B25J

MANIPULATORS; CHAMBERS PROVIDED WITH MANIPULATION DEVICES (manipulators specially adapted for use in surgery A61B 19/22; manipulators used in cleaning hollow articles B08B 9/04; manipulators associated with rolling mills B21B 39/20; manipulators associated with forging machines B21J 13/10; manipulators associated with picking-up and placing mechanisms B23P 19/007; means for holding wheels or parts thereof B60B 30/00; vehicles with ground-engaging propulsion means, e.g. walking members B62D 57/02, B62D 57/032; devices for picking-up and depositing articles or materials between conveyers B65G 47/90, B65G 47/91; manipulators with gripping or holding means for transferring packages B65H 67/065; cranes B66C; manipulators used in the protection or supervision of pipe-line installations F17D 5/00; walking equipment adapted for nuclear steam-generators F22B 37/006; manipulators specially adapted for, or associated with, nuclear reactors G21C; apparatus used for handling wafers during manufacture or treatment of semiconductor H01L 21/68)

Definition statement

This subclass covers:
Handling tools, devices, or machines having a gripping or work head capable of bodily movement in space and of change of orientation, such bodily movement and change of orientation being controlled, at will, by means remote from the head. The group B25J 21/00 moreover covers chambers provided with manipulation devices.

Most of the manipulators classified in B25J are industrial robots.

The International Organization for Standardization gives the following definition of an industrial robot in ISO 8373:
an automatically controlled, reprogrammable, multipurpose manipulator programmable in three or more axes, which may be either fixed in place or mobile for use in industrial automation applications.

This definition is used by the International Federation of Robotics, the European Robotics Research Network (EURON) and many national standards committees.
Here is a list of other types of manipulators or robots classified in B25J, i.e. manipulators which are usually not industrial robots:

<table>
<thead>
<tr>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manipulators positioned in space by hand</td>
<td>B25J 1/00</td>
</tr>
<tr>
<td>Manipulators not otherwise provided for</td>
<td>B25J 11/00</td>
</tr>
<tr>
<td>Master-slave manipulators</td>
<td>B25J 3/00</td>
</tr>
<tr>
<td>Manipulators mounted on wheels or on carriages</td>
<td>B25J 5/00,</td>
</tr>
<tr>
<td>B25J 9/162</td>
<td></td>
</tr>
<tr>
<td>Micromanipulators</td>
<td>B25J 7/00</td>
</tr>
<tr>
<td>Service robots</td>
<td>B25J 9/0003</td>
</tr>
<tr>
<td>Exoskeletons</td>
<td>B25J 9/0006</td>
</tr>
<tr>
<td>Manipulators moved by gravity</td>
<td>B25J 9/1055</td>
</tr>
<tr>
<td>Manipulators comprising mechanical &quot;programming&quot; means, e.g. cams</td>
<td>B25J 9/109</td>
</tr>
<tr>
<td>Cellular, reconfigurable manipulators, e.g. cebot</td>
<td>B25J 9/1617</td>
</tr>
</tbody>
</table>

**References relevant to classification in this subclass**

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manipulators for surgery</td>
<td>A61B 19/22</td>
</tr>
<tr>
<td>Spray heads moved by robots or articulated arms</td>
<td>B05B 13/0431</td>
</tr>
<tr>
<td>Manipulators for transferring metal sheets from / to a press</td>
<td>B21D 43/105</td>
</tr>
<tr>
<td>Manipulators in machines for forging, hammering, pressing riveting</td>
<td>B21J 13/10</td>
</tr>
<tr>
<td>Manipulators for moving laser head in more than two directions</td>
<td>B23K 26/0884</td>
</tr>
<tr>
<td>Manipulators for moving workpieces between mould parts</td>
<td>B29C 37/0007</td>
</tr>
<tr>
<td>Manipulators in machines for gluing by wetting</td>
<td>B65C 9/2226</td>
</tr>
<tr>
<td>Manipulators for handling sheets</td>
<td>B65G 49/067</td>
</tr>
<tr>
<td>Manipulators for stacking or de-stacking articles</td>
<td>B65G 61/00</td>
</tr>
<tr>
<td>Manipulators with gripping or holding means for transferring the packages from one station to another</td>
<td>B65H 67/065</td>
</tr>
<tr>
<td>Manipulators for underwater operations</td>
<td>E21B 41/04</td>
</tr>
<tr>
<td>Automatic analysis systems comprising robots</td>
<td>G01N 35/0099</td>
</tr>
</tbody>
</table>
Manipulators integrated in shielded cells: G21F 7/061
Manipulators for transferring wafers: H01L 21/67742, H01L 21/67766, H01L 21/68707
Pick and place apparatus for mounting of components: H05K 13/0404

B25J 1/00

Manipulators positioned in space by hand (of master-slave type B25J 3/00; micromanipulators B25J 7/00)

Definition statement

This group covers:
Manipulators which are not computer controlled but controlled directly by the hand of a user.

Informative references

Attention is drawn to the following places, which may be of interest for search:
Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Manual manipulators | 3C007/BS29 |
| Structures and purposes of manual manipulators | 3C007/XF00 |

B25J 1/02

articulated or flexible

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 1/02
Informative references

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

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

<table>
<thead>
<tr>
<th>Manual manipulators having a joint</th>
<th>3C007/XF01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexible manual manipulators</td>
<td>3C007/XF02</td>
</tr>
</tbody>
</table>

**B25J 1/04**

rigid, e.g. shelf-reachers{(without grippers **A47F 13/06**)}

**Definition statement**

This subgroup covers:

Illustrative example of subject matter classified in **B25J 1/04**
Informative references

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

| Devices for picking apples or like fruits | A01D 46/24 |
| Reaching devices in a shop | A47F 13/06 |
| Pliers; Other hand-help gripping tools with jaws on pivoted limbs | B25B 7/00 |
| Hand-held gripping tools other than those covered by group B25B 7/00 | B25B 9/00 |
| Hand implements for removing undesirable matter, e.g. litter pickers | E01H 1/12 |

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Tool hands | 3C007/XF05 |
| Support hands | 3C007/XF06 |
B25J 1/06

of the lazy-tongs type

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 1/06

DE 8901596 U

B25J 1/08

movably mounted in a wall

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 1/08
Informative references

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

| Shielded cells or rooms in structural combination with remotely controlled apparatus, e.g. with manipulators | G21F 7/06 |

Special rules of classification within this group

Manipulators of master-slave type should additionally be classified in B25J 3/02.

Synonyms and Keywords

In patent documents the following expression/word "telemanipulator" is often used.

B25J 1/10

Sleeve and pivot mountings therefor

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 1/10
**B25J 1/12**

having means for attachment to a support stand

**Definition statement**

*This subgroup covers:*

Manipulators which are moved in space by hand and which are attached to the ground or the ceiling.
Informative references

Attention is drawn to the following places, which may be of interest for search:
Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Manual manipulator containing mounting device to support structure | 3C007/XF03 |

B25J 3/00

Manipulators of master-slave type, i.e. both controlling unit and controlled unit perform corresponding spatial movements

Definition statement

This group covers:
Manipulators consisting of a master unit for inputting the movements of a user and a remote slave unit, connected to the master unit, for performing movements corresponding to the input movements.
**B25J 3/02**

Involving a parallelogram coupling of the master and slave units (pantographic instruments **B43L 13/00**)

**Definition statement**

*This subgroup covers:*

Master-slave manipulators having a mechanical connection between the master unit and the slave unit (e.g. connection by shafts, rods, wires, etc).

WO 9718927

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**References relevant to classification in this group**

*This subgroup does not cover:*

| Manual master-slave manipulators mounted in a wall | B25J 1/08 |

**Informative references**

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

*Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:*

<table>
<thead>
<tr>
<th>Control bar connected mechanically to subordinated part</th>
<th>3C007/JT01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connected by wires</td>
<td>3C007/JT02</td>
</tr>
</tbody>
</table>
**B25J 3/04**

**involving servo mechanisms (servo-actuated heads B25J 15/02)**

**Definition statement**

This subgroup covers:

Master-slave manipulators having an electrical connection between the master unit and the slave unit (i.e. the movements of the master unit are transformed into electrical signals for controlling actuators of the slave unit).

US 6197017

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**References relevant to classification in this group**

This subgroup does not cover:

<table>
<thead>
<tr>
<th>Master part in the form of hand-grip control means</th>
<th>B25J 13/02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control systems of master-slave manipulators</td>
<td>B25J 9/1689</td>
</tr>
</tbody>
</table>
Informative references

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

Manipulators specially adapted for use in surgery | A61B 19/22

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Control bars electrically connected to slave parts | 3C007/JT04 |
| Having reaction force sensing functions | 3C007/JT05 |
| Correspondence relationships between main parts and slave parts changeable | 3C007/JT06 |
| Having additional setting functions | 3C007/JT07 |
| Providing manipulators per se as control bars | 3C007/JT09 |
| Realization or copying human motions | 3C007/JT10 |

B25J 5/00

Manipulators mounted on wheels or on carriages (B25J 1/00 takes precedence; programme-controlled manipulators B25J 9/00; vehicle aspects B60, B62, e.g. remote-controlled steering for motor vehicles B62D 1/24; control of position of vehicles G05D 1/00))

Definition statement

This group covers:
Mobile manipulators, meant to work at different locations.

Informative references

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

Walking robots | B62D 57/032

B25J 5/005

{mounted on endless tracks or belts}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 5/005
Informative references

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

| Endless track vehicles | B62D 55/00 |

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Crawlers                  | 3C007/WA17 |

Synonyms and Keywords

In patent documents the following expressions/words (DE)"raupenkette", "gleiskette" and (FR)"chenilles" are often used as synonyms.

B25J 5/007

{mounted on wheels}

Definition statement

This subgroup covers:

Illustrative example of subject matter classified in B25J 5/007
Informative references

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

<table>
<thead>
<tr>
<th>Topic</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacuum cleaners</td>
<td>A47L</td>
</tr>
<tr>
<td>Control of land vehicles</td>
<td>G05D 1/021</td>
</tr>
</tbody>
</table>

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheel-type autonomous robots</td>
<td>3C007/WA16</td>
</tr>
</tbody>
</table>

Special rules of classification within this group

Home robots should additionally be classified in B25J 9/0003.

**B25J 5/02**

travelling along a guideway

**Definition statement**

This subgroup covers:

Illustrative example of subject matter classified in B25J 5/02
References relevant to classification in this group

This subgroup does not cover:

| Cartesian coordinate type manipulators | B25J 9/023 |

Informative references

Attention is drawn to the following places, which may be of interest for search:
Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Robot base travelling along a track    | 3C007/CS01 |
| Autonomous robot moving on a track     | 3C007/WA20  |

B25J 5/04

wherein the guideway is also moved, e.g. travelling crane bridge type

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 5/04
EP 0317491

References relevant to classification in this group

The following group takes precedence:

| Gantry type manipulators | B25J 9/026 |

B25J 5/06

Manipulators combined with a control cab for the operator

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 5/06
Special rules of classification within this subclass/group

The cab is not necessarily part of the manipulator but can be remote from the manipulator.

B25J 7/00

Micromanipulators{(specimen supports for investigating or analysing materials G01N 23/2204; associated with microscopes G02B 21/32; means for supporting or positioning the objects or the material in discharge tubes H01J 37/20)}

Definition statement

This group covers:
Manipulators performing tasks at a level of precision that can usually not be achieved by the unaided human hand.
Informative references

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

<table>
<thead>
<tr>
<th>Micro-structural devices or systems</th>
<th>B81B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nano-structures</td>
<td>B82B</td>
</tr>
<tr>
<td>Piezo-electric devices</td>
<td>H01L 41/00</td>
</tr>
</tbody>
</table>

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

<table>
<thead>
<tr>
<th>Micromanipulators</th>
<th>3C007/BS30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure / purpose of micromanipulators</td>
<td>3C007/XG00</td>
</tr>
</tbody>
</table>

**B25J 9/00**

**Programme-controlled manipulators**

**Definition statement**

*This group covers:*
Manipulators performing a series of actions corresponding to a list of instructions.
B25J 9/0003

{Home robots, i.e. small robots for domestic use}

Definition statement

This subgroup covers:
Robots which operate semi- or fully autonomously to perform services useful to the well-being of humans and equipment, excluding manufacturing operations.

US 2005091684

Informative references

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

<table>
<thead>
<tr>
<th>Category</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacuum cleaners</td>
<td>A47L</td>
</tr>
<tr>
<td>Control of land vehicles</td>
<td>G05D 1/021</td>
</tr>
</tbody>
</table>

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

<table>
<thead>
<tr>
<th>Category</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robots for service</td>
<td>3C007/AS34</td>
</tr>
<tr>
<td>Robots for medical treatment</td>
<td>3C007/AS35</td>
</tr>
<tr>
<td>Robots for entertainment</td>
<td>3C007/AS36</td>
</tr>
</tbody>
</table>
Special rules of classification within this group

Home robots mounted on wheels or tracks should additionally be classified in B25J 5/00.

Synonyms and Keywords

In patent documents the following expressions/words "service robots", and "domestic robots" are often used as synonyms.

B25J 9/0006

{Exoskeletons, i.e. resembling a human figure}

Definition statement

This subgroup covers:
Powered mobile machines consisting primarily of a skeleton-like framework worn by a person and a power supply that supplies at least part of the activation-energy for limb movement.

US 6301526

Informative references

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

| Orthopaedic devices specially adapted for correcting deformities of the limbs or for supporting them | A61F 5/0102 |
**B25J 9/0009**

{Constructional details, e.g. manipulator supports, bases}

**Definition statement**

*This subgroup covers:*

Illustrative example of subject matter classified in **B25J 9/0009**

WO 03031125

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**Table:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apparatus for passive stretching or bending of the lower limbs</td>
<td>A61H 1/0237</td>
</tr>
<tr>
<td>Apparatus for passive stretching or bending of the upper limbs</td>
<td>A61H 1/0274</td>
</tr>
<tr>
<td>Suspension devices for supporting the body of disabled persons in an upright walking or standing position</td>
<td>A61H 3/00</td>
</tr>
<tr>
<td>Walking robots</td>
<td>B62D 57/032</td>
</tr>
<tr>
<td>Input/output arrangements in interaction with the human body for transferring data to be processed</td>
<td>G06F 3/015</td>
</tr>
</tbody>
</table>

---

Fig. 1
B25J 9/0012
{making use of synthetic construction materials, e.g. plastics, composites}

Definition statement

This subgroup covers:

Illustrative example of subject matter classified in B25J 9/0012

US 2010304097

Informative references

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

Attention is drawn to the following Jterms (Japanese classification scheme), which may be of interest for search:

<table>
<thead>
<tr>
<th>Material to form an arm</th>
<th>3C007/CU01</th>
</tr>
</thead>
</table>
Glossary of terms

In this subgroup, the following terms (or expressions) are used with the meaning indicated:

| Synthetic materials | Man-made materials made of artificial chemicals as opposed to organic ones. They include plastics (polythene, polystyrene), synthetic fibres (nylon, acrylics, polyesters), synthetic resins and synthetic rubber |

B25J 9/0081

{with master teach-in means}

Definition statement

This subgroup covers:

Illustrative example of subject matter classified in B25J 9/0081

US 4283764

Informative references

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

| Teaching successive positions by walk-through, i.e. the tool head or end effector being grasped and guided directly to follow a path | G05B 19/423 |
Attention is drawn to the following Fterms (Japanese classification scheme),
which may be of interest for search:

<table>
<thead>
<tr>
<th>Term</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching auxiliary tool</td>
<td>3C007/JU07</td>
</tr>
<tr>
<td>Mount hand</td>
<td>3C007/JU08</td>
</tr>
<tr>
<td>Teaching by man power</td>
<td>3C007/LS02</td>
</tr>
</tbody>
</table>

Glossary of terms

In this subgroup, the following terms (or expressions) are used with the meaning indicated:

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>master teach-in means</td>
<td>Devices manually moved in space by an operator for teaching the path of a manipulator.</td>
</tr>
</tbody>
</table>

B25J 9/0084

{comprising a plurality of manipulators}

Definition statement

This subgroup covers:
Both robotic installation comprising several manipulators and manipulators comprising two arms connected to a single basis.
References relevant to classification in this group

This subgroup does not cover:

Humanoid robots having two arms (mostly in)  B62D 57/032

Informative references

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

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

<table>
<thead>
<tr>
<th>Term</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double-arm manipulator</td>
<td>3C007/BS26</td>
</tr>
<tr>
<td>Control device related to peripheral device such as other robot</td>
<td>3C007/JS02</td>
</tr>
<tr>
<td>Cooperation among manipulators</td>
<td>3C007/LV02</td>
</tr>
</tbody>
</table>
**B25J 9/0093**

(co-operating with conveyer means)

**Definition statement**

*This subgroup covers:*

Illustrative example of subject matter classified in **B25J 9/0093**

EP 0512126

---

**Informative references**

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

<table>
<thead>
<tr>
<th>Programme-control systems consisting of manipulators and conveyer only</th>
<th>G05B 19/4182</th>
</tr>
</thead>
</table>

*Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:*

<table>
<thead>
<tr>
<th>Work object movable by conveyer</th>
<th>3C007/NS02</th>
</tr>
</thead>
</table>
B25J 9/0096

(co-operating with a working support, e.g. work-table)

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/0096

WO 9104522

Informative references

Attention is drawn to the following places, which may be of interest for search:
Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Work object movable by rotation/oscillating base | 3C007/NS03 |
**B25J 9/02**

characterised by movement of the arms, e.g. cartesian coordinate type (*B25J 9/06* takes precedence)

**Definition statement**

*This subgroup covers:*

The main types of industrial manipulators, each type corresponding to a specific kinematic chain.

**B25J 9/023**

{Cartesian coordinate type}

**Definition statement**

*This subgroup covers:*

Manipulators consisting of prismatic joints connected in series and allowing movements along perpendicular axis.

US 6264419
Informative references

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

| Movable work or tool support with a single sliding pair followed perpendicularly by a single sliding pair | B23Q 1/621 |

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Cartesian coordinates robots with two degrees of freedom | 3C007/BS02 |
| Cartesian coordinates robots with three degrees of freedom | 3C007/BS03 |

B25J 9/026

{Gantry-type}

Definition statement

This subgroup covers:
Cartesian coordinate type manipulators having three prismatic joints, wherein one joint is formed by a carriage running on an overhead horizontal beam supported at its two ends by other beams.
GB2179322

**FIG. 1**

**References relevant to classification in this group**

*This subgroup does not cover:*

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

| Manipulators travelling along a guideway, wherein the guideway is also moved (details concerning the guideways/rails should also be classified here) | B25J 5/04 |

**Informative references**

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

| Portals | B23Q 1/012 |

*Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:*

| Gantry type robots | 3C007/BS05 |
Synonyms and Keywords

In patent documents the following expressions/words (FR) "robot portique", and (DE) "portalroboter" are often used as synonyms.

B25J 9/04

by rotating at least one arm, excluding the head movement itself, e.g. cylindrical coordinate type or polar coordinate type

Definition statement

This subgroup covers:
Manipulators having a kinematic chain (excluding the kinematic pairs of the head itself) including at least one revolute joint.

B25J 9/041

{Cylindrical coordinate type}

Definition statement

This subgroup covers:
Manipulators having a kinematic chain including at least a revolute joint and arranged so that the working envelope of the manipulator is a cylinder. The kinematic chain usually includes a revolute joint having a vertical axis and two prismatic joints having respectively a vertical and a horizontal axis.
Informative references

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

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Cylindrical coordinates robots | 3C007/BS06 |

**B25J 9/042**

{comprising an articulated arm}

**Definition statement**

This subgroup covers:

Cylindrical coordinate type manipulators having at least two subsequent revolute pairs having parallel axes.
References relevant to classification in this group

This subgroup does not cover:

<table>
<thead>
<tr>
<th>Description</th>
<th>CPC Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer devices for transferring semiconductors into and out of processing chambers</td>
<td>H01L 21/67742</td>
</tr>
<tr>
<td>Apparatus specially adapted for handling semiconductor, the wafer being placed on a robot blade, or gripped for conveyance</td>
<td>H01L 21/68707</td>
</tr>
</tbody>
</table>

Informative references

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

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

<table>
<thead>
<tr>
<th>Term</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontally articulated robots</td>
<td>3C007/BS15</td>
</tr>
</tbody>
</table>

Synonyms and Keywords

In patent documents the following abbreviations are often used:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCARA</td>
<td>Selective Compliance Assembly Robot Arm</td>
</tr>
</tbody>
</table>
In patent documents the following expression/word "horizontal articulated manipulator" is often used.

**B25J 9/045**

{Polar coordinate type}

**Definition statement**

*This subgroup covers:*

Manipulators having a kinematic chain comprising two revolute joints and a prismatic joint arranged so that the working envelope of the manipulator is a part of a sphere.

US3784031

**Informative references**

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

*Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:*

| Polar coordinates robots | 3C007/BS07 |

**Synonyms and Keywords**

*In patent documents the following expression/word "spherical" is often used.*
B25J 9/046

{Revolute coordinate type}

Definition statement

This subgroup covers:
Manipulators having a kinematic chain including at least two subsequent revolute joints having parallel horizontal axis.

The most common revolute coordinate type manipulators have six revolute joints: a first joint having a vertical axis between a basis and a carrousel, a second joint between the carrousel and a lower arm, a third joint between the lower arm and an upper arm, the second and third joint having parallel horizontal axis and three further joints for the wrist.

DE 3939836

Informative references

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

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

<table>
<thead>
<tr>
<th>Verticaly articulated robots</th>
<th>3C007/BS10</th>
</tr>
</thead>
<tbody>
<tr>
<td>With five degrees of freedom</td>
<td>3C007/BS11</td>
</tr>
<tr>
<td>With six degrees of freedom</td>
<td>3C007/BS12</td>
</tr>
</tbody>
</table>
Glossary of terms

In this subgroup, the following terms (or expressions) are used with the meaning indicated:

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthropomorphic</td>
<td>Designates manipulators having a kinematic chain similar to a human arm, i.e. two revolute joints for the shoulder, two revolute joints for the elbow and three revolute joints for the wrist.</td>
</tr>
</tbody>
</table>

Synonyms and Keywords

In patent documents the following expressions/words "articulated type", and "jointed type" are often used as synonyms.

B25J 9/047

{the pivoting axis of the first arm being offset to the vertical axis}

Definition statement

This subgroup covers:

Revolute coordinate type manipulators having the axis of the second revolute joint -between the carrousel and the lower arm - being offset from the vertical axis of the first revolute joint - between the basis and the carrousel -. 
Informative references

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

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

<table>
<thead>
<tr>
<th>Vertically articulated robots</th>
<th>3C007/BS10</th>
</tr>
</thead>
<tbody>
<tr>
<td>With five degrees of freedom</td>
<td>3C007/BS11</td>
</tr>
<tr>
<td>With six degrees of freedom</td>
<td>3C007/BS12</td>
</tr>
<tr>
<td>With seven degrees of freedom</td>
<td>3C007/BS13</td>
</tr>
<tr>
<td>With eight or more degrees of freedom</td>
<td>3C007/BS14</td>
</tr>
</tbody>
</table>

B25J 9/048

{Pendulum type}

Definition statement

This subgroup covers:

Illustrative example of subject matter classified in B25J 9/048
EP 0162392

**B25J 9/06**

characterised by multi-articulated arms

**Definition statement**

*This subgroup covers:*
Manipulator arms having multiple articulations placed in series.
Informative references

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

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Snake-shaped robots           | 3C007/BS17 |

Special rules of classification within this group

Documents should additionally be classified in B25J 18/06 when the number of articulations is very high and the articulations very closed to each other, because the robot arm can be considered as flexible.

B25J 9/08

characterised by modular constructions

Definition statement

This subgroup covers:

Manipulators which can be easily and quickly mounted / dismounted so that their components can be arranged in different possible configurations.
B25J 9/10
characterised by positioning means for manipulator elements

Definition statement
This subgroup covers:
Constructional elements allowing the manipulators to perform their movement.

B25J 9/1005
{comprising adjusting means}

Definition statement
This subgroup covers:
Constructional elements allowing to adjust the movement of the manipulators.
**B25J 9/101**

(using limit-switches, -stops)

**Definition statement**

*This subgroup covers:*

Illustrative example of subject matter classified in **B25J 9/101**.

US 20100178101

---

**Informative references**

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

<table>
<thead>
<tr>
<th>Means for preventing, limiting or returning the movements of parts of a control mechanism</th>
<th>G05G 5/04</th>
</tr>
</thead>
</table>

*Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:*

| Butting and stopping | 3C007/CY13 |
Glossary of terms

In this subgroup, the following terms (or expressions) are used with the meaning indicated:

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limit stop</td>
<td>A mechanical device for stopping the travel of a manipulator part along or around an axis.</td>
</tr>
<tr>
<td>Limit switch</td>
<td>An electromechanical device operated by the motion of a part of the manipulator to make or break an electrical connection.</td>
</tr>
</tbody>
</table>

B25J 9/1015

{using additional, e.g. micro adjustment of the end effector}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1015
EP 0149806
B25J 9/102

{Gears specially adapted therefor, e.g. reduction gears (gearings in general F16H)}

Definition statement

This subgroup covers:
Rotating elements for transmitting a torque specially adapted for manipulators.

B25J 9/1025

{Harmonic drives (in general: F16H 49/001)}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1025

US 4518308

Informative references

Attention is drawn to the following places, which may be of interest for search:
Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Harmonic reduction gears | 3C007/HT26 |
Special rules of classification within this subclass/group

Harmonic drives consist of three basic parts:

- the circular spline which is a rigid ring with internal teeth, engaging the teeth of the flexspine across the major axis of the wave generator
- the flexspine which is a non-rigid, thin cylindrical cup with external teeth on a slightly smaller pitch diameter than the circular spline; it fits over and is held in an elliptical shape by the wave generator; and
- the wave generator which is a thin, raced ball bearing fitted onto an elliptical plug serving as a high efficiency torque converter.

The advantages include: no backlash, compactness and light weight, high gear ratios and high torque capability.

**B25J 9/103**

*{with backlash-preventing means}*  

**Definition statement**

*This subgroup covers:*

Illustrative example of subject matter classified in [B25J 9/103](#)

JP 63023064
Informative references

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

<table>
<thead>
<tr>
<th>Special devices for taking up backlash in toothed wheels</th>
<th>F16H 55/18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrangements for adjusting or for taking-up backlash not provided for elsewhere</td>
<td>F16H 57/12</td>
</tr>
</tbody>
</table>

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Back-lash prevention | 3C007/HT31 |

Glossary of terms

In this subgroup, the following terms (or expressions) are used with the meaning indicated:

| Backlash | Amount of clearance between mated gear teeth. |

Synonyms and Keywords

In patent documents the following expression/word "play" is often used.

**B25J 9/1035**

{Pinion and fixed rack drivers, e.g. for rotating an upper arm support on the robot base}

Definition statement

This subgroup covers:

Illustrative example of subject matter classified in **B25J 9/1035**
Informative references

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

| Gearings for conveying or interconverting oscillating or reciprocating motions comprising a rack | F16H 19/005, F16H 19/006 |
| Racks | F16H 55/26 |

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Rack and pinion | 3C007/HT22 |

**B25J 9/104**

{with cables, chains or ribbons}

**Definition statement**

*This subgroup covers:*

Illustrative example of subject matter classified in **B25J 9/104**
Informative references

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

| Gearings for conveying rotary motion by endless flexible members | F16H 7/00 |

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Flexible transmission member | 3C007/HT01 |
| Belt | 3C007/HT02 |
| Chain | 3C007/HT03 |
| Rope / Wire | 3C007/HT04 |

**B25J 9/1045**

{comprising tensioning means}

**Definition statement**

This subgroup covers:

Illustrative example of subject matter classified in **B25J 9/1045**
Informative references

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

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Adjust tension | 3C007/HT07 |

**B25J 9/105**

{using eccentric means ([B25J 9/109](#) takes precedence)}

**Definition statement**

*This subgroup covers:*

Illustrative example of subject matter classified in [B25J 9/105](#)
B25J 9/1055

{by gravity}

Definition statement

This subgroup covers:

Manipulators having at least one part set in motion by the sole force of gravity acting on this part.

Illustrative example of subject matter classified in B25J 9/1055
B25J 9/106

{with articulated links}

Definition statement

This subgroup covers:
Manipulators having rods or bar for transmitting the motion from an actuator to the working head.

WO 02085580

FIG. 1
**B25J 9/1065**

{with parallelograms}

**Definition statement**

*This subgroup covers:*

Illustrative example of subject matter classified in **B25J 9/1065**

EP 0396752

**Informative references**

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

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

<table>
<thead>
<tr>
<th>Parallel link type</th>
<th>3C007/BS22</th>
</tr>
</thead>
</table>

**Special rules of classification within this subclass/group**

A single parallelogram is sufficient for classification in this group.
B25J 9/107

{of the froglegs type}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/107

WO 2010143505

Informative references

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

<table>
<thead>
<tr>
<th>Apparatus for conveying wafers into and out of processing chamber via a lock</th>
<th>H01L 21/67739</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apparatus specially adapted for handling semiconductor, the wafers being placed on a robot blade, or gripped by a gripper for conveyance</td>
<td>H01L 21/68707</td>
</tr>
</tbody>
</table>

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

<table>
<thead>
<tr>
<th>Frog-leg type</th>
<th>3C007/BS23</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pantograph mechanisms</td>
<td>5F031/GA44</td>
</tr>
</tbody>
</table>
**B25J 9/1075**

*{with muscles or tendons}*

**Definition statement**

*This subgroup covers:*

Illustrative example of subject matter classified in **B25J 9/1075**

US 2005121929

---

**Informative references**

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid-actuated devices for displacing a member, the motor being of the muscle type</td>
<td><strong>F15B 15/103</strong></td>
</tr>
</tbody>
</table>

*Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:*

<table>
<thead>
<tr>
<th>Description</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artificial muscles</td>
<td><strong>3C007/HS21</strong></td>
</tr>
<tr>
<td>Types of actuators; Elastic shrink-tubes or rubber bags</td>
<td><strong>3H081/AA18</strong></td>
</tr>
</tbody>
</table>
Special rules of classification within this group
Fluid activated muscles should additionally be classified in B25J 9/142.

Glossary of terms
*In this subgroup, the following terms (or expressions) are used with the meaning indicated:*

| Artificial muscle | Generic term used for materials or devices that can reversibly contract, expand, or rotate within one component due to an external stimulus (such as voltage, current, pressure or temperature). Conventional motors and pneumatic linear or rotary actuators do not qualify as artificial muscles because there is more than one component involved in the actuation. |

B25J 9/108

{Bearings specially adapted therefor (bearings in general F16C)}

Definition statement
*This subgroup covers:*
Illustrative example of subject matter classified in B25J 9/108
B25J 9/1085

{positioning by means of shape-memory materials (shape memory actuators F03G 7/06)}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1085
Informative references

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

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Mechano-thermal actuator | 3C007/HS06 |

**B25J 9/109**

{comprising mechanical programming means, e.g. cams}

**Definition statement**

This subgroup covers:

Illustrative example of subject matter classified in **B25J 9/109**
Informative references

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

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Cam mechanism          | 3C007/HT33 |

Glossary of terms

In this subgroup, the following terms (or expressions) are used with the meaning indicated:

| Mechanical programming means | Mechanical parts having a specific shape which allow to create a periodic movement so that the manipulator can execute a predetermined sequence of operations in a synchronized way. |
**B25J 9/1095**

{chemically actuated}

**Definition statement**

*This subgroup covers:*

Manipulators provided with an actuator directly powered by a chemical reaction or comprising a chemically synthesized material (e.g. a polymer) able to produce mechanical energy when stimulated (e.g. by an electric current).

Illustrative example of subject matter classified in [B25J 9/1095](#)

US 2008169729

---

**Informative references**

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

| Electro-chemical actuators | F03G 7/005 |

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Mechano-chemical actuator | 3C007/HS07 |
Synonyms and Keywords

*In patent documents the following expression/word “polymer actuator” is often used.*

**B25J 9/12**

electric

**Definition statement**

*This subgroup covers:*

Electric actuators specially adapted for manipulators.

**B25J 9/123**

{Linear actuators}

**Definition statement**

*This subgroup covers:*

Illustrative example of subject matter classified in **B25J 9/123**

DE 102006016195

---

**Informative references**

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

<table>
<thead>
<tr>
<th>Linear motors</th>
<th>H02K 41/02</th>
</tr>
</thead>
</table>
Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Linear motors | 3C007/HS26 |

**Special rules of classification within this subclass/group**

A manipulator having only one electric linear actuator would also be classified in this subgroup.

**B25J 9/126**

{Rotary actuators}

**Definition statement**

*This subgroup covers:*
Illustrative example of subject matter classified in **B25J 9/126**

FR 2617751
Informative references

Attention is drawn to the following places, which may be of interest for search:
Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Rotary solenoid | 3C007/HS25 |

B25J 9/14

fluid

Definition statement

This subgroup covers:
Pneumatic or hydraulic actuators specially adapted for manipulators.

B25J 9/142

{comprising inflatable bodies}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/142

US 4784042
Informative references

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

| Fluid-actuated motor of the muscle type | F15B 15/103 |

Special rules of classification within this group

McKibben actuators should additionally be classified in B25J 9/1075.

Synonyms and Keywords

In patent documents the following expressions/words "fluidic muscle", "rubbertuator" and "McKibben actuator" are often used as synonyms.

B25J 9/144

{Linear actuators}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/144

US 4473249

B25J 9/146

{Rotary actuators}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/146
B25J 9/148
{of the oscillating vane-type (in general F15B 15/12)}

Definition statement
This subgroup covers:
Illustrative example of subject matter classified in B25J 9/148

EP 0332506
B25J 9/16

Programme controls (programme controls in general G05B 19/00, e.g. numerical programme controls G05B 19/18; { recording or playback systems G05B 19/42})

Definition statement

This subgroup covers:
All the topics linked to the control of manipulators.

B25J 9/1602

{characterised by the control system, structure, architecture}

Definition statement

This subgroup covers:
Specific types of control systems.

B25J 9/1605

{Simulation of manipulator lay-out, design, modelling of manipulator}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1605

US 2003018412
B25J 9/1607

{Calculation of inertia, jacobian matrixes and inverses}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1607

US 2006271241

B25J 9/161

{Hardware, e.g. neural networks, fuzzy logic, interfaces, processor}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/161
Informative references

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

| Computer systems based on biological models                  | G06N 3/00 |
| Artificial life based on physical entities controlled by simulated intelligence so as to replicate life forms, e.g. robots replicating pets of humans in their appearance or behaviour | G06N 3/008 |
| Using neural network models                                   | G06N 3/02 |

B25J 9/1612

{characterised by the hand, wrist, grip control}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1612
B25J 9/1615

{characterised by special kind of manipulator, e.g. planar, scara, gantry, cantilever, space, closed chain, passive/active joints and tendon driven manipulators}

Definition statement

This subgroup covers:
Control systems dedicated to specific types of manipulators.

B25J 9/1617

{Cellular, reconfigurable manipulator, e.g. cebot}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1617
B25J 9/162

{Mobile manipulator, movable base with manipulator arm mounted on it}

Definition statement

*This subgroup covers:*

Illustrative example of subject matter classified in B25J 9/162
B25J 9/1623

{Parallel manipulator, Stewart platform, links are attached to a common base and to a common platform, plate which is moved parallel to the base}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1623
Special rules of classification within this group

Parallel manipulators as such should additionally be classified in B25J 9/106, B25J 17/0216 or B25J 17/0266.

Glossary of terms

*In this subgroup, the following terms (or expressions) are used with the meaning indicated:*

| Parallel manipulator | A mechanical system that uses several computer-controlled serial chains to support a single platform, or end-effector. |

**B25J 9/1625**

*{Truss-manipulator for snake-like motion}*

Definition statement

*This subgroup covers:*

Illustrative example of subject matter classified in B25J 9/1625
{characterised by the control loop}

**Definition statement**

*This subgroup covers:*
Specific types of control loops.

**B25J 9/163**

**{learning, adaptive, model based, rule based expert control}**

**Definition statement**

*This subgroup covers:*
Systems which emulate the decision making ability of a human expert.

An expert system is divided into two sub-systems: the inference engine and the knowledge base. The knowledge base represents facts and rules or models. The inference engine applies the rules or models to the known facts to deduce new facts.

In a rule based expert system, the knowledge base is represented by an IF-THEN structure, that relates given information of fact in the IF part (so called
antecedent, premise or condition) to some action in the THEN part (so called conclusion, consequence or action).

In a model based expert system, the knowledge base is represented by the design and function of the object to be controlled.

Illustrative example of subject matter classified in B25J 9/163

US 2011208356

**FIG. 1**

B25J 9/163

{compliant, force, torque control, e.g. combined with position control}

**Definition statement**

*This subgroup covers:

Illustrative example of subject matter classified in B25J 9/163*
B25J 9/1635

{flexible-arm control}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1635

US 5049797
B25J 9/1638
{compensation for arm bending/inertia, pay load weight/inertia}

Definition statement
This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1638

US 2008297092

B25J 9/1641
{compensation for backlash, friction, compliance, elasticity in the joints}

Definition statement
This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1641
B25J 9/1643

{redundant control}

Definition statement
This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1643

US 2010168919

Fig. 5B
Glossary of terms

In this subgroup, the following terms (or expressions) are used with the meaning indicated:

<table>
<thead>
<tr>
<th>Term</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redundant control</td>
<td>designates the control of a redundant manipulators, i.e. which have redundant joints (It does not mean that several control systems are used in parallel).</td>
</tr>
</tbody>
</table>

Synonyms and Keywords

In patent documents the following expression/word “avoiding singularities” is often used.

B25J 9/1646

{variable structure system, sliding mode control}

Definition statement

This subgroup covers:

Illustrative example of subject matter classified in B25J 9/1646

EP 0875341
B25J 9/1648
{non-linear control combined or not with linear control}

Definition statement
This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1648

EP 0128355

B25J 9/1651
{acceleration, rate control}

Definition statement
This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1651
B25J 9/1653

{parameters identification, estimation, stiffness, accuracy, error analysis}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1653
B25J 9/1656

{characterised by programming, planning systems for manipulators}

Definition statement

This subgroup covers:
Different types or robot programmes.

B25J 9/1658

{characterised by programming language}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1658
B25J 9/1661

{characterised by task planning, object-oriented languages}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1661
US 2009210090

**B25J 9/1664**

{characterised by motion, path, trajectory planning}

**Definition statement**

*This subgroup covers:*
Illustrative example of subject matter classified in **B25J 9/1664**

FR 2682905

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**FIG. 2**
B25J 9/1666

{Avoiding collision or forbidden zones}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1666

EP 1604790

B25J 9/1669

{characterised by special application, e.g. multi-arm co-operation, assembly, grasping}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1669
WO 2004114037

B25J 9/1671

{characterised by simulation, either to verify existing program or to create and verify new program, CAD/CAM oriented, graphic oriented programming systems}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1671
B25J 9/1674
{characterised by safety, monitoring, diagnostic}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1674
B25J 9/1676

{Avoiding collision or forbidden zones}

Definition statement

This subgroup covers:

Illustrative example of subject matter classified in B25J 9/1676


**B25J 9/1679**

{characterised by the tasks executed}

**Definition statement**

*This subgroup covers:*
Different control systems dedicated to a specific task of the manipulator.

**B25J 9/1682**

{Dual arm manipulator; Coordination of several manipulators}

**Definition statement**

*This subgroup covers:*
Illustrative example of subject matter classified in B25J 9/1682
Informative references

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

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

<table>
<thead>
<tr>
<th>Overall configuration relating to peripheral devices such as other robots</th>
<th>3C007/JS02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperation of manipulators with each other</td>
<td>3C007/LV02</td>
</tr>
</tbody>
</table>

**B25J 9/1684**

{Tracking a line or surface by means of sensors}

**Definition statement**

*This subgroup covers:*

Illustrative example of subject matter classified in [B25J 9/1684](#)
B25J 9/1687

{Assembly, peg and hole, palletising, straight line, weaving pattern movement}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1687
Special rules of classification within this group

Compliant mechanisms per se should additionally be classified in B25J 17/0208.

B25J 9/1689

{Teleoperation}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1689
Special rules of classification within this group

Master / slave systems as such should additionally be classified in B25J 3/00.

Hand-grip control means as such should additionally be classified in B25J 13/02.

**B25J 9/1692**

{Calibration of manipulator}

**Definition statement**

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1692
B25J 9/1694

{characterised by use of sensors other than normal servo-feedback from position, speed or acceleration sensors, perception control, multi-sensor controlled systems, sensor fusion}

Definition statement

This subgroup covers:

Illustrative example of subject matter classified in B25J 9/1694
B25J 9/1697

{Vision controlled systems}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 9/1697
Informative references

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

| Image feed-back for automatic industrial control, e.g. robot with camera | G06T 1/0014 |
| Image analysis | G06T 7/00 |

Special rules of classification within this group

Details concerning the mounting of the vision system on the manipulator should be classified in B25J 19/021.

**B25J 9/20**

**fluidic**

**Definition statement**

This subgroup covers:

Illustrative example of subject matter classified in B25J 9/20
B25J 11/00
Manipulators not otherwise provided for

Definition statement
This group covers:
Special types of manipulators not covered by the other groups of B25J or manipulators for performing a specific tasks not covered by other subclasses.

B25J 13/00
Controls for manipulators (programme controls B25J 9/16 ; control in general G05)

Definition statement
This group covers:
Hardware components involved in the motion control procedure of a manipulator.

This includes input means which allow a user/operator to give instructions to the manipulator (i.e. to control its motions in real-time or to teach such motions).
This also includes all types of sensors which measure a physical quantity of the manipulator (e.g. force or speed) or its environment and convert it into a signal for a motion control system of the manipulator.

**B25J 13/003**

{by means of an audio-responsive input (audible safety signals B25J 19/061)}

**Definition statement**

This subgroup covers:

Illustrative example of subject matter classified in B25J 13/003

DE 3327808

**Informative references**

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

<table>
<thead>
<tr>
<th>Speech recognition</th>
<th>G10L 15/00</th>
</tr>
</thead>
</table>

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

<table>
<thead>
<tr>
<th>Control of robot by voice input</th>
<th>3C007/WB19</th>
</tr>
</thead>
</table>

**Synonyms and Keywords**

In patent documents the following expression/word “voice control” is often used.
B25J 13/02

Hand grip control means{(handles or pedals for crane control B66C 13/56 ; for measuring the force applied to control members G01L 5/22 ; hand-held casings for switching devices, e.g. joy-sticks H01H 9/0214)}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 13/02

EP 0353841

Informative references

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

| Manually-actuated control mechanisms movable by hand about orthogonal axes, e.g. joysticks | G05G 9/047 |
B25J 13/04

Foot-operated control means

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 13/04

US 6016385

B25J 13/06

Control stands, e.g. consoles, switch-boards

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 13/06
Informative references

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

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

<table>
<thead>
<tr>
<th>Term</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure of operator panel</td>
<td>3C007/JU01</td>
</tr>
<tr>
<td>With human interface part</td>
<td>3C007/JU02</td>
</tr>
<tr>
<td>With display device</td>
<td>3C007/JU03</td>
</tr>
<tr>
<td>Operator panel type</td>
<td>3C007/JU11</td>
</tr>
<tr>
<td>Remote operation</td>
<td>3C007/JU12</td>
</tr>
<tr>
<td>Operable from multiple points</td>
<td>3C007/JU13</td>
</tr>
<tr>
<td>Portable type</td>
<td>3C007/JU14</td>
</tr>
<tr>
<td>Stationary type</td>
<td>3C007/JU15</td>
</tr>
<tr>
<td>Teaching device in combination with control device</td>
<td>3C007/JU17</td>
</tr>
</tbody>
</table>
B25J 13/065
{comprising joy-sticks}

Definition statement
This subgroup covers:
Illustrative example of subject matter classified in B25J 13/065

JP 3003787

B25J 13/08
by means of sensing devices, e.g. viewing or touching devices

Definition statement
This subgroup covers:
Different types of sensors which can be used in the control systems of manipulators.
B25J 13/081

{Touching devices, e.g. pressure-sensitive}

Definition statement

This subgroup covers:
Contact sensors.

B25J 13/082

{Grasping-force detectors (in general G01L 5/16, G01L 5/22)}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 13/082

US 4600357
**B25J 13/083**

*{fitted with slippage detectors}*  

**Definition statement**  

*This subgroup covers:*  

Illustrative example of subject matter classified in [B25J 13/083](#)

DE 3332147

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**B25J 13/084**

*{Tactile sensors (in general G01L 5/16, G01L 5/22)}*

**Definition statement**  

*This subgroup covers:*  

Illustrative example of subject matter classified in [B25J 13/084](#)
B25J 13/085

{Force or torque sensors (B25J 13/082, B25J 13/084 take precedence)}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 13/085
B25J 13/086

{Proximity sensors}

**Definition statement**

*This subgroup covers:*

Illustrative example of subject matter classified in [B25J 13/086](#)

EP 0518836
B25J 13/087

{for sensing other physical parameters, e.g. electrical or chemical properties}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 13/087

WO 2011077730

B25J 13/088

{with position, velocity or acceleration sensors}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 13/088
{Determining the position of the robot with reference to its environment}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 13/089
B25J 15/00

Gripping heads {and other end effectors (grippers used in machine tools B23Q 7/04 ; gripping members fitted on cranes B66C 1/42 , B66C 1/44 ; gripping means used in the manufacture of semiconductors H01L 21/68707 ; gripping means used for mounting electrical components H05K 13/04)}

Definition statement

This group covers:
End effectors for manipulators designed to hold an object. It also includes other types of end effectors specially adapted for being mounted on manipulators.

B25J 15/0004

{with provision for adjusting the gripped object in the hand}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 15/0004
Special rules of classification within this subclass/group

In this subgroup, hand should be understood as head since this subgroup is drawn to reorienting the object with respect to the “hand/head”, while the object is gripped in “head/hand”.

Glossary of terms

In this subgroup, the following terms (or expressions) are used with the meaning indicated:

<table>
<thead>
<tr>
<th>Term</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjusting</td>
<td>Modifying the orientation of a work piece while being gripped</td>
</tr>
</tbody>
</table>

B25J 15/0009

{comprising multi-articulated fingers, e.g. resembling a human hand}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 15/0009
Informative references

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

| Hand prostheses | A61F 2/583 |

**B25J 15/0019**

{End effectors other than grippers}

**Definition statement**

This subgroup covers:

Any end-effector mounted on a manipulator and which is not a gripper. This includes welding tools, machining tools, spraying tools, screwing tools, medical or surgical tools/instruments, etc.

Illustrative example of subject matter classified in B25J 15/0019
EP 0520076

**FIG. 1**

![Diagram of a robot sewing machine with labeled parts such as ARM 11, FIXING PLATE 21, WRIST PORTION 12, RAIL 22, SLIDING PORTION 3, SEWING MACHINE 5, NEEDLE 51, SIMPLE HARMONIC MOTION DEVICE 2.]

**B25J 15/0023**

{Gripper surfaces directly activated by a fluid (flexible fingers B25J 15/12)}

**Definition statement**

*This subgroup covers:*

Illustrative example of subject matter classified in B25J 15/0023

SU 1047680
Informative references

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

| Devices for picking up and depositing articles or materials with inflatable picking-up means | B65G 47/908 |

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Use of fluid pressure | 3C007/EV12 |
| Elastic membrane (with open spaces, closed spaces, filled spaces) | 3C007/EV14 |

B25J 15/0028

{with movable, e.g. pivoting gripping jaw surfaces}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 15/0028

DE 4400354
References relevant to classification in this group

This subgroup does not cover:

| Grippers with jaw surfaces comprising actuating means for moving the gripped objects | B25J 15/0004 |

B25J 15/0052

{multiple gripper units or multiple end effectors}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 15/0052
EP 0094338

B25J 15/02

servo-actuated

Definition statement

This subgroup covers:
Grippers having actuators for moving holding elements, sensors and a feedback loop for correcting an error on the position, speed or force of the holding elements.
B25J 15/0206
{comprising articulated grippers}

Definition statement

This subgroup covers:
Grippers having pivoting fingers or jaws.

B25J 15/0213
{actuated by gears}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 15/0213
US 62217094

B25J 15/022
{actuated by articulated links}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 15/022
B25J 15/0226

{actuated by cams}

Definition statement

This subgroup covers:

Illustrative example of subject matter classified in B25J 15/0226
B25J 15/0253
{comprising parallel grippers}

Definition statement
This subgroup covers:
Grippers having fingers or jaws moving in translation.

B25J 15/026
{actuated by gears}

Definition statement
This subgroup covers:
Illustrative example of subject matter classified in B25J 15/026
GB 2119894

**B25J 15/0266**

{actuated by articulated links}

**Definition statement**

*This subgroup covers:*

Illustrative example of subject matter classified in **B25J 15/0266**
EP 0293153

**B25J 15/0273**

*{comprising linear guide means}*

**Definition statement**

*This subgroup covers:*

Illustrative example of subject matter classified in **B25J 15/0273**
B25J 15/028

{actuated by cams}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 15/028
B25J 15/04

with provision for the remote detachment or exchange of the head or parts thereof

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 15/04
Informative references

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

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Gripping device replacement | 3C007/GS00 |
| Conjunction means           | 3C007/GS01 |
| Ball type                   | 3C007/GS02 |
| Gripping claw type          | 3C007/GS03 |
| Plug-in type (screw, pin, pile) | 3C007/GS04 |
| Twist type/thread connection| 3C007/GS05 |
| Magnetic type               | 3C007/GS06 |
| Joint for power feed / fluid supply | 3C007/GS11 |
| Control for hand replacement| 3C007/GS19 |

B25J 15/0475

{Exchangeable fingers}

Definition statement

This subgroup covers:

Illustrative example of subject matter classified in B25J 15/0475
B25J 15/0491
{comprising end-effector racks}

Definition statement

This subgroup covers:

Illustrative example of subject matter classified in B25J 15/0491
Informative references

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

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

<table>
<thead>
<tr>
<th>Term</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand storage</td>
<td>3C007/GS15</td>
</tr>
<tr>
<td>Having moving means</td>
<td>3C007/GS16</td>
</tr>
<tr>
<td>Having gripper device extraction or junction facility</td>
<td>3C007/GS17</td>
</tr>
</tbody>
</table>

Special rules of classification within this subclass/group

Documents classified in this subgroup also disclose some information concerning the head, the head exchange mechanism or the head exchange process as such.

B25J 15/06

with vacuum or magnetic holding means

Definition statement

This subgroup covers:

Grippers holding an object by suction or magnetic force.
Relationship between large subject matter areas

A document is classified in B25J 15/06 when it both discloses vacuum holding means and magnetic holding means (in different embodiments or combined in one embodiment). In this case, and provided that the inventive concept is independent of the very nature of the holding means, the document should be classified in B25J 15/06 only and not in the subgroups B25J 15/0608 and B25J 15/0616. If the inventive concept of a document directly concerns the design of vacuum holding means, respectively of magnetic holding means, the document should be classified in B25J 15/0616, respectively in B25J 15/0608.

B25J 15/0608

{with magnetic holding means}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 15/0608

DE 102009015345

Informative references

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

| Magnetic work holders                                           | B25B 11/002 |
| Devices for picking-up and depositing articles incorporating electrostatic or magnetic grippers | B65G 47/92 |
| Load-engaging elements by magnetic means attached to lifting or lowering gear of cranes | B66C 1/04 |
B25J 15/0616

{with vacuum}

Definition statement

This subgroup covers:

Illustrative example of subject matter classified in B25J 15/0616

US 2008202602

Informative references

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

<table>
<thead>
<tr>
<th>Vacuum work holders</th>
<th>B25B 11/005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Devices for picking-up and depositing articles incorporating pneumatic, e.g. suction, grippers</td>
<td>B65G 47/91</td>
</tr>
<tr>
<td>Separating articles from piles using suction grippers</td>
<td>B65H 3/0808</td>
</tr>
<tr>
<td>Load-engaging elements with suction means attached to lifting or lowering gear of cranes</td>
<td>B66C 1/02</td>
</tr>
<tr>
<td>Suction cups for attaching purposes</td>
<td>F16B 47/00</td>
</tr>
</tbody>
</table>

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

<table>
<thead>
<tr>
<th>Vacuum absorption</th>
<th>3C007/FS01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure of absorption part</td>
<td>3C007/FT00</td>
</tr>
<tr>
<td>Purpose of absorption device</td>
<td>3C007/FU00</td>
</tr>
</tbody>
</table>
Synonyms and Keywords

In patent documents the following expressions/words (EN) "vacuum", "suction", "sucking", (FR) "vide", "dépression", "aspir+", (DE) "saug+", and "vakuum" are often used as synonyms.

In patent documents the following expressions/words (EN) "cup", "pad", (DE) "napf", and (FR) "ventouse" are often used as synonyms.

**B25J 15/08**

having finger members (**B25J 15/02** , **B25J 15/04** take precedence)

**Definition statement**

This subgroup covers:
Grippers having a plurality of finger members not covered by **B25J 15/02**.

**B25J 15/10**

with three or more finger members{(**B25J 15/0009** takes precedence)}

**Definition statement**

This subgroup covers:
Illustrative example of subject matter classified in **B25J 15/10**
B25J 15/103

{for gripping the object in three contact points}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 15/103
Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 15/106

US 5011207
Informative references

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

| Vices having a plurality of parts with linear movement | B25B 1/2421 |

**B25J 15/12**

with flexible finger members

**Definition statement**

This subgroup covers:

Illustrative example of subject matter classified in B25J 15/12

DE 102004034537

![Diagram](image)

Informative references

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

| Devices for picking-up and depositing articles with inflatable picking-up means | B65G 47/908 |
Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Wholly flexible finger member | 3C007/ES10 |

Special rules of classification within this group

Fingers directly actuated by a fluid should additionally be classified in B25J 15/0023.

B25J 17/00

Joints

Definition statement

This group covers:
Devices for linking two parts of a manipulator while allowing a freedom of movement between these two parts.

B25J 17/02

Wrist joints

Definition statement

This subgroup covers:
Joints specially adapted for linking an end effector to the manipulator.

B25J 17/0208

{Compliance devices}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 17/0208
Informative references

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

| Machines for aligning articles to be assembled | B23P 19/10 |
| Machines for connecting objects by press fit | B23P 19/02 |

Special rules of classification within this group

Passive compliant mechanisms avoiding breaking of a robot arm when this robot hurts an obstacle should also additionally classified in B25J 19/063.

B25J 17/0216

{comprising a stewart mechanism}

Definition statement

This subgroup covers:

Exclusively parallel kinematics manipulators having 6 linear actuators linked to a base and a moving platform by means of universal or ball joints and allowing 6 degrees of freedom for the platform.
Illustrative example of subject matter classified in B25J 17/0216

References relevant to classification in this group

This subgroup does not cover:

<table>
<thead>
<tr>
<th>Type of Kinematics Manipulators</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other type of 3D parallel kinematics manipulators</td>
<td>B25J 17/0266</td>
</tr>
<tr>
<td>2D parallel kinematics manipulators</td>
<td>B25J 9/106</td>
</tr>
<tr>
<td>Control of parallel manipulators</td>
<td>B25J 9/1623</td>
</tr>
</tbody>
</table>

Informative references

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

| Machine tools having parallel kinematics | B23Q 1/5462 |
| Gearings comprising primarily only links or levers, with movements in three dimensions | F16H 21/46 |

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Parallel link type manipulator | 3C007/BS24 |

Synonyms and Keywords

In patent documents the following expressions/words “parallel manipulators”, “parallel robots” and “parallel kinematics” are often used as synonyms.
B25J 17/0241

{One-dimensional joints}

Definition statement

*This subgroup covers:*
Illustrative example of subject matter classified in B25J 17/0241

DE 202011004164 U

B25J 17/025

{mounted in series}

Definition statement

*This subgroup covers:*
Illustrative example of subject matter classified in B25J 17/025
Special rules of classification within this group

Manipulators having a high numbers of joints mounted in series should additionally be classified in B25J 9/06.

B25J 17/0258

{Two-dimensional joints}

Definition statement

This subgroup covers:

Illustrative example of subject matter classified in B25J 17/0258
EP 0309329

B25J 17/0266
{comprising more than two actuating or connecting rods}

Definition statement
This subgroup covers:
Illustrative example of subject matter classified in B25J 17/0266

WO 0035640
References relevant to classification in this group

This subgroup does not cover:

<table>
<thead>
<tr>
<th>Description</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stewart mechanism (6 linears actuators linked to the base and the platform by universal joints and allowing 6 degrees of freedom for the platform)</td>
<td>B25J 17/0216</td>
</tr>
<tr>
<td>2D parallel manipulators (movements in one plane only)</td>
<td>B25J 9/106</td>
</tr>
<tr>
<td>Control of parallel manipulators</td>
<td>B25J 9/1623</td>
</tr>
</tbody>
</table>

Informative references

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine tools having parallel kinematics</td>
<td>B23Q 1/5462</td>
</tr>
<tr>
<td>Gearings comprising primarily only links or levers, with movements in three dimensions</td>
<td>F16H 21/46</td>
</tr>
</tbody>
</table>

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

<table>
<thead>
<tr>
<th>Description</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parallel link type manipulator</td>
<td>3C007/BS24</td>
</tr>
</tbody>
</table>

Synonyms and Keywords

In patent documents the following expressions/words "parallel manipulators", "parallel robots" and "parallel kinematics" are often used as synonyms.

**B25J 17/0275**

{Universal joints, e.g. Hooke, Cardan, ball joints}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in **B25J 17/0275**
B25J 17/0283

{Three-dimensional joints}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 17/0283

EP 0479739

B25J 18/00

Arms

Definition statement

This group covers:
Main elongated parts of manipulators.
**B25J 18/002**

{comprising beam bending compensation means}

**Definition statement**

*This subgroup covers:*
Illustrative example of subject matter classified in [B25J 18/002](#)

US 4606691

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**Informative references**

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

<table>
<thead>
<tr>
<th>Accessories fitted to machine tools; Weight and flexion compensation</th>
<th>B23Q 11/001</th>
</tr>
</thead>
</table>

---

**Special rules of classification within this group**

Control aspects should additionally be classified in [B25J 9/1638](#).

---

**B25J 18/007**

{the end effector rotating around a fixed point}

**Definition statement**

*This subgroup covers:*
Illustrative example of subject matter classified in [B25J 18/007](#)
Synonyms and Keywords

In patent documents the following expression/word "spherical robot" is often used.

**B25J 18/02**

**extensible**

**Definition statement**

This subgroup covers:
This group covers manipulator arms having a variable length.

**B25J 18/025**

**{telescopic}**

**Definition statement**

This subgroup covers:
Illustrative example of subject matter classified in **B25J 18/025**
Informative references

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

| Telescopic jib-crane | B66C 23/701 |

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Expandable and contractible | 3C007/ CU023C007/CV02 |
| Telescopic type | 3C007/ CU033C007/CW02 |

B25J 18/04

rotatable

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 18/04
Special rules of classification within this group
SCARA robots should additionally be classified in B25J 9/042.

B25J 18/06
flexible

Definition statement
This subgroup covers:
Illustrative example of subject matter classified in B25J 18/06
Informative references

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

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Snake-shaped robots       | 3C007/BS17 |

Special rules of classification within this group

Manipulator arms being flexible by means of a large number of articulations must additionally be classified in B25J 9/06.
B25J 19/00

Accessories fitted to manipulators, e.g. for monitoring, for viewing; Safety devices combined with or specially adapted for use in connection with manipulators (safety-devices in general F16P; protection against radiation in general G21F)

Definition statement

This group covers:
This group covers all accessories for manipulators, i.e. components of manipulators not directly intended for structure, actuation or control functions.

B25J 19/0004

{Braking devices (brakes in general F16D)}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 19/0004

EP 0109252

Fig. 1
Informative references

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

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

<table>
<thead>
<tr>
<th>Locking mechanism in joint</th>
<th>3C007/CX05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brakes</td>
<td>3C007/HT40</td>
</tr>
</tbody>
</table>

B25J 19/0008

{Balancing devices}

Definition statement

This subgroup covers:
Accessories allowing to partially compensate the load applied on the manipulator.

Informative references

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

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

<table>
<thead>
<tr>
<th>Load balance mechanism</th>
<th>3C007/CY21</th>
</tr>
</thead>
</table>

B25J 19/0012

{using fluidic devices}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 19/0012
Informative references

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

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Load balance mechanism by fluid pressure | 3C007/CY24 |

B25J 19/0016

{using springs}

Definition statement

This subgroup covers:

Illustrative example of subject matter classified in B25J 19/0016
Informative references

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

Springs; shock-absorbers; means for damping vibration  F16F

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Load-balancing by springs  3C007/CY23

B25J 19/002

{using counterweights}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 19/002
Informative references

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

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Load balance mechanism; providing balance weight | 3C007/CY22 |

Synonyms and Keywords

In patent documents the following expressions/words (DE) "gegengewicht", "ausgleichgewicht" and (FR) "contrepoids" are often used as synonyms.

B25J 19/0025

{Means for supplying energy to the end effector}

Definition statement

This subgroup covers:

Illustrative example of subject matter classified in B25J 19/0025
Informative references

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrangements of means for transmitting pneumatic, hydraulic, or electric power to movable parts of a crane</td>
<td>B66C 13/12</td>
</tr>
<tr>
<td>Supports for pipes, cables or protective tubing</td>
<td>F16L 3/00</td>
</tr>
<tr>
<td>Arrangements of electric cables or lines between relatively-movable parts</td>
<td>H02G 11/00</td>
</tr>
</tbody>
</table>

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

<table>
<thead>
<tr>
<th>Description</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable disposition along external main body surface</td>
<td>3C007/CY07</td>
</tr>
</tbody>
</table>

Synonyms and Keywords

In patent documents the following expressions/words (EN) “cable”, “line”, “pipe”, “hose”, “umbilical member”, (DE) “energieversorgung”, “kabel”, “schlauch”, (FR) “alimentation en énergie”, are often used as synonyms.
B25J 19/0029

{arranged within the different robot elements}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 19/0029

EP 1852225

Informative references

Attention is drawn to the following places, which may be of interest for search:
Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

<table>
<thead>
<tr>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable penetrating into rotation axis</td>
<td>3C007/CY04</td>
</tr>
<tr>
<td>Rotary connection means</td>
<td>3C007/CY05</td>
</tr>
<tr>
<td>Cable wound helically</td>
<td>3C007/CY09</td>
</tr>
<tr>
<td>Cable folded in U-shape</td>
<td>3C007/CY10</td>
</tr>
</tbody>
</table>
**B25J 19/0037**

{comprising a light beam pathway, e.g. laser}

**Definition statement**

*This subgroup covers:*

Illustrative example of subject matter classified in [B25J 19/0037](#)

US 4667081

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**Informative references**

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

| Robots for moving a laser beam | B23K 26/0884 |

**B25J 19/005**

{using batteries, e.g. as a back-up power source}

**Definition statement**

*This subgroup covers:*

Illustrative example of subject matter classified in [B25J 19/005](#)
Informative references

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

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| **Battery**          | 3C007/HS09 |

Synonyms and Keywords

In patent documents the following expressions/words “energy cell”, “accumulator” and "power source" are often used as synonyms.

B25J 19/0054

{Cooling means}

Definition statement

This subgroup covers:

Illustrative example of subject matter classified in B25J 19/0054
Informative references

Attention is drawn to the following places, which may be of interest for search:
Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Heat radiation / cooling | 3C007/CY34 |

B25J 19/0058

{Means for cleaning manipulators, e.g. dust removing means}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 19/0058
References relevant to classification in this group

This subgroup does not cover:

| Means for preventing dust from entering/escaping manipulators | B25J 19/0075 |

B25J 19/0075

{Means for protecting the manipulator from its environment or vice versa}

Definition statement

This subgroup covers:

Means for avoiding the intrusion of foreign matter, e.g. dust, inside the manipulator or for avoiding the release of harmful matter, e.g. grease particles, from the manipulator into its environment.

Informative references

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

| Protective coverings for parts of machine tools | B23Q 11/08 |
Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Dust proof; provide cover 3C007/CY29

B25J 19/0079

{using an internal pressure system}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 19/0079

EP 0447881

Informative references

Attention is drawn to the following places, which may be of interest for search:
Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Dust proof by pressurizing the body 3C007/CY28
B25J 19/0083
{using gaiters}

Definition statement
This subgroup covers:
Illustrative example of subject matter classified in - B25J 19/0083

US 4762455

Synonyms and Keywords
In patent documents the following expressions/words (EN)"bellow", 
"(protective) boot", (FR)"soufflet", "manchon (protecteur)" (DE)"schutzbalg"
and "faltenbalg" are often used as synonyms.

B25J 19/0091

{Shock absorbers (in general F16F)}

Definition statement
This subgroup covers:
Illustrative example of subject matter classified in B25J 19/0091
Informative references

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

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Cushioning         | 3C007/CY32 |

**B25J 19/02**

**Sensing devices**

**Definition statement**

*This subgroup covers:*

Sensors fitted on manipulators and not directly used in the control systems of the manipulators.

**References relevant to classification in this group**

*This subgroup does not cover:*

| Sensors specifically used for controlling manipulators | B25J 13/08 |
B25J 19/021

{Optical sensing devices}

**Definition statement**

*This subgroup covers:*
Sensors having optical components.

**B25J 19/022**

{using lasers}

**Definition statement**

*This subgroup covers:*
Illustrative example of subject matter classified in [B25J 19/022](#)

EP 0339560

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**B25J 19/023**

{including video camera means}

**Definition statement**

*This subgroup covers:*
Illustrative example of subject matter classified in [B25J 19/023](#)
B25J 19/025

{including optical fibres}

**Definition statement**

This subgroup covers:
Illustrative example of subject matter classified in B25J 19/025

FR 2664525

B25J 19/026

{Acoustical sensing devices}

**Definition statement**

This subgroup covers:
Illustrative example of subject matter classified in B25J 19/026
Special rules of classification within this group
This group includes robots with ultrasonic sensors.

**B25J 19/027**

**{Electromagnetic sensing devices}**

**Definition statement**
This subgroup covers:
Illustrative example of subject matter classified in **B25J 19/027**

FR 2663105
B25J 19/028

{Piezoresistive or piezoelectric sensing devices}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 19/028

US 5511931

B25J 19/04

Viewing devices

Definition statement

This subgroup covers:
Sensors for capturing an image.

B25J 19/06

Safety devices

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 19/06
Informative references

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

| Safety devices independent of the control and operation of the machine | F16P 1/00 |
| Safety devices acting in conjunction with the control or operation of the machine | F16P 3/00 |

B25J 19/061

{with audible signals (audio controls B25J 13/003)}

Definition statement

This subgroup covers:

Illustrative example of subject matter classified in B25J 19/061
Informative references

Attention is drawn to the following places, which may be of interest for search:
Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

| Safety means with alarm               | 3C007/MS28 |

**B25J 19/063**

{working only upon contact with an outside object}

**Definition statement**

This subgroup covers:
Illustrative example of subject matter classified in [B25J 19/063](#)
Special rules of classification within this group

Devices comprising a compliant mechanism should additionally be classified in B25J 17/0208.

B25J 21/00

Chambers provided with manipulation devices (constructional features of the mounting of the manipulator in the wall B25J 1/08 ; { glove-boxes for nuclear applications G21F 7/04})

Definition statement

This group covers:
Closed spaces containing manipulation means.

B25J 21/005

{Clean rooms}

Definition statement

This subgroup covers:
Illustrative example of subject matter classified in B25J 21/005
Glove-boxes, i.e. chambers in which manipulations are performed by the human hands in gloves built into the chamber walls{(glove-boxes for removal of dirt B08B 15/026; glove-boxes shielded against radiation G21F 7/04)}; Gloves therefor

**Definition statement**

*This subgroup covers:*

Illustrative example of subject matter classified in B25J 21/02
Informative references

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

<table>
<thead>
<tr>
<th>Category</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baby incubators</td>
<td>A61G 11/00</td>
</tr>
<tr>
<td>Microbiological incubators</td>
<td>C12M 1/005</td>
</tr>
<tr>
<td>Apparatus providing an anaerobic atmosphere</td>
<td>C12M 1/045</td>
</tr>
</tbody>
</table>

Synonyms and Keywords

In patent documents the following expressions/words (EN)"isolator", (FR)"boîte à gants" and (DE)"handschuhkasten" are often used as synonyms.