F15B

SYSTEMS ACTING BY MEANS OF FLUIDS IN GENERAL; FLUID-PRESSURE ACTUATORS, e.g. SERVOMOTORS; DETAILS OF FLUID-PRESSURE SYSTEMS, NOT OTHERWISE PROVIDED FOR

Definition statement

This place covers:

Systems transferring mechanical energy by means of a fluid under pressure using the principles of fluid statics or hydrostatics, i.e. hydraulic or pneumatic systems

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:

Fluid clutches or brakes	F16D
Fluid springs	F16F
Fluid gearing	F16H
Fluid-operating means for valves	F16K 31/12

Informative references

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

Hydraulically or pneumatically operated lifting devices for soil-working machines	A01B 63/10
Hydraulic drawing presses	B21D
Hydraulic or pneumatic manipulators	B25J
Hydraulic or pneumatic tipping devices for vehicles	B60P 1/00
Hydraulic or pneumatic remote control for railway signals	B61L 7/04
Desalination	B63J 1/00
Water purification	C02F 1/00
Hydraulic or pneumatic mine supports	E21D 15/44
Motors, turbines, compressors, blowers, pumps	F01 - F04
Steam engines	F01B
Engine water cooling	F01P 3/00
Fuel injection	F02M
Perpetua mobilia using fluid	F03B 17/00
Fluid signal amplifiers, relays	F15C
Fluid dynamics	F15D
Pistons, cylinders packing	F16J
Valves, taps, cocks, actuating-floats	F16K
Safety valves with auxiliary fluid operation of the main valve	F16K 17/10
Pipes, pipe joints	F16L

Lubricating	F16N
Central heating systems	F24D 3/00

Glossary of terms

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

Pneumatic	using air or an inert gas (except steam) as a pressure medium.
Hydraulic	using a liquid as the pressure medium.
Telemotor	system or device in which a substantially constant amount of fluid is trapped between an input member and an output member to act as a fluid link
Servomotor	fluid-pressure actuator, e.g. a piston and a cylinder, directly controlled by a valve or other device (e.g. pump) which is responsive to operation of an initial controlling member (e.g. joystick). The initial controlling member may be adjacent to the servomotor or at a distance and may be, e.g. a hand lever.

F15B 1/00

Installations or systems with accumulators; Supply reservoir or sump assemblies

References

Informative references

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

Hydro-pneumatic suspensions	B60G 17/056 , F16F 9/06
Pumps having reservoirs	F04B 41/04
Central heating systems	F24D 3/1008

Special rules of classification

The main group F15B 1/00 is complemented by the main group F15B 2201/00 and is used for classifying invention information only.

Glossary of terms

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

Accumulator	vessel for storing pressurised liquid (e.g. using a liquid and a gas chamber separated by a membrane or piston or using an elastic housing)

F15B 1/02

Installations or systems with accumulators

References

Informative references

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

Energy recuperation means	F15B 21/14

Glossary of terms

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

Accumulator	vessel for storing pressurised liquid (e.g. using a liquid and a gas chamber separated by a membrane or piston or using an elastic housing)

F15B 1/021

{used for damping}

References

Informative references

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

Pumps having accumulators for reducing pressure pulsations	F04B 11/0008
Hydro-pneumatic suspensions	F16F 9/08
Buffers for preventing water hammer	F16L 55/05

F15B 1/022

{used as an emergency power source, e.g. in case of pump failure}

References

Informative references

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

See also	F15B 2211/212

Special rules of classification

F15B 2211/212 takes precedence

F15B 1/024

{used as a supplementary power source, e.g. to store energy in idle periods to balance pump load}

Definition statement

This place covers:

Also for recuperation of hydraulic energy (as e.g. used in hydraulic excavators)

References

Informative references

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

Dredgers or soil-shifting machinery with energy recovery arrangements	E02F 9/2217

F15B 1/025

{used for thermal compensation, e.g. to collect expanded fluid and to return it to the system as the system fluid cools down}

References

Informative references

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

Central heating systems	F24D 3/1008

F15B 1/027

having accumulator charging devices

Definition statement

This place covers:

E.g. valves controlling flow of hydraulic fluid to and from the liquid chamber of an accumulator.

References

Informative references

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

Accumulator gas charging devices	F15B 1/08, F15B 2201/415
Control of fluid pressure in general	G05D 16/00

F15B 1/04

Accumulators

Definition statement

This place covers:

Vessel for storing pressurised liquid (e.g. using a liquid and a gas chamber separated by a membrane or piston or using an elastic housing).

References

Informative references

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

Pumps having accumulators for reducing pressure pulsations	F04B 11/0008
Hydro-pneumatic suspensions	F16F 9/08
Buffers for preventing water hammer	F16L 55/05
Pressure vessels per se	F17C 1/00
Central heating systems	F24D 3/1008

Special rules of classification

The sub-group F15B 1/04 is complemented by the main group F15B 2201/00

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- "pressure accumulator", "Druckspeicher", "Hydrospeicher "and "Accumulateur"
- "bladder-type accumulator" and "Blasenspeicher"
- "membrane-type accumulator" and "Membranspeicher"
- "accumulator using pistons" and "Kolbenspeicher"
- "accumulators having springs" and "Federspeicher"

F15B 1/08

using a gas cushion; Gas charging devices; Indicators or floats therefor

References

Informative references

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

See also	F15B 2201/205

Special rules of classification

F15B 2201/205 takes precedence.

F15B 1/083

{the accumulator having a fusible plug}

Definition statement

This place covers:

Accumulators with a safety plugs that melt at a certain temperature for relieving the pressure.

F15B 1/086

{the gas cushion being entirely enclosed by the separating means, e.g. foam or gas-filled balls}

References

Limiting references

This place does not cover:

Accumulators using bladders	F15B 1/165

Informative references

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

See also	F15B 2201/3154

Special rules of classification

F15B 2201/3154 takes precedence.

F15B 1/10

with flexible separating means

References

Informative references

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

Accumulators with flexible separating means but without gas cushion	F15B 1/04
See also	F15B 2201/315

Special rules of classification

F15B 2201/315 takes precedence.

Accumulators not using a gas cushion are classified in F15B 1/04 even if they have flexible separating means (e.g. a membrane).

F15B 1/103

{the separating means being bellows}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

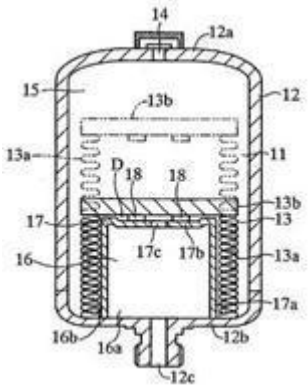


Fig. from US2004244857

References

Informative references

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

See also	F15B 2201/3153

Special rules of classification

F15B 2201/3153 takes precedence.

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- "bellows", "Faltenbalg" and " soufflet"

F15B 1/106

{characterised by the way housing components are assembled}

References

Informative references

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

See also	F15B 2201/605

Special rules of classification

F15B 2201/605 takes precedence.

F15B 1/125

{characterised by the attachment means (F15B 1/14 takes precedence)}

Special rules of classification

F15B 1/14 takes precedence.

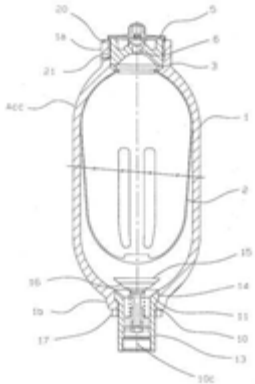
F15B 1/165

{in the form of a bladder}

Definition statement

This place covers:

Accumulators using bladders, i.e. essentially cylindrical flexible separating means having a first open end portion which is normally rounded and a second end portion with a fluid inlet for separating a



hydraulic fluid and a gas.

Fig. from US2006042707

References

Informative references

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

See also	F15B 2201/3152

Special rules of classification

F15B 2201/3152 takes precedence.

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- "bladder", "Blase" and "vessie"
- " bladder-type accumulator", "Blasenspeicher" and "accumulateur à vessie"

F15B 1/18

Anti-extrusion means

References

Informative references

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

See also	F15B 2201/43

Special rules of classification

F15B 2201/43 takes precedence.

F15B 1/20

fixed to the separating means

References

Informative references

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

See also	F15B 2201/435

Special rules of classification

F15B 2201/435 takes precedence.

F15B 1/22

Liquid port constructions

References

Informative references

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

See also	F15B 2201/41

Special rules of classification

F15B 2201/41 takes precedence.

F15B 1/24

with rigid separating means, e.g. pistons

References

Informative references

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

See also	F15B 2201/31

Special rules of classification

F15B 2201/31 takes precedence.

Accumulators using springs and no gas cushion are classified in F15B 1/04 even if they have rigid separating means (e.g. a piston).

F15B 1/26

Supply reservoir or sump assemblies

References

Informative references

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

Reservoirs for vehicle braking systems	B60T 17/06
Fluid supply systems for power Power-steering systems with reservoirs	B62D 5/07
Pumps having reservoirs	F04B 41/04

F15B 1/265

{with pressurised main reservoir}

References

Informative references

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

Systems with accumulators	F15B 1/02

F15B 3/00

Intensifiers or fluid-pressure converters, e.g. pressure exchangers; Conveying pressure from one fluid system to another, without contact between the fluids {(fluid-driven pumps F04B 9/08)}

Definition statement

This place covers:

Devices for converting fluid energy, i.e. from a flow of fluid having high pressure and low flow rate to a flow of fluid having low pressure and high flow rate or vice versa.

E.g. devices using pistons of different size or rotating fluid pumps and motors of different capacity.

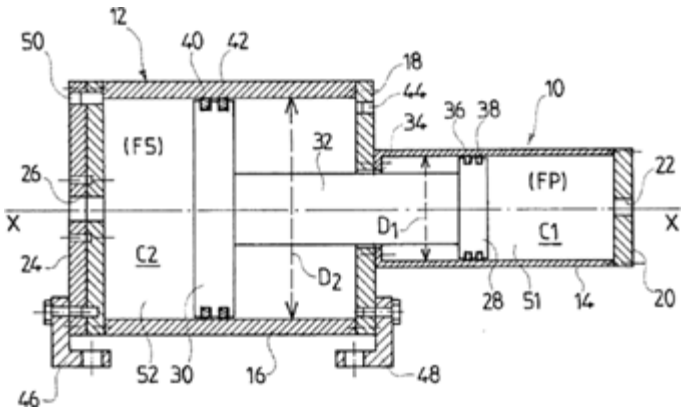


Fig. from FR2822906

References

Limiting references

This place does not cover:

Fluid-driven pumps	F04B 9/08

Informative references

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

Pressure intensifiers in processes of separation using semi-permeable membranes, e.g. dialysis, osmosis	B01D 61/00
Fluid-driven pumps	F04B 9/08

F15B 5/00

Transducers converting variations of physical quantities, e.g. expressed by variations in positions of members, into fluid-pressure variations or vice versa; Varying fluid pressure as a function of variations of a plurality of fluid pressures or variations of other quantities (F15B 9/00 takes precedence)

References

Limiting references

This place does not cover:

Servomotors with follow-up action	F15B 9/00

Informative references

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

Transducers for measuring or controlling	G01, G05
Pressure sensors	G01L 9/00

F15B 7/00

Systems in which the movement produced is definitely related to the output of a volumetric pump; Telemotors

Definition statement

This place covers:

E.g. systems wherein a master cylinder is directly connected to a slave cylinder. Illustrative example:

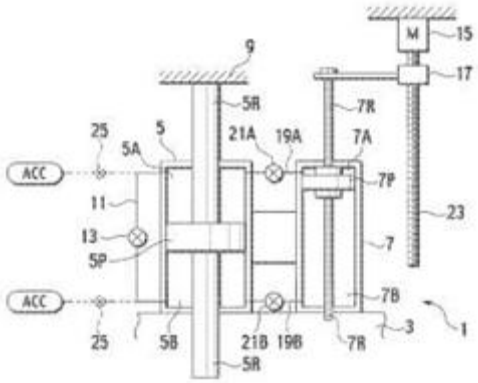


Fig. from WO2006129746

References

Informative references

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

Combinations of telemotor and servomotor systems	F15B 17/00
For control in motor vehicles	B60K
Vehicle brakes	B60T 1/08, B60T 1/093
For control in ships	B63H 25/00
For control in aircraft	B64C 13/00
Hydraulic clutch actuation	F16D 25/00
Hydraulic gear shifting devices	F16H 61/30

Glossary of terms

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

Telemotor	system or device in which a substantially constant amount of fluid is trapped between an input member and an output member to act as a fluid link, e.g. realised as a master cylinder which is directly connected to a slave cylinder.

F15B 7/001

{With multiple inputs, e.g. for dual control}

References

Informative references

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

Input units (e.g. master cylinders)	F15B 7/08

F15B 7/005

{With rotary or crank input}

References

Informative references

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

Input units	F15B 7/08

F15B 7/04

In which the ratio between pump stroke and motor stroke varies with the resistance against the motor

References

Informative references

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

In brake actuating systems for motor vehicles	B60T

F15B 7/06

Details (F15B 15/00 takes precedence)

Special rules of classification

F15B 15/00 takes precedence for slave cylinders.

F15B 7/08

Input units; Master units

References

Informative references

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

Vehicle brake master cylinders	B60T 11/16

F15B 7/10

Compensation of the liquid content in a system (F15B 7/08 takes precedence)

References

Limiting references

This place does not cover:

Details of input units or master units	F15B 7/08

Informative references

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

Pressure-maintaining arrangements for brake master cylinders	B60T 11/228

F15B 9/00

Servomotors with follow-up action, {e.g. obtained by feed-back control,} i.e. in which the position of the actuated member conforms with that of the controlling member

Definition statement

This place covers:

Fluid power drives using position feed-back

Glossary of terms

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

Servomotor	fluid-pressure acutator, e.g. a piston and a cylinder, directly controlled by a valve or other device (e.g. pump) which is responsive to operation of an initial controlling member (e.g. joystick). The initial controlling member may be adjacent to the servomotor or at a distance and may be, e.g. a hand lever.

F15B 9/10

in which the controlling element and the servomotor each controls a separate member, these members influencing different fluid passages or the same passage

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

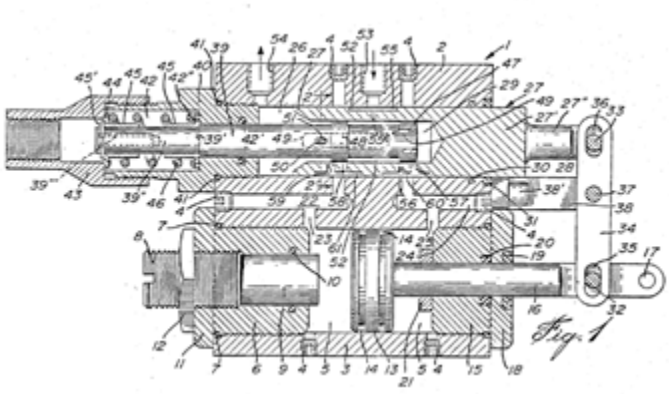


Fig. from US4733601

F15B 9/12

in which both the controlling element and the servomotor control the same member influencing a fluid passage and are connected to that member by means of a differential gearing

Definition statement

This place covers:

This class is also used for systems with a differential gear ratio of 1:1. Illustrative example:

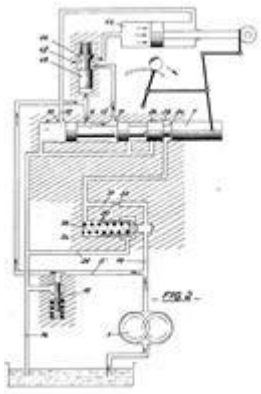


Fig. from FR74115

F15B 9/16

Systems essentially having two or more interacting servomotors {, e.g. multi-stage (F15B 18/00, F15B 20/00 take precedence)}

Definition statement

This place covers:

E.g. multi-stage systems

References

Limiting references

This place does not cover:

Parallel arrangements of independent servomotor systems	F15B 18/00
Safety arrangements therefor	F15B 20/00

Informative references

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

Servo-operated pilot valves for the following stage	F15B 13/042

F15B 11/00

Servomotor systems without provision for follow-up action; {Circuits therefor} (F15B 3/00 takes precedence)

Definition statement

This place covers:

Servomotor systems without provision for follow-up action and circuits therefor

Special rules of classification

The main group F15B 11/00 is omplemented by the main group F15B 2211/00 and is used for classifying invention information only. F15B 2211/00 takes precedence.

Glossary of terms

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

Servomotor	fluid-pressure acutator, e.g. a piston and a cylinder, directly controlled by a valve or other device (e.g. pump) which is responsive to operation of an initial controlling member (e.g. joystick). The initial controlling member may be adjacent to the servomotor or at a distance and may be, e.g. a hand lever.

F15B 11/003

{Systems with load-holding valves}

Definition statement

This place covers:

This class comprises releasable check valves and proportional braking valves.

References

Informative references

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

Locking valve details	F15B 13/01
See also	F15B 2211/30515

Special rules of classification

F15B 2211/30515 takes precedence.

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- "load holding valve" and "Lasthalteventil"
- "releasable check valve" and "Entsperrbares Rückschlagventil "

F15B 11/022

{in which a rapid approach stroke is followed by a slower, high-force working stroke (F15B 11/0325 takes precedence)}

References

Limiting references

This place does not cover:

fluid-pressure converters increasing the working force after an approach stroke	F15B 11/0325

Informative references

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

Combined control for output members	F15B 2211/775

F15B 11/024

by means of differential connection of the servomotor lines, e.g. regenerative circuits

References

Informative references

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

Regeneration valves per se	F15B 13/021
Systems with directional control valves having a regenerative position	F15B 2211/3133

F15B 11/028

for controlling the actuating force (F15B 11/024 takes precedence)

References

Informative references

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

See also	F15B 2211/76

Special rules of classification

F15B 11/024, F15B 2211/76 take precedence.

F15B 11/032

by means of fluid-pressure converters

References

Informative references

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

Fluid pressure converters	F15B 3/00

F15B 11/036

by means of servomotors having a plurality of working chambers

References

Informative references

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

Servomotors (fluid pressure actuators)	F15B 15/00

F15B 11/0406

{during starting or stopping (F15B 11/048 takes precedence)}

References

Informative references

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

See also	F15B 2211/755, F15B 2211/851, F15B 2211/853

Special rules of classification

F15B 11/048, F15B 2211/00 take precedence.

F15B 11/042

by means in the feed line {, i.e. "meter in"} (F15B 11/046, F15B 11/05 take precedence)

References

Limiting references

This place does not cover:

Servomotor systems for controlling the speed of an output member, the speed depending on the position of the working member	F15B 11/046
Servomotor systems specially adapted to maintain constant speed force of an output member	F15B 11/05

Informative references

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

Servomotor systems with directional control combined with flow control by regulating in feed line, i.e. meter-in control	F15B 2211/351

Special rules of classification

F15B 11/05, F15B 2211/351 take precedence.

F15B 11/0423

{by controlling pump output or bypass, other than to maintain constant speed}

References

Informative references

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

Adjusting pump output or bypass to maintain constant speed	F15B 11/055

F15B 11/0426

{by controlling the number of pumps or parallel valves switched on}

Definition statement

This place covers:

E.g. systems controlling the speed by means of so-called digital valves or by means of systems using pulse code modulation (PCM)

References

Informative references

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

Circuits with digital valves	F15B 2211/40592

F15B 11/044

by means in the return line {, i.e. "meter out"} (F15B 11/046, F15B 11/05 take precedence)

References

Limiting references

This place does not cover:

Servomotor systems for controlling the speed of an output member, the speed depending on the position of the working member	F15B 11/046
Servomotor systems specially adapted to maintain constant speed force of an output member	F15B 11/05

Informative references

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

Servomotor systems with directional control combined with flow control by regulating means in return line, i.e. meter-out control	F15B 2211/353

Special rules of classification

F15B 11/05, F15B 2211/353 take precedence.

F15B 11/0445

{with counterbalance valves, e.g. to prevent overrunning or for braking}

References

Informative references

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

Counterbalance valves	F15B 13/029
Pressure control using counterbalance valves	F15B 2211/50581

Special rules of classification

F15B 2211/50581 takes precedence

F15B 11/05

specially adapted to maintain constant speed, e.g. pressure-compensated, load-responsive {(F15B 11/161 takes precedence)}

References

Limiting references

This place does not cover:

maintaining constant speed with sensing of servomotor demand and load, for two or more servomotors	F15B 11/161

Informative references

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

Counterbalance valves	F15B 11/0445
Valves for load sensing	F15B 13/0416
Directional control valves in combination with pressure compensating valves	F15B 2211/3053
Flow control using pressure compensating valves	F15B 2211/40553

Synonyms and Keywords

In patent documents, the following abbreviations are often used:

LS	Load sensing

In patent documents, the following words/expressions are often used as synonyms:

- "pressure-compensated", "Lastdruckunabhängig" and "LUDV"
- "pressure compensator", "pressure compensating valve" and "Druckwaage"

F15B 11/055

{by adjusting the pump output or bypass}

References

Informative references

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

Pressure margin control in load sensing systems	F15B 2211/253
Pump control	F04B 49/002

Special rules of classification

F15B 11/165 takes precedence.

F15B 11/06

involving features specific to the use of a compressible medium, e.g. air, steam

References

Informative references

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

Control specific to compressible fluids	F15B 2211/8855

F15B 11/12

providing distinct intermediate positions; with step-by-step action

References

Informative references

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

Step-by-step action obtained by combining two or more servomotors (actuators)	F15B 11/18
Restricting the stroke of servomotors (actuators)	F15B 15/24

F15B 11/15

with special provision for automatic return

References

Informative references

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

Fluid gearing with oscillating input or output	F16H 43/00

F15B 11/16

with two or more servomotors

References

Informative references

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

For soil-shifting machines	E02F 9/22

Synonyms and Keywords

In patent documents, the following abbreviations are often used:

LS	Load sensing

In patent documents, the following words/expressions are often used as synonyms:

- "pressure-compensated", "Lastdruckunabhängig" and "LUDV"
- "pressure compensator", "pressure compensating valve" and "Druckwaage"

F15B 11/162

{for giving priority to particular servomotors or users}

References

Informative references

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

Priority valve details	F15B 13/022
Flow control using flow dividers	F15B 2211/40523
One or more output members having priority	F15B 2211/781
For power steering	B62D 5/07

F15B 11/163

{for sharing the pump output equally amongst users or groups of users, e.g. using anti-saturation, pressure compensation}

References

Informative references

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

Valves for load sensing	F15B 13/0416
Directional control valves in combination with pressure compensating valves	F15B 2211/3053
Flow control using pressure compensating valves	F15B 2211/40553

F15B 11/165

{for adjusting the pump output or bypass in response to demand}

References

Informative references

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

Maintaining constant speed by controlling pump output or bypass	F15B 11/055
Pressure margin control in load sensing systems	F15B 2211/253
Pump control	F04B 49/002

F15B 11/168

{with an isolator valve (duplicating valve), i.e. at least one load sense [LS] pressure is derived from a work port load sense pressure but is not a work port pressure itself}

References

Informative references

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

Load-sensing circuits with isolator valves	F15B 2211/6058

Special rules of classification

F15B 2211/6058 takes precedence.

F15B 11/17

using two or more pumps

References

Informative references

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

Servomotor systems with multiple pumps	F15B 2211/20576

F15B 11/20

controlling several interacting or sequentially-operating members

References

Informative references

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

Fluid distribution or supply devices for the control of two or more servomotors	F15B 13/06

F15B 11/205

{the position of the actuator controlling the fluid flow to the subsequent actuator}

References

Informative references

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

Telescopic booms	B66C 23/70

F15B 11/22

Synchronisation of the movement of two or more servomotors

References

Informative references

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

See also	F15B 2211/782
Synchronisation of cylinders in fluid-driven presses	B30B 15/24

F15B 13/00

Details of servomotor systems ({F15B 1/04, F15B 1/26, F15B 3/00, F15B 7/08, F15B 11/02, F15B 11/10,} F15B 15/00 take precedence){; Valves for servomotor systems}

Definition statement

This place covers:

Components of hydraulic or pneumatic circuits such as valves and flow dividers.

F15B 13/01

Locking-valves or other detent {i.e. load-holding} devices

References

Informative references

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

Systems with load holding valves	F15B 11/003, F15B 2211/30515
Locking mechanisms associated with the actuator	F15B 15/26

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- "over-centre valve", "locking-valve"

F15B 13/02

Fluid distribution or supply devices characterised by their adaptation to the control of servomotors

References

Informative references

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

Multiple-way valves	F16K 11/00

Special rules of classification

Subgroups F15B 13/022 - F15B 13/029 are not complete

F15B 13/021

{Valves for interconnecting the fluid chambers of an actuator}

References

Informative references

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

Regenerative circuits	F15B 11/024
Systems with directional control valves having a separate valve for interconnecting the fluid chambers of an actuator	F15B 2211/3058
Systems with directional control valves having a regenerative position	F15B 2211/3133

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- "valves for interconnecting the fluid chambers of an actuator" and "Regeneration valves"

F15B 13/022

{Flow-dividers; Priority valves}

References

Informative references

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

Circuits for giving priority to a particular servomotor	F15B 11/162
Flow control using flow dividers	F15B 2211/40523
Priotity valves for power steering	B62D 5/07

F15B 13/023

{Excess flow valves, e.g. for locking cylinders in case of hose burst}

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- "excess flow valves", "Rohrbruchsicherung" and "clapet parachute"

F15B 13/027

{Check valves}

References

Informative references

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

Load holding valves	F15B 13/01

Locking valves	F15B 13/01

F15B 13/029

{Counterbalance valves}

References

Informative references

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

Servomotor systems with counterbalance valves	F15B 11/0445
Pressure control using counterbalance vavles	F15B 2211/50581

F15B 13/0402

{for linearly sliding valves, e.g. spool valves}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

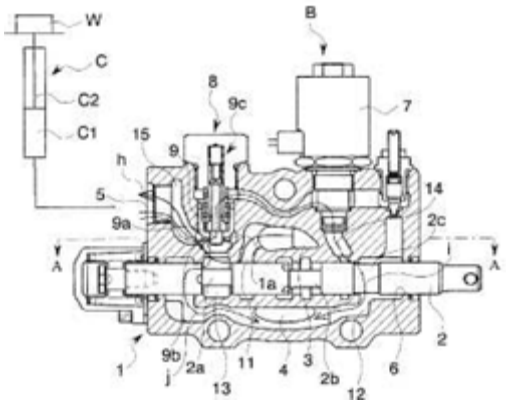


Fig. from WO2008015752

F15B 13/0416

{with means or adapted for load sensing}

References

Informative references

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

Systems with load sensing	F15B 11/05, F15B 11/161, F15B 2211/3053

F15B 13/0422

{with manually-operated pilot valves, e.g. joysticks}

References

Informative references

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

Arrangements of handles or pedals for cranes	B66C 13/54
Control levers for dredgers and soil shifting machines	E02F 9/2004
Similar mechanical control actuators	G05G 9/047

F15B 13/043

with electrically-controlled pilot valves

References

Informative references

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

Electrically operated main valves	F15B 13/044

F15B 13/044

operated by electrically-controlled means, e.g. solenoids, torque-motors

References

Informative references

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

Electrically controlled pilot valves	F15B 13/043

F15B 13/0832

{Modular valves}

References

Informative references

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

Modular valves in general	F16K 27/003

F15B 13/0867

{Data bus systems}

References

Informative references

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

Servomotor systems using data bus, e.g. CAN bus	F15B 21/085

F15B 13/16

Special measures for feedback {, e.g. by a follow-up device}

References

Informative references

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

Servomotors with follow-up action	F15B 9/00
Devices with means or adapted for load sensing	F15B 13/0416

F15B 15/00

Fluid-actuated devices for displacing a member from one position to another; Gearing associated therewith

Definition statement

This place covers:

Hydraulic or pneumatic actuators with linear or non-continuous rotary output.

References

Informative references

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

Motors with continuous rotary movement	F01, F03

F15B 15/06

for mechanically converting rectilinear movement into non- rectilinear movement

References

Informative references

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

Fluid-driven safety belt tensioners	B60R 22/4628

F15B 15/063

{Actuator having both linear and rotary output, i.e. dual action actuator}

References

Informative references

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

Corresponding FI class	F15B15/06&E

F15B 15/08

Characterised by the construction of the motor unit

References

Informative references

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

Pistons, cylinders, packings	F16J

F15B 15/082

{the motor being of the slotted cylinder type}

References

Informative references

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

Locking mechanisms therefor	F15B 15/265

F15B 15/084

{the motor being of the rodless piston type, e.g. with cable, belt or chain}

References

Informative references

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

Locking mechanisms therfor	F15B 15/265

F15B 15/10

the motor being of diaphragm type

References

Informative references

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

Connection of valves to inflatable elastic bodies	B60C 29/00

Inflatable flexible elements for lifting goods	B66F 3/35
Pneumatic actuators for EGR valves	F02M 26/58
Clutches with fluid-actuated elastic clutching member	F16D 25/04
Bellows pistons	F16J 3/06

F15B 15/103

{using inflatable bodies that contract when fluid pressure is applied, e.g. pneumatic artificial muscles or McKibben-type actuators}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

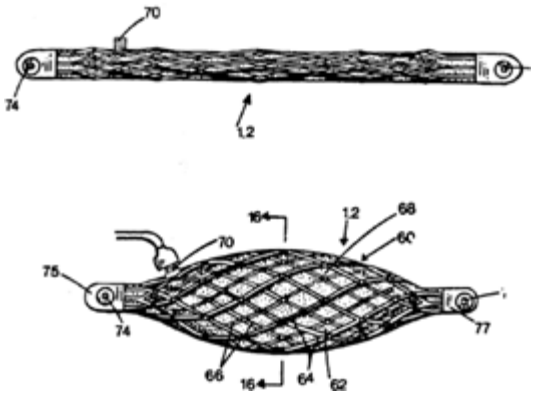


Fig. from US4819547

References

Informative references

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

Corresponding FI class	F15B15/10&H

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- "fluidic muscle-type actuator", "McKibben-type actuator" and "Fluidischer Muskel"

F15B 15/12

of the oscillating-vane or curved-cylinder type

References

Limiting references

This place does not cover:

Rotary motors with continuous output movement	F01C 9/002, F03C 4/00, F04C 9/002

Sealings for vane motors	F16J 15/545

F15B 15/125

{of the curved-cylinder type}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

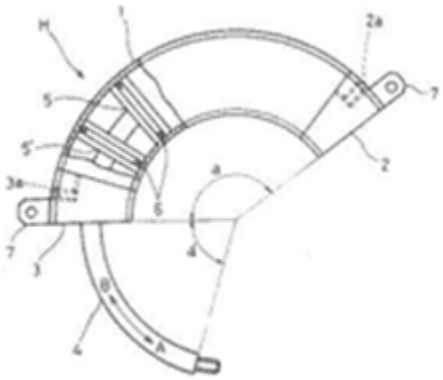


Fig. from JP58163805

F15B 15/1404

{in clusters, e.g. multiple cylinders in one block}

References

Informative references

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

Systems with servomotors having a plurality of working chambers	F15B 11/036
Motors with two or more independently movable working pistons	F15B 15/1409

F15B 15/1409

{with two or more independently movable working pistons}

References

Informative references

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

Servomotor systems with step-by-step action	F15B 11/12
Servomotor systems with stepwise operation	F15B 11/18

F15B 15/1447

{Pistons; Piston to piston rod assemblies}

References

Limiting references

This place does not cover:

Pistons per se	F16J 1/00

F15B 15/1466

{Hollow piston sliding over a stationary rod inside the cylinder}

References

Informative references

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

Systems for controlling the actuator force	F15B 11/036

F15B 15/1485

{Special measures for cooling or heating}

Special rules of classification

When the fluid powering the fluid-actuated device is used for cooling or for heating said device, either one of F15B 21/0423 additional information when the fluid-actuated device is cooled or F15B 21/0427 additional information when the device is heated, has to be allocated complementary to the classification in this group.

F15B 15/18

Combined units comprising both motor and pump

References

Informative references

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

Telemotors	F15B 7/00

F15B 15/26

Locking mechanisms

References

Informative references

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

Locking valves not combined with the actuator	F15B 13/01

F15B 15/261

{using positive interengagement, e.g. balls and grooves, for locking in the end positions}

Definition statement

This place covers:

Locking mechanisms using positive interengagement for locking in any distinct position (not restricted to locking in the end positions).

F15B 15/264

{Screw mechanisms attached to the piston}

Definition statement

This place covers:

This subgroup contains documents relating to locking mechanisms using screw mechanisms attached to the piston but not using friction.

F15B 15/2869

{using electromagnetic radiation, e.g. radar or microwaves}

Special rules of classification

F15B 15/2846 takes precedence.

F15B 17/00

Combinations of telemotor and servomotor systems

References

Informative references

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

Telemotors	F15B 7/00
Servomotors with follow-up	F15B 9/00
Servomotors without follow-up	F15B 11/00

F15B 18/00

Parallel arrangements of independent servomotor systems

Definition statement

This place covers:

E.g. redundant systems.

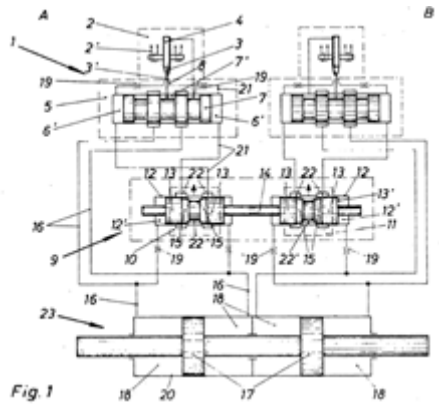


Fig. from DE1940946A1

F15B 19/00

Testing; {Calibrating; Fault detection or monitoring; Simulation or modelling of} fluid-pressure systems or apparatus not otherwise provided for

References

Informative references

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

Testing of fluid pressure systems	F15B 2211/855
Monitoring of fluid pressure systems	F15B 2211/857

F15B 20/00

Safety arrangements for fluid actuator systems; Applications of safety devices in fluid actuator systems; Emergency measures for fluid actuator systems

References

Informative references

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

Control during or prevention of an electric or electronic failure	F15B 2211/862
Control during or prevention of an hydraulic or pneumatic failure	F15B 2211/863
Control during or prevention of a human failure	F15B 2211/8643
Prevention of failures	F15B 2211/865
Detection of failures	F15B 2211/87
Control measures for coping with failures	F15B 2211/875

Safety devices in general	F16P
Safety devices for pneumatic or hydraulic control systems	F16P 3/22

F15B 20/002

{Electrical failure}

References

Informative references

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

Control during or prevention of electric or electronic failures	F15B 2211/862

F15B 20/004

{Fluid pressure supply failure}

References

Informative references

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

Fluid supply failure	F15B 2211/8633

F15B 20/005

{Leakage; Spillage; Hose burst}

References

Informative references

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

Valve or hose failure	F15B 2211/8636

F15B 20/008

{Valve failure}

References

Informative references

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

Valve or hose failure:	F15B 2211/8636

F15B 21/006

{Compensation or avoidance of ambient pressure variation}

References

Informative references

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

Systems with a pressurised main reservoir	F15B 1/265

F15B 21/008

{Reduction of noise or vibration}

References

Informative references

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

For pumps	F04B 39/0027

F15B 21/02

Servomotor systems with programme control derived from a store or timing device; Control devices therefor

References

Informative references

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

Servomotor systems with electrically operated control means	F15B 21/08
Programme control in washing machines	D06F 33/04
Programme control in general	G05B 19/00

F15B 21/04

Special measures taken in connection with the properties of the fluid

References

Informative references

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

Using the fluid for cooling or heating a fluid-actuated device, i.e. a fluidic actuator	F15B 15/1485

Special rules of classification

When the fluid is used for cooling or heating a specific component, e.g. an electric motor, other than a fluid-actuated device, i.e. a fluidic actuator, it is classified in F15B 21/04 as inventive information

and in F15B 21/0423 additional information when the fluid is used for cooling said component, or F15B 21/0427 additional information when the fluid is used for heating said component.

F15B 21/042

Controlling the temperature of the fluid

Special rules of classification

When the fluid is used for cooling or heating a specific component, e.g. an electric motor, classification in F15B 21/04 applies in accordance with the special rule of F15B 21/04.

F15B 21/0427

Heating

Special rules of classification

Control of a cooling device to increase the temperature of the fluid, e.g. bypassing a cooling device for warmup, is classified in F15B 21/0427 as inventive information and also in F15B 21/0423 as additional information.

F15B 21/044

Removal or measurement of undissolved gas, e.g. de-aeration, venting or bleeding

References

Informative references

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

Preventing cavitation	F15B 21/047

Synonyms and Keywords

In patent documents, the following words/expressions are often used as synonyms:

- "deaeration" and "Entlüftung"

F15B 21/045

Compensating for variations in viscosity or temperature

References

Informative references

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

Warming up fluid systems	F15B 21/042

F15B 21/047

Preventing foaming, churning or cavitation

References

Informative references

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

Supply reservoir or sump assemblies	F15B 1/26
Control during or prevention of cavitation	F15B 2211/8609

F15B 21/048

Arrangements for compressed air preparation, e.g. comprising air driers, air condensers, filters, lubricators or pressure regulators

References

Informative references

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

For mist lubrication	F16N 7/32
For steam traps	F16T
For airconditioning	F24F

F15B 21/06

Use of special fluids, e.g. liquid metal; Special adaptations of fluid-pressure systems, or control of elements therefor, to the use of such fluids

References

Limiting references

This place does not cover:

Actuators having special fluid pressurization means	F15B 2015/208

F15B 21/065

{Use of electro- or magnetosensitive fluids, e.g. electrorheological fluid}

References

Informative references

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

Control specific to the type of fluid, e.g. specific to magnetorheological fluid	F15B 2211/885

F15B 21/085

{using a data bus, e.g. "CANBUS"}

References

Informative references

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

Modular units using data bus	F15B 13/0867

Special rules of classification

F15B 13/0867 takes precedence.

F15B 21/10

Delay devices or arrangements

References

Informative references

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

Hydraulic braking	F15B 11/076
Delay devices associated with fluid motors or actuators	F15B 15/22

F15B 21/12

Fluid oscillators or pulse generators

References

Informative references

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

Fluid oscillators used for computing or control purposes	F15C 1/22, F15C 3/16

F15B 21/14

Energy-recuperation means

References

Informative references

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

Regenerative circuits	F15B 11/024
Control measure for saving energy	F15B 2211/88
For vehicles	B60T 1/10
Systems for storing electric energy in the form of pneumatic energy	H02J 15/006

F15B 2211/3058

having additional valves for interconnecting the fluid chambers of a double-acting actuator, e.g. for regeneration mode or for floating mode

References

Informative references

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

Floating position connecting the working ports and the return line	F15B 2211/3127
Regenerative position connecting the working ports or connecting the working ports to the pump, e.g. for high-speed approach stroke	F15B 2211/3133