

D21C

PRODUCTION OF CELLULOSE BY REMOVING NON-CELLULOSE SUBSTANCES FROM CELLULOSE-CONTAINING MATERIALS; REGENERATION OF PULPING LIQUORS; APPARATUS THEREFOR

Definition statement

This place covers:

- Pretreatment of the finely-divided materials before digesting, e.g. with water, acid reacting compounds, alkaline reacting compounds or oxygen-generating compounds or physical methods for facilitating impregnation.
- Pulping cellulose-containing materials, e.g. sulfate processes, or other features of pulping processes.
- Other processes for obtaining cellulose, e.g. cooking cotton linters; working-up other than mechanical of waste-paper.
- Digesters.
- After-treatment of cellulose pulp, e.g. of wood pulp or cotton linters, e.g. washing, removal of fats, resins, pitch or waxes, bleaching or de-watering other than in general.
- Regeneration of pulp liquors, e.g. treatment of pulp gases, recovery of the heat content of the gases, deodorisation, concentrating spent liquor by evaporation other than evaporating and distillation or combustion of pulp liquors.

Relationships with other classification places

Subclass [D21B](#) covers fibrous raw material or their mechanical treatment.

Subclass [D21D](#) covers treatment of the materials before passing to the paper-making machine.

Subclass [D21F](#) covers paper-making machines and methods of producing paper thereon.

Subclass [D21H](#) covers pulp compositions.

Subclass [C08B](#) covers polysaccharides and derivatives thereof.

References

Limiting references

This place does not cover:

Mechanical treatment of waste paper by dry methods	D21B 1/08
Mechanical treatment of waste paper by wet methods, by the use of steam or other means	D21B 1/32

Application-oriented references

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

Evaporating	B01D 1/00
Distillation	B01D 3/00
Drying solid materials or objects by removing liquid therefrom	F26B

Informative references

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

Cellulose as gelling or thickening agents in food	A23L 29/262
Filtration material of cellulose	B01D 39/18
Semi-permeable membrane of cellulose	B01D 71/10
Moulding material of cellulose	B29K 2001/00
Treatment of water, waste water, sewage or sludge to be treated from the paper or cellulose industry	C02F 2103/28
Use of cellulosic materials as fillers for mortars, concrete or artificial stone	C04B 16/02
Compositions of mortars, concrete or artificial stone, containing only organic binders, e.g. cellulosic waste liquor	C04B 26/24
Peptides immobilised on cellulose	C07K 17/12
Lignin; Modified lignin; High-molecular-weight products derived therefrom	C08H 6/00
Macromolecular compounds derived from lignocellulosic materials	C08H 8/00
Compositions of cellulose, modified cellulose or cellulose derivatives	C08L 1/00
Coating compositions based on cellulose	C09D 101/00
Obtaining, purification or chemical modification of natural resins	C09F 1/00
Destructive distillation of cellulose-containing material	C10B 53/02
Production of fats or fatty oils	C11B 1/00
Processes using or culture media containing cellulose or hydrolysates thereof	C12N 1/22
Processes using or culture media containing waste sulfite liquor	C12N 1/24
Ethanol produced as by-product or from waste or cellulosic material substrate	C12P 7/06
Glucose by saccharification of cellulosic material	C13K 1/02
Obtain filaments or fibers for spinning	D01C
Monocomponent artificial filaments of cellulose or cellulose derivatives	D01F 1/00

Special rules of classification

The invention per se should be classified in the last appropriate place. Ideally, one group should be given for covering the main aspect of the invention per se. Exceptionally, the core of the invention may also be classified by using several groups (up to three).

Glossary of terms

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

bagasse	fibre remaining after the extraction of the sugar-bearing juice from sugarcane
bleaching	treatment of lignocellulosic material to obtain a pulp/paper having an increased brightness
cellulose	structural component of the primary cell wall of green plants. It is an organic compound with the formula $(C_6H_{10}O_5)_n$ and is the major constituent of paper, paper-board and of textiles made from cotton, linen and other plant fibres.

cotton linters	fine, silky fibres which adhere to the seeds of the cotton plant after ginning and are traditionally used in the manufacture of paper and as a raw material in the manufacture of cellulose
delignification	treatment of lignocellulosic material to remove a part of the lignin
lignocellulosic material	cellulosic material which also comprises lignin
linings	material that covers the inner surface of something
pulp	a dispersion (e.g. aqueous suspension) comprising cellulosic fibres and optional additives; it is prepared by chemically or mechanically separating cellulose fibres from wood, fibre crops or waste paper

Synonyms and Keywords

In patent documents, the following words/expressions are often used with the meaning indicated:

fibres	fibers
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D21C 1/00

Pretreatment of the finely-divided materials before digesting (of waste paper [D21C 5/02](#))

Definition statement

This place covers:

Different pre-treatments (e.g. impregnation) of finely divided cellulosic containing material using e.g. water, steam, acids, alkaline compounds, oxygen generating compounds or physical methods for facilitating impregnation.

References

Limiting references

This place does not cover:

Working up waste paper	D21C 5/02
Treatment of wood	B27K

Informative references

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

Pre-treatment of the raw material by physical or chemical means	D21B 1/02
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D21C 3/00

Pulping cellulose-containing materials (digesters [D21C 7/00](#))

Definition statement

This place covers:

Pulping with inorganic bases or alkaline reacting compounds, e.g. the sulphate process

Pulping with acid, acid salts or acid anhydrides

Definition statement

Pulping with sulphur dioxide, sulphurous acid, bisulphites or sulphites

Pulping with nitrogen oxides, nitric acid, nitrates or nitrites

Pulping with organic solvents or in solvent environment

Other features of the pulping process

References

Limiting references

This place does not cover:

Digesters	D21C 7/00
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D21C 5/00

Other processes for obtaining cellulose, e.g. cooking cotton linters (obtaining fibres for spinning [D01C](#)); {Processes characterised by the choice of cellulose-containing starting materials}

Definition statement

This place covers:

Other processes for obtaining cellulose such as:

- cooking cotton linters
- processes characterised by the choice of cellulose-containing starting material
- treatment of cellulose-containing material with microorganisms or enzymes
- working-up waste paper
- working-up waste paper, e.g. de-inking

References

Limiting references

This place does not cover:

Mechanical part of working up waste paper	D21B 1/08
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Informative references

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

Enzymes (generally)	C12N , C12R
De-inking of waste paper using flotation	D21B 1/325
Pulp from non-woody plants or crops, e.g. cotton, flax, straw, bagasse	D21H 11/12
Pulp from secondary fibres	D21H 11/14
Microorganisms or enzymes added to the pulp or as a paper impregnating material	D21H 17/005

D21C 7/00

Digesters

Definition statement

This place covers:

This group refers to structural features of the digester, i.e. defining different types or parts of the digester, e.g. rotary digesters, linings, feeding devices, discharge devices, heating devices, devices for regulating or controlling, means for circulating the lye (e.g. white or black liquor) or safety devices.

References

Informative references

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

Continuous (pulping) processes	D21C 3/24
Multistage (pulping) processes	D21C 3/26
Processes or apparatuses for adding material to the pulp or paper; controlling or regulating not limited to any particular process or apparatus	D21H 23/78

D21C 9/00

**After-treatment of cellulose pulp, e.g. of wood pulp, or cotton linters {;
Treatment of dilute or dewatered pulp or process improvement taking place
after obtaining the raw cellulosic material and not provided for elsewhere
(polysaccharides, derivatives thereof [C08B](#); paper-making [D21B](#) - [D21H](#))}**

Definition statement

This place covers:

Modification of pulp properties

Washing

Displacing cooking or pulp-treating liquors contained in the pulps by fluids, e.g. wash water or other pulp treating agents

Removal of fats, resin pitch or waxes

Chemical or physical purification i.e. refining of crude cellulose by removing non-cellulose contaminants, optionally in combination with bleaching

Bleaching, e.g. with halogen or halogen containing compounds, with ClO₂ or chlorites, with oxygen or its allotropic modifications, with ozone, with per compounds such as peroxides or peracids

Apparatus for bleaching

De-watering

Elimination of cooking or pulp-treating liquors from the pulp

References

Informative references

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

Hemicellulose	C08B 37/14
Natural resins	C09F 1/00
Purification by mechanical means	D21D 5/00
Modification of the pulp properties by a particular after treatment	D21H 11/16 - D21H 11/22
Agents for preventing deposition on paper mill equipment, e.g. pitch or slime control	D21H 21/02 - D21H 21/04
De-watering in general	F26B

D21C 11/00

Regeneration of pulp liquors {or effluent waste waters}

Definition statement

This place covers:

Aspects concerning the production and the treatment of green and white liquors, e.g. causticizing green liquor

Combustion of pulp liquors

Concentration spent liquors by evaporation

Deodorisation or elimination of malodorous compounds, e.g. sulphur compounds such as hydrogen sulphide and mercaptans, for gas streams

Introduction of auxiliary substances into the regenerating system in order to improve the performance of certain steps of the latter, the presence of these substances being confined to the regeneration cycle

Recovery of by-products, i.e. compounds other than those necessary for pulping

Regeneration of alkali lye, of pulp liquors or effluent waste waters, of acid, neutral or alkaline sulphite lye

Treatment of pulp gases or of gases arising from various sources in pulp and paper mills

Recovery of the heat content in the gases

Regeneration of gaseous SO₂, e.g. arising from liquors containing sulphur compounds

Wet combustion

Treatment of pulp liquor without previous evaporation, by oxidation of liquors remaining at least partially in the liquid phase, e.g. by application of pressure

References

Limiting references

This place does not cover:

Water treatment	C02F
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Informative references

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

Evaporation in general	B01D
Hemicellulose	C08B 37/14
Macromolecular compounds derived from lignin	C08H 6/00
Macromolecular compounds derived from lignocellulosic material	C08H 8/00
Production of biofuel, i.e. ethanol	C10L 1/02