C12M

APPARATUS FOR ENZYMOLOGY OR MICROBIOLOGY; {APPARATUS FOR CULTURING MICROORGANISMS FOR PRODUCING BIOMASS, FOR GROWING CELLS OR FOR OBTAINING FERMENTATION OR METABOLIC PRODUCTS, i.e. BIOREACTORS OR FERMENTERS}

Definition statement

This place covers:

Apparatus or devices specially adapted to the fermentation or to the growth of microorganisms, animal or plant cells or tissues, i.e. bioreactors and fermenters. The apparatus or devices covered by this subclass are designed for producing biomass or artificial tissues in laboratory or industrial scale.

The most simple bioreactor or fermenter is an apparatus comprising at least a container where the microorganisms or cells are placed and which is put under conditions that make it suitable for the culturing of the microorganisms or cells.

This subclass covers also devices for the pre-treatment of the material to be treated in the apparatus and for the after-treatment of the biomass, cells or tissues grown in the apparatus.

This subclass does not cover the methods or processes taking place in bioreactors which are not based on the use of the apparatus or its parts.

In this subclass the term microorganism includes prokaryotic and eukaryotic cells. Viruses, human, animal or plant cells, protozoa and unicellular algae are considered microorganisms.

Relationships with other classification places

Apparatus and devices per se which are not specifically intended or adapted for culturing microorganisms or cells are classified in the subclasses corresponding to their general function, e.g. mixing and mixers in general B01F, chemical or physical laboratory apparatus for general use B01L, apparatus for chemical or physical processes in general B01J.

Documents describing an apparatus or device and mentioning its use for culturing microorganisms, cells or tissue among other different uses are to be primarily classified in the subclasses corresponding to the general type of apparatus or device (e.g. B01F, B01L, B01J, etc.) with a secondary classification should be given in C12M.

C12M covers devices for controlling the product of the biomass production process taking place in the bioreactor. The analysis and determination of microorganisms and cells per se as well as apparatus for cellular observation or diagnostic are classified in C12Q and G01N.

References

Limiting references

This place does not cover:

Apparatus for culturing plant tissue	A01H 4/001
Apparatus for preservation of excised living parts of the human or animal body	A01N 1/142
Chemical or physical processes in general. Chemical or physical laboratory apparatus for general use. Investigating or analysing biological material	B01J, B01L, G01N 33/48
Apparatus or devices for DNA or RNA technology	B01L 7/52, B01J 19/0046, C12N 15/1003

Apparatus for the biological treatment of water, waste water, sewage or sludge	C02F 3/00, C02F 11/00
Apparatus for preparing fertilisers characterised by the composting step	C05F 17/90
Apparatus for beer brewing	C12C
Apparatus for production of wine or vinegar	C12G, C12J 1/10
Fermentation processes	C12P
Apparatus for bioleaching of ores	C22B 3/18
Removing non-cellulose substances from cellulose-containing materials	D21C
Investigating individual particles	G01N 15/10
Investigating or analysing the degree of sterilisation of non-bioligical materials using chemical indicators	G01N 31/226
Testing or evaluating the effect of a chemical or biological compound involving human or animal cells	G01N 33/5005
Investigating or analysing biological material by immunoassay	G01N 33/5302
Automatic analysis	G01N 35/00

Informative references

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

Disinfection or sterilisation of materials or objects, in general; Accessories therefor	A61L 2/00

Special rules of classification

IPC groups C12M 1/00 - C12M 3/00 are not used in CPC.

The CPC groups C12M 21/00 - C12M 99/00 do not correspond to former or current IPC groups.

The concordance table ECLA:IPC under the title of the subclass should be disregarded.

All the inventive technical features of the bioreactor should be classified in the corresponding groups and subgroups of C12M. Additional information can also be classified in C12M and should be taken into account for proposing a classification in other subclasses.

The last place rule for classification is not used in C12M.

Glossary of terms

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

Bioreactor	Apparatus comprising at least a container where the microorganisms or cells are placed and which is put under conditions that make it suitable for the culturing of the microorganisms or cells.
Fermenter	Term used for bioreactors for culturing bacteria or yeast with the purpose of obtaining their metabolic or fermentation products

Synonyms and Keywords

In patent documents, the following abbreviations are often used:

Bioreactor	Fermenter, Digester, Biodigester
Cell growth	Cell expansion, cell differentiation
Incubator	Apparatus for temperature control

C12M 21/00

{Bioreactors or fermenters specially adapted for specific uses (digesters for manure A01C 3/023; apparatus for PCR B01L 7/52; destroying or transforming solid waste B09B 3/00; methods for genetic engineering C12N 15/00, C12Q 1/68; nucleic acid amplification reactions C12Q 1/6844)}

References

Limiting references

This place does not cover:

Apparatus for biological treatment of water, waste water, sewage or sludge	C02F 3/00, C02F 11/00
Apparatus for preparing organic fertiliser by composting	C05F 17/90

Informative references

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

Digesters for manure	A01C 3/023
Apparatus for PCR	B01L 7/52
Destroying or transforming solid waste	B09B 3/00
Methods for genetic engineering	C12N 15/00, C12Q 1/68
Nucleic acid amplification reactions	C12Q 1/6844

Special rules of classification

The main group C12M 21/00 should not be used for classification.

The titles of the subgroups of C12M 21/00 form a non exhaustive list of the most common uses of bioreactors or fermenters covered by C12M. Documents relating to one of the uses enumerated in the subgroups of C12M 21/00 should be classified in the relevant subgroups. Documents on bioreactors or fermenters which are not related to one of the uses enumerated in the subgroups of C12M 21/00 should not be classified in C12M 21/00 or its subgroups at all.

Notwithstanding the classification according to the use in C12M 21/00, at least a further classification should be given in C12M 23/00 - C12M 99/00 according the technical features of the apparatus.

C12M 21/02

{Photobioreactors (culturing algae A01G 33/00, A01H 4/001, C12N 1/12)}

Definition statement

This place covers:

Bioreactors or fermenters using a source of illumination which is needed for achieving cellular growth.

Photobioreactors can be closed systems or open systems such ponds or basins.

References

Informative references

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

Methods for culturing algae	A01G 33/00, C12N 1/12
Apparatus for plant tissue culture	A01H 4/001

Glossary of terms

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

PBR	Photobioreactor

C12M 21/04

{for producing gas, e.g. biogas (digesters for manure with production of biogas A01C 3/028, biological treatment of water, waste water or sewage C02F 3/00, C02F 11/02, preparation of natural gas or syngas C10L 3/06, C10L 3/10)}

References

Limiting references

This place does not cover:

Biological treatment of water, waste water, sewage or sludge	C02F 3/00, C02F 11/02

Informative references

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

Digesters for manure with production of biogas	A01C 3/028
Preparation of natural gas or syngas or other gaseous fuels	C10L 3/06, C10L 3/08, C10L 3/10

C12M 21/06

{for in vitro fertilization}

Glossary of terms

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

IVF	in vitro fertilization

C12M 21/08

{for producing artificial tissue or for ex-vivo cultivation of tissue (prostheses A61F 2/00, grafts A61L 27/00)}

References

Informative references

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

Prostheses, artificial parts of the human body	A61F 2/00
Grafts, transplant tissues	A61L 27/00

C12M 21/12

{for producing fuels or solvents (C12M 21/04 takes precedence; liquid carbonaceous fuels C10L 1/00, solid fuels C10L 5/00)}

References

Limiting references

This place does not cover:

Bioreactors or fermenters for producing gas	C12M 21/04

Informative references

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

Grafts, transplant tissues	A61L 27/00
Liquid carbonaceous fuels	C10L 1/00
Solid Fuels	C10L 5/00

C12M 21/16

{Solid state fermenters, e.g. for koji production}

Definition statement

This place covers:

Bioreactors or fermenters for solid state fermentation. Solid state fermentation is characterized by a content of at least 90% of dry matter. In the solid state fermentation the liquid phase is not continuous.

Glossary of terms

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

SSF	Solid-state fermentation
SLF	Submerged liquid fermentation
Non submerged state fermenter	Solid-state fermenter

C12M 23/00

{Constructional details, e.g. recesses, hinges (flow directing inserts in C12M 27/18-C12M 27/24; apparatus for chemical or physical processes in general B01J, chemical or physical laboratory apparatus in general B01L)}

Definition statement

This place covers:

Apparatus or devices for culturing microorganisms or cells or for culturing tissues characterized by constructional details of the vessel of the bioreactor or characterized by parts with a mechanical function not covered by groups C12M 25/00 - C12M 41/00.

References

Limiting references

This place does not cover:

Flow directing inserts	C12M 27/18

Informative references

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

Apparatus for chemical or physical processes in general	B01J
Chemical or physical laboratory apparatus in general	B01L

C12M 23/02

{Form or structure of the vessel (large containers B65D 88/00)}

References

Limiting references

This place does not cover:

Large containers in general	B65D 88/00

C12M 23/04

{Flat or tray type, drawers (C12M 23/10, C12M 23/12, C12M 23/16 take precedence)}

References

Limiting references

This place does not cover:

Petri dish	C12M 23/10
Well or multiwell plates	C12M 23/12
Microfluidic devices; Capillary tubes	C12M 23/16

C12M 23/06

{Tubular (C12M 23/08, C12M 23/16 take precedence)}

References

Limiting references

This place does not cover:

Test tubes	C12M 23/08
Capillary tubes	C12M 23/16

C12M 23/08

{Flask, bottle or test tube}

References

Informative references

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

Tubes and flasks for laboratory use in general	B01L 3/561 , B01L 3/08

C12M 23/10

{Petri dish (crystallising dishes B01L 3/06)}

References

Informative references

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

Crystallizing dishes in general	B01L 3/06

C12M 23/12

{Well or multiwell plates (C12M 25/04 takes precedence)}

References

Limiting references

This place does not cover:

Membranes or filters in combination with well or multiwell plates	C12M 25/04

Informative references

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

Multi-well filtration in general	B01L 3/50255

C12M 23/16

{Microfluidic devices; Capillary tubes (integrated microfluidic structures B01L 3/5027; microreactors B01J 19/0093)}

References

Informative references

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

Biochips	B01J 19/0046
Microreactors per se	B01J 19/0093
Integrated microfluidic devices in general	B01L 3/5027

C12M 23/18

{Open ponds; Greenhouse type or underground installations}

Definition statement

This place covers:

i.a. combinations of closed and open bioreactors.

References

Limiting references

This place does not cover:

Closed bioreactors which are situated in or on an open water space itself not used for culture	C12M 23/56

C12M 23/20

{Material Coatings (immunocoatings C12M 25/00)}

Definition statement

This place covers:

Materials and coatings for the materials other than immunocoatings.

References

Limiting references

This place does not cover:

Immunocoatings	C12M 25/00

C12M 23/22

{Transparent or translucent parts (glassware for laboratory use B01L 3/00)}

References

Informative references

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

Glassware for laboratory use in general	B01L 3/00

C12M 23/26

{flexible (flexible containers for laboratory use B01L 3/505)}

References

Limiting references

This place does not cover:

Bags	C12M 23/14

Informative references

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

Flexible containers for laboratory use in genera	B01L 3/505

C12M 23/40

{Manifolds; Distribution pieces (fluid transfer means B01L 3/563)}

References

Informative references

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

Fluid transfer means in general	B01L 3/563

C12M 23/42

{Integrated assemblies, e.g. cassettes or cartridges}

Definition statement

This place covers:

Bioreactors or fermenters built as integral units comprising all the different parts disposed in a compact unit. This compact unit comprising all parts of the bioreactor can be in the form of a cassette or a cartridge which could also be assembled with other devices.

C12M 23/44

{Multiple separable units; Modules}

Definition statement

This place covers:

Bioreactors or fermenters comprising separated or separable units which can be mounted or dismounted independently from each other.

References

Limiting references

This place does not cover:

Reaction vessels connected in series or in parallel	C12M 23/58

C12M 23/48

{Holding appliances; Racks; Supports (holding devices for laboratory apparatus B01L 9/00)}

References

Informative references

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

Holding devices for laboratory use in general	B01L 9/00

C12M 23/50

{Means for positioning or orientating the apparatus (C12M 41/08 takes precedence)}

References

Limiting references

This place does not cover:

Control of illumination by means of changing the orientation	C12M 41/08

C12M 23/52

{Mobile; Means for transporting the apparatus (transportable laboratories B01L 1/52)}

References

Informative references

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

Transportable laboratories in general	B01L 1/52

C12M 23/58

{Reaction vessels connected in series or in parallel (combinations of bioreactors with other apparatus, C12M 43/00)}

References

Limiting references

This place does not cover:

Combinations of bioreactors or fermenters with other apparatus (different from a bioreactor or fermenter)	C12M 43/00

Informative references

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

Connected reactors for chemical or physical processes in general	B01J 19/1818, B01J 19/1825, B01J 19/1856, B01J 19/1862, B01J 19/242, B01J 19/2425, B01J 19/2445, B01J 19/245

C12M 25/00

{Means for supporting, enclosing or fixing the microorganisms, e.g. immunocoatings}

Definition statement

This place covers:

Apparatus, devices or systems for culturing microorganisms or cells or for culturing tissues characterized by the means for supporting the organism to be cultured, e.g. immunological coatings of the walls of the vessel.

Relationships with other classification places

Note that C12N 5/0068 covers supports for cell culture "per se" and C12M 25/00 and subgroups covers these supports when they form part of a bioreactor or fermenter.

References

Informative references

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

Apparatus in general for separation processes using semipermeable membranes	B01D 63/00
Fluidized bed apparatus	B01J 8/18
Packing elements for chemical or physical processes	B01J 19/32

C12M 25/02

{Membranes; Filters (filters or filtration in general B01D 24/00-B01D 41/00)}

References

Informative references

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

Filters or filtration in general	B01D 24/00 - B01D 41/00

C12M 25/10

{Hollow fibers or tubes (hollow fiber modules in general B01D 63/02)}

References

Informative references

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

Hollow fibre modules in general	B01D 63/02

C12M 25/14

{Scaffolds; Matrices (in general C12N 5/0068)}

References

Informative references

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

Substrate, supports and/or coatings for cell culture	C12N 5/0068, C12N 2533/00

C12M 25/16

{Particles; Beads; Granular material; Encapsulation (chemical or physical processes conducted in the presence of fluids and solid particles B01J 8/00)}

References

Informative references

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

Chemical or physical processes conducted in the presence of fluids and solid particles	B01J 8/00

C12M 25/20

{Fluidized bed (in chemical or physical processes B01J 8/18)}

References

Informative references

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

Fluidized bed apparatus in chemical or physical processes	B01J 8/18

C12M 27/00

{Means for mixing, agitating or circulating fluids in the vessel (by introduction of gas C12M 29/06, C12M 29/14, mixing in general or mixers per se B01F; mixing in apparatus for chemical or physical processes B01J)}

Definition statement

This place covers:

Bioreactors or fermenters characterized by means for mixing, agitating or fluid circulation.

Relationships with other classification places

Mixing and mixers in general are covered by B01F.

References

Limiting references

This place does not cover:

Bioreactors or fermenters characterized by means for mixing, agitating or fluid circulation by introduction of gas when the gas is not introduced through an stirrer	C12M 29/06, C12M 29/14

Informative references

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

Digesters for manure with mixing means	A01C 3/026
Mixing in apparatus for chemical or physical processes	B01J

C12M 27/02

{Stirrer or mobile mixing elements}

References

Informative references

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

Mixing with completely immersed stirring elements	B01F 23/233
Stirrers in general	B01F 27/05
Stirred reactor in general	B01J 19/0066

C12M 27/04

{with introduction of gas through the stirrer or mixing element}

References

Informative references

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

Mixing in general with introduction of gas through the stirrer	B01F 23/2331

C12M 27/06

{with horizontal or inclined stirrer shaft or axis}

References

Informative references

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

Mixing in general with stirrer rotating around an horizontal axis	B01F 23/2332

C12M 27/10

{Rotating vessel}

References

Informative references

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

Mixers with rotating receptacles per se	B01F 29/00
Rotating reactors in general	B01J 19/28

C12M 27/16

{Vibrating; Shaking; Tilting}

References

Informative references

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

Mixers in general with shaking, oscillating or vibrating mechanisms	B01F 31/00
In chemical or physical processes in general	B01J 19/285

C12M 27/20

{Baffles; Ribs; Ribbons; Auger vanes}

References

Informative references

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

Baffles in general	B01F 35/55
Baffles in reactors for physical or chemical processes	B01J 19/006

C12M 29/00

{Means for introduction, extraction or recirculation of materials, e.g. pumps (pumps per se F04B)}

Definition statement

This place covers:

Means for introduction or extraction of materials in or from a bioreactor or fermenter. These materials can be in gaseous, liquid or solid form and do not include microorganisms or biomass.

Means for extraction and reintroduction (i.e. recirculation) of materials other than microorganisms or biomass are also covered in this section.

References

Limiting references

This place does not cover:

Pumps per se	F04B

C12M 29/02

{Percolation}

Definition statement

This place covers:

Bioreactors or fermenters with a recirculation of filtered culture medium not containing microorganisms or cells to the same vessel or to a different bioreactor vessel.

C12M 29/06

{Nozzles; Sprayers; Spargers; Diffusers (per se B01F 23/231, B01J 19/26)}

References

Informative references

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

Mixing in general by use of nozzles, diffusers or sprayers	B01F 23/231, B01F 25/20, B01F 25/30, B01F 25/70, B01J 19/26

C12M 29/16

{Hollow fibers (hollow fiber modules in general B01D 63/02)}

Definition statement

This place covers:

Hollow fibers used as means for introduction or extraction of materials in the bioreactor or fermenter.

References

Limiting references

This place does not cover:

Hollow fibers used as means for supporting the microorganims.	C12M 25/10

Informative references

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

Hollow fibre modules in general	B01D 63/02

C12M 29/18

{External loop; Means for reintroduction of fermented biomass or liquid percolate (loop type reactors for chemical or physical processes B01J 19/2435)}

Definition statement

This place covers:

Bioreactors or fermenters with systems for recirculation and reintroduction of biomass or culture medium containing microorganisms or cells.

References

Informative references

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

Loop type reactors for chemical and physical processes in general	B01J 19/2435

C12M 29/20

{Degassing; Venting; Bubble traps (means for collection or storage of gas C12M 23/36; gas collection apparatus for laboratory use B01L 5/02)}

References

Limiting references

This place does not cover:

Means for collection or storage of gas	C12M 23/36

Informative references

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

Gas collection apparatus for laboratory use in general	B01L 5/02

C12M 31/00

{Means for providing, directing, scattering or concentrating light (C12M 41/06 takes precedence)}

References

Limiting references

This place does not cover:

Means for control of illumination	C12M 41/06

C12M 31/12

{Rotating light emitting elements}

Definition statement

This place covers:

Bioreactors or fermenters with rotating light emitting and/or light transmitting elements.

C12M 33/00

{Means for introduction, transport, positioning, extraction, harvesting, peeling or sampling of biological material in or from the apparatus (chemical or physical laboratory apparatus in general B01L, devices for taking cell samples A61B 10/0045, withdrawing or distributing predetermined quantities of fluid B01L 99/00)}

Definition statement

This place covers:

Means for introduction into the bioreactor or extraction from the bioreactor of biomass comprising the microorganisms or cells that are to be cultured or have been already cultured.

Means for shifting the biomass or positioning the biomass inside the bioreactor.

References

Limiting references

This place does not cover:

Loop means for reintroduction of biomass	C12M 29/18
Sampling of air borne microorganisms	G01N 33/497

Informative references

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

Devices for taking samples of body liquids	A61B 10/0045
Chemical or physical laboratory apparatus in general	B01L
Withdrawing or distributing predetermined quantities of fluid	B01L 3/0289

C12M 33/02

{by impregnation, e.g. using swabs or loops (fluid transport using swabs B01L 3/5029)}

Definition statement

This place covers:

Absorbing means for transferring liquids.

References

Informative references

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

Fluid transport using swabs	B01L 3/5029

C12M 33/04

{by injection or suction, e.g. using pipettes, syringes, needles (pipettes in general B01L 3/02)}

References

Informative references

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

Pipettes in general	B01L 3/02

C12M 33/10

{by centrifugation (centrifuges in general B04B); Cyclones (cyclones in general B04C)}

References

Informative references

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

Centrifuges in general	B04B
Cyclones in general	B04C

C12M 35/00

{Means for application of stress for stimulating the growth of microorganisms or the generation of fermentation or metabolic products; Means for electroporation or cell fusion (machines for extracting juice from animal or plant tissue by electroplasmolysis A23N 1/006, processes employing electric or wave energy B01J 19/08; treatment of microorganisms or enzymes with electrical or wave energy C12N 13/00; methods for cell fusion C12N 15/02; introduction of foreign genetic material C12N 15/87)}

References

Limiting references

This place does not cover:

Methods for cell fusion	C12N 15/02
Introduction of foreign genetic material	C12N 15/87

Informative references

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

Machines or apparatus for extracting juice from animal or vegetable tissue by electroplasmolysis	A23N 1/006
Processes employing electric or wave energy	B01J 19/08
Treatment of microorganisms or enzymes with electrical or wave energy	C12N 13/00

C12M 35/06

{Magnetic means (C12M 35/02 takes precedence)}

References

Limiting references

This place does not cover:

Application of stress on microorganisms or cells or electroporation by electromagnetic means	C12M 35/02

C12M 37/00

{Means for sterilizing, maintaining sterile conditions or avoiding chemical or biological contamination (C12M 23/38 takes precedence; filtration in general and filters per se B01D 24/00-B01D 41/00; autoclaves B01J 3/04; treatment of microorganisms with electrical or wave energy C12N 13/00)}

References

Limiting references

This place does not cover:

Caps or covers	C12M 23/38

Informative references

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

Filters and filtration in general	B01D 24/00 - B01D 41/00
Autoclaves	B01J 3/04
Treatment of microorganisms with electrical or wave energy	C12N 13/00

C12M 37/04

{Seals}

References

Informative references

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

Seals for reactors in general	B01J 19/0073
Seals for laboratory containers	B01L 3/565
Seals in general	F16L

C12M 37/06

{Means for testing the completeness of the sterilization (testing for sterility conditions C12Q 1/22)}

References

Informative references

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

Sterilizing in general	A61L
Testing for sterility conditions	C12Q 1/22

C12M 39/00

{Means for cleaning the apparatus or avoiding unwanted deposits of microorganisms (apparatus for cleaning laboratory receptacles or instruments B01L 13/02; cleaning in general B08B)}

References

Informative references

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

Apparatus for cleaning laboratory receptacles or instruments	B01L 13/02
Cleaning in general	B08B

C12M 41/00

{Means for regulation, monitoring, measurement or control, e.g. flow regulation (controlling or regulating chemical, physical or physicochemical processes B01J 19/0006; heating or cooling apparatus for laboratory use B01L 7/00; electro optical investigation of individual particles, flow cytometers G01N 15/14; automatic analysis G01N 35/00; controlling or regulating in general G06N)}

References

Informative references

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

Controlling or regulating chemical, physical or physico-chemical processes	B01J 19/0006
Heating or cooling apparatus for laboratory use	B01L 7/00
Electro-optical investigation of individual particles, flow cytometers	G01N 15/14
Automatic analysis	G01N 35/00
Controlling or regulating in general	G05

C12M 41/02

{of foam (foam prevention during gasification of liquids B01D 19/02)}

References

Informative references

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

Foam prevention during degasification of liquids	B01D 19/02

C12M 41/04

{Means for foam enhancement (making foam by mixing B01F 23/235)}

References

Informative references

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

Making foam by mixing	B01F 23/235

C12M 41/12

{of temperature (controlling the temperature of chemical or physical processes B01J 19/0013, heating or cooling apparatus for laboratory use B01L 7/00)}

References

Informative references

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

Digesters for manure with heat recuperation means	A01C 3/025
Controlling the temperature of chemical or physical processes	B01J 19/0013
Heating or cooling apparatus for laboratory use	B01L 7/00

C12M 41/14

{Incubators; Climatic chambers (per se B01L 1/00)}

References

Informative references

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

Enclosures or chambers for laboratory use	B01L 1/00

C12M 41/36

{of biomass, e.g. colony counters or by turbidity measurements (electrooptical investigation of individual particles G01N 15/14, flow cytometers G01N 15/1404)}

References

Informative references

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

Electrooptical investigation of individual particles	G01N 15/14
Flow cytometers	G01N 15/1404

C12M 41/48

{Automatic or computerized control (automatic analysis G01N 35/00)}

References

Informative references

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

Automatic analysis	G01N 35/00

C12M 43/00

{Combinations of bioreactors or fermenters with other apparatus}

Definition statement

This place covers:

Bioreactors or fermenters characterized in that they are connected to other apparatus which are not bioreactors or fermenters.

References

Limiting references

This place does not cover:

Bioreactors or fermenters connected with other bioreactors or fermenters	C12M 23/58

C12M 43/04

{Bioreactors or fermenters combined with combustion devices or plants, e.g. for carbon dioxide removal (C12M 43/06 takes precedence; recovery of carbon dioxide C12F 3/02)}

References

Limiting references

This place does not cover:

Photobioreactors combined with devices or plants for gas production	C12M 43/06

Informative references

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

Recovery of carbon dioxide	C12F 3/02

C12M 45/00

{Means for pre-treatment of biological substances}

Definition statement

This place covers:

Means for treating the biomass before introducing it into the bioreactor or fermenter and before starting the culturing process. These means are normally situated outside the bioreactor or fermenter.

References

Informative references

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

Preservation of excised living parts of the human or animal body	A01N 1/10

C12M 45/02

{by mechanical forces; Stirring; Trituration; Comminuting (crushing, pulverizing, disintegrating in general B02C)}

References

Informative references

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

Cutting apparatus specially adapted for plant tissue culture	A01H 4/003
Crushing, pulverizing, disintegrating in general	B02C

C12M 45/05

{by centrifugation (centrifuges in general B04B)}

References

Informative references

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

Centrifuges in general	B04B

C12M 45/22

{Means for packing or storing viable microorganisms (casings for storing cell samples A61B 10/0096, preservation of living parts of the human or animal body A01N 1/10)}

References

Informative references

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

Preservation of excised living parts of the human or animal body	A01N 1/10
Casings for storing cell samples	A61B 10/0096

C12M 47/00

{Means for after-treatment of the produced biomass or of the fermentation or metabolic products, e.g. storage of biomass (filters in general B01D 24/00 - B01D 41/00)}

Definition statement

This place covers:

Means for treating the biomass that has been already cultured. These means are normally situated outside the bioreactor or fermeneter.

References

Informative references

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

Preservation of excised living parts of the human or animal body	A01N 1/10
Filters and filtration in general	B01D 24/00 - B01D 41/00

C12M 47/02

{Separating microorganisms from the culture medium; Concentration of biomass (separating microorganisms from their culture media C12N 1/02)}

References

Informative references

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

Separating microorganisms from their culture media	C12N 1/02

C12M 47/04

{Cell isolation or sorting (purging biological preparations of unwanted cells C12N 5/0081, determining the presence or kind of microorganism C12Q 1/04)}

References

Informative references

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

Purging biological preparations of unwanted cells	C12N 5/0081
Determining the presence or kind of microorganism	C12Q 1/04

C12M 47/06

{Hydrolysis; Cell lysis; Extraction of intracellular or cell wall material (lysis of microorganisms C12N 1/06; extracting or separating nucleic acids from biological samples C12N 15/1003)}

References

Informative references

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

Lysis of microorganisms	C12N 1/06
Extracting or separating nucleic acids from biological samples	C12N 15/1003

C12M 47/10

{Separation or concentration of fermentation products (bioreactors combined with means for distillation or extraction of liquid fuel C12M 43/02)}

References

Limiting references

This place does not cover:

Bioreactors or fermenters combined with means for liquid fuel extraction	C12M 43/02

C12M 47/12

{Purification (C12M 47/04 takes precedence)}

References

Limiting references

This place does not cover:

Cell isolation or sorting	C12M 47/04

C12M 47/16

{Sterilization (autoclaves in general B01J 3/04)}

References

Informative references

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

Autoclaves in general	B01J 3/04

C12M 47/18

{Gas cleaning, e.g. scrubbers; Separation of different gases (separating dispersed particles from gases or vapours B01D 45/00; separation of gases or vapours B01D 53/00; gas washing apparatus for laboratory uses B01L 5/04)}

References

Informative references

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

Separating dispersed particles from gases or vapours	B01D 45/00
Separation of gases or vapours	B01D 53/00
Gas washing apparatus for laboratory use	B01L 5/04

C12M 47/20

{Heating or cooling (heating or cooling apparatus for laboratory uses B01L 7/00)}

References

Informative references

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

Heating or cooling apparatus for laboratory use	B01L 7/00