COOPERATIVE PATENT CLASSIFICATION

PERFORMING OPERATIONS; TRANSPORTING

(NOTES omitted)

MICROSTRUCTURAL TECHNOLOGY; NANOTECHNOLOGY

MICROSTRUCTURAL TECHNOLOGY

(NOTES omitted)

MICROSTRUCTURAL DEVICES OR SYSTEMS, e.g. MICROMECHANICAL DEVICES (piezo-electric, electrostrictive or magnetostrictive elements per se H01L 41/00)

NOTES

1. This subclass does not cover:
   - purely electrical or electronic devices per se which are covered by section H, e.g. subclass H01L;
   - purely optical devices per se which are covered by subclasses G02B or G02F;
   - essentially two-dimensional structures, e.g. layered products which are covered by subclass B32B;
   - chemical or biological structures per se which are covered by section C;
   - structures in atomic scale produced by manipulation of single atoms or molecules, which are covered by group B82B 1/00.

2. Devices or systems classified in this subclass are also classified in appropriate subclasses providing for their structural or functional features, if such features are of interest.

3. Attention is drawn to the following places:
   - A61K 9/50
   - B25J 7/00
   - G02B 21/32
   - G11B 5/127
   - H01P 3/08
   - Waveguide microstrips.

4. In this subclass, local "residual" subgroups, e.g. B81B 7/0077, are used with the following purpose:
   - When classifying a document which does not fit in any of a set of subgroups with the same dot-level, the document should be classified in the residual group, if present, and not in the group at the hierarchical level one dot above.
   - In the example, the document shall be classified in B81B 7/0077 and not in B81B 7/0032 as B81B 7/0077 is "residual" to B81B 7/0035-B81B 7/0074.

WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

1/00 Devices without movable or flexible elements, e.g. microcapillary devices

1/002 . . (Holes characterised by their shape, in either longitudinal or sectional plane)

1/004 . . (Through-holes, i.e. extending from one face to the other face of the wafer)

1/006 . . (Microdevices formed as a single homogeneous piece, i.e. wherein the mechanical function is obtained by the use of the device, e.g. cutters)

1/008 . . (Microtips)

3/00 Devices comprising flexible or deformable elements, e.g. comprising elastic tongues or membranes (B81B 5/00 takes precedence)

3/0002 . . (Arrangements for avoiding sticking of the flexible or moving parts)

3/0005 . . . (Anti-stiction coatings)

3/0008 . . . (Structures for avoiding electrostatic attraction, e.g. avoiding charge accumulation)

3/001 . . . (Structures having a reduced contact area, e.g. with bumps or with a textured surface)

3/0013 . . . (Structures dimensioned for mechanical prevention of stiction, e.g. spring with increased stiffness)

3/0016 . . . (Arrangements for avoiding sticking of the flexible or moving parts not provided for in groups B81B 3/0005 - B81B 3/0013)

3/0018 . . . (Structures acting upon the moving or flexible element for transforming energy into mechanical movement or vice versa, i.e. actuators, sensors, generators)

3/0021 . . . (Transducers for transforming electrical into mechanical energy or vice versa (dynamo-electric machines H02K 99/00; electrostatic machines H02N 1/00; piezo-electric devices H01L 41/00))

3/0024 . . . (Transducers for transforming thermal into mechanical energy or vice versa, e.g. thermal or bimorph actuators (electric motors using thermal effects H02N 10/00))

3/0027 . . . (Structures for transforming mechanical energy, e.g. potential energy of a spring into translation, sound into translation)

3/0029 . . . (Transducers for transforming light into mechanical energy or vice-versa)
Devices comprising elements which are movable in relation to each other, e.g. comprising slidable or rotatable elements

7/00 Microstructural systems; [Auxiliary parts of microstructural devices or systems]

7/0003 [MEMS mechanisms for assembling automatically hinged components, self-assembly devices (self-assembly processes B81C 1/00007)]

7/0006 [Interconnects]
B81B

B81B 7/008
(continued)

2. This group does not cover: electronic circuits per se, e.g. for controlling or driving application specific MEMS

7/0083 . { Temperature control
7/0087 . { On-device systems and sensors for controlling, regulating or monitoring
7/009 . { Maintaining a constant temperature by heating or cooling
7/0093 . { by cooling
7/0096 . { by heating
7/02 . containing distinct electrical or optical devices of particular relevance for their function, e.g. microelectro-mechanical systems [MEMS] (B81B 7/04 takes precedence)
7/04 . Networks or arrays of similar microstructural devices

2201/000 Specific applications of microelectromechanical systems

2201/01 . Switches
2201/012 . characterised by the shape
2201/014 . having a cantilever fixed on one side connected to one or more dimples
2201/016 . having a bridge fixed on two ends and connected to one or more dimples
2201/018 . Switches not provided for in B81B 2201/014 - B81B 2201/016
2201/02 . Sensors
2201/0207 . Bolometers
2201/0214 . Biosensors; Chemical sensors
2201/0221 . Variable capacitors
2201/0228 . Inertial sensors
2201/0235 . Accelerometers
2201/0242 . Gyroscopes
2201/025 . Inertial sensors not provided for in B81B 2201/0235 - B81B 2201/0242
2201/0257 . Microphones or microspeakers
2201/0264 . Pressure sensors
2201/0271 . Resonators; ultrasonic resonators
2201/0278 . Temperature sensors
2201/0285 . Vibration sensors
2201/0292 . Sensors not provided for in B81B 2201/0207 - B81B 2201/0285
2201/03 . Microengines and actuators
2201/031 . Thermal actuators
2201/032 . Bimorph and unimorph actuators, e.g. piezo and thermo
2201/033 . Comb drives
2201/034 . Electrical rotating micromachines
2201/035 . Microgears
2201/036 . Micropumps
2201/037 . Microtransmissions
2201/038 . Microengines and actuators not provided for in B81B 2201/031 - B81B 2201/037
2201/04 . Optical MEMS
2201/042 . Micromirrors, not used as optical switches
2201/045 . Optical switches
2201/047 . Optical MEMS not provided for in B81B 2201/042 - B81B 2201/045
2201/05 . Microfluidics
2201/051 . Micromixers, microreactors
2201/052 . Ink-jet print cartridges

2201/054 . Microvalves
2201/055 . Microneedles
2201/057 . Micropipets, dropformers
2201/058 . Microfluidics not provided for in B81B 2201/051 - B81B 2201/054
2201/06 . Bio-MEMS
2201/07 . Data storage devices, static or dynamic memories
2201/10 . Microfilters, e.g. for gas or fluids
2201/11 . Read heads, write heads or micropositioners for hard- or optical disks
2201/12 . STM or AFM microtips
2201/13 . Mechanical connectors, i.e. not functioning as an electrical connector

2203/00 Basic microelectromechanical structures

2203/01 . Suspended structures, i.e. structures allowing a movement
2203/0109 . Bridges
2203/0118 . Cantilevers
2203/0127 . Diaphragms, i.e. structures separating two media that can control the passage from one medium to another; Membranes, i.e. diaphragms with filtering function
2203/0136 . Comb structures
2203/0145 . Flexible holders
2203/0154 . Torsion bars
2203/0163 . Spring holders
2203/0172 . Flexible holders not provided for in B81B 2203/0154 - B81B 2203/0163
2203/0181 . See-saws
2203/019 . characterized by their profile
2203/03 . Static structures
2203/0307 . Anchors
2203/0315 . Cavities
2203/0323 . Grooves
2203/033 . Trenches
2203/0338 . Channels
2203/0346 . Grooves not provided for in B81B 2203/03 - B81B 2203/0338
2203/0353 . Holes
2203/0361 . Tips, pillars
2203/0369 . characterized by their profile
2203/0376 . rounded profile
2203/0384 . sloped profile
2203/0392 . profiles not provided for in B81B 2203/0376 - B81B 2203/0384
2203/04 . Electrodes
2203/05 . Type of movement
2203/051 . Translation according to an axis parallel to the substrate
2203/053 . Translation according to an axis perpendicular to the substrate
2203/055 . Translation in a plane parallel to the substrate, i.e. enabling movement along any direction in the plane
2203/056 . Rotation in a plane parallel to the substrate
2203/058 . Rotation out of a plane parallel to the substrate
2203/06 . Devices comprising elements which are movable in relation to each other, e.g. slidable or rotatable

2207/00 Microstructural systems or auxiliary parts thereof

2207/01 . comprising a microelectromechanical device connected to control or processing electronics, i.e. Smart-MEMS
the micromechanical device and the control or processing electronics being separate parts in the same package

the micromechanical device and the control or processing electronics being integrated on the same substrate

Smart-MEMS not provided for in

Electronic circuits for micromechanical devices which are not application specific, e.g. for controlling, power supplying, testing, protecting

Arrays

of movable structures

of static structures

Interconnects

Packages

Arrangements for connecting external electrical signals to mechanical structures inside the package

Buried interconnects in the substrate or in the lid

Conductive package seal

Feed-through, via

through the lid

through the substrate

Interconnects arranged on the substrate or the lid, and covered by the package seal

Arrangements not provided for in groups

Structural features, others than packages, for protecting a device against environmental influences

Protective layers applied directly to the device before packaging

Microstructural systems or auxiliary parts thereof not provided for in