

D21F

PAPER-MAKING MACHINES; METHODS OF PRODUCING PAPER THEREON

Definition statement

This place covers:

Methods and devices in the wet end, press section and drying section of a papermaking machine, embossing paper, forming discontinuous sheets of paper.

References

Limiting references

This place does not cover:

Calendering paper webs	D21G
Coating paper webs	D21H

Informative references

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

Making paper articles	B31D
Articles for writing or drawing upon	B43L
Handling webs in general	B65H
Making textile fabrics from fibers or filamentary material in general	D04H
Marking, inspecting, seaming or severing textile materials in general	D06H
Systems for controlling or regulating non-electric variables	G05D

Special rules of classification

Subgroups and main groups.

If a document concerns embodiments which are covered by several subgroups dependent on a higher hierarchy group, the following rules apply:

- the specific technical information relevant for some of the subgroups is classified in all said subgroups, for example a fiber rearranging device located in the nozzle of a headbox is classified in [D21F 1/0018](#) and [D21F 1/028](#);
- if relevant, the structural association (e.g. the combination) of the elements covered by the subgroups is classified in the head group;
- analogously, if generic technical information common to all of the subgroups is disclosed and only schematic embodiments of the specific subgroup embodiments are represented, the documents is classified in the head group only.

Glossary of terms

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

Section	portion of a paper production machine effecting a certain process step, for example forming, pressing, drying, calendering, coating, etc.
Yankee	steam heated drying cylinder of large diameter, mainly used for the production of creped tissue paper

TAD	through air drying process, drying paper webs by passing streams of air therethrough
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D21F 1/00

Wet end of machines for making continuous webs of paper

Definition statement

This place covers:

Wet end of papermaking machines, starting at the stable section, ending at the transfer/pick up to press section

D21F 1/0009

{Regulating the freeness of the pulp}

Definition statement

This place covers:

Controlling and regulating drainage rate, fiber length or degree of refining of a paper pulp suspension.

D21F 1/0018

{Devices for dispensing fibres in a fluid}

Definition statement

This place covers:

Devices or altering the distribution of the fibers in the suspension, like for example by pressure pulse or ultrasound, the suspension flowing through the headbox of a papermaking machine.

D21F 1/0027

{Screen-cloths}

Definition statement

This place covers:

Screens or fabrics made from plastic materials and useable for forming paper webs in a paper machine by separating fibers from an aqueous suspension or also if usable for drying a paper web in the drying section of a paper machine.

D21F 1/0045

{Triple layer fabrics}

Definition statement

This place covers:

Fabrics comprising two separate layers (paper side layer and machine side layer) and a system of binding yarns interconnecting said layers. The binding yarns can also contribute to the forming of the paper side layer (known as sheet support binding [SSB]).

References

Informative references

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

Paper making felts	D21F 7/08
Heat treatment of fabrics	D04H

D21F 1/009

{Fibre-rearranging devices}

Definition statement

This place covers:

Devices for altering the distribution of the fibers in the suspension, like for example by pressure pulse or ultrasound, the suspension being already spread on the forming screen.

D21F 1/02

Head boxes of Fourdrinier machines

Definition statement

This place covers:

Head boxes for Fourdrinier, gap former, twin-wire former or hybrid former machines.

References

Informative references

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

Headboxes of paper machines suitable only for cylinder machines	D21F 1/04
Valves in general	F16K

D21F 1/022

{Means for injecting material into flow within the headbox}

Definition statement

This place covers:

Devices for injecting additional dilution water, dilution suspension or chemicals into a pulp flow within the headbox.

D21F 1/06

Regulating pulp flow

Definition statement

This place covers:

Regulating the pulp flow into and out of the headbox.

D21F 1/08**Regulating consistency****Definition statement**

This place covers:

Dilution devices before or in the headbox.

D21F 1/10**Wire-cloths****Definition statement**

This place covers:

Forming or drying wires only if made from metallic materials.

References**Informative references**

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

Production of wire-cloths	B21F
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D21F 1/18**Shaking apparatus for wire-cloths and associated parts****Definition statement**

This place covers:

Shaking apparatus for wire and screen cloths, including ultrasound principles.

D21F 1/20**in Fourdrinier machines****Definition statement**

This place covers:

Shaking apparatus in all type of Fourdrinier, gapformer, twinformer or hybridformer machines.

D21F 1/22**in cylinder machines****Definition statement**

This place covers:

Shaking apparatus specially adapted for being used in a cylinder machine.

D21F 1/24

Tilting, raising, or lowering mechanisms for wire-cloths

Definition statement

This place covers:

Tilting, raising or lowering mechanisms for wire and screen cloths.

D21F 1/26

in Fourdrinier machines

Definition statement

This place covers:

Tilting, raising or lowering mechanisms in all type of Fourdrinier, gapformer, twinformer or hybridformer machines.

D21F 1/28

in cylinder machines

Definition statement

This place covers:

Tilting, raising or lowering mechanisms specially adapted for being used in a cylinder machine.

D21F 1/30

Protecting wire-cloths from mechanical damage

Definition statement

This place covers:

Protecting wire and screen cloths from mechanical damage and contamination, coatings and impregnation agents.

D21F 1/32

Washing wire-cloths or felts

Definition statement

This place covers:

Washing wire or screen cloths or felts.

D21F 1/36

Guiding mechanisms

Definition statement

This place covers:

Wire or screen guiding mechanisms including air curtains, guide rolls, stretching rolls or spreading rolls for the wire or screen.

References

Informative references

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

Suction rolls	D21F 3/10
Registering, tensioning, smoothing or guiding webs	B65H 23/00
Controlled deflection rolls	D21G 1/0206

D21F 1/44

Watermarking devices

Definition statement

This place covers:

Watermarking in general, watermarking devices acting on the fibrous suspension or layer while on the forming screen or wire; producing special forming wires or screens for making watermarks; separate watermark elements.

D21F 1/48

Suction apparatus (suction rolls [D21F 3/10](#))

Definition statement

This place covers:

Suction apparatus in general, including those that perform regulation, steam application by suction, removal of water, suction on both sides of the screen or wire, or dewatering by change of direction or centrifugal effect.

References

Limiting references

This place does not cover:

Suction rolls, e.g. couch rolls	D21F 3/10
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D21F 1/56

Deckle frame arrangements

Definition statement

This place covers:

Sheet edge limiting devices; devices for setting the width of the web.

D21F 1/66

Pulp catching, de-watering, or recovering; Re-use of pulp-water

Definition statement

This place covers:

Treatment of white waters or broke, devices and processes in the short circulation of paper machines.

D21F 1/70**by flotation****Definition statement**

This place covers:

Pulp catching, de-watering, recovering or re-use of pulp-water by flotation.

References**Informative references**

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

Flotation in general	B03D
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D21F 2/00**Transferring continuous webs from wet ends to press sections****References****Informative references**

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

Transfer belts, bands, felts or fabrics	D21F 7/086
Handling webs in general	B65H

D21F 3/0227**{Belts or sleeves therefor}****Definition statement**

This place covers:

Press shells, jackets, covers.

D21F 3/04**Arrangements thereof****Definition statement**

This place covers:

Combinations of individual press elements forming a press section or part of such a section.

D21F 3/08**Pressure rolls****Definition statement**

This place covers:

Web treatment rolls for press section.

References

Informative references

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

Rolls, drums, discs or the like	F16C 13/00
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D21F 3/10

Suction rolls, e.g. couch rolls

Definition statement

This place covers:

Suction rolls for forming, pressing and drying sections.

D21F 5/004

{Drying webs by contact with heated surfaces or materials}

Definition statement

This place covers:

Contact drying using anything except for rolls.

D21F 5/02

Drying on cylinders

Definition statement

This place covers:

Drying webs on heated cylinders.

References

Informative references

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

Drying webs by hot air on a Yankee dryer	D21F 5/181
Drying webs by hot air through perforated cylinders	D21F 5/182

D21F 5/021

{Construction of the cylinders}

Definition statement

This place covers:

Construction details of cylinders for drying webs of paper, e.g. material of cylinder, production process like welding or casting, or isolation.

References

Informative references

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

Details of heat-exchange rotary drums or rollers in general	F28F 5/02
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D21F 5/042

{in combination with suction or blowing devices}

Definition statement

This place covers:

Drying sections including suction or blowing devices, for example including a single-tier drying group.

D21F 5/12

Festoon drying

Definition statement

This place covers:

Drying paper webs on loops formed by a series of rods.

D21F 5/18

Drying webs by hot air

References

Informative references

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

Drying on two or more cylinders using air hoods over the cylinder for making continuous webs of paper	D21F 5/044
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D21F 7/008

{Steam showers}

Definition statement

This place covers:

Steam blow boxes arranged in the paper machine.

References

Informative references

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

Web conditioning devices in calenders	D21G 1/0093
Damping devices	D21G 7/00

D21F 7/086**{Substantially impermeable for transferring fibrous webs}****Definition statement***This place covers:*

Transfer belts, bands, felts or fabrics.

D21F 9/00**Complete machines for making continuous webs of paper****Definition statement***This place covers:*

Complete machines (i.e. at least two sections combined) for making paper or for producing air-laid webs.

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

Apparatus for glaze-coating paper webs	D21G 9/009
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D21F 9/006**{paper or board consisting of two or more layers}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Processes for making continuous lengths of paper, cardboard, or of wet web for fibre board production, on paper-making machines	D21F 11/00
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D21F 11/006**{Making patterned paper}****Definition statement***This place covers:*

Methods for making patterned paper, e.g. non-planar surfaces or colour variations as obtained directly by the web-forming process.

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

Details of the base fabric of imprinting, embossing, texturing belts	D21F 1/0027
Embossing	B31F 1/07

Crêping	B31F 1/12
Patterned paper	D21H 27/02

D21F 11/04

paper or board consisting on two or more layers

References

Informative references

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

Processes for making continuous lengths of paper, cardboard, or of wet web for fibre board production, on paper-making machines	D21F 11/00
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D21F 11/14

Making cellulose wadding, filter or blotting paper

Definition statement

This place covers:

Machines and processes specially adapted for forming tissue papers.

References

Informative references

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

Embossing	B31F 1/07
Crêping	B31F 1/12

D21F 13/02

Making hand-made paper

Definition statement

This place covers:

Making hand-made paper, restoration of paper.