

F16K

VALVES; TAPS; COCKS; ACTUATING-FLOATS; DEVICES FOR VENTING OR AERATING {(devices for emptying and evacuating the excess liquid in valves or conduits [F16L 55/07](#))}

F16K 1/00

Lift valves {or globe valves}, i.e. cut-off apparatus with closure members having at least a component of their opening and closing motion perpendicular to the closing faces ({in combination with sliding valves [F16K 3/246](#), [F16K 3/267](#)} ; diaphragm valves [F16K 7/00](#))

References

Limiting references

This place does not cover:

In combination with sliding valves	F16K 3/246 , F16K 3/267
Diaphragm valves	F16K 7/00

Informative references

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

Functional types of lift valves	F16K 15/00 , F16K 17/00 , F16K 24/00 , F16K 31/00 , F16K 31/06
---------------------------------	--

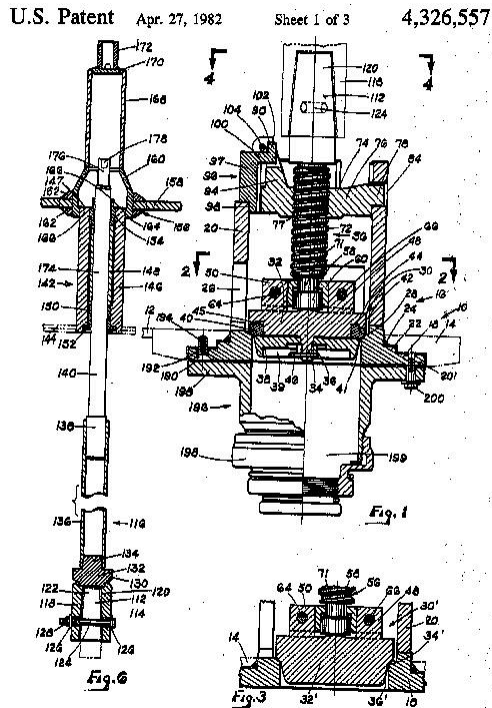
F16K 1/02

with screw-spindle ([F16K 1/12](#) - [F16K 1/28](#) take precedence; actuating mechanisms with screw-spindles [F16K 31/50](#))

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



References

Informative references

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

For the actuation mechanism	F16K 31/50
-----------------------------	----------------------------

F16K 1/04

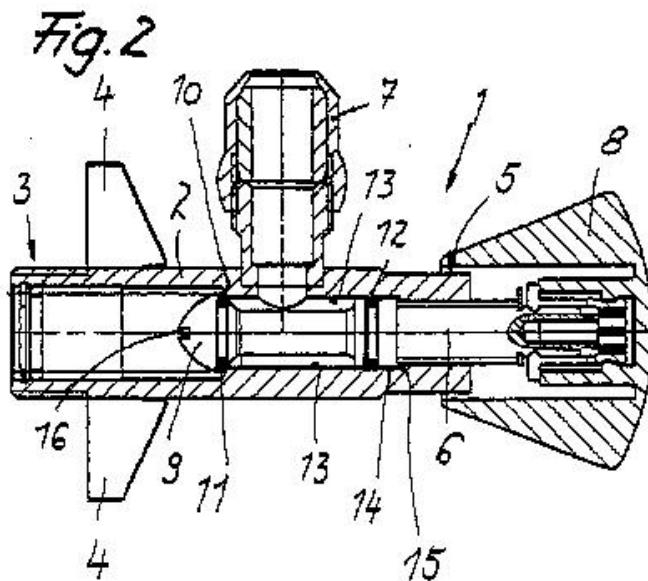
with a cut-off member rigid with the spindle, e.g. main valves

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

EP 1 273 836 A2

**F16K 1/12**

with streamlined valve member around which the fluid flows when the valve is opened

Definition statement

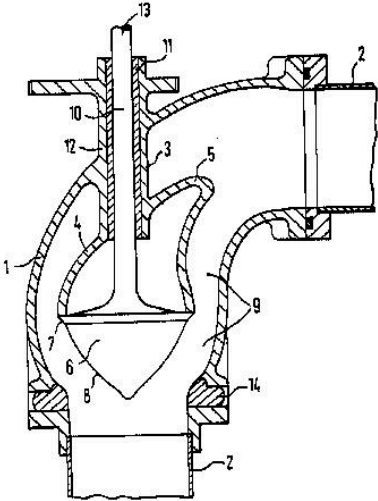
This place covers:

The valve member is within the flow passage.

Illustrative example:

2156045

1/1



F16K 1/123

{with stationary valve member and moving sleeve}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

U.S. Patent

Sept. 26, 1978

4,116,212

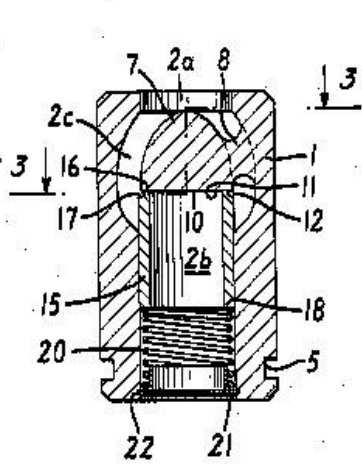


FIG. 1

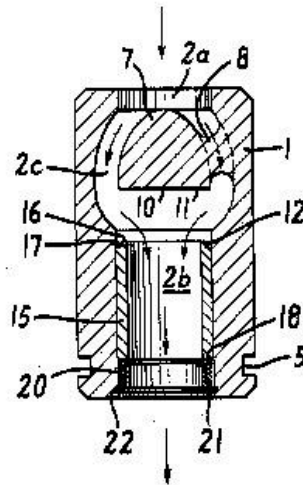


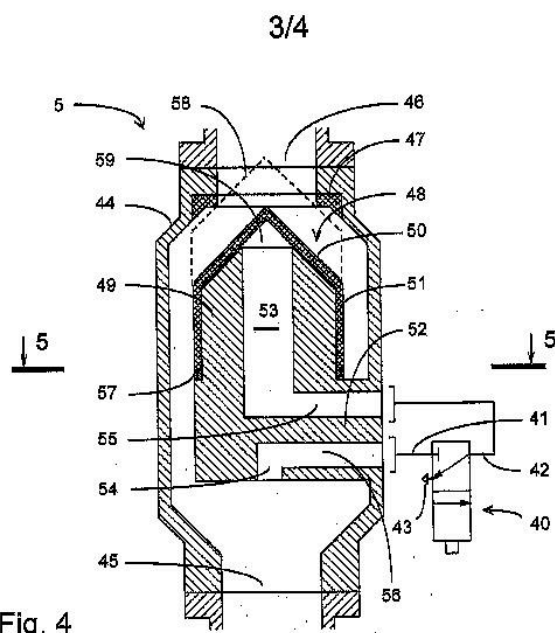
FIG. 2

F16K 1/126**{actuated by fluid}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group.

WO 2006/096092

PCT/RD2006/000043

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

Valves actuated by fluid in general	F16K 31/12
-------------------------------------	----------------------------

F16K 1/14

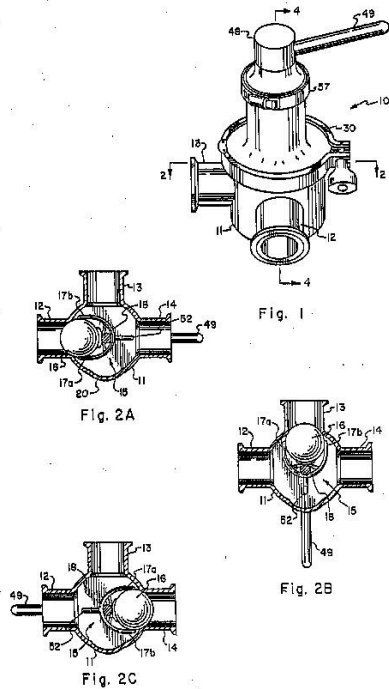
with ball-shaped valve member (check valves [F16K 15/04](#))

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

U.S. Patent Jun. 19, 1990 Sheet 1 of 6 4,934,408

**References****Informative references**

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

Check valves	F16K 15/04
Safety/equalising valves	F16K 17/0406
Fluid delivery valves of the self-closing type	F16K 21/08
Venting valves	F16K 24/046

F16K 1/16

with pivoted closure-members

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

WO 2007/080321

PCT/EP2006/006288

1 / 10

Fig. 1

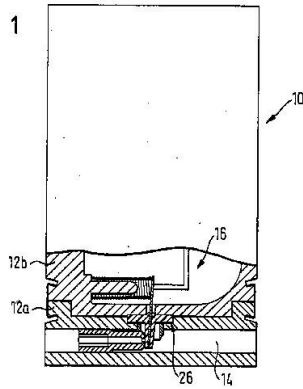
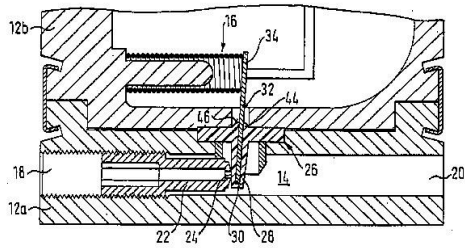


Fig. 2



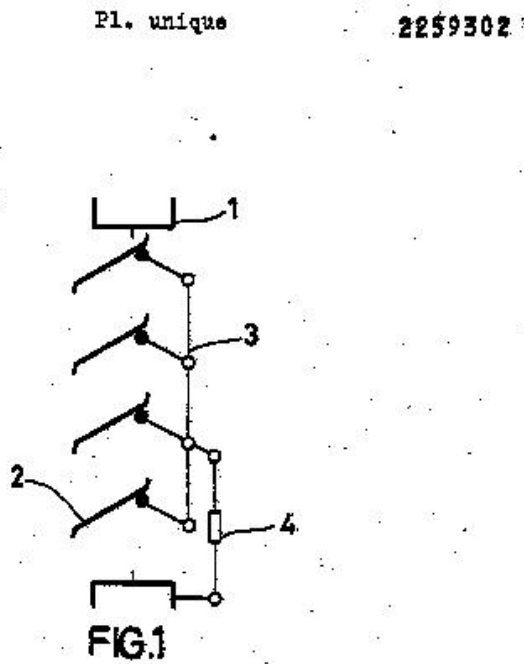
F16K 1/165

{with a plurality of closure members}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



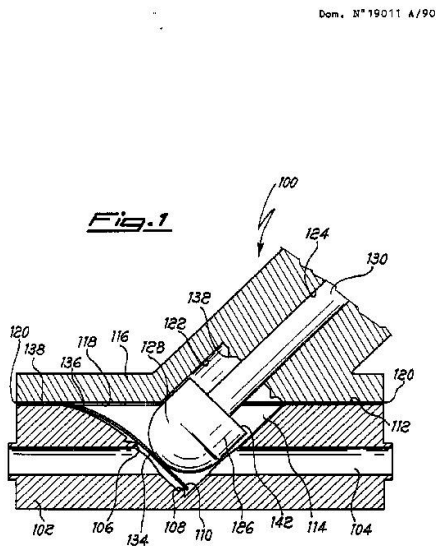
F16K 1/18

with pivoted discs or flaps

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.




Il Mandatario: 
SOCIETÀ ITALIANA BREVETTI S.p.A. Dr. Luciano ALMI
Al. inv. - Lib. 520

F16K 1/20

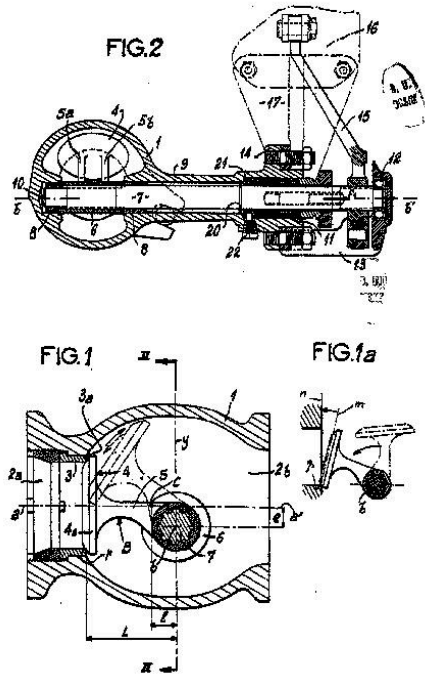
with axis of rotation arranged externally of valve member

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

N° 1.821.594 Société Anonyme dite : Worthington 2 planches. - Pl. I



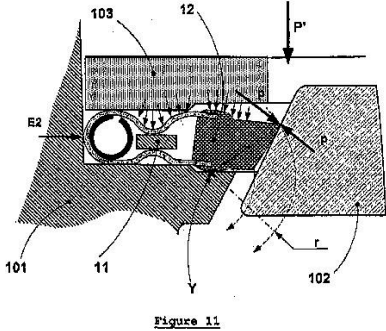
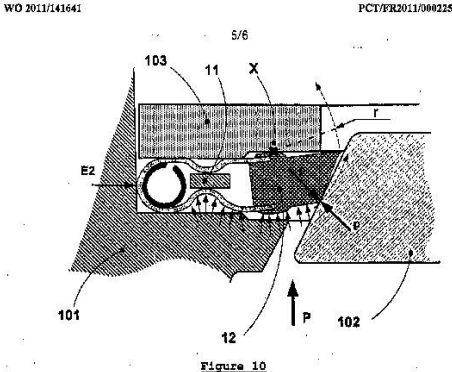
F16K 1/228

Movable sealing bodies

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



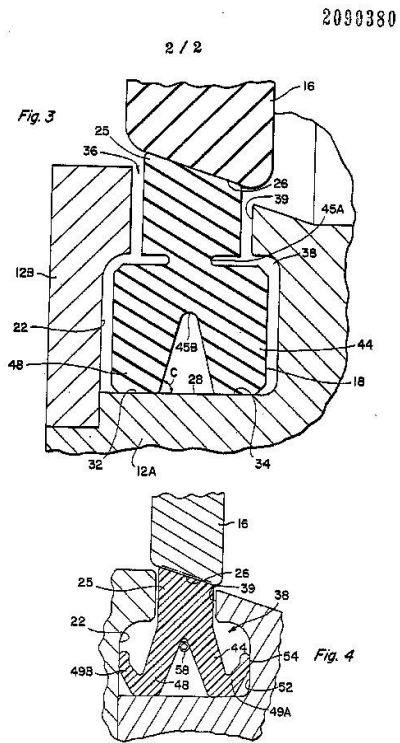
F16K 1/2285

{the movement being caused by the flowing medium}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



F16K 1/24

with valve members that, on opening of the valve, are initially lifted from the seat and next are turned around an axis parallel to the seat

Definition statement

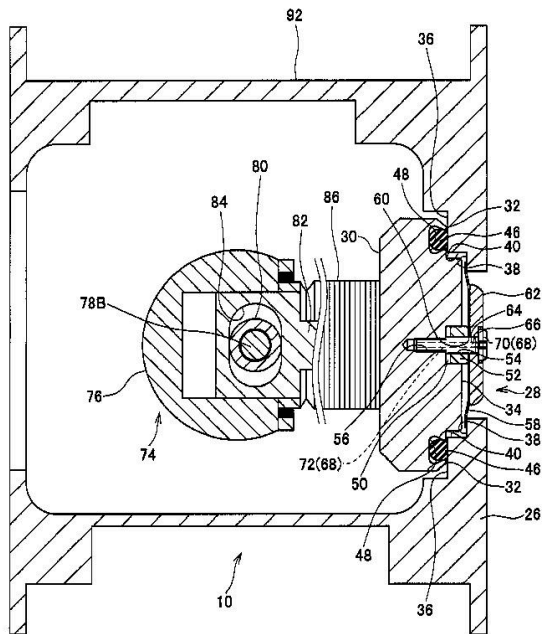
This place covers:

Illustrative example of subject matter classified in this group.

WO 2010/113891

PCT/JP2010/055599

[圖6]



F16K 1/30

specifically adapted for pressure containers

Definition statement

This place covers:

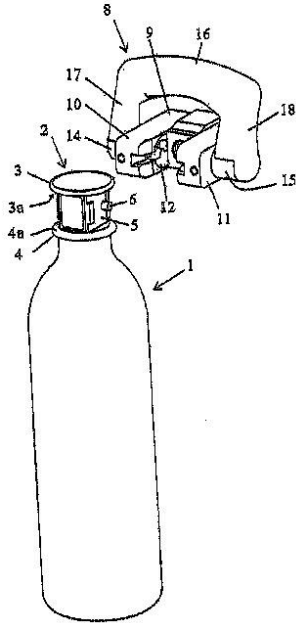
High-pressure valves, generally used in connection with pressure containers. See also [F17C](#) (Gas vessels) and [G05D](#) (Pressure regulators).

Illustrative example:

WO 2009/125180

1/16

PCT/GB2009/000915



References

Informative references

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

Connectors used in connection with pressure containers / the connectors comprising valves	F16L 37/28
---	----------------------------

F16K 1/301

{only shut-off valves, i.e. valves without additional means}

Definition statement

This place covers:

Valves used for opening/closing the flow path, without other functions (e.g. regulation) or other valves on the same valve body (e.g. safety valves).

F16K 1/302

{with valve member and actuator on the same side of the seat}

Definition statement

This place covers:

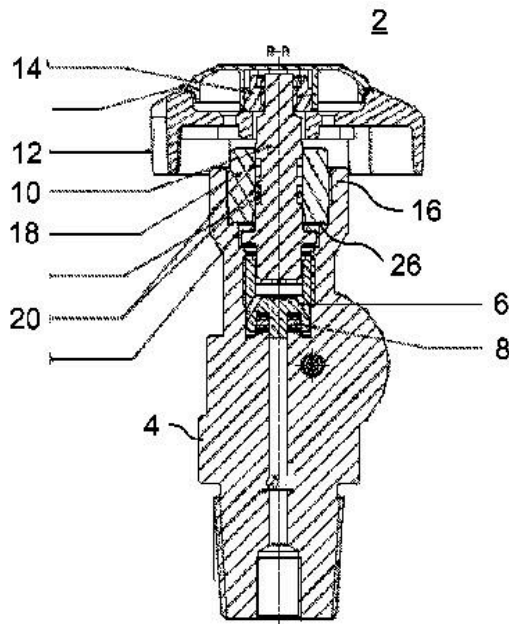
Illustrative example of subject matter classified in this group.

WO 2011/138283

PCT/EP2011/056970

1/2

FIG 1



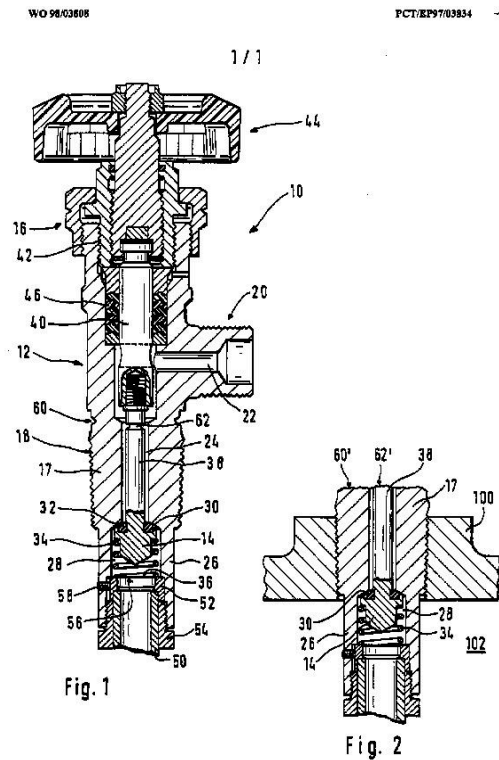
F16K 1/303

{with a valve member, e.g. stem or shaft, passing through the seat}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

**F16K 1/304**

{Shut-off valves with additional means}

Glossary of terms

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

Additional means	Valves or devices, used for other functional purposes than only opening/closing the valve (e.g. regulation, safety, monitoring).
------------------	--

F16K 1/307

{Additional means used in combination with the main valve}

References**Limiting references**

This place does not cover:

Flow regulation	G05D
-----------------	----------------------

Special rules of classification

The application focuses on the "other" functions of the main valve.

Glossary of terms

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

Additional means	Valves or devices, used for other functional purposes than only opening/closing the valve (e.g. regulation, safety, monitoring).
------------------	--

F16K 1/308

{Connecting means}

Definition statement

This place covers:

Details of the (permanent) connection of the valve to the container.

References

Limiting references

This place does not cover:

Connectors per se (quick connectors with valves)	F16L 37/28
--	----------------------------

F16K 1/32

Details (details of more general applicability [F16K 25/00](#) - [F16K 51/00](#))

Definition statement

This place covers:

Details (e.g. shape, materials, function) of valve members, seats, attaching members to spindles, preventing rotation, additional adjustment (with additional means) of the flow and other arrangements of the valve member for modifying the rate of flow (see sub-classes).

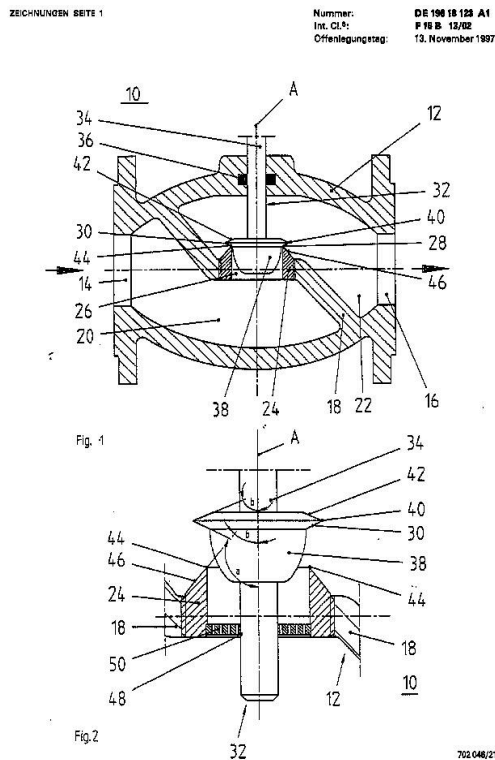
F16K 1/34

Cutting-off parts, e.g. valve members, seats ([F16K 1/06](#), [F16K 1/12](#), [F16K 1/14](#), [F16K 1/26](#) take precedence)

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



F16K 1/385

{contacting in the closed position, over a substantial axial length, a seat surface having the same inclination}

Definition statement

This place covers:

E.g. "needle" valves.

F16K 1/443

{the seats being in series}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

EP 1 983 239 A1

FIG 3E

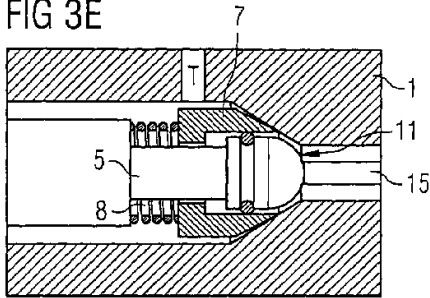
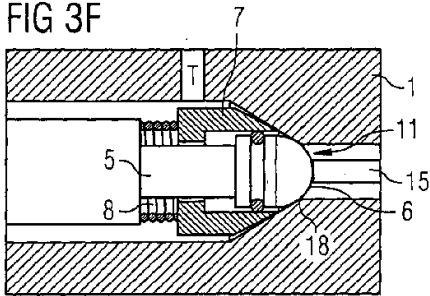


FIG 3F



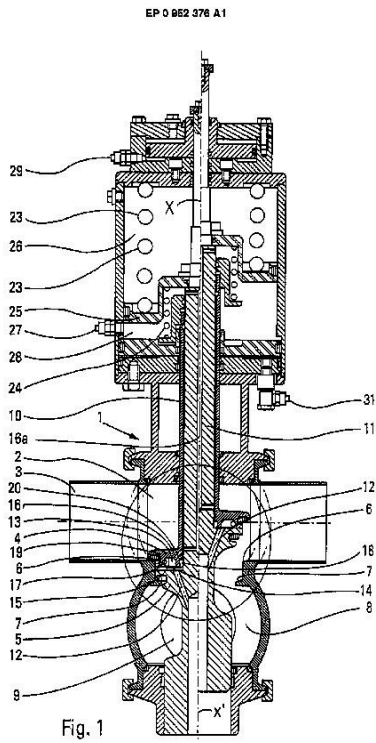
F16K 1/446

{with additional cleaning or venting means between the two seats}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



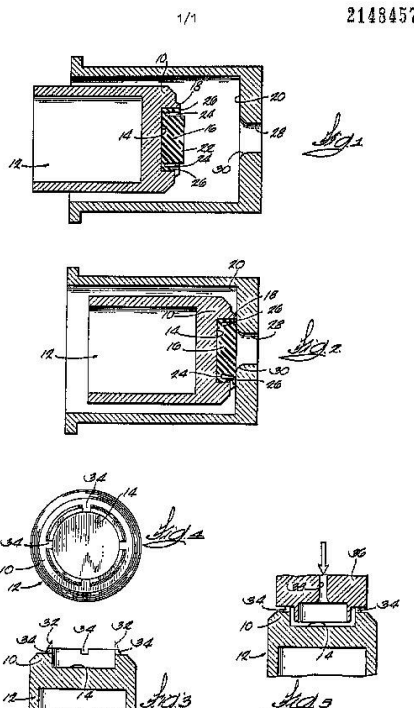
F16K 1/46

Attachment of sealing rings

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



F16K 1/48

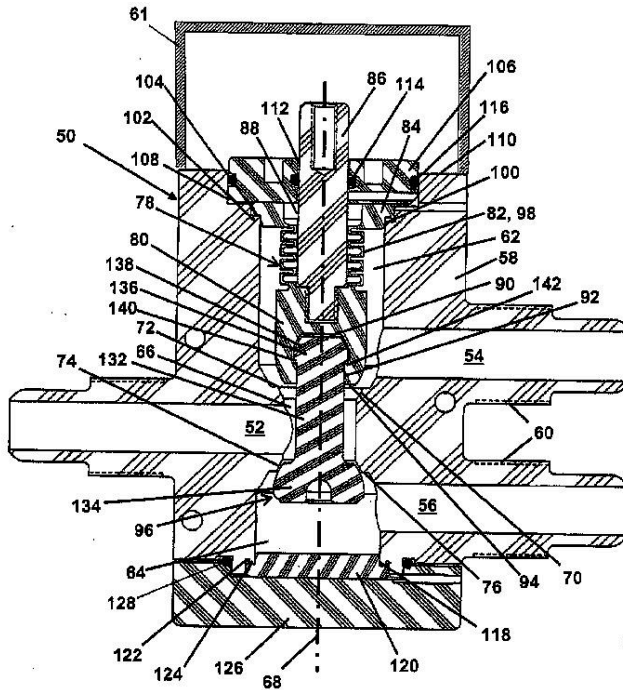
Attaching valve members to screw-spindles

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

Patent Application Publication Nov. 1, 2007 Sheet 3 of 6 US 2007/0251588 A1



F16K 1/50**Preventing rotation of valve members****Definition statement**

This place covers:

Illustrative example of subject matter classified in this group.

WO 00/20145

PCT/DK98/00429

3/3

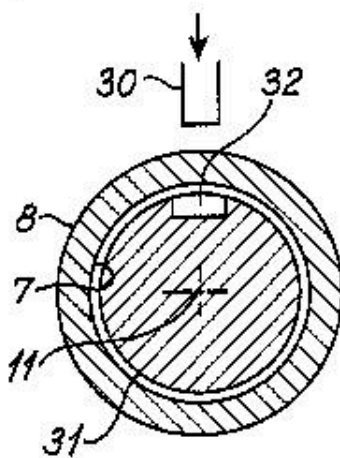


Fig. 3a

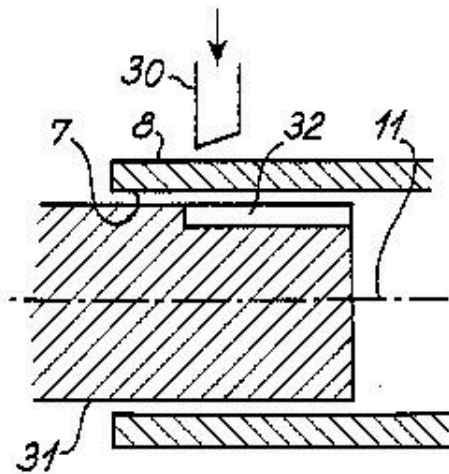


Fig. 3b

F16K 1/52**Means for additional adjustment of the rate of flow****Definition statement**

This place covers:

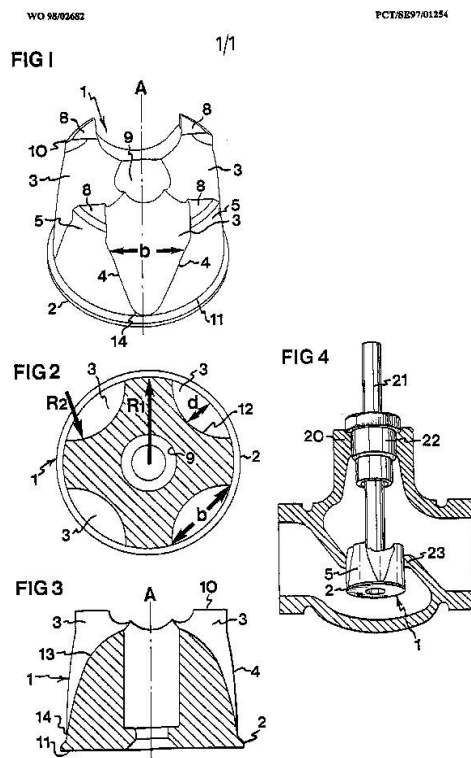
Additional means for adjusting the rate of flow in combination with the cutting-off parts.

F16K 1/54**Arrangements for modifying the way in which the rate of flow varies during the actuation of the valve****Definition statement**

This place covers:

Only the valve member modifies the flow during the actuation of the valve.

Illustrative example:



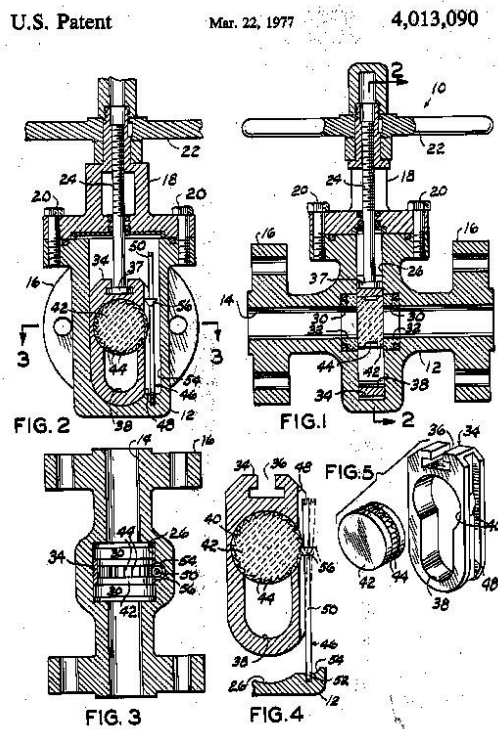
F16K 3/00

Gate valves or sliding valves, i.e. cut-off apparatus with closing members having a sliding movement along the seat for opening and closing ([F16K 5/00](#) takes precedence; in barrages or weirs [E02B 8/04](#))

Definition statement

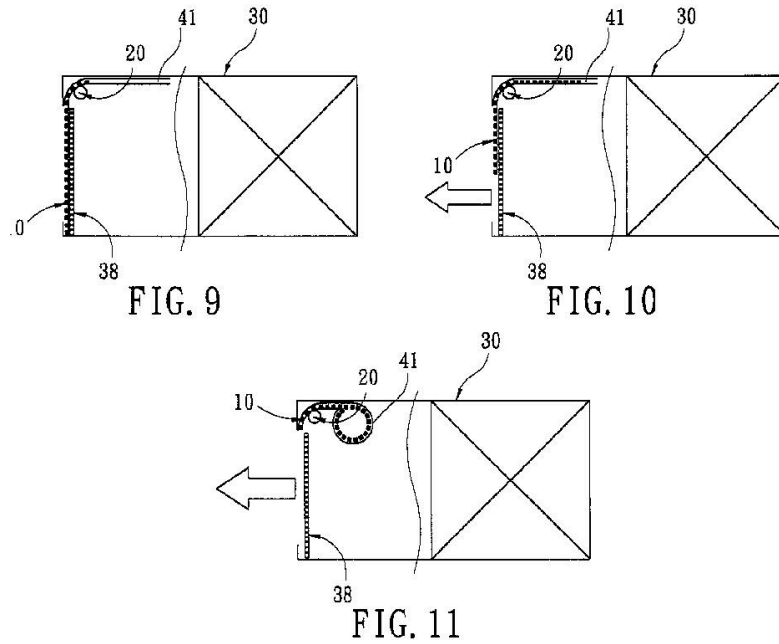
This place covers:

Illustrative example of subject matter classified in this group.



F16K 3/0245**{Curtain gate valves}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group.



Patent Application Publication

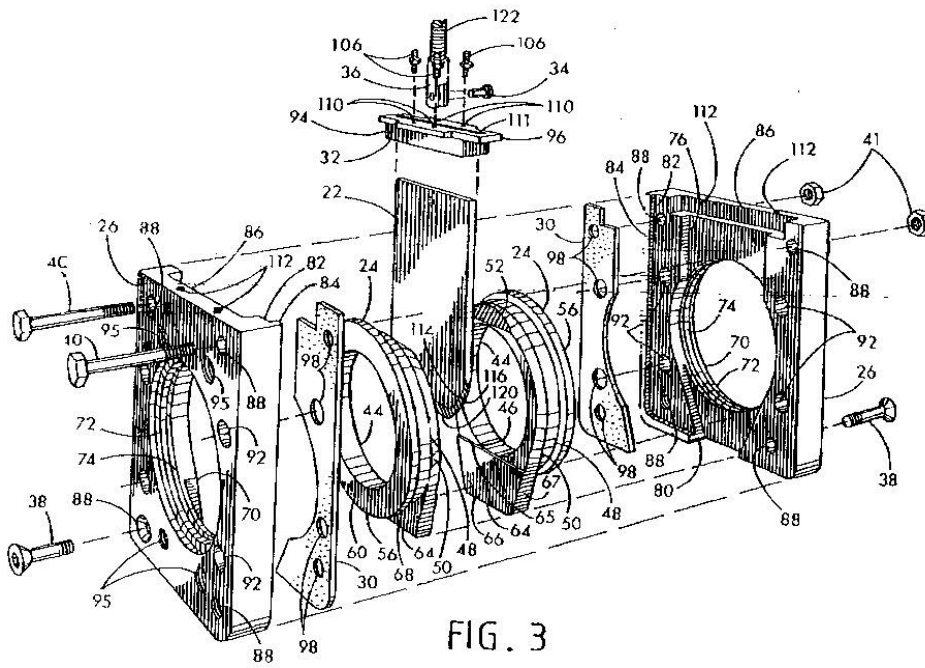
Jul. 3, 2003 Sheet 6 of 7

US 2003/0121556 A1

F16K 3/0281**{Guillotine or blade-type valves, e.g. no passage through the valve member}****Definition statement***This place covers:*

Blade-type: no through-hole is present in the valve member.

Illustrative example:



ZEICHNUNGEN SEITE 2

Nummer: DE 41 18 106 A1
Int. Cl. 5: F 16K 3/18
Offenlegungstag: 10. Dezember 1992

F16K 3/03

with a closure member in the form of an iris-diaphragm

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

WO 2006/060185

3/4

PCT/US2005/041807

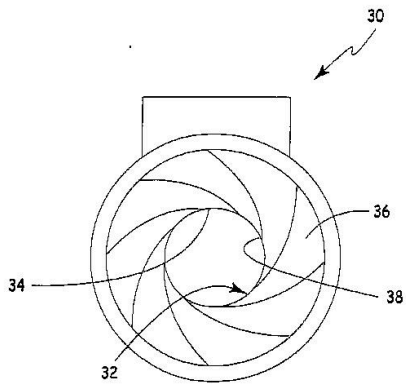


FIG. 2B

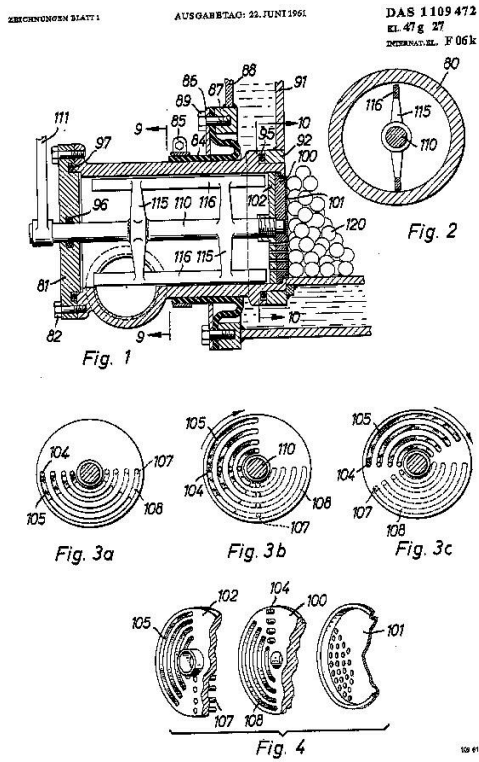
F16K 3/08

with circular plates rotatable around their centres

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



F16K 3/085

{the axis of supply passage and the axis of discharge passage being coaxial and parallel to the axis of rotation of the plates}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

U.S. Patent Nov. 3, 1998 Sheet 1 of 2 5,829,735

Fig. 1

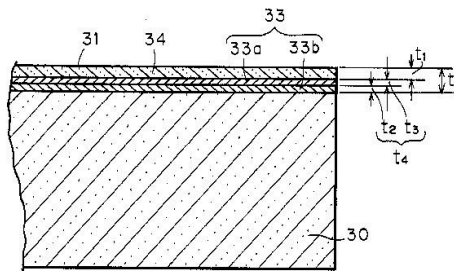
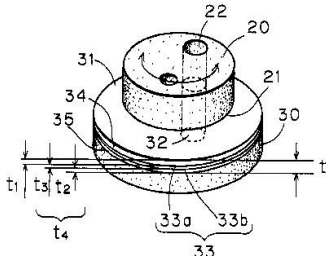


Fig. 2



F16K 3/10

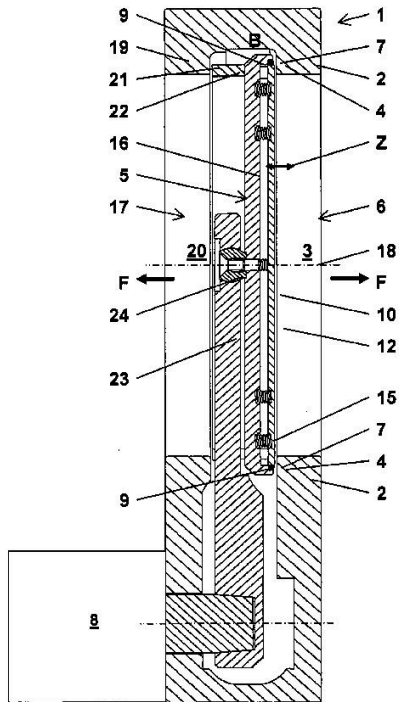
with special arrangements for separating the sealing faces or for pressing them together

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

Patent Application Publication Jun. 21, 2007 Sheet 1 of 5 US 2007/0138424 A1



F16K 3/12

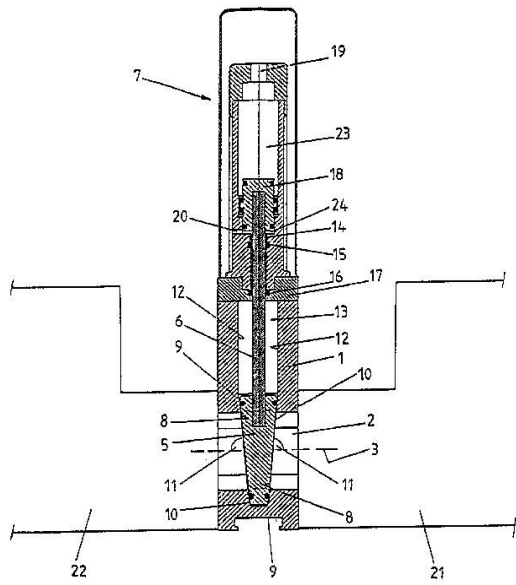
with wedge-shaped arrangements of sealing faces

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

U.S. Patent Apr. 9, 2002 Sheet 2 of 4 US 6,367,770 B1



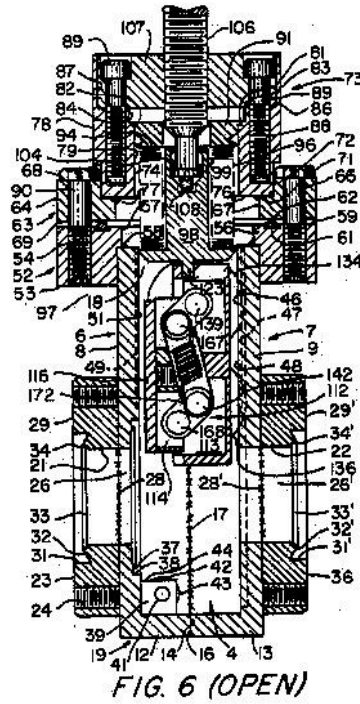
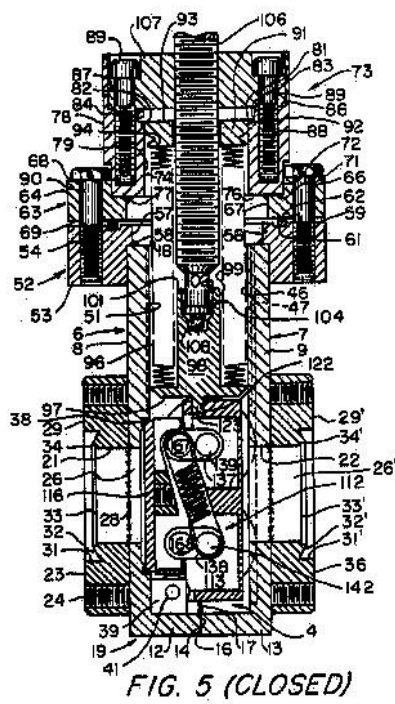
F16K 3/182

{by means of toggle links}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



U.S. Patent

Dec. 14, 1993

Sheet 5 of 8

5,269,491

F16K 3/184

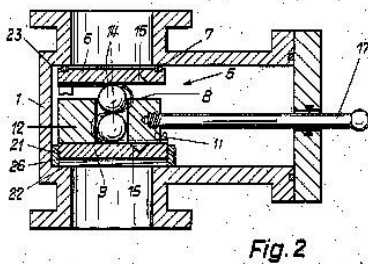
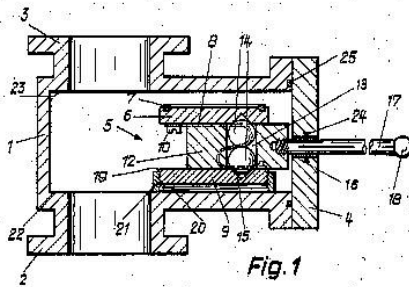
{by means of cams}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

Feb. 13, 1968 S. SCHERTLER 3,368,792
GATE STOP VALVE
Filed Feb. 16, 1966



F16K 3/188

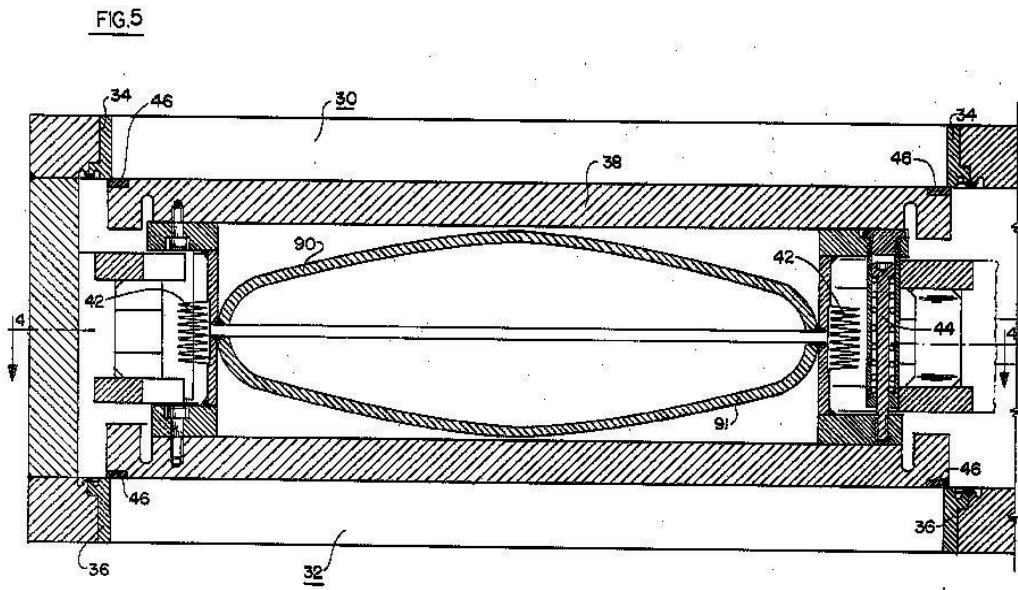
{by means of hydraulic forces}

Definition statement

This place covers:

The closure members are pushed towards the seats by hydraulic forces.

Illustrative example:



U.S. Patent Jun. 5, 1979
Sheet 5 of 5
4,157,169

References

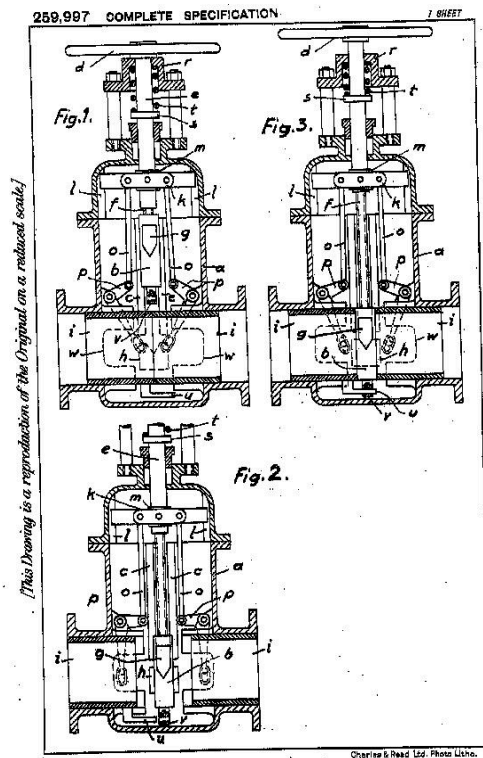
Limiting references

This place does not cover:

Fluid actuation of the valve	F16K 31/12
------------------------------	----------------------------

F16K 3/202**{by movement of toggle links}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group.

**F16K 3/207****{by means of hydraulic forces}****Definition statement***This place covers:*

The seat members are pushed towards valve members by hydraulic forces.

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

Fluid actuation of the valve	F16K 31/12
------------------------------	----------------------------

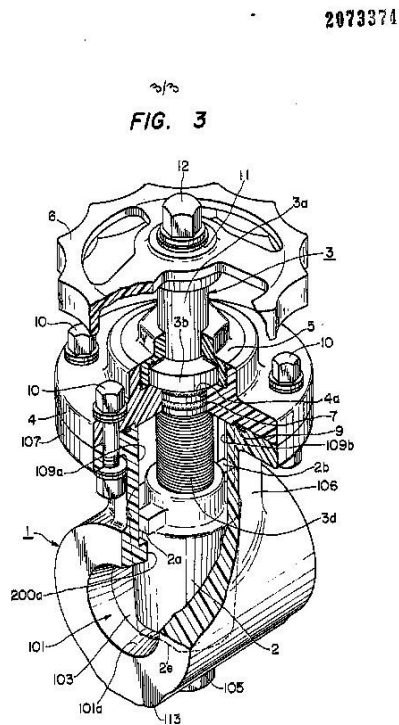
F16K 3/22

with sealing faces shaped as surfaces of solids of revolution ([F16K 13/02](#) takes precedence; with resilient valve members [F16K 3/28](#))

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



References

Limiting references

This place does not cover:

Taps and cocks	F16K 5/00
Multiple-way (e.g. more than two) sliding valves with sealing faces shaped as surfaces of solids of revolution	F16K 11/00

F16K 3/243

{Packings (F16K 3/246 takes precedence)}

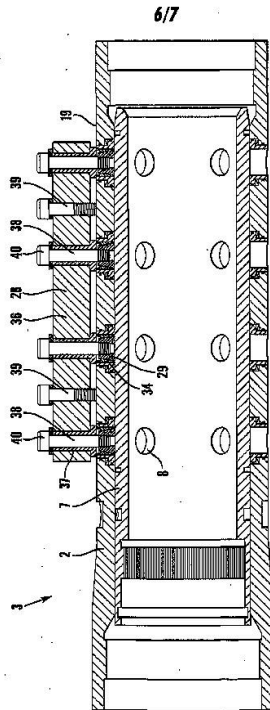
Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

WO 02/46575

PCT/NO01/08475



F16K 3/246

{Combination of a sliding valve and a lift valve}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

DE 10 2006 053 552 B3 2008.02.07

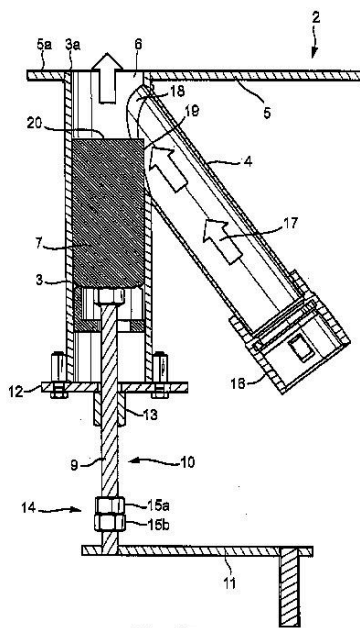


Fig. 2B

F16K 3/26

with fluid passages in the valve member

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

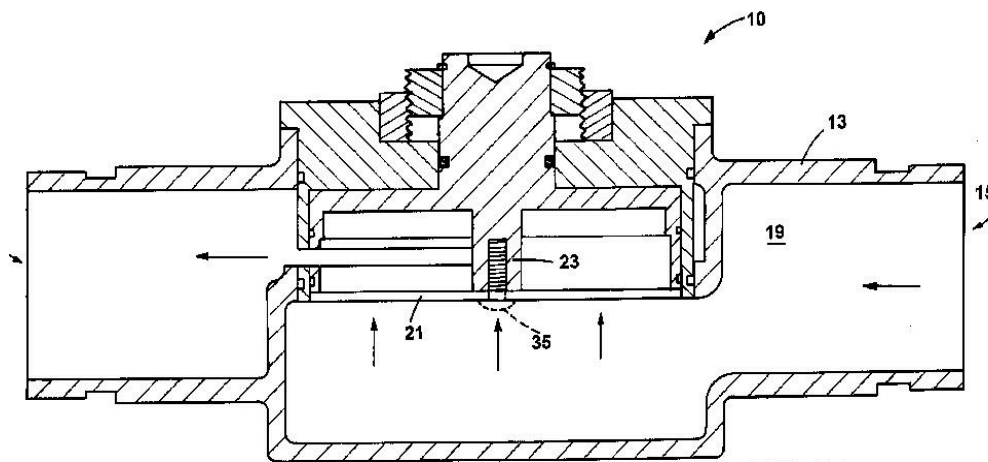


FIG. 2A

U.S. Patent

Mar. 21, 2000

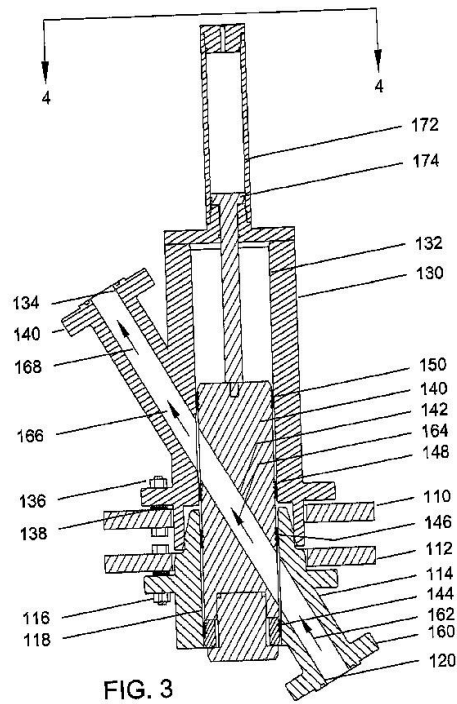
Sheet 3 of 12

6,039,065

F16K 3/262**{with a transverse bore in the valve member}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group.

Patent Application Publication Jul. 24, 2003 Sheet 3 of 7 US 2003/0136927 A1



F16K 3/265

{with a sleeve sliding in the direction of the flow line}

Definition statement

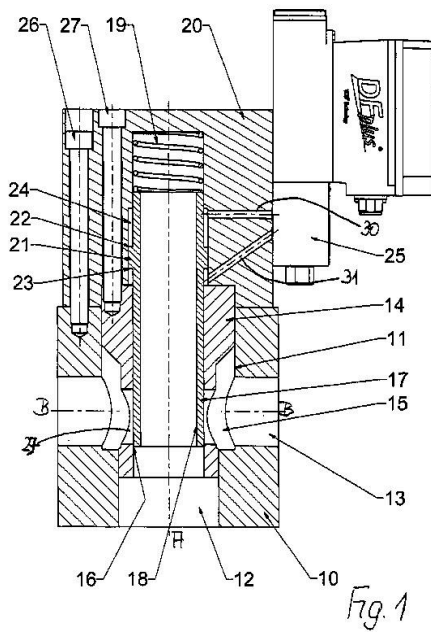
This place covers:

Illustrative example of subject matter classified in this group.

WO 2010/060555

1/2

PCT/EP2009/008235



F16K 3/267

{Combination of a sliding valve and a lift valve ([F16K 3/262](#), [F16K 3/265](#) take precedence)}

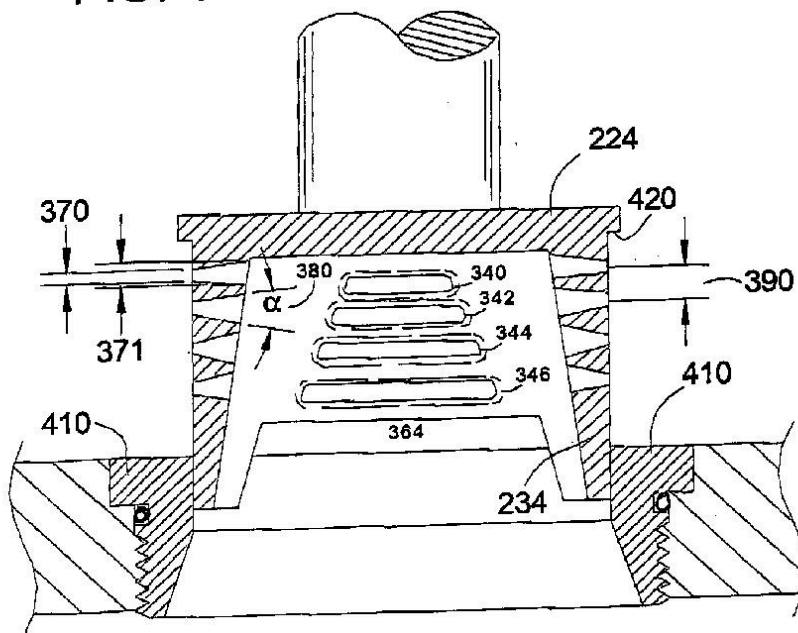
Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

Patent Application Publication Jun. 24, 2004 Sheet 4 of 6

US 2004/0118462 A1

FIG. 4

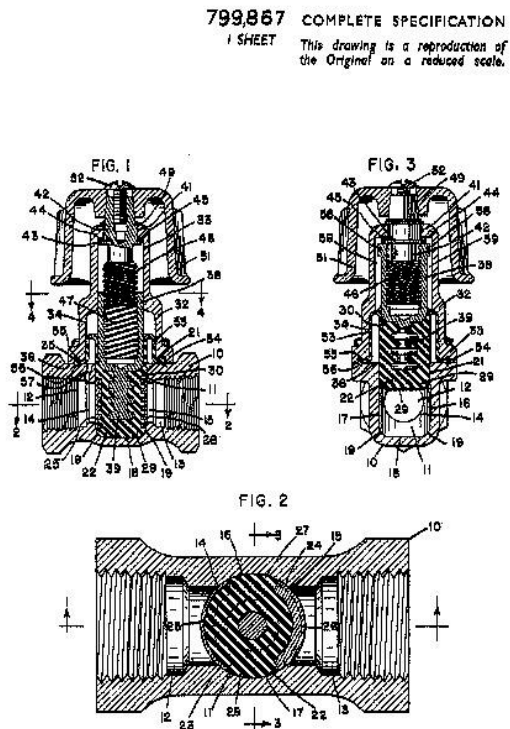
F16K 3/28

with resilient valve members

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



F16K 3/30

Details

Definition statement

This place covers:

Constructional details of the valve member, guiding and attachment to the spindle, lubrication and other details of special arrangements for influencing the flow.

F16K 5/00

{Plug valves;} Taps or cocks comprising only cut-off apparatus having at least one of the sealing faces shaped as a more or less complete surface of a solid of revolution, the opening and closing movement being predominantly rotary (taps of the lift-valve type [F16K 1/00](#))

References

Limiting references

This place does not cover:

Multiple way taps or cocks	F16K 11/00
----------------------------	----------------------------

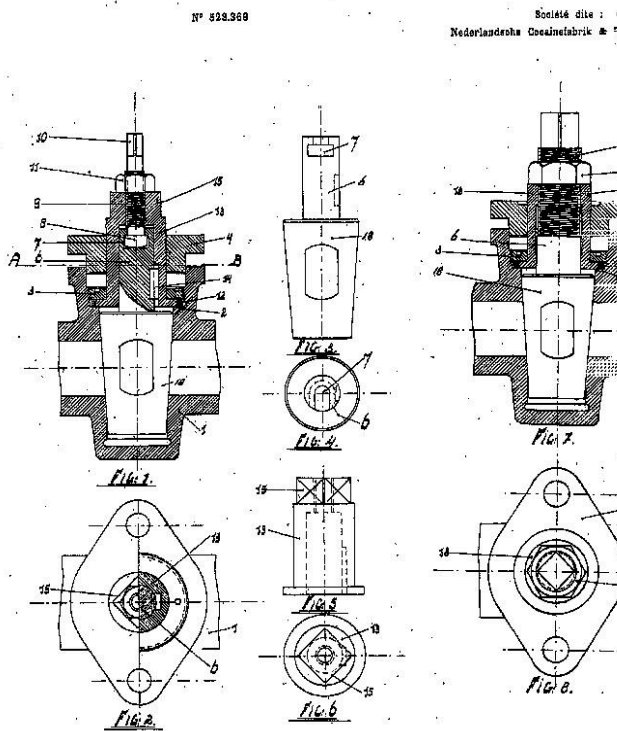
F16K 5/02

with plugs having conical surfaces; Packings therefor

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



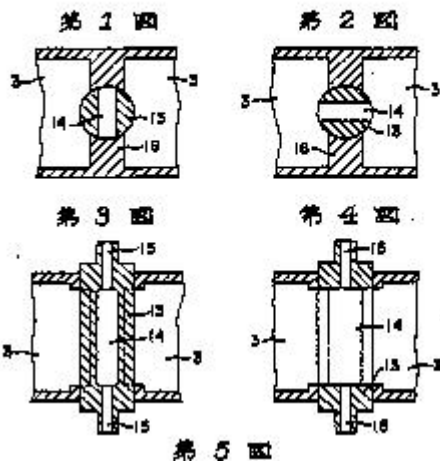
F16K 5/04

with plugs having cylindrical surfaces; Packings therefor

Definition statement*This place covers:*

Illustrative example of subject matter classified in this group.

特加碼 61-45175(3)



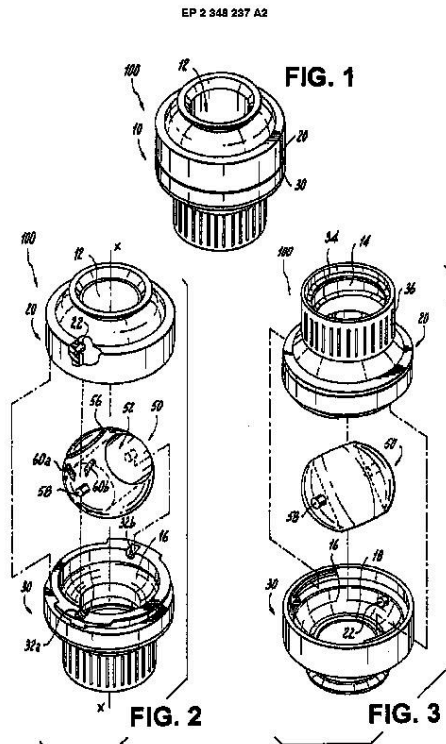
F16K 5/06

with plugs having spherical surfaces; Packings therefor

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

**F16K 5/08****Details****Definition statement**

This place covers:

Details of the valve member's sealing not covered by [F16K 5/02](#) - [F16K 5/06](#); Lubrication; Other means for adjusting the flow.

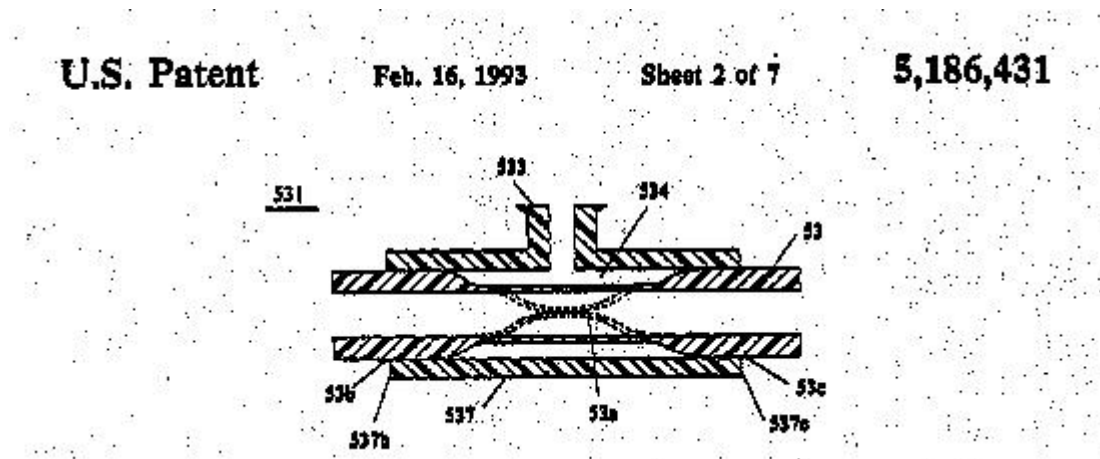
F16K 7/02

with tubular diaphragm

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



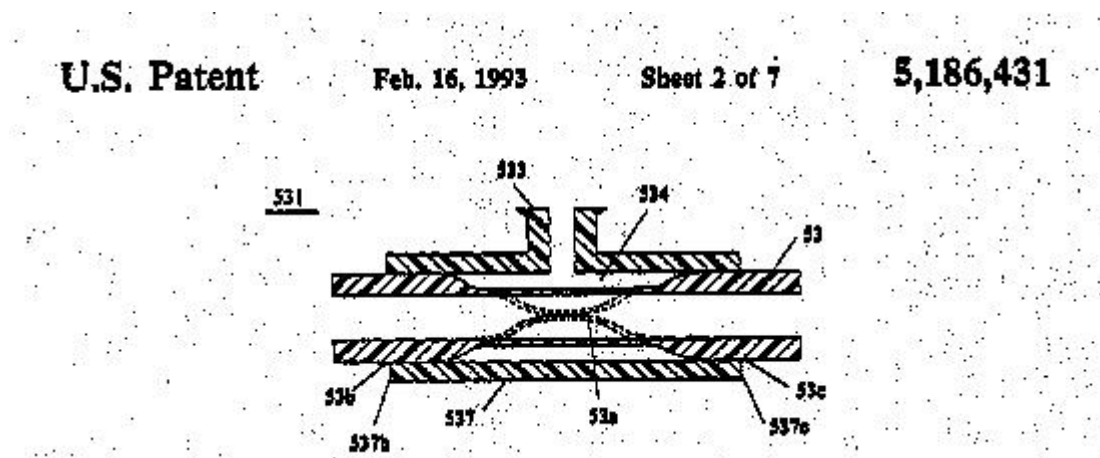
F16K 7/04

constrictable by external radial force

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



F16K 7/045

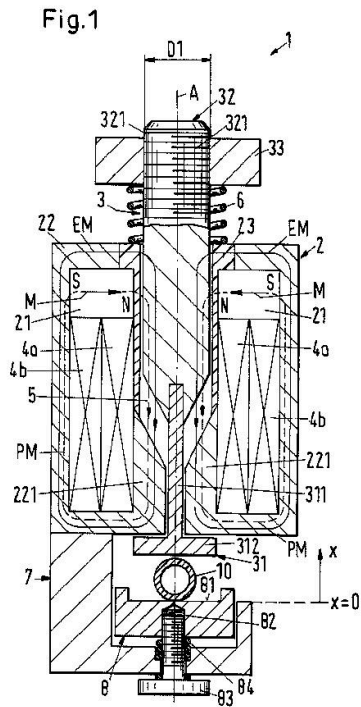
{by electric or magnetic means}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

Patent Application Publication Sep. 6, 2001 Sheet 1 of 6 US 2001/0019117 A1



F16K 7/06

by means of a screw-spindle, cam, or other mechanical means {(F16K 7/045 takes precedence)}

Definition statement

This place covers:

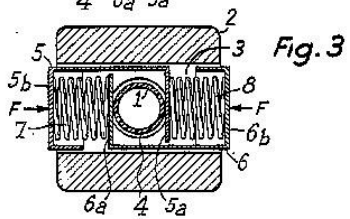
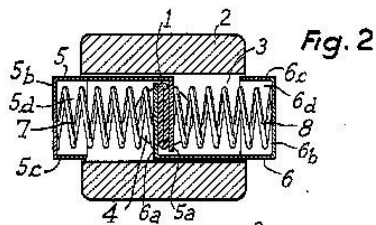
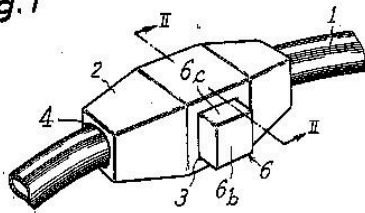
Illustrative example of subject matter classified in this group.

N° 1.829.636

M. Guyot

Pl. unique

Fig. 1



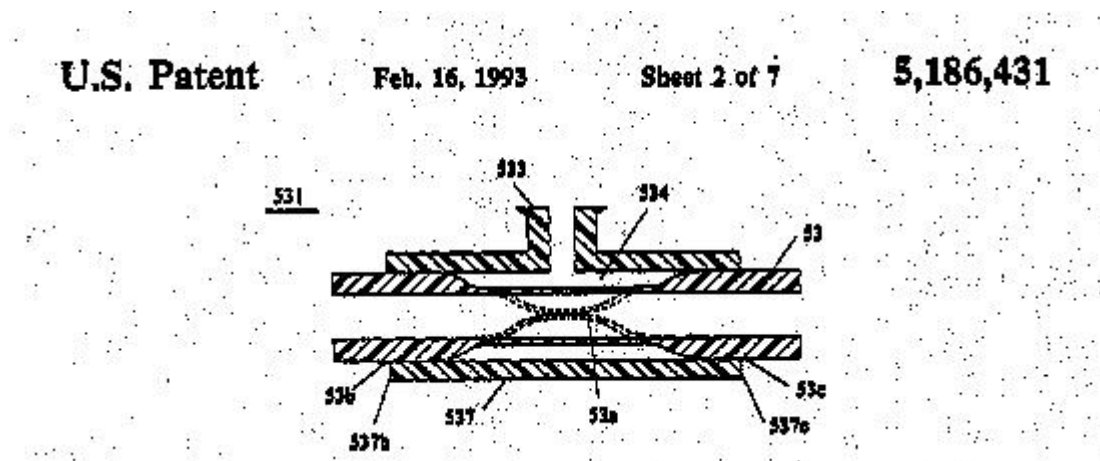
F16K 7/07

by means of fluid pressure

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



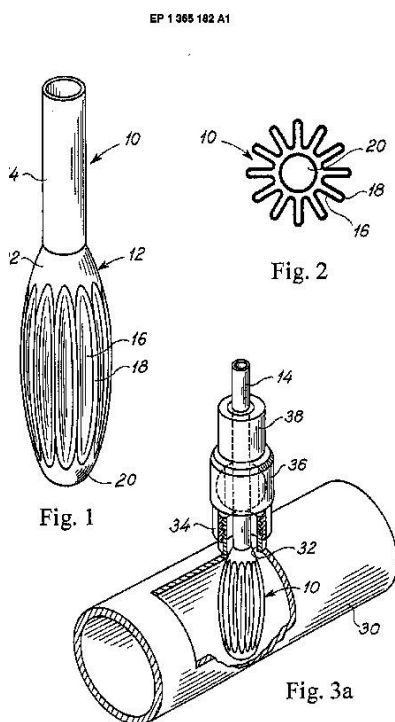
F16K 7/10

with inflatable member

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



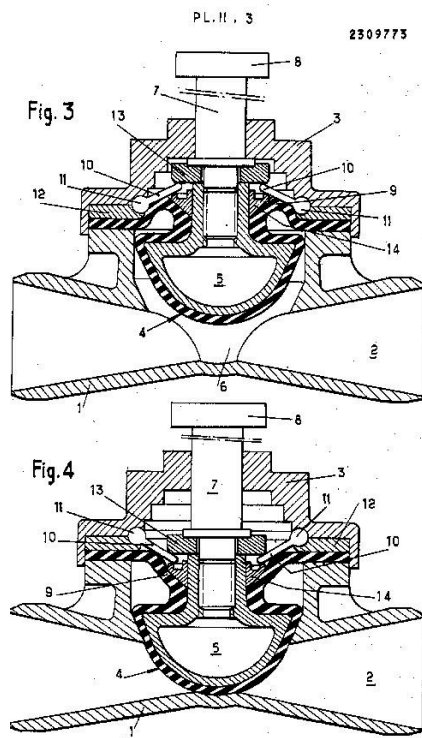
F16K 7/123

{the seat being formed on the bottom of the fluid line}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



F16K 7/126

{the seat being formed on a rib perpendicular to the fluid line}

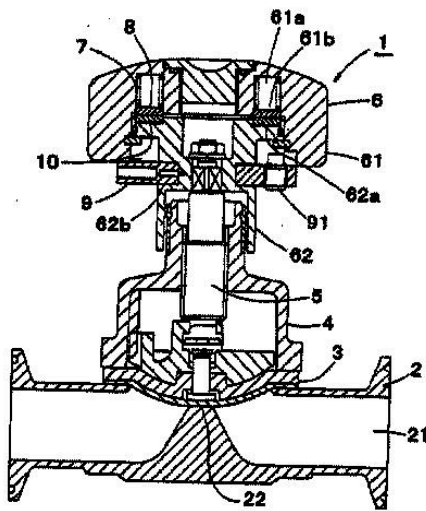
Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

EP 1 726 047 A1

FIG. 1



F16K 7/14

arranged to be deformed against a flat seat

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

Patent Application Publication Sep. 29, 2011 Sheet 2 of 5 US 2011/0233443 A1

FIG.3A

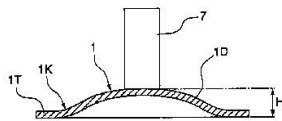


FIG.3B

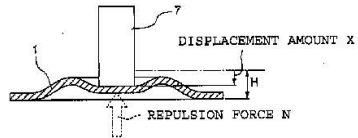
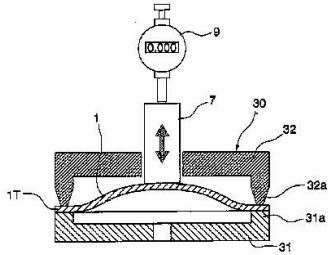


FIG.3C



F16K 7/18

with diaphragm secured at one side only, e.g. to be laid on the seat by rolling action

Definition statement

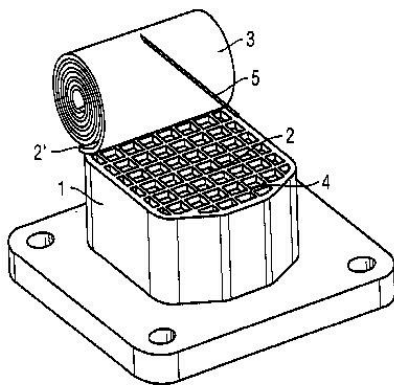
This place covers:

Illustrative example of subject matter classified in this group.

DE 10 2007 010 536 A1 2008.09.11

Anhängende Zeichnungen

FIG 1



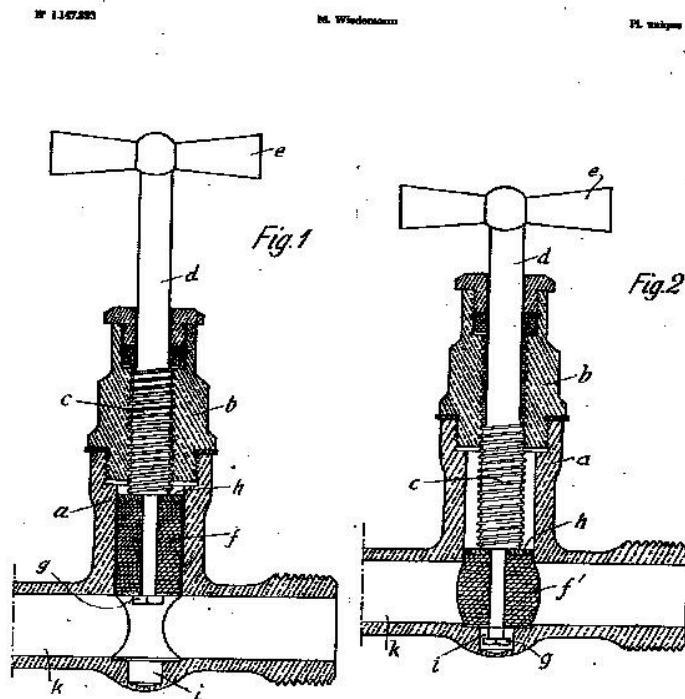
F16K 7/20

with a compressible solid closure member

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



F16K 11/00

Multiple-way valves, e.g. mixing valves; Pipe fittings incorporating such valves

References

Limiting references

This place does not cover:

Faucet diverter valves	E03C
------------------------	----------------------

F16K 11/02

with all movable sealing faces moving as one unit

Definition statement

This place covers:

A common valve member seals several seats

F16K 11/044

with movable valve members positioned between valve seats

Definition statement

This place covers:

Stationary valve seats and a movable valve member.

Illustrative example:

Patent Application Publication Jun. 24, 2010 Sheet 2 of 20 US 2010/0154896 A1

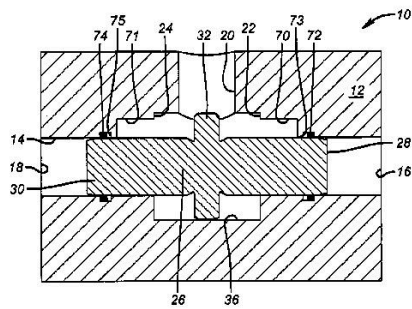
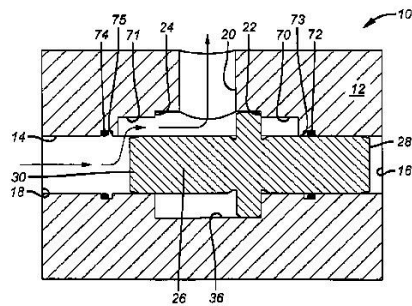


FIG. 3

**F16K 11/048**

with valve seats positioned between movable valve members

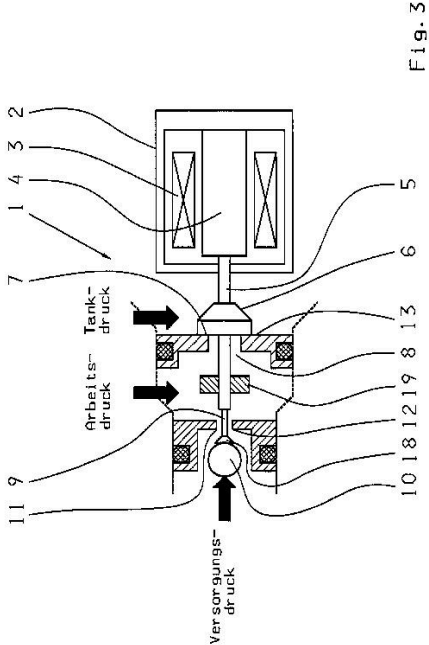
Definition statement

This place covers:

Stationary seats positioned between movable valve members.

Illustrative example:

DE 10 2007 042 890 A1 2009.03.12



F16K 11/052

with pivoted closure members, e.g. butterfly valves

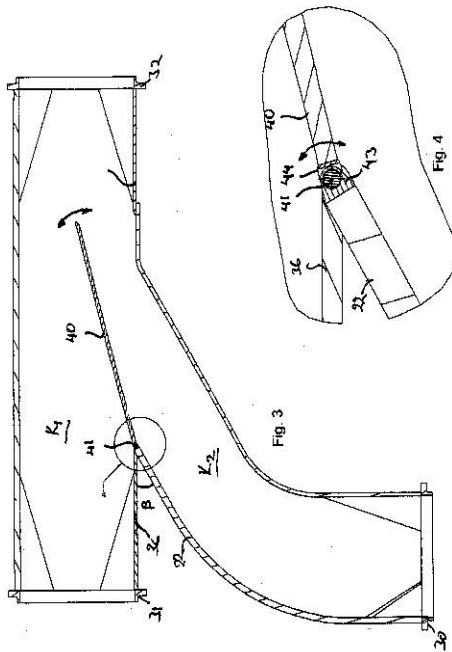
Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

WO 2010/043760

PCT/EP12009/050747



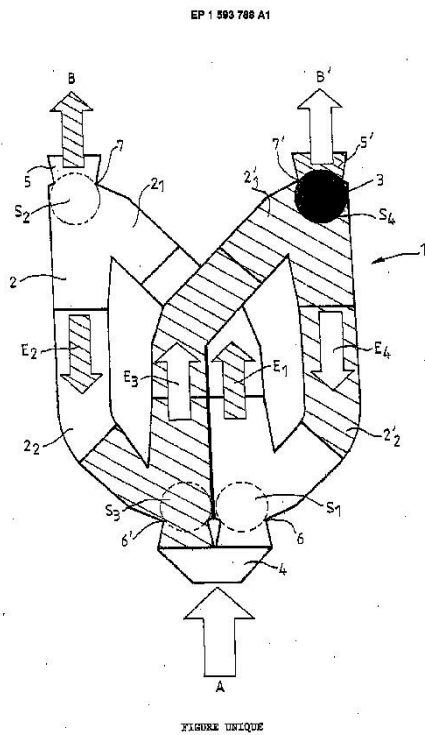
F16K 11/056

with ball-shaped valve members

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



F16K 11/0565

{moving in a combined straight line and rotating movement}

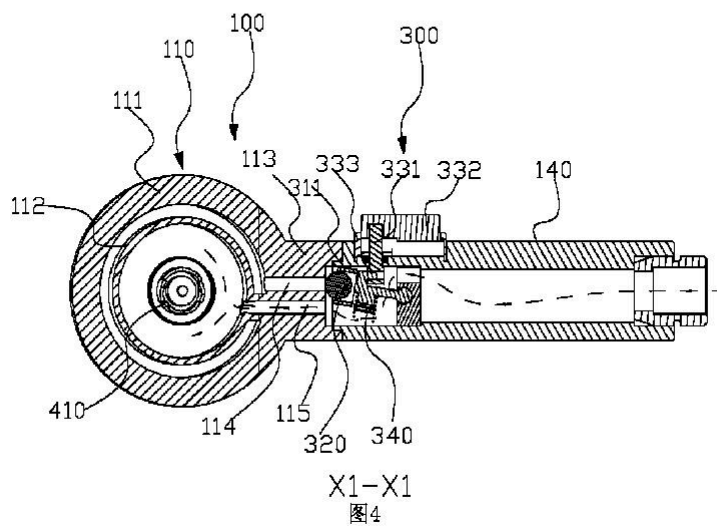
Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

WO 2011/103795

PCT/CN2011/071127



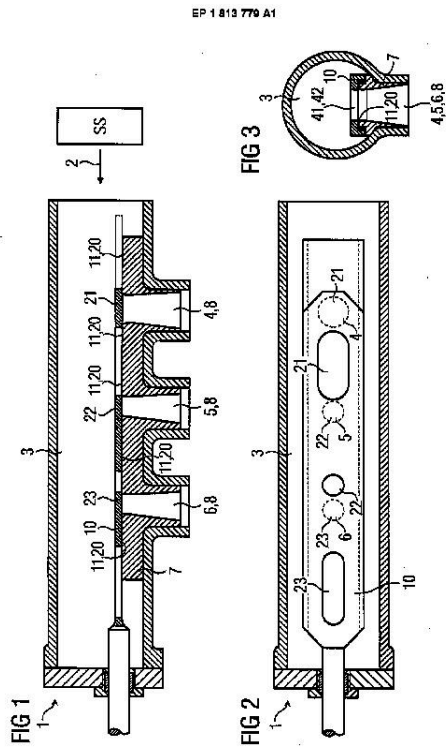
F16K 11/0655

{with flat slides}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



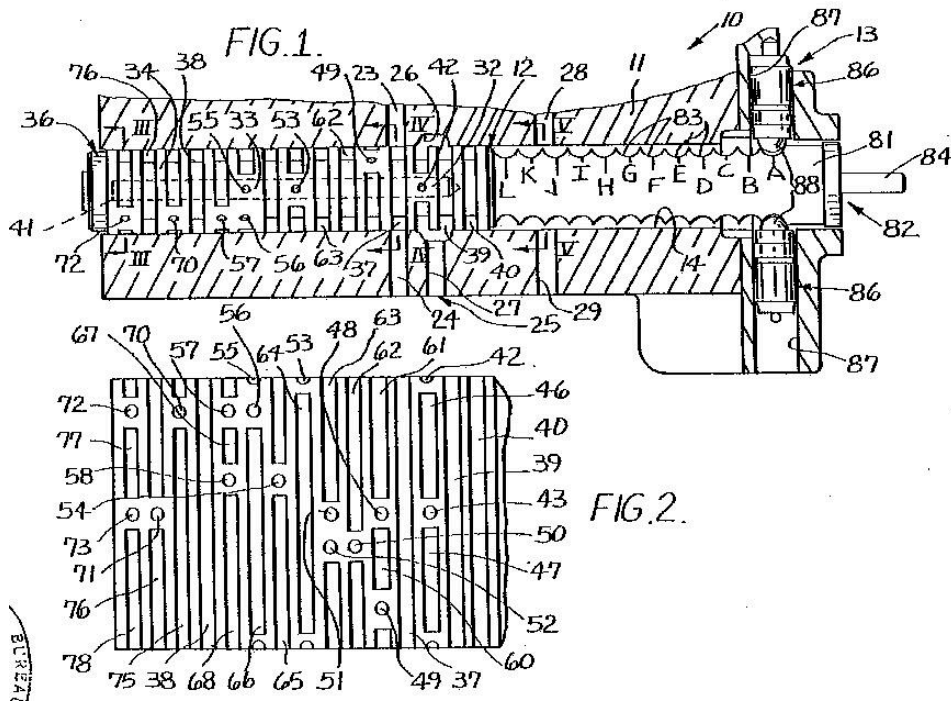
F16K 11/0704

{comprising locking elements}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



F16K 11/0708

{comprising means to avoid jamming of the slide or means to modify the flow}

Definition statement

This place covers:

Including means for modifying the flow for avoiding the jamming of the slide.

Illustrative example:

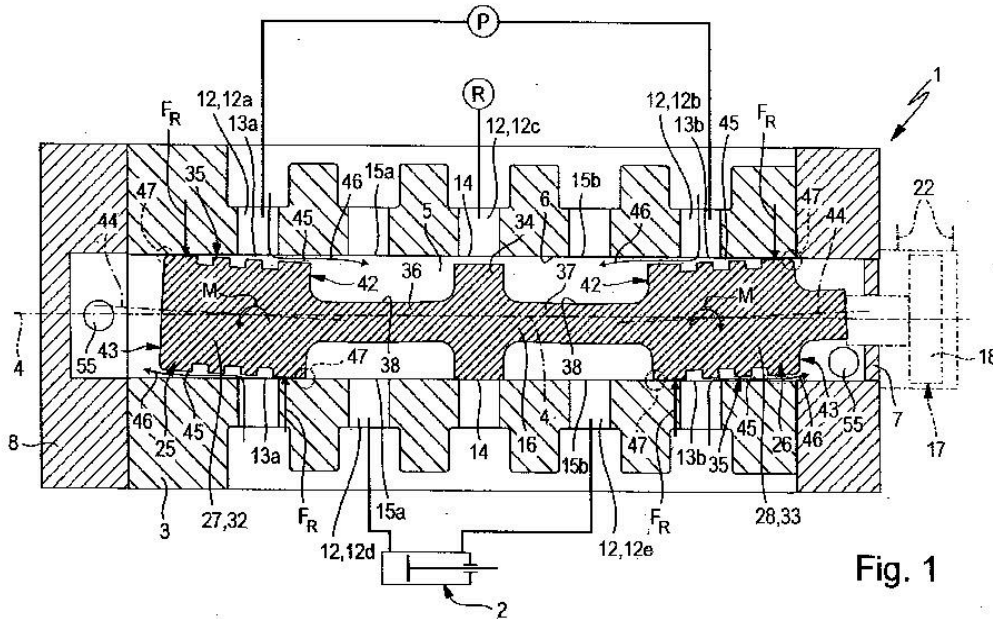


Fig. 1

DE 10 2010 010 061 A1 2011.09.08
 Anhängende Zeichnungen

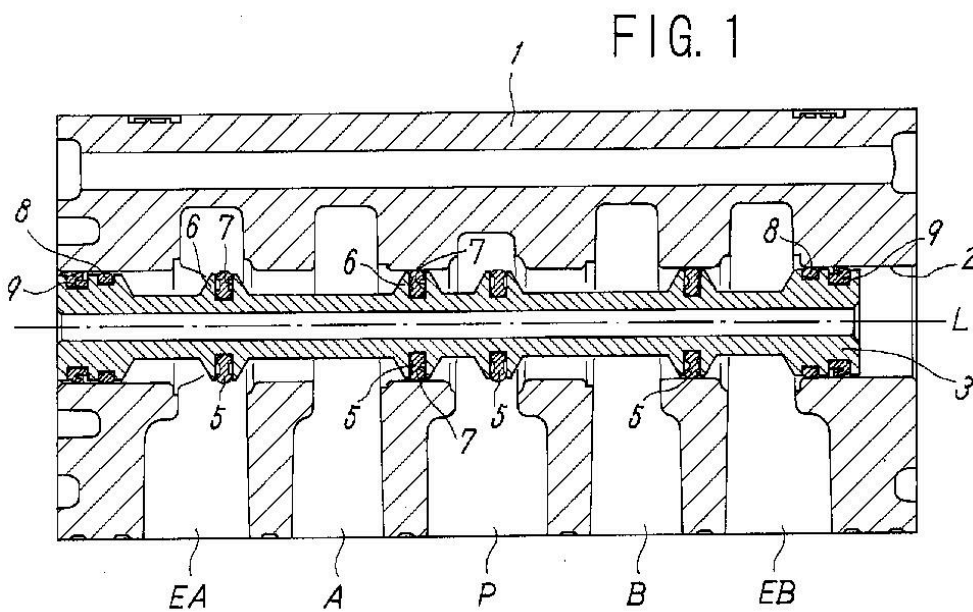
F16K 11/0712

{comprising particular spool-valve sealing means}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



Patent Application Publication Apr. 22, 2010 Sheet 1 of 3 US 2010/0096033 A1

F16K 11/0716

{with fluid passages through the valve member ([F16K 11/0704](#), [F16K 11/0708](#), [F16K 11/0712](#) take precedence)}

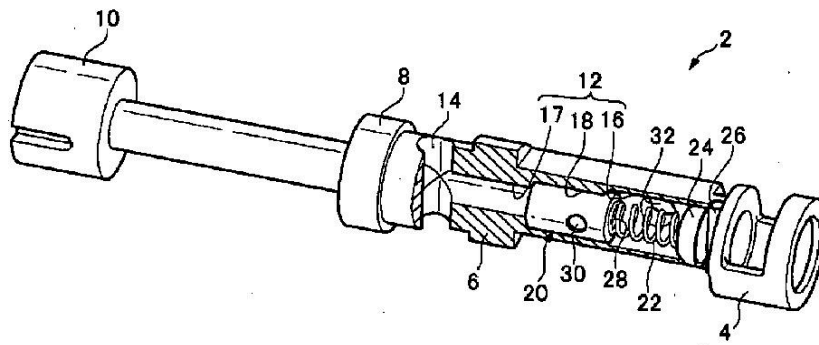
Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

Patent Application Publication Jun. 7, 2007 Sheet 2 of 4 US 2007/0125433 A1

FIG.2



F16K 11/072

with pivoted closure members

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

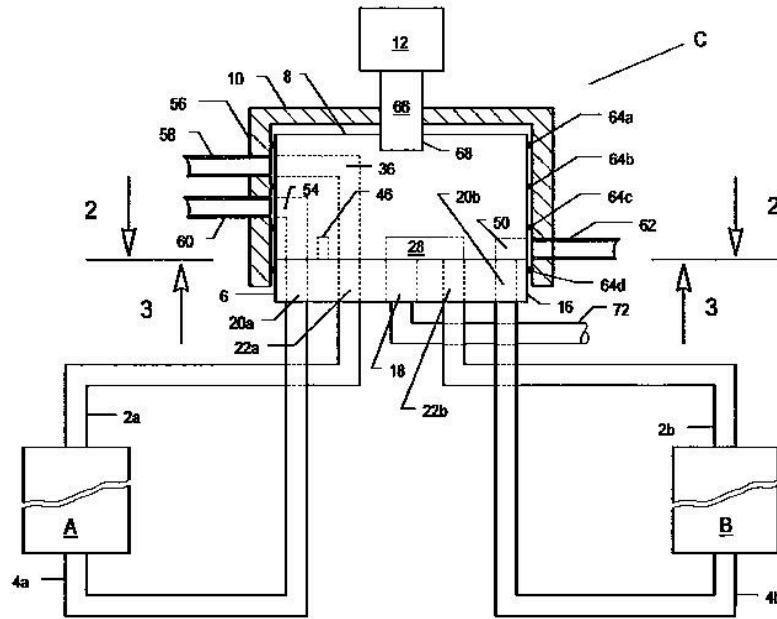


FIG. 1

EP 0 882 879 A2

F16K 11/078

with pivoted and linearly movable closure members

Definition statement

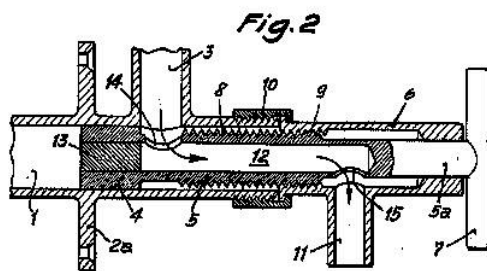
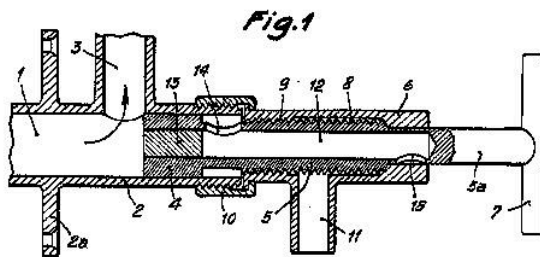
This place covers:

Illustrative example of subject matter classified in this group.

N° 1.213.886

M. Oertli

El. unique



F16K 11/10

with two or more closure members not moving as a unit

Definition statement

This place covers:

Multiple-way valves with either a common actuating means or separate actuating means for every valve member.

F16K 13/00

Other constructional types of cut-off apparatus (means for plugging pipes or hoses [F16L 55/10](#)); Arrangements for cutting-off

Definition statement

This place covers:

Valve arrangements which do not belong per se to any of the previous constructional classes or having a function which cannot be classified under the existing functional classes.

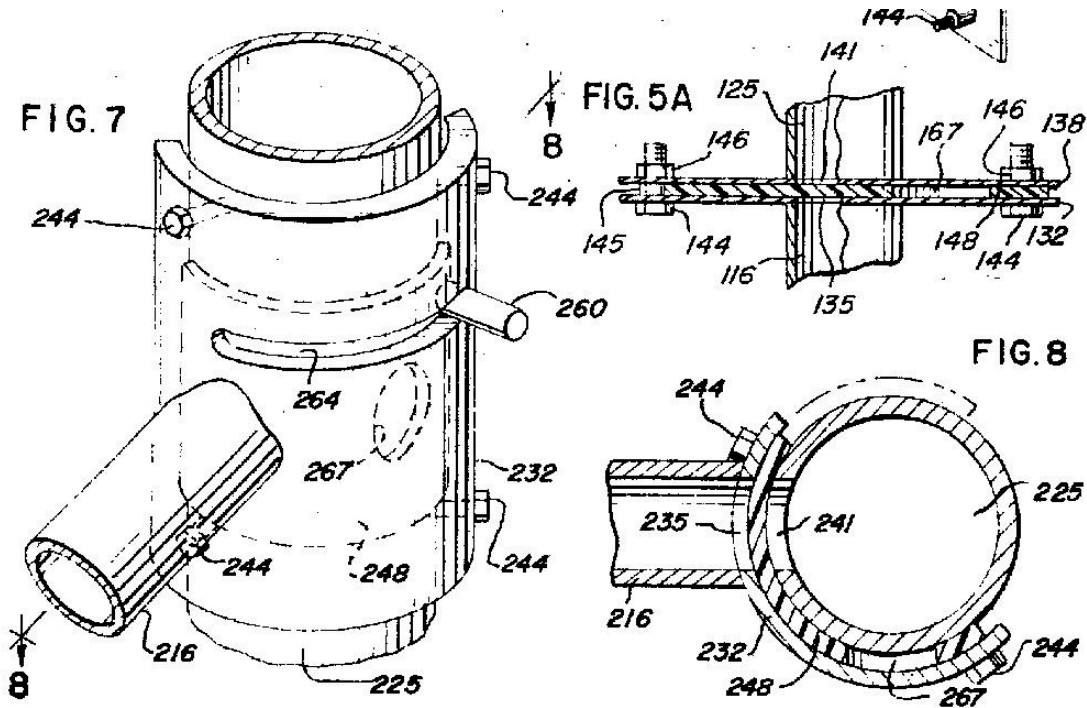
F16K 13/02

with both sealing faces shaped as small segments of a cylinder and the moving member pivotally mounted

Definition statement

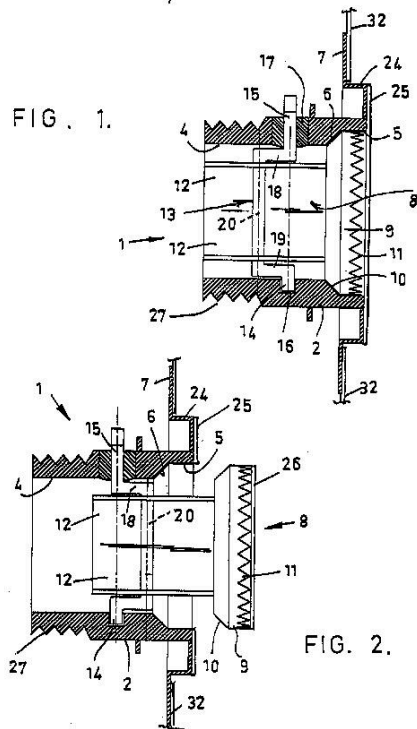
This place covers:

Illustrative example of subject matter classified in this group.



F16K 13/04**{with a breakable closure member}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group.



F16K 13/10

by means of liquid or granular medium

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

WO 2004/000475

PCT/GB2003/002697

4/4

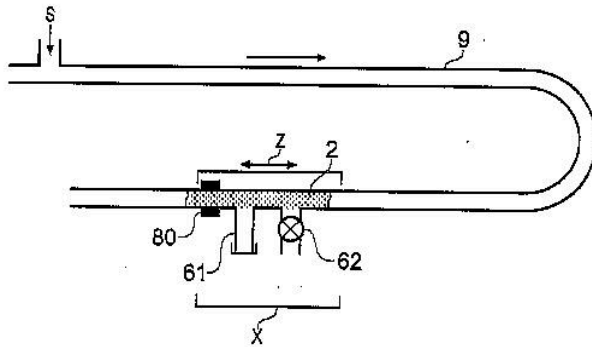


Fig. 10

F16K 15/00

Check valves (valves specially adapted for inflatable balls [A63B 41/00](#))

Definition statement

This place covers:

Valves that normally allow fluid (liquid or gas) to flow through it in only one direction. (also known as non-return valve, reflux valve, retention valve, one-way valve or as clack valve).

Relationships with other classification places

Check valves may also be characterized by their structural type (i.e. lift valves, gate valves/sliding valves, plug valves/taps/cocks, diaphragm valves, multiple-way valves) in the following groups [F16K 1/00](#) - [F16K 13/00](#), when it is not possible to fully classify the structural features in [F16K 15/00](#) alone.

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:

Inhalers with inhalation check valves	A61M 15/0013
---------------------------------------	------------------------------

Application-oriented references

Inhalers with exhalation check valves	A61M 15/0018
One-way valves in medical respiratory devices	A61M 16/208
Check valves for medical applications. Details of check valves in devices for introducing media into, or onto, the body	A61M 39/24
Valves specially adapted for inflatable balls	A63B 41/00
Check valves used in devices for preventing contamination of drinking-water pipes	E03C 1/104 , E03C 1/106
Using check valves with a crankcase	F01M 2013/0494
Valves for positive displacement machines, pumps	F04B 1/182 , F04B 39/10 , F04B 53/10
Check valves for hydraulic or pneumatic systems	F15B 13/027
Check valves in means for varying tension of belts	F16H 2007/0859
Check valves for lubrication systems	F16N 23/00

Informative references

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

Three-way check or safety valves with two or more closure members	F16K 11/105
Safety valves; Equalising valves	F16K 17/00
Details on the construction of the housing in check valves of the lift valve type	F16K 27/0209

Special rules of classification

If the structural features of the check valve cannot be fully classified in this area or when special features so entitle, then classification in [F16K 1/00](#) or [F16K 11/04](#) and respective subgroups should also be considered.

In some exceptional cases, valves classified in [F16K 17/00](#) can also be classified in this subgroup when structural features so entitle. In general, if the structural features are already fully classified in [F16K 17/00](#), then additional classification in [F16K 15/00](#) is not needed.

Classification should also be given in [F16K 11/105](#) if the valve is a multi-way valve.

Reference "valves specially adapted for inflatable balls [A63B 41/00](#)" is non-limiting in the main group [F16K 15/00](#). CPC will be corrected once this inconsistency is resolved in IPC.

Glossary of terms

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

Valve member	generally refers to the component that is moving relative to the seating surface. The valve member itself may be stationary, but there is generally relative movement between it and the seating surface during opening and closing of the valve.
--------------	---

References

Limiting references

This place does not cover:

Check valves with guided rigid valve members having particular constructional features.	F16K 15/025 - F16K 15/12
---	---

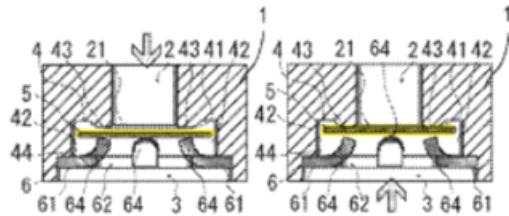
F16K 15/023

{the valve member consisting only of a predominantly disc-shaped flat element}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



References

Application-oriented references

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

Disc valves in compressors	F04B 39/102
----------------------------	-----------------------------

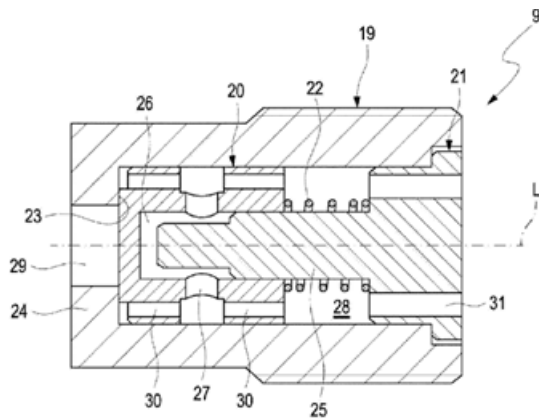
F16K 15/025

{the valve being loaded by a spring ([F16K 15/03](#) - [F16K 15/12](#) take precedence)}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



References

Limiting references

This place does not cover:

Check valves with guided rigid valve members being loaded by a spring of particular constructional types covered by groups	F16K 15/03 - F16K 15/12
--	---

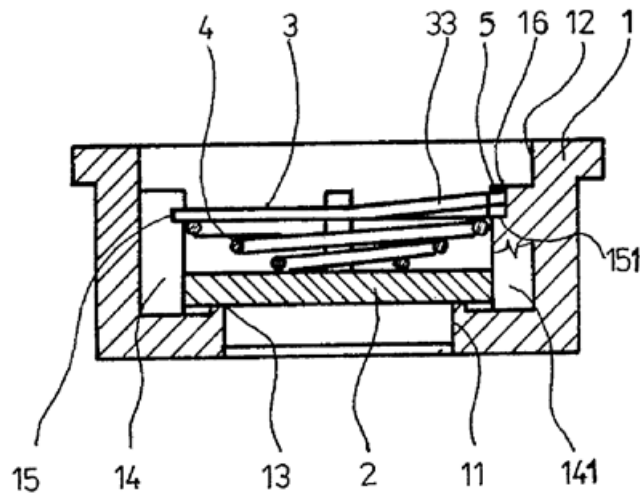
F16K 15/028

{the valve member consisting only of a predominantly disc-shaped flat element}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

**F16K 15/03**

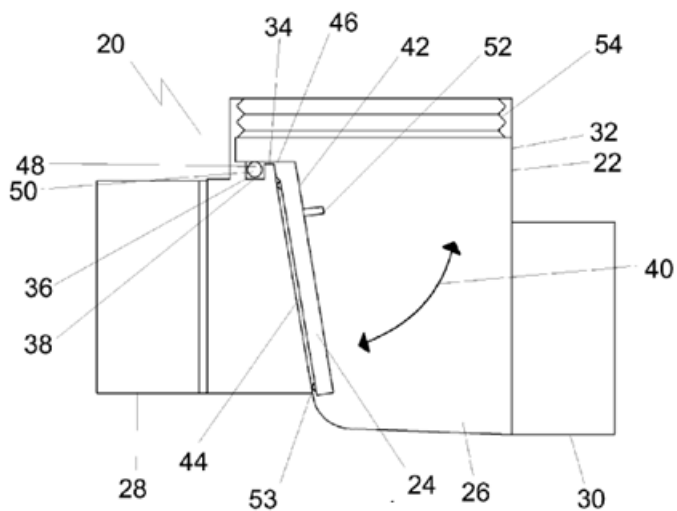
with a hinged closure member {or with a pivoted closure member}

Definition statement

This place covers:

Check valves with a hinged closure member or with a pivoted closure member.

Illustrative example of subject matter classified in this group.



F16K 15/031

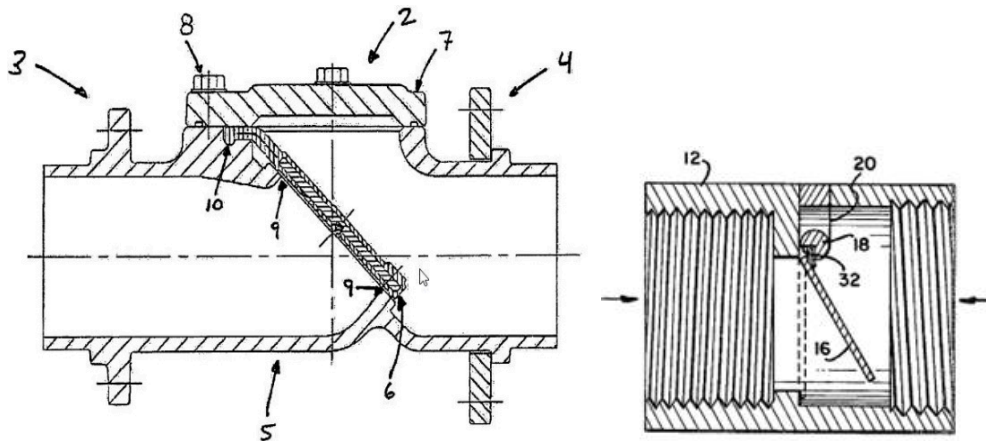
{the hinge being flexible}

Definition statement

This place covers:

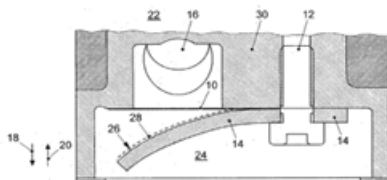
Rigid valve members connected by a hinge formed of a flexible member.

Illustrative example of subject matter classified in this group.



Special rules of classification

For purposes of classification, pivoted valves as shown below, would be considered as flexible member are NOT classified here, and are normally placed in [F16K 15/14 - F16K 15/16](#).



Even though hinge (24) is flexible, since the valve member is also flexible and not rigid, it would be better classified in [F16K 15/14 - F16K 15/16](#).

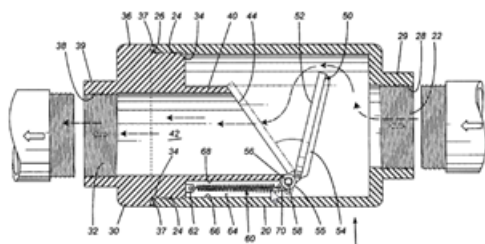
F16K 15/033

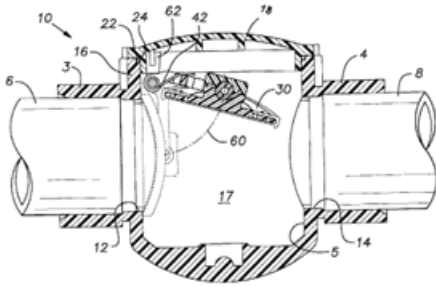
{spring-loaded}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.





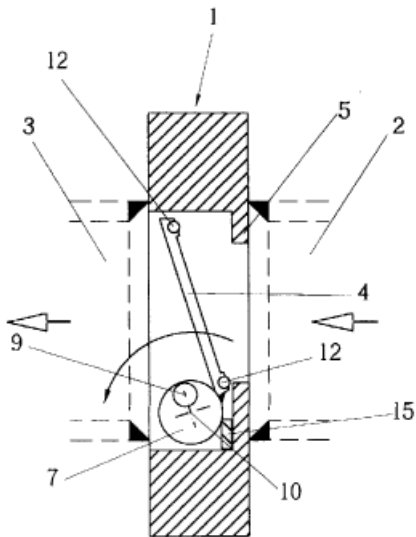
F16K 15/034

{weight-loaded}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



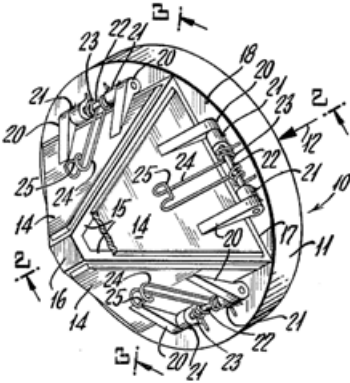
F16K 15/035

{with a plurality of valve members}

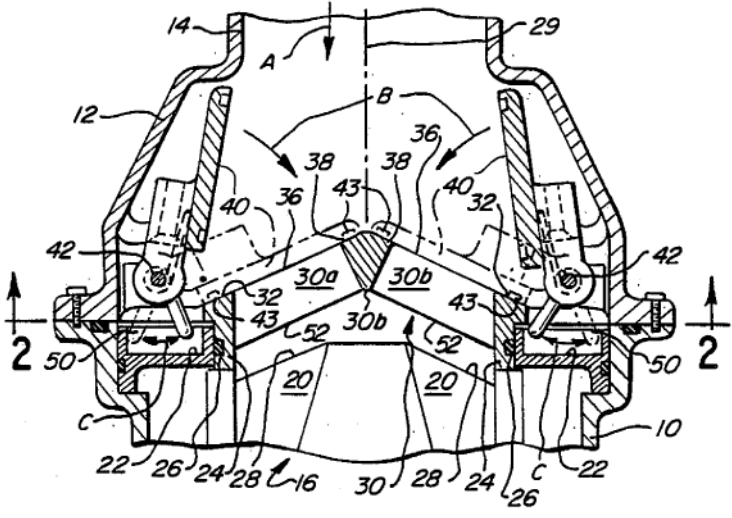
Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



Centrifugal pump with splitter vane/shut-off valve system



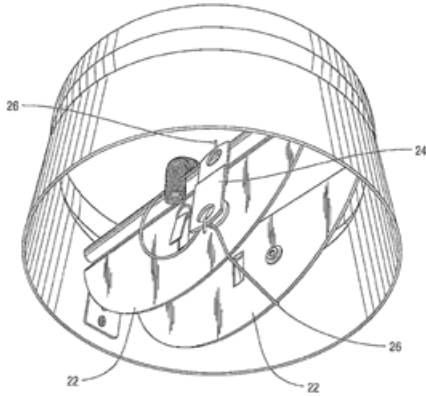
F16K 15/036

{Dual valve members with hinges crossing the flow line substantially diametrical}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



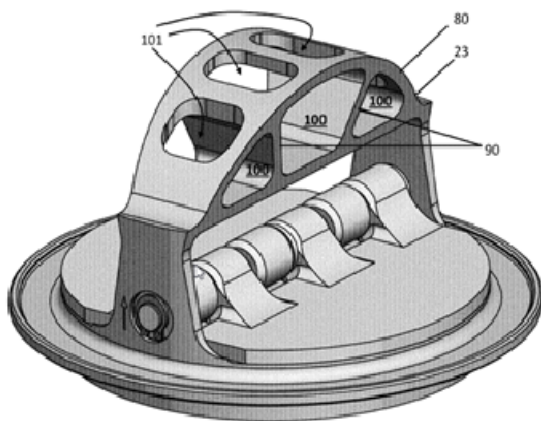
F16K 15/038

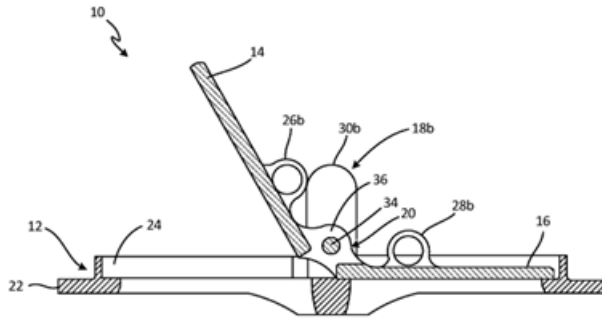
{having a common hinge}

Definition statement

This place covers:

Illustrative examples of subject matter classified in this group.





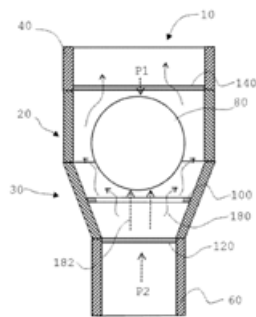
F16K 15/04

shaped as balls

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



References

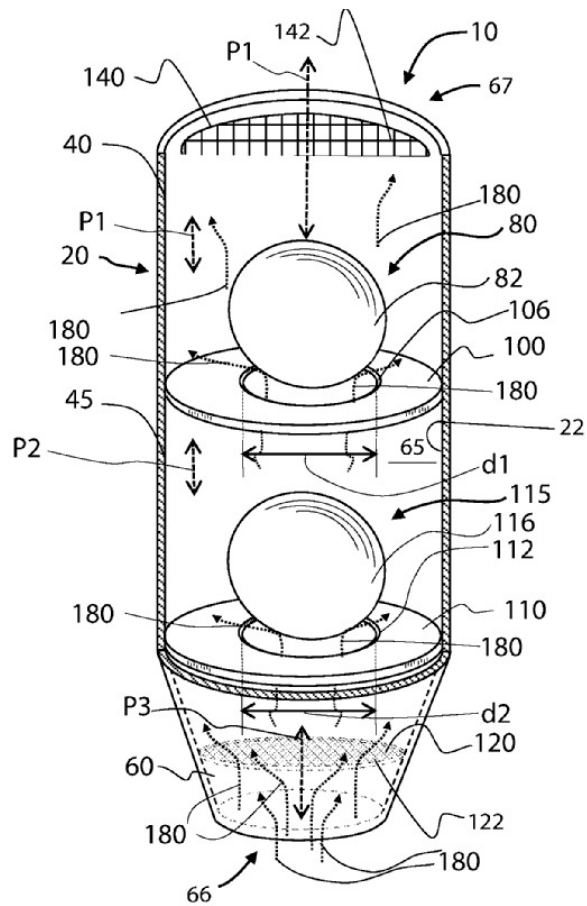
Application-oriented references

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

Ball valves in devices for introducing media into, or onto, the body	A61M 2039/248
Ball valves in positive displacement machines, pumps	F04B 39/1006

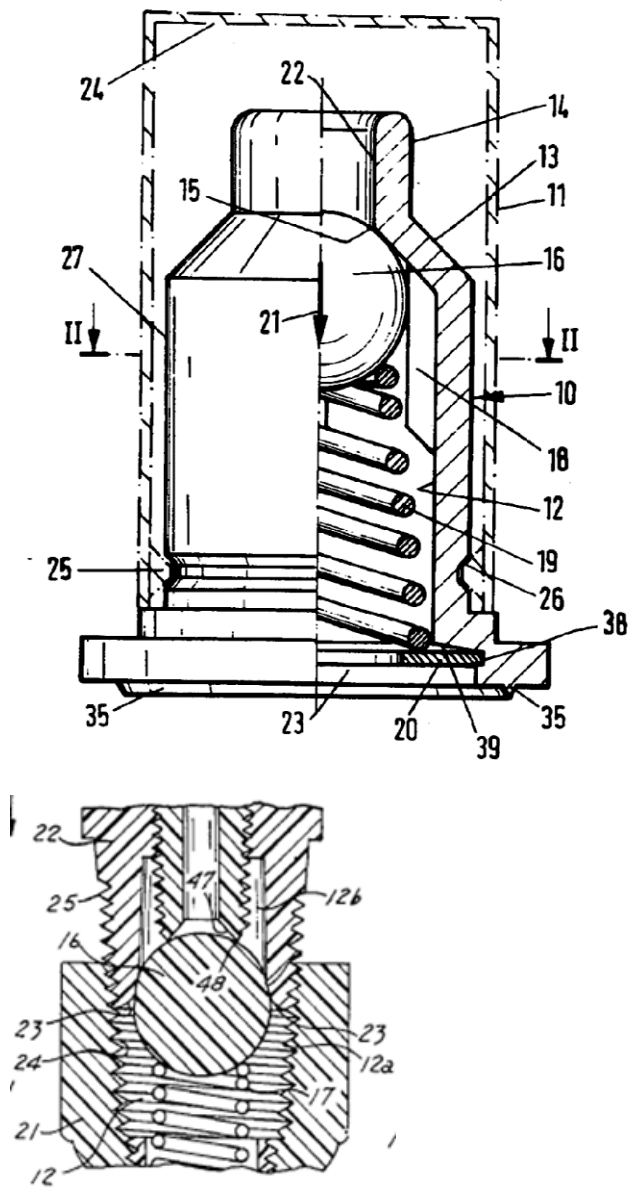
F16K 15/042**{with a plurality of balls}****Definition statement***This place covers:*

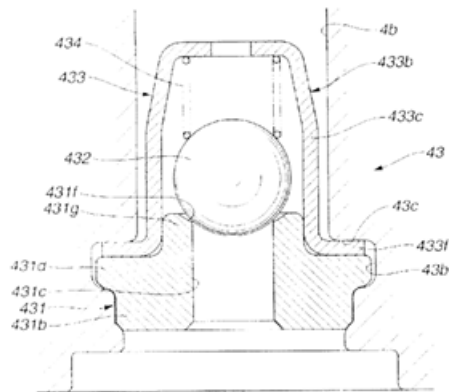
Illustrative example of subject matter classified in this group.



F16K 15/044**{spring-loaded}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group.





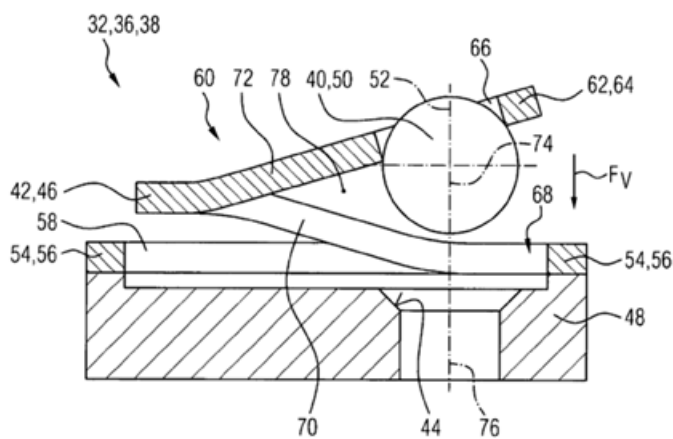
F16K 15/046

{by a spring other than a helicoidal spring}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



F16K 15/048

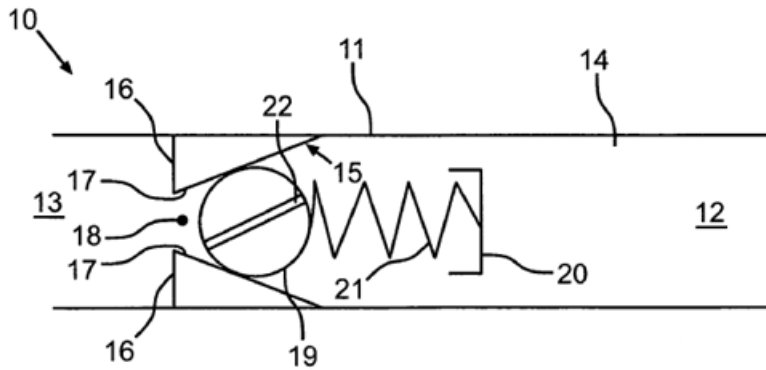
{Ball features}

Definition statement

This place covers:

Ball valves in which the ball has features considered to be special characteristics in view of the inventive concept.

Illustrative example of subject matter classified in this group.



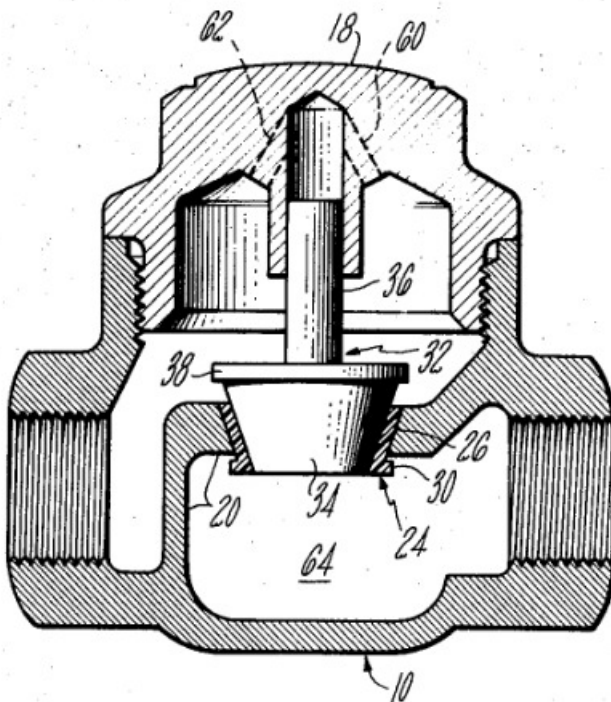
F16K 15/06

with guided stems

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



References

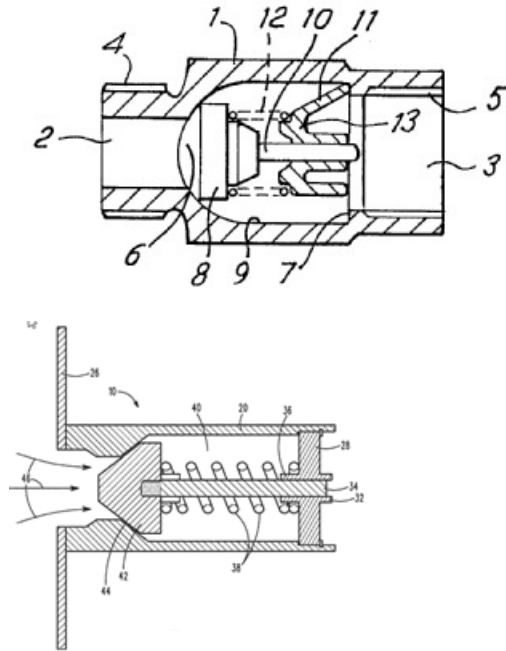
Application-oriented references

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

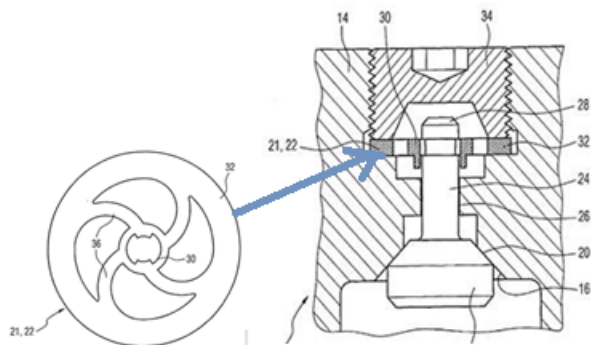
Check valves with guided stems in devices for introducing media into, or onto, the body	A61M 2039/2486
---	--------------------------------

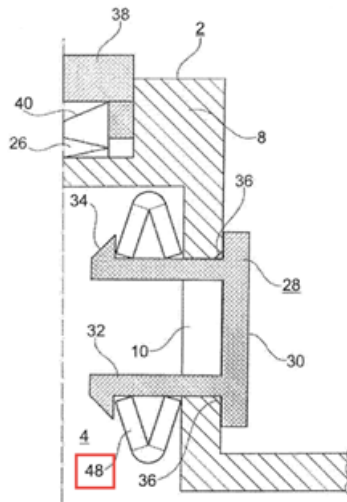
F16K 15/063**{the valve being loaded by a spring}****Definition statement***This place covers:*

Illustrative examples of subject matter classified in this group.

**F16K 15/064****{with a spring other than a helicoidal spring}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group.





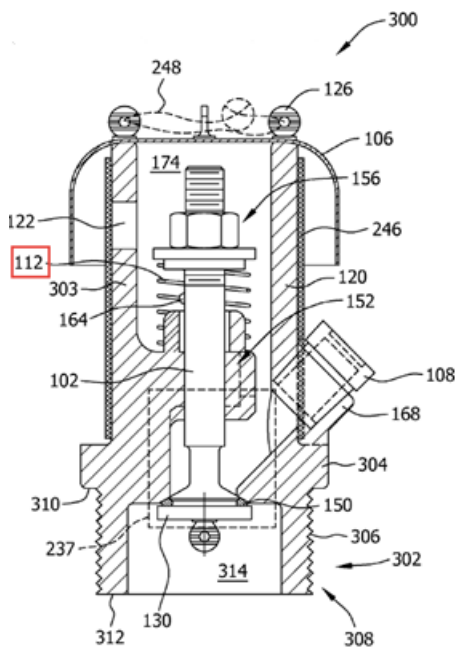
F16K 15/065

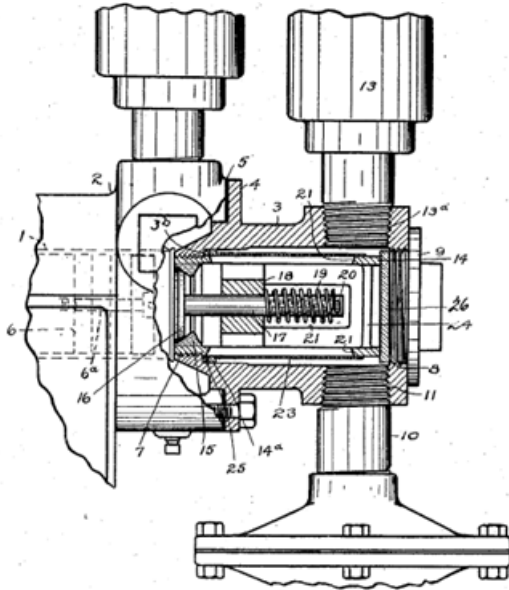
{spring pulling the closure member against the seat}

Definition statement

This place covers:

Illustrative examples of subject matter classified in this group.





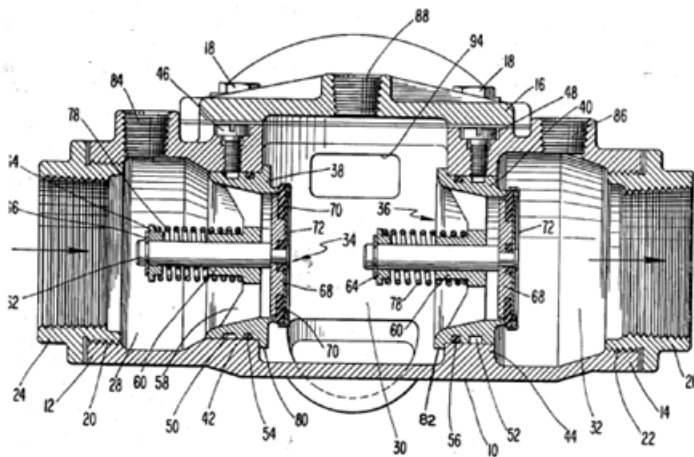
F16K 15/066

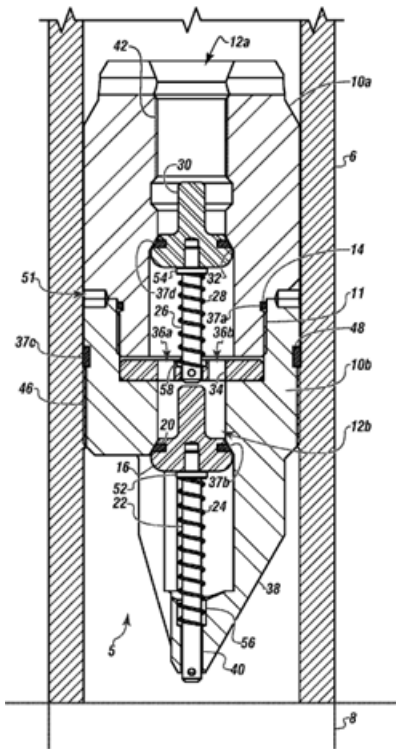
{with a plurality of valve members}

Definition statement

This place covers:

Illustrative examples of subject matter classified in this group.





F16K 15/067

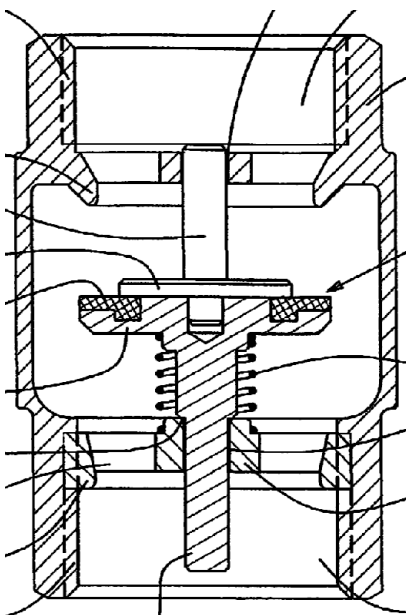
{stem guided at two or more points}

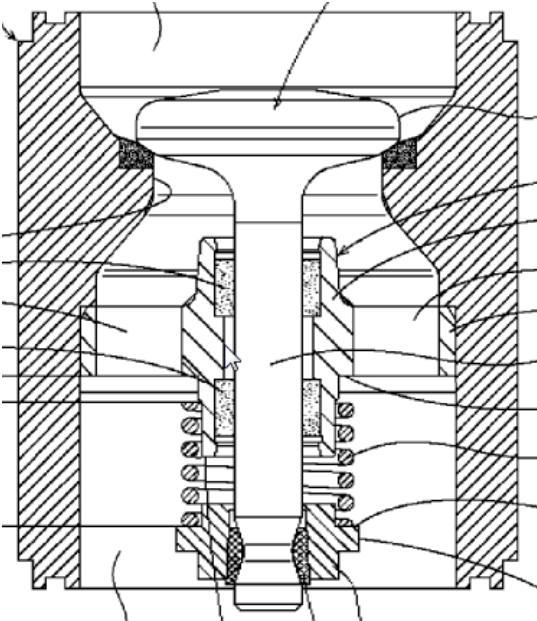
Definition statement

This place covers:

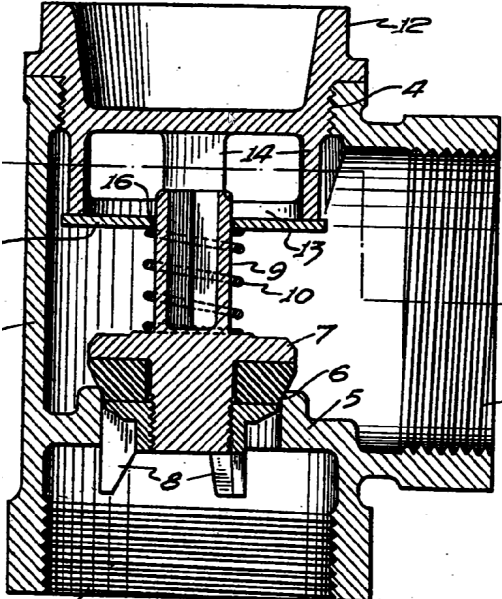
Valves where the stem is guided at two or more points along the longitudinal axis of the valve member.

Illustrative example of subject matter classified in this group.





A guided closure member is also considered a guide point, as illustrated below.



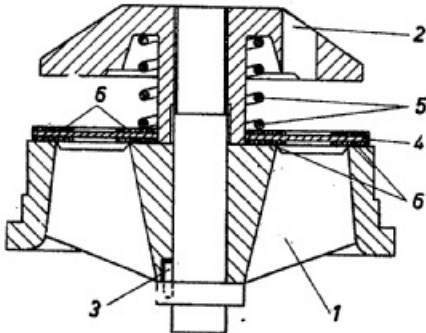
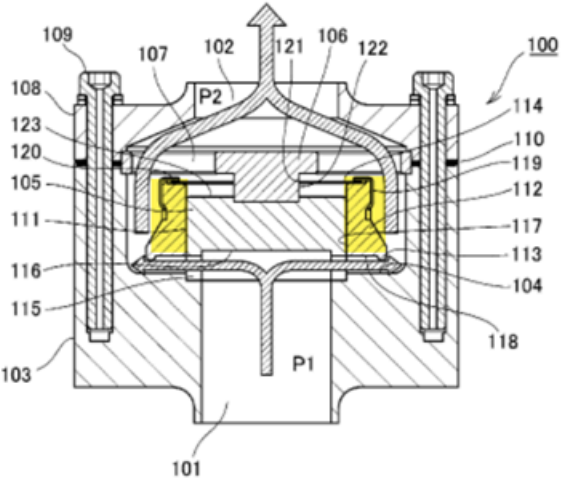
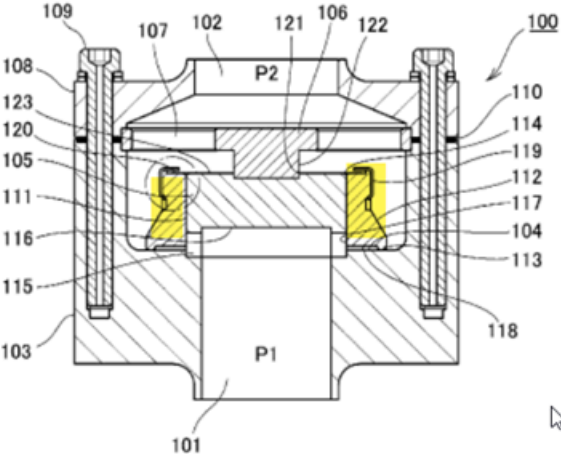
F16K 15/08

shaped as rings

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



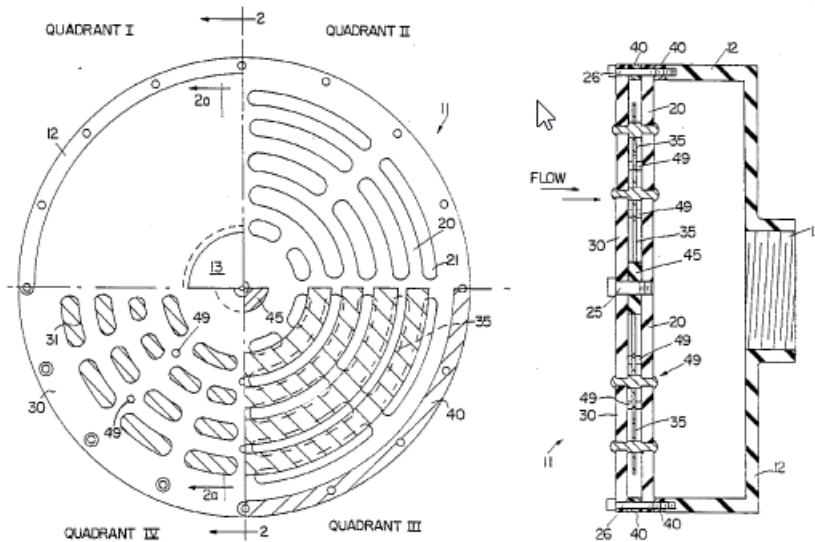
F16K 15/10

integral with, or rigidly fixed to, a common valve plate

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



References

Application-oriented references

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

Annular disc valves in compressors	F04B 39/1033
Hoerbiger valves in compressors	F04B 39/1053

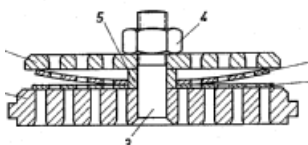
F16K 15/12

Springs for ring valves

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



F16K 15/14

with flexible valve members

Definition statement

This place covers:

Check valve in which the valve member is made of resilient deformable material which yields in response to pressure to open the valve.

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:

Slit valve specially adapted for medical use	A61M 2039/2426
Valve comprising a resilient or deformable element specially adapted for medical use	A61M 2039/2433 - A61M 2039/2466
Valves formed of one or more flexible elements in positive displacement machines for liquids; pumps	F04B 53/1047 - F04B 53/107

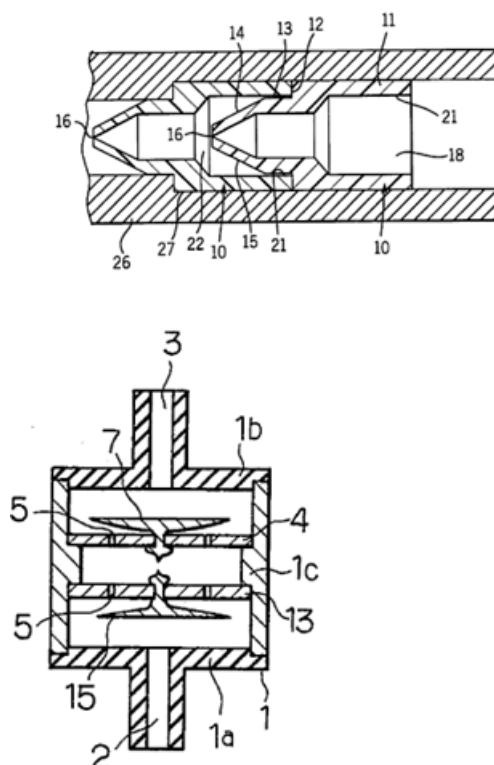
F16K 15/1401

{having a plurality of independent valve members}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



F16K 15/1402

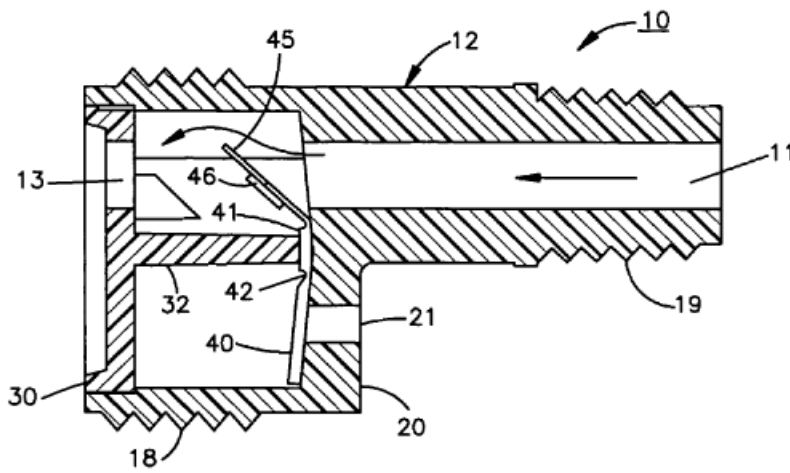
{having an integral flexible member cooperating with a plurality of seating surfaces}

Definition statement

This place covers:

A single flexible valve member controls the flow through a plurality of openings, by cooperating with the seating surface of each of the individual openings.

Illustrative example of subject matter classified in this group.



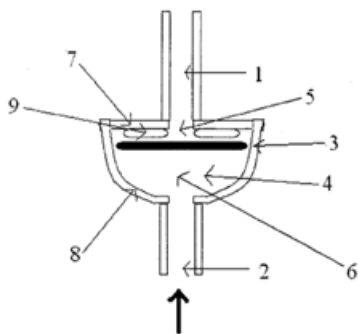
F16K 15/141

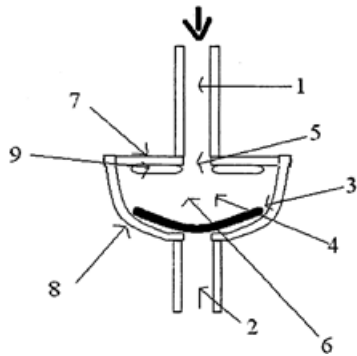
{the closure elements not being fixed to the valve body}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.





References

Application-oriented references

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

Flexible disc check valves not being fixed to the valve body specially adapted for medical use	A61M 2039/2453
--	--------------------------------

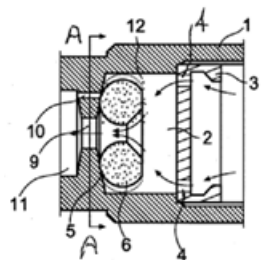
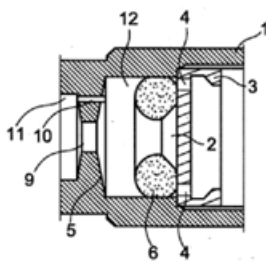
F16K 15/142

{the closure elements being shaped as solids of revolution, e.g. toroidal or cylindrical rings}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



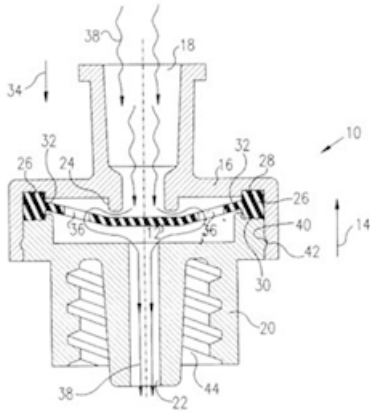
F16K 15/144

{the closure elements being fixed along all or a part of their periphery}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



F16K 15/1441

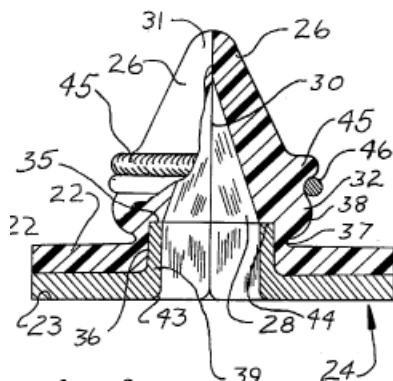
{with biasing means in addition to material resiliency, e.g. spring}

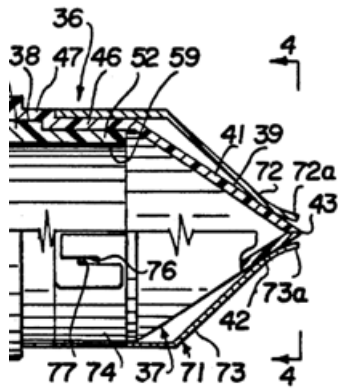
Definition statement

This place covers:

Valves with flexible members where there is a biasing means in addition to the resiliency of the flexible valve member.

Illustrative example of subject matter classified in this group.





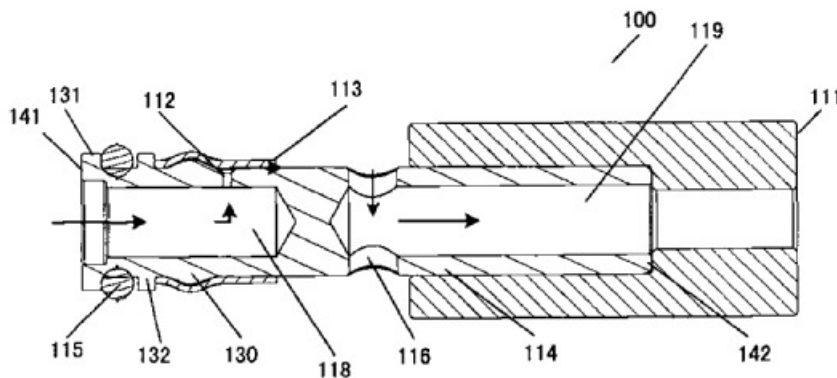
F16K 15/145

{the closure elements being shaped as a solids of revolution, e.g. cylindrical or conical}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



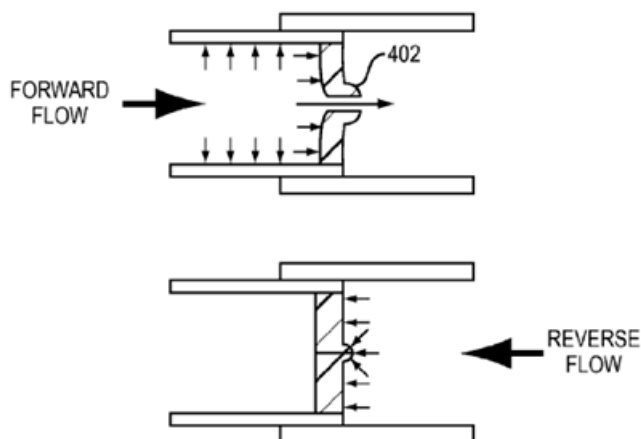
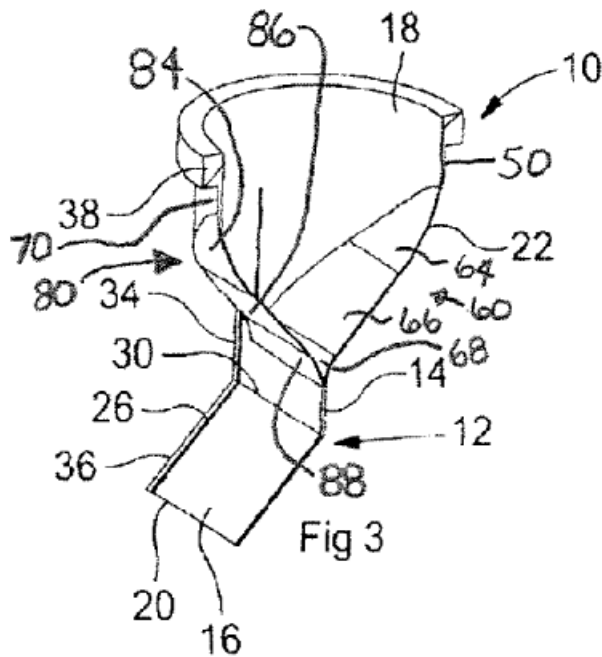
F16K 15/147

{the closure elements having specially formed slits or being of an elongated easily collapsible form}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



References

Application-oriented references

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

Slit valves in devices for introducing media into, or onto, the body
--

A61M 2039/2426

Valves for dispensing bottles, e.g. ketchup squeeze bottle	B65D 47/2031
Slit valves in containers for storage or transport	B65D 51/165

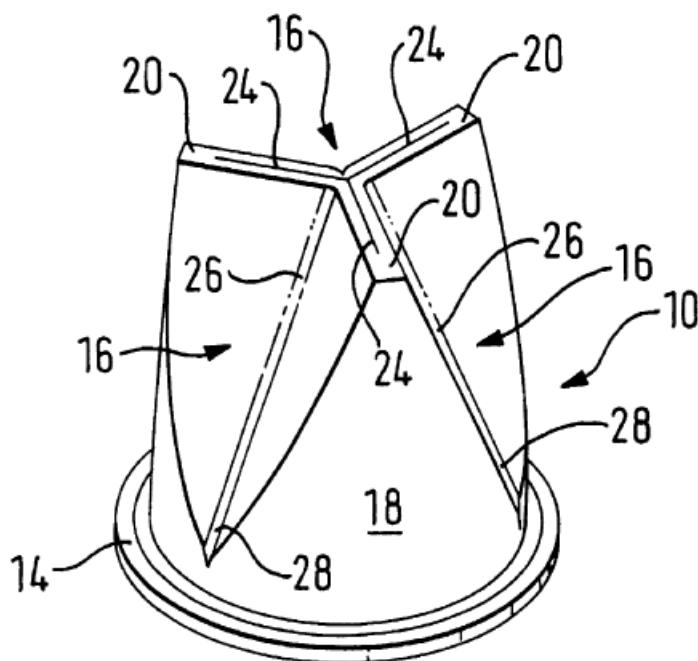
F16K 15/1471

{slits arranged along multiple axes}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



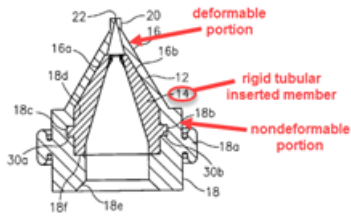
F16K 15/1472

{the closure elements being fixed onto an internally extending mount}

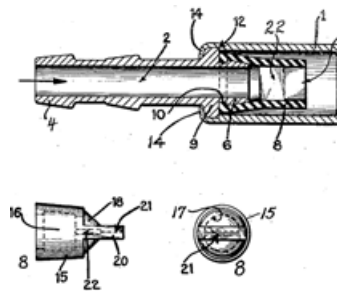
Definition statement

This place covers:

Illustrative examples of subject matter classified in this group.



Cross-section of duckbill check valve assembly



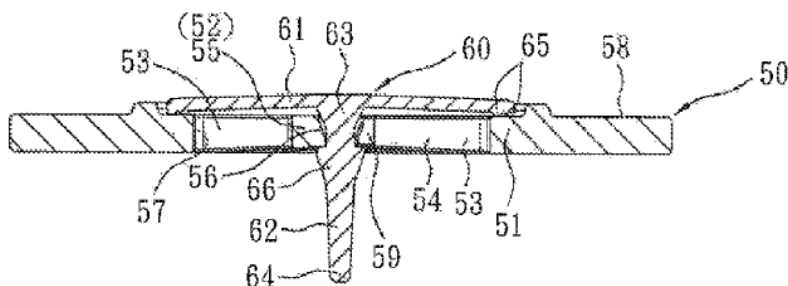
F16K 15/148

{the closure elements being fixed in their centre}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



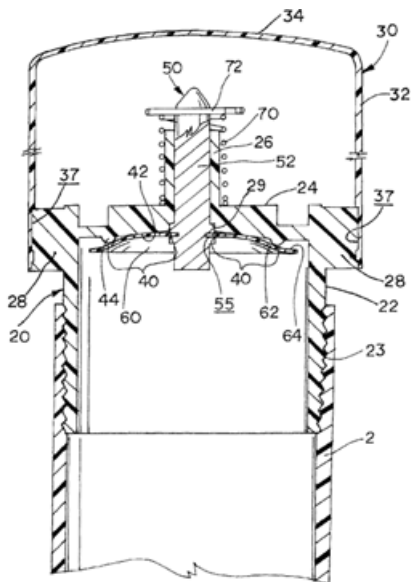
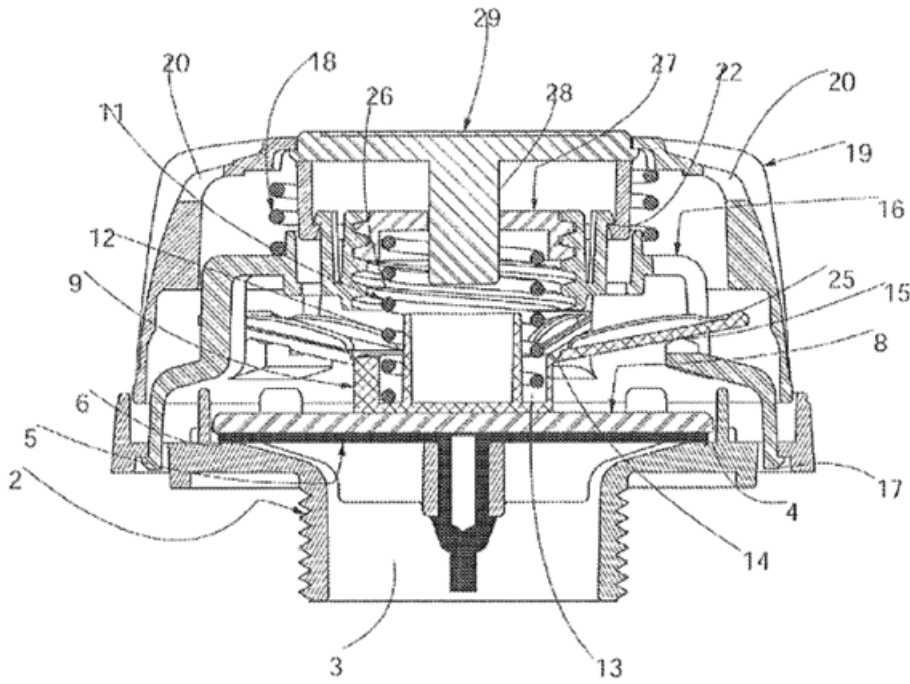
F16K 15/1481

{with biasing means in addition to material resiliency, e.g. spring}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



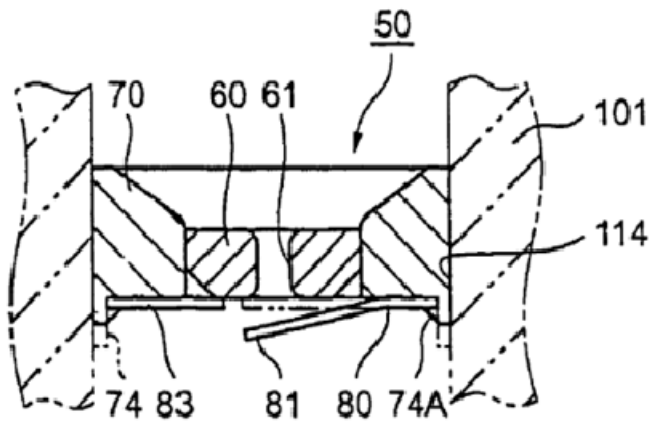
F16K 15/16

with tongue-shaped laminae

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



References

Application-oriented references

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

Valve comprising a resilient or deformable flap, specially adapted for medical use	A61M 2039/244
Reed valves for positive displacement machines for liquids, pumps	F04B 39/1073

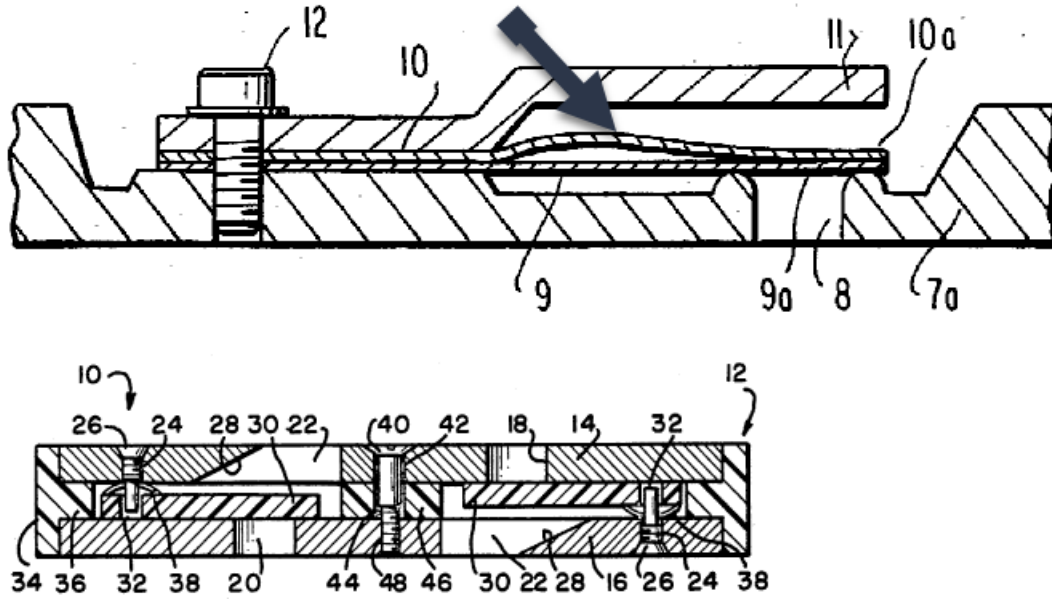
F16K 15/161

{with biasing means in addition to material resiliency, e.g. spring}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



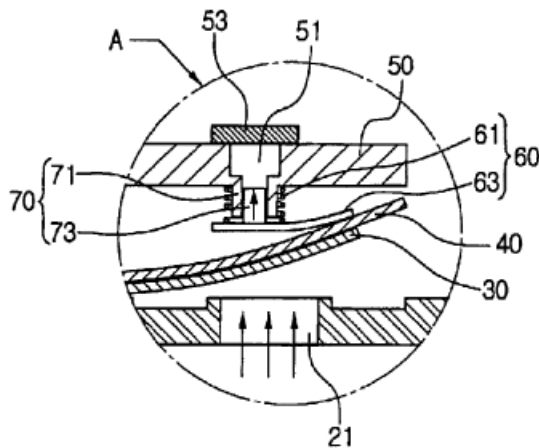
F16K 15/162

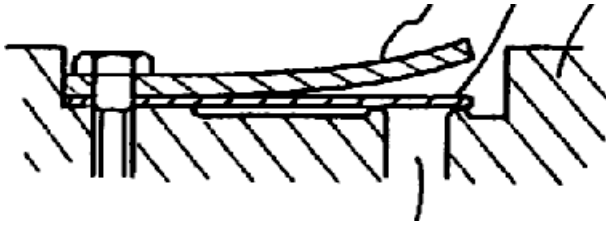
{with limit stop}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.





F16K 15/18

with actuating mechanism; Combined check valves and actuated valves

Definition statement

This place covers:

This subgroup includes two different categories:

- check valves with an actuating mechanism [F16K 15/182](#) and subgroups
- combined check valves and actuated valves [F16K 15/184](#) and subgroups

F16K 15/182

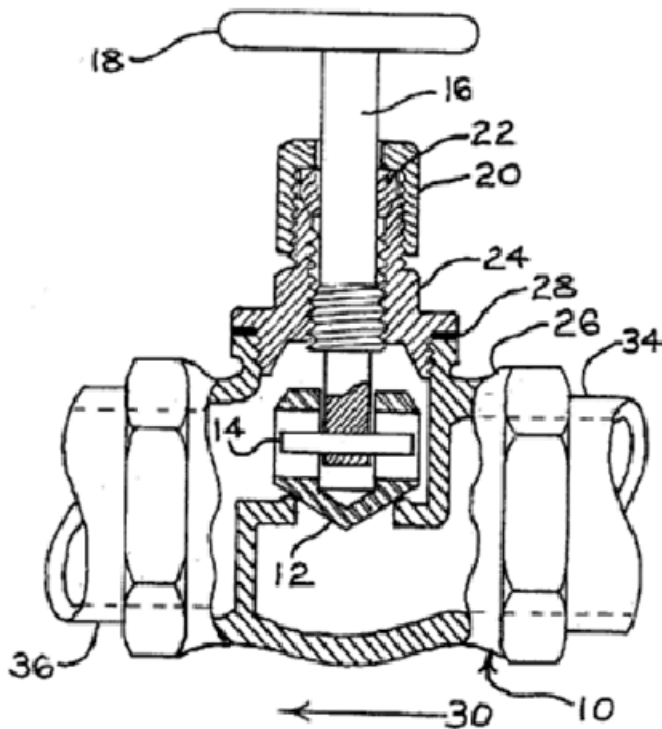
{with actuating mechanism}

Definition statement

This place covers:

Check valves with an actuating mechanism that can alternatively move or hold the valve closure member open or closed.

Illustrative example of subject matter classified in this group.



F16K 15/1821

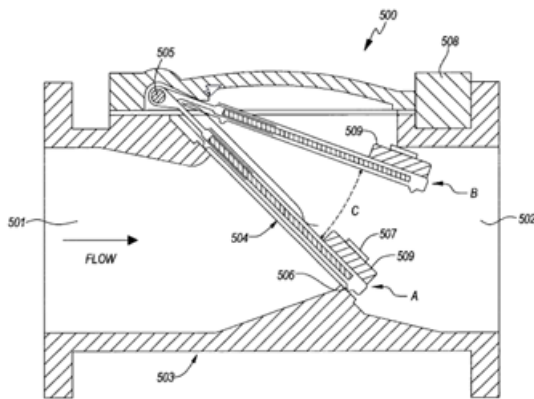
{for check valves with a hinged or pivoted closure member}

Definition statement

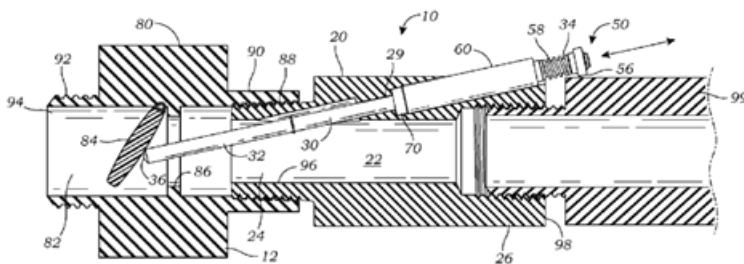
This place covers:

Check valves with a hinged or pivoted closure member and with an actuating mechanism that can alternatively move or hold the valve closure member open or closed.

Illustrative example of subject matter classified in this group.



Ref 508: magnet.



F16K 15/1823

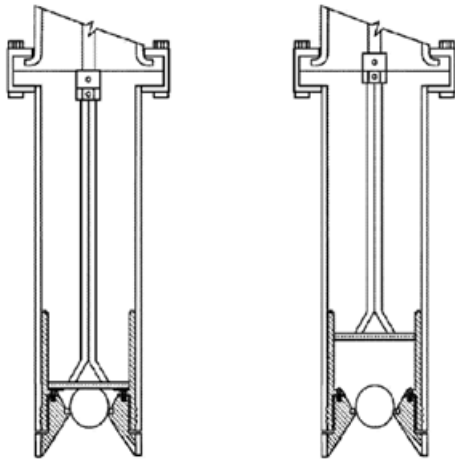
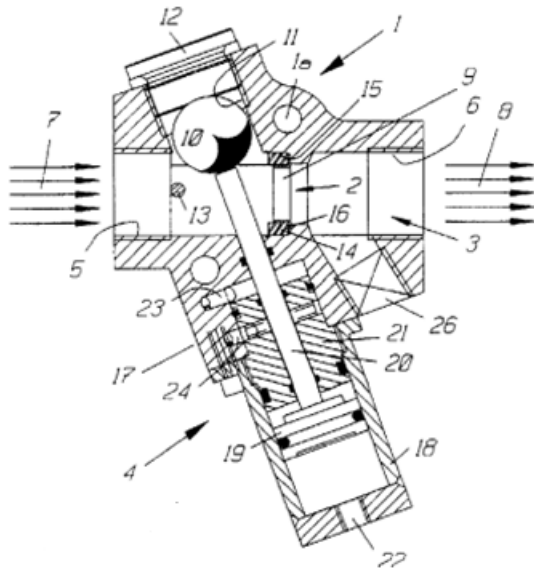
{for ball check valves}

Definition statement

This place covers:

Ball check valves with an actuating mechanism that can alternatively move or hold the valve closure member open or closed.

Illustrative example of subject matter classified in this group.



F16K 15/1825

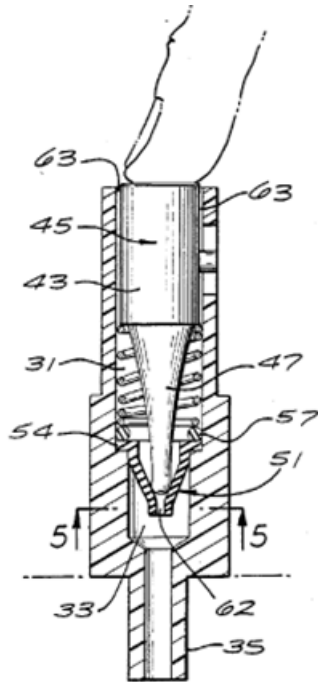
{for check valves with flexible valve members}

Definition statement

This place covers:

Check valves with flexible valve members and with an actuating mechanism that can alternatively move or hold the valve closure member open or closed.

Illustrative example of subject matter classified in this group.



F16K 15/1826

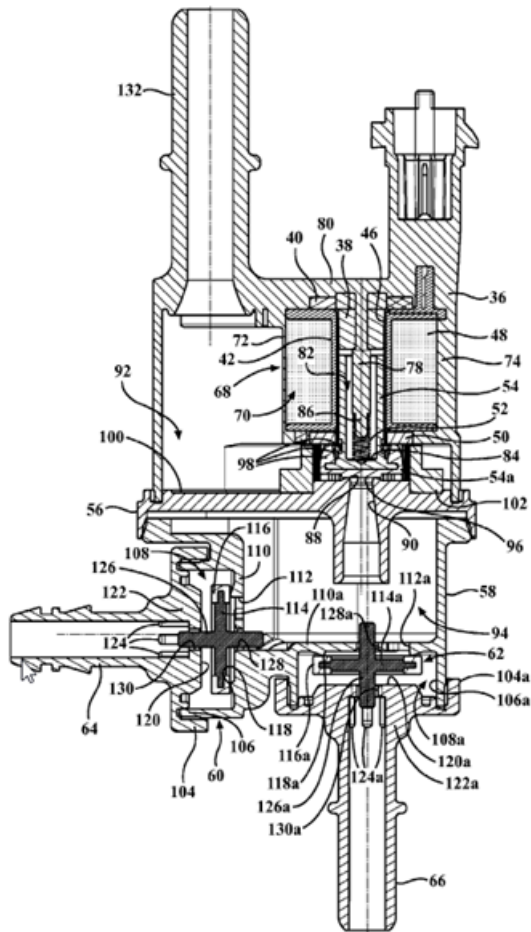
{Check valves which can be actuated by a pilot valve}

Definition statement

This place covers:

Check valves which can be actuated by a pilot valve.

Illustrative example of subject matter classified in this group.



Ref 60, 62 check valves and 68 pilot valve

F16K 15/184

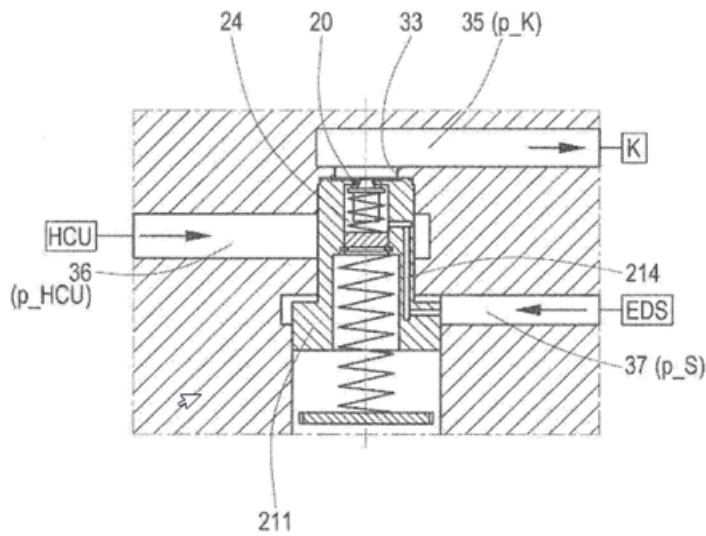
{Combined check valves and actuated valves}

Definition statement

This place covers:

Valve arrangements including a check valve in combination with an actuated valve.

Illustrative example of subject matter classified in this group.



F16K 15/1841

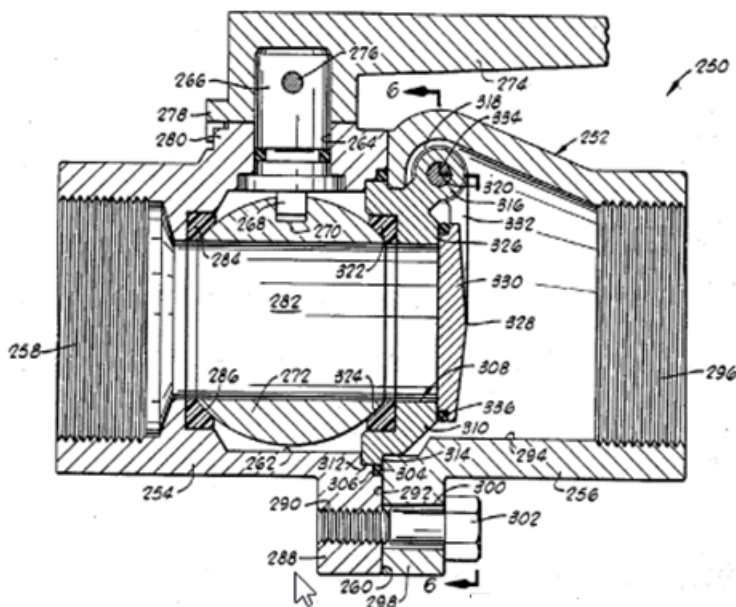
{for check valves with a hinged closure member}

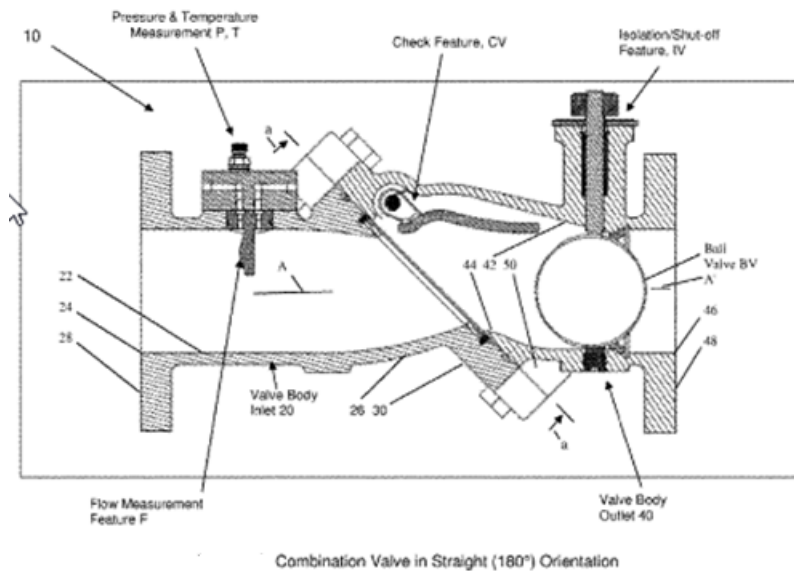
Definition statement

This place covers:

Valve arrangements including a check valve with a hinged or pivoted closure member in combination with an actuated valve.

Illustrative example of subject matter classified in this group.





F16K 15/1843

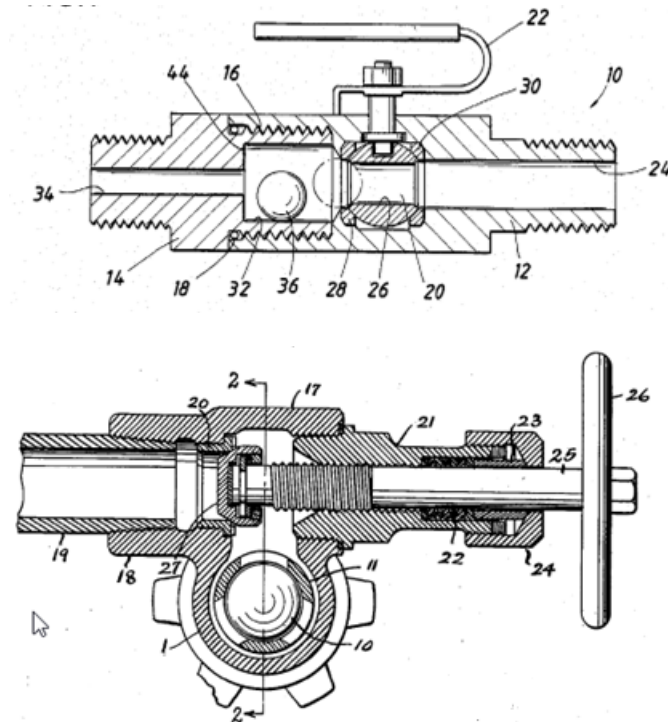
{for ball check valves}

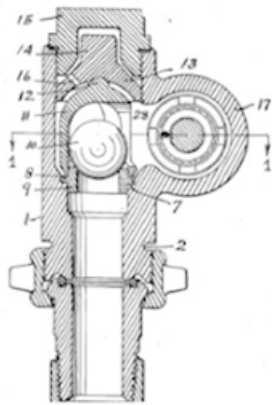
Definition statement

This place covers:

Valve arrangements including a ball check valve in combination with an actuated valve.

Illustrative example of subject matter classified in this group.





F16K 15/1845

{for check valves with flexible valve members}

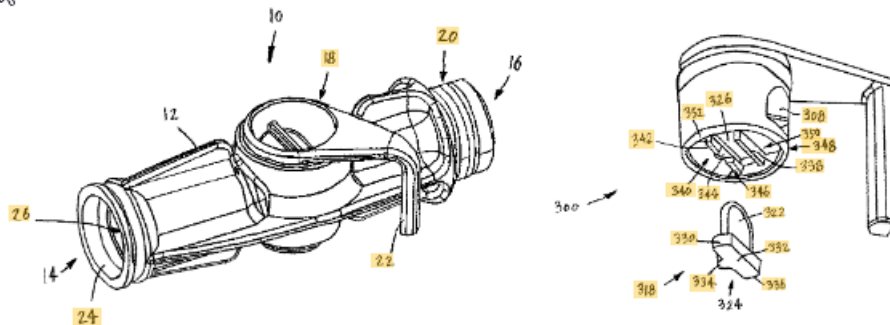
Definition statement

This place covers:

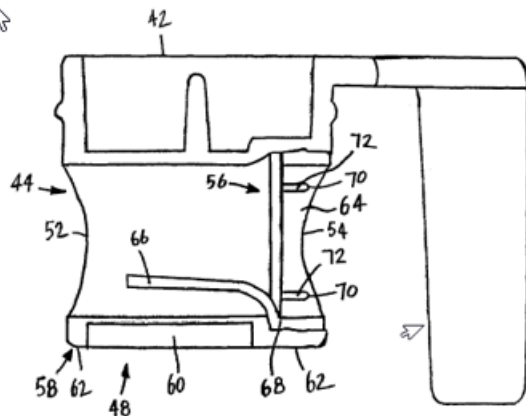
Valve arrangements including a check valve with flexible valve member in combination with an actuated valve.

Illustrative example of subject matter classified in this group.

↳



↳



Disposable dental valve device having a check valve

Ref. 18 main rotary plug valve member and 66 flex check valve

F16K 15/1848

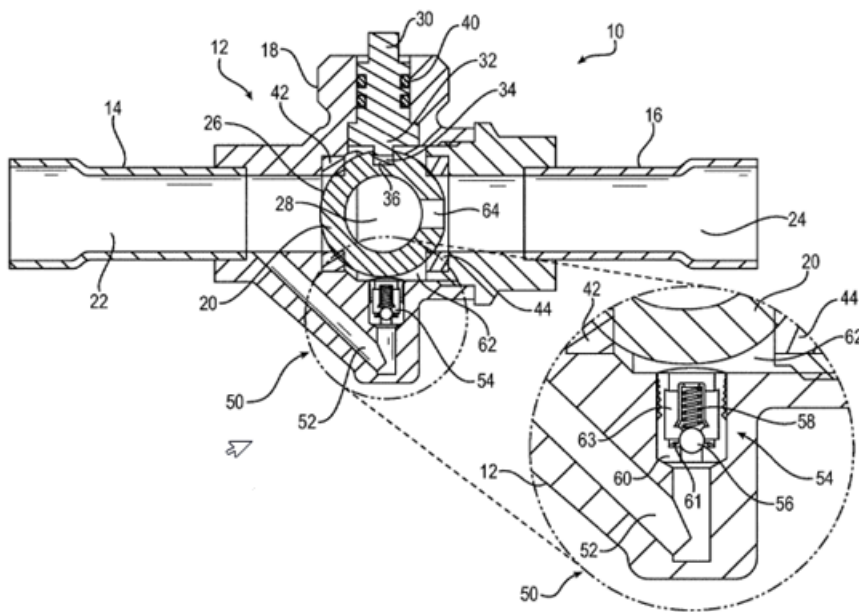
{Check valves combined with valves having a rotating tap or cock}

Definition statement

This place covers:

Valve arrangements including a check valve in combination with actuated valves having a rotating tap or cock.

Illustrative example of subject matter classified in this group.



F16K 15/20

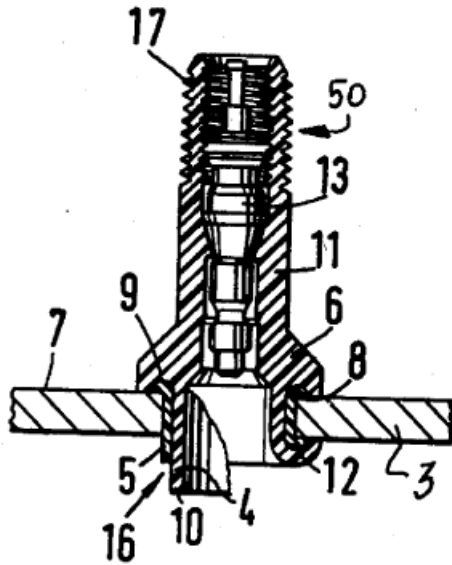
especially designed for inflatable bodies, e.g. tyres (connecting valves to inflatable bodies [B60C 29/00](#))

Definition statement

This place covers:

Apparatus comprising valved inflation stems of the type attached to pneumatic tires and analogous inflatable articles, including filling and/or relief extensions of such stems, valved filling chucks or the type attached to pressure fluid supplying conduits and employed to inflate such articles by means of the inflation stems, and combinations of such inflation stems and filling chucks.

Illustrative example of subject matter classified in this group.



Valve construction for tubeless tire

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:

Inflatable mattresses	A47C 27/081
Hollow inflatable balls	A63B 41/00
Inflatable kites	A63H 27/085
Valves for balloons	A63H 2027/1083
Arrangements of tyre-inflating valves relative to tyres or wheel rims; connection of valves to wheel rims, tyres or other inflatable elastic bodies	B60C 29/00
Dunnage (inflatable bags for packaging, load protection) for trailers	B60P 7/065
Dunnage for trains	B61D 45/008
Inflatable boats	B63B 7/08
Dunnage in general	B65D 81/052

Special rules of classification

Reference "connecting valves to inflatable bodies [B60C 29/00](#)" is non-limiting in the subgroup [F16K 15/20](#). CPC will be corrected once this inconsistency is resolved in IPC.

F16K 15/202

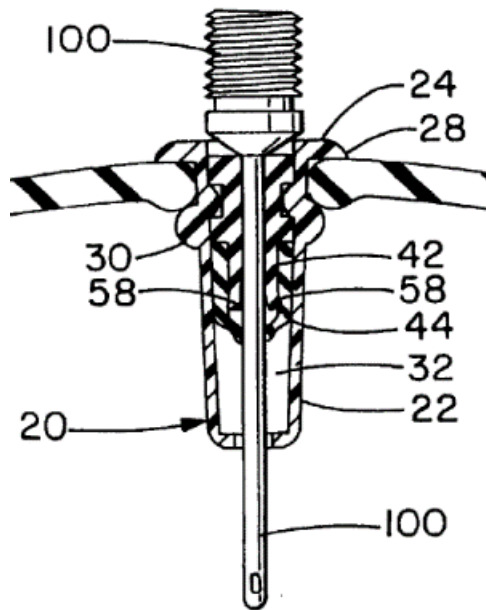
{and with flexible valve member}

Definition statement

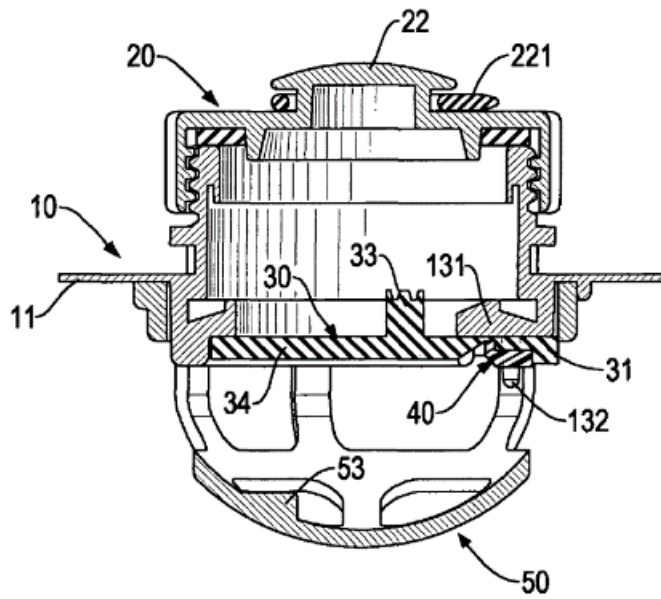
This place covers:

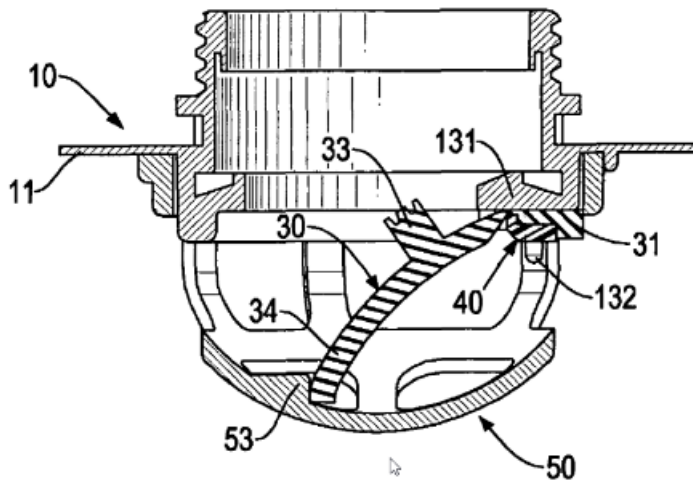
Flexible element controls flow into or out of inflatable article.

Illustrative example of subject matter classified in this group.



Ball with inflation valve sleeve for rapid deflation





Releasing valve for an inflatable object

F16K 15/205

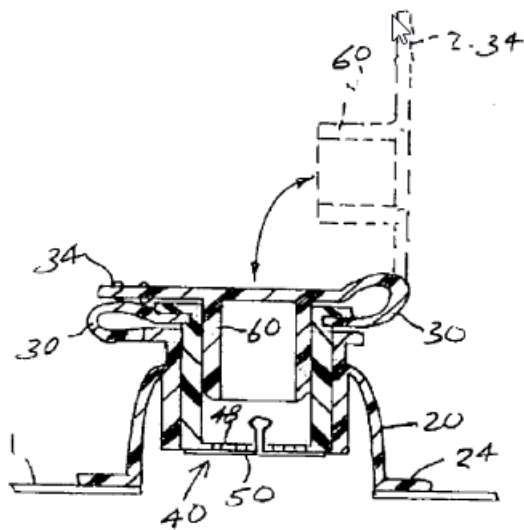
{and with closure plug}

Definition statement

This place covers:

Devices including a feature other than the valve member that obstructs a valve inlet or outlet.

Illustrative example of subject matter classified in this group.



Air Valve

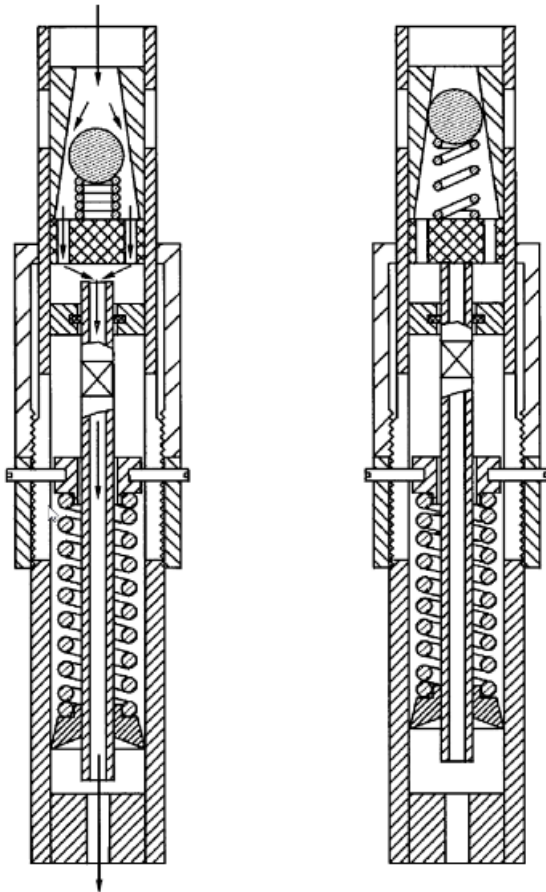
F16K 15/207

{and combined with other valves, e.g. safety valves}

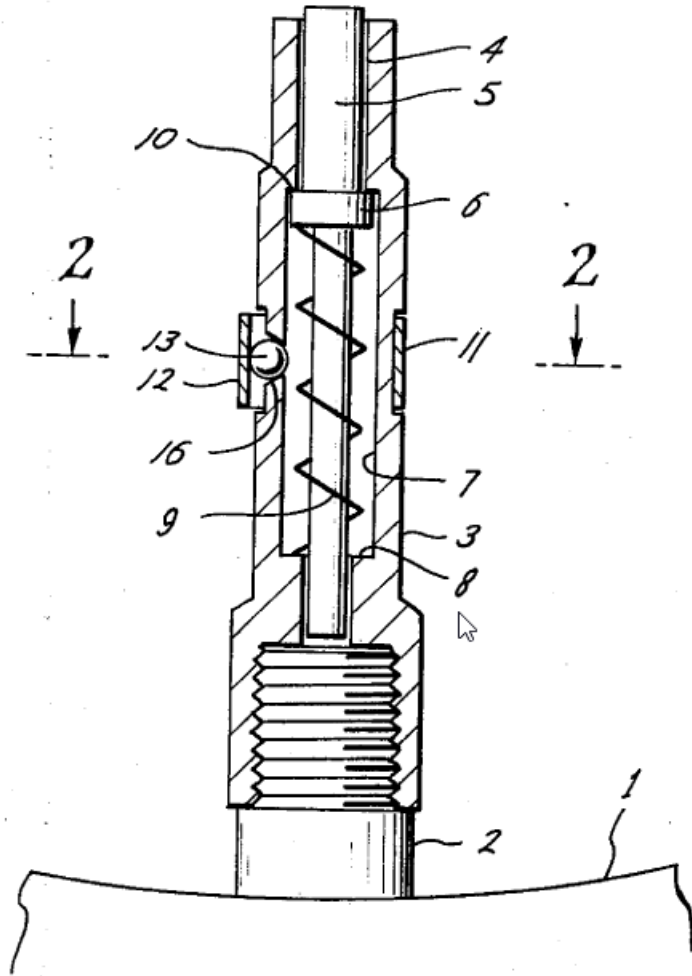
Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



Pressure regulator and method of use



Air regulator for tires

F16K 17/00

Safety valves; Equalising valves, {e.g. pressure relief valves}

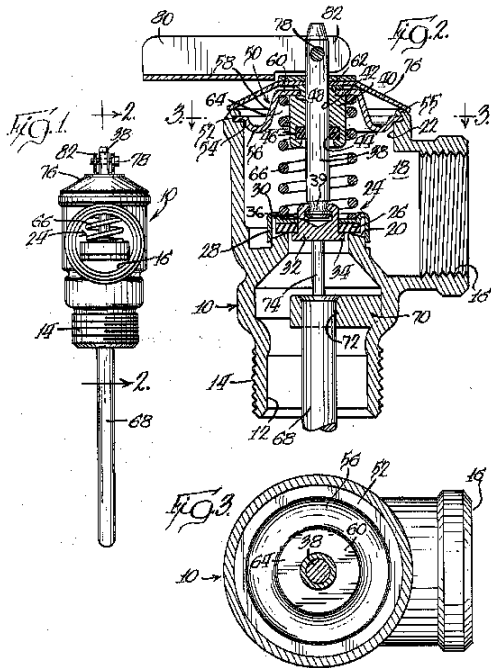
Special rules of classification

Check valves ([F16K 15/00](#)) can be classified in this sub-class when their function can be identified as falling under this title.

F16K 17/003**{reacting to pressure and temperature}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group.

U.S. Patent March 14, 1978 4,078,722

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

Actuated by temperature only	F16K 31/002
------------------------------	-----------------------------

F16K 17/006**{specially adapted for shelters}****Definition statement***This place covers:*

Adapted for bomb-shelters.

F16K 19/00

{Arrangements of valves and flow lines specially adapted for mixing fluids (multiple-way valves [F16K 11/00](#))}

Definition statement

This place covers:

When no details of the valve members or seats are disclosed in the document.

F16K 21/00

Fluid-delivery valves, {e.g. self-closing valves} (for liquid handling [B67D](#); for flushing devices for water-closets or the like [E03D](#))

Definition statement

This place covers:

Valves that are either self-closing or provide a continuous small flow.

F16K 23/00

Valves for preventing drip from nozzles

References

Informative references

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

Nozzles, spray heads or other discharge apparatus for spraying or atomising	B05B
---	----------------------

F16K 24/00

Devices, e.g. valves, for venting or aerating enclosures (equalising valves [F16K 17/00](#); arrangement or mounting in pipes or pipe systems [F16L 55/07](#); venting or aerating as an additional function of steam traps or like apparatus [F16T](#); ventilation of rooms, vehicles, see the appropriate subclass, e.g. [F24F](#))

References

Informative references

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

Fuel tanks	B60K
------------	----------------------

F16K 24/04

for venting only ([F16K 24/02](#) takes precedence)

Definition statement

This place covers:

The air (or fluid) from the circuit is released.

F16K 24/06

for aerating only ([F16K 24/02](#) takes precedence)

Definition statement

This place covers:

Fluid (air) is admitted in the circuit.

References

Limiting references

This place does not cover:

Venting of plumbing installations, waste pipes	E03C
--	----------------------

F16K 25/00

Details relating to contact between valve members and seats (movement of valve members other than for opening and closing [F16K 29/00](#))

Definition statement

This place covers:

Materials and arrangements of valve members and seats not otherwise provided for

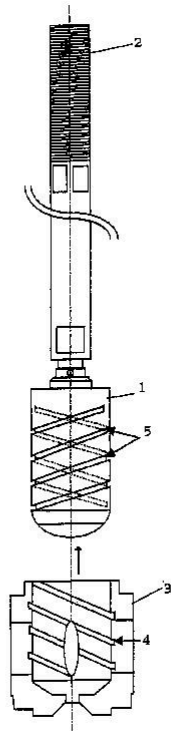
F16K 25/02

Arrangements using fluid issuing from valve members or seats

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



F16K 27/003

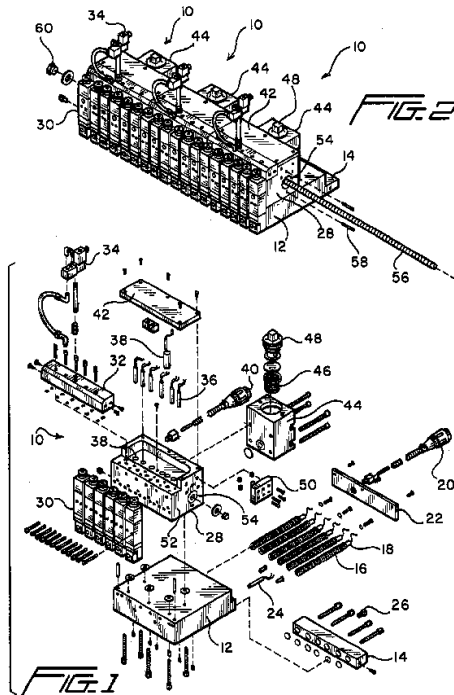
{Housing formed from a plurality of the same valve elements}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

U.S. Patent Jul. 17, 2001 US 6,260,583 B1



F16K 27/0232

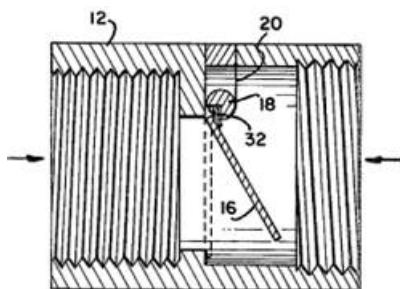
{the valve member retained by a removable closure}

Definition statement

This place covers:

Devices in which the valve housing is provided with a removable closure element which retains the valve member in assembled relation with its seat.

Illustrative example of subject matter classified in this group.



F16K 31/00

{Actuating devices;} Operating means; Releasing devices {(regulating means [G05D](#))}

References**Limiting references**

This place does not cover:

Magnetic constructions with armature (actuators)	H01F 7/08
Control or regulation of electric motors	H02P 7/00

F16K 31/002

{actuated by temperature variation (thermo-electric [F16K 31/025](#))}

References**Limiting references**

This place does not cover:

Sensitive elements producing movements (e.g. bimetallic strips).	G12B 1/02
--	---------------------------

Informative references

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

Shape memory alloy	F03G 7/0614
--------------------	-----------------------------

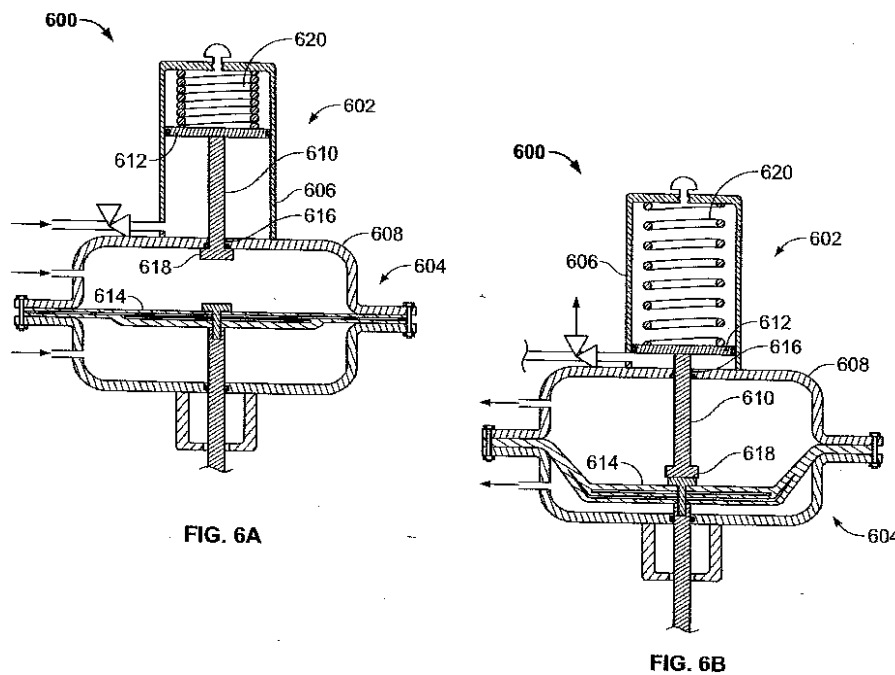
F16K 31/003

{operated without a stable intermediate position, e.g. with snap action
([F16K 31/56](#) takes precedence)}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

**F16K 31/004**

{actuated by piezoelectric means}

References**Informative references**

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

Piezoelectric devices	H10N 30/00
-----------------------	----------------------------

F16K 31/02

electric {([F16K 31/004](#) takes precedence)}; magnetic

References**Limiting references**

This place does not cover:

Magnetic circuits and magnets in general	H01F
--	----------------------

F16K 31/0613

{with cylindrical slides}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

WD 2010/098168

PCT/US2010/021921

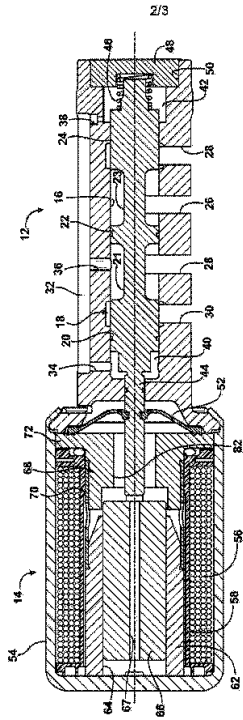


FIG. 2

F16K 31/0627

{with movable valve member positioned between seats}

Definition statement

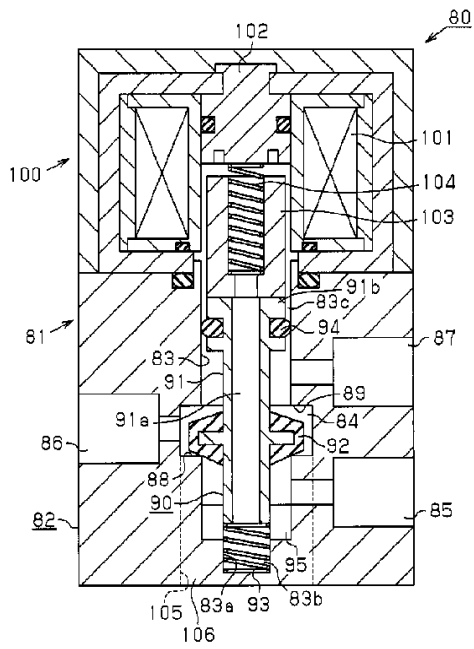
This place covers:

Illustrative example of subject matter classified in this group.

WO 2011/122147

PCT/JP2011/053369

[Fig. 4]



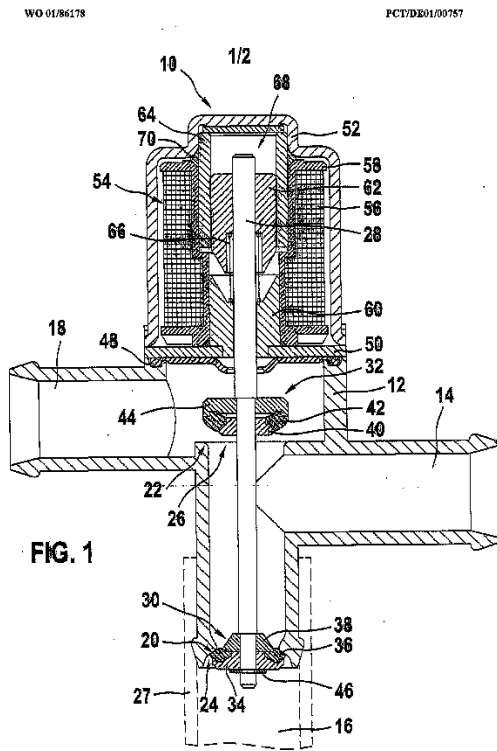
F16K 31/0634

{with fixed seats positioned between movable valve members}

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



F16K 31/0648

{the armature and the valve member forming one element ([F16K 31/0651](#) takes precedence)}

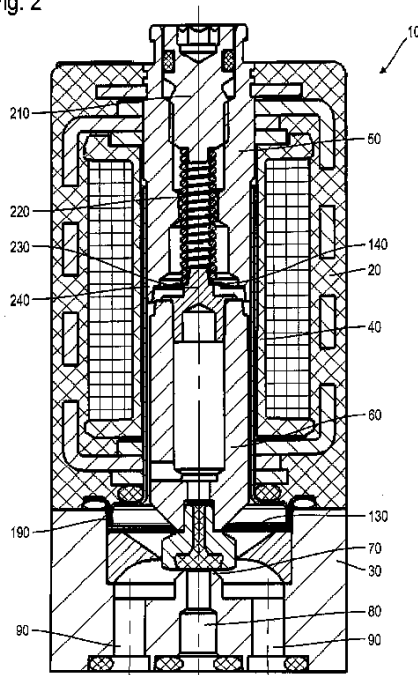
Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

DE 20 2010 010 279 U1 2010.12.23

Fig. 2



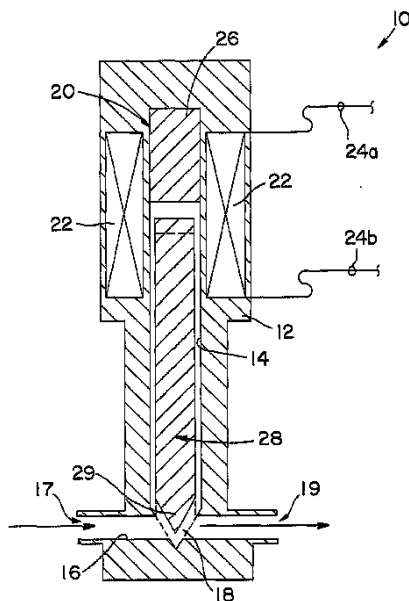
F16K 31/0658**{Armature and valve member being one single element}****Definition statement***This place covers:*

Illustrative example of subject matter classified in this group.

WO 02/103720

PCT/US02/18826

1/1

**F16K 31/60****Handles {(form, features or function of taps or faucet handles for domestic plumbing installations [E03C 1/04](#))}****References****Limiting references***This place does not cover:*

Form, features and function of taps or faucets handles	E03C 1/04
--	---------------------------

F16K 33/00**Floats for actuation of valves or other apparatus {(float actuated valves [F16K 31/18](#))}****Definition statement***This place covers:*

Construction of the float per se.

F16K 35/00**Means to prevent accidental or unauthorised actuation****Definition statement**

This place covers:

Locking or interlocking the valve actuating device. Not the lock per se.

References**Informative references**

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

Locks	E05B
-------	----------------------

F16K 37/00**Special means in or on valves or other cut-off apparatus for indicating or recording operation thereof, or for enabling an alarm to be given****References****Informative references**

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

Testing or monitoring control systems or parts; Electric testing	G05B
--	----------------------

F16K 37/0075**{For recording or indicating the functioning of a valve in combination with test equipment}****References****Limiting references**

This place does not cover:

Above ground control means for valves in boreholes or wells	E21B 34/16
Testing static or dynamic balance of machines or structures; Investigate fluid-tightness (leaks)	G01M 3/00
Testing or monitoring control systems or parts; Electric testing	G05B 23/02

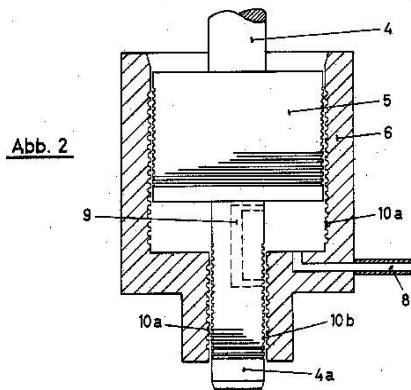
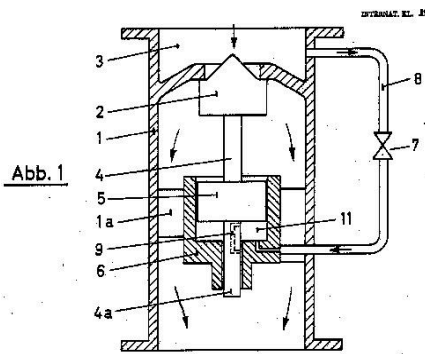
F16K 39/00

Devices for relieving the pressure on the sealing faces

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



F16K 43/00

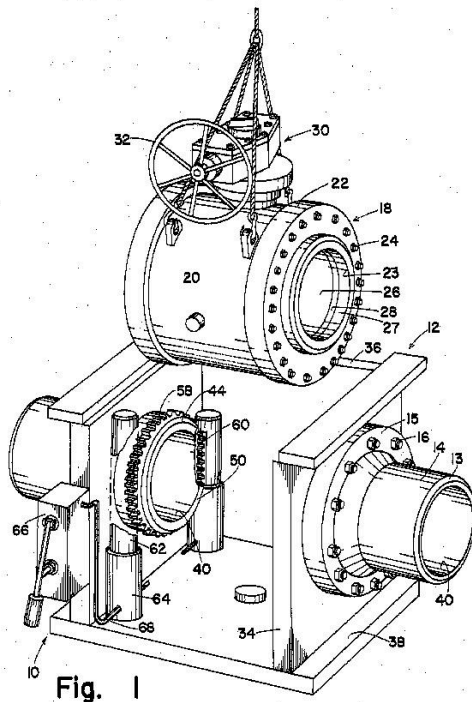
Auxiliary closure means in valves, which in case of repair, e.g. rewashing, of the valve, can take over the function of the normal closure means; Devices for temporary replacement of parts of valves for the same purpose

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.

U.S. Patent Jun. 14, 1983 Sheet 1 of 3 4,387,735



F16K 47/01

{Damping of valve members}

Definition statement

This place covers:

Feature that slows, cushions movement or reduces oscillation of a valve member.

References

Informative references

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

Dampers, per se	F16F
-----------------	----------------------

Special rules of classification

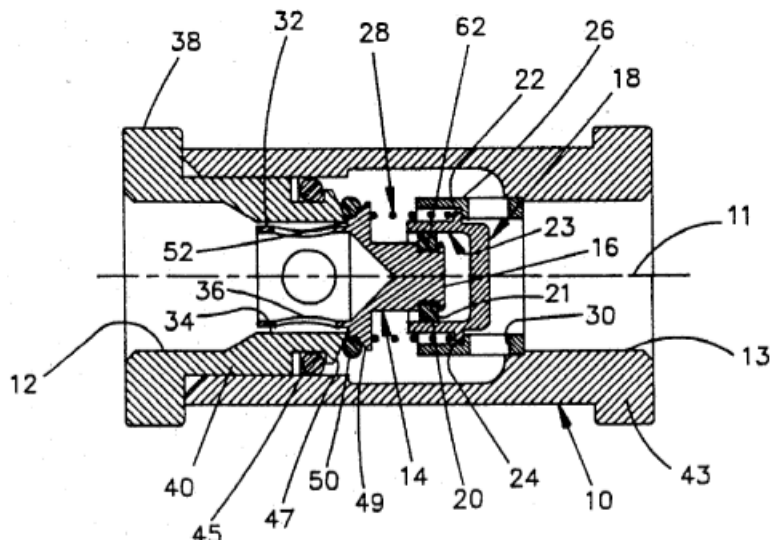
Devices for preventing water hammer or noise should also be classified in [F16K 47/02](#) – [F16K 47/026](#).

Electromagnetically actuated valves should also be classified in [F16K 31/0696](#), as applicable.

F16K 47/011**{by means of a dashpot}****Definition statement***This place covers:*

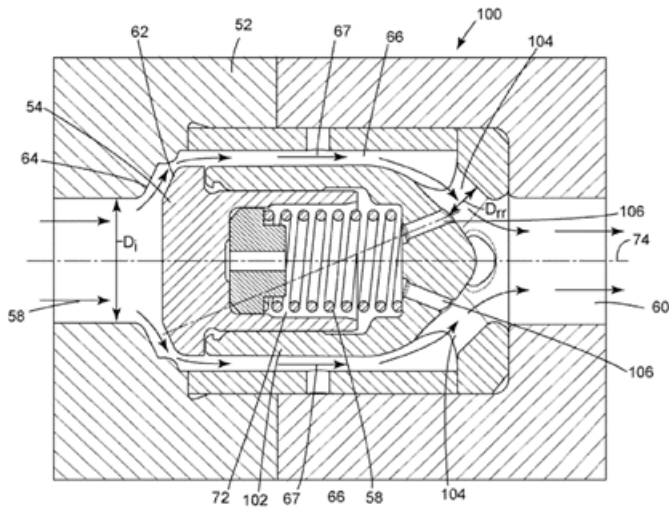
Valves provided with a dashpot to prevent or reduce chattering or hunting of the valve member or to dampen the opening and/or closing of the valve member.

Illustrative example of subject matter classified in this group.

**F16K 47/0111****{the valve members comprising a plunger sliding within a fixed dashpot}****Definition statement***This place covers:*

A movable plunger (comprising the valve member) slides within a fixed dashpot.

Illustrative example of subject matter classified in this group.



F16K 47/0112

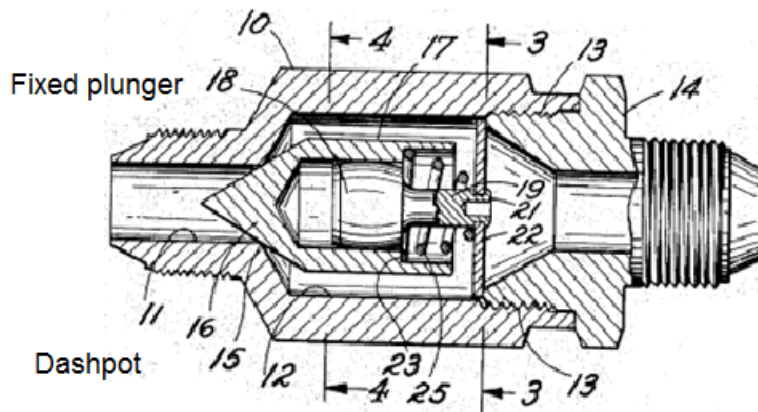
{the valve members comprising a dashpot sliding over a fixed plunger}

Definition statement

This place covers:

A movable dashpot (comprising the valve member) slides over a fixed plunger.

Illustrative example of subject matter classified in this group.



F16K 47/012

{by means of a resilient damping element}

Definition statement

This place covers:

Valves provided with a resilient damping means to prevent or reduce chattering or hunting of the valve or to dampen the opening and/or closing of the valve member.

F16K 47/02

for preventing water-hammer or noise

Definition statement

This place covers:

Valves with arrangements for the specific purpose of reducing water-hammer or noise.

F16K 47/023

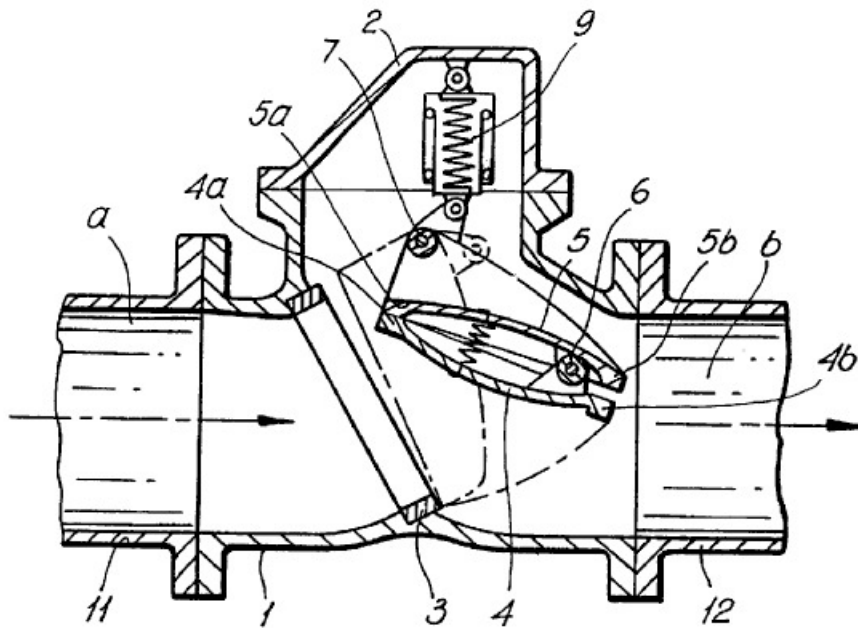
{for preventing water-hammer, e.g. damping of the valve movement}

Definition statement

This place covers:

Damping for the specific purpose of reducing water-hammer.

Illustrative example of subject matter classified in this group.

**F16K 47/026**

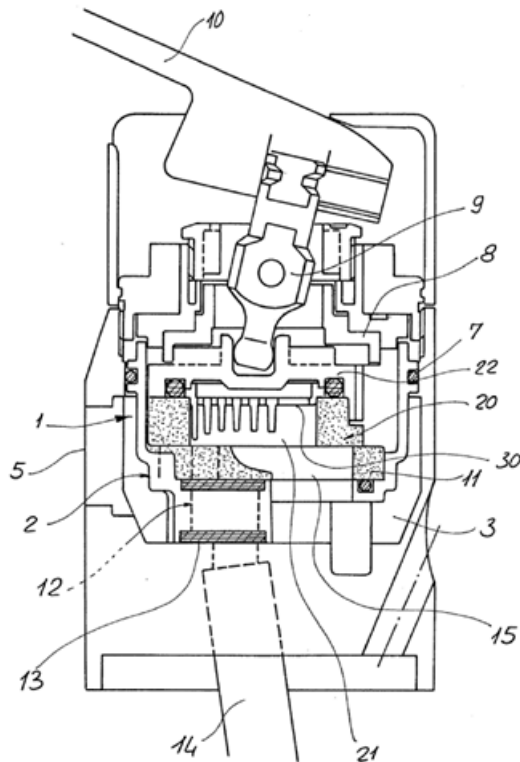
{preventing noise in a single handle mixing valve}

Definition statement

This place covers:

Arrangements for preventing noise in single handle mixing valves.

Illustrative example of subject matter classified in this group.



F16K 51/00

Other details not peculiar to particular types of valves or cut-off apparatus

References

Informative references

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

Housings	F16K 27/07
----------	----------------------------

F16K 99/00

Subject matter not provided for in other groups of this subclass

References

Informative references

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

Microvalves	F16K 99/0001
-------------	------------------------------

F16K 99/0001

{Microvalves (microdevices [B81B 1/00](#); manufacture or treatment of devices or systems in or on a substrate [B81C 1/00](#); microfluidic structures [B01L 3/5027](#); micropumps [F04B 19/006](#))}

Relationships with other classification places

[B01F 33/30](#) - Micromixers.

[B01L 3/00](#) - Containers or dishes for laboratory use.

[B81B 1/00](#) - Microcapillary devices in general.

[B81B 7/00](#) - Microstructural systems (Auxiliary parts of microstructural devices or systems.)

[B81C 1/00](#) - Microstructural technology.

[B01J 19/0093](#) - Microreactors.

[F04B 19/006](#) - Micropumps.

[F04B 43/043](#) - Membrane micropumps.

[G01N 27/447](#) - Electrophoresis for analysis in microdevices.

See also: [B81B 2201/054](#) - Microvalves, [B81B 2203/0127](#) - Diaphragms, membranes for microelectromechanical structures.

F16K 2200/10

Means for compensation of misalignment between seat and closure member

Special rules of classification

In the case where both the closure member and seat are self-aligning, classification should be given in both [F16K 2200/101](#) and [F16K 2200/102](#).

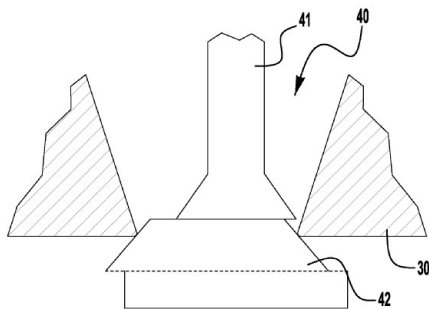
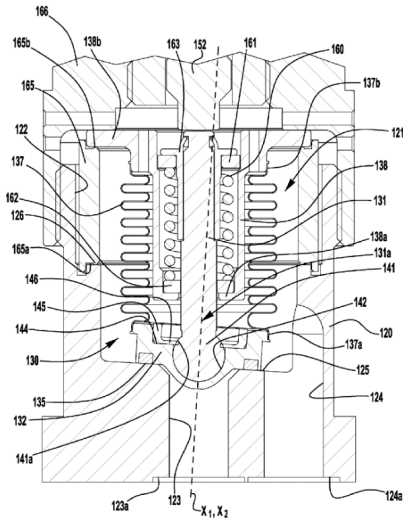
F16K 2200/101

closure member self-aligning to seat

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



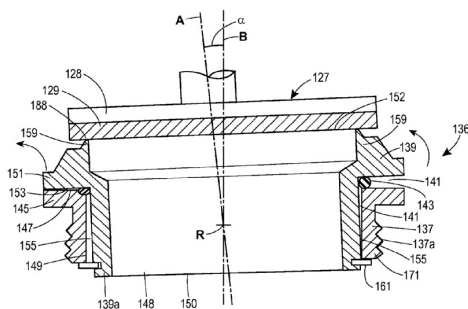
F16K 2200/102

seat self-aligning to closure member

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



F16K 2200/20

Common housing having a single inlet, a single outlet and multiple valve members

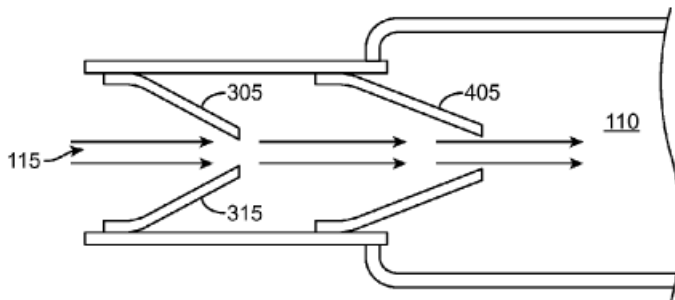
Definition statement

This place covers:

Devices classified in this group have a single inlet and a single outlet.

Multi-port and multi-way valves are not classified in this group.

Illustrative example of subject matter classified in this group.



References

Informative references

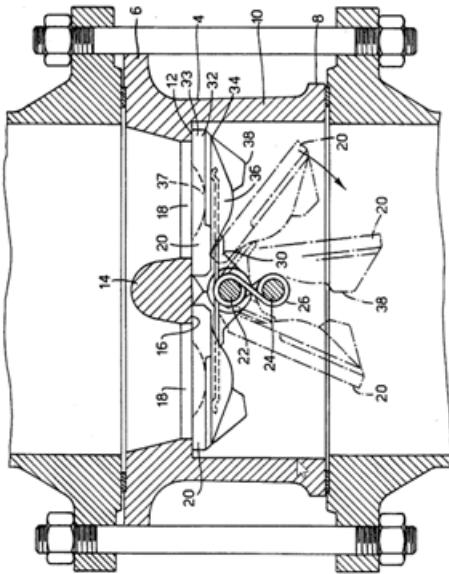
Attention is drawn to the following places, which may be of interest for search:

Plurality of pivoted valve members	F16K 1/165 , F16K 1/2021 , F16K 1/223
Double-seat lift valves	F16K 1/44
Second valve for limiting the maximum flow rate of a lift valve	F16K 1/526
Sliding valves having two or more gates	F16K 3/029
Check valves having a plurality of hinged valve members	F16K 15/035
Check valves having a plurality of balls	F16K 15/042
Check valves having a plurality of stem guided valve members	F16K 15/066
Check valves having a plurality of flexible valve members	F16K 15/1401
Combined check valves and actuated valves	F16K 15/184
Auxiliary valve for relieving pressure on sealing faces of lift valves	F16K 39/024 , F16K 39/026
Auxiliary closure means in valves	F16K 43/00

Special rules of classification

Multi-way valves do not belong in this subgroup and should be classified in [F16K 11/10](#).

Also, dual flap pivot valves as shown below should not be classified here, but in [F16K 15/036](#) - [F16K 15/038](#).



F16K 2200/201

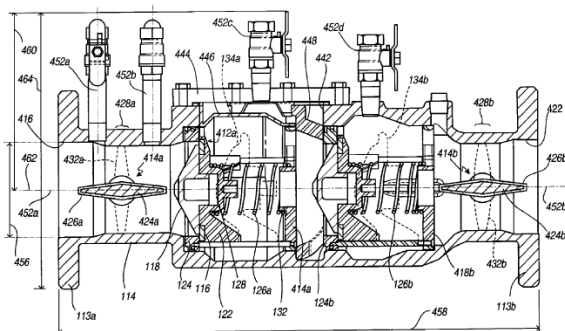
of diverse type, size or shape

Definition statement

This place covers:

Devices in which the valves are of different types, e.g. disc valves and ball valves, or are of different size so that they operate at different pressures.

Illustrative example of subject matter classified in this group.



F16K 2200/202

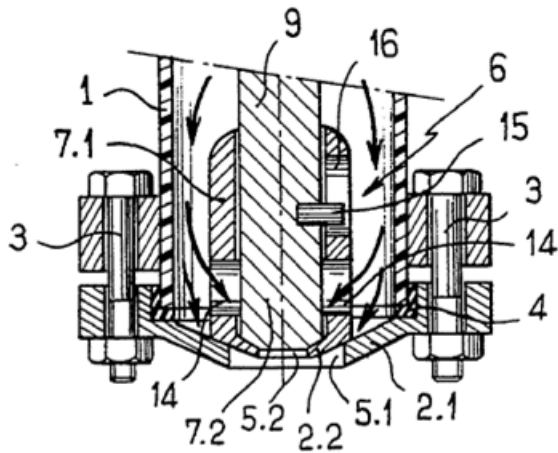
one valve arranged inside of the valve member of a second valve, e.g. nested valve members

Definition statement

This place covers:

Devices in which one of the valves carries the seat for at least one other valve, and also serves as the support for the other valve.

Illustrative example of subject matter classified in this group.



References

Informative references

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

Auxiliary valve on main lift valve for relieving pressure on sealing faces	F16K 39/024
--	-----------------------------

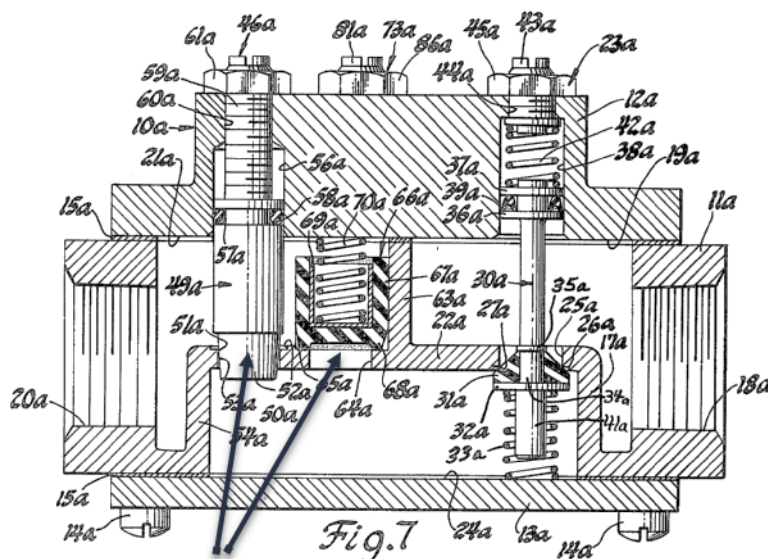
F16K 2200/203

in parallel

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



These two valve members
 are in parallel

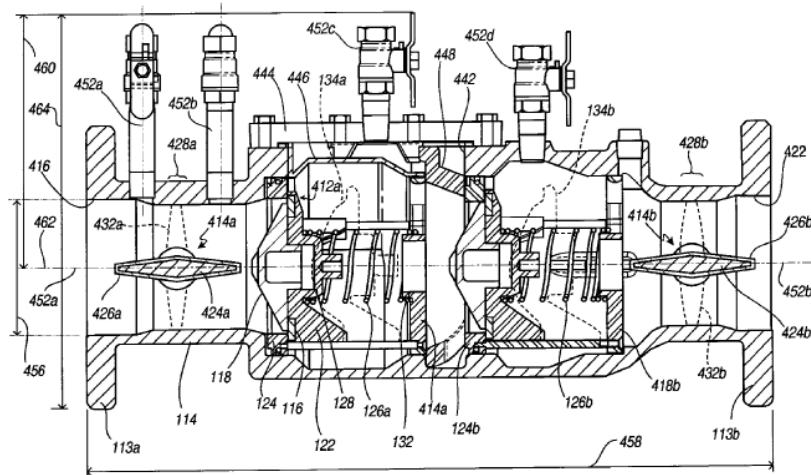
F16K 2200/204

in series

Definition statement

This place covers:

Illustrative example of subject matter classified in this group.



F16K 2200/30

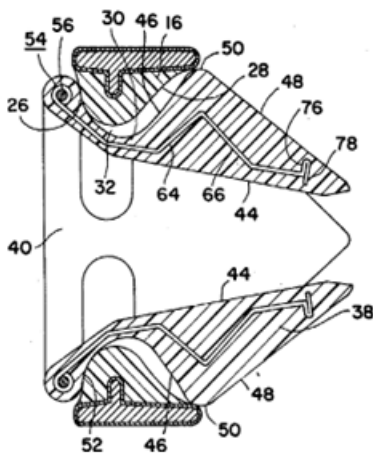
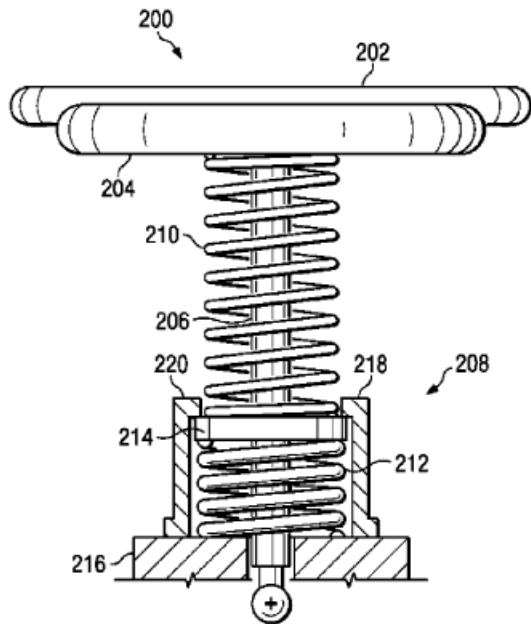
Spring arrangements

Definition statement

This place covers:

The spring may be any type of resilient element.

Illustrative example of subject matter classified in this group.



References

Informative references

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

Springs in general	F16F
--------------------	----------------------

F16K 2200/301

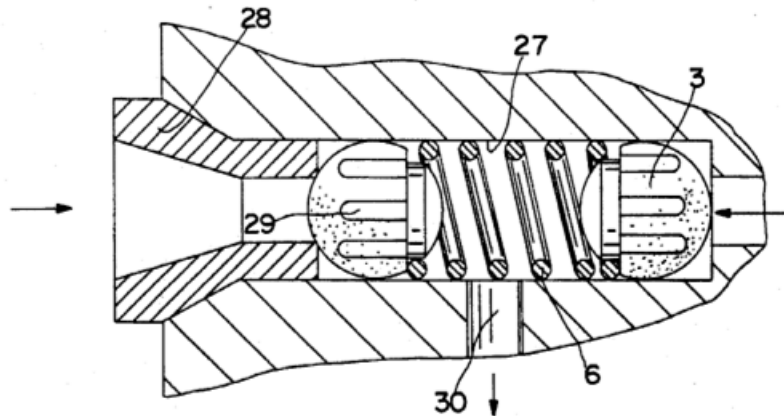
Common spring for multiple closure members

Definition statement

This place covers:

A single spring biasing a plurality of closure members.

Illustrative example of subject matter classified in this group.



F16K 2200/302

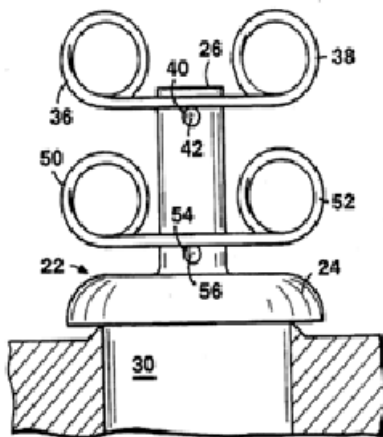
Plurality of biasing means, e.g. springs, for opening or closing single valve member

Definition statement

This place covers:

Valves in which the plural springs bias the single valve member open or closed.

Illustrative example of subject matter classified in this group.



References

Informative references

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

Pressure relief valves with more than one spring	F16K 17/044
--	-----------------------------

F16K 2200/303

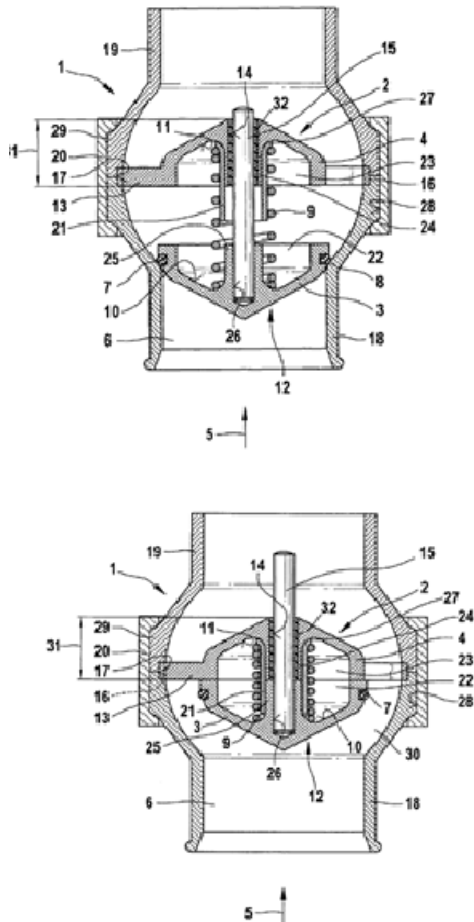
Means for protecting the spring in the fluid flow path

Definition statement

This place covers:

The spring must be in the flow path of the fluid, and the means for protecting the spring must prevent or reduce the impingement of the fluid on the spring.

Illustrative example of subject matter classified in this group.



F16K 2200/304

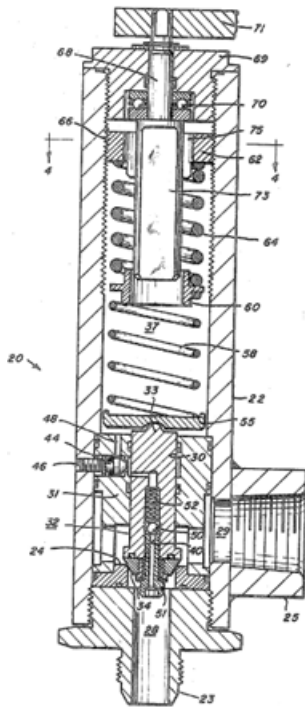
Adjustable spring pre-loading

Definition statement

This place covers:

Valves provided with means adjusting the preload of the biasing means, usually in terms of the pressure at which the valve will open. In devices classified in this group, only the preload is adjustable. The spring rate of the spring is not modified.

Illustrative example of subject matter classified in this group.



References

Informative references

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

Pressure relief valve with arrangement for adjusting the opening pressure	F16K 17/06
---	----------------------------

F16K 2200/305

Construational features of springs

Definition statement

This place covers:

Valves with spring arrangements of non-conventional type.

References

Informative references

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

Ball check valve with a spring other than a helicoidal spring	F16K 15/046
Stem guided check valve with a spring other than a helicoidal spring	F16K 15/064
Pressure relief valve with a spring other than a helicoidal spring	F16K 17/0493

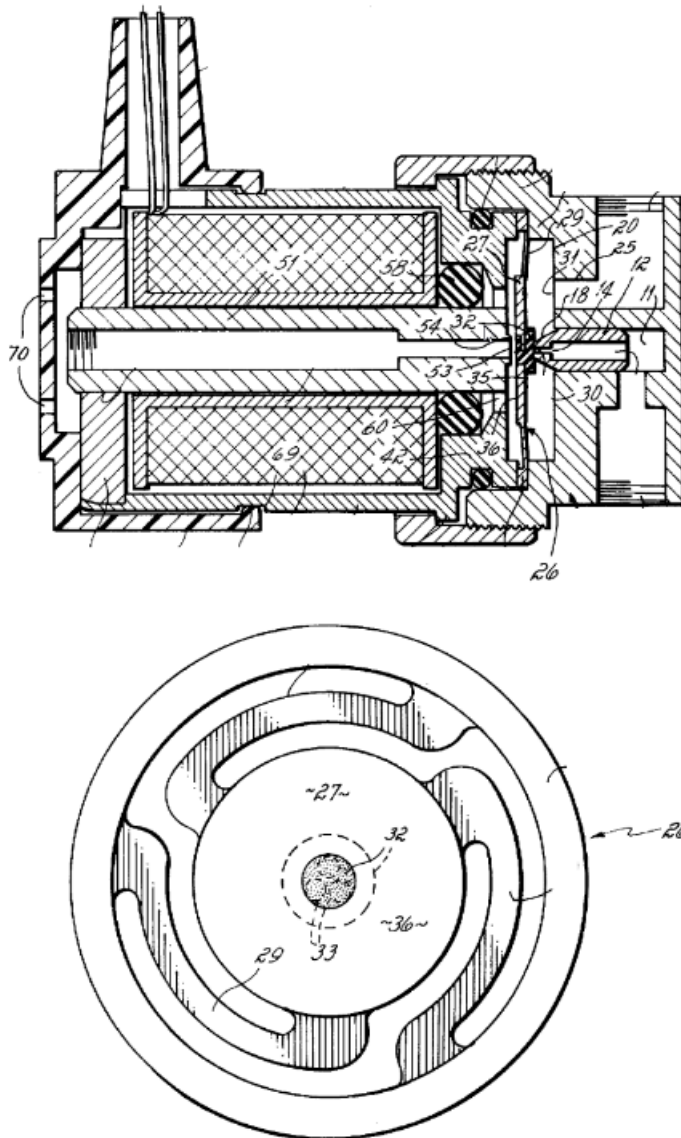
F16K 2200/3051

Generally flat springs

Definition statement

This place covers:

Springs that are generally planar in the uncompressed state.



Magnetically operated valve with spider armature

F16K 2200/3052

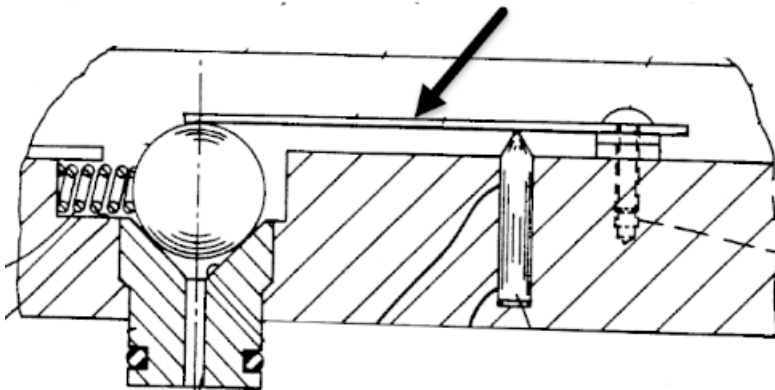
Cantilever springs

Definition statement

This place covers:

At least a portion of the spring projects along a plane extending from one or more attachment points.

Illustrative example of subject matter classified in this group.



Actuating mechanism for a rolling ball valve

F16K 2200/3053

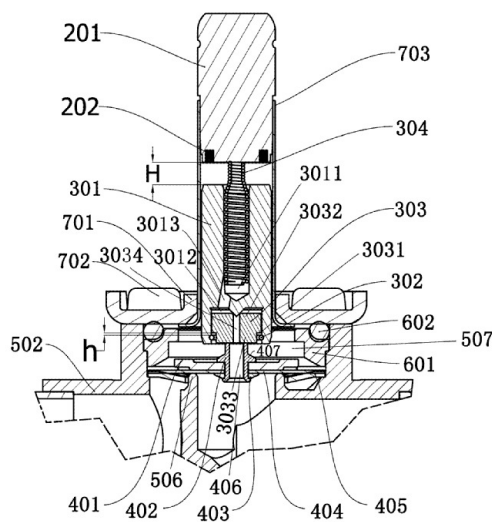
Helicoidal springs of variable pitch, diameter or spring rate

Definition statement

This place covers:

Spring includes a pitch, diameter or spring rate value that is not constant.

Illustrative example of subject matter classified in this group.



F16K 2200/40

Bleeding means in closed position of the valve, e.g. bleeding passages

Definition statement

This place covers:

Valves provided with at least one passage for allowing a limited amount of fluid to flow through the valve when the valve is in the closed position, including details of leak passages.

Special rules of classification

For purposes of classification, bypass lines for pilot pressure actuated valves should not be classified in this subgroup but in [F16K 31/36](#) or [F16K 31/42](#) and respective subgroups.

For purposes of classification, fluid-delivery valves providing a continuous small flow should not be classified in this subgroup but in [F16K 21/02](#) only.

For purposes of classification, valves provided with a bypass for relieving the pressure on the sealing faces should not be classified in this subgroup but in [F16K 39/00](#) and respective subgroups.

F16K 2200/401

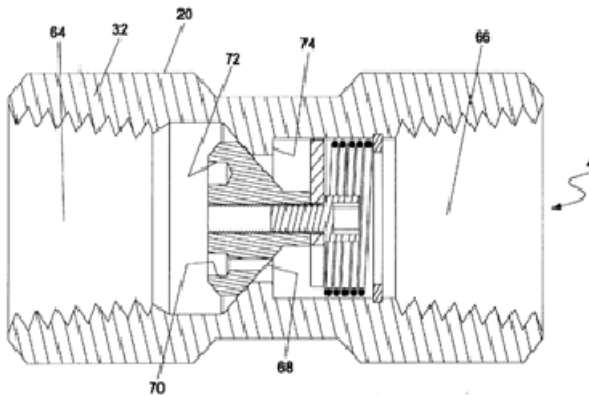
arranged on the closure member

Definition statement

This place covers:

Valves provided with at least one passage arranged on the closure member for allowing a limited amount of fluid to flow through the valve when the valve is in the closed position.

Illustrative example of subject matter classified in this group.



Bleeding passage 68 provided on closure member

F16K 2200/402

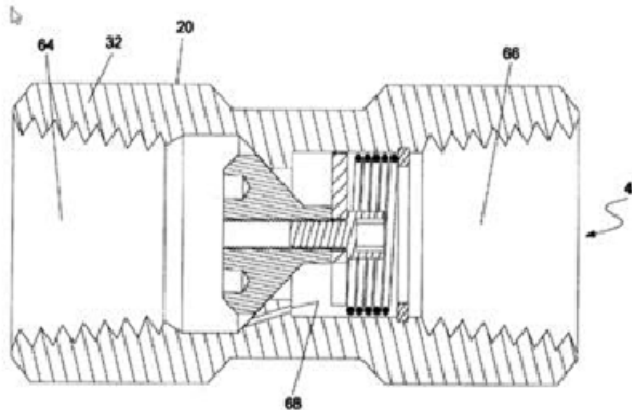
arranged on the valve housing or seat

Definition statement

This place covers:

Valves provided with at least one passage arranged on the valve housing or seat for allowing a limited amount of fluid to flow through the valve when the valve is in the closed position.

Illustrative example of subject matter classified in this group.



Bleeding passage 68 provided on seat/housing 20.

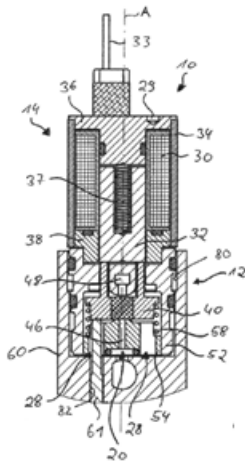
F16K 2200/50

Self-contained valve assemblies

Definition statement

This place covers:

Valve assemblies with most or all of its components housed in a separate housing that are then inserted into the valve housing.



Cartridge valve 10 is inserted into housing 12

F16K 2200/501

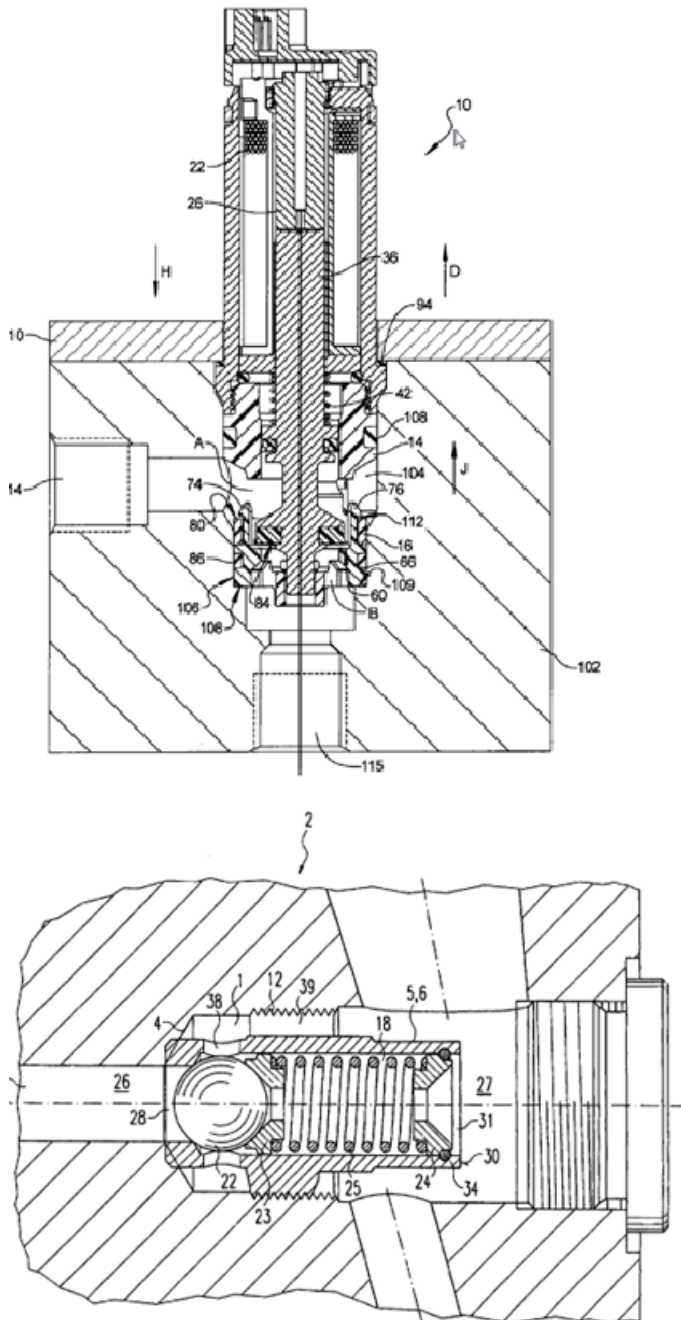
Cartridge valves

Definition statement

This place covers:

A valve assembly contained within a housing, which is usually replaceable and designed to permit ready insertion or removal into another housing or manifold.

Illustrative example of subject matter classified in this group.



F16K 2200/502

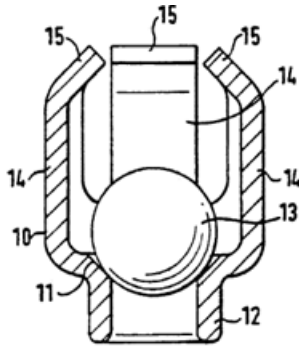
Cages for valves, i.e. means to be inserted within the valve housing, surrounding and guiding the closure member

Definition statement

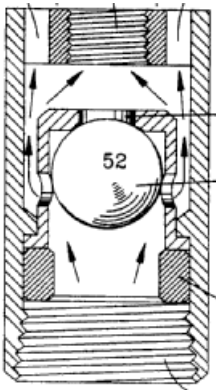
This place covers:

Valves provided with a separate housing component (i.e. cage) that is inserted within the valve housing and with said cage surrounding and guiding the closure member.

Illustrative example of subject matter classified in this group.



Cage 14 guides closure member 13.



Special rules of classification

For purposes of classification, cages or trim with a throttle for decreasing pressure or noise should not be classified in this subgroup but in [F16K 47/00](#).