

This heading is the general heading for operations involving filtering and straining liquids or unspecified fluids and coalescing liquids by filtration. It covers the operations for separating mixtures of liquids or of liquids and solids by gravity or inertia only and operations for removing floating liquids and solids from liquid surfaces. The heading is general for filters and filtering elements for separating suspended matter from fluids. The heading also includes some filter media subject matter

The heading includes associations of filtering and settling operations with functionally different operations and some servicing arrangements for filtering and settling operations

The heading is divided into four parts. PART A relates to certain special subjects (*viz* the selection of filter aids, coagulants &c; filter media and filter elements and their assemblies), disclosures in which would be undesirably fragmented as a search field if classified according to the type of filtering or settling apparatus or method in which they occur. PART B relates to filter apparatus, and operation thereof. PART C relates to separation other than by filtering, in particular settling, and includes combinations of such separation with filtering or coalescing. PART D relates to subjects not elsewhere provided for, *eg* other combinations

The heading does not include disclosures of filters and filtering elements specifically directed to the filtering of gases. This subject matter is to be found in heading B1T, Separating particles from gases, and consideration should be given when searching for a subject applicable to treatment of fluids generally (*eg* a filter element construction) to extension of search to that heading

Note: Similar subjects in this heading and in heading B1T have been assigned corresponding classifying codes to facilitate such searches

Definitions

In this heading the following terms are used with the following meanings:

- . filter medium: porous material or porous arrangement of material used to filter solids from fluids or to coalesce particles of liquid dispersed in gas or another liquid, or to separate a mixture of liquids by allowing one liquid phase to pass while retaining another
- . filter element: a section of filter medium plus parts to which the medium is demountably or permanently fixed, *including* other sections of medium, end caps, peripheral frames and edge strips, but *excluding* housings
- . shape of filter element: refers to the shape(s) of the inlet and/or outlet surface(s) of the element, *ie* the surface on which the solids content of fluid being filtered tends to accumulate and the surface, from which filtered fluid emerges. The shape is termed "hollow" if it is possible to produce two lines perpendicular to and out of the inlet or outlet surface, or out of each surface, which two lines intersect to include an angle of 90 to 180 degrees
- . filter elements or sections of filter medium in parallel and series: covers the relative arrangement in the fluid flow path of all distinguishable sections of filter medium, including wound and other multi-layer constructions of filter elements wherein the layers act in series but excluding edge-type filters in which layers act in parallel. Apart from the case of edge-type filters, elements or sections are in parallel if their respective inlet surfaces are in fluid communication with a common supply of fluid to be filtered, even if valves prevent simultaneous flow to each surface. Elements or sections are in series if the outlet surface of one is in fluid communication with the inlet surface of another
- . filter apparatus or filter: filter element(s) together with such parts as housings, integral or otherwise, cleaning arrangements, motors &c as characterise the particular type of apparatus. Ancillary devices such as pumps and valves are considered part of a filtering apparatus when inside the apparatus but not devices performing similar or different unit operation such as comminutors, mixers and non-filtering separators whether inside the apparatus or not. The term does not extend to apparatus, (*eg* a washing machine) of which the filter forms only a part
- . floating filter: a filter element with or without a housing and arranged to float on a body of liquid
- . funnel filter: a filter element bridging an open housing which confines a body of unfiltered liquid above the element other than moving types of filter apparatus or filter beds
- . filter housing: the fluid-constraining impervious vessel, whether open or closed which contains or is adapted to contain one or more filter element(s)
- . filter chamber: the space(s) within a filter housing where filter element(s) are located. Partitions may divide a single housing into a plurality of chambers

Explanation of heading subject matter and relationships with other headings

Part A

Filter aids, coagulants &c: Classified here are disclosures concerned with the selection *per se* or in combination with selection of liquid under treatment of filter aids, chemicals and non-chemical means used to facilitate filtering or settling. Also classified here is associated apparatus not peculiar to the type of filtering or settling. The heading is, however, residual for such materials *per se*, which are classified here only when they cannot be adequately classified in another heading. Further, disclosures concerned with selection of filter aids &c in combination with filtering/settling features (*other than* the mere selection of liquid under treatment) are to be found under the appropriate subdivision for the filtering or settling apparatus or process improved

Filter media: Classified here are disclosures concerned with filter media *per se*, their manufacture and filter elements, filters or filtering methods characterised solely by choice of filter media. The media may have purely mechanical filtering action or exhibit in addition other fluid treatment action. N.B. The heading is residual for filter media subject matter and materials for use as filter media are classified here only when they cannot be classified adequately elsewhere in such headings as B2E, Coated products; C1A, Inorganic substances; C1M, Glass and vitreous enamels; C3P, Addition polymers &c; D1K, Fabrics &c; D1P, Treating textiles &c; D1R, Non-woven fibrous materials &c

- Notes:
- (i) filter elements, filter apparatus &c characterised by features in addition to choice of filter media are not classified here, but under the subdivision appropriate to the type of filter element, filter apparatus &c
 - (ii) multiple layers of media may be classified here but are instead classified under 'filter elements' or 'multiple filter element assemblies' *below* if characterised in addition by other features *eg* shape

Filter elements: Classified here are disclosures concerned with the constructional details of filter elements *per se* other than or in relation to choice of filter media

- Notes:
- (i) Edge filter elements are classified under 'filter media' *above*
 - (ii) Multiple element assemblies not specifically mentioned in the classifying terms of this section are classified instead under 'Multiple filter element assemblies' *below*
 - (iii) Elements are classified by shape of inlet and outlet surfaces of filter media

Multiple filter element assemblies: Classified here are disclosures concerned with assemblies of filter elements wherein each element comprises more than just filter media, and *including* methods of forming elements to build larger elements

Excluded from Part A are:

- . sieves or screens for sifting or dry screening apparatus—B2H, Separating solids
- . filter papers—D1R, Non-woven fibrous materials &c
- . constructional tiles of aerating and draining filter beds—E1D, Buildings &c

Part B

Filter apparatus: operation thereof: Classified here are disclosures concerned with the overall organisation of filter apparatus and with single features (unit functions or sub-systems) thereof not covered by Part A *above*. Arrangements for cleaning filter elements are also dealt with here

The situation regarding combinations of filter apparatus/methods with other filtering or non-filtering apparatus is that:

- (i) combinations with apparatus/methods appropriate to other headings are classified here (*See* "classifying and searching note" 1 *below*)
- (ii) combinations of filter apparatus/methods of the same general type are classified here under the most appropriate term having regard to the perceived inventive step
- (iii) combinations of filtering with settling are not classified here, but in Part C *below*
- (iv) combinations of filter apparatus/methods of differing general type are only classified here when specific provision is made for the particular combination, otherwise they are classified in Part D *below*

Explanation of heading subject matter and relationships with other headings—contPart B—cont

Excluded are:

- . processes for treating particular materials involving filtering and/or settling which is combined with other processes and/or where interest does not reside in the filtering or settling technique *per se*—*See* relevant headings such as: A2B, Food preparations (separating curds and whey); C2C, Organic compounds; C5C, Animal and vegetable fats and oils &c; C6F, Microbiology &c
- . apparatus for separation of dissolved or colloiddally suspended substances from liquids by reverse osmosis, membrane filtration, ultra-filtration and similar techniques using semi-permeable membranes—B1X, Miscellaneous chemical apparatus &c
- . separating by magnetic or electrostatic action—B2J, Electrostatic and magnetic separation
- . apparatus, other than centrifugal strainers for separating liquids from solids or other liquids by centrifugal force involving rotation through more than 360° in one direction—B2P, Centrifuges
- . draining-racks—B8T, Bottling, stoppers &c; F4G, Drying &c; G2X, Miscellaneous photographic processes and apparatus
- . contact beds and percolating or trickling filters for treating sewage and the like without solids extraction—C1C, Treating water, sewage &c
- . separating by injecting gas to induce flotation—C1C, Treating water, sewage &c
- . wells with filtering walls—E1F, Earth and rock working &c

- Notes:
- (i) The initial classification in this Part is according to the kinds and types of filter apparatus. Accordingly, when searching for a single feature (or unit function &c) of possibly general applicability, consideration should be given to extending the search beyond the term(s) for the particular type of filter apparatus with which it is disclosed to appropriate terms in respect of other kinds or types of filter apparatus
 - (ii) When searching for apparatus characterised by single features of general use, *eg* valves, heaters, seals &c, which *per se* are subject matter for other headings, consideration should be given as to whether search in the other heading(s) is appropriate instead of or in addition to search in this heading

Part C

Separation by other than filtering: Classified here are disclosures concerned with the overall organisation of such separating apparatus (in particular settling apparatus) and with single features (unit functions or sub-systems) thereof not covered by Part A *above*

Combinations of non-filtering separation with each other and/or with filters and/or coalescers and/or with separation of other liquid treatment outside the scope of this heading are also classified here

Excluded are:

- . apparatus and processes for settling specifically modified for obtaining graded materials—B2H, Separating solids

Part D

Other combinations: Classified here are combinations of different kinds of filter *not elsewhere provided for*, *including* such combinations which also include matter outside the scope of this heading. Combinations including separators other than filters are classified in Part C *above*

Other subject matter: Classified here are disclosures which it is considered are correctly classified in this heading but which are not covered by any other specific term

The exclusion references in this heading are not exhaustive. Reference should be made to the appropriate general heading/s for processes, materials, elements or devices which may be more widely applicable than can appropriately be classified in this heading

Relationship with the Universal Indexing Schedules (heading U1S)

In addition to recording the nature of broader processes or apparatus with or in which inventions classified here may be used, U1S is used, subject to its indexing rules, to index materials operated on and useful products obtained, except that where it is clearly intended to produce only a single useful product from a mixture of starting materials the latter are not indexed

Operative date for Key entries

The operative dates of the terms in this heading are:

1. for terms annotated by a marginal code, that of the Edition corresponding to that code
2. for all other terms, that of Edition I

Classifying and searching notes

1. In general classification terms are designed to cover both apparatus and method aspects, so specifically “method” terms are residual
2. Inventions defined in terms of combination of matter within B1D with outside matter appropriate to other headings are classified here without taking account of the outside matter, except when classification terms make specific provision for such combination, *eg* combinations of filters with magnetic separators or filters for specific purposes such as molten metal filtration
3. Coalescing media and elements of filter-like construction are classified as filter media and elements
4. Terms having codes marked with the symbol † are of modified scope compared with the corresponding Edition I terms with the same codes

Guide to the Classifying Schedule

Main subjects:

Part A: Special subjects

- . selection of filter aids and chemical or non-chemical means to facilitate filtering or settling (DAAA-DACA)
- . filter media (DBAA-DCFA)
- . filter elements (DDAA-DDXB)
- . filter element assemblies (DEAA-DEXA)

Part B: Filter apparatus; operation thereof

- . large scale filter beds (DFAA-DFXA)
- . filter presses (DGAA-DGXA)
- . screw presses (DHAB-DHBB)
- . platen presses (DJAA-DJAX)
- . inflatable membrane presses (DLAA-DLAX)
- . other moving filters and presses (DMAA-DMQA)
- . other filters (DNAA-DNUD)

Part C: Separation other than by filtering

- . single separators (DPAA-DPJA, DPQA)
- . multiple separators; combinations with filtering or certain other devices (DPLB-DPPE)

Part D: Other subjects

- . other combinations of filters (DQAA-DQAX)
 - . other subject matter (DXAA)
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Classifying SchedulePART A: Special subjects

(i) Selection of filter aids, coagulants &c, including selection thereof *per se* or in combination with selection of liquid under treatment; *also* associated apparatus not peculiar to the type of filter

. NB for related subject matter *See* terms DMGH, DNFA *below*

DAAA . filter aids

DABA . coagulants, flocculants, precipitants and other chemicals, used to facilitate filtering or settling

DACA . non-chemical means used to facilitate filtering or setting, *eg* sound waves used to coagulate particles

. . combinations of coalescing using filter media with settling—*See* terms DPLB-DPNA *below*

. . separation by sound waves *per se*—*See* term DXAA *below*

(ii) Filter media (including manufacture thereof, and filter elements, filters or filtering methods characterised *solely* thereby)—

. the media having purely mechanical filtering action—

. *Note* multiple layers of media may be classified here or under terms DDAA-DEXA *below* depending on the characterising feature(s)

DBAA . . brush-like construction, including axial flow bundles and pile fabrics

. . edge filters—

. . . perforated sheets and similar moulded structures—*See* term DBEB *below*

. . . gratings comprising bars; wedge-wire, weldmesh, woven wire—*See* term DBEC *below*

DBCA . . . stacked or wound impervious sheet or ribbon

DBCB . . . stacked or wound pervious sheet or ribbon, *including* toilet rolls

DBCC . . . stacked or wound impervious non-sheet material, *eg* wire springs

DBCD . . . stacked or wound pervious non-sheet material, *eg* reels of string

DBCX . . . other edge filter construction

. . foam structures—

DBDA . . . ceramic

DBDX . . . other

DBEB . . perforated sheets and similar moulded structures

DBEC . . gratings comprising bars; wedge-wire, weldmesh, woven wire

DBFA . . loose media, *including* granules and/or fibres

DBGA . . self-supporting, three-dimensional structures, *not otherwise provided for*

. . sheet filter media, *not otherwise provided for*—

DBHA . . . felt, paper and similar structures

DBHX . . . other sheet media

DBXA . . multiple media, *not provided for* by a single one of terms DBAA to DBHX *above*

. the media having *other than* purely mechanical filtering action, the media being characterised by—

. *Note* Multiple stage separators wherein different layers perform mechanical and non-mechanical separation are *not* classified here but in Part B *below*

DCAA . . absorption or adsorption action

DCBA . . adhesive action

DCCA . . electrostatic action, *other than* on molecular scale involving zeta potential

DCDA . . magnetic action

DCEA . . other separating action, *including* ion exchange and zeta potential

DCFA . . non-separating chemical action, *including* bactericide or fungicide

(iii) Filter elements characterised by constructional details *other than* or *additional to* choice of filter media—

. *Note*: Elements are classified by shape of inlet and outlet surfaces of filter media when in use

. edge filter elements—*See* terms DBCA to DBCX *above*

. filter press cloths—*See* term DGAA *below*

. filter belts—*See* term DMBA *below*

. multiple element assemblies *not specifically provided for* in this section—*See* terms DEAA to DEXA *below*

DDAA . non-hollow, non-extended, *including* flat

DDBA . flat hollow bags or plates *other than* discs or sectors thereof

DDCA . flat hollow discs or sectors of discs

DDDA . . dish or bag-like, with handles, supports or substantial impervious areas, *including* tea strainers, sink ties and like

DDFA . . other bags or baskets, *not covered* by terms DDDBA or DDDDA *above* and *not extended*

DDGA . . extended by parallel pleats or grooves, arranged for axial flow

DDHA . . extended to resemble a row of flat bags

DDJA . . extended by radial pleats or grooves, arranged for axial flow

DDKA . . extended by concentric pleats or grooves, arranged for axial flow

DDLA . . extended by spiral pleats or grooves, arranged for axial flow

DDMA . . extended by dimples and arranged for axial flow, or presenting a chess-board array of inlet/outlet cavities

DDNA . . re-entrant shapes not covered by terms DDGA to DDMA *above*

DDPA . . tubular with straight axes and no pleats or dimples

DDQA . . tubular with axial pleats only

DDRA . . tubular with concentric non-pleated and axially pleated filtering layers

DDTA . . other tubular shapes, *eg* non-straight or helically pleated tubes

DDXB . . other shapes *including* parallel hollow tubes or fibres acting in parallel

PART A - Special subjects—*cont*

(iv) Multiple filter element assemblies, wherein each element comprises more than just filter media, including methods of joining elements to build larger elements, the assemblies comprising—

- . parallel hollow tubes or fibres acting in parallel—*See* term DDXB *above*
- . stacked circular discs acting in parallel
- . stacked rectangular plates or sheets acting in parallel
- . other arrangements

DEAA
DEBA
DEXA

PART B: Filter apparatus; operation thereof

(i) Large scale filter beds

- DFAA . combined with other separators for acting on the liquid being filtered, *eg* absorption beds or layers, outside the scope of this heading
- . combined with settling—*See* terms DPLB, DPMB *below*
- . single features—
 - . . . choice of filter media—*See* Part A(ii) *above*
- DFBA . . arrangements for cleaning of filter media and removing solid impurities from bed housings (*other than* nozzles and conduits for cleaning fluids)
- DFBB . . supports for filter beds, *including* nozzles and conduits for filtrand, filtrate or cleaning fluids
- DFBX . . other single features, *eg* housings, heaters, signals
- . overall organisation of single beds—
- DFCA . . moving beds, *including* beds intermittently recirculated for cleaning *but not* those merely agitated by reverse flow
- . . non-moving beds, for filtering by—
 - . . . upward flow
 - . . . other flow
- DFDA . overall organisation of multiple beds
- DFDX . . .
- DFEA . overall organisation of multiple beds
- DFXA . methods of operation of filter bed apparatus, *not otherwise provided for*

(ii) Filter presses, characterised by demountable assemblies of plates and/or frames, defining alternate inlet and outlet spaces separated by filter medium—

- . single features—
 - † DGAA . . cloth construction and/or mounting
 - . . . characterised solely by choice of filter medium—*See* Part A(ii) *above*
 - . . . characterised by mounting to facilitate cake discharge—*See* term DGAF *below*
 - . . . plate/frame constructions—
 - . . . with inflatable membranes
 - . . . other
 - . . . press opening/closing, plate spreading mechanisms
 - . . . arrangements for removing filter cake, *not provided for* by terms DGAA to DGAE *above* or term DGBA *below*
- DGAC . . .
- DGAD . . .
- DGAE . . .
- DGAF . . .
- DGAX . . other single features *eg* housings, heaters, signals
- . overall organisation of single presses—
- DGBA . . presses with filter belts with move between filtering steps, with or without inflatable membranes
- DGBB . . presses with inflatable membranes but no movable filter belts
- DGBX . . other presses
- DGCA . overall organisation of multiple filter presses
- DGXA . methods of operation of filter presses, *not otherwise provided for*

(iii) Screw presses, characterised by rotary screws which force liquid through a filter element—

- . single features—
 - . . construction of filter barrel—*See* Part A *above*
- DHAB . . construction of screw(s)
- DHAC . . arrangements for discharge of solids
- DHAX . . other single features, *eg* slurry feed, heaters
- . overall organisation—
- DHBA . . multiple screws and/or multiple presses
- DHBB . . single screw presses

(iv) Platen presses, characterised by reciprocating platens which force liquid through a filter element—

- . presses with intermittently moving belts, turntables &c—*See* terms DMMA, DMNA *below*
- DJAA . small scale presses of syringe type, *eg* for sampling and filtering blood, *including* filtering plungers in centrifugal separators
- DJAX . other platen presses

(v) Inflatable membrane presses characterised by inflatable membranes which force liquid through a filter element—

- . filter presses with inflatable membranes—*See* terms DGAC, DGBA, DGBB *above*
- DLAA . membranes pressed against filter cake by filtrand pressure
- DLAX . other inflatable membrane presses, *eg* inflatable bag or tube presses

Part B—cont

- (vi) **Other moving filters and presses**, including moving belts, rotary drums &c
 . filter elements stationary in use but capable of limited movement for cleaning, bypassing &c—*See terms DNCA, DNCC &c below*
 . cross-flow filters with rotary filter elements, with or without stationary filter elements—*See term DQAA below*
 . combined with non-filtering centrifugal separation, in—
 DMAA . . . centrifugal filters
 DMAB . . . non-centrifugal filters
 DMAX . . . combined with other separation treatments, *not facilitating filtration*
 . . . moving filters and presses combined with settling—*See terms DPLC and DPMX below*
 . . . single features—
 . . . constructions of filter drums, discs or plates—*See Part A (iii) above*
 . . . belt constructions, *other than* mere choice of filter media or edge guiding means
 † DMBA . . . belt guiding, mounting, supporting, lubricating or driving *including* brakes and controls
 † DMBB . . . mounting, guiding, supporting, lubricating or driving (*including* brakes and controls) of filter drums,
 discs, plates or pots
 . . . feeding and handling of filtrand (*including* pumps, conduits, baffles)—
 . . . valves for distributing fluids to/from angularly separated sectors in rotary filters—*See term DMGB below*
 DMCA . . . in centrifugal filters
 DMCB . . . in non-centrifugal filters with belts
 DMCX . . . in non-centrifugal filters without belts
 . . . removal of filtrate (*including* pumps, conduits, baffles)
 . . . valves for distributing fluids to/from angularly separated sectors in rotary filters—*See term DMGB below*
 DMDA . . . in centrifugal filters
 DMDB . . . in non-centrifugal filters with belts
 DMDX . . . in non-centrifugal filters without belts
 . . . removal and handling of separated solids (*other than* solely by centrifugal force)—
 . . . valves for distributing fluids to/from angularly separated sectors in rotary filters—*See term DMGB below*
 . . . in centrifugal filters using—
 † DMEA . . . purely relatively rotating scrapers or brushes
 † DMEB . . . other scrapers or brushes, *eg* reciprocating
 † DMEX . . . other means, *including* nozzles
 . . . in non-centrifugal filters, using—
 † DMFA . . . scrapers or brushes
 † DMFX . . . other means, *including* nozzles
 DMGA . . . washing and/or drying of filter cake
 DMGB . . . valves for distributing fluids to/from angularly separated sectors in rotary filters
 DMGC . . . heaters and coolers, *other than* used to dry cake
 DMGD . . . housing constructions and mounting *including* doors and latches therefor
 DMGE . . . indicators and signals
 DMGF . . . intermittant seals between relatively movable parts
 DMGG . . . sliding or rolling seals between relatively moving parts
 † DMGH . . . use of filter aid or other additive, *including* recycling of filtrate to use filter cake as filter aid
 . . . characterised by mere choice of aid or other additive—*See terms DAAA and DABA above*
 DMGX . . . other single features
 . . . overall organisation—
 . . . centrifugal filters—
 . . . centrifuges incorporating test tubes with movable filtering plungers—*See term DJAA above*
 DMHA . . . intermittently rotated only to remove solids from filter elements
 . . . rotated to effect filtering under centrifugal force, with—
 † DMHB . . . single drum or cone designed for outward flow filtration and rotating about single axis
 † DMHC . . . multiple drums or cones rotating about single axis
 j DMHD . . . single or multiple drums or cones rotating about multiple axes, *including* planetary drums
 DMHX . . . other filter means
 . . . non-centrifugal, rotary filters without belts or pressing, with—
 DMJA . . . hollow filter discs or plates
 DMJB . . . non-hollow filter discs
 DMJC . . . single filter drums with inward filtration
 DMJD . . . single filter drums with outward filtration
 DMJE . . . multiple filter drums
 DMJX . . . other filter means
 . . . pot filters wherein filter pots or other separate filter units move round a closed path—*See term DMMA below*
 . . . non-centrifugal, moving belt filters without pressing—
 DMLA . . . filter belt continuously emerging from housing in a plug of sealant
 DMLB . . . filter belt entrained round a hollow drum which supplies filtrand or receives filtrate
 . . . other belt filters, the belt being—
 DMLC . . . endless
 DMLD . . . non-endless

Part B—cont

- DMMA . . . pot filters, wherein filter pots or other separate filter units move round a closed path, *including* such filters with pressing stages
- . . . press filters, wherein pressing is effected between—
- DMNA . . . one or more belts and one or more reciprocating platens or membranes
- DMNB . . . one or more belts and other pressing member(s) such as rolls or drums
- DMNC . . . different parts of one belt *eg* folded over belt
- DMND . . . two or more rotary discs
- DMNE . . . two or more rotary rolls or drums *including* eccentric inner and outer drums
- DMNF . . . two or more belts
- DMNG . . . non-centrifugal moving belt filters with separate pressing and non-pressing stages
- . . . filter beds supported on moving drums or belts—*See* term DFCA *above*
- . . . moving filters and presses *not provided for above*—*See* term DQAX *below*
- DMQA . . . methods of operation, *not otherwise provided for*
- (vii) Other filters, *including* coalescers without distinct settling stages—
- . . . combined with other separators, namely—
- . . . settling or impingement separators—*See* terms DPLC, DPMX *below*
- DNAA . . . absorption, adsorption, ion-exchange apparatus or the like
- . . . *NB* for related subject matter—*See* terms DCAA, DCEA *above* and DPPB *below*
- DNAB . . . hydrocyclones and other non-filtering centrifuges, *including* filters with tangential inlets
- . . . *NB* for related subject matter—*See* terms DNPA to DNPX, DPPA *below*
- j DNAG . . . distilling, evaporating, condensing or drying apparatus
- DNAD . . . electrostatic separators
- . . . *NB* for related subject matter—*See* terms DCCA *above* and DPPC *below*
- DNAF . . . magnetic separators
- . . . *NB* for related subject matter—*See* terms DCDA *above* and DPPE *below*
- . . . combined with certain other fluid treatments, *not facilitating filtration*—
- DNBA . . . chemical or biological fluid treatments
- . . . *NB* for related subject matter—*See* term DPPB *below*
- DNBB . . . comminutors, macerators &c for reducing particle size
- DNBC . . . heating or cooling means
- . . . *NB* for related subject matter—*See* terms DNAG *above* and DNCM *below*
- DNBD . . . irradiation treatment, *including* ultra-violet
- . . . single features—
- . . . cleaning of filter elements—
- . . . ex-situ—*See* term DXAA *below*
- . . . in-situ by—
- beating, shaking, inverting, tilting or deforming, by—
- direct fluid action—*See* terms DNCE to DNCL *below*
- DNCA relatively moving vanes, paddles or rotors agitating the adjacent fluid
- *NB* for related subject matter—*See* term DNPB *below*
- DNCB other means
- *NB* for related subject matter—*See* term DNPA *below*
- brushing or scraping, of—
- bar screens—*See* term DNGA *below*
- DNCC edge filters
- DNCD other filter elements
- centrifugal force—*See* terms DMHA, DMJC *above*
- fluid flow, *including* shaking by direct fluid action, wherein—
- filtrand flow across filtering surface removes debris—
- continuously—*See* terms DNPA to DNPX *below*
- intermittently
- DNCE fixed nozzles direct fluid jets at or away from fixed filter elements
- DNCF relatively moving nozzles deliver or remove fluid or debris, and—
- † DNCG nozzles rotate unidirectionally to align with successive filter elements
- DNCH nozzles rotate unidirectionally relative to filtering surfaces
- DN CJ nozzles describe other movements relative to filter elements *including* helical movements
- other reverse flow cleaning—
- in duplex &c filters—*See* term DNHA *below*
- combined with opening of filtering gaps—*See* term DNCN *below*
- other
- DNCK other fluid cleaning, *including* combinations of methods defined by terms DNCE to DNCK *above*
- DNCL heating, melting, burning, use of solvents or other chemical action
- DNCM *NB* for related subject matter—*See* term DNBC *above*
- DN CN combined fluid flow and opening of filtering gaps
- DN CX other cleaning means, *including* combinations of methods defined by terms DNCA to DNCN *above*
not provided for by term DNCL *above*

Part B—cont

- .. arrangements for removing separated matter from filter housings—
- ... combined with arrangements for cleaning filter elements—*See terms DNCA to DNCX above*
- DNDA .. removable sumps
- DNDB .. scrapers *other than* screw pumps
- DNDC .. valves or pumps, *including* screw pumps
- DNDX .. other means
- .. control of fluid flow, *other than* for cleaning—
- DNEA .. by-passing filtrand, *including* associated signals
- ... when changing filter elements or filters—*See term DNED below*
- ... *NB* for related subject matter—*See term DNMC below*
- DNEB .. by-passing gas in liquid filters, or venting gas from filters—*See also term DNMB below*
- DNEC .. maintaining unidirectional flow through filters in circuits subject to flow reversals
- DNED .. preventing fluid leakage, permitting or preventing by-passing (i) during changing of filter elements or filters or (ii) if filter elements or filters are omitted- also *including* indicating if filter elements or filters are omitted
- DNEE .. varying distribution of fluid between elements or parts of an element
- ... in duplex &c filters—*See terms DNHA to DNHX below*
- DNEF .. varying fluid flow, *including* stopping flow, in response to element bursting, clogging or other accumulation of matter
- DNFA .. filter aids, coagulants &c, apparatus and methods for adding, using or recovering, *including* recycling of filtrate to use filter cake as filter aid
- ... *NB* for related subject matter—*See terms DAAA, DABA above*
- DNFB .. housing construction and mounting, *not otherwise provided for*
- DNFC .. indicators and signals
- ... associated directly with by-passing or changing filters or filter elements—*See terms DNEA and DNED above*
- .. mounting of filter elements and associated seals—
- ... combined with arrangements for removing filter elements—*See terms DNQA to DNQX below*
- ... to facilitate shaking—*See term DNCB above*
- DNFD .. securing mouths of hollow elements to tube plate apertures, spigots or housing mouths
- DNFE .. other mounting
- DNFF .. marking parts, *eg* by colour codes
- DNFG .. preventing or extinguishing fires, preventing electrostatic charging
- DNFH .. sampling fluids or filter media, testing filters
- ... filters used in liquid analysers and samplers—*See term DNRJ below*
- DNFJ .. tools for manipulating filters; methods of modifying filters
- ... exchanging dirty elements for clean—*See terms DNQA to DNQX below*
- DNFX .. other single features
- ... heaters or coolers—*See term DNBC above*
- DNGA .. overall organisation, characterised by construction—
- .. bar screens in open ducts, *including* cleaning thereof
- .. duplex, triplex &c filters—
- DNHA .. with reverse flow cleaning
- DNHX .. other
- DNJA .. filter elements mounted directly in pipes, pumps or valves, without particular provision for cleaning or exchange of elements
- DNKA .. floating filters *including* preferentially wettable filters to remove floating oil from water
- DNLA .. funnel filters and other gravity filters, without provision for removing solids
- ... *NB* for related subject matter—*See term DDDA above*
- .. integral constructions of filter elements and enclosing housings, for filtering—
- DNMB .. laboratory and medical fluids, *eg* blood
- DNMC .. hydrocarbons, *including* lubricating oil
- DNMX .. other fluids
- DNNA .. modular filters, built to desired size by adding units
- .. cross-flow filters, wherein continuous filtrand flow across the filtering surface(s) removes debris or prevents its deposition, characterised by—
- ... rotary filter elements with or without stationary filter elements—*See term DQAA below*
- DNPA .. inclined and/or vibratory, non-hollow screens
- DNPB .. rotary agitators, scrapers, and/or nozzles
- DNPC .. very small pore sizes suitable for ultrafiltration
- DNPX .. other
- .. filters characterised by arrangements for inserting and removing filter elements, *other than* mere provision of removable covers—
- ... for radioactive and other toxic materials—*See term DNRM below*
- † DNQA .. with single filter elements integral with or mounted on removable plugs or covers to facilitate removal
- DNQB .. wherein filtration is maintained while one element replaces another in a single duct or housing
- DNQX .. other

Part B—cont

- . overall organisation, characterised by application; filters for—
- . . *NB* terms DNGA to DNQX *above* take priority
- DNRA . . aquaria and garden ponds
- DNRC . . domestic and personal water supplies
- DNRD . . food and beverage preparation, domestic and commercial
- DNRE . . internal combustion engine fuel and heating fuel
- † DNRF . . internal combustion engine and machine tool coolants, lubricants and hydraulic fluids
- . . . *NB* for related subject matter—*See* term DNMC *above*
- DNRJ . . laboratory, medical, surgical and dental applications
- . . . *NB* for related subject matter—*See* terms DJAA, DNLA and DNMB *above*
- j DNRS . . mains and irrigation water supplies, waste water *other than* in washing machines, dishwashers and the like
- DNRK . . molten metal
- DNRL . . molten polymer
- DNRM . . radioactive and other toxic or explosive materials
- j DNRY . . swimming pools, *including* swimming pool filters with skimming intakes
- DNRQ . . washing machines, dishwashers, dry-cleaning machines and the like
- DNTA . . methods of operation *not otherwise provided for*
- . . . construction *not otherwise provided for*—
- . . . *NB* term DNTA *above* takes priority
- DNUA . . single element filters with housings
- . . . multiple element filters with single housings
- DNUB . . . elements in parallel only
- DNUC . . . elements in series or series and parallel
- DNUD . . multiple housing filters
- . . . duplex &c filters—*See* terms DNHA, DNHX *above*

PART C: Separation by other than filtering, including combination of such separation with filtering or coalescing—

- . combinations with other separators—*See* terms DPLB to DPPE *below*
- . separation by sound waves *per se*—*See* term DXAA *below*
- . single features—
- . . use of chemical and other means to assist separation by modifying particle characteristics—*See* terms DABA, DACA *above*
- DPAA . . construction, mounting and spacing of baffles or tube bundles
- DPAB . . construction, mounting and spacing of absorbing or impingement elements, *other than* baffles or tube bundles
- . . . *NB* for related subject matter—*See* terms DPBD and DPHA *below*
- DPAC . . construction and mounting of separator vessels
- . . . *NB* terms DPAD, DPAE *below* take priority
- DPAD . . feeding of liquid to be separated
- . . . tangential feeding to assist separation by centrifugal force—*See* term DPPA *below*
- DPAE . . heating and cooling
- DPAF . . auxiliary fluid jets used to assist separation or removal of separated matter
- . . . *NB* for related subject matter—*See* term DPHA *below*
- . . . removal of floating liquid or solid phase from a separator or from open water, using—
- DPBA . . . overflows, underflows, weirs
- skimming intakes in swimming pool filters—*See* term DNRY *above*
- moving non-absorbent or non-wettable skimming blades, which—
- DPBB rotate unidirectionally, *including* endless belt movements
- DPBC move otherwise
- DPBD . . . moving skimmers with preferentially absorbent or wettable elements
- DPBE . . . valves or pumps
- associated with suction nozzles—*See* term DPBX *below*
- DPBX . . . other means, *including* fixed or moving suction nozzles and combinations of means defined by terms DPBA to DPBE *above*
- DPCA . . arrangements for removal of lower liquid phase or intermediate liquid phase from separators
- . . removal of settled solid phase, using—
- . . . moving scrapers or brushes which—
- are combined with suction nozzles—*See* term DPDE *below*
- † DPDB rotate unidirectionally about vertical axes only
- † DPDC reciprocate
- † DPDD move otherwise
- † DPDE . . suction nozzles, with or without associated scrapers, brushes, valves or pumps
- DPDF . . valves or pumps
- associated with suction nozzles—*See* term DPDE *above*
- DPDG . . removable sumps
- DPDX . . other means, *including* combinations of means defined by terms DPDB to PDG *above*

Part C—cont

- DPEA . . combinations of means defined by terms DPBA to DPDX *above not provided for* by term DPDX (*eg* combined floor scrapers and surface skimmers)
- DPEB . . arrangements for removal of separated matter *not covered* by term DPBA to DPEA *above eg* cleaning solids from baffles or impingement elements
- DPEC . . signals and indicators
- DPEX . . other single features
- . . overall organisation—
- . . single liquid separators, for removing solids or other liquids from liquids, not combined with filters, coalescers or other separators—
- DPFA . . . simple, small scale settling chambers, *eg* blood bags and water traps in fuel lines
- DPFC . . . large scale open settling tanks, without baffles or dividing walls
- DPFE . . . intermediate scale settling chambers of simple form, *eg* grease traps for drains
- . . . settling tanks or chambers characterised by fixed dividing walls, tube bundles or baffles which define a plurality of distinct settling spaces acting in series and/or parallel, said walls, tube bundles or baffles being—
- DPGA generally parallel and rectilinear
- DPGC generally coaxial or concentric, *including* stacked washers
- DPGX otherwise arranged
- DPHA . . . devices for removing oil slicks from open water
- . . . characterised by pick-up means—*See* terms DNKA and DPBA to DPBX *above*
- DPJA . . . other separators, *eg* moving drum decanters, pipes or channels with separation means
- . . liquid separators as covered by terms DPFA to DPJA *above* combined with filters and/or coalescers, for separating—
- . . . solid particles from liquids—
- DPLB with filter beds
- DPLD with moving filter bands, discs or drums
- DPLC other
- . . . liquids or solids and liquids from other liquids—
- . . . small scale devices with minimal details of interest with regard to settling aspect—*See* terms DNRE, DNRF *above*
- DPMB with filter beds
- DPMX other
- DPNA . . multiple arrangements of liquid separators, with or without filters and/or coalescers
- . . liquid separators covered by terms DPFA to DPNA *above* combined with certain other devices, namely—
- DPPA . . . centrifugal separators (*eg* hydrocyclones) *other than* centrifugal filters, but *including* tangential delivery of liquids to create vortices in settling tanks
- DPPB . . . chemical or biochemical plant (*eg* sewage digestion plant), absorption and absorption plant, aerators
- DPPC . . . electrostatic separators
- DPPD . . . gas washers, *including* scrubbers, cooling towers, humidifiers, water curtains in spray booths
- DPPE . . . magnetic separators
- DPQA . . methods of operation of separating apparatus *not otherwise provided for*

PART D: Other subjects

Other combinations of different kinds of filter *not otherwise provided for including* such combinations which also include matter outside the scope of this heading—

- DQAA . . cross-flow filters with rotary filter elements, with or without stationary filter elements
- DQAX . . other
- DXAA . . Other subject matter not covered by any of above terms