

SECTION D — TEXTILES; PAPER

D04 BRAIDING; LACE-MAKING; KNITTING; TRIMMINGS; NON-WOVEN FABRICS

D04H MAKING TEXTILE FABRICS, e.g. FROM FIBRES OR FILAMENTARY MATERIAL (weaving D03; knitting D04B; braiding D04C; net-making D04G; sewing D05B; tufting D05C; finishing non-woven fabrics D06); **FABRICS MADE BY SUCH PROCESSES OR APPARATUS, e.g. FELTS, NON-WOVEN FABRICS; COTTON-WOOL; WADDING** (non-woven fabrics having an intermediate or external layer of a different kind, e.g. of woven fabric, B32B)

Note(s)

- In this subclass, the following expression is used with the meaning indicated:
 - "non-woven fabrics" means fabrics formed wholly or partly of textile material by processes comprising operations other than the weaving, knitting, braiding, lacing, or knotting of yarns, threads, or filaments for which provision is made in other subclasses of section D. This expression includes felts, cotton-wool and wadding.
- In this subclass:
 - some of the non-woven fabrics can also be regarded as "layered products" within the meaning of subclass B32B, and further classification in that subclass should be considered in accordance with the notes thereto;
 - in cases where the making of non-woven fabrics involves the use of particular chemical compounds or compositions, e.g. for treating or bonding fibres, filaments, or yarns, further classification in other appropriate subclasses should also be considered.
- By varying the proportions of fibres or threads, and the chemical compounds or compositions, the final products may be given the appearance of paper, cardboard, leather, or the like.

Subclass index

TYPES AND CONSTRUCTIONAL FEATURES OF NON-WOVEN FABRICS; APPARATUS AND PROCESSES FOR PRODUCING THEM

From short fibres; from long fibres; from mixture of short and long fibres.....	1/00, 3/00, 5/00
Pile fabrics.....	11/00
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FELTING APPARATUS; NEEDLING MACHINES.....	17/00, 18/00

Kinds or types of non-woven fabrics; Apparatus or processes for making such products

- 1/00 Non-woven fabrics formed wholly or mainly of staple fibres or like relatively short fibres**
- 1/02 • Cotton wool; Wadding
 - 1/04 • from fleeces or layers composed of fibres having existing or potential cohesive properties, e.g. natural fibres, prestretched or fibrillated artificial fibres (felting apparatus D04H 17/00) **[1, 2012.01]**
 - 1/06 • • by treatment to produce shrinking, swelling, crimping or curling of fibres **[1, 2012.01]**
 - 1/067 • • • Regenerated cellulose series **[2012.01]**
 - 1/073 • • • Acrylonitrile series **[2012.01]**
 - 1/08 • • and hardened by felting; Felts or felted products **[1, 2012.01]**
 - 1/09 • • • Silk **[2012.01]**
 - 1/10 • • • Felts made from mixtures of fibres
 - 1/12 • • • • and incorporating artificial organic fibres
 - 1/14 • • • • and incorporating inorganic fibres
 - 1/16 • • • Laminated felts in which the separate layers are united by a felting process
 - 1/20 • • • Felts incorporating inserts or attachments, e.g. for ornamental purposes

- 1/22 • • • Three-dimensional articles formed by felting processes
- 1/24 • • • Covers felted on to three-dimensional articles
- 1/26 • • Wood pulp **[2012.01]**
- 1/28 • • Regenerated cellulose series **[2012.01]**
- 1/30 • • Collagen **[2012.01]**
- 1/32 • • Synthetic pulp **[2012.01]**
- 1/40 • from fleeces or layers composed of fibres without existing or potential cohesive properties **[1, 2012.01]**
- 1/407 • • containing absorbing substances, e.g. activated carbon **[2012.01]**
- 1/413 • • containing granules other than absorbent substances **[2012.01]**
- 1/42 • • characterised by the use of certain kinds of fibres insofar as this use has no preponderant influence on the consolidation of the fleece **[1, 2012.01]**
- 1/4209 • • • Inorganic fibres **[2012.01]**
- 1/4218 • • • • Glass fibres **[2012.01]**
- 1/4226 • • • • characterised by the apparatus for manufacturing the glass fleece **[2012.01]**
- 1/4234 • • • • Metal fibres **[2012.01]**
- 1/4242 • • • • Carbon fibres **[2012.01]**
- 1/425 • • • Cellulose series **[2012.01]**
- 1/4258 • • • • Regenerated cellulose series **[2012.01]**

- 1/4266 • • • Natural fibres not provided for in group D04H 1/425 **[2012.01]**
- 1/4274 • • • Rags; Fabric scraps **[2012.01]**
- 1/4282 • • • Addition polymers **[2012.01]**
- 1/4291 • • • • Olefin series **[2012.01]**
- 1/43 • • • • Acrylonitrile series **[2012.01]**
- 1/4309 • • • • Polyvinyl alcohol **[2012.01]**
- 1/4318 • • • • Fluorine series **[2012.01]**
- 1/4326 • • • Condensation or reaction polymers **[2012.01]**
- 1/4334 • • • • Polyamides **[2012.01]**
- 1/4342 • • • • • Aromatic polyamides **[2012.01]**
- 1/435 • • • • Polyesters **[2012.01]**
- 1/4358 • • • • Polyurethanes **[2012.01]**
- 1/4366 • • • • Phenol series **[2012.01]**
- 1/4374 • • • using different kinds of webs, e.g. by layering webs **[2012.01]**
- 1/4382 • • • Stretched reticular film fibres; Composite fibres; Mixed fibres; Ultrafine fibres; Fibres for artificial leather **[2012.01]**
- 1/4391 • • • characterised by the shape of the fibres **[2012.01]**
- 1/44 • • the fleeces or layers being consolidated by mechanical means, e.g. by rolling
- 1/45 • • • by forming intermeshing loops or stitches from some of the fibres **[4]**
- 1/46 • • • by needling or like operations to cause entanglement of fibres (D04H 1/45 takes precedence; needling machines D04H 18/00) **[4, 2012.01]**
- 1/48 • • • • in combination with at least one other method of consolidation **[1, 2012.01]**
- 1/482 • • • • • in combination with shrinkage **[2012.01]**
- 1/485 • • • • • in combination with weld-bonding **[2012.01]**
- 1/488 • • • • • in combination with bonding agents **[2012.01]**
- 1/49 • • • • • entanglement by fluid jet in combination with another consolidation means **[2012.01]**
- 1/492 • • • • • by fluid jet (D04H 1/49 takes precedence) **[2012.01]**
- 1/495 • • • • • for formation of patterns, e.g. drilling or rearrangement **[2012.01]**
- 1/498 • • • • • entanglement of layered webs **[2012.01]**
- 1/50 • • • by treatment to produce shrinking, swelling, crimping or curling of fibres (in combination with needling D04H 1/482) **[1, 2012.01]**
- 1/52 • • • by applying or inserting filamentary binding elements
- 1/54 • • • by welding together the fibres, e.g. by partially melting or dissolving (in combination with needling D04H 1/485) **[1, 2012.01]**
- 1/541 • • • Composite fibres e.g. sheath-core, sea-island or side-by-side; Mixed fibres **[2012.01]**
- 1/542 • • • Adhesive fibres **[2012.01]**
- 1/544 • • • • Olefin series **[2012.01]**
- 1/545 • • • • Polyvinyl alcohol **[2012.01]**
- 1/546 • • • • Polyvinyl acetate **[2012.01]**
- 1/548 • • • • Acrylonitrile series **[2012.01]**
- 1/549 • • • • Polyamides **[2012.01]**
- 1/55 • • • • Polyesters **[2012.01]**
- 1/551 • • • • Resins thereof not provided for in groups D04H 1/544-D04H 1/55 **[2012.01]**
- 1/552 • • • by applying solvents or auxiliary agents **[2012.01]**
- 1/554 • • • by radio-frequency heating **[2012.01]**
- 1/555 • • • by ultrasonic heating **[2012.01]**
- 1/556 • • • by infrared heating **[2012.01]**
- 1/558 • • • in combination with mechanical or physical treatments other than embossing **[2012.01]**
- 1/559 • • • the fibres being within layered webs **[2012.01]**
- 1/56 • • • in association with fibre formation, e.g. immediately following extrusion of staple fibres
- 1/58 • • • by applying, incorporating or activating chemical or thermoplastic bonding agents, e.g. adhesives (in combination with needling D04H 1/488) **[1, 2012.01]**
- 1/587 • • • characterised by the bonding agents used **[2012.01]**
- 1/593 • • • to layered webs **[2012.01]**
- 1/60 • • • the bonding agent being applied in dry state, e.g. thermo-activatable agents in solid or molten state, and heat being applied subsequently
- 1/62 • • • • at spaced points or locations
- 1/64 • • • the bonding agent being applied in wet state, e.g. chemical agents in dispersions or solutions **[1, 2012.01]**
- 1/645 • • • • Impregnation followed by a solidification process **[2012.01]**
- 1/65 • • • • • using mixed or composite fibres **[2012.01]**
- 1/655 • • • • characterised by the apparatus for applying bonding agents **[2012.01]**
- 1/66 • • • • at spaced points or locations (D04H 1/68 takes precedence) **[1, 2012.01]**
- 1/68 • • • • the bonding agent being applied in the form of foam **[1, 2012.01]**
- 1/70 • characterised by the method of forming fleeces or layers, e.g. reorientation of fibres **[4, 2012.01]**
- 1/72 • • the fibres being randomly arranged **[1, 2012.01]**
- 1/724 • • • forming webs during fibre formation, e.g. flash-spinning **[2012.01]**
- 1/728 • • • by electro-spinning **[2012.01]**
- 1/732 • • • by fluid current, e.g. air-lay **[2012.01]**
- 1/736 • • • characterised by the apparatus for arranging fibres (D04H 1/728, D04H 1/732 take precedence) **[2012.01]**
- 1/74 • • the fibres being orientated, e.g. in parallel
- 1/76 • • otherwise than in a plane, e.g. in a tubular way **[2012.01]**
- 3/00 Non woven fabrics formed wholly or mainly of yarns or like filamentary material of substantial length [1, 2012.01]**
- 3/002 • Inorganic yarns or filaments **[2012.01]**
- 3/004 • • Glass yarns or filaments **[2012.01]**
- 3/005 • Synthetic yarns or filaments (D04H 3/013 takes precedence) **[2012.01]**
- 3/007 • • Addition polymers **[2012.01]**
- 3/009 • • Condensation or reaction polymers **[2012.01]**
- 3/011 • • • Polyesters **[2012.01]**
- 3/013 • Regenerated cellulose series **[2012.01]**
- 3/015 • Natural yarns or filaments **[2012.01]**
- 3/016 • characterised by the fineness **[2012.01]**
- 3/018 • characterised by the shape **[2012.01]**
- 3/02 • characterised by the method of forming fleeces or layers, e.g. reorientation of yarns or filaments **[4]**
- 3/03 • • at random **[1, 2012.01]**
- 3/033 • • • reorientation immediately after yarn or filament formation **[2012.01]**

- 3/037 • • • reorientation by liquid [2012.01]
- 3/04 • • in rectilinear paths, e.g. crossing at right angles [1, 2012.01]
- 3/045 • • • for net manufacturing [2012.01]
- 3/05 • • in another pattern, e.g. zig-zag, sinusoidal
- 3/07 • • otherwise than in a plane, e.g. in a tubular way [1, 2012.01]
- 3/073 • • • Hollow cylinder shaped [2012.01]
- 3/077 • • • Stick, rod or solid cylinder shaped [2012.01]
- 3/08 • characterised by the method of strengthening or consolidating
- 3/10 • • with bonds between yarns or filaments made mechanically [1, 2012.01]
- 3/105 • • • by needling (needling machines D04H 18/00) [2012.01]
- 3/11 • • • by fluid jet [2012.01]
- 3/115 • • • by applying or inserting filamentary binding elements [2012.01]
- 3/12 • • with filaments or yarns secured together by chemical or thermo-activatable bonding agents, e.g. adhesives, applied or incorporated in liquid or solid form
- 3/14 • • with bonds between thermoplastic yarns or filaments produced by welding [1, 2012.01]
- 3/147 • • • Composite yarns or filaments [2012.01]
- 3/153 • • • Mixed yarns or filaments [2012.01]
- 3/16 • • • with bonds between thermoplastic filaments produced in association with filament formation, e.g. immediately following extrusion [4]
- 5/00 Non woven fabrics formed of mixtures of relatively short fibres and yarns or like filamentary material of substantial length [1, 2012.01]**
- 5/02 • strengthened or consolidated by mechanical methods, e.g. needling (needling machines D04H 18/00) [1, 2012.01]
- 5/03 • • by fluid jet [2012.01]
- 5/04 • strengthened or consolidated by applying or incorporating chemical or thermo-activatable bonding agents in solid or liquid form
- 5/06 • strengthened or consolidated by welding-together thermoplastic fibres, filaments, or yarns
- 5/08 • characterised by the method of forming fleeces or layers, e.g. reorientation of fibres or yarns [4, 2012.01]
- 5/10 • • otherwise than in a plane, e.g. in a tubular way [2012.01]
- 5/12 • Glass fibres [2012.01]
- 11/00 Non-woven pile fabrics** (layered products forming non-woven pile fabrics B32B)
- 11/04 • formed by zig-zag folding of a fleece or layer of staple fibres, filaments, or yarns, strengthened or consolidated at the folds
- 11/08 • formed by creation of a pile on at least one surface of a non-woven fabric without addition of pile-forming material, e.g. by needling, by differential shrinking (needling machines D04H 18/00)
- 13/00 Other non-woven fabrics**
- 13/02 • Production of non-woven fabrics by partial defibrillating of oriented thermoplastics films [4]

- 17/00 Felting apparatus**
- 17/10 • for felting between rollers, e.g. heated rollers
- 17/12 • • Multi-roller apparatus
- 18/00 Needling machines [1, 2012.01]**
- 18/02 • with needles [2012.01]
- 18/04 • with water jets [2012.01]