F16D

COUPLINGS FOR TRANSMITTING ROTATION; CLUTCHES; BRAKES

Definition statement

This place covers:

Systems of clutches or couplings for transmitting rotation used within a mechanism of general utility.

Combinations of clutches and brakes used within a mechanism of general utility.

Combinations couplings for transmitting rotation from one element to another and brakes used in conjunction with each other in a mechanism of general utility.

Combinations of couplings for transmitting rotation from one element to another and a clutch used in conjunction with each other in a mechanism of general utility.

Couplings per se for transmitting rotation of the following types:

- Rigid couplings (e.g. for connecting two coaxial shafts or for attaching a member on a shaft);
- Yielding couplings (e.g. Oldham couplings, Hooke's joints, cardan joints);
- Impulse couplings;
- Slip couplings;
- Safety couplings;
- Hydrostatic couplings;
- Hydrokinetic couplings.

Clutches per se of the following types:

- Friction clutches (e.g. disc clutches, multiple disc clutches);
- Freewheel clutches;
- Hydrostatic clutches;
- Hydrokinetic clutches;
- Visco clutches;
- Internally controlled automatic clutches, e.g. centrifugal clutches, torque limiting clutches;
- External control of clutches.

Clutch components or special features related to clutches:

- Actuation mechanisms;
- Clutch slack adjusters;
- Clutch cooling devices.

Brakes per se of the following types:

- Liquid- or air-resistant brakes, e.g. Föttinger brakes, retarder;
- Self-acting brakes;
- Drum brakes;
- Disc brakes.

Brake components or special features related to brakes:

- Brake shoes, pads or bands;
- Brake discs or drums;
- Actuation mechanisms;
- Brake slack adjusters;
- Brake cooling devices;

- Brake monitoring, e.g. wear indication.

Friction linings in general:

- Composition of linings;
- Attachment of linings.

Other types of couplings for transmitting rotation, clutches or brakes not provided for in another subclass of the CPC.

Relationships with other classification places

F16D is a general function-orientated place.

Application-orientated places for this subject matter are provided elsewhere in the classification – see below.

References

Limiting references

This place does not cover:

Electrodynamic brake systems for vehicles in general	B60L 7/00
Vehicle brake control systems	B60T
Conjoint control of vehicle sub-units of different type or different function, e.g. when at least one sub-unit is a clutch or a brake	B60W
Fluid gearings	F16H 39/00, F16H 41/00, F16H 43/00
Combinations of fluid gearings with clutches or couplings	F16H 45/00
Combinations of mechanical gearings with fluid clutches	F16H 47/00
Differential gearings, e.g. with freewheels or other clutches	F16H 48/00
Dynamo-electric brakes or clutches, e.g. of the Eddy-current hysteresis type	H02K 49/00
Clutches or holding devices using electrostatic attraction, e.g. using Johnson-Rahbek effect	H02N 13/00

Informative references

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

Couplings:

Couplings for metal-rolling mills	B21B 35/14
Attachment of wheels to axles for railway carriages	B60B
Attachment of marine propellers on shafts	B63H 23/34
Couplings for drilling rods	E21B 17/02

Clutches:

Clutches of harvesters or mowers for grass, cereals or other crops	A01D 69/08
Clutches in dental machines for boring or cutting	A61C 1/18
Clutches specially adapted for presses	B30B 15/12

Arrangement or location of clutches in vehicles	B60K 17/02
Arrangement or mounting of control devices for main transmission clutches in vehicles	B60K 23/02
Cycle brakes controlled by back-pedalling	B62L 5/00
Details of rotary fluid gearing of the hydrokinetic type	F16H 41/24
Combinations of mechanical gearings with fluid clutches	F16H 47/00
Clutches for apparatus for transmitting or receiving coded digital information	H04L 13/04

Brakes:

Brakes of harvesters or mowers for grass, cereals or other crops	A01D 69/10
Brakes for threshing machines	A01F 12/58
Brakes for swings	A63G 9/22
Brakes specially adapted for presses	B30B 15/10
Braking devices for ribbon-feed devices in selective printing mechanisms	B41J 33/52
Electrodynamic brake systems for vehicles in general	B60L 7/00
Vehicle brake control systems	B60T
Brakes peculiar to rail vehicles	B61H
Braking mechanisms for hand carts	B62B 5/04
Braking mechanisms for children's carriages or perambulators	B62B 9/08
Braking mechanisms for animal-drawn vehicles	B62C 7/00
Cycle brakes	B62L
Braking devices for lifting or hoisting gear	B66D 5/00
Brakes for electric motors, generators, or dynamo-electric converters	H02P 3/04

Couplings, clutches and/or brakes:

Conjoint control of vehicle sub-units of different type or different function, e.g. when at least one sub-unit is a clutch or a brake	B60W
Fluid gearings	F16H 39/00, F16H 41/00, F16H 43/00
Combinations of fluid gearings with clutches or couplings	F16H 45/00

Special rules of classification

For this subclass reference is made to the corresponding Indexing Code scheme: F16D.

For clutches and couplings in F16D 1/00 - F16D 48/00 only: see F16D 2300/00, F16D 1/00 - F16D 48/00 and F16D 2500/00.

Special rules of classification for brakes, i.e. for groups F16D 48/00 - F16D 71/04:

Classification rules in groups F16D 48/00 - F16D 71/04 for brakes:

The CPC-guide refers to "invention information". This definition is not followed, since "the addition to the prior art" of most documents is not always clear. In subclass F16D the criteria for classification

derive from the main rule that all relevant technical information of a document is classified to allow efficient retrieval. Most documents should preferably have two or more classification symbols. One symbol to describe the general configuration or overall construction and one or more further symbols to identify additional features should be assigned.

To avoid duplication of entries for the same subject matter, most of the existing subgroups relating to the type of operation force (e.g. hydraulic) are no longer used for classification. Instead the codes relating to brake actuation in groups F16D 2121/00 - F16D 2131/00 are given to each document.

Examples:

A hydraulically actuated band brake previously classified in IPC group F16D 49/12 is classified according the rules in F16D 49/08 and F16D 2121/04.

A hydraulically and magnetically actuated band brake also classified in IPC group F16D 49/12 is classified according the rules in F16D 49/08, F16D 2121/04, F16D 2121/20 and F16D 2123/00.

Glossary of terms

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

actuator	a component of a mechanism that causes movement of a motion-conveying component or motion-inhibiting component but does not itself directly convey or inhibit motion.
brake	a mechanism with at least one component that is moved by an actuator to selectively or automatically engage or stop a member with respect to a stationary part.
clutch	a mechanism with at least two relatively movable components that are selectively or automatically engaged with each other by control means, e.g. an actuator, to transmit mechanical power or convey motion from a first member to a second member or disengaged by control means to stop transmitting mechanical power or conveying motion.
coupling for transmitting rotation	a mechanism that transmits torque or conveys rotary motion from a first shaft to a second shaft or other rotating member and that either does not include relatively moving components or, if it has relatively moving components, the components move without the use of control means.

Synonyms and Keywords

In patent documents, the following abbreviations are often used:

Slack adjuster	Wear compensation mechanism, automatic adjuster, automatically adjusting device, automatic adjustment device, self-adjustment device
Freewheel clutch	One-way clutch

F16D 1/00

Couplings for rigidly connecting two coaxial shafts or other movable machine elements (attachment of wheels to axles for railway carriages B60B; for attachment of cranks to their shafts F16C 3/10)

References

Limiting references

This place does not cover:

Attachment of cranks to their shafts	F16C 3/10

Glossary of terms

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

Rigidly	"rigidly" means that there is no play or clearance intended in the connection (DE:spiel, FR:jeu).

F16D 1/027

non-disconnectable, e.g. involving gluing, welding or the like

Definition statement

This place covers:

Used for adhesive connection or welding, but not limited thereto. Rivets are also non-disconnectable therefore this type of connection would also be classified here. But bolts are usually disconnectable and would be classified rather in F16D 1/033 when connecting two faces perpendicular to the axis of rotation.

F16D 1/04

with clamping hub; with hub and longitudinal key

Definition statement

This place covers:

Used for connecting two abutting shafts or the like by means of a clamping hub or hub with a longitudinal key. Examples of clamping hubs (radial clamping/loading) and keys can be found in the titles of the subgroups of F16D 1/08.

F16D 1/05

with radial clamping due to axial loading of at least one pair of conical surfaces

Definition statement

This place covers:

Used for connecting two abutting shafts or the like by means of radial clamping due to axial loading of at least one pair of conical surfaces. Examples of this kind of clamping can be found in the subgroups of F16D 1/09.

F16D 1/08

with clamping hub; with hub and longitudinal key

Definition statement

This place covers:

Used for attachment of a member on a shaft or on a shaft end by means of a clamping hub or a hub with a longitudinal key.

F16D 1/0805

{with radial clamping due to deformation of a resilient body or a body of fluid (F16D 1/091 takes precedence; elastic couplings F16D 3/80; fluid pressure clutches F16D 25/04)}

Definition statement

This place covers:

Used for attachment of a member on a shaft or on a shaft end by means of a radial clamping hub due to deformation of a resilient body or a body of fluid, e.g. used for hubs comprising cavities which can be pressurised by fluid, so that a wall of the hub can expand towards the shaft in order to radially clamp the shaft.

F16D 1/0811

{with radial clamping due to tilting of a hub part or ring about a diametral axis}

Definition statement

This place covers:

Used for attachment of a member on a shaft or on a shaft end by means of a radial clamping hub due to tilting of a hub part or ring about a diametral axis, meaning that radially clamping is achieved by means of tilting of a hub part or ring about an axis perpendicularly crossing the rotational axis.

F16D 1/0817

{with radial clamping due to rotation along an eccentric surface, e.g. arcuate wedging elements (similar clutches F16D 17/00; similar free-wheel clutches F16D 41/06)}

Definition statement

This place covers:

Used for attachment of a member on a shaft or on a shaft end by means of a radial clamping hub due to rotation along an eccentric surface, e.g. arcuate wedging elements on the inner surface of the hub and/or the mating outer surface of the shaft, whereby clamping is achieved when the shaft and hub are relatively rotated and the elements wedge.

F16D 1/0823

{with radial clamping of a helical wrap spring on the shaft or in the hub bore (similar clutches F16D 13/025, F16D 13/08, F16D 27/025, F16D 27/105; similar slip couplings F16D 7/022; similar free-wheel clutches F16D 41/206)}

Definition statement

This place covers:

Used for attachment of a member on a shaft or on a shaft end by means of a radial clamping hub due to clamping of a helical wrap spring on the shaft or in the hub bore, e.g. by expanding the wrap spring against the hub bore due to relative rotation of the spring ends around the rotational axis.

F16D 1/0847

{with radial clamping due to a radial screw}

Definition statement

This place covers:

Used for attachment of a member on a shaft or on a shaft end by means of a radial clamping hub due to clamping by a set screw, e.g. a screw screwed in the hub in a radial direction through the hub and ending in the hub bore and thereby hitting the shaft outer surface.

F16D 1/0858

{due to the elasticity of the hub (including shrink fits)}

Definition statement

This place covers:

Used for attachment of a member on a shaft or on a shaft end by means of a radial clamping between the mating surfaces of the hub and the shaft due to the elasticity of the hub, e.g. a hub is heated (to enlarge its bore), is then put on the shaft and subsequently cooled in order to crimp or e.g. a hub is press fit on a shaft.

F16D 1/0864

{due to tangential loading of the hub, e.g. a split hub}

Definition statement

This place covers:

Used for attachment of a member on a shaft or on a shaft end by means of a radial clamping between the mating surfaces of the hub and the shaft due to tangential loading of the hub, e.g. a split hub, meaning e.g. a hub which has a radial split in the direction of the rotational axis, whereby the parts of the hub adjacent to the split and facing each other are clamped together by e.g. a screw so that the bore of the hub clamps around the shaft.

F16D 1/09

with radial clamping due to axial loading of at least one pair of conical surfaces {(tapered keys F16D 1/0882)}

References

Limiting references

This place does not cover:

Tapered keys	F16D 1/0882

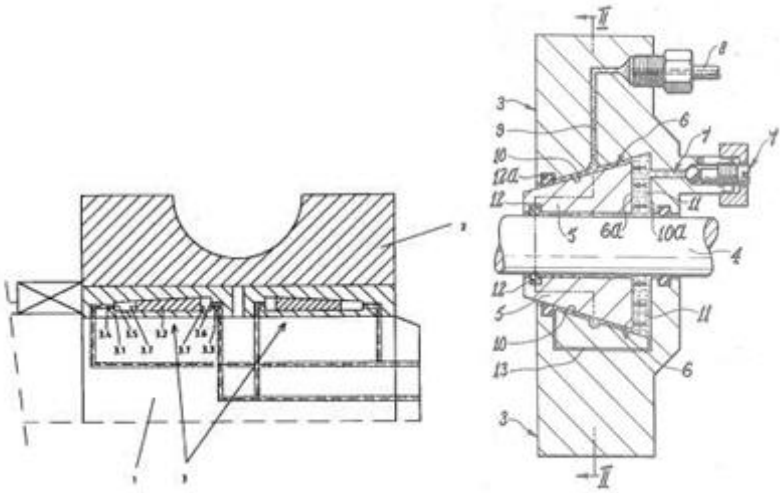
F16D 1/091

and comprising a chamber including a tapered piston moved axially by fluid pressure to effect clamping

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 1/091.



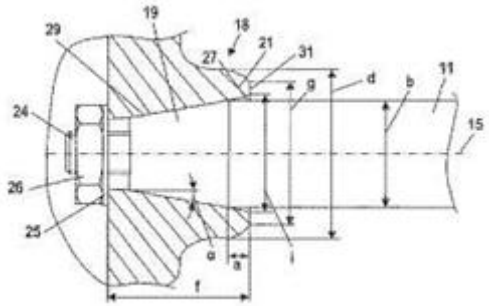
F16D 1/092

the pair of conical mating surfaces being provided on the coupled hub and shaft

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 1/092.



F16D 1/093

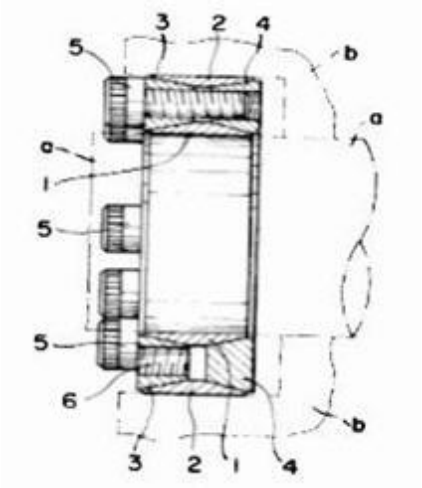
using one or more elastic segmented conical rings forming at least one of the conical surfaces, the rings being expanded or contracted to effect clamping (F16D 1/091 takes precedence)

References

Limiting references

This place does not cover:

Couplings comprising a chamber including a tapered piston moved axially by fluid pressure to effect clamping	F16D 1/091



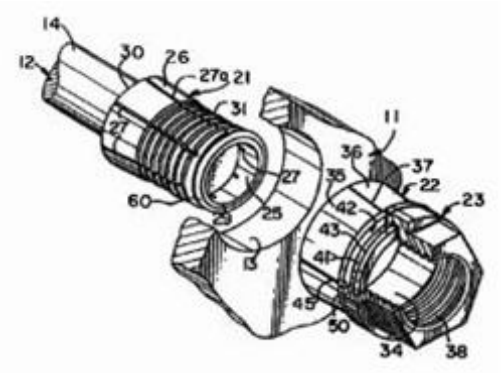
F16D 1/094

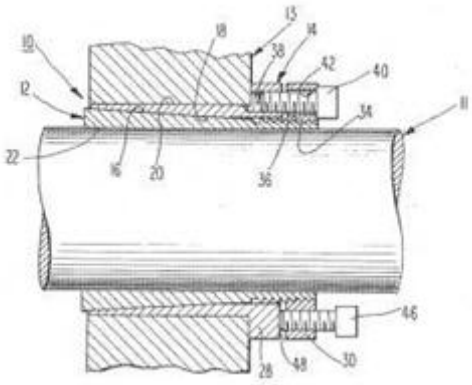
using one or more pairs of elastic or segmented rings with mutually mating conical surfaces, one of the mating rings being contracted and the other being expanded

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 1/094.





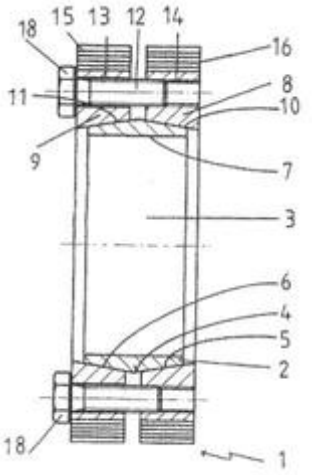
F16D 1/095

with clamping effected by ring contraction only {(for connecting two abutting shafts F16D 1/02)}

Definition statement

This place covers:

Used for attachment of a member on a shaft or on a shaft-end with clamping hub, with radial clamping due to axial loading of at least one pair of conical surfaces, using one of more elastic segmented conical rings forming at least one of the conical surfaces, the rings being contracted to effect clamping, with clamping effected by ring contraction only, e.g. used for the following arrangements: see figure:



the rings 9,10 are stiff and the elastic ring 3 is contracted when the rings 9,10 are loaded (when the bots are tightened).

References

Limiting references

This place does not cover:

Couplings for connecting two abutting shafts	F16D 1/02

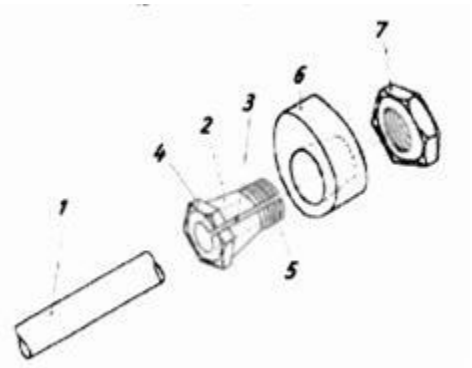
F16D 1/096

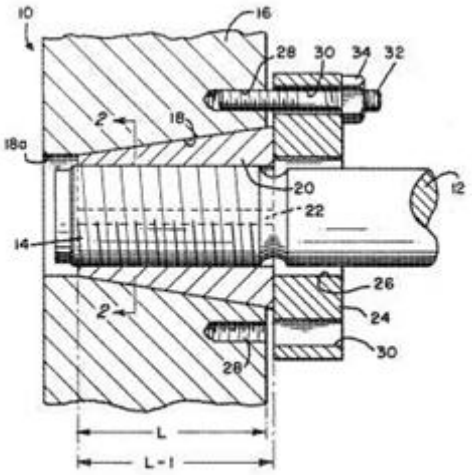
the ring or rings being located between the shaft and the hub

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 1/096.





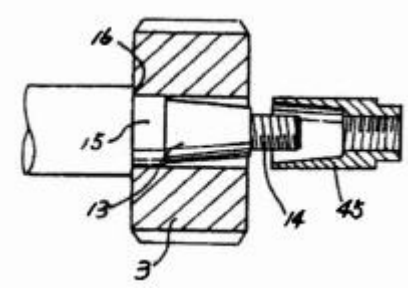
F16D 1/097

with clamping effected by ring expansion only, e.g. with an expanded ring located between hub and shaft

Definition statement

This place covers:

Used for attachment of a member on a shaft or on a shaft-end with clamping hub, with radial clamping due to axial loading of at least one pair of conical surfaces, using one of more elastic segmented conical rings forming at least one of the conical surfaces, the rings being expanded to effect clamping, with clamping effected by ring expansion only, e.g. used for the following arrangements: see figure (the elastic ring 45 is expanded between the shaft part 13 and the hub 3 when screwed on the shaft end 14):



F16D 3/00

Yielding couplings, i.e. with means permitting movement between the connected parts during the drive (couplings disconnectable simply by axial movement F16D 1/10; slip couplings F16D 7/00)

References

Limiting references

This place does not cover:

Couplings disconnectable simply by axial movement	F16D 1/10
Slip couplings	F16D 7/00

F16D 3/02

adapted to specific functions

References

Informative references

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

Other joints having more than one degree of angular freedom, i.e. universal joints	F16C 11/06

F16D 3/223

the rolling members being guided in grooves in both coupling parts

Definition statement

This place covers:

Universal joints in which flexibility is produced by means of rolling connecting parts, one coupling part entering a sleeve of the other coupling part and connected thereto by rolling members whereby the rolling members are being guided in grooves in both coupling parts.

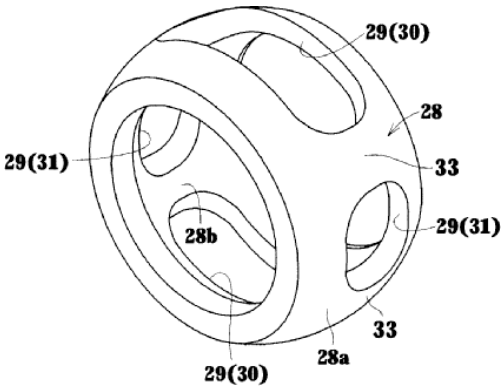
F16D 2003/22303

{Details of ball cages}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2003/22303.



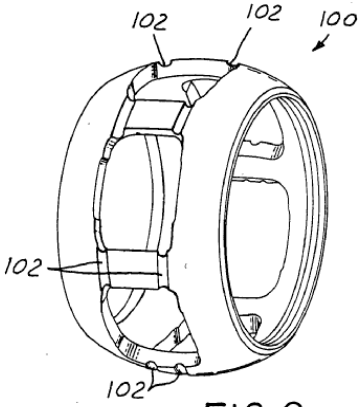
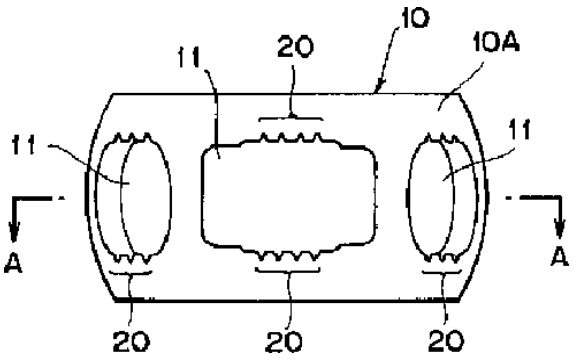


FIG. 6



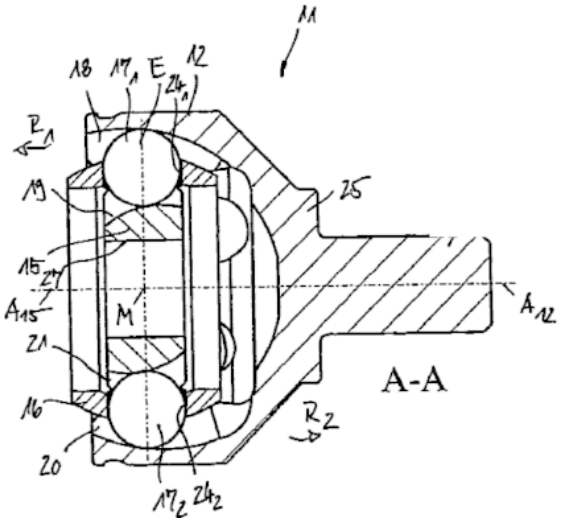
F16D 2003/22306

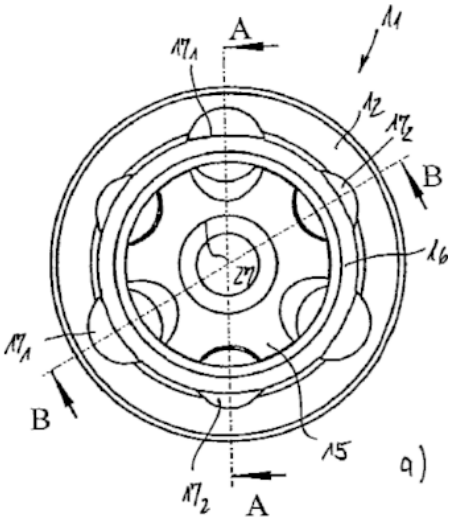
{having counter tracks, i.e. ball track surfaces which diverge in opposite directions}

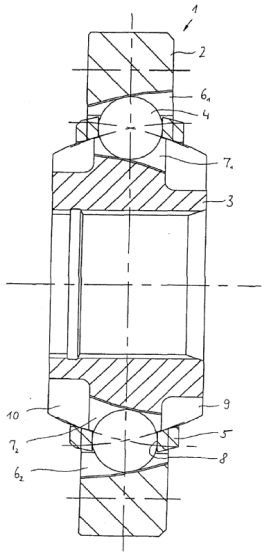
Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2003/22306.







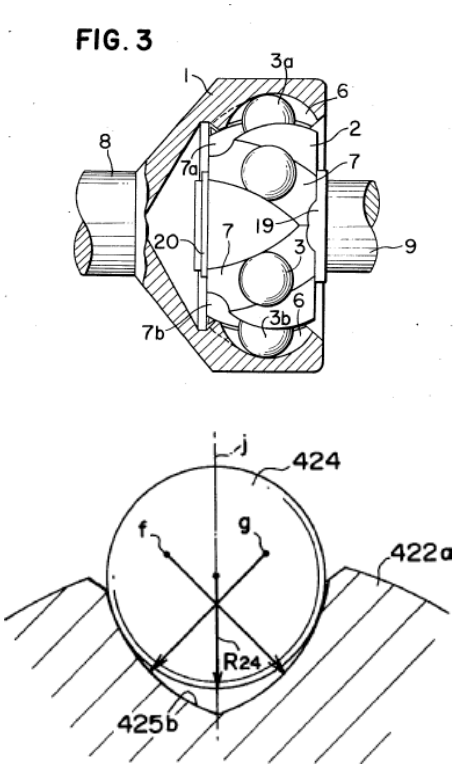
F16D 2003/22309

{Details of grooves}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2003/22309.



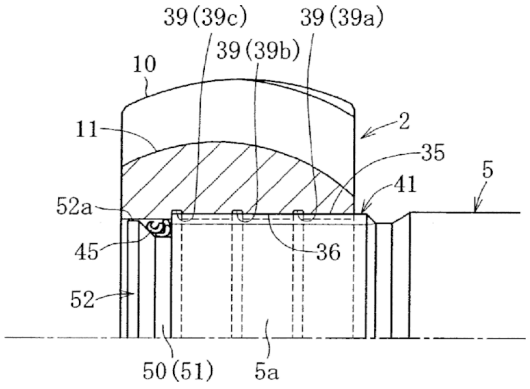
F16D 2003/22313

{Details of the inner part of the core or means for attachment of the core on the shaft}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2003/22313.



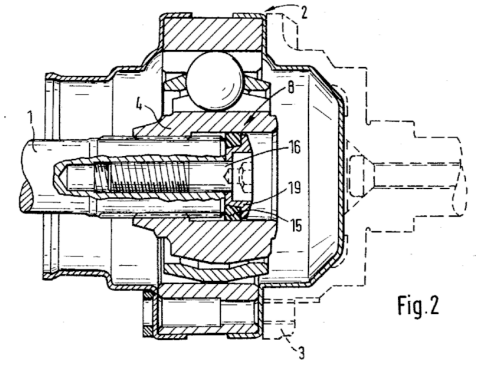
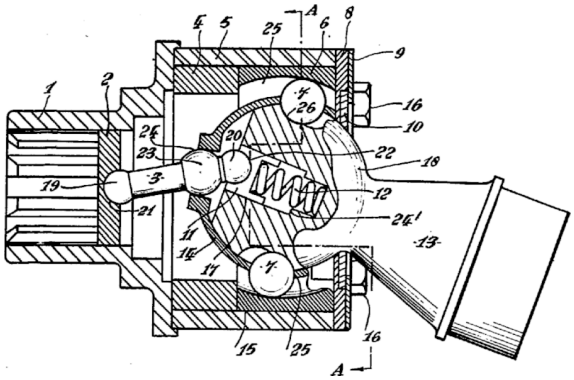


Fig.2



F16D 2003/22316

{Means for fastening or attaching the bellows or gaiters}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2003/22316.

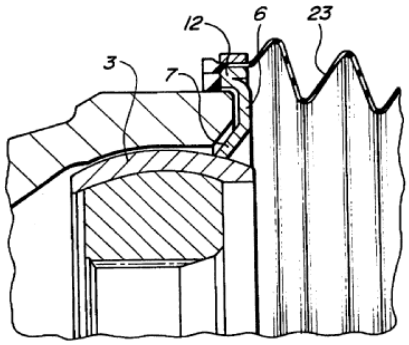
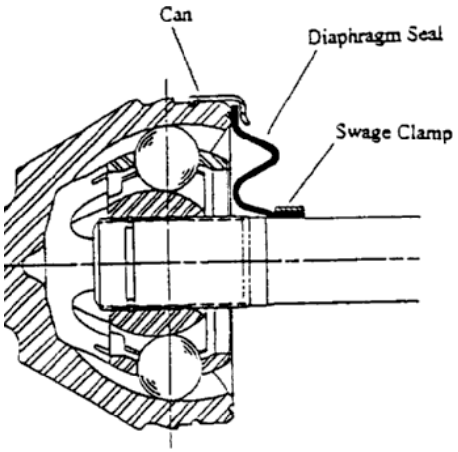
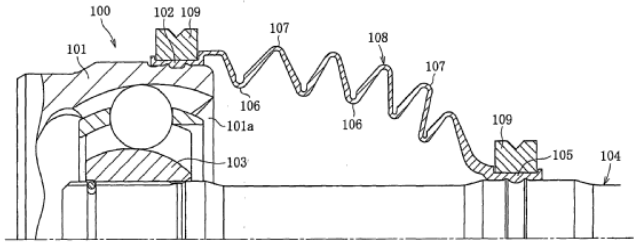


Fig-5





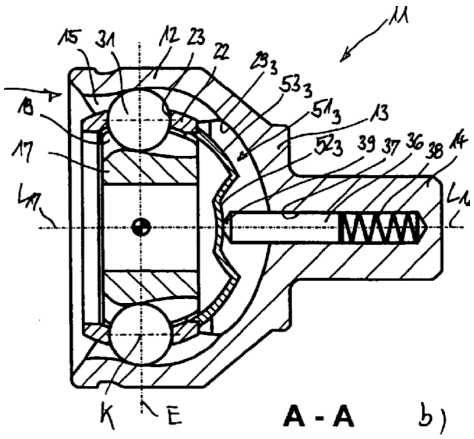
F16D 2003/2232

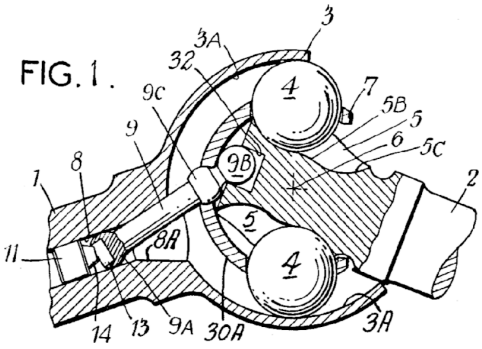
{Elements arranged in the hollow space between the end of the inner shaft and the outer joint member}

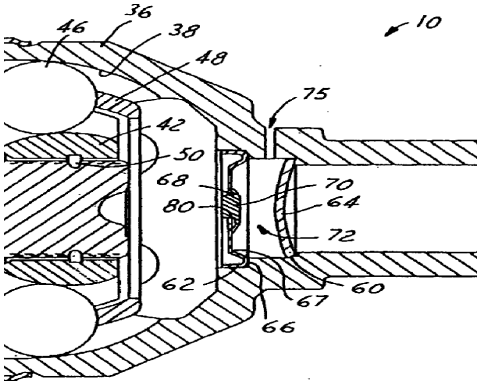
Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2003/2232.







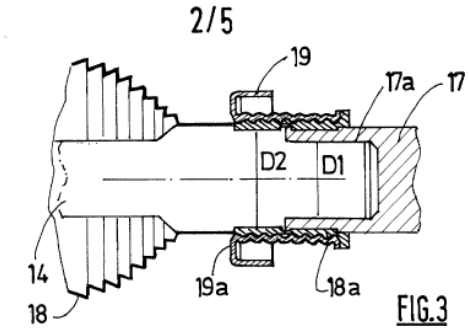
F16D 2003/22323

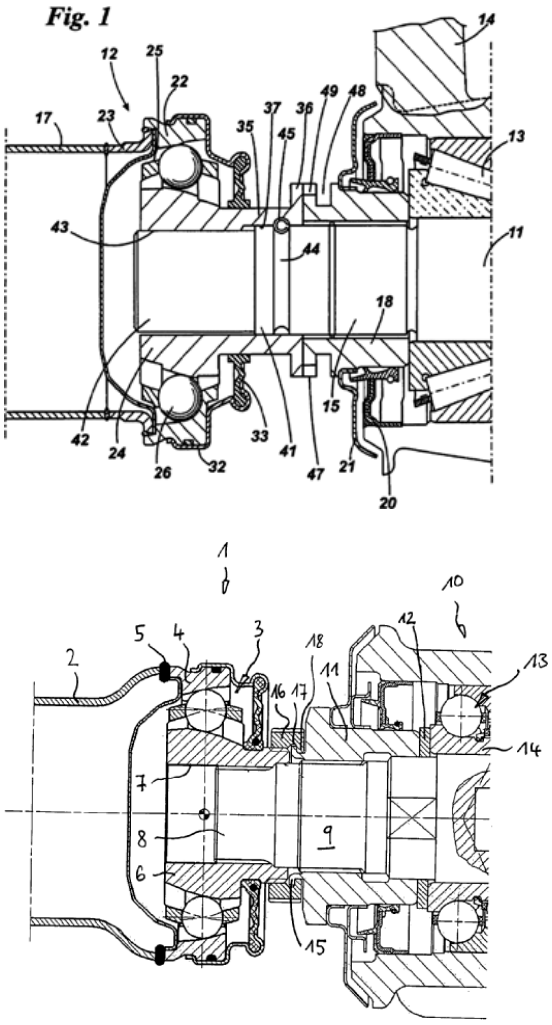
{Attachments to the shaft of the inner joint member whereby the attachments are distanced from the core}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2003/22323.





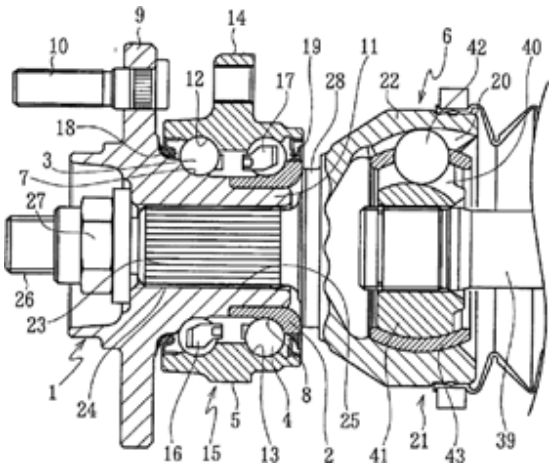
F16D 2003/22326

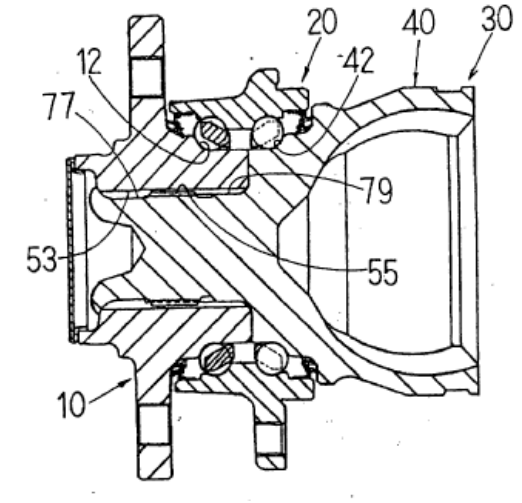
{Attachments to the outer joint member, i.e. attachments to the exterior of the outer joint member or to the shaft of the outer joint member}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2003/22326.





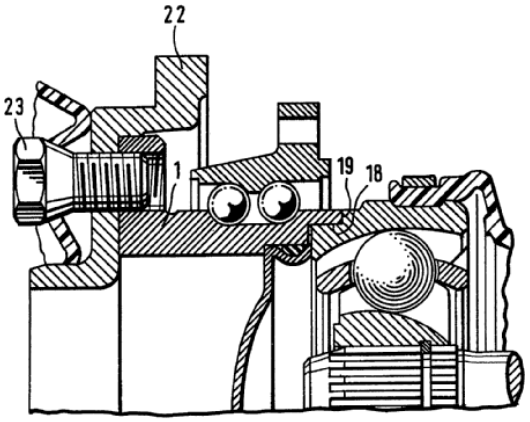
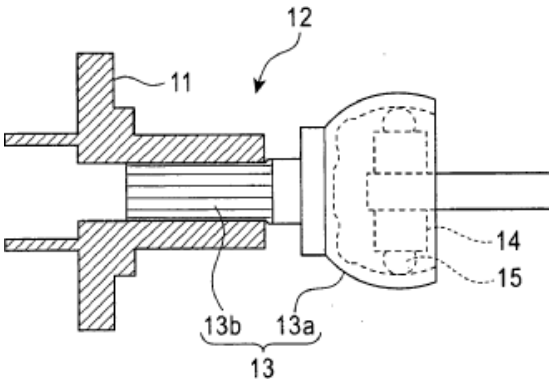


FIG.3



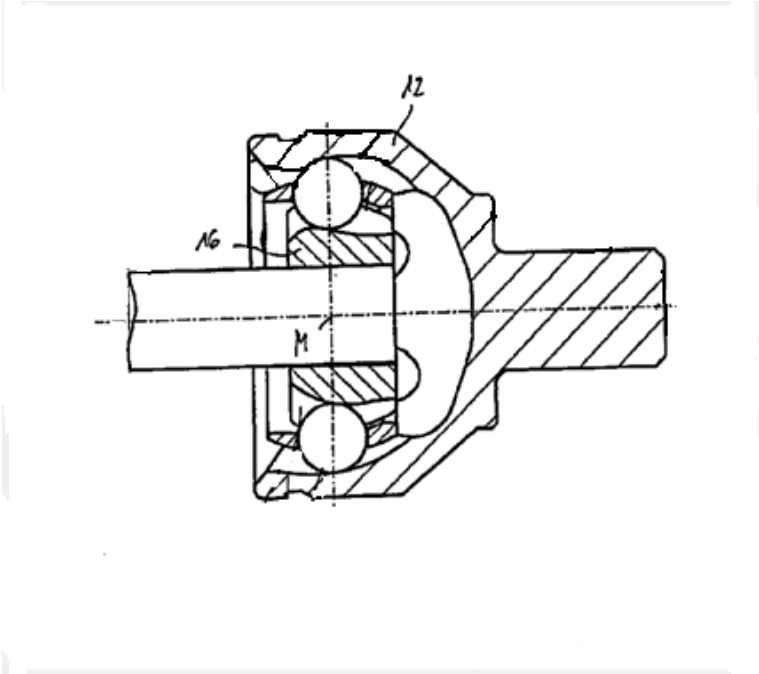
F16D 3/2233

where the track is made up of two curves with a point of inflexion in between, i.e. S-track joints

Definition statement

This place covers:

Universal joints where the rolling members are being guided in grooves on both coupling parts. The projection of the groove lines forming a S curve with an inflection point, see inner contour of part (12) and outer contour of part (16) in the figure.



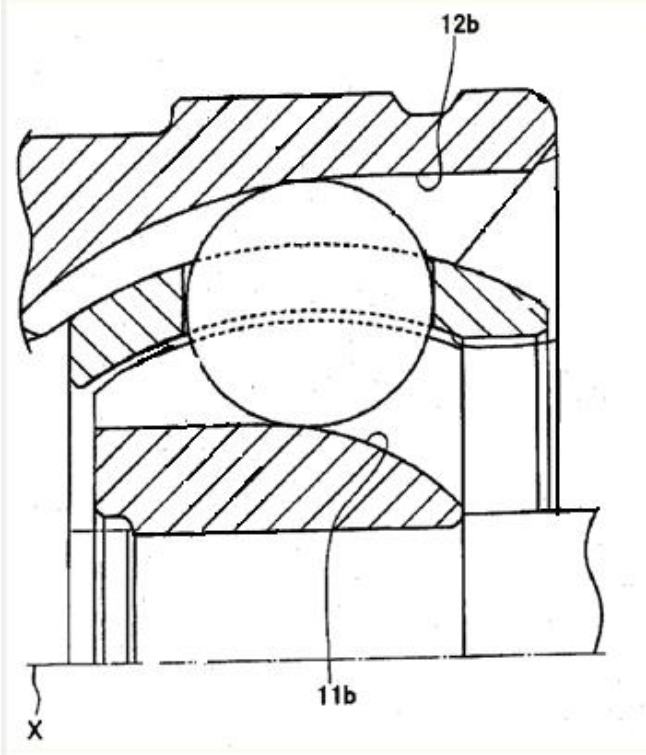
F16D 3/2237

where the grooves are composed of radii and adjoining straight lines, i.e. undercut free [UF] type joints

Definition statement

This place covers:

Universal joints where the rolling members are being guided in grooves on both coupling parts. In the projection these grooves are composed of radii and straight lines, see groove line (11b) and (12b) in the figure.



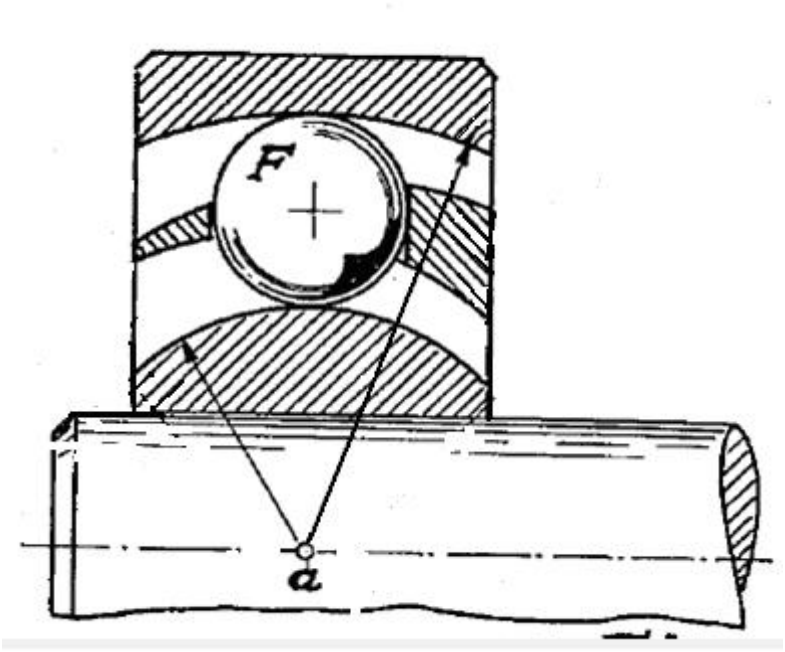
F16D 3/224

the groove centre-lines in each coupling part lying on a sphere

Definition statement

This place covers:

Universal joints where the rolling members are being guided in grooves in both coupling parts, and the groove centre-lines of each coupling part are lying on a sphere with the same centre.



F16D 3/2245

where the groove centres are offset from the joint centre

Definition statement

This place covers:

Universal joints where the rolling members are being guided in grooves in both coupling parts, the groove centre-lines are lying on spheres and the centres of these spheres (D1, G1) are offset from the joint centre (E1).

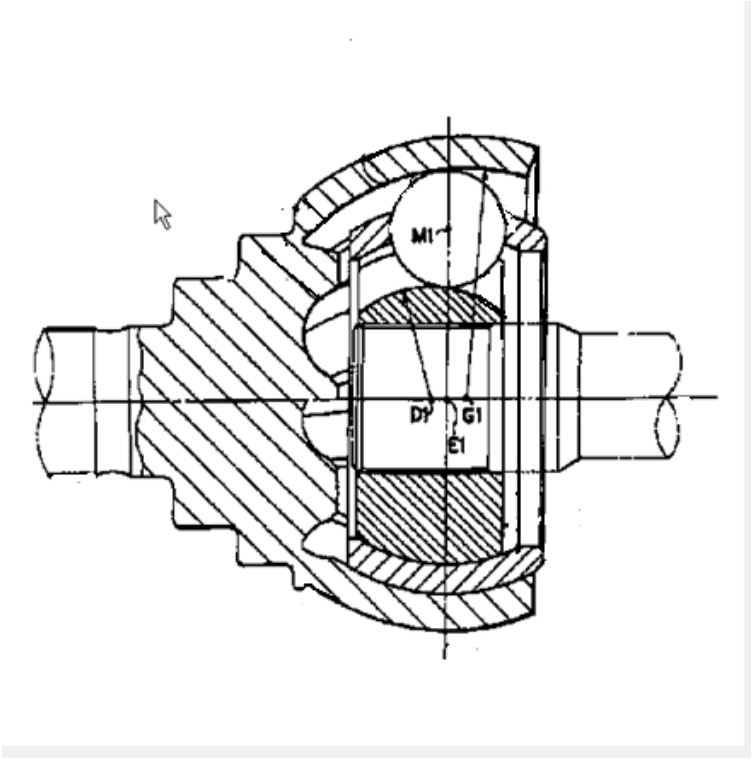
Each complete groove centre-line lying on (a part of) a single sphere.

References

Limiting references

This place does not cover:

In case the groove centre-lines are composed of combinations of parts of several spheres	F16D 3/223.



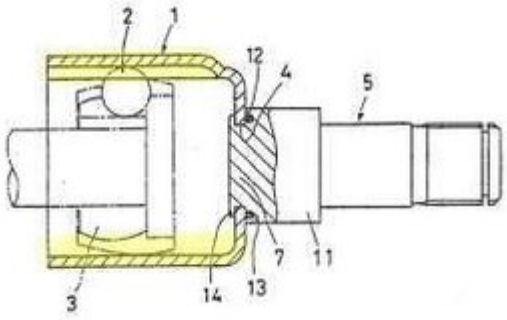
F16D 3/226

the groove centre-lines in each coupling part lying on a cylinder co-axial with the respective coupling part

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 3/226.



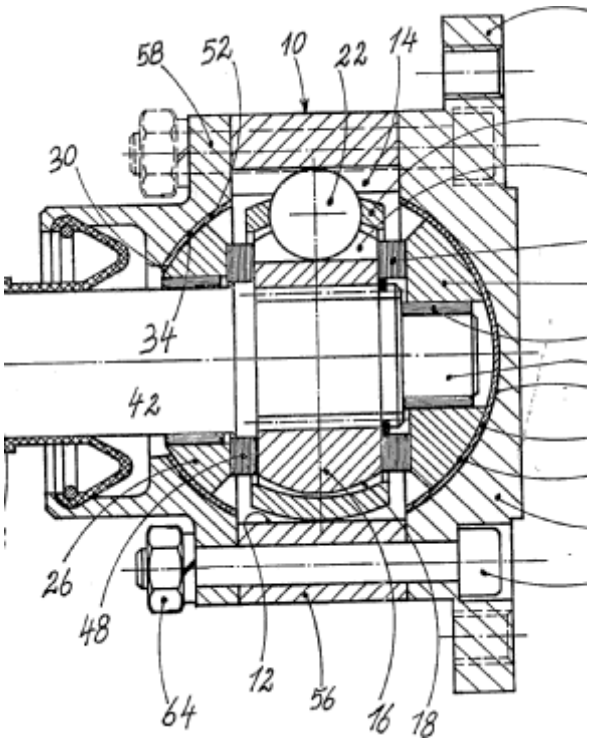
F16D 3/2265

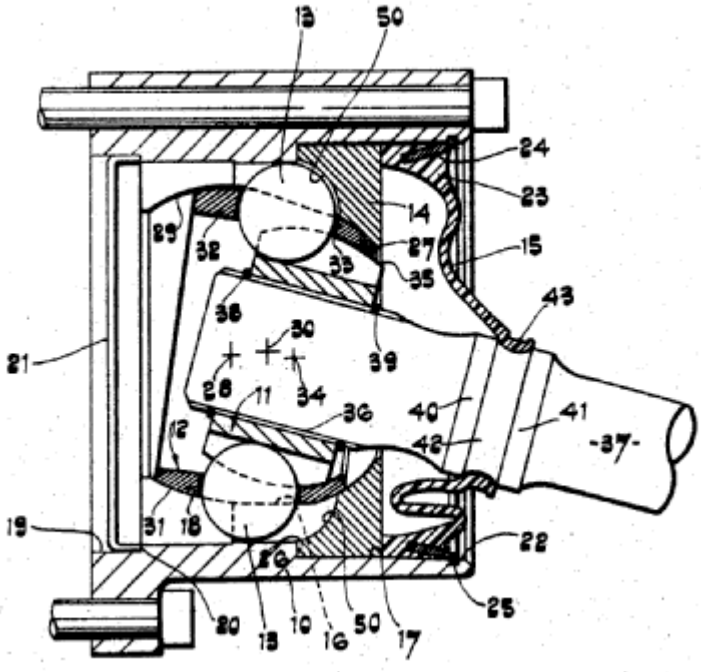
{the joints being non-telescopic}

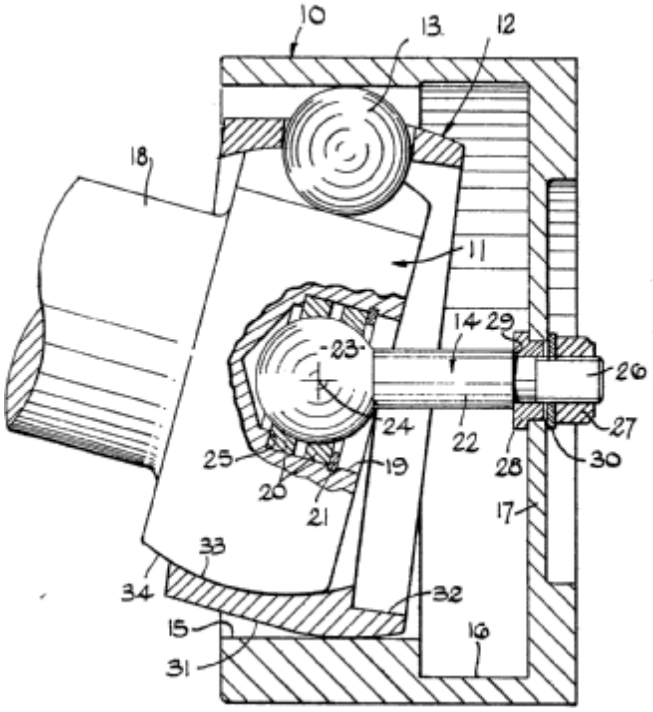
Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 3/2265.







F16D 3/229

Prismatic coupling parts having each groove centre-line lying on planes parallel to the axis of the respective coupling part (F16D 3/224, F16D 3/226 take precedence)

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 3/229.

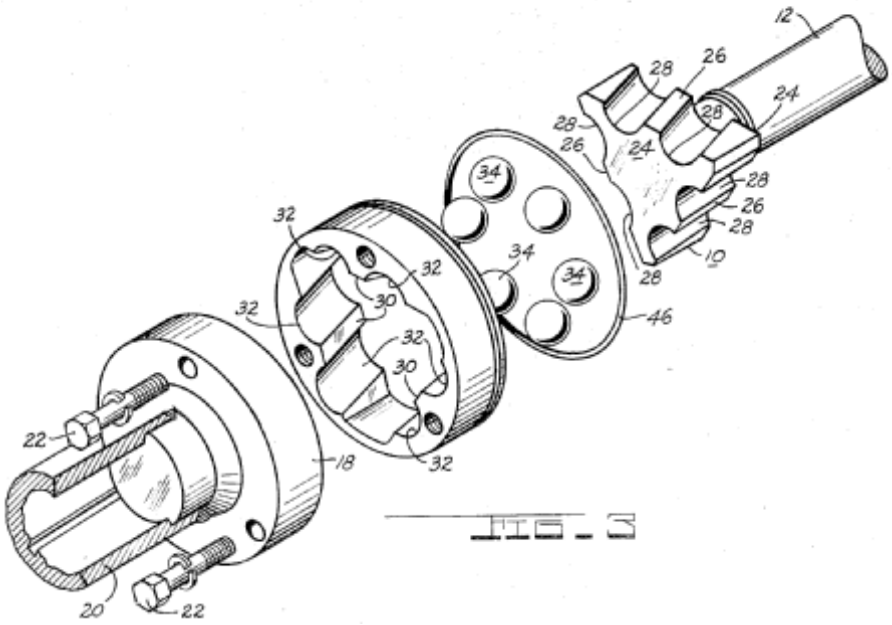
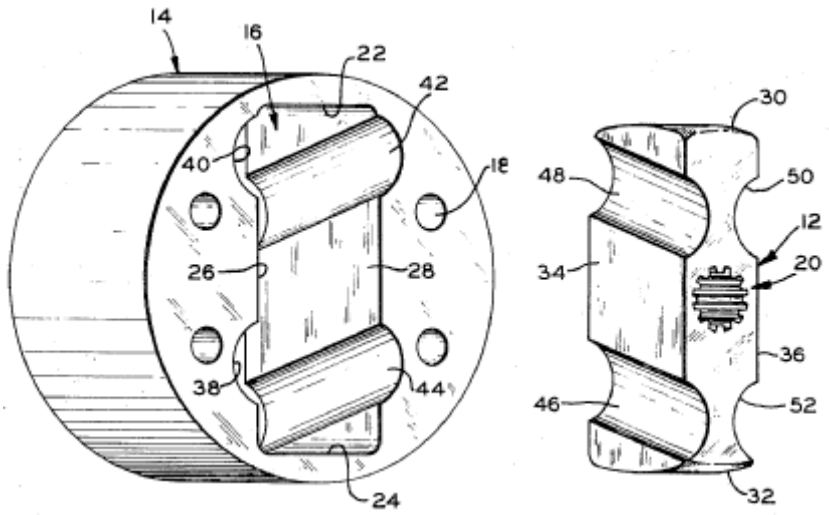


FIG. 3



F16D 3/82

with a coupling element in the form of a pneumatic tube (similar clutches F16D 25/04)

References

Informative references

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

Similar clutches	F16D 25/04

F16D 7/00

Slip couplings, e.g. slipping on overload, for absorbing shock (combined with yielding shaft couplings F16D 3/14; fluid slip couplings F16D 31/00 - F16D 35/00)

References

Informative references

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

Combined with yielding shaft couplings	F16D 3/14
Fluid slip couplings	F16D 31/00 - F16D 35/00
Gearings with arrangements or devices for absorbing overload or preventing damage by overload	F16H 35/10

F16D 7/02

of the friction type

References

Informative references

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

Couplings in which overload initiates a decrease of coupling pressure or a disconnection, see the relevant groups for clutches, e.g. for friction overload clutches	F16D 43/20, F16D 43/21

F16D 7/04

of the ratchet type (similar gearings based on repeated accumulation and delivery of inertia-energy F16H 33/08; {overload clutches of the ratchet type F16D 43/202})

References

Informative references

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

Overload clutches of the ratchet type	F16D 43/202

F16D 11/00

Clutches in which the members have interengaging parts (arrangements for synchronisation F16D 23/02)

References

Informative references

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

Arrangements for synchronisation	F16D 23/02

F16D 13/00

Friction clutches (arrangements for synchronisation F16D 23/02)

References

Informative references

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

Arrangements for synchronisation	F16D 23/02

F16D 13/08

with a helical band or equivalent member, which may be built up from linked parts, with more than one turn embracing a drum or the like, with or without an additional clutch actuating the end of the band (F16D 13/02 takes precedence; {similar slip couplings F16D 7/022; similar clutches electromagnetically actuated F16D 27/025, F16D 27/105} ; similar free-wheel clutches F16D 41/20; similar brakes F16D 49/02)

References

Informative references

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

Similar clutches electromagnetically actuated	F16D 7/022, F16D 27/105
Similar slip clutches	F16D 7/022
Similar freewheel clutches	F16D 41/206
Similar brakes	F16D 49/02

F16D 13/10

with clutching members co-operating with the periphery of a drum, a wheel-rim, or the like (F16D 13/02 - F16D 13/08 take precedence; similar brakes F16D 49/00)

References

Informative references

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

Similar brakes	F16D 49/00

F16D 13/12

with an expansible band or coil co-operating with the inner surface of a drum or the like (F16D 13/02 takes precedence; similar brakes F16D 51/02)

References

Informative references

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

Similar brakes	F16D 51/02

F16D 13/14

with outwardly-movable clutching members co-operating with the inner surface of a drum or the like (F16D 13/02, F16D 13/06, F16D 13/12 take precedence; similar brakes F16D 51/00)

References

Informative references

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

Similar brakes	F16D 51/00

F16D 13/20

with clutching members co-operating with both the periphery and the inner surface of a drum or wheel-rim (similar brakes F16D 53/00)

References

Informative references

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

Similar brakes	F16D 53/00

F16D 13/22

with axially-movable clutching members (similar brakes F16D 55/00)

References

Informative references

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

Similar brakes	F16D 55/00

F16D 13/58

Details {(tools for assembling or disassembling clutches B25B 27/0064)}

References

Limiting references

This place does not cover:

Tools for assembling or disassembling clutches	B25B 27/0064

F16D 13/60

Clutching elements (friction lining or attachment thereof F16D 69/00)

References

Limiting references

This place does not cover:

Friction lining or attachment thereof	F16D 69/00

F16D 13/62

Clutch-bands; Clutch shoes; Clutch-drums (brake-bands, brake-shoes, brake-drums F16D 65/00)

References

Limiting references

This place does not cover:

Brake-bands, brake-shoes, brake-drums	F16D 65/00

F16D 13/64

Clutch-plates; Clutch-lamellae (brake-plates, brake-lamellae F16D 65/12)

References

Limiting references

This place does not cover:

Brake-plates, brake-lamellae	F16D 65/12

F16D 13/68

Attachments of plates or lamellae to their supports {(one or more discs connected to the linings transmitting torque to one or more discs connected to the hub by helical springs in windows in the discs, i.e. rotary vibration dampers F16F 15/12)}

References

Limiting references

This place does not cover:

One or more discs connected to the linings transmitting torque to one or more discs connected to the hub by helical springs in windows in the discs, i.e. rotary vibration dampers	F16F 15/12

F16D 13/70

Pressure members, e.g. pressure plates, for clutch-plates or lamellae; Guiding arrangements for pressure members {(clutch flywheels comprising two or more masses with a rotational damper F16F 15/12)}

References

Limiting references

This place does not cover:

Clutch flywheels comprising two or more masses with a rotational damper	F16F 15/12

F16D 15/00

Clutches with wedging balls or rollers or with other wedgeable separate clutching members (freewheels, freewheel clutches F16D 41/00)

References

Limiting references

This place does not cover:

Freewheels, freewheel clutches	F16D 41/00

F16D 21/00

Systems comprising a plurality of actuated clutches (for synchronisation F16D 23/04)

References

Limiting references

This place does not cover:

For synchronisation	F16D 23/04

F16D 21/02

for interconnecting three or more shafts or other transmission members in different ways (in endless-track vehicles B62D)

References

Informative references

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

In endless-track vehicles	B62D

F16D 21/06

at least two driving shafts or two driven shafts being concentric

Glossary of terms

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

Mechanically actuated clutches	include also clutches other than mechanically actuated, e.g. electrically or hydraulically actuated

F16D 23/02

Arrangements for synchronisation, also for power-operated clutches (shape or mounting of interengaging parts of clutch members to facilitate engagement F16D 11/08)

References

Limiting references

This place does not cover:

Shape or mounting of interengaging parts of clutch members to facilitate engagement	F16D 11/08

F16D 23/08

with a blocking mechanism that only releases the clutching member on synchronisation (in combination with an additional friction clutch F16D 23/06)

References

Limiting references

This place does not cover:

In combination with an additional friction clutch	F16D 23/06

F16D 23/12

Mechanical clutch-actuating mechanisms arranged outside the clutch as such (specific for combined clutches F16D 21/00; mechanisms specific for synchronisation F16D 23/02)

References

Limiting references

This place does not cover:

Specific for combined clutches	F16D 21/00
Mechanisms specific for synchronisation	F16D 23/02

F16D 25/00

Fluid-actuated clutches

References

Limiting references

This place does not cover:

Fluid actuated torque limiting clutches	F16D 43/28

Glossary of terms

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

Fluid	any gas or liquid, e.g. for pneumatic or hydraulic control

F16D 2025/081

{Hydraulic devices that initiate movement of pistons in slave cylinders for actuating clutches, i.e. master cylinders}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2025/081.

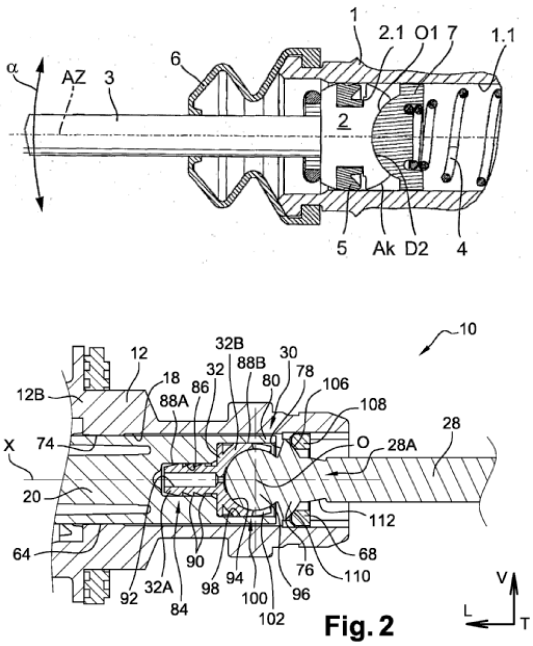


Fig. 2

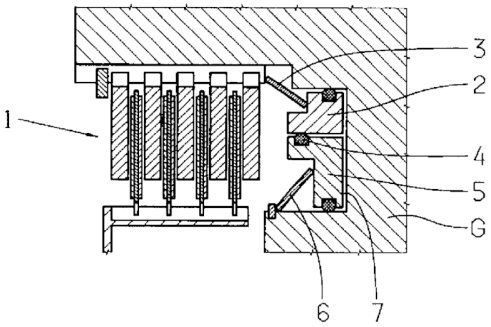
F16D 25/082

{the line of action of the fluid-actuated members co-inciding with the axis of rotation}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 25/082.



F16D 25/10

Clutch systems with a plurality of fluid-actuated clutches (arrangements or mounting of clutches in vehicles B60K 17/00)

References

Informative references

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

Arrangements or mounting of clutches in vehicles	B60K 17/02

F16D 27/00

Magnetically- {or electrically-} actuated clutches; Control or electric circuits therefor (clutches with magnetisable particles F16D 37/02; {with electro-rheological fluids F16D 37/008})

References

Limiting references

This place does not cover:

Clutches with electro-rheological fluids	F16D 37/008
Clutches with magnetisable particles	F16D 37/02
Magnetic clutches e.g. electrostatic or Eddy current clutches	H02K

F16D 28/00

Electrically-actuated clutches (arrangements for synchronisation F16D 23/02; clutches actuated directly by means of an electromagnet F16D 27/00; automatic clutches F16D 43/00 - F16D 45/00; external control F16D 48/00)

References

Limiting references

This place does not cover:

Clutches actuated directly by means of an electromagnet	F16D 27/02- F16D 27/12
Clutches with electro-rheological fluids	F16D 37/008
Clutches with magnetisable particles	F16D 37/02
Magnetic clutches e.g. electrostatic or Eddy current clutches	H02K

F16D 33/00

Rotary fluid couplings or clutches of the hydrokinetic type

References

Limiting references

This place does not cover:

Retarders	B60T
Torque converters	F16H 41/00

F16D 33/16

by means arranged externally of the coupling or clutch (mounting of such means in vehicles B60K 23/00, e.g. B60K 23/02)

References

Informative references

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

Mounting of such means in vehicles	B60K 23/02

F16D 33/18

Details (applicable also to fluid gearing F16H 41/24)

References

Informative references

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

Applicable also to fluid gearing	F16H 41/24

F16D 35/00

Fluid clutches in which the clutching is predominantly obtained by fluid adhesion (F16D 37/00 takes precedence {; arrangements of viscous clutches in four-wheel drives - B60K 17/3465 and B60K 17/351})

References

Informative references

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

Arrangements of viscous clutches in four-wheel drives	B60K 17/351

F16D 41/00

Freewheels or freewheel clutches (cycle brakes controlled by back-pedalling B62L 5/00 {; one-way linear clutches F16B 7/16})

References

Informative references

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

Cycle brakes controlled by back-pedalling	B62L 5/00
One-way linear clutches	F16B 7/16

F16D 43/00

Automatic clutches (varying the relationship between two coaxial shafts F16D 3/10; freewheels, freewheel clutches F16D 41/00)

References

Informative references

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

Couplings for varying the relationship between two coaxial shafts	F16D 3/10
Freewheels, freewheel clutches	F16D 41/00

F16D 43/04

controlled by angular speed (F16D 43/24 takes precedence; clutches in which the drive is transmitted through a medium consisting of small particles F16D 37/00)

References

Limiting references

This place does not cover:

Clutches in which the drive is transmitted through a medium consisting of small particles	F16D 37/00

F16D 43/202

of the ratchet type (slip couplings of the ratchet type F16D 7/04)

References

Informative references

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

Slip couplings of the ratchet type	F16D 7/04

F16D 43/204

with intermediate balls or rollers

References

Informative references

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

Slip couplings with intermediate balls or rollers	F16D 7/06

F16D 43/206

moving axially between engagement and disengagement

References

Informative references

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

Corresponding slip couplings	F16D 7/08

F16D 43/208

moving radially between engagement and disengagement

References

Informative references

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

Corresponding slip couplings	F16D 7/10

F16D 43/21

with friction members {(slip couplings of the friction type F16D 7/02)}

References

Informative references

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

Corresponding slip couplings	F16D 7/02

F16D 43/26

acting at definite angular position or disengaging after {consecutive} definite number of rotations (actuating by means of stationary abutment F16D 11/02, F16D 13/02, F16D 15/00; control of change-speed or reversing-gearings conveying rotary motion F16H 59/00 - F16H 63/00)

References

Informative references

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

Actuating by means of stationary abutment	F16D 11/02, F16D 13/02, F16D 15/00
Control of change-speed or reversing-gearings conveying rotary motion	F16H 59/00 - F16H 63/00

F16D 47/02

of which at least one is a coupling

References

Informative references

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

Clutch flywheels with damping devices	F16F 15/10

F16D 47/04

of which at least one is a freewheel (F16D 47/02, F16D 47/06 take precedence; freewheels combined with a clutch to lock the driving and driven members of the freewheel F16D 41/04, F16D 41/26)

References

Informative references

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

Freewheels combined with a clutch to lock the driving and driven members of the freewheel	F16D 41/04, F16D 41/26

F16D 2048/0209

{characterised by fluid valves having control pistons, e.g. spools}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/0209

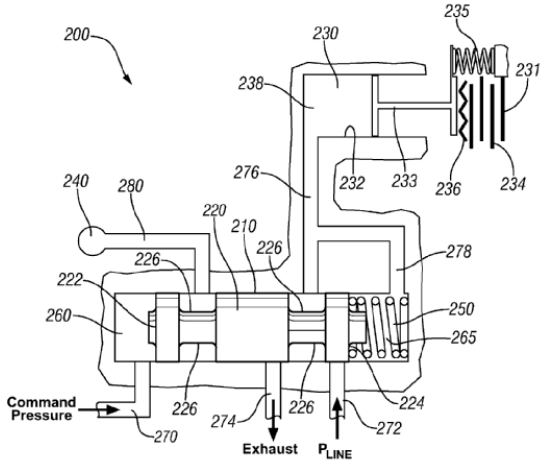


FIG. 4

F16D 2048/0212

{Details of pistons for master or slave cylinders especially adapted for fluid control (for other details of pistons in master or slave cylinders F16D 2025/081 or F16D 25/082)}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/0212.

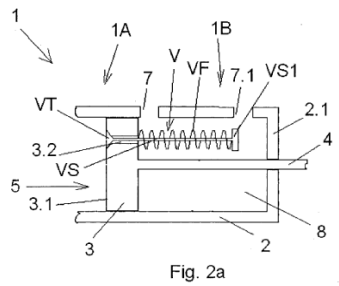


Fig. 2a

References

Informative references

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

Details of pistons in master or slave cylinders	F16D 2025/081, F16D 25/082

F16D 2048/0221

{Valves for clutch control systems; Details thereof}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/0221.

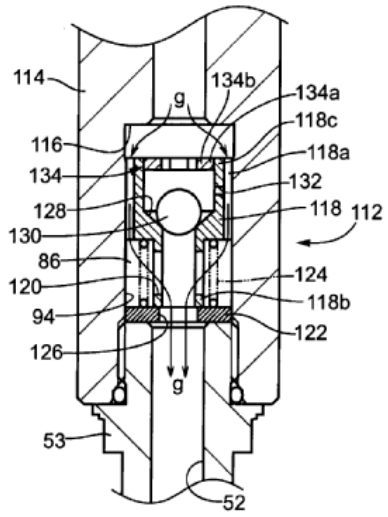
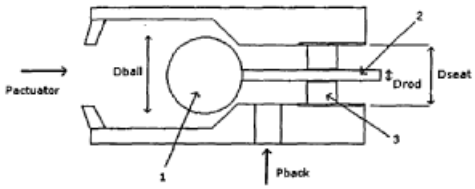


FIGURE 1



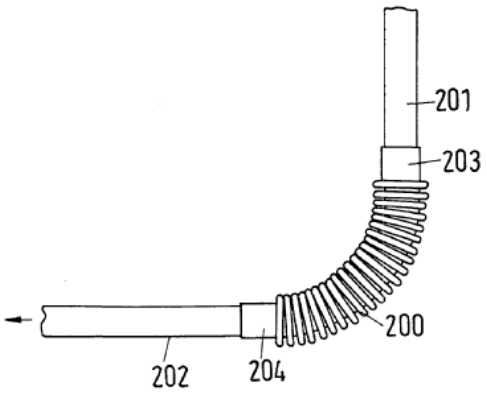
F16D 2048/0224

{Details of conduits, connectors or the adaptors therefor specially adapted for clutch control}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/0224.



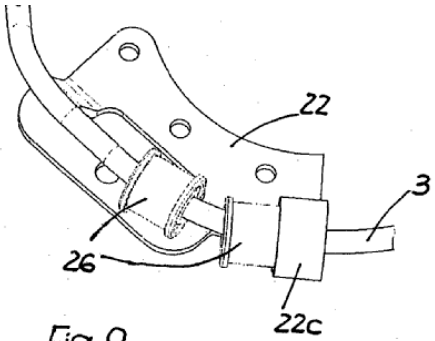
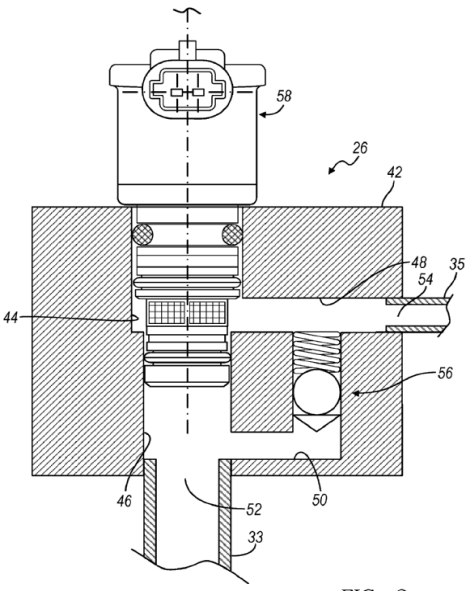


Fig. 9



F16D 2048/023

{by pedal actuation (for pedals per se G01G 1/30)}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/023.

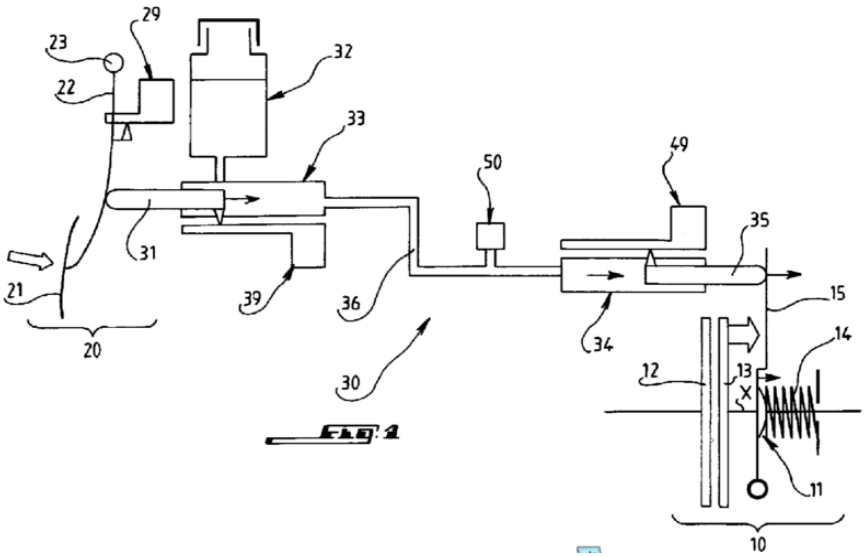


Fig. 1

References

Informative references

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

Pedals per se	G05G 1/30

F16D 2048/0233

{by rotary pump actuation}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/0233.

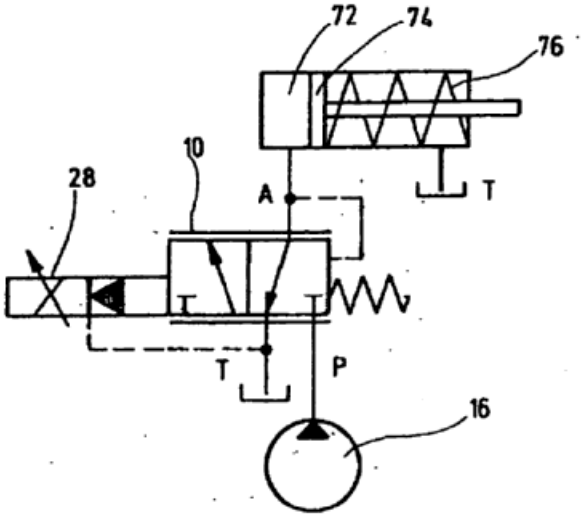


Fig.7

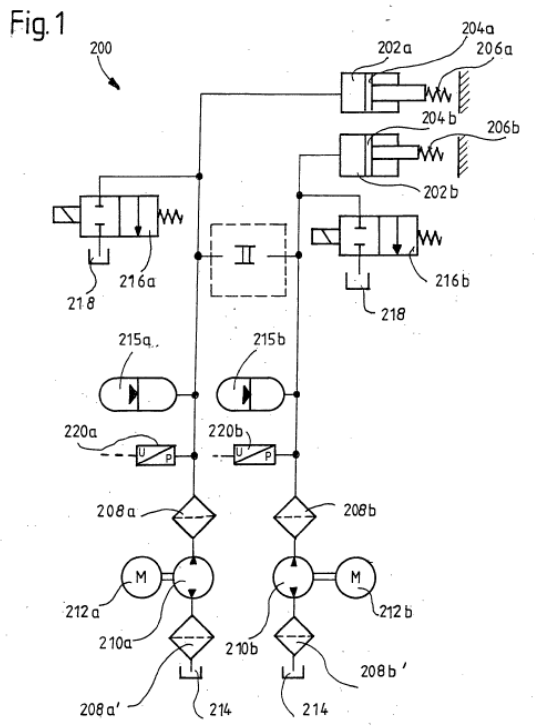
F16D 2048/0236

{with multiple independent pumps, e.g. one per clutch, or for supplying fluid to different systems}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/0236.



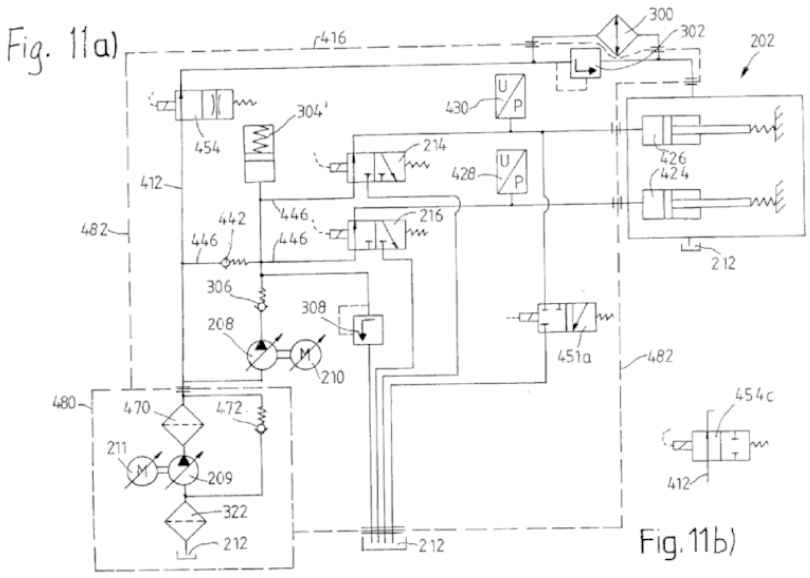
F16D 2048/0239

{One fluid source supplying fluid at high pressure and one fluid source supplying fluid at low pressure}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/0239.



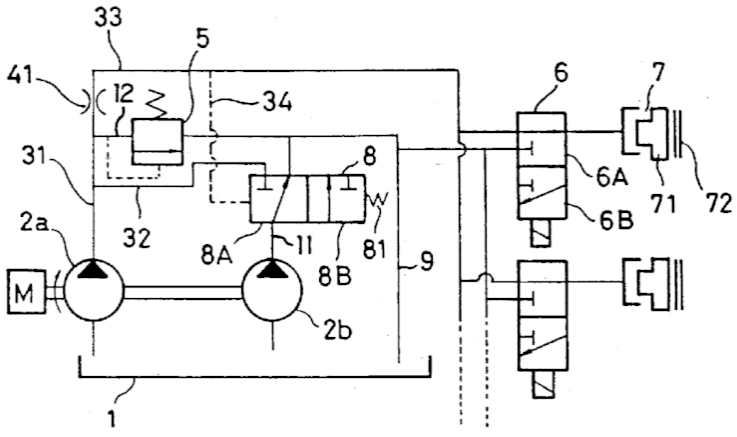
F16D 2048/0242

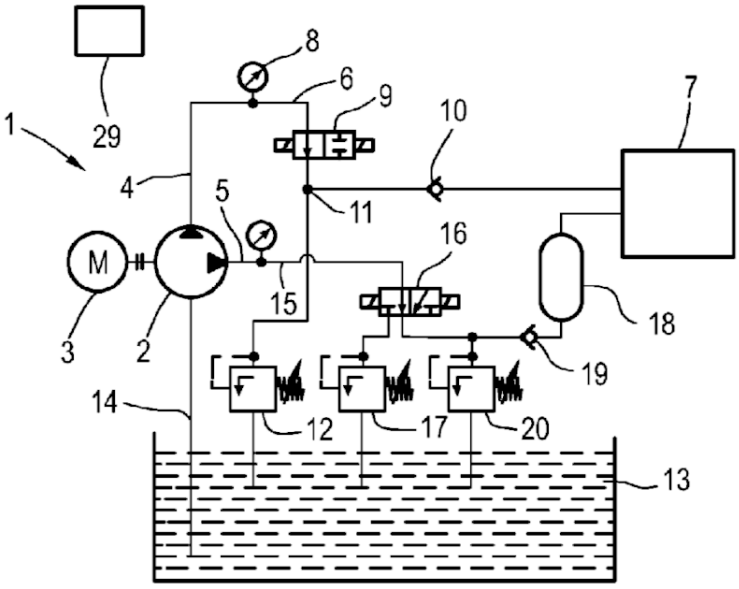
{Two or more rotating pumps driven together by the same power source, e.g. connected by a shaft, or a single pump having two or more fluid outputs}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/0242.





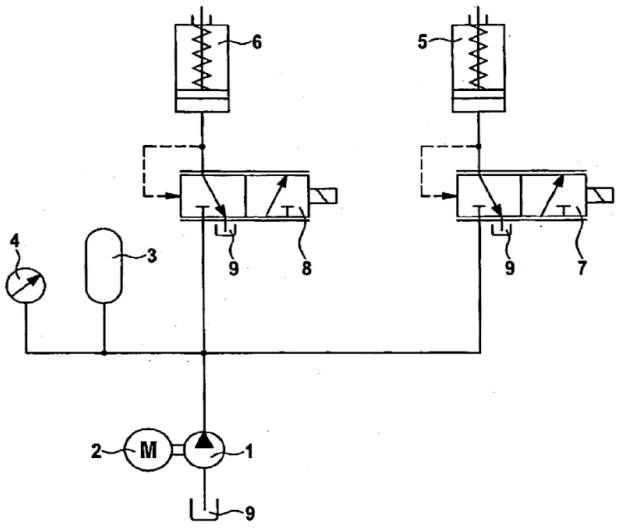
F16D 2048/0245

{Electrically driven rotary pumps}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/0245



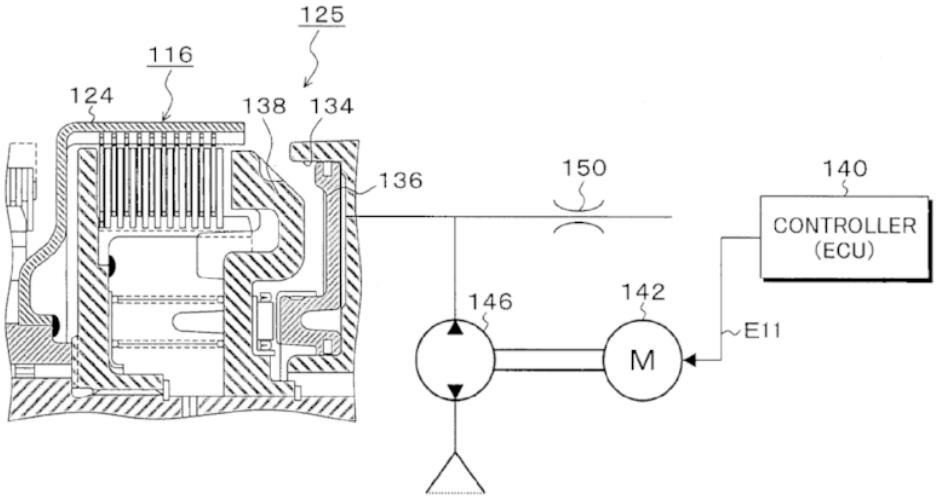
F16D 2048/0248

{Reversible rotary pumps, i.e. pumps that can be rotated in the two directions}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/0248.



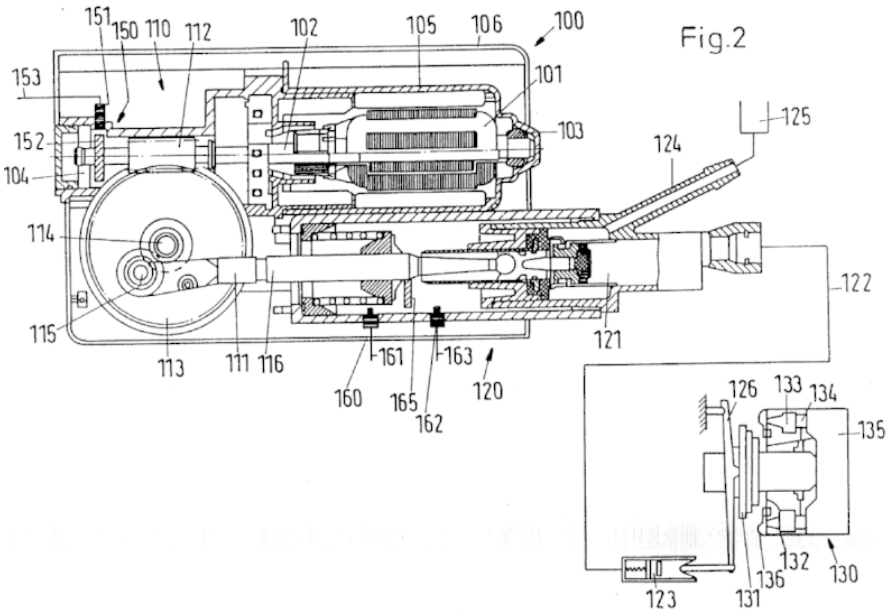
F16D 2048/0251

{Electric motor driving a piston, e.g. for actuating the master cylinder (for details of the actuator per se F16D 29/00)}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/0251.



References

Informative references

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

Details of actuators per se	F16D 29/00

F16D 2048/0254

{Double actuation, i.e. two actuation means can produce independently an engagement or disengagement of the clutch}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/0254.

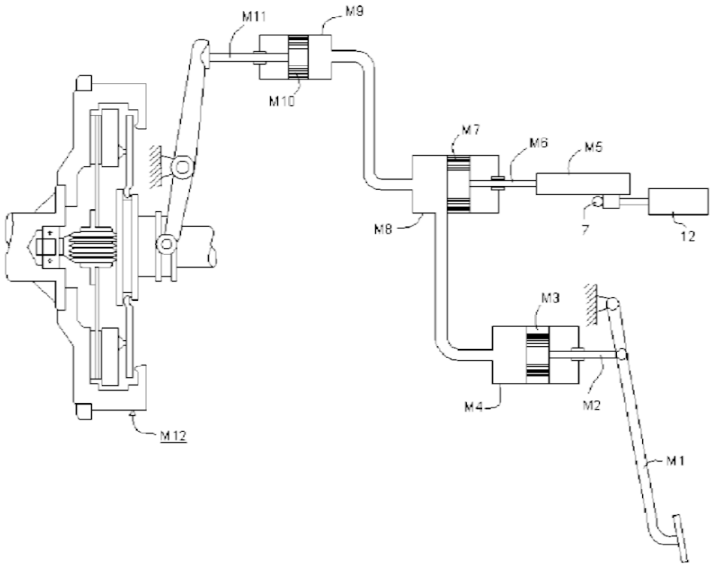
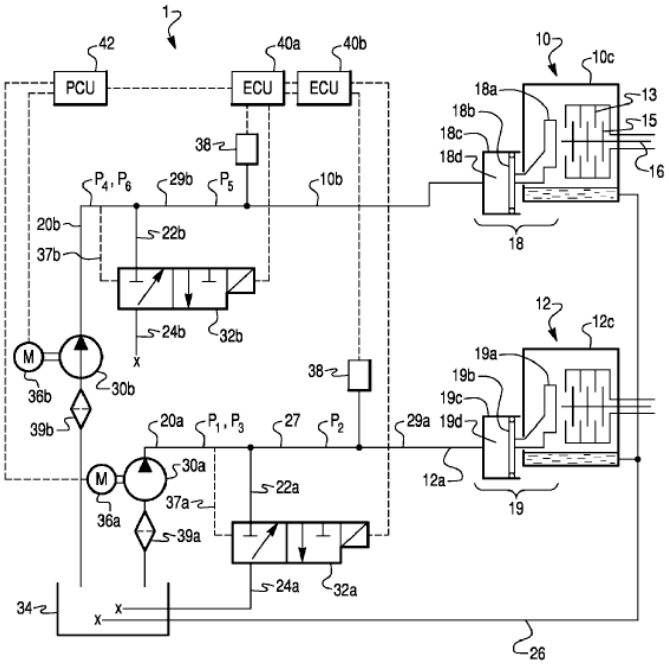


Fig. 5



F16D 2048/026

{The controlling actuation is directly performed by the pressure source, i.e. there is no intermediate valve for controlling flow or pressure}

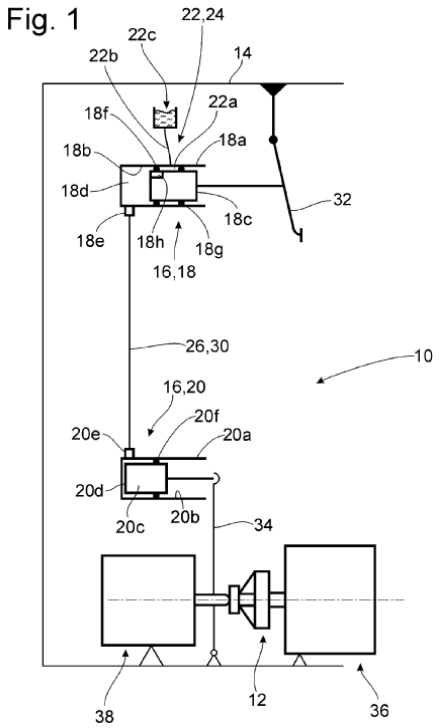
Definition statement

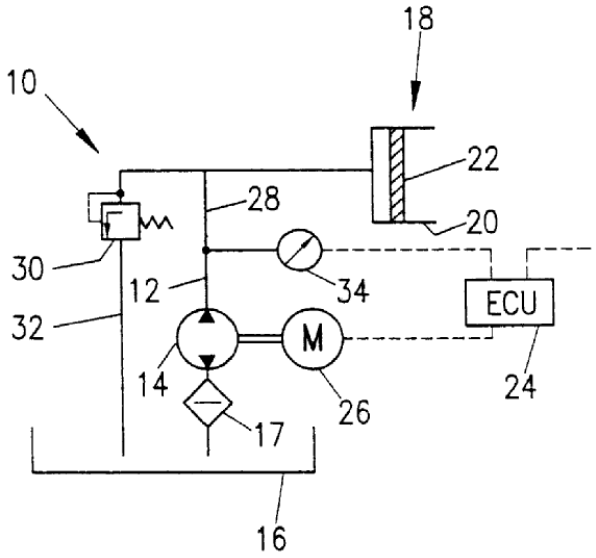
This place covers:

Illustrative example of subject matter classified in F16D 2048/026.

Arrangement: Source - Actuation cylinder

Fig. 1





F16D 2048/0263

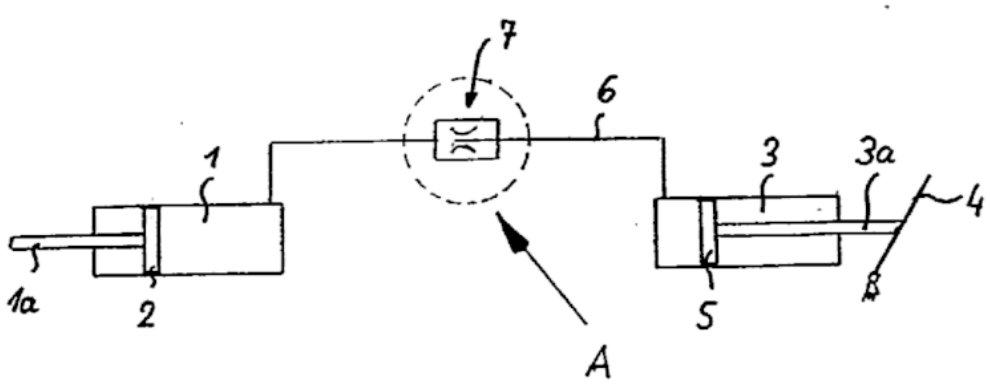
{Passive valves between pressure source and actuating cylinder, e.g. check valves or throttle valves}

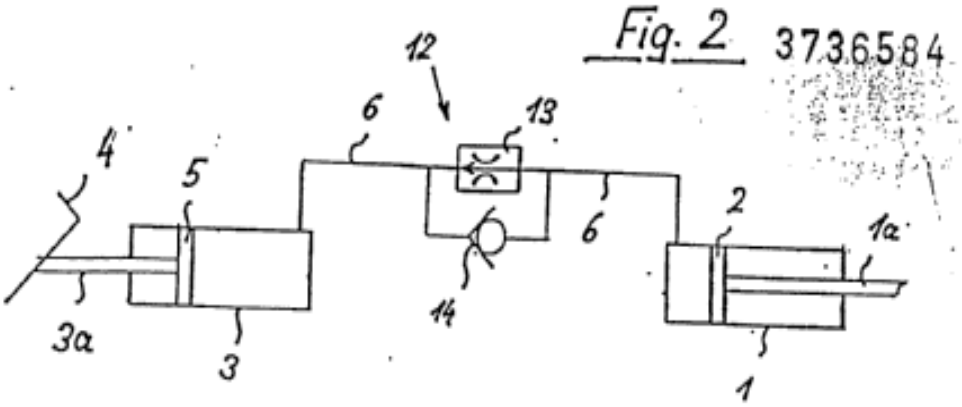
Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/0263.

Arrangement: Source- Passive valves - Actuation cylinder





F16D 2048/0266

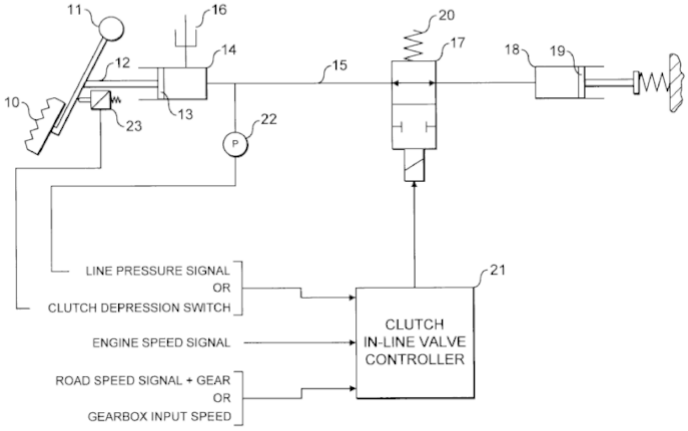
{Actively controlled valves between pressure source and actuation cylinder}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/0266.

Arrangement: Source - Active valves - Actuation cylinder



F16D 2048/0269

{Single valve for switching between fluid supply to actuation cylinder or draining to the sump}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/0269.

Arrangement: Source - Single valve - Actuation cylinder

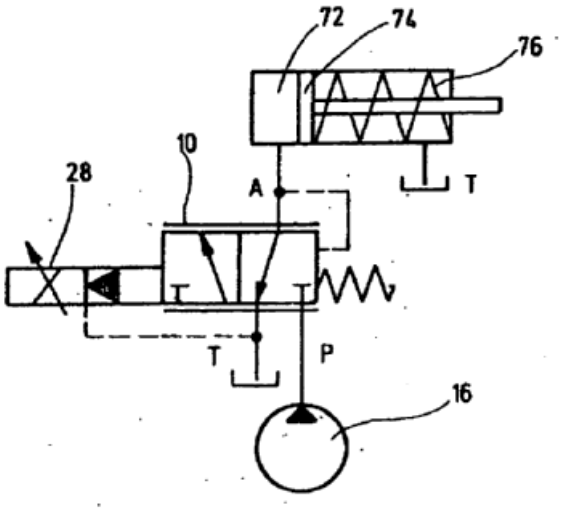
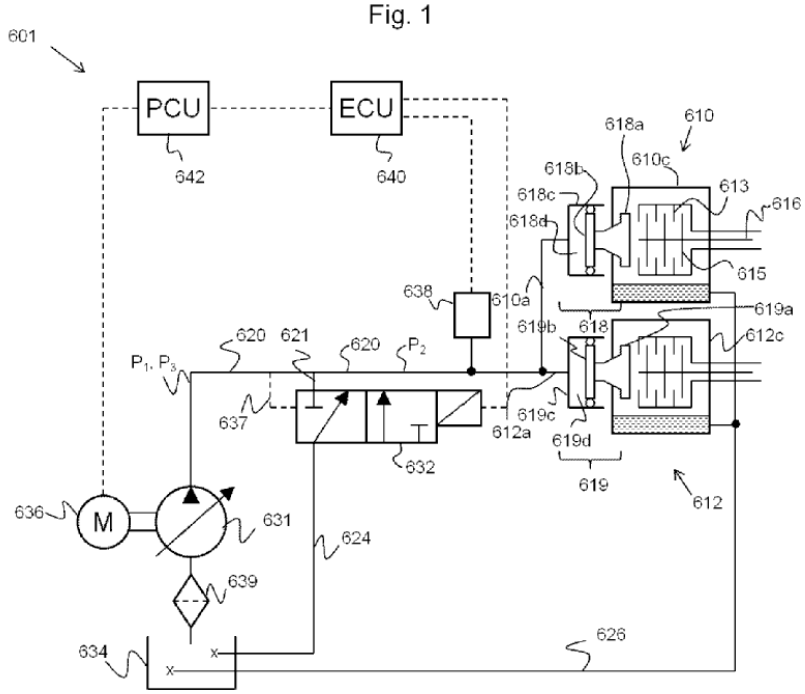


Fig. 1



F16D 2048/0272

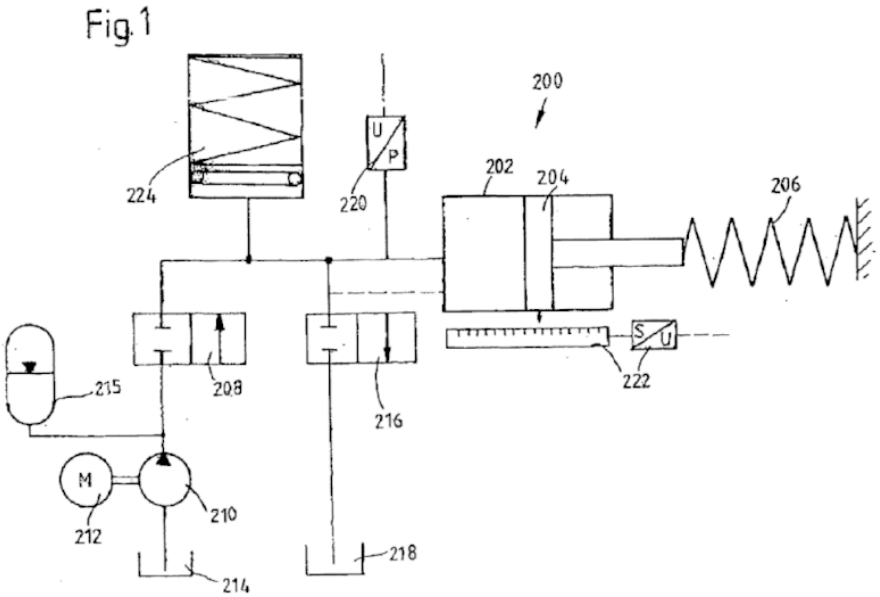
{Two valves, where one valve is supplying fluid to the cylinder and the other valve is for draining fluid to the sump}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/0272.

Arrangement: Source - Two valves - Actuation cylinder/Sump



F16D 2048/0275

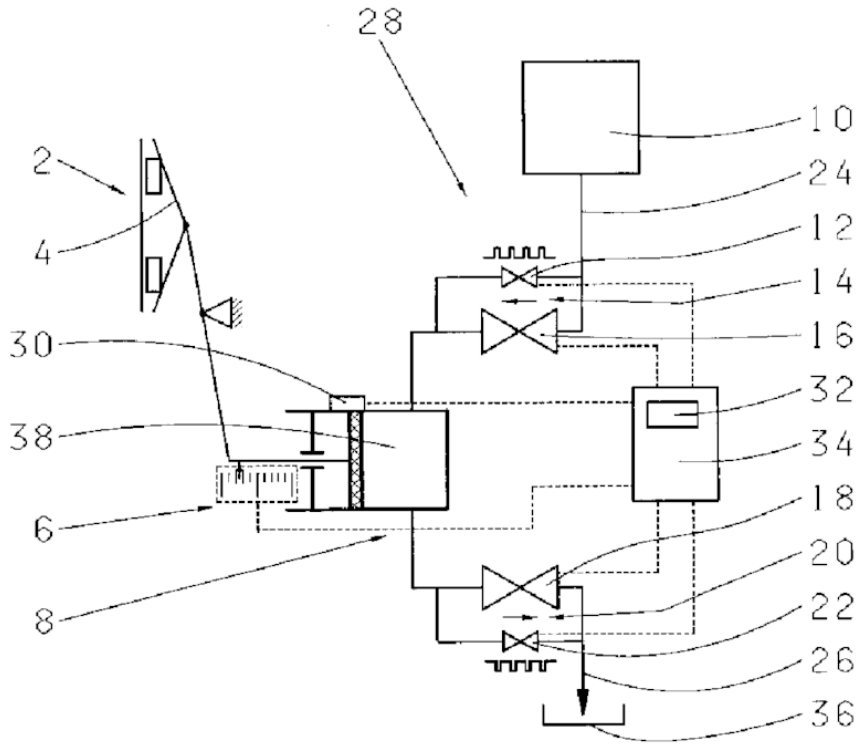
{Two valves arranged in parallel, e.g. one for coarse and the other for fine control during supplying or draining fluid from the actuation cylinder}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/0275.

Arrangement: Source - Two valves in parallel - Actuation cylinder



F16D 2048/0278

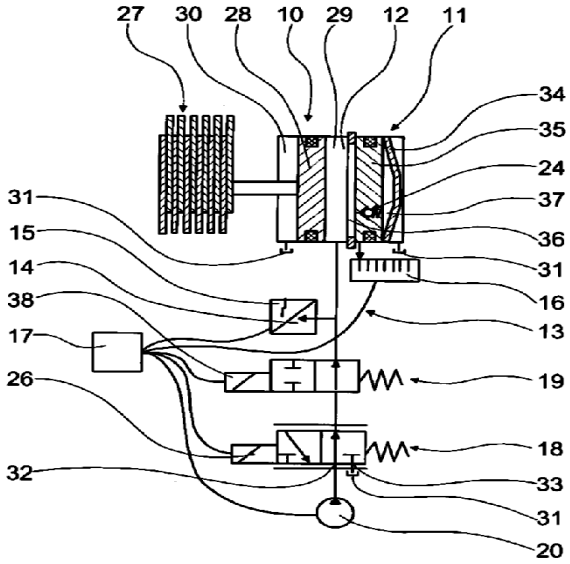
{Two valves in series arrangement for controlling supply to actuation cylinder}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/0278.

Arrangement: Source - Two valves in series - Actuation cylinder



F16D 2048/0281

{Complex circuits with more than two valves in series or special arrangements thereof not provided for in previous groups}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/0281.

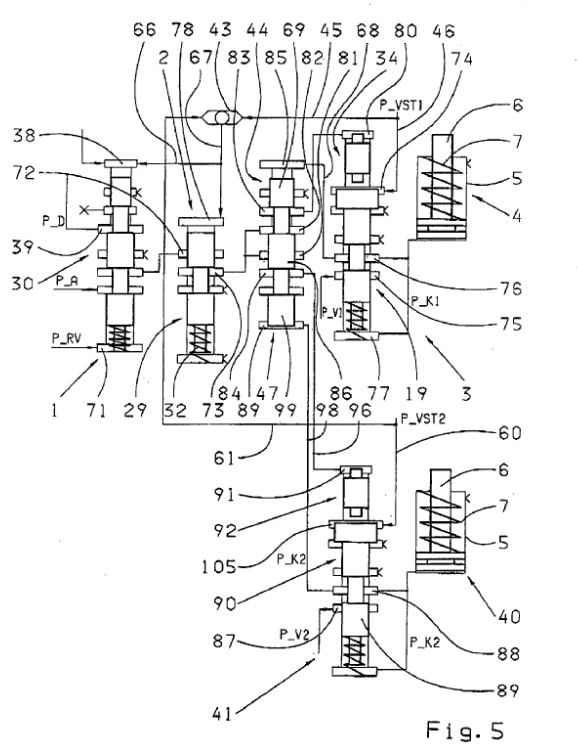


Fig. 5

F16D 2048/0284

{characterised by valve arrangements supplying fluid to a two chamber-cylinder}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/0284.

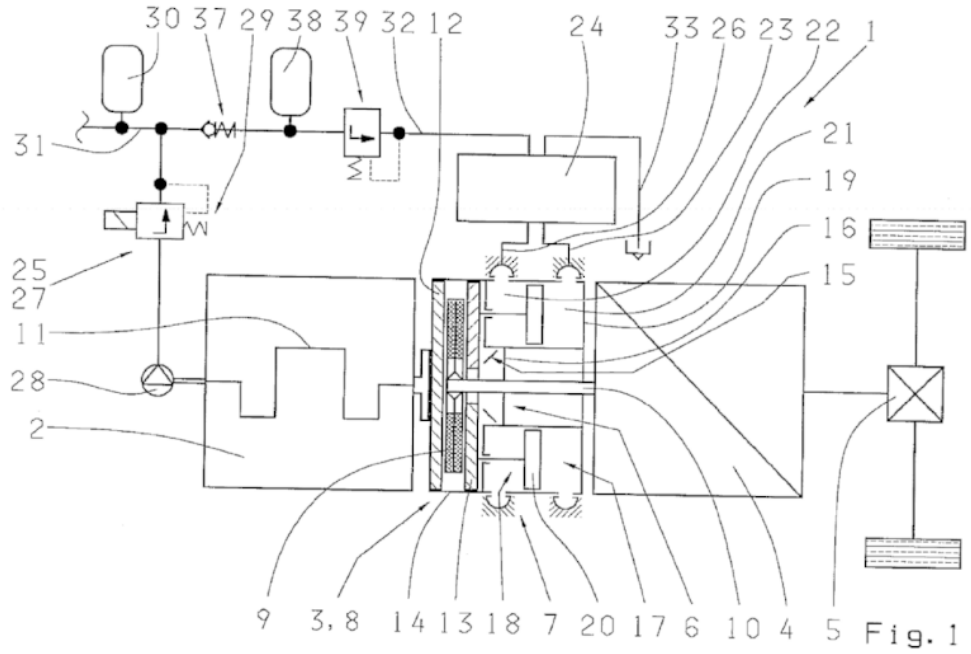


Fig. 1

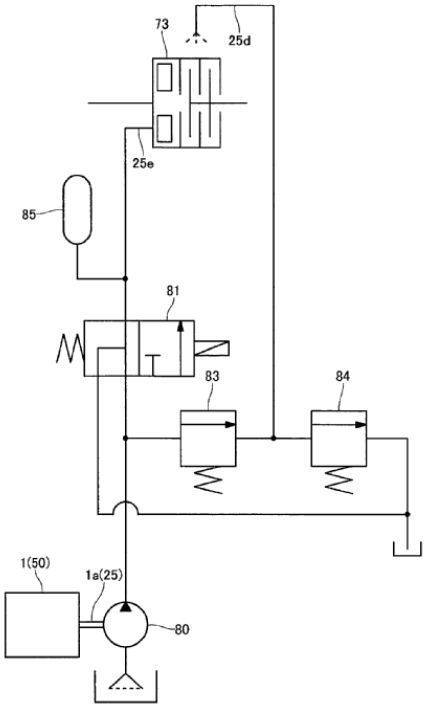
F16D 2048/029

{Hydraulic circuits combining clutch actuation with clutch lubrication or cooling}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/029.



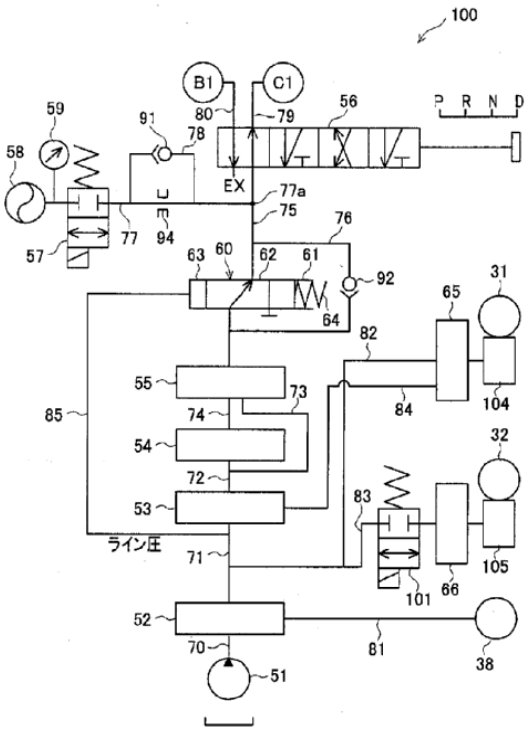
F16D 2048/0293

{Hydraulic circuits combining clutch and transmission actuation}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/0293.



F16D 2048/0296

{Hydraulic circuits controlled exclusively by hydraulic pressure, i.e. with no electrically controlled valves}

Definition statement

This place covers:

Illustrative example of subject matter classified in F16D 2048/0296.

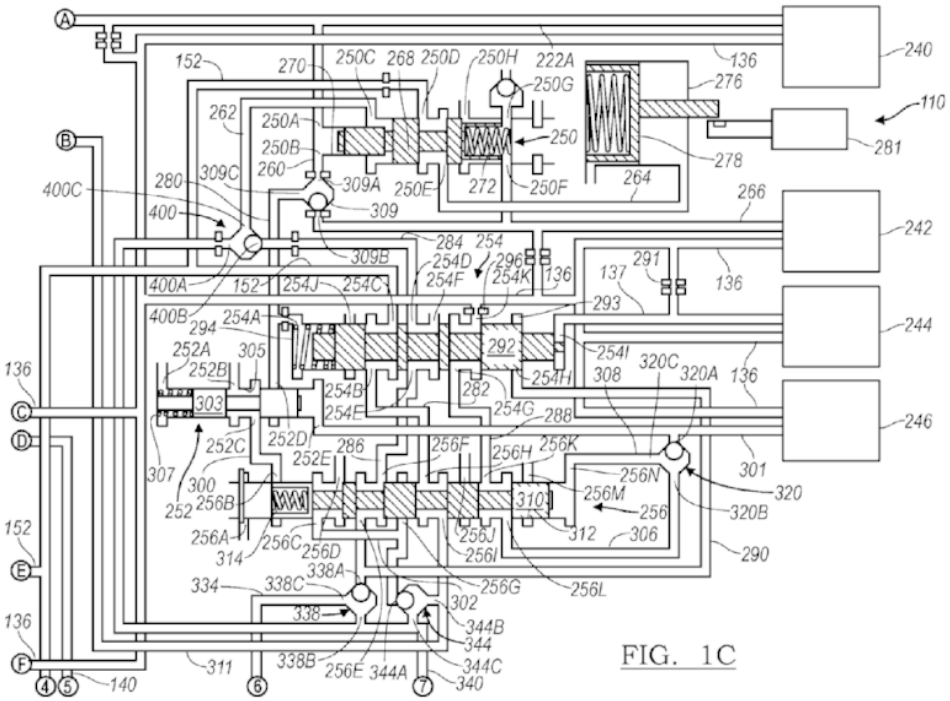


FIG. 1C

F16D 49/00

Brakes with a braking member co-operating with the periphery of a drum, wheel-rim, or the like (similar clutches F16D 13/10)

Definition statement

This place covers:

External drum brakes.

References

Limiting references

This place does not cover:

Bicycle brakes engaging the tyre surface	**B62L1/05**

Special rules of classification

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups F16D 2121/00 - F16D 2129/00.

F16D 51/00

Brakes with outwardly-movable braking members co-operating with the inner surface of a drum or the like (similar clutches F16D 13/14)

Definition statement

This place covers:

Internal drum brakes

Special rules of classification

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups F16D 2121/00 - F16D 2131/00.

F16D 53/00

Brakes with braking members co-operating with both the periphery and the inner surface of a drum, wheel-rim, or the like (similar clutches F16D 13/20)

Definition statement

This place covers:

Brakes with a drum that is engaged both radially internally and externally.

Special rules of classification

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups F16D 2121/00 - F16D 2131/00.

F16D 55/00

Brakes with substantially-radial braking surfaces pressed together in axial direction, e.g. disc brakes (similar clutches F16D 13/38)

Special rules of classification

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups F16D 2121/00 - F16D 2131/00.

F16D 55/22

by clamping an axially-located rotating disc between movable braking members, e.g. movable brake discs or brake pads

Definition statement

This place covers:

Standard disc brakes having an axially fixed disc.

F16D 55/224

with a common actuating member for the braking members

Definition statement

This place covers:

The common actuating member (e.g. caliper) is movably mounted (sliding, pivoting) in order to apply the brake force evenly on both sides of the disc.

Special rules of classification

This group is used if the way of mounting of the actuating member is not relevant or not shown.

F16D 55/2245

{in which the common actuating member acts on two levers carrying the braking members, e.g. tong-type brakes (similar brakes for rail vehicles B61H 5/00)}

Definition statement

This place covers:

Tong brakes, mainly for railway vehicles.

References

Limiting references

This place does not cover:

Rim brakes for bicycles	B62L 1/06

F16D 55/2255

in which the common actuating member is pivoted

Definition statement

This place covers:

e.g. pivoting caliper disc brakes.

F16D 55/228

with a separate actuating member for each side

Definition statement

This place covers:

so-called fixed caliper brakes.

F16D 55/24

with a plurality of axially-movable discs, lamellae, or pads, pressed from one side towards an axially-located member

Definition statement

This place covers:

The term "plurality of" relates to stator and rotor elements, i.e. brakes with one axially movable rotor and one axially movable stator (disc or pad) fall within the scope of this class.

F16D 55/28

Brakes with only one rotating disc

Definition statement

This place covers:

Brakes with a single disc which is rotating and axially movable.

F16D 55/36

Brakes with a plurality of rotating discs all lying side by side

Definition statement

This place covers:

so-called multi-disc or lamellae brakes.

F16D 57/00

Liquid-resistance brakes; {Brakes using the internal friction of fluids or fluid-like media, e.g. powders (for braking drums, barrels or ropes of cranes, lift hoists or winches B66D 5/026)}

Special rules of classification

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups F16D 2121/00 - F16D 2131/00.

F16D 59/00

Self-acting brakes, e.g. coming into operation at a predetermined speed

Special rules of classification

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups F16D 2121/00 - F16D 2131/00.

F16D 59/02

spring-loaded and adapted to be released by mechanical, fluid, or electromagnetic means

Definition statement

This place covers:

Spring-applied brakes, regardless of their type (drum / disc).

Special rules of classification

This group is not used for classification anymore. Instead a classification for the type of brake and the appropriate codes in group F16D 2121/00 "for releasing a normally applied brake" is assigned.

Example:

A spring-applied, electromagnetically released fixed caliper disc brake is classified F16D 55/228 and F16D 2121/22.

F16D 61/00

Brakes with means for making the energy absorbed available for use (F16D 57/00 takes precedence)

References

Limiting references

This place does not cover:

Electrodynamic brake systems for vehicles	B60L 7/00
Dynamo-electric brakes	H02K 49/00

Special rules of classification

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups F16D 2121/00 - F16D 2131/00.

F16D 63/00

Brakes not otherwise provided for; Brakes combining more than one of the types of groups F16D 49/00 - F16D 61/00

Definition statement

This place covers:

Brakes combining a plurality of brakes, each of these brakes is additionally classified in the relevant groups, e.g. a combined disc and drum brake is classified F16D 63/00 and F16D 51/00 and F16D 55/00.

Special rules of classification

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups F16D 2121/00 - F16D 2131/00.

F16D 65/00

Parts or details (similar members for clutches F16D 13/58)

Definition statement

This place covers:

Brake parts, details and accessories which cannot be classified in any of the other groups or in the subgroups of F16D 65/00.

Special rules of classification

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups F16D 2121/00 - F16D 2131/00.

F16D 65/0006

{Noise or vibration control}

Definition statement

This place covers:

Means for noise or vibration control in brakes.

References

Limiting references

This place does not cover:

Resilient means interposed between pads and supporting members (so-called anti-rattle springs)	F16D 65/097

Special rules of classification

If noise or vibration of a specific brake or component is controlled, an additional classification is given.

Example:

A brake disc with means for noise damping is classified F16D 65/0006 and F16D 65/12.

F16D 65/005

{Components of axially engaging brakes not otherwise provided for}

Definition statement

This place covers:

Parts of axially engaging brakes, e.g. disc brakes, which are classified F16D 55/00.

F16D 65/02

Braking members; Mounting thereof (friction linings or attachment thereof F16D 69/00)

Definition statement

This place covers:

Members interacting with each other to produce the braking effect, including active braking members, e.g. brake pads, and passive members to be braked, e.g. brake discs and drums; Accessories for mounting, e.g. holding springs, abutments.

References

Limiting references

This place does not cover:

Friction linings as such (physical aspects, e.g. shape)	F16D 69/00
Friction lining composition	F16D 69/02

F16D 65/09

Pivots or supporting members therefor

Definition statement

This place covers:

Drum brake shoe pivots or abutments, e.g. anchor blocks.

F16D 65/091

{for axially holding the segments}

Definition statement

This place covers:

e.g. springs holding drum brake shoes in contact with the brake carrier.

F16D 65/095

Pivots or supporting members therefor

Definition statement

This place covers:

e.g. details of disc brake pad abutments.

F16D 65/097

Resilient means interposed between pads and supporting members {or other brake parts}

Definition statement

This place covers:

primarily so-called anti-rattle springs.

F16D 65/10

Drums for externally- or internally-engaging brakes

Definition statement

This place covers:

Cylindrical braked members, engaged on the radially inner and/or outer side. Contains mainly brake drums for standard drum brakes, i.e. with radially inner braking surface.

References

Limiting references

This place does not cover:

Rotors having both a drum and a disc part	F16D 65/12

Special rules of classification

Additional classification is given in groups F16D 2065/13.

F16D 65/12

Discs; Drums for disc brakes

Definition statement

This place covers:

Simple disc rotors and rotors having both a drum and a disc part.

Special rules of classification

Additional classification is given in groups F16D 2065/13.

F16D 65/16

arranged in or on the brake

Definition statement

This place covers:

Actuating mechanisms which are integrated in the brake itself.

References

Limiting references

This place does not cover:

Actuation mechanisms arranged apart from the brake, e.g. connected to the brake by a rod.	F16D 65/12

F16D 65/18

adapted for drawing members together {, e.g. for disc brakes}

Definition statement

This place covers:

in particular disc brake actuators.

F16D 65/22

adapted for pressing members apart {, e.g. for drum brakes}

Definition statement

This place covers:

in particular drum brake actuators.

F16D 65/28

arranged apart from the brake

Definition statement

This place covers:

Independent actuator units, e.g. slave cylinders acting on the brake members via a rod.

References

Informative references

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

Brake cylinders other than ultimate actuators	B60T 17/08

F16D 65/78

Features relating to cooling

Definition statement

This place covers:

Anything to do with cooling of brakes; e.g. modification of brakes to improve cooling, liquid cooling circuits.

References

Limiting references

This place does not cover:

Brake drums with cooling fins	F16D 65/10 and F16D 2065/1332
Internally ventilated brake discs	F16D 65/12 and F16D 2065/1328
Vehicle modifications to facilitate cooling of brakes	B60T 5/00

F16D 66/00

Arrangements for monitoring working conditions, e.g. wear, temperature

Definition statement

This place covers:

Devices for brake monitoring only.

References

Limiting references

This place does not cover:

Monitoring brake control circuits	B60T 17/18

Special rules of classification

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups F16D 2121/00 - F16D 2131/00.

F16D 67/00

Combinations of couplings and brakes; Combinations of clutches and brakes (combinations of couplings and clutches F16D 47/02; conjoint control of brake systems and driveline clutches in vehicles B60W 10/02, B60W 10/18)

Definition statement

This place covers:

Arrangements combining clutches with brakes in one unit

Arrangements combining couplings with brakes in one unit

References

Limiting references

This place does not cover:

Conjoint control of brake systems and driveline clutches in vehicles	B60W 10/02, B60W 10/18

Special rules of classification

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups F16D 2121/00 - F16D 2131/00, e.g. additional classification for indicating type of brake and actuating force are assigned.

F16D 67/02

Clutch-brake combinations

Definition statement

This place covers:

Clutches with external or internal control combined with a brake.

F16D 69/00

Friction linings; Attachment thereof; Selection of coacting friction substances or surfaces (clutching elements F16D 13/60; braking members F16D 65/02)

Definition statement

This place covers:

Friction elements characterised by their physical aspects (e.g. shape or surface structure).

References

Limiting references

This place does not cover:

Braking members, e.g. assembly of friction material and support structure, friction block with backing plate	F16D 65/02
Friction lining composition	F16D 69/02

Special rules of classification

All technical features that are considered relevant for future prior art searches should be classified by using codes in groups F16D 2200/00 and F16D 2250/00.

F16D 69/02

Composition of linings {; Methods of manufacturing}

Definition statement

This place covers:

- processes for making friction linings
- special shapes or arrangements of linings
- semi-metallic compositions e.g. metal-ceramic

References

Limiting references

This place does not cover:

- ceramic composites (e.g. C/SiC): F16D 69/023 with Indexing Code for "ceramic composite" and C04B

- anti friction materials: F16C 33/00

Informative references

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

Clutching elements	F16D 13/60
Braking elements	F16D 65/02
Mating compositions for stator / rotor	F16D 2069/003
Layered structure	F16D 2069/005, F16D 2069/006, F16D 2069/007
Clutch discs	**F13D13/64**

Special rules of classification

Surface treatment of the friction surface F16D 69/02 and Indexing Code for "surface treatment"

F16D 69/023

{Composite materials containing carbon and carbon fibres or fibres made of carbonizable material}

Definition statement

This place covers:

C/C composites and ceramic composites : carbon/carbon composites infiltrated with Si, B or Metals.

References

Informative references

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

C/C composites infiltrated with silicium, in general	C04B 35/573
C/C composite materials in general	C04B 35/83

Special rules of classification

For ceramic composites: F16D 69/023 and Indexing Code for "ceramic composite".

F16D 69/027

{Compositions based on metals or inorganic oxides}

Definition statement

This place covers:

Compositions containing :

- metals or metal oxides as BINDER
- inorganic binders
- sintered metals

References

Informative references

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

Metal alloys	C22C

F16D 2121/00

Type of actuator operation force

Definition statement

This place covers:

This code indicates which operation force drives the brake and is combined with a classification characterising the general structure of the brake or the actuator itself (e.g. drum / disc brake).

If different sources are present, each is classified separately, and in addition, a classification in group F16D 2123/00 is assigned.

References

Informative references

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

Actuator components	F16D 2125/00
Actuators for ancillary elements like parking brake locks	F16D 2129/00

F16D 2121/18

Electric or magnetic

References

Limiting references

This place does not cover:

Brakes comprising a medium with electrically or magnetically controlled internal friction	F16D 57/002
Electrodynamic brake systems for vehicles	B60L 7/00
Dynamo-electric brakes; eddy current brakes	H02K 49/00

F16D 2123/00

Multiple operation forces

Definition statement

This place covers:

This code indicates the presence of multiple independently operating actuators. Not used for plural actuators which are connected to the same power source and can only work in concert, like interconnected hydraulic cylinders.

When this code is assigned, each operation force is indexed additionally.

F16D 2125/00

Components of actuators

Definition statement

This place covers:

The code is used to describe the mechanical construction of actuators; a symbol is assigned for each individual component.

F16D 2127/00

Auxiliary mechanisms

Definition statement

This place covers:

Additional control mechanisms having a specific function; does not include slack adjusters (classified in group **F16D38/00**) or simple mechanical elements (indexed F16D 2125/00).