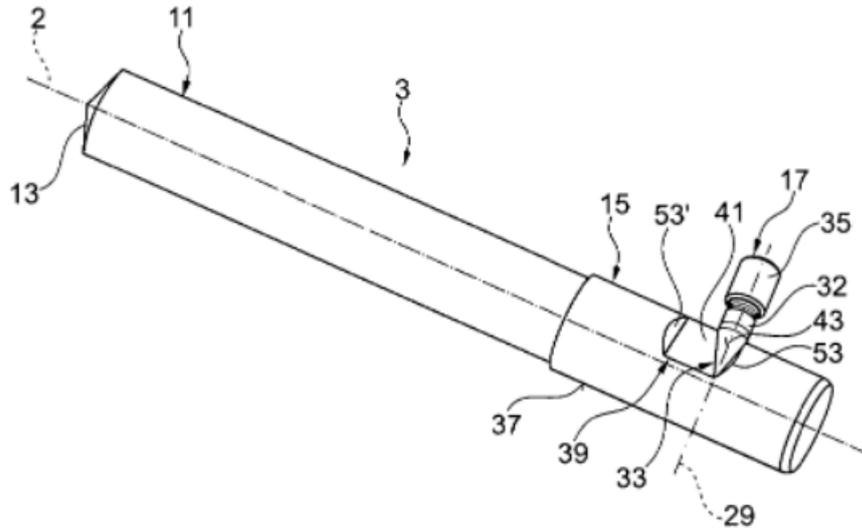
B23B 31/1073

{Retention by conical elements (conical elements acting as jaws [B23B 31/226](#))}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group:



Chuck with conical detents. To be classified in this group, the conical elements should enter a groove or recess in the shank being held.

Relationships with other classification places

[B23B 31/1073](#) is used for conical elements to hold the shank of the tool where the shank has a depression or groove to receive the conical elements.

[B23B 31/226](#) is used for conical elements which form jaws in which the shank is solid and the conical elements that form jaws abut the outer circumference of the shank.

References**Limiting references**

This place does not cover:

Conical elements acting as jaws	B23B 31/226
---------------------------------	-----------------------------

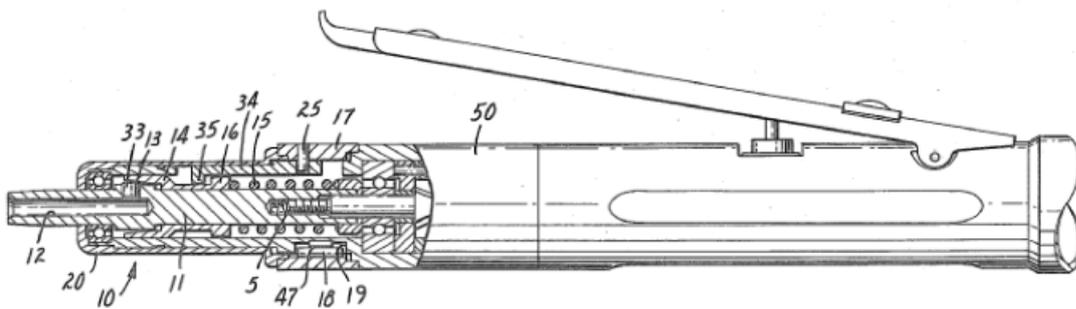
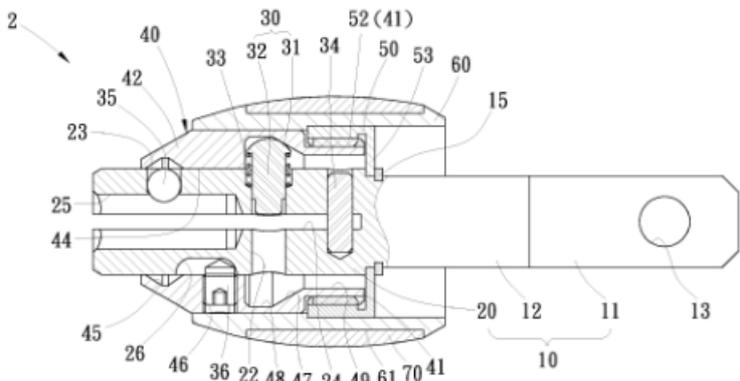
B23B 31/10741

{Retention by substantially radially oriented pins}

Definition statement

This place covers:

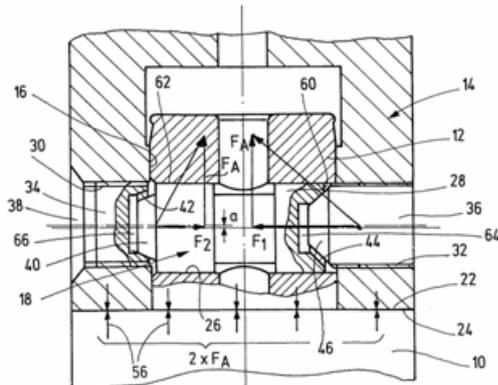
Illustrative examples of subject matter classified in this group.



Chuck with radial pin detent.

B23B 31/1077**{acting on a floating pin}****Definition statement***This place covers:*

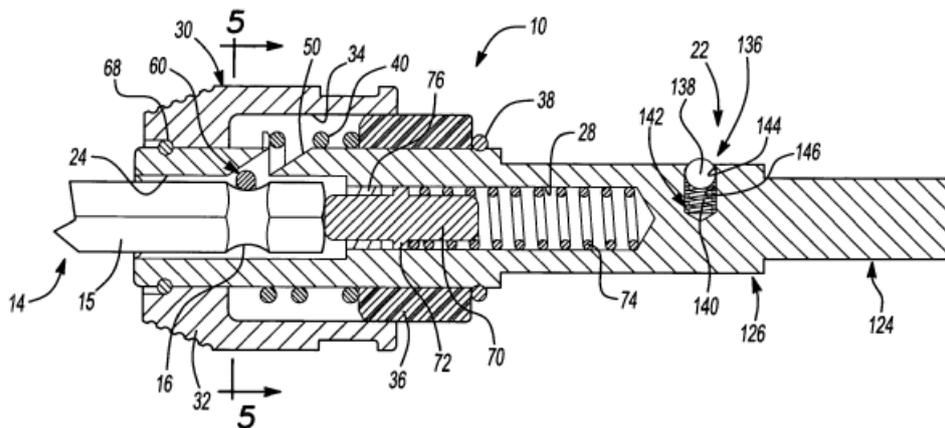
Illustrative example of subject matter classified in this group.



Chuck (14) with screw detent (36) acting on floating pin (18).

B23B 31/1079**{Retention by spring or wire}****Definition statement***This place covers:*

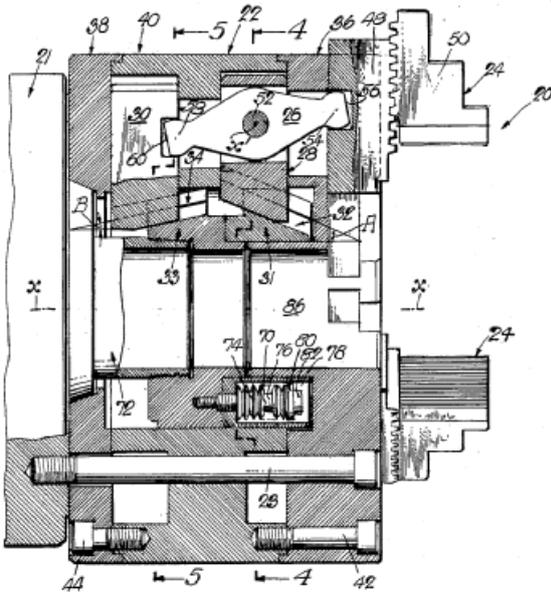
Illustrative example of subject matter classified in this group.



Chuck with spring or wire detent (60).

B23B 31/141**{To counterbalance the jaws}****Definition statement***This place covers:*

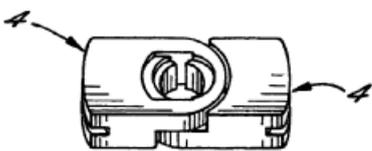
Illustrative example of subject matter classified in this group.



Chuck using centrifugal force to counterbalance the jaws. Action bar 26 extends substantially longitudinally of the chuck axis x , and is mounted intermediate its ends on a pivot pin 52 with an axis x' .

B23B 31/142**{To grip a tool or workpiece}****Definition statement***This place covers:*

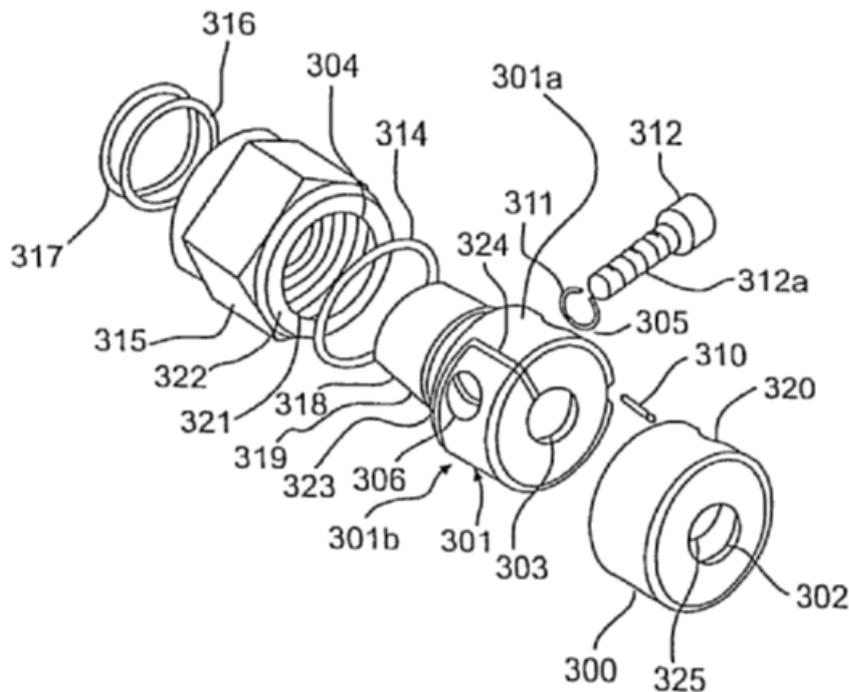
Illustrative example of subject matter classified in this group.



Chuck using centrifugal force to grip a tool or workpiece.

B23B 31/2025**{Wherein the sleeve is split into two relatively movable parts}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group.



Collet chuck comprises a sleeve (301) split into two relatively movable parts (301a/301b).

B23B 31/204**{using fluid-pressure means to actuate the gripping means ([B23B 31/207](#) take precedence)}****References****Limiting references***This place does not cover:*

Using mechanical transmission through the spindle	B23B 31/207
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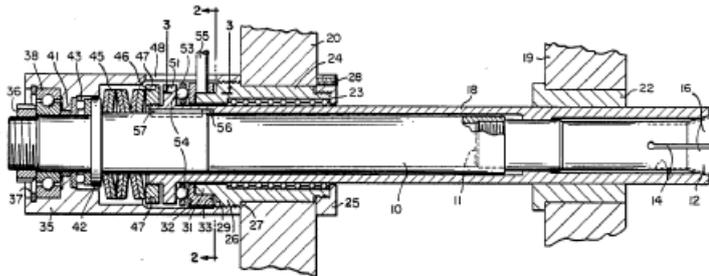
B23B 31/206

{Reciprocating cam actuator ([B23B 31/207](#) takes precedence)}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



Collet chuck with reciprocating cam actuator.

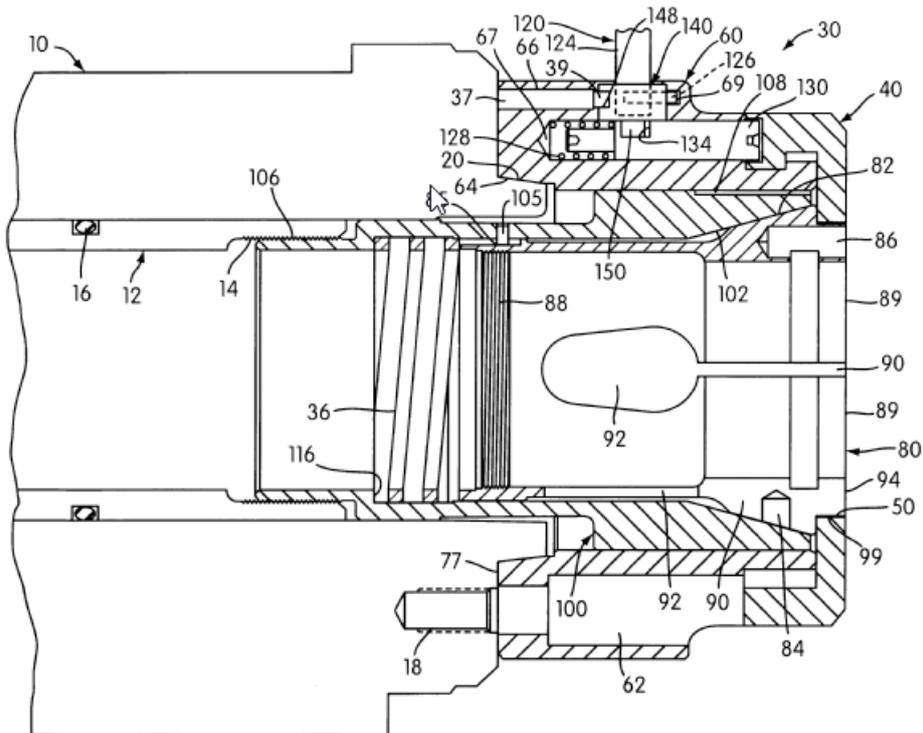
References**Limiting references**

This place does not cover:

Using mechanical transmission through the spindle	B23B 31/207
---	-----------------------------

B23B 31/2072**{Axially moving cam, fixed jaws}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group.



Collet chuck with axial moving cam actuator (100) and fixed jaws (89).

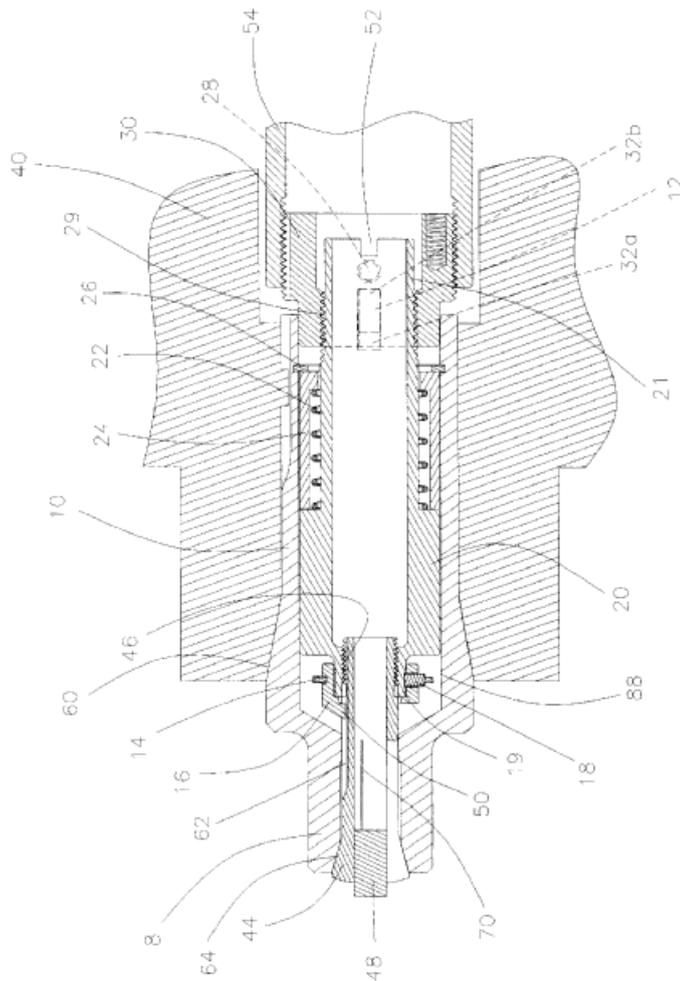
B23B 31/2073

{Axially fixed cam, moving jaws ([B23B 31/20125](#) takes precedence)}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



Collet chuck with axially fixed cam actuator (8) and moving jaws (44).

References**Limiting references**

This place does not cover:

Axially fixed cam, moving jaws	B23B 31/20125
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B23B 31/22**Jaws in the form of balls****Definition statement**

This place covers:

Illustrative example of subject matter classified in this group:

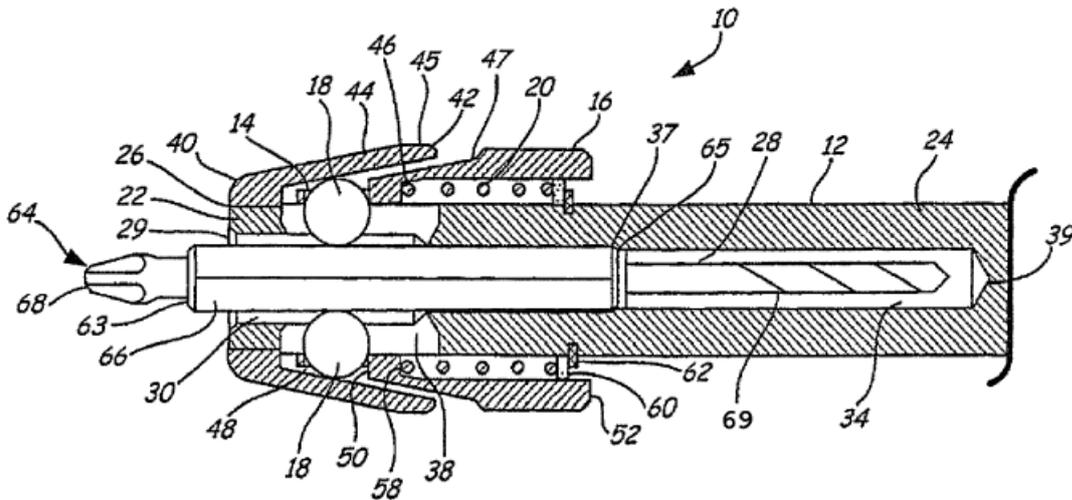


FIG. 2

Chuck with balls that are used as jaws. To be classified in this group, the balls should contact a solid outer surface of the shank being held.

Relationships with other classification places

[B23B 31/1071](#) is used for retention balls to hold the shank of the tool where the shank has a depression or groove to receive the ball.

[B23B 31/22](#) is used for balls which form jaws in which the shank is solid and the balls that form jaws abut the outer circumference of the shank.

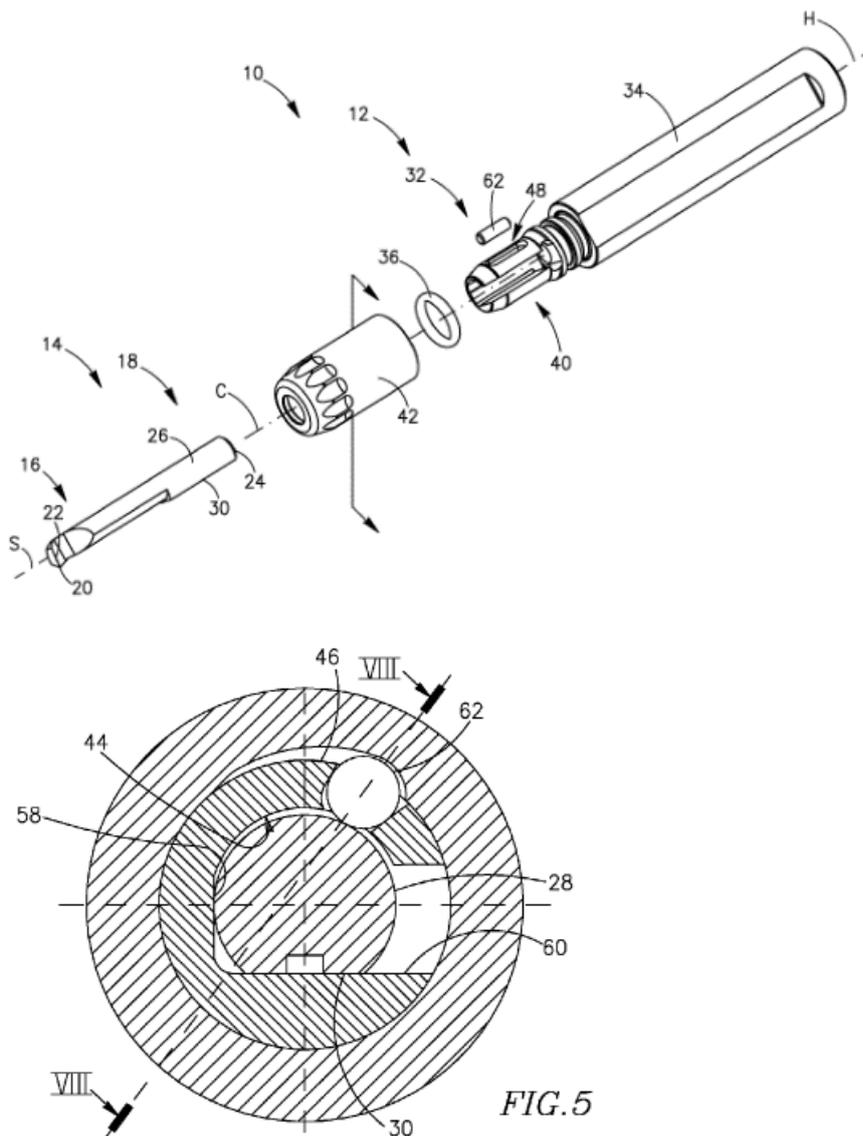
References**Informative references**

Attention is drawn to the following places, which may be of interest for search:

Retention by balls acting as detents	B23B 31/1071
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B23B 31/223**{Jaws in the form of cylindrical elements}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group:



Chuck with axial or circumferential cylindrical elements used as jaws. To be classified in this group, the cylindrical elements should contact a solid outer surface of the shank being held.

Relationships with other classification places

[B23B 31/1072](#) is used for cylindrical elements to hold the shank of the tool where the shank has a depression or groove to receive the cylindrical elements.

[B23B 31/223](#) is used for cylindrical elements which form jaws in which the shank is solid and the cylindrical elements that form jaws abut the outer circumference of the shank.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Retention by axially or circumferentially oriented cylindrical elements acting as detents	B23B 31/1072
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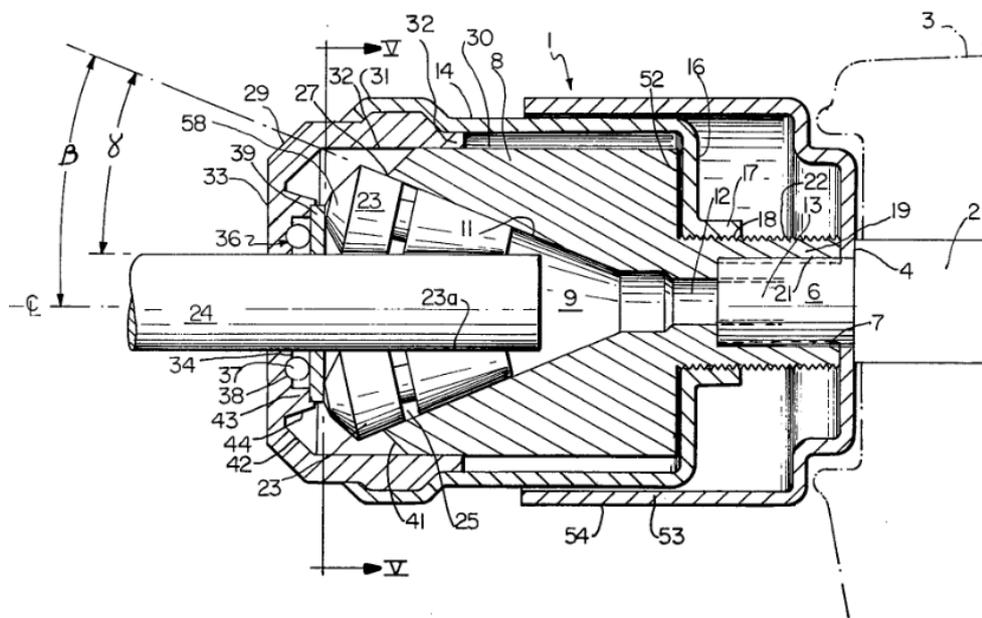
B23B 31/226

{Jaws in the form of conical elements}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group:



Chuck with conical elements used as jaws. To be classified in this group, the conical elements should contact a solid outer surface of the shank being held.

Relationships with other classification places

[B23B 31/1073](#) is used for conical elements to hold the shank of the tool where the shank has a depression or groove to receive the conical elements.

[B23B 31/226](#) is used for conical elements which form jaws in which the shank is solid and the conical elements that form jaws abut the outer circumference of the shank.

References

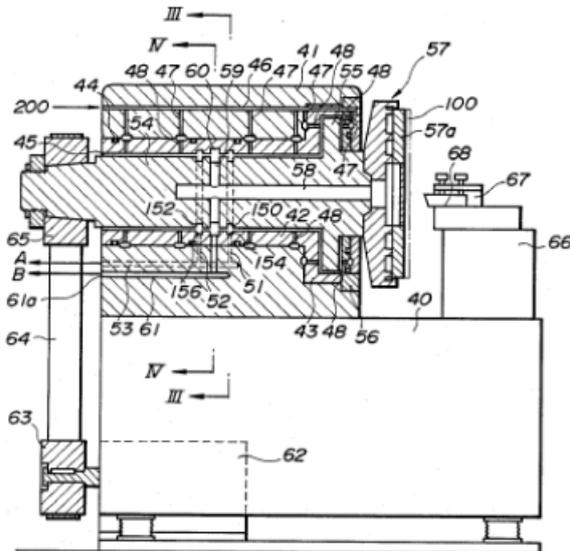
Informative references

Attention is drawn to the following places, which may be of interest for search:

Retention by conical elements acting as detents	B23B 31/1073
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B23B 31/307**{Vacuum chucks}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group.

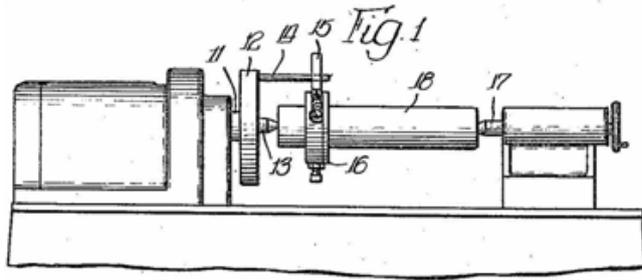


Vacuum chuck.

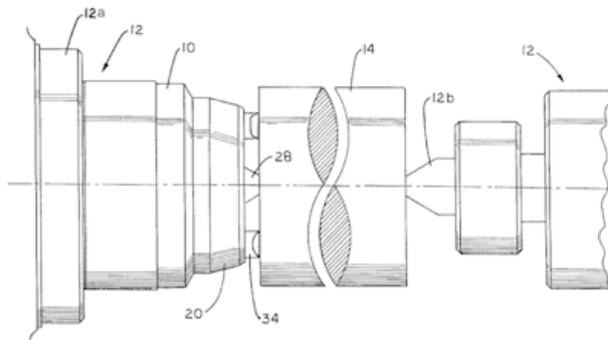
B23B 33/00**Drivers; Driving centres, Nose clutches, e.g. lathe dogs****Definition statement***This place covers:*

Drivers; driving centres and nose clutches. Drivers or driving centres are devices used to drive workpieces on lathes, when the workpiece is not held in a chuck mounted on the driving spindle, e.g. when the workpiece is supported between centres or similar devices. This group does not encompass driving spindles for workpieces (see [B23Q 1/70](#)), driving or feeding mechanisms for spindles (see [B23Q 5/04](#)), driving or feeding mechanisms for static tools or tools driven in rotation ([B23Q 5/04](#) or [B23Q 5/22](#)), or feeding mechanisms for carriages (see [B23Q 5/22](#)). Please see the table of IPC classes missing from ECLA under the main heading of [B23B](#).

Illustrative example of subject matter classified in this group:



[B23B 33/00](#) Lathe dog (16), (Source: US 2418864).



[B23B 33/005](#) Driver (10) with pins (34) (Source: WO 01/76793).

Special rules of classification

Classification is generally per literal interpretation of the group and subgroup headings.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Drive dog	device used to drive a workpiece held between centres in rotation that interacts with a pin on the faceplate
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B23B 35/00

Methods for boring or drilling, or for working essentially requiring the use of boring or drilling machines; Use of auxiliary equipment in connection with such methods

Definition statement

This place covers:

Methods for boring or drilling. The method must be related to the drilling or boring operation per se. The term "drilling" is intended to mean the removal of material by the rotation of a tool relative to a workpiece with the primary purpose of the efficient removal of material. In drilling to tool generally has an elongated cutting edge. The term "boring" is intended to mean the machining of an existing hole by a relative helical movement of one or more single point cutting tools with respect to the workpiece in order to either improve the surface finish of the hole or to more precisely establish the centre of the hole. A boring operation may thus remove more material from one side of a hole than from the opposite side, whereas in a drilling operation the same amount of material is removed from each side

of the axis of the tool. A drilling operation generally has a higher material removal rate than a boring operation.

Special rules of classification

Documents should not be classed if they relate to merely to work holding or the workpiece being machined by known methods.

Classification is generally per literal interpretation of the group and sub-group headings.

B23B 37/00

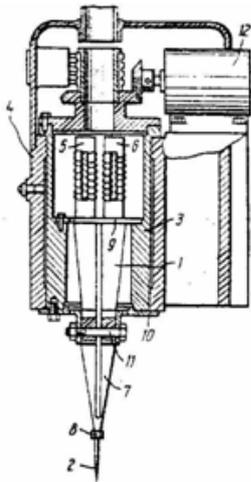
Boring by making use of ultrasonic energy (essentially using abrasive material [B24B](#), e.g. [B24B 1/04](#))

Definition statement

This place covers:

Ultrasonic drilling or boring, methods and equipment for ultrasonic drilling or boring.

Illustrative example of subject matter:



[B23B 37/00](#) Drilling using ultrasound(Source: GB 1094115).

B23B 39/00

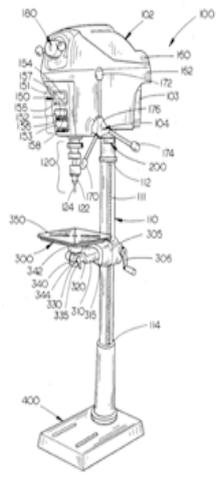
General-purpose boring or drilling machines or devices; Sets of boring and/or drilling machines

Definition statement

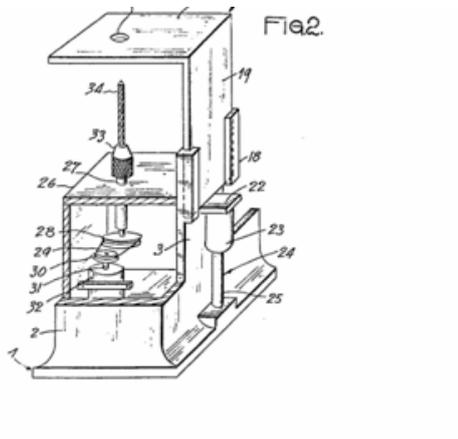
This place covers:

Machines designed for drilling only.

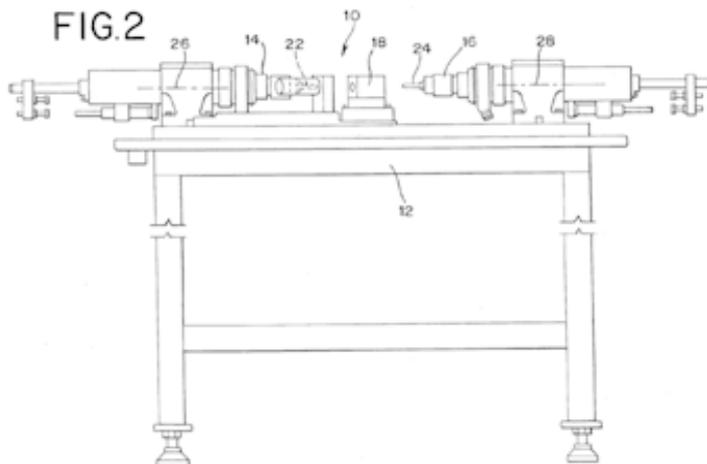
Illustrative examples:



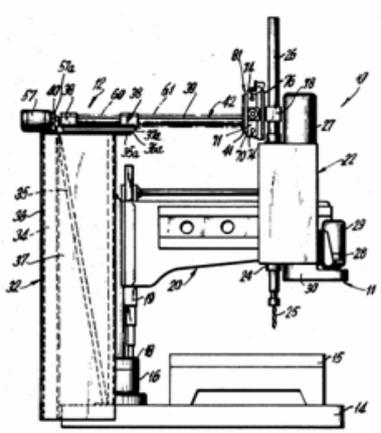
[B23B 39/00](#) General purpose pillar drill (not systematically classified) (Source: US 2006/0104731).



[B23B 39/003](#) Drill with spindle situated beneath workpiece (Source: FR 1537128).



[B23B 39/22](#) Drilling machines with opposite headstocks (Source: US 2008/0145161).



[B23B 39/12](#) Radial drill (not systematically classified) (Source: US 4 043 700).

Relationships with other classification places

Most modern machine tools (e.g. horizontal boring machines and jig-boring machines) perform drilling and milling, as well as other operations and will not be classed here, being classed instead in [B23Q](#) for constructional features. Similarly, a drill with an auxiliary device for measuring, sensing or positioning the workpiece will only be classed in the group for the invention.

B23B 39/16

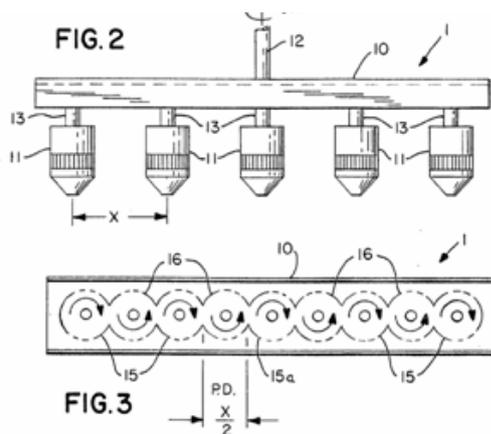
Drilling machines with a plurality of working-spindles; Drilling automatons

Definition statement

This place covers:

Drilling machines with multiple (including parallel) working spindles.

Illustrative example:



[B23B 39/162](#) Multispindle drill with gears transmission between spindles

(Source: US 2004/0136797).

Special rules of classification

Since usually only drilling is possible on such machines, all such machines should be systematically classified here.

B23B 41/00

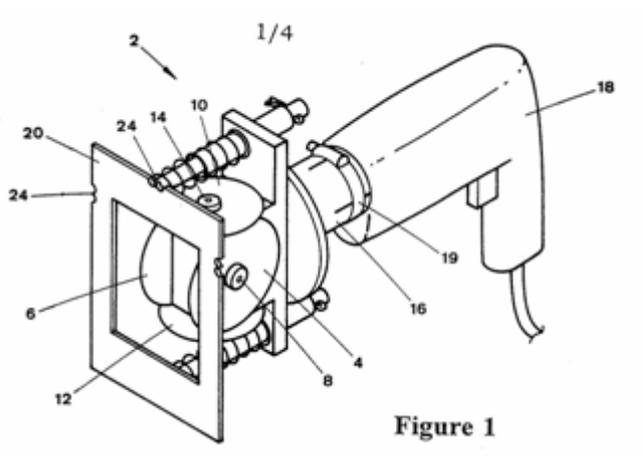
Boring or drilling machines or devices specially adapted for particular work [{\(surgical drilling machines A61B 17/16\)}](#); **Accessories specially adapted therefor**

Definition statement

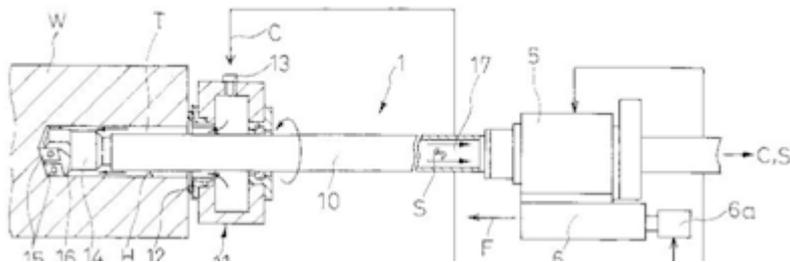
This place covers:

Drilling machines for special purpose.

Illustrative examples:

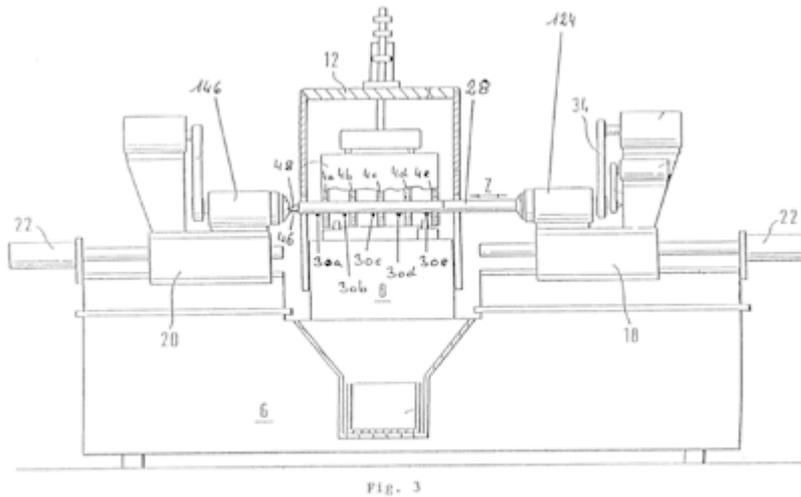


[B23B 41/04](#) Device for drilling non-circular holes (see also [B23B 51/0072](#)) (Source: WO 00/03828).

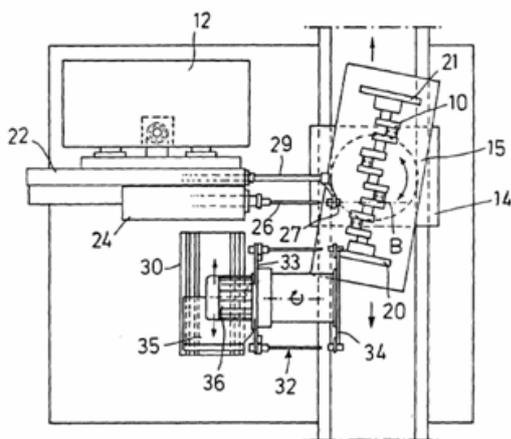


Definition statement

[B23B 41/02](#) Deep hole drilling machine. Typically coolant in the form of neat oil is fed down outside of tool to cutting tips and chips and coolant are discharged through the centre of the drill tube. (Source: WO 2009/118948).



[B23B 41/12](#) Machine for boring engine block bearing surfaces (Source: WO 98/41350).



[B23B 41/12](#) machine for drilling oil galleries in crankshafts (Source: DE 29907963U).

Special rules of classification

Systematic classification required.

B23B 43/00

Boring or drilling devices able to be attached to a machine tool, whether or not replacing an operative portion of the machine tool (if specially adapted for particular work [B23B 41/00](#))

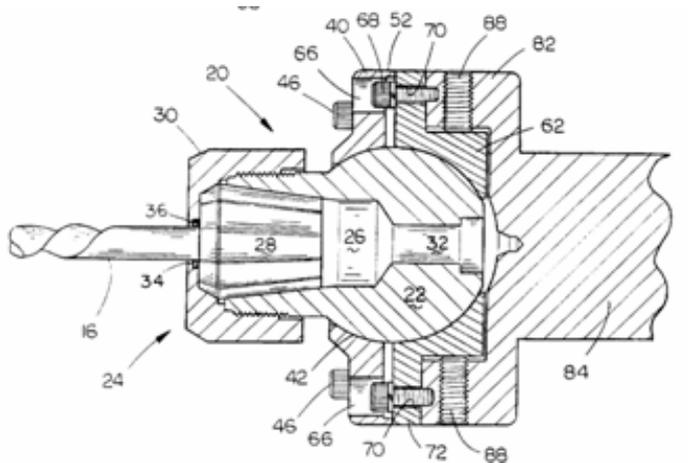
Definition statement

This place covers:

Drilling devices to be attached to a machine tool.

Definition statement

Illustrative example:



[B23B 43/02](#) Device to allow a drill bit (16) to be fitted to a tailstock quill (84) of a lathe (Source: US 5 752 706).

Special rules of classification

This group is hardly used. Manual in nature.

B23B 45/00

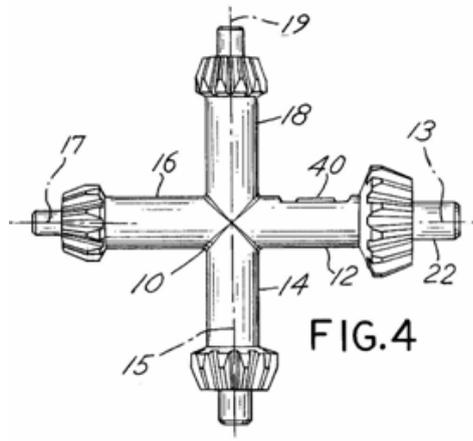
Hand-held or like portable drilling machines, e.g. drill guns; Equipment therefor (details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed [B25F 5/00](#))

Definition statement

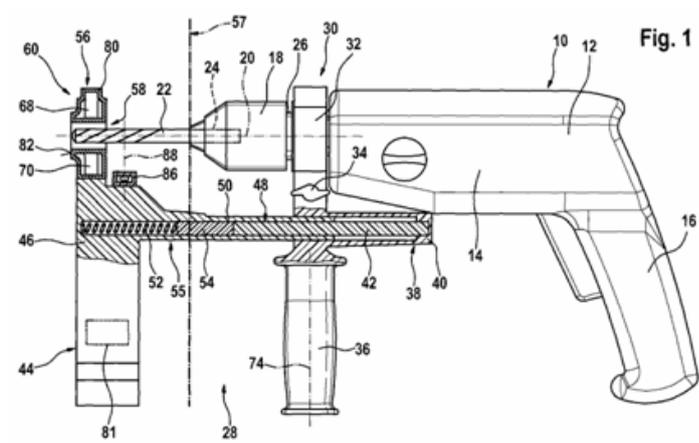
This place covers:

Hand-held or like portable drilling machines, e.g. drill guns, and equipment therefor. In order to be classified in this group the features of the hand tool must relate to the drilling operation. If a document relates to features of the hand tool, which are applicable to other hand tools (e.g. casings, handles) it should be classified only in [B25F 5/00](#), even if it presents a hand drill as the illustrative embodiment. Documents detailing gearing should be classified in [B23B 45/00](#) if the details of the gearing contain features relevant to the drilling operation (e.g. two speed drilling, overload clutch in case drill jams) but not if the details relate to operations other than drilling (e.g. adjustable torque clutch for screwdriving operations). Combined driver/drills should only be classed in [B23B 45/02](#) if there are features relevant to the drilling operation. Drivers are classed in [B25B 21/00](#). Arrangements for the removal or collection of swarf (e.g. by suction) for portable drilling machines are not classified in [B23B 45/00](#) but in [B23Q 11/0042](#)

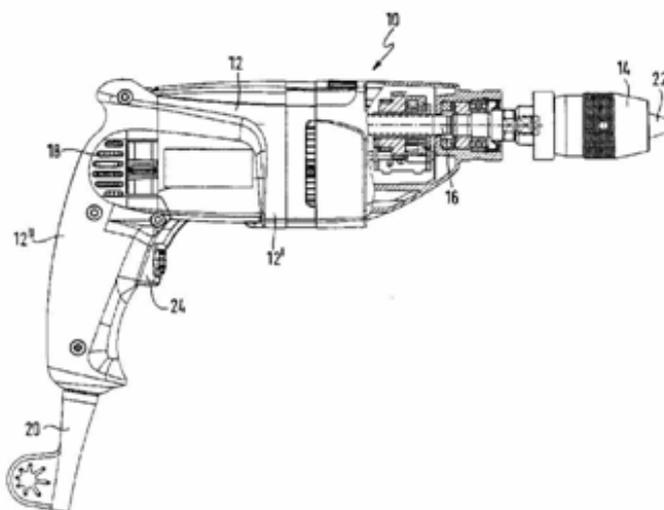
Illustrative examples of subject matter classified in this group:



[B23B 45/006](#) Drilling machine chuck keys (Source: US 6 488 288).



[B23B 45/003](#) Aligning accessory for hand drill (drill stands [B25H 1/0021](#)) (Source: EP 1 897 662).



[B23B 45/008](#) (see also [B25F 5/001](#) for hand tools in general) Details of gearings, clutches etc. Note drill stands [B25H](#), feed mechanisms [B23Q 5/00](#).

(Source: DE 10316889).

Relationships with other classification places

Must be related to drilling operation itself to be classed here. If related to general construction of the hand tool rather than the drilling operation per se the document should be classed in [B25F](#).

B23B 45/02

driven by electric power

Special rules of classification

No systematic classification here for just being an electric hand drill. See notes to [B23B 45/00](#). Electric hand drills should be classified for the features of the claimed invention.

B23B 47/00

Constructional features of components specially designed for boring or drilling machines; Accessories therefor (working-spindles, bearing sleeves therefor [B23Q 1/70](#); for machine tools in general [B23Q](#))

Definition statement

This place covers:

Constructional details of boring or drilling machines and accessories for boring or drilling machines.

Relationships with other classification places

Contrary to the IPC, documents for constructional features of drive and feed mechanisms are classified in [B23Q](#).

B23B 47/28

Drill jigs for workpieces (equipment for setting or guiding the drill [B23B 49/00](#))

Definition statement

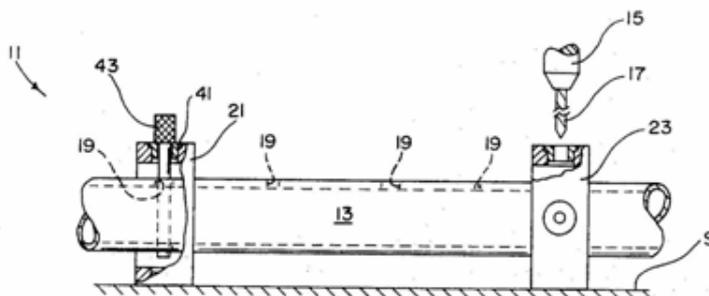
This place covers:

Drill jig.

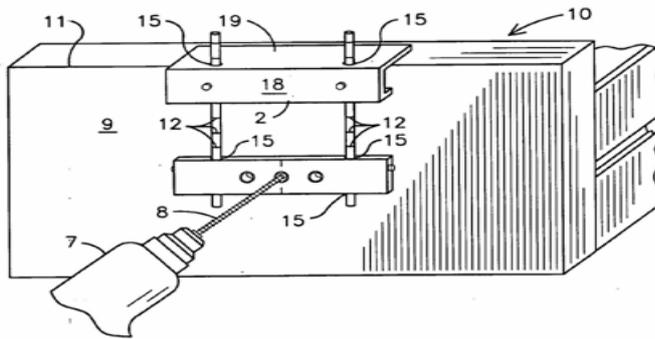
Guides tool to a known point on workpiece.

Jig has means for location of and/or reference of the workpiece thus placing the workpiece in a repeatable position with respect to the jig.

Illustrative examples:



[B23B 47/281](#) Pipe drill jig (Source: US 3743433).



[B23B 47/287](#) Drill jig for plate-like workpiece (Source: US 2007/0101598).

Relationships with other classification places

Drill bushes are classified in [B23B 49/023](#) and [B23B 49/026](#).

B23B 47/34

Arrangements for removing chips out of the holes made; Chip- breaking arrangements attached to the tool {(chip-breaking in turning machines [B23B 25/02](#); in turning tools [B23B 27/22](#))}

Relationships with other classification places

Vacuum or blowing systems for the evacuation of drilling debris from holes is classed In [B23Q 11/0042](#), which takes precedence. [B23B 47/34](#) is used when the evacuation of chips from drilled holes is performed as a result of the drilling process (e.g. by virtue of feed movement or configuration of drilling tool or machine).

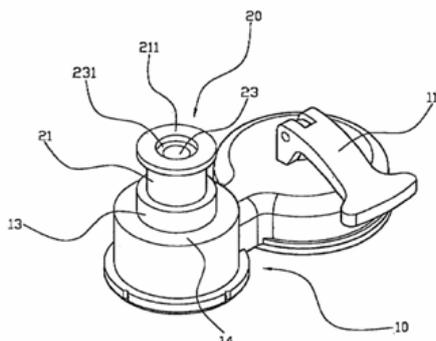
B23B 49/00

Measuring or gauging equipment on boring machines for positioning or guiding the drill; Devices for indicating failure of drills during boring; Centering devices for holes to be bored (marking-out equipment [B25H 7/00](#); measuring devices, gauges [G01B](#))

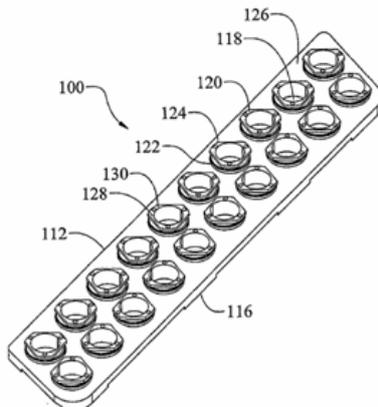
Definition statement

This place covers:

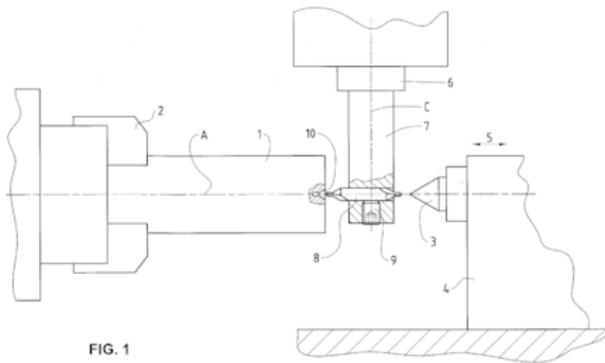
Illustrative examples of subject matter classified in this group:



[B23B 49/026](#) Drill bush attached to workpiece by suction (Source: DE 20 2009 004 053 U).



[B23B 49/023](#) Boring bushings (120) and their connection to template (116),
(Source: EP 2 025 439).



[B23B 49/04](#) Devices for drilling centre holes (Source: EP 1 440 753).

Relationships with other classification places

[B23Q 17/00](#) for measuring and gauging applicable to other operations and measuring or gauging on machine tools in general.

B23B 49/003

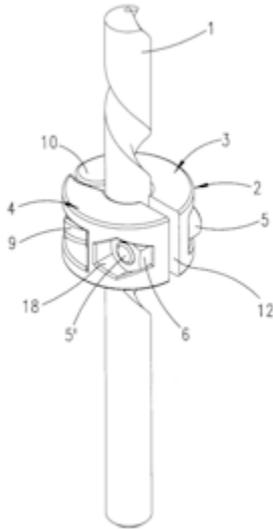
{Stops attached to drilling tools, tool holders or drilling machines ([B23B 51/104](#) takes precedence)}

Definition statement

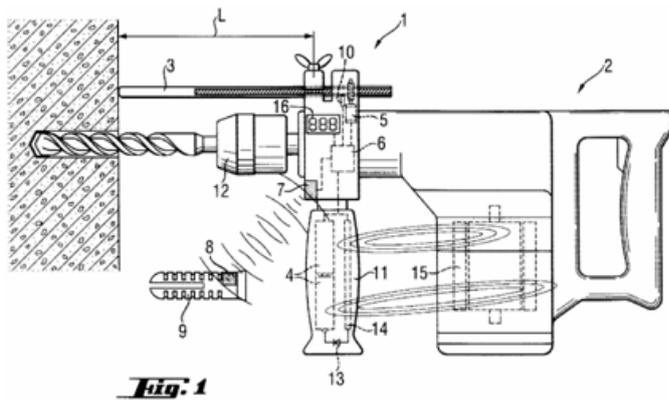
This place covers:

Stops attached to drilling tools, tool holders or drilling machines. Although most documents in this group relate to depth stops, fence-type stops particularly for drilling machines may also be classified here as they fall within the definition of the sub-group.

Illustrative examples of subject matter classified in this group:



[B23B 49/005](#) Depth stop attached to drill bit (Source: DE 10 2007 011 289).



[B23B 49/008](#) Depth stop attached to drilling machine (Source: EP 1 163 982).

References

Limiting references

This place does not cover:

Bits for countersinking with stops	B23B 51/104
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Special rules of classification

This group takes precedence over [B25F 5/003](#) - stops for limiting depth in rotary hand tools.

B23B 49/02

Boring templates or bushings

Definition statement

This place covers:

Bushes that are attached to either a template or directly to the workpiece. In contrast to drill jigs, the drill bush must be positioned relative to the workpiece.

B23B 51/00

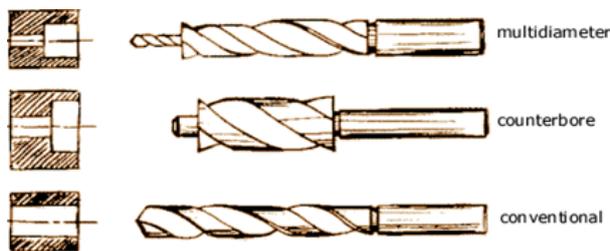
Tools for drilling machines

Definition statement

This place covers:

Tools for drilling machines that must be related to a drilling operation. The term "drilling" refers to the removal of material of from a workpiece with at least one geometrically defined cutting edge of the drilling tool during rotation of the tool, relative to the workpiece, about a rotation axis thereof. Furthermore, during drilling the tool only moves axially relative to the workpiece during operation. The primary purpose of the efficient removal of material for forming or enlarging a bore or hole.

Illustrative examples of drilling tools classed within [B23B 51/00](#) and subgroups:



[B23B 51/009](#) Stepped drill (top figure)

[B23B 51/107](#) Counterboring drill with pilot (middle figure)

[B23B 51/02](#) Twist drill (bottom figure)

Relationships with other classification places

[B23B 51/00](#) covers features of tools specifically related to drilling of metal or metal-like materials. Features relating to the drilling of materials other than metal will only be classified in [B23B](#) if the content of such documents renders them applicable to metal cutting.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Drill bits for surgery	A61B 17/1615
Drill bits for dentistry	A61C 3/02
Implanting tools or instruments	A61C 8/0089
Forming collars by flow-drilling	B21C 37/298
Flow drills	B21J 5/066
Tools for orbital drilling	B23C 3/02 , B23C 2220/52
Shank-type milling cutters, i.e. with an integral shaft	B23C 5/10
Reaming tools	B23D 77/00
Making holes by electrical discharge machine or electrochemical machining	B23H 9/14
Boring by laser beam	B23K 26/00
Making drilling tools	B23P 15/32 , B23P 15/28

Perforating tools	B26F 1/16
Perforating by non-mechanical means, e.g. by fluid jet	B26F 1/26
Wood bits that would not be suitable for use on metal or metal-like substances	B27B 5/12
Drill bits for drilling wood	B27G 15/00
Drill bits for stone or stone-like materials, e.g. brick, concrete, glass	B28D 1/00
Drill bits with geometrically undefined cutting edges for stone or glass materials	B28D 1/146 , B28D 1/041
Implements for stirring paint	B44D 3/06
Drill bits or drill inserts characterized only by the composition of the coating	C23C 30/005
Drill bits for earth drilling	E21B 10/00

Special rules of classification

Allocation of 2000-series Indexing Codes from the section [B23B 2251/00](#) is mandatory.

Paint stirrers, yacht sail hoisters, pumps for hosepipes or other tools that are attached to a portable drilling machine as a source of power are classified in the application-oriented places.

B23B 51/0002

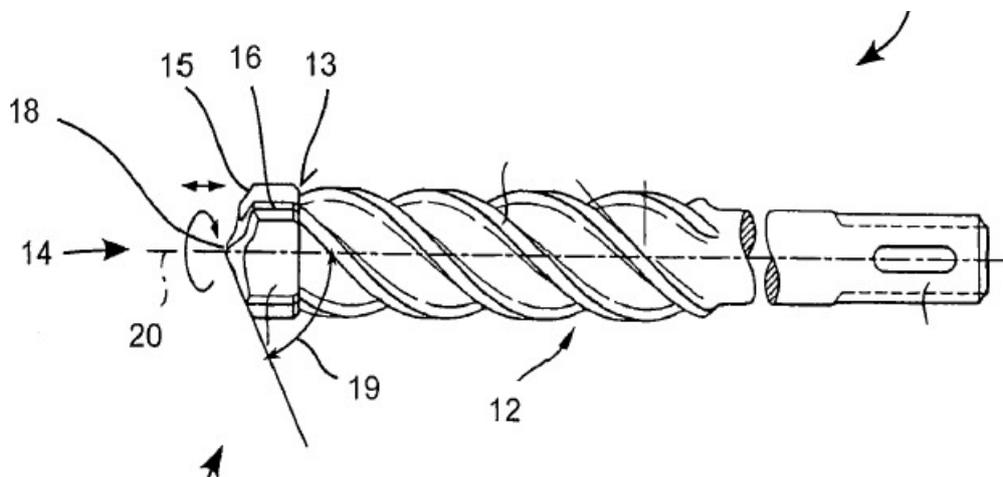
{Drills with connected cutting heads, e.g. with non-exchangeable cutting heads; Drills with a single insert extending across the rotational axis and having at least two radially extending cutting edges in the working position}

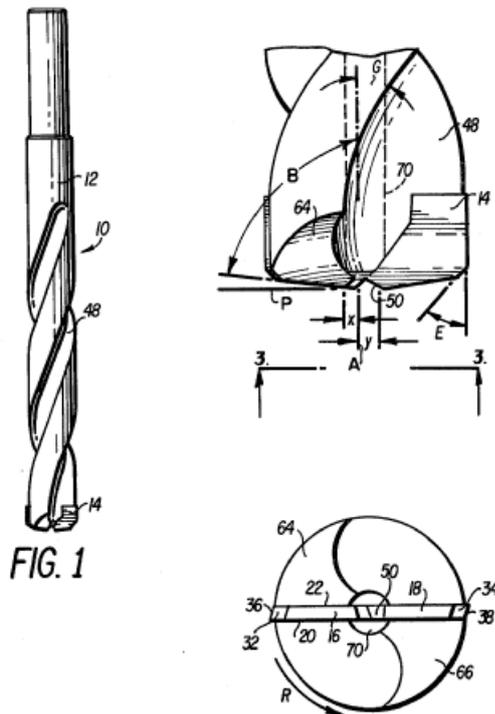
Definition statement

This place covers:

Drills with separate cutting heads permanently attached to the drill, e.g. brazing or welding. A single insert extending across the rotational axis and having at least two radially extending cutting edges in the working position is considered to be within the scope of this group.

Illustrative example of subject-matter classified in this group:





The drill 10 comprises a steel shank 12 and a carbide tip 14 brazed in the end of the shank (see Fig.1).

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Drill bits with other types of cutting inserts	B23B 51/0006
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B23B 51/0003

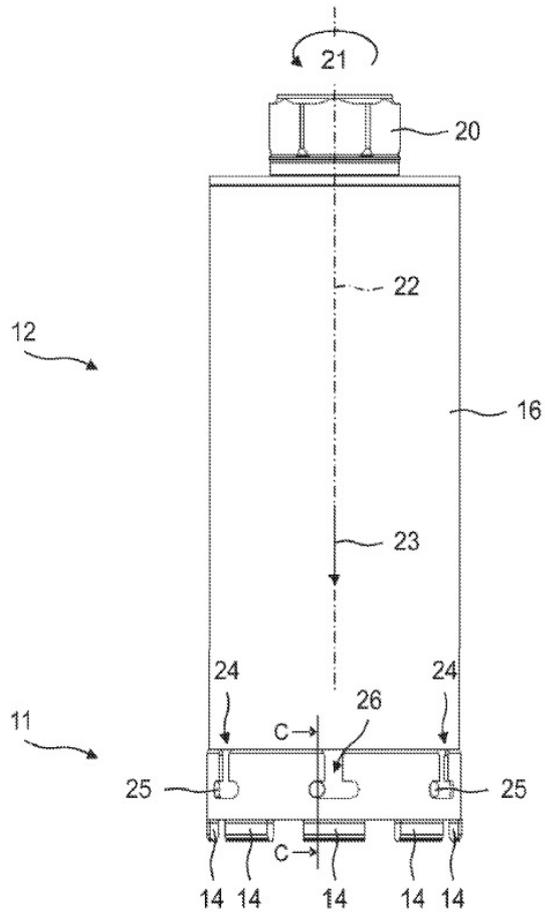
{with exchangeable heads or inserts}

Definition statement

This place covers:

Drills with separate cutting heads removably attached to the drill. A single insert extending across the rotational axis and having at least two radially extending cutting edges in the working position is considered to be within the scope of this group.

Illustrative example of subject-matter classified in this group:



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Drill bits with other types of cutting inserts	B23B 51/0006
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B23B 51/00035

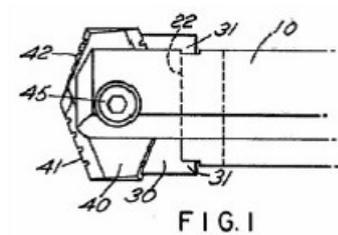
{Spade drills}

Definition statement

This place covers:

Drills with a removable insert having a flat spade configuration, which includes a centre tip cutting edge and two radially extending cutting edges.

Illustrative example of subject-matter classified in this group:



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Drill bits with other types of cutting inserts	B23B 51/0006
Other spade drill bits	B23B 51/0095

B23B 51/0004

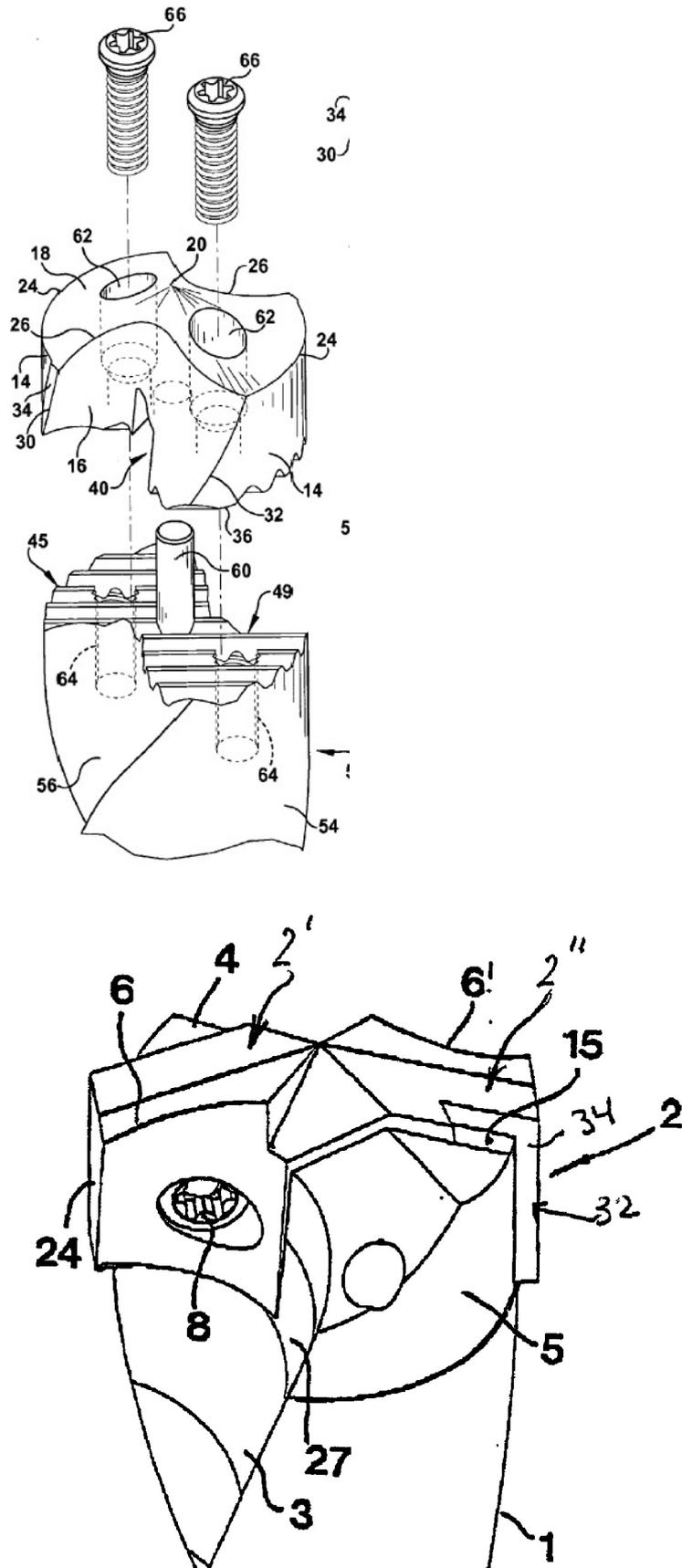
{with cutting heads or inserts attached by screw means}

Definition statement

This place covers:

Drills with separate cutting heads removably attached to the drill by screw means. A single insert extending across the rotational axis and having at least two radially extending cutting edges in the working position is considered to be within the scope of this group when it is attached via screw means.

Illustrative example of subject-matter classified in this group:



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Drill bits with other types of cutting inserts	B23B 51/0006
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B23B 51/0005

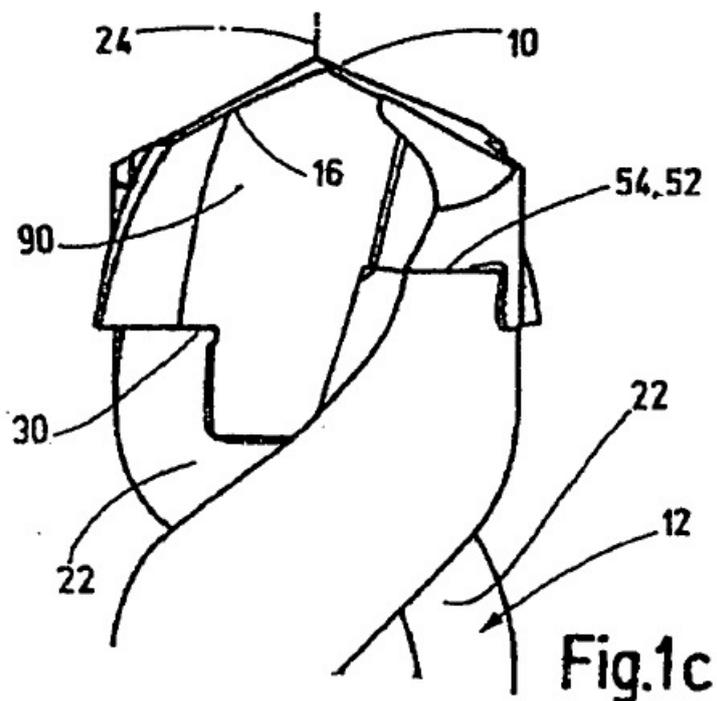
{with cutting heads or inserts attached by wedge means}

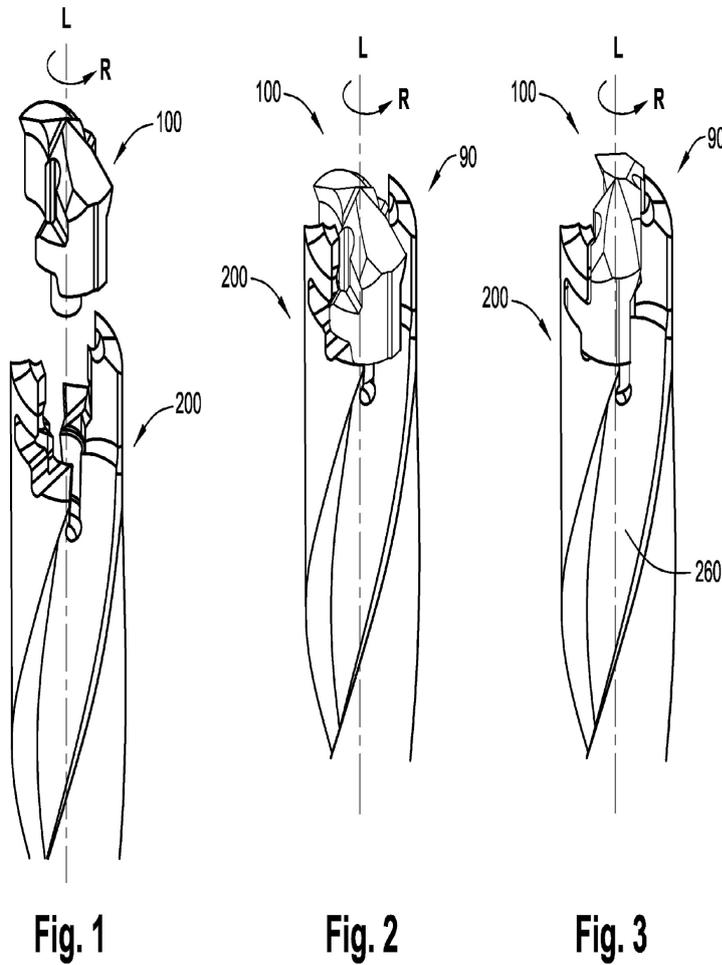
Definition statement

This place covers:

Drills with separate cutting heads removably attached to the drill by wedge means (i.e., producing a wedging effect between the separate cutting head and the shank of the drill). A single insert extending across the rotational axis and having at least two radially extending cutting edges in the working position is considered to be within the scope of this group via a wedging action.

Illustrative example of subject-matter classified in this group:





References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Drill bits with other types of cutting inserts	B23B 51/0006
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B23B 51/0006

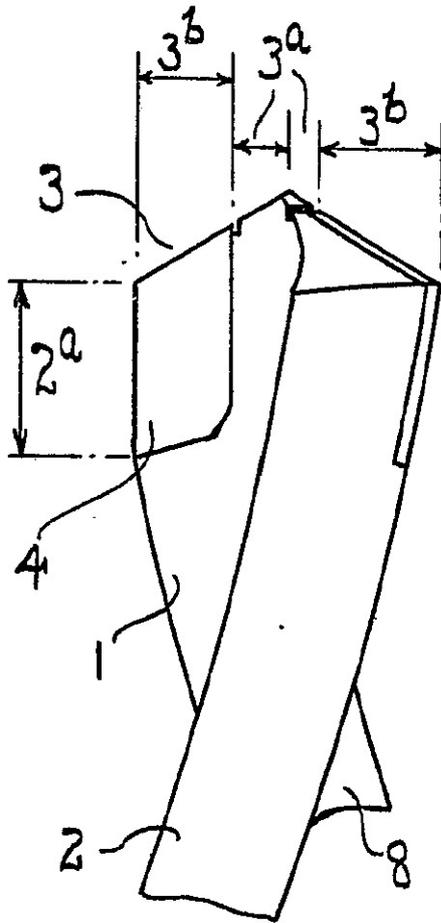
{Drills with cutting inserts ([B23B 51/0002](#) takes precedence)}

Definition statement

This place covers:

Drills with non-exchangeable cutting inserts, e.g. via brazing or welding.

Illustrative example of subject-matter classified in this group:



References

Limiting references

This place does not cover:

Drills with a single insert extending across the rotational axis and having at least two radially extending cutting edges in the working position	B23B 51/0002
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Informative references

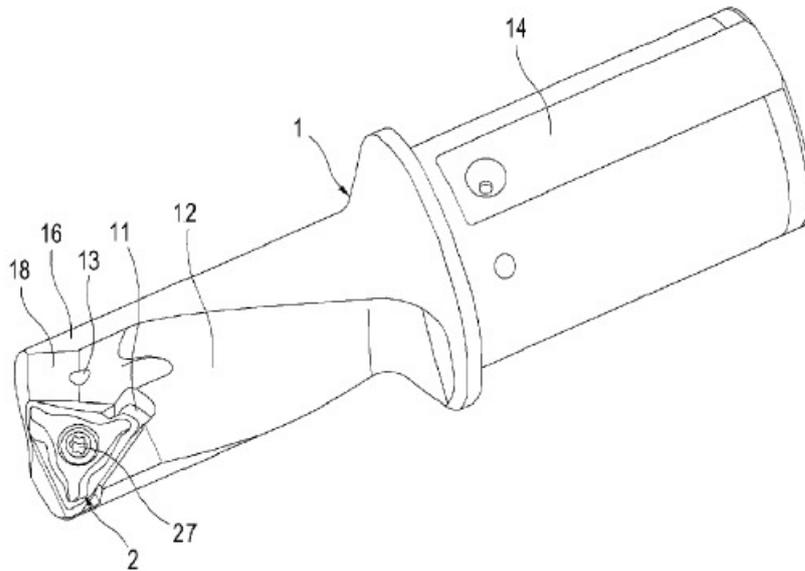
Attention is drawn to the following places, which may be of interest for search:

Cutting tools of which the bits or tips (or cutting inserts) are of special material	B23B 27/14
Cutting inserts for milling	B23C 5/18 , B23C 5/20
Cutting inserts for reaming	B23D 77/02

Special rules of classification

Allocation of 2000 series Indexing Codes from the section [B23B 2200/00](#) is mandatory.

Illustrative example of subject-matter classified in this group:



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Drills with a single insert extending across the rotational axis and having at least two radially extending cutting edges in the working position	B23B 51/0002
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Special rules of classification

Allocation of 2000-series Indexing Codes from the section [B23B 2200/00](#) is mandatory.

B23B 51/0011

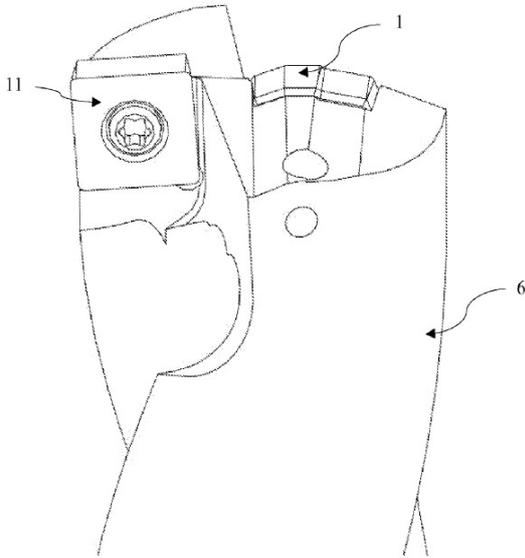
{with radially inner and outer cutting inserts}

Definition statement

This place covers:

Drills with cutting inserts set at different radial distances from the rotation axis.

Illustrative example of subject matter classified in this group:



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Drills with a single insert extending across the rotational axis and having at least two radially extending cutting edges in the working position	B23B 51/0002
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B23B 51/0018

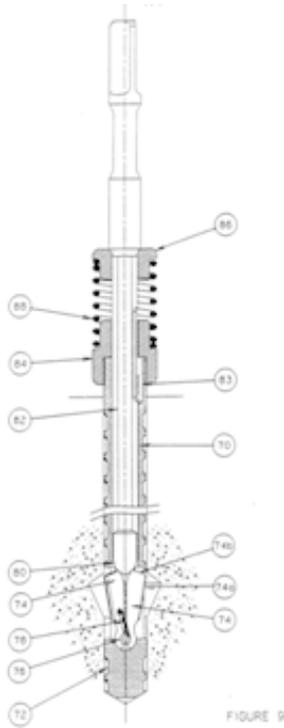
{Drills for enlarging a hole}

Definition statement

This place covers:

Drills for enlarging a hole without enlarging the hole's opening to provide an undercut or reverse taper. Very common when drilling foundations.

Illustrative example:



[B23B 51/0045](#) Drill for enlarging a hole (at a distance from surface) by expanding the tool head (Source: WO 93/16291).

B23B 51/0063

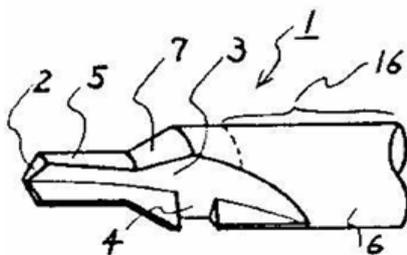
{Centerdrills}

Definition statement

This place covers:

centre drills.

Illustrative example of subject matter classified in this group:

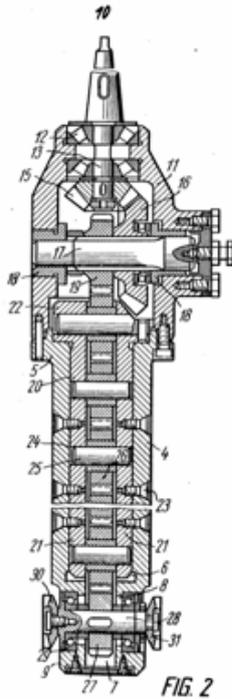


[B23B 51/0063](#) Centre drill (Source: JP 2-100807).

B23B 51/0072**{Drills for making non-circular holes}****Definition statement***This place covers:*

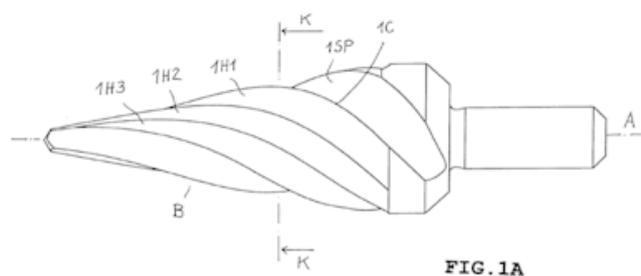
Drills for making non-circular holes.

Illustrative example of subject matter classified in this group.

[B23B 51/0072](#) Drill for making non circular hole (see also [B23B 41/04](#)) (Source: US 3 803 980).**B23B 51/0081****{Conical drills}****Definition statement***This place covers:*

Conical drills

Illustrative example of subject matter classified in this group.



[B23B 51/0081](#) Conical drill, (Source: DE 20 2006 019 580 U).

B23B 51/0095

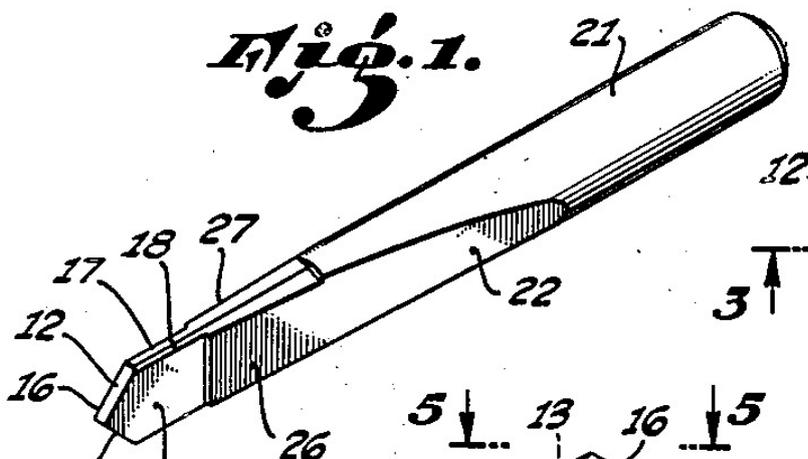
{Spade drills ([B23B 51/00035](#) takes precedence)}

Definition statement

This place covers:

Monolithic drills that have a generally flat spade configuration in the cutting portion, which includes a centre tip cutting edge and two radially extending cutting edges. These drills are also commonly referred to as paddle bits.

Illustrative example of subject-matter classified in this group:



References

Limiting references

This place does not cover:

Spade drills with exchangeable heads or inserts	B23B 51/00035
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Bits for woodworking	B27G 15/00
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B23B 51/011

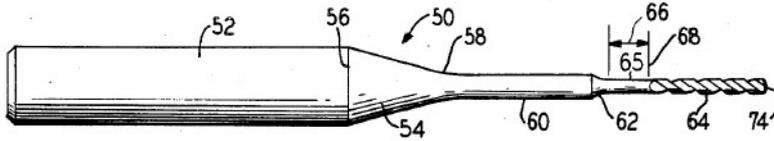
{Micro drills}

Definition statement

This place covers:

Drills having a cutting portion smaller than one millimetre in diameter.

Illustrative example of subject matter classified in this group:



References

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Drills for printed circuits	H05K 3/0047
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Drilling machines for very small holes	B23B 41/14
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B23B 51/02

Twist drills

Special rules of classification

Use of 2000-series Indexing Codes from the section "details of drilling tools", i.e. [B23B 2251/00](#) is mandatory.

Definitions for features altering along the length of the drill are always considered starting from the tip of drill and progressing towards the shank.

B23B 51/04

{Drills} for trepanning

Definition statement

This place covers:

Drills for cutting a disc or cylindrical core from a workpiece.

Note: Commonly, but not exclusively, drills for trepanning are drills with cutting edges arranged annularly about an open end of a tubular body. These drills are also known as hole saws, core drills and plug cutters.

Illustrative examples of subject matter classified in this group:

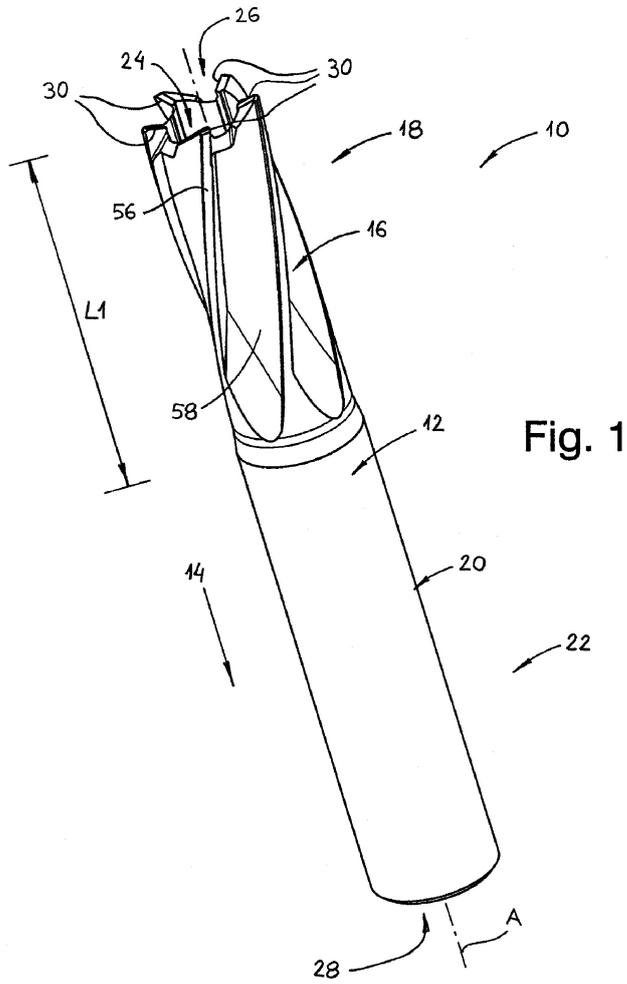
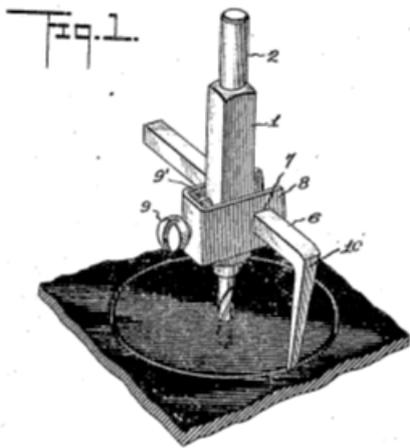


Fig. 1



[B23B 51/05](#): Drills for trepanning for cutting discs from sheet

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Cylinder saws for trepanning wood that would not be suitable for use on metal or metal-like substances	B27B 5/12
Cylinder saws for trepanning stone or glass and having their cutting rim equipped with abrasive particles	B28D 1/041

B23B 51/0411

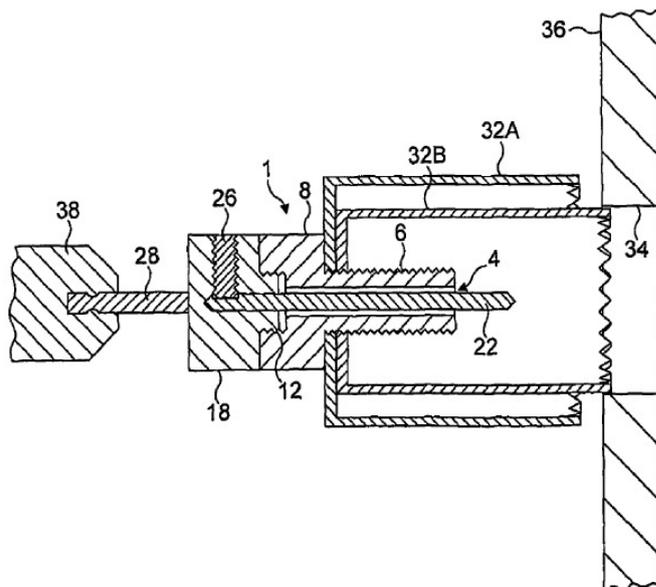
{with stepped tubular cutting bodies}

Definition statement

This place covers:

Drills for trepanning with stepped tubular cutting bodies.

Illustrative example of subject-matter classified in this group:



B23B 51/0413

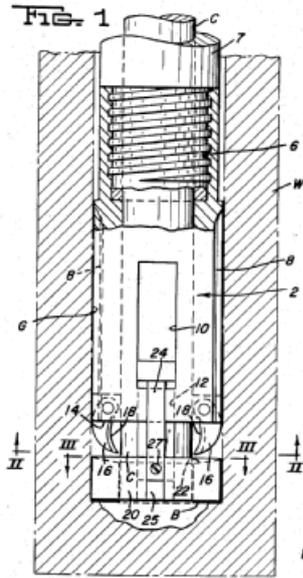
{with core-cutting-off devices}

Definition statement

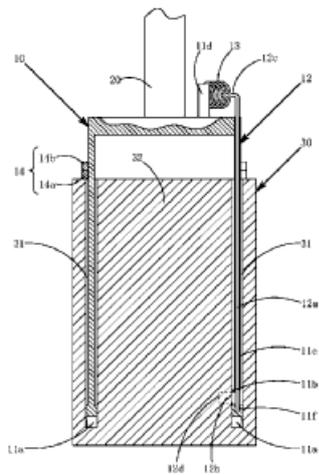
This place covers:

Means for cutting off a cylindrical core, e.g. a cutter axially spaced from the trepanning cutting edges for cutting off.

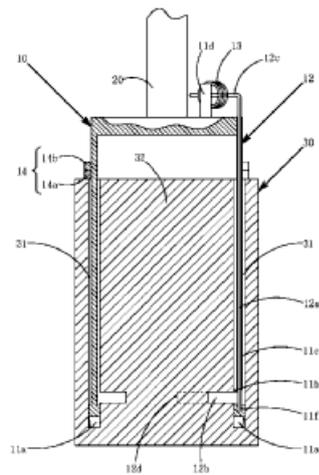
Illustrative example of subject-matter classified in this group:



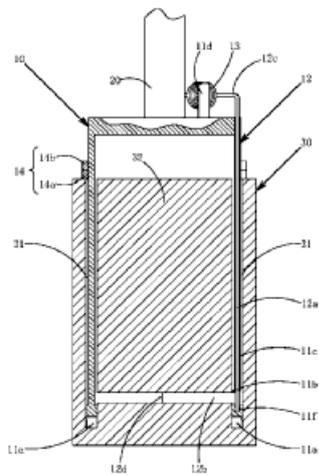
【图 7】



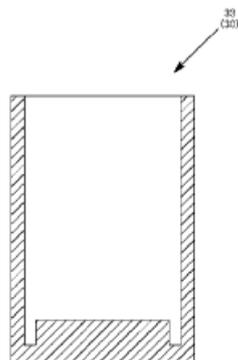
【图 8】



【图 9】



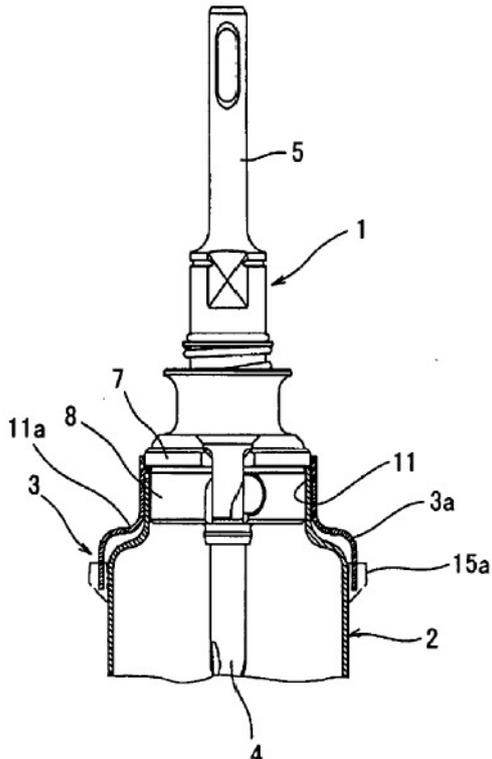
【图 10】



B23B 51/0417**{including chamfer or spot bore cutter}****Definition statement***This place covers:*

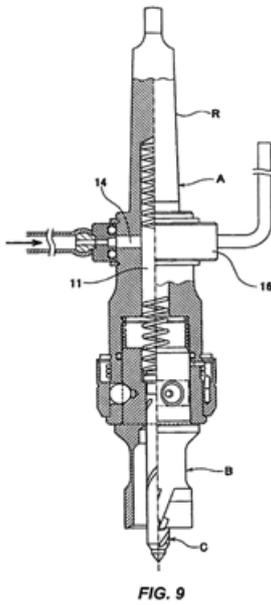
Drills for trepanning including a chamfer cutter or spot bore (also referred to as counterbore) cutter.

Illustrative example of subject-matter classified in this group:

**B23B 51/042****{with lubricating or cooling equipment}****Definition statement***This place covers:*

Trepanning drills including cooling or lubricating means.

Illustrative example of subject-matter classified in this group:



B23B 51/0426

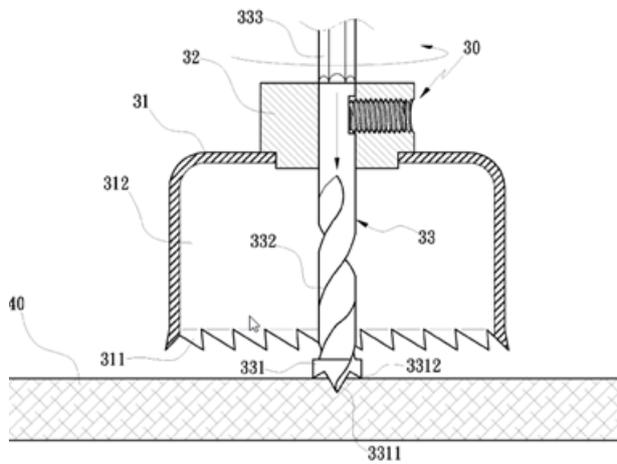
{with centering devices}

Definition statement

This place covers:

Trepanning drills including means for centering the drill relative to a new, e.g. a pilot drill, or existing hole, e.g. an attachment that engages an existing hole.

Illustrative example of subject-matter classified in this group:



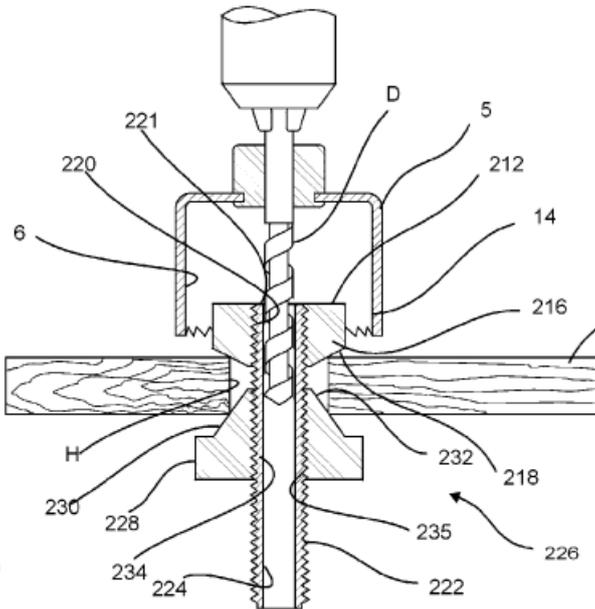
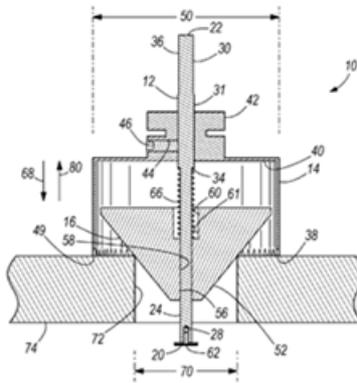


Fig. 6

B23B 51/044

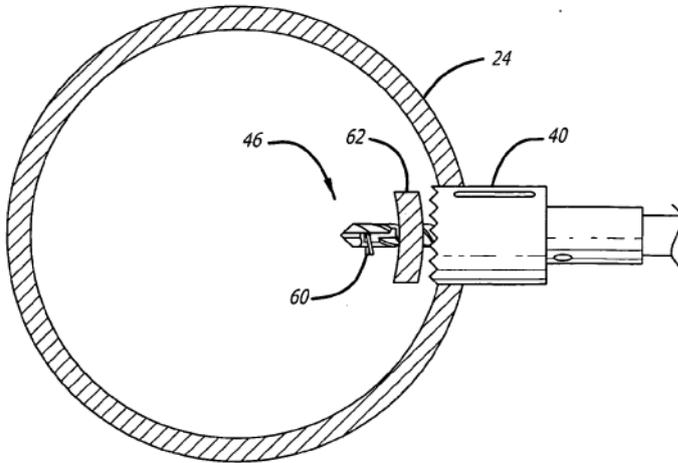
{with core holding devices}

Definition statement

This place covers:

Trepanning drills with devices for holding core relative to the drill such that the core is removed when the drill is removed.

Illustrative example of subject-matter classified in this group:



B23B 51/0453

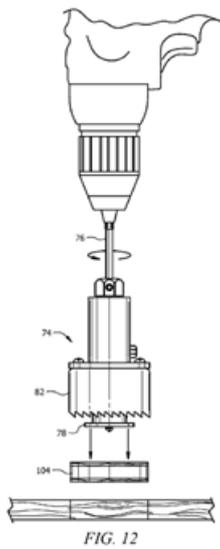
{with ejecting devices}

Definition statement

This place covers:

Trepanning drills with devices for ejecting the core or slug from the interior of the drill.

Illustrative example of subject-matter classified in this group:



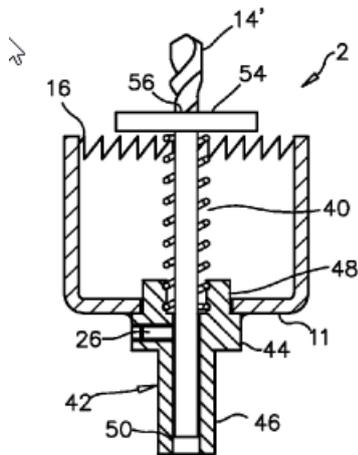


Fig. 5

B23B 51/0467

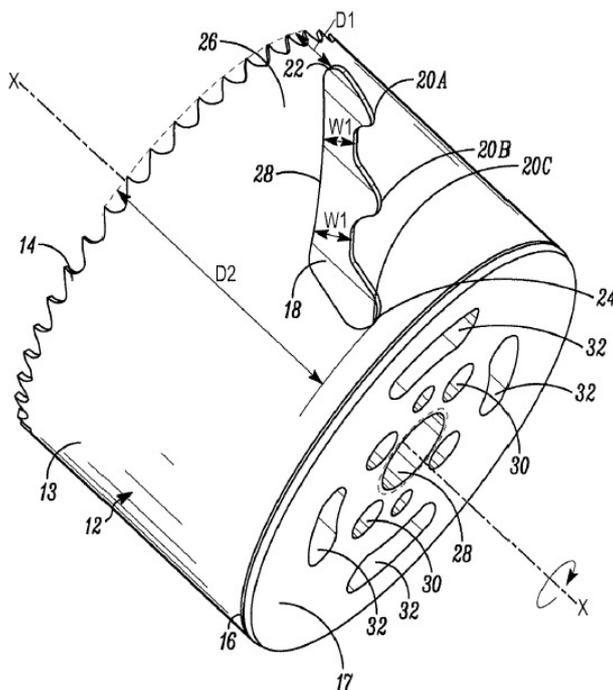
{Details of the tubular body sidewall}

Definition statement

This place covers:

Details of the tubular body sidewall of drills for trepanning.

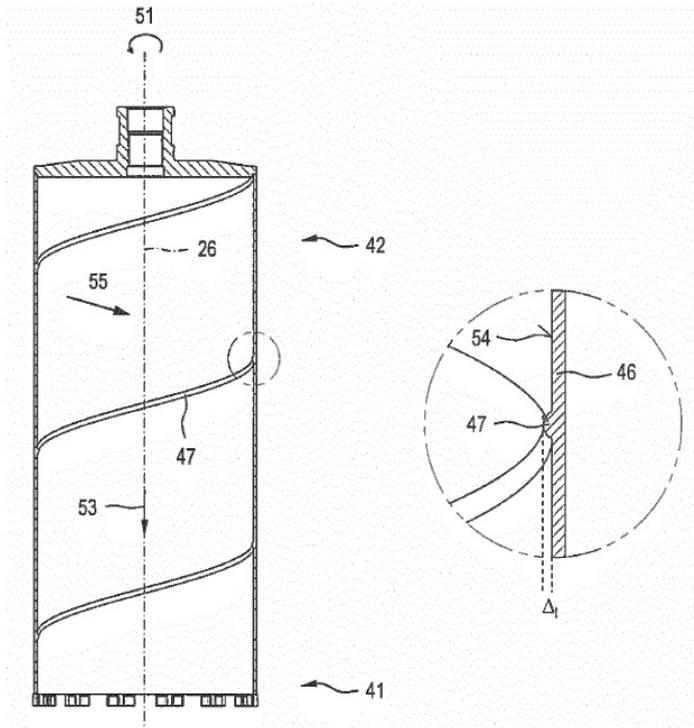
Illustrative example of subject-matter classified in this group:



B23B 51/0468**{Internal grooves}****Definition statement***This place covers:*

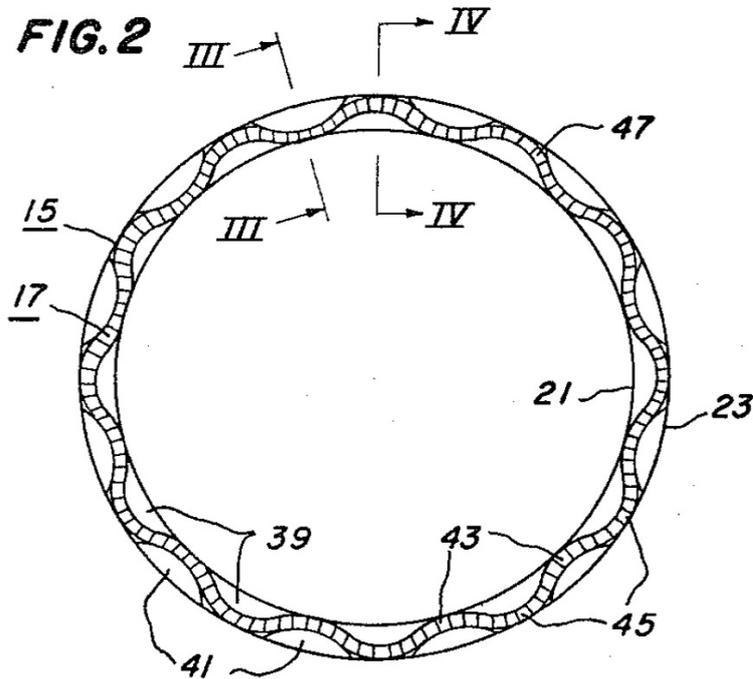
Details of internal grooves of the tubular body sidewall of drills for trepanning.

Illustrative example of subject-matter classified in this group:

**B23B 51/0469****{Eccentric or non-circular}****Definition statement***This place covers:*

Details of eccentric or non-circular tubular body sidewalls of drills for trepanning.

Illustrative example of subject-matter classified in this group:



B23B 51/0473

{Details about the connection between the driven shaft and the tubular cutting part; Arbors}

Definition statement

This place covers:

Details of connections between the driven shaft (e.g., spindle or arbor) and the tubular cutting part.

Illustrative example of subject-matter classified in this group:

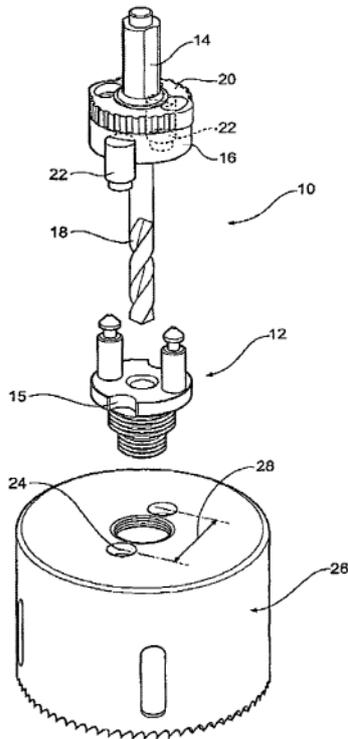


Fig 1

B23B 51/05

for cutting discs from sheet

Definition statement

This place covers:

Trepanning tools proper, i.e. tools particularly for removing material from the work by forming an annular trench therein, which trench is made progressively deeper as the tool proceeds, thereby leaving a disc. These tools have few teeth.

B23B 51/06

Drills with lubricating or cooling equipment {(B23B 51/042 takes precedence)}

Definition statement

This place covers:

Drilling tools in which the cooling or lubricating means are of primary importance (i.e. drilling tools which have special cooling or lubricating means).

Illustrative example of subject matter classified in this group:



[B23B 51/06](#) Drill with cooling equipment

Relationships with other classification places

Drilling tools having lubricating means that are not of special significance can be allocated the indexing code [B23B 2250/12](#).

References

Limiting references

This place does not cover:

Drills for trepanning with lubricating or cooling equipment	B23B 51/042
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B23B 51/063

{Deep hole drills, e.g. ejector drills}

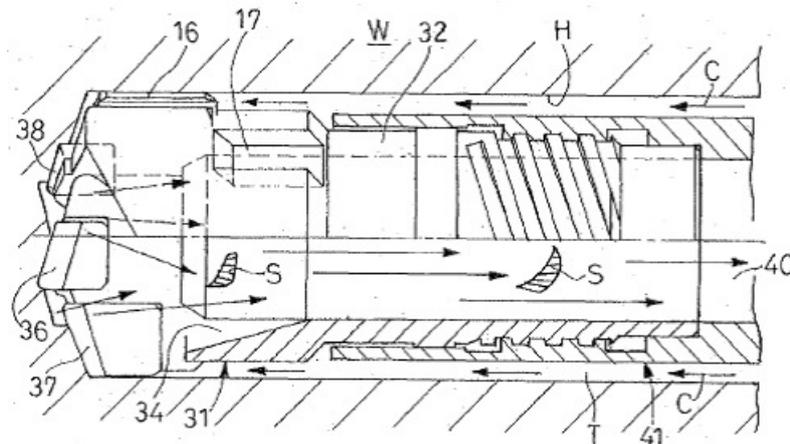
Definition statement

This place covers:

Deep hole drills for producing new as well as for machining of existing bore holes. Deep bore holes refer to bore holes that are machined by classical deep hole drilling methods and/or drilling methods with a length-to-diameter ratio larger than 10. The classical deep hole drilling methods are single-lip gun drilling ([B23B 51/066](#)) and drilling with a single-tube or double-tube system ([B23B 51/063](#)).

Illustrative example of subject-matter classified in this group:

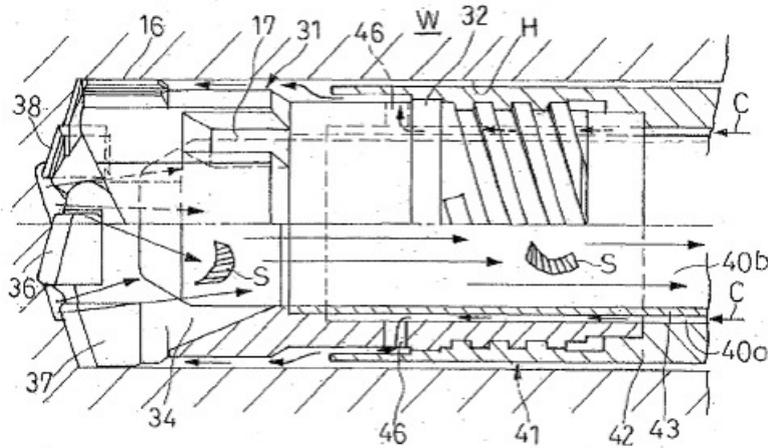
In the single-tube system (STS or BTA system), the cooling lubricant is introduced from outside under pressure in an annular space between the bore wall and the boring bar while the chips are removed through the die chip mouth and the boring bar.



In the double-tube system (DTS or ejector system), the cooling lubricant is introduced via an annular space between the boring bar and an inner tube. The cooling lubricant exits at the side of the drill head, flows around it and then back out up the inner tube together with the chips. A part of the cooling

Definition statement

lubricant is guided into the inner tube via a concentric nozzle. The underpressure at the chip mouth makes the return flow possible (ejector effect).



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Boring or drilling machines for boring deep holes	B23B 41/02
---	----------------------------

B23B 51/066**{Gun drills}****Definition statement**

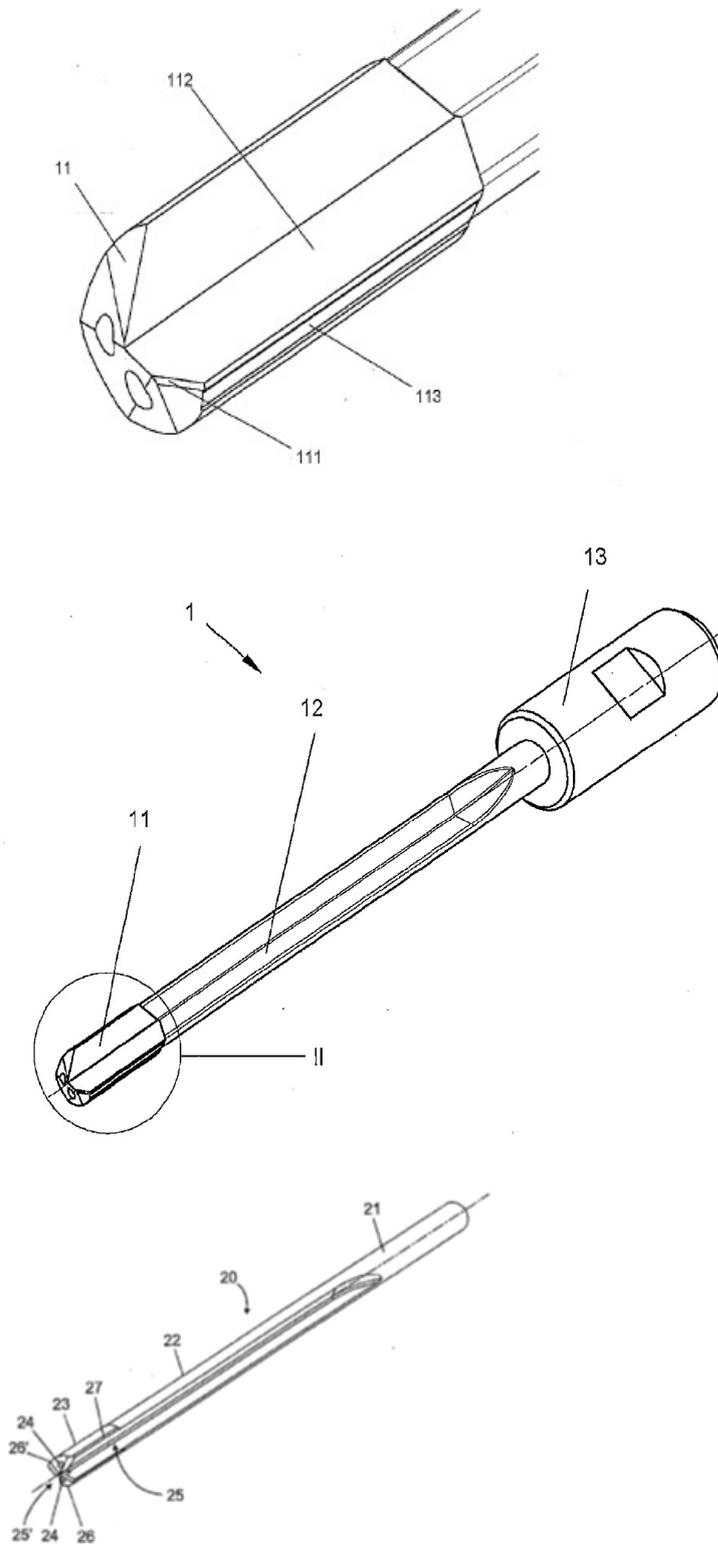
This place covers:

Gun drills.

Illustrative example of subject-matter classified in this group:

In the classical single-lip gun drill, the cooling lubricant is delivered through one or more holes, which pass through the tool shank. The mixture of chips and cooling lubricant is removed

along a single straight flute or longitudinal groove (bead) on the outside of the tool shank.



In the double-lip gun drill, the cooling lubricant passes through the tool shank and the mixture of chips and cooling lubricant is removed along two symmetrical straight flutes on the outside of the tool shank.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Boring or drilling machines for boring deep holes, e.g. in gun or rifle barrels	B23B 41/02
---	----------------------------

B23B 51/068

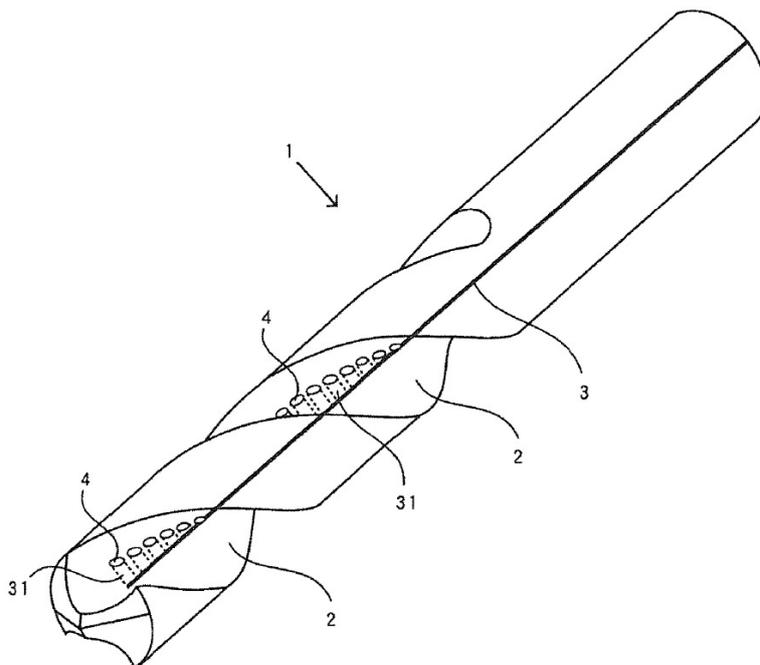
{Details of the lubricating or cooling channel}

Definition statement

This place covers:

Drilling tools in which the details of the cooling or lubricating channel(s) are of importance.

Illustrative example of subject-matter classified in this group:



B23B 51/0682

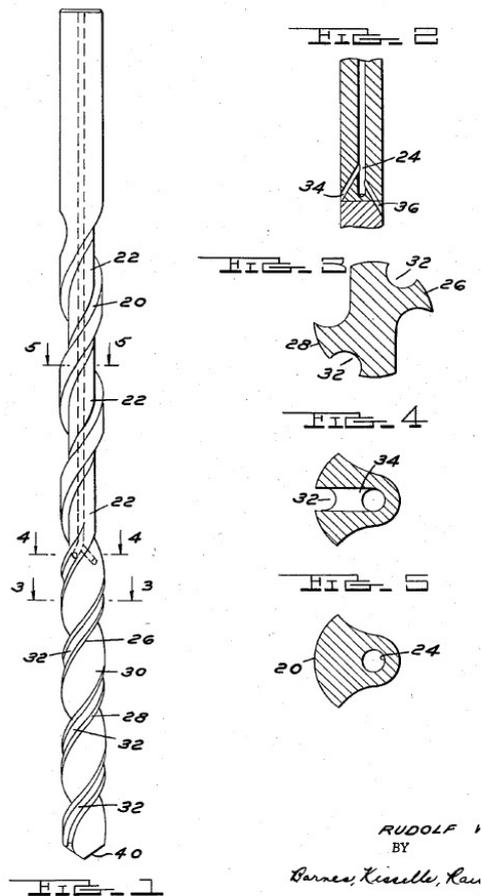
{Coolant moves along outside of tool periphery toward cutting edges}

Definition statement

This place covers:

Drills with lubricating or cooling equipment, wherein coolant moves along outside of tool periphery toward cutting edges.

Illustrative example of subject-matter classified in this group:



B23B 51/0684

{Deflector or nozzle on drill to point the coolant in a desired direction}

Definition statement

This place covers:

Drills with lubricating or cooling equipment with deflector or nozzle on to point direct the coolant in a desired direction.

Illustrative examples of subject matter classified in this group:

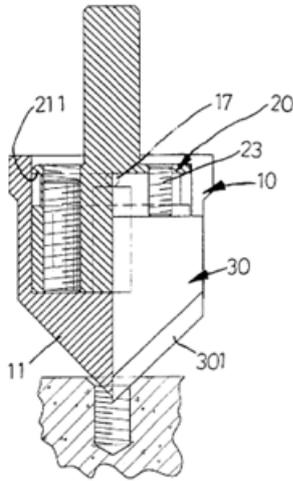


FIG. 4

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Deburring by milling	B23C 3/12
Deburring by scraping	B23D 79/02
Deburring by grinding	B24B

B23B 51/101

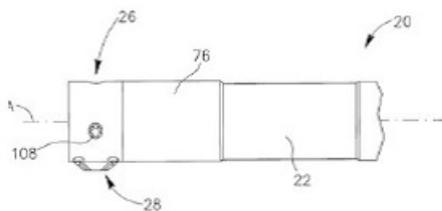
{Deburring tools ([B23B 51/103](#) takes precedence)}

Definition statement

This place covers:

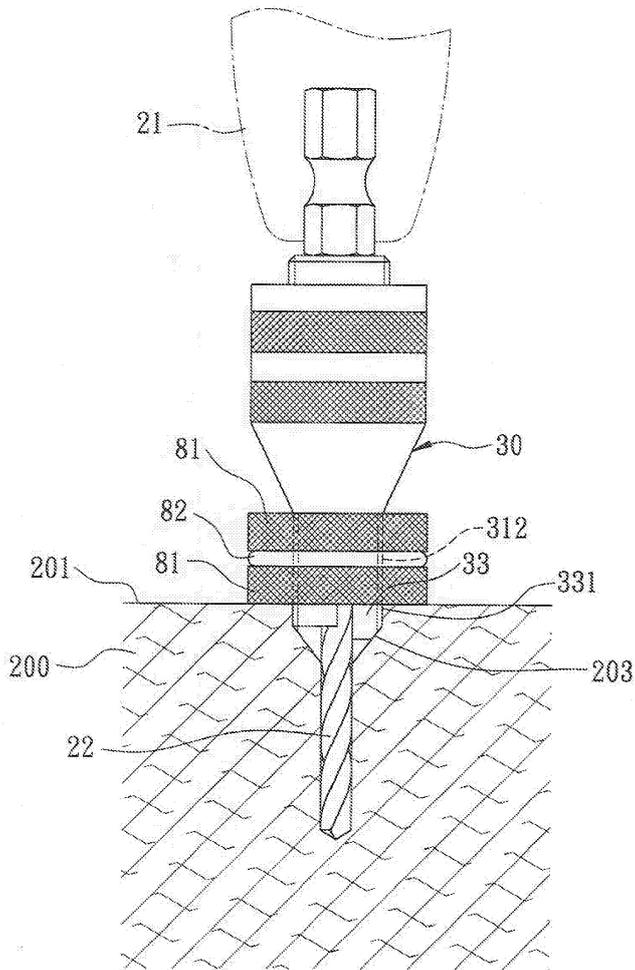
Tools for removing burrs by smoothing of rough edges or ridges of a hole.

Illustrative example of subject-matter classified in this group:



Deburring drill with insert "28"

Illustrative example of subject-matter classified in this group:



Chamfer drill with depth stop

B23B 51/105

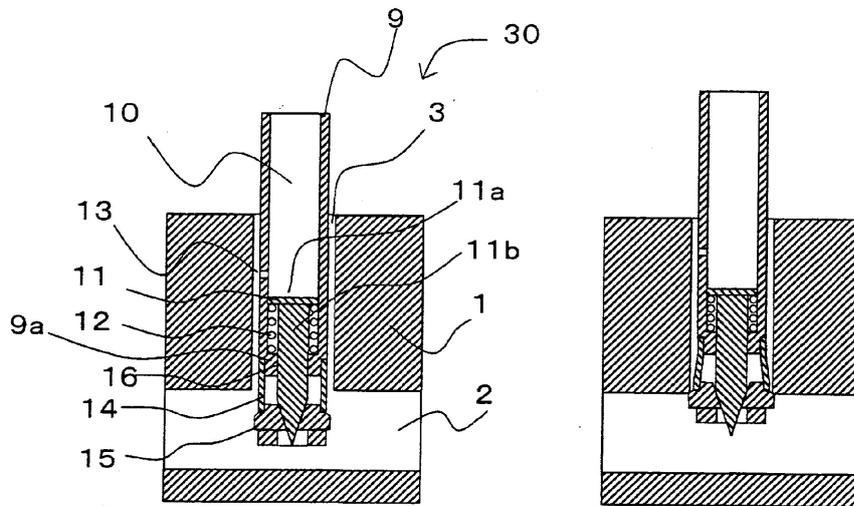
{Deburring or countersinking of radial holes}

Definition statement

This place covers:

Tools for removing burrs from edges or ridges of a hole crossing the hole in which the tool is inserted. Also, tools for enlarging the rim of such crossing hole, especially by chamfering or bevelling.

Illustrative example of subject matter classified in this group:



Tool to deburr radial holes

B23B 51/106

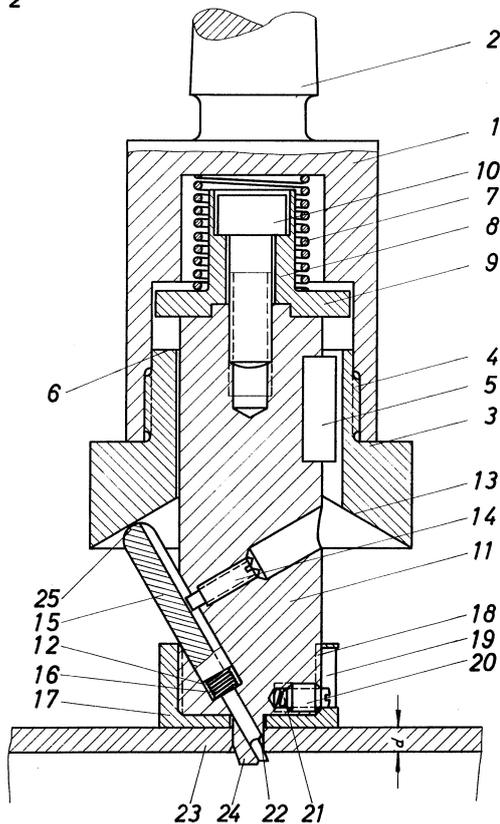
{with a cutting edge adjustable along a direction oblique to the axis}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group:

Abb. 2



Chamfering tool with cutting edge moving obliquely to the axis

References

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Deburring by milling	B23C 3/12
Thermal deburring	B23D 79/005
Deburring by scraping	B23D 79/02
Deburring by grinding	B24B

Informative references

Attention is drawn to the following places, which may be of interest for search:

Bevelling, chamfering, or deburring the ends of bars or tubes	B23B 5/16
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B23B 51/108

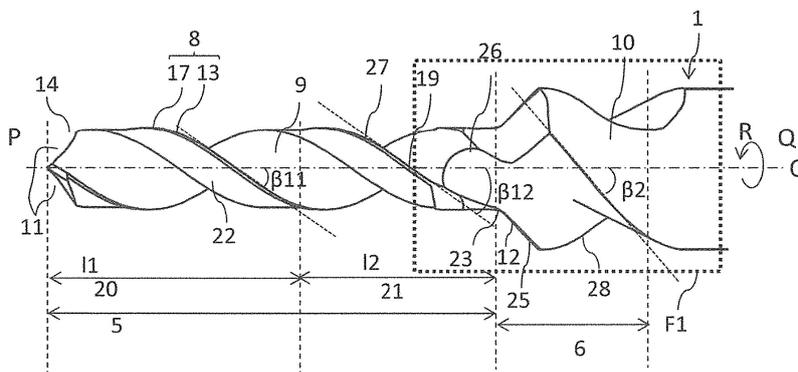
{having a centering drill}

Definition statement

This place covers:

Bits for countersinking having a centering drill axially forward of the countersinking cutting edges.

Illustrative example of subject-matter classified in this group:



References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Drills for trepanning including chamfer or spot bore cutter	B23B 51/0417
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B23B 51/1085

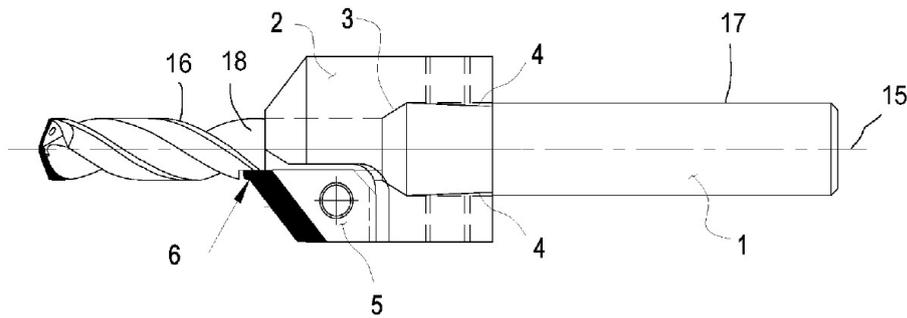
{countersink in the form of an attachment to the drill}

Definition statement

This place covers:

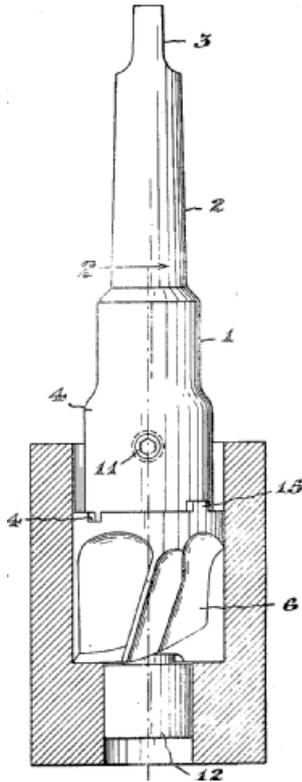
Bits for countersinking having a centering drill and a countersink in the form of an attachment to the drill.

Illustrative example of subject-matter classified in this group:



B23B 51/109**{Counterboring tools ([B23B 51/102](#) takes precedence)}****Definition statement***This place covers:*

Illustrative example of subject-matter classified in this group:

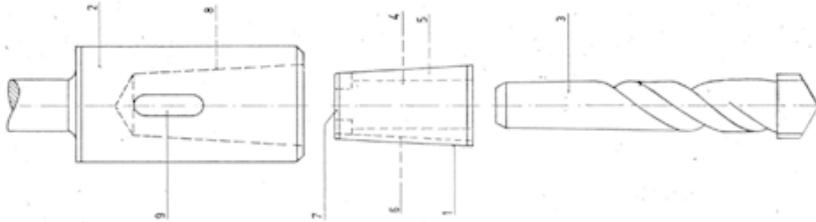
**References****Limiting references***This place does not cover:*

Back spot-facing or back chamfering tools	B23B 51/102
---	-----------------------------

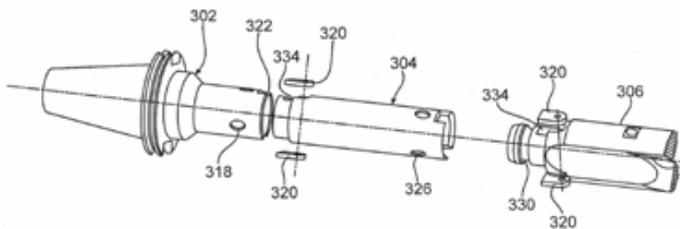
B23B 51/12**Adapters for drills or chucks; Tapered sleeves****Definition statement***This place covers:*

Adapters or chucks specifically for drilling bits otherwise document will be classed in [B23B 31/00](#).
Taper sleeves.

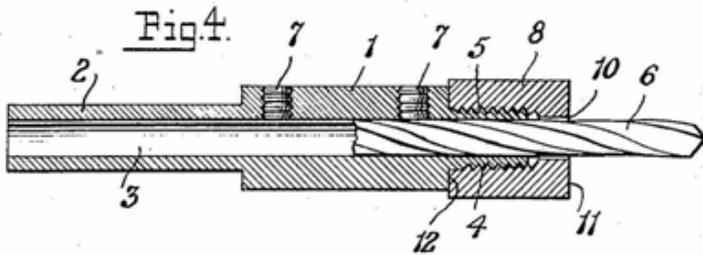
Illustrative examples:



[B23B 51/123](#) Conical reduction sleeve(Source: NL 6617411).



[B23B 51/126](#) Drill elongation device(Source: US 2009/0092455).



[B23B 51/14](#) Adapters for broken drills(Source: US 2361683).

B23B 2200/081

with projections

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Cutting inserts by chip breaking projections	B23B 2200/321
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B23B 2200/087**for chip breaking****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Cutting inserts by chip breaking depressions	B23B 2200/323
Cutting inserts by multiple chip-breaking grooves	B23B 2200/325

B23B 2200/321**by chip breaking projections****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Projections on rake or top surfaces	B23B 2200/081
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B23B 2200/323**by chip breaking depressions****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Rake or top surfaces for chip breaking	B23B 2200/087
Cutting inserts by multiple chip-breaking grooves	B23B 2200/325

B23B 2200/325**by multiple chip-breaking grooves****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Rake or top surfaces for chip breaking	B23B 2200/087
Cutting inserts by chip breaking depressions	B23B 2200/323

B23B 2200/3627**Indexing****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Cutting inserts with polygonal bottom surfaces	B23B 2200/166
Milling cutting inserts with one or more grooves on bottom surfaces	B23C 2200/165
Milling cutting inserts with star form bottom surfaces	B23C 2200/167

B23B 2200/3654**being variable****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Lands having negative cutting angles with variable width	B23B 2200/3672
--	--------------------------------

B23B 2200/3663**having negative cutting angles****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Cross section of the bevelled or chamfered cutting edge	B23C 2200/243
---	-------------------------------

B23B 2200/3672**being variable****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Lands being of variable width	B23B 2200/3654
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B23B 2210/12**Tools comprising weakened spot on the tool at a preferred breakage location****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Shanks of tools having a reduced cross section at a position where breakage of the tool is preferred	B23B 2231/0212
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B23B 2220/24**Finishing****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Roughing and finishing	B23B 2220/445
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B23B 2222/14**Cast iron****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Materials of tools or workpieces composed of iron	B23B 2222/44
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B23B 2222/32**Details of high-speed steel****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Materials of tools or workpieces composed of stainless steel	B23B 2222/80
Materials of tools or workpieces composed of steel	B23B 2222/84

B23B 2222/44**Iron****References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Materials of tools or workpieces composed of cast iron	B23B 2222/14
--	------------------------------

B23B 2222/80**Stainless steel****References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Materials of tools or workpieces composed of high-speed steel	B23B 2222/32
Materials of tools or workpieces composed of steel	B23B 2222/84

B23B 2222/84**Steel****References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Materials of tools or workpieces composed of high-speed steel	B23B 2222/32
Materials of tools or workpieces composed of stainless steel	B23B 2222/80

B23B 2226/45**Glass****References****Informative references**

Attention is drawn to the following places, which may be of interest for search:

Working stone or stone-like materials by boring or drilling	B28D 1/14
Working stone or stone-like materials by turning	B28D 1/16

B23B 2226/75**Stone, rock or concrete****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Working stone or stone-like materials	B28D
---------------------------------------	----------------------

B23B 2231/0212**Shanks of tools having a reduced cross section at a position where breakage of the tool is preferred****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Tools comprising weakened spot on the tool at a preferred breakage location	B23B 2210/12
Shanks having a section of reduced diameter	B23B 2231/0252

B23B 2231/0252**Shanks having a section of reduced diameter****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Shanks of tools having a reduced cross section at a position where breakage of the tool is preferred	B23B 2231/0212
--	--------------------------------

B23B 2231/026**Grooves****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Keyways	B23B 2231/0276
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B23B 2231/0276**Keyways****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Axial grooves	B23B 2231/0264
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B23B 2231/2013**Non-cylindrical****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Polygonal operating surfaces of collets	B23B 2231/2016
---	--------------------------------

B23B 2231/26**Detection of clamping****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Arrangements for indicating the presence of a work or tool in its holder	B23Q 17/006
--	-----------------------------

B23B 2231/28**Dust covers****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Nose pieces in chucks	B23B 2231/44
Dust covers for turning, boring or drilling	B23B 2260/058

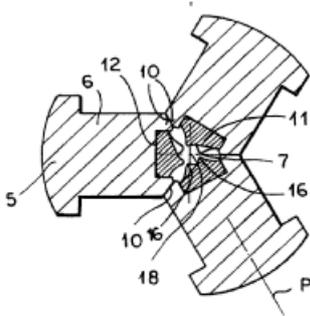
B23B 2231/341

Jaws with hard inserts

Definition statement

This place covers:

Illustrative examples of subject matter classified in this group.



Drill chuck with hard-metal insert 11.

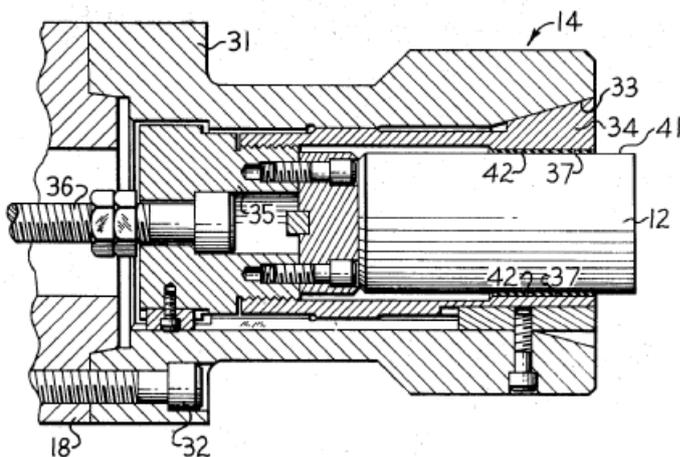
B23B 2231/342

Padded or cushioned jaws

Definition statement

This place covers:

Illustrative examples of subject matter classified in this group.



Jaws with elastomeric material 42.

B23B 2231/44

Nose pieces

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Dust covers in chucks	B23B 2231/28
Dust covers for turning, boring or drilling	B23B 2260/058

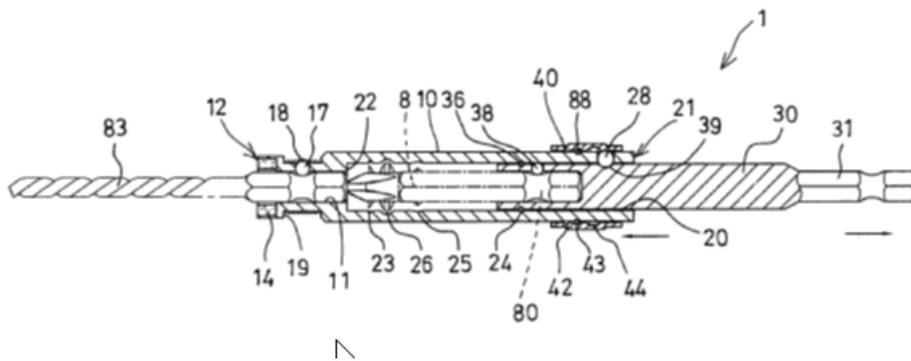
B23B 2231/56

Chucks with more than one set of gripping means

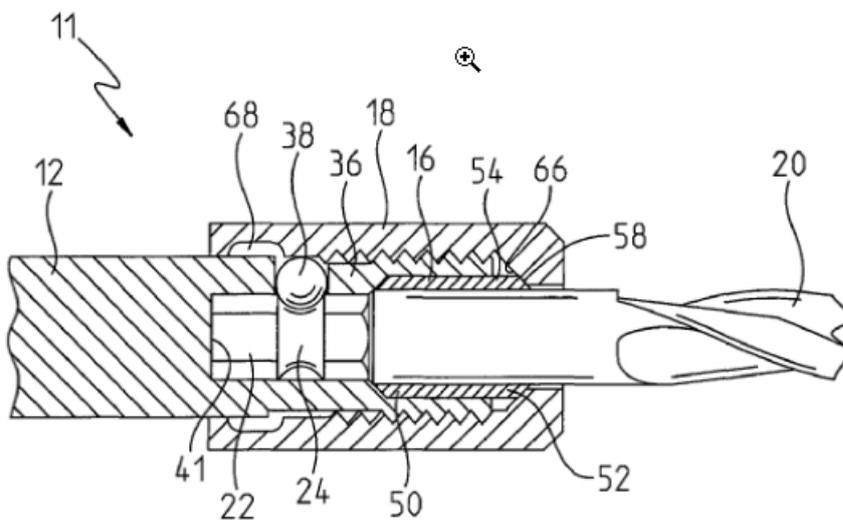
Definition statement

This place covers:

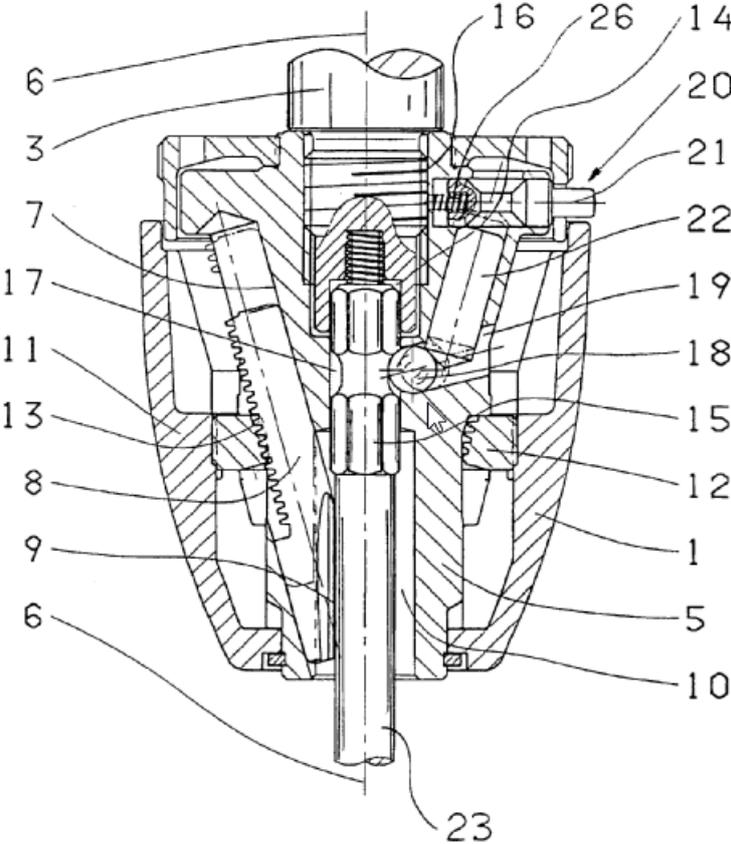
Illustrative examples of subject matter classified in this group.



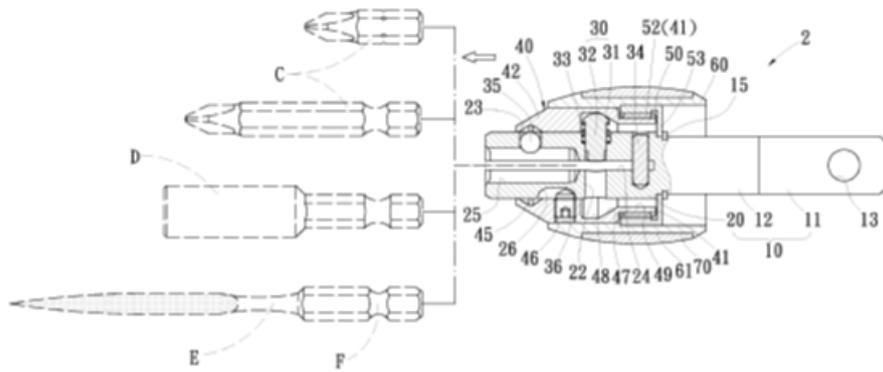
Tool retaining or connecting device: bit detent ball: 17 and 38.



Bitholder Ball 38 and collet 16.



Drill for smooth and hex-shank bits. Jaws 8, ball 18.



Note items 30 and 35 in both illustrations above.

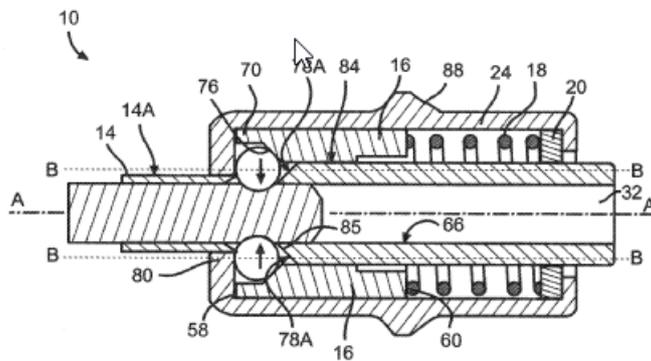
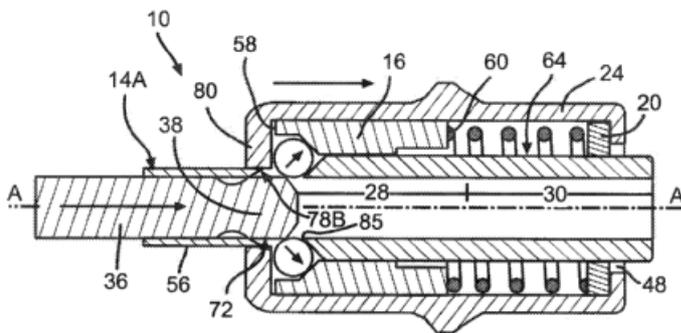
B23B 2231/58

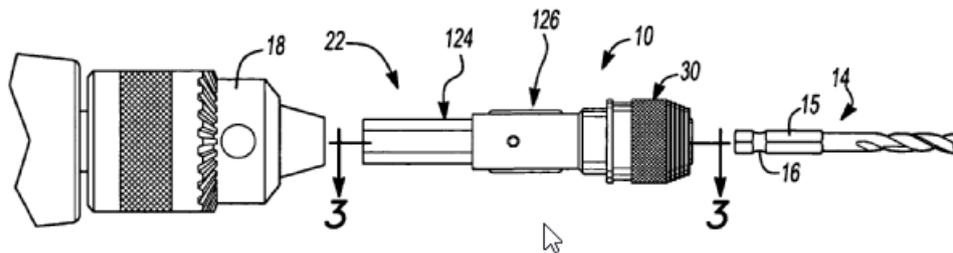
Self-grasping, i.e., automatic grasping upon insertion of tool or workpiece

Definition statement

This place covers:

Illustrative examples of subject matter classified in this group.





B23B 2240/28

Shrink-fitted connections, i.e. using heating and cooling to produce interference fits

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Chucks characterised by retention done by friction only, using heating and cooling	B23B 31/1179
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B23B 2247/02

Jigs for drilling spectacles

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Working stone or stone-like materials by lens-drilling machines	B28D 1/143
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B23B 2260/0482

Depth controls, e.g. depth stops

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Constructional elements being stops	B23B 2260/12
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B23B 2260/0487**Depth indicators****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Indication scales	B23B 2260/088
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B23B 2260/058**Dust covers****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Dust covers in chucks	B23B 2231/28
Nose pieces in chucks	B23B 2231/44

B23B 2260/12**Stops****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Depth controls of the cut, e.g. depth stops	B23B 2260/0482
---	--------------------------------

B23B 2260/132**Serrations****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Cutting inserts with serrated bottom surfaces	B23B 2200/167
---	-------------------------------

B23B 2260/134**Spacers or shims****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Shims for cutting inserts in holders	B23B 2205/16
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B23B 2270/04**Use of centrifugal force****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Compensation of centrifugal force during turning, boring or drilling	B23B 2250/08
--	------------------------------

B23B 2270/22**Externally located features, machining or gripping of external surfaces****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Machining or gripping of both internal and external surfaces	B23B 2270/205
--	-------------------------------

B23B 2270/30**Chip guiding or removal****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Drills with provision for suction	B23B 2251/68
Use of suction	B23B 2270/62

B23B 2270/38**Using magnetic fields****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Constructional elements being magnets	B23B 2260/10
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B23B 2270/62**Use of suction****References*****Informative references***

Attention is drawn to the following places, which may be of interest for search:

Drills with provision for suction	B23B 2251/68
Suction pads or vacuum cups, e.g. for attachment of guides to workpieces	B23B 2260/118
Chip guiding or removal	B23B 2270/30