

CPC COOPERATIVE PATENT CLASSIFICATION

B PERFORMING OPERATIONS; TRANSPORTING

(NOTES omitted)

SEPARATING; MIXING

B01 PHYSICAL OR CHEMICAL PROCESSES OR APPARATUS IN GENERAL

B01L CHEMICAL OR PHYSICAL LABORATORY APPARATUS FOR GENERAL USE (apparatus for medical or pharmaceutical purposes [A61](#); apparatus for industrial purposes or laboratory apparatus whose construction and performance are comparable to that of similar industrial apparatus, see the relevant classes for industrial apparatus, particularly subclasses of [B01](#) and [C12](#); separating or distilling apparatus [B01D](#); mixing or stirring devices [B01F](#); atomisers [B05B](#); {vibrating devices, e.g. shaking tables,} sieves [B07B](#); corks, bungs [B65D](#); handling liquids in general [B67](#); vacuum pumps [F04](#); siphons [F04F 10/00](#); taps, stop-cocks [F16K](#); tubes, tube joints [F16L](#); apparatus specially adapted for investigating or analysing materials [G01](#), particularly [G01N](#); electrical or optical apparatus, see the relevant classes in Sections [G](#) and [H](#))

NOTE

This subclass covers only laboratory apparatus which is either applicable solely to laboratory purposes or which, by reason of its simple construction and adaptability, is such as would not be suitable for industrial use.

WARNINGS

- The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
- [B01L 3/14](#) covered by [B01L 3/50](#)
- 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	Enclosures; Chambers (fume cupboards B08B ; provided with manipulation devices, glove boxes B25J ; {industrial clean rooms F24F 3/167 ; } cooling chambers F25D)	3/0213	. . . . {Accessories for glass pipettes; Gun-type pipettes, e.g. safety devices, pumps}
		3/0217	. . . . {of the plunger pump type (medical syringes A61M)}
1/02	. Air-pressure chambers; Air-locks therefor	3/022	. . . . {Capillary pipettes, i.e. having very small bore (B01L 3/0224 - B01L 3/0237 take precedence)}
1/025	. . {Environmental chambers (incubators for culturing cells C12M 41/14 ; test chambers to test weather resistance G01N 17/002)}	3/0224	. . . . {having mechanical means to set stroke length, e.g. movable stops (B01L 3/0231 , B01L 3/0234 take precedence)}
1/04	. Dust-free rooms or enclosures {(clean rooms suitable for industrial purposes F24F 3/167)}	3/0227	. . . . {Details of motor drive means (B01L 3/0231 , B01L 3/0234 take precedence)}
1/50	. {for storing hazardous materials in the laboratory, e.g. cupboards, waste containers (sample containers B01L 3/50)}	3/0231	. . . . {having several coaxial pistons}
1/52	. {Transportable laboratories; Field kits}	3/0234	. . . . {Repeating pipettes, i.e. for dispensing multiple doses from a single charge}
3/00	Containers or dishes for laboratory use, e.g. laboratory glassware (bottles B65D ; apparatus for enzymology or microbiology {specially adapted for culturing} C12M 1/00); Droppers (receptacles for volumetric purposes G01F)	3/0237	. . . . {Details of electronic control, e.g. relating to user interface}
3/02	. Burettes; Pipettes	3/0241	. . {Drop counters; Drop formers (making arrays for combinatorial libraries B01J 19/0046 ; automation of dispensing for analysis G01N 35/10)}
3/0203	. . {Burettes, i.e. for withdrawing and redistributing liquids through different conduits}	3/0244	. . . . {using pins}
3/0206	. . . {of the plunger pump type}	3/0248	. . . . {Prongs, quill pen type dispenser}
3/021	. . {Pipettes, i.e. with only one conduit for withdrawing and redistributing liquids}	3/0251	. . . . {Pin and ring type or pin in tube type dispenser}
		3/0255	. . . . {characterized by the form or material of the pin tip}

- 3/0258 . . . {using stamps}
- 3/0262 . . . {using touch-off at substrate or container}
- 3/0265 . . . {using valves to interrupt or meter fluid flow, e.g. using solenoids or metering valves}
- 3/0268 . . . {using pulse dispensing or spraying, eg. inkjet type, piezo actuated ejection of droplets from capillaries}
- 3/0272 . . . {Dropper bottles}
- 3/0275 . . {Interchangeable or disposable dispensing tips}
- 3/0279 . . . {co-operating with positive ejection means}
- 3/0282 . . {mounted within a receptacle ([wash bottles B01L 3/10](#))}
- 3/0286 . . {Ergonomic aspects, e.g. form or arrangement of controls}
- 3/0289 . . {Apparatus for withdrawing or distributing predetermined quantities of fluid ([B01L 3/02](#) takes precedence; sample taking [G01N 1/00](#); sample taking within automatic analysers [G01N 35/00](#); volume measuring in general [G01F](#))}
- 3/0293 . . . {for liquids}
- 3/0296 . . . {from pierceable tubing, e.g. in extracorporeal blood sampling}
- 3/04 . . Crucibles
- 3/06 . . Crystallising dishes
- 3/08 . . Flasks ([specially adapted for distillation B01D 3/10](#))
- 3/10 . . Wash bottles
- 3/12 . . Gas jars or cylinders
- 3/16 . . Retorts
- 3/18 . . Spatulas
- 3/50 . . {Containers for the purpose of retaining a material to be analysed, e.g. test tubes ([devices for taking samples of blood A61B 5/15](#))}
- 3/502 . . {with fluid transport, e.g. in multi-compartment structures ([centrifugal-type cuvettes G01N 21/07](#); analysis by separation into components [G01N 30/00](#); automatic analysers [G01N 35/00](#))}
- 3/5021 . . . {Test tubes specially adapted for centrifugation purposes ([centrifuges B04B 5/04](#))}
- 3/50215 . . . {using a float to separate phases}
- 3/5023 . . . {with a sample being transported to, and subsequently stored in an absorbent for analysis}
- 3/5025 . . . {for parallel transport of multiple samples}
- 3/50255 . . . {Multi-well filtration}
- 3/5027 . . . {by integrated microfluidic structures, i.e. dimensions of channels and chambers are such that surface tension forces are important, e.g. lab-on-a-chip ([B01L 3/5023](#) takes precedence; micromixers [B01F 33/30](#); microreactors for synthesis [B01J 19/0093](#); microcapillary devices in general [B81B 1/00](#))}
- 3/502707 . . . {characterised by the manufacture of the container or its components (manufacture of microstructural devices in general [B81C](#); by shaping or joining plastic parts [B29C 59/00](#) [B29C 65/00](#), by laminating [B32B 37/00](#))}
- 3/502715 . . . {characterised by interfacing components, e.g. fluidic, electrical, optical or mechanical interfaces}
- 3/502723 . . . {characterised by venting arrangements}
- 3/50273 {characterised by the means or forces applied to move the fluids ([micropumps F04B 19/006](#), of the membrane type [F04B 43/043](#))}
- 3/502738 {characterised by integrated valves ([microvalves F16K 99/0001](#))}
- 3/502746 {characterised by the means for controlling flow resistance, e.g. flow controllers, baffles ([B01L 3/502738](#) takes precedence)}
- 3/502753 {characterised by bulk separation arrangements on lab-on-a-chip devices, e.g. for filtration or centrifugation (separation in general [B01D](#); microapparatus for analysis using electrophoresis [G01N 27/44791](#); sample preparation [G01N 1/28](#))}
- 3/502761 {specially adapted for handling suspended solids or molecules independently from the bulk fluid flow, e.g. for trapping or sorting beads, for physically stretching molecules ([investigating characteristics of particles G01N 15/00](#))}
- 3/502769 {characterised by multiphase flow arrangements}
- 3/502776 {specially adapted for focusing or laminating flows}
- 3/502784 {specially adapted for droplet or plug flow, e.g. digital microfluidics ([automatic analysis using a stream of discrete samples in a tube system G01N 35/08](#))}
- 3/502792 {for moving individual droplets on a plate, e.g. by locally altering surface tension}
- 3/5029 . . . {using swabs}
- 3/505 . . {flexible containers not provided for above}
- 3/5055 . . . {Hinged, e.g. opposable surfaces}
- 3/508 . . {rigid containers not provided for above}
- 3/5082 . . . {Test tubes *per se*}
- 3/50825 {Closing or opening means, corks, bungs ([closures for containers B65D](#); means for removing stoppers [B67B 7/02](#))}
- 3/5085 . . . {for multiple samples, e.g. microtitration plates}
- 3/50851 {specially adapted for heating or cooling samples ([laboratory heating apparatus B01L 7/00](#); incubators [C12M](#))}
- 3/50853 {with covers or lids}
- 3/50855 {using modular assemblies of strips or of individual wells}
- 3/50857 {using arrays or bundles of open capillaries for holding samples}
- 3/5088 . . . {confining liquids at a location by surface tension, e.g. virtual wells on plates, wires ([B01L 3/50857](#) takes precedence)}
- 3/52 . . {Containers specially adapted for storing or dispensing a reagent ([B01L 3/02](#) takes precedence; containers for medical or pharmaceutical purposes [A61J 1/00](#); containers in general [B65D](#); storing or dispensing test elements [G01N 33/4875](#); automated reagent dispensing [G01N 35/1002](#))}
- 3/523 . . {with means for closing or opening}
- 3/527 . . {for a plurality of reagents}
- 3/54 . . {Labware with identification means ([identification of carriers, materials or components in automatic analysers G01N 35/00732](#))}
- 3/545 . . {for laboratory containers}

- 3/5453 . . . {for test tubes}
- 3/5457 . . . {for container closures}
- 3/56 . {Labware specially adapted for transferring fluids}
- 3/561 . . {Tubes; Conduits (in general F16L)}
- 3/563 . . {Joints or fittings (in general F16L); Separable fluid transfer means to transfer fluids between at least two containers, e.g. connectors}
- 3/5635 . . . {connecting two containers face to face, e.g. comprising a filter}
- 3/565 . . {Seals (in general F16L)}
- 3/567 . . {Valves, taps or stop-cocks (in combination with burettes B01L 3/0203; in general F16K)}
- 3/569 . . {Glassware}
- 5/00 Gas handling apparatus** (gas jars or cylinders B01L 3/12; cold traps, cold baffles B01D 8/00; separation of gases or vapours B01D 53/00; gas generators B01J 7/00; steam traps F16T)
- 5/02 . Gas collection apparatus, e.g. by bubbling under water (for sampling G01N)
- 5/04 . Gas washing apparatus, e.g. by bubbling
- 7/00 Heating or cooling apparatus** (evaporators B01D 1/00; drying gases or vapours, e.g. desiccators, B01D 53/26; autoclaves B01J 3/04; drying ovens F26B; furnaces, ovens F27); **Heat insulating devices**
- 7/02 . Water baths; Sand baths; Air baths
- 7/04 . Heat insulating devices, e.g. jackets for flasks
- 7/50 . {Cryostats}
- 7/52 . {with provision for submitting samples to a predetermined sequence of different temperatures, e.g. for treating nucleic acid samples (amplification or hybridisation processes per se C12Q 1/68; controlling sequential reactions for synthesis B01J 19/0046)}
- 7/525 . . {with physical movement of samples between temperature zones}
- 7/5255 . . . {by moving sample containers}
- 7/54 . {using spatial temperature gradients}
- 9/00 Supporting devices; Holding devices** (tweezers, tongs B25B)
- 9/02 . Laboratory benches or tables; Fittings therefor
- 9/04 . Retort stands; Retort clamps
- 9/06 . Test-tube stands; Test-tube holders
- 9/065 . . {specially adapted for capillary tubes}
- 9/50 . {Clamping means, tongs (in general F16B 2/06)}
- 9/52 . {Supports specially adapted for flat sample carriers, e.g. for plates, slides, chips}
- 9/523 . . {for multisample carriers, e.g. used for microtitration plates}
- 9/527 . . {for microfluidic devices, e.g. used for lab-on-a-chip}
- 9/54 . {Supports specially adapted for pipettes and burettes (automated pipetting stations G01N 35/10)}
- 9/543 . . {for disposable pipette tips, e.g. racks or cassettes}
- 9/547 . . {for dispensing pins}
- 9/56 . {Means for indicating position of a recipient or sample in an array}
- 13/00 {Cleaning or rinsing apparatus}**
- 13/02 . {for receptacle or instruments}

- 99/00 Subject matter not provided for in other groups of this subclass**
- 2200/00 Solutions for specific problems relating to chemical or physical laboratory apparatus**
- 2200/02 . Adapting objects or devices to another
 - 2200/021 . . Adjust spacings in an array of wells, pipettes or holders, format transfer between arrays of different size or geometry
 - 2200/022 . . . Variable spacings
 - 2200/023 . . adapted for different sizes of tubes, tips or container
 - 2200/025 . . Align devices or objects to ensure defined positions relative to each other
 - 2200/026 . . Fluid interfacing between devices or objects, e.g. connectors, inlet details
 - 2200/027 . . . for microfluidic devices
 - 2200/028 . . Modular arrangements
 - 2200/04 . Exchange or ejection of cartridges, containers or reservoirs
 - 2200/06 . Fluid handling related problems
 - 2200/0605 . . Metering of fluids
 - 2200/061 . . Counting droplets
 - 2200/0615 . . Loss of fluid by dripping
 - 2200/0621 . . Control of the sequence of chambers filled or emptied
 - 2200/0626 . . using levitated droplets
 - 2200/0631 . . Purification arrangements, e.g. solid phase extraction [SPE]
 - 2200/0636 . . Focussing flows, e.g. to laminate flows
 - 2200/0642 . . Filling fluids into wells by specific techniques
 - 2200/0647 . . Handling flowable solids, e.g. microscopic beads, cells, particles
 - 2200/0652 . . . Sorting or classification of particles or molecules
 - 2200/0657 . . . Pipetting powder
 - 2200/0663 . . . Stretching or orienting elongated molecules or particles
 - 2200/0668 . . . Trapping microscopic beads
 - 2200/0673 . . Handling of plugs of fluid surrounded by immiscible fluid
 - 2200/0678 . . Facilitating or initiating evaporation
 - 2200/0684 . . Venting, avoiding backpressure, avoid gas bubbles
 - 2200/0689 . . Sealing
 - 2200/0694 . . Creating chemical gradients in a fluid
 - 2200/08 . Ergonomic or safety aspects of handling devices
 - 2200/082 . . Handling hazardous material
 - 2200/085 . . Protection against injuring the user
 - 2200/087 . . Ergonomic aspects
 - 2200/10 . Integrating sample preparation and analysis in single entity, e.g. lab-on-a-chip concept
 - 2200/12 . Specific details about manufacturing devices
 - 2200/14 . Process control and prevention of errors
 - 2200/141 . . Preventing contamination, tampering
 - 2200/142 . . Preventing evaporation
 - 2200/143 . . Quality control, feedback systems
 - 2200/145 . . . Detecting door closure
 - 2200/146 . . . Employing pressure sensors
 - 2200/147 . . . Employing temperature sensors
 - 2200/148 . . Specific details about calibrations
 - 2200/16 . Reagents, handling or storing thereof
 - 2200/18 . Transport of container or devices

2200/185	. . Long distance transport, e.g. mailing	2300/0867	. . . Multiple inlets and one sample wells, e.g. mixing, dilution
2300/00	Additional constructional details	2300/087	. . . Multiple sequential chambers
2300/02	. Identification, exchange or storage of information	2300/0874	. . . Three dimensional network
2300/021	. . Identification, e.g. bar codes	2300/0877	. . . Flow chambers
2300/022	. . . Transponder chips	2300/088	. . . Channel loops
2300/023	. . Sending and receiving of information, e.g. using bluetooth	2300/0883	. . . Serpentine channels
2300/024	. . Storing results with means integrated into the container	2300/0887	. . Laminated structure
2300/025	. . Displaying results or values with integrated means	2300/089	. . Virtual walls for guiding liquids
2300/026	. . . Drum counters	2300/0893	. . having a very large number of wells, microfabricated wells
2300/027	. . . Digital display, e.g. LCD, LED	2300/0896	. . Nanoscaled
2300/028	. . . Graduation	2300/10	. Means to control humidity and/or other gases
2300/04	. Closures and closing means	2300/105	. . using desiccants
2300/041	. . Connecting closures to device or container	2300/12	. Specific details about materials
2300/042	. . . Caps; Plugs	2300/123	. . Flexible; Elastomeric
2300/043	. . . Hinged closures	2300/126	. . Paper
2300/044	. . . pierceable, e.g. films, membranes	2300/14	. Means for pressure control
2300/045	. . . whereby the whole cover is slidable	2300/16	. Surface properties and coatings
2300/046	. . Function or devices integrated in the closure	2300/161	. . Control and use of surface tension forces, e.g. hydrophobic, hydrophilic
2300/047	. . . Additional chamber, reservoir	2300/163	. . . Biocompatibility
2300/048	. . . enabling gas exchange, e.g. vents	2300/165	. . . Specific details about hydrophobic, oleophobic surfaces
2300/049	. . . Valves integrated in closure	2300/166	. . . . Suprahydrophobic; Ultraphobic; Lotus-effect
2300/06	. Auxiliary integrated devices, integrated components	2300/168	. . Specific optical properties, e.g. reflective coatings
2300/0609	. . Holders integrated in container to position an object	2300/18	. Means for temperature control
2300/0618	. . . for removable separation walls	2300/1805	. . Conductive heating, heat from thermostatted solids is conducted to receptacles, e.g. heating plates, blocks
2300/0627	. . Sensor or part of a sensor is integrated	2300/1811	. . . using electromagnetic induction heating
2300/0636	. . . Integrated biosensor, microarrays	2300/1816	. . . using induction heating
2300/0645	. . . Electrodes	2300/1822	. . . using Peltier elements
2300/0654	. . . Lenses; Optical fibres	2300/1827	. . . using resistive heater
2300/0663	. . . Whole sensors	2300/1833	. . using electrical currents in the sample itself
2300/0672	. . Integrated piercing tool	2300/1838	. . using fluid heat transfer medium
2300/0681	. . Filter	2300/1844	. . . using fans
2300/069	. . Absorbents; Gels to retain a fluid	2300/185	. . . using a liquid as fluid
2300/08	. Geometry, shape and general structure	2300/1855	. . using phase changes in a medium
2300/0803	. . Disc shape	2300/1861	. . using radiation
2300/0806	. . . Standardised forms, e.g. compact disc [CD] format	2300/1866	. . . Microwaves
2300/0809	. . rectangular shaped	2300/1872	. . . Infrared light
2300/0812	. . . Bands; Tapes	2300/1877	. . using chemical reactions
2300/0816	. . . Cards, e.g. flat sample carriers usually with flow in two horizontal directions	2300/1883	. . using thermal insulation
2300/0819	. . . Microarrays; Biochips	2300/1888	. . Pipettes or dispensers with temperature control
2300/0822	. . . Slides	2300/1894	. . Cooling means; Cryo cooling
2300/0825	. . . Test strips	2400/00	Moving or stopping fluids
2300/0829	. . . Multi-well plates; Microtitration plates	2400/02	. Drop detachment mechanisms of single droplets from nozzles or pins
2300/0832	. . cylindrical, tube shaped	2400/021	. . non contact spotting by inertia, i.e. abrupt deceleration of the nozzle or pin
2300/0835	. . . Ampoules	2400/022	. . droplet contacts the surface of the receptacle
2300/0838	. . . Capillaries	2400/024	. . . touch-off at the side wall of the receptacle
2300/0841	. . . Drums	2400/025	. . . tapping tip on substrate
2300/0845	. . . Filaments, strings, fibres, i.e. not hollow	2400/027	. . electrostatic forces between substrate and tip
2300/0848	. . Specific forms of parts of containers	2400/028	. . Pin is moved through a ring which is filled with a fluid
2300/0851	. . . Bottom walls	2400/04	. Moving fluids with specific forces or mechanical means
2300/0854	. . . Double walls	2400/0403	. . specific forces
2300/0858	. . . Side walls	2400/0406	. . . capillary forces
2300/0861	. . Configuration of multiple channels and/or chambers in a single devices	2400/0409	. . . centrifugal forces
2300/0864	. . . comprising only one inlet and multiple receiving wells, e.g. for separation, splitting		

- 2400/0412 using additionally coriolis forces
- 2400/0415 . . . electrical forces, e.g. electrokinetic
- 2400/0418 electro-osmotic flow [EOF]
- 2400/0421 electrophoretic flow
- 2400/0424 Dielectrophoretic forces
- 2400/0427 Electrowetting
- 2400/043 . . . magnetic forces
- 2400/0433 . . . vibrational forces
- 2400/0436 acoustic forces, e.g. surface acoustic waves [SAW]
- 2400/0439 ultrasonic vibrations, vibrating piezo elements
- 2400/0442 . . . thermal energy, e.g. vaporisation, bubble jet
- 2400/0445 Natural or forced convection
- 2400/0448 Marangoni flow; Thermocapillary effect
- 2400/0451 Thermophoresis; Thermodiffusion; Soret-effect
- 2400/0454 . . . radiation pressure, optical tweezers
- 2400/0457 . . . passive flow or gravitation
- 2400/046 . . . Chemical or electrochemical formation of bubbles
- 2400/0463 . . . Hydrodynamic forces, venturi nozzles
- 2400/0466 . . . Evaporation to induce underpressure
- 2400/0469 . . . Buoyancy
- 2400/0472 . . . Diffusion
- 2400/0475 . . specific mechanical means and fluid pressure
- 2400/0478 . . . pistons
- 2400/0481 . . . squeezing of channels or chambers
- 2400/0484 . . . Cantilevers
- 2400/0487 . . . fluid pressure, pneumatics
- 2400/049 vacuum
- 2400/0493 . . Specific techniques used
- 2400/0496 . . . Travelling waves, e.g. in combination with electrical or acoustic forces
- 2400/06 . . Valves, specific forms thereof
- 2400/0605 . . check valves
- 2400/0611 . . . duck bill valves
- 2400/0616 . . . Ball valves
- 2400/0622 . . distribution valves, valves having multiple inlets and/or outlets, e.g. metering valves, multi-way valves
- 2400/0627 . . Molecular gates forcing or inhibiting diffusion
- 2400/0633 . . with moving parts
- 2400/0638 . . . membrane valves, flap valves
- 2400/0644 . . . rotary valves
- 2400/065 . . . sliding valves
- 2400/0655 . . . pinch valves
- 2400/0661 . . . shape memory polymer valves
- 2400/0666 . . . Solenoid valves
- 2400/0672 . . . Swellable plugs
- 2400/0677 . . phase change valves; Meltable, freezing, dissolvable plugs; Destructible barriers
- 2400/0683 . . . mechanically breaking a wall or membrane within a channel or chamber
- 2400/0688 . . surface tension valves, capillary stop, capillary break
- 2400/0694 . . vents used to stop and induce flow, backpressure valves
- 2400/08 . . Regulating or influencing the flow resistance
- 2400/082 . . Active control of flow resistance, e.g. flow controllers
- 2400/084 . . Passive control of flow resistance
- 2400/086 . . . using baffles or other fixed flow obstructions
- 2400/088 . . . by specific surface properties