CPC  COOPERATIVE PATENT CLASSIFICATION

C  CHEMISTRY; METALLURGY
    (NOTES omitted)

METALLURGY

C22  METALLURGY; FERROUS OR NON-FERROUS ALLOYS; TREATMENT OF ALLOYS OR NON-FERROUS METALS

C22C  ALLOYS (flints C06C 15/00; treatment of alloys C21D, C22F)

NOTES
1. In this subclass, the following terms or expressions are used with the meanings indicated:
   • "alloys" includes also:
     a. metallic composite materials containing a substantial proportion of fibres or other somewhat larger particles;
     b. ceramic compositions containing free metal bonded to carbides, diamond, oxides, borides, nitrides or silicides, e.g.
        cermet, or other metal compounds, e.g. oxynitrides or sulfides, other than as macroscopic reinforcing agents;
   • "based on" requires at least 50% by weight of the specified constituent or of the specified group of constituents.
2. In the absence of an indication to the contrary, in groups C22C 5/00 - C22C 32/00 an alloy is classified in the last appropriate place.
3. In this subclass it is desirable to classify the individual aspects of combinations of processes or materials for powder metallurgy using Combination Sets with symbols chosen from groups C22C 1/00 - C22C 43/00 or from groups B22F 1/00 - B22F 9/00.
4. In this subclass the special database "ALLOYS" is used. This system includes patent documents classified in groups C22C 1/04 and C22C 5/00 - C22C 49/14 and provides information on the composition of the alloys, their uses and characteristics.

WARNINGS
1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
   C22C 101/00-C22C 101/22 covered by C22C 111/00-C22C 111/02 covered by C22C 121/00-C22C 121/02 covered by
2. In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

Non-ferrous alloys, i.e. alloys based essentially on metals other than iron (master alloys for iron and steel C22C 35/00; alloys containing radioactive material C22C 43/00; amorphous alloys C22C 45/00; alloys containing fibres or filaments C22C 47/00, C22C 49/00)

1/00 Making alloys (powder-metallurgical apparatus or processes, not specially modified for making alloys B22F; by electrothermical methods C22B 4/00; by electrolysis C22C 1/04)
   1/002 . . . [Making amorphous alloys (processes for making amorphous material by powder metallurgy B22F)]
   1/005 . . . [Making alloys with holding in the range of the solid-liquid phase]
   1/007 . . . [Preparing arsenides or antimonides, especially of the III-VI-compound type, e.g. aluminium or gallium arsenide]
   1/02 . . . by melting (C22C 1/1036 takes precedence)
   1/023 . . . {Alloys based on nickel}
   1/026 . . . {Alloys based on aluminium}
   1/03 . . . using master alloys
   1/04 . . . by powder metallurgy (C22C 1/08, C22C 1/05, C22C 1/10, C22C 32/00, C22C 47/00, C22C 49/00 take precedence)

   1/0408 . . . [Light metal alloys]
   1/0416 . . . . [Aluminium-based alloys]
   1/0425 . . . . [Copper-based alloys]
   1/0433 . . . . [Nickel- or cobalt-based alloys]
   1/0441 . . . . [Alloys based on intermetallic compounds of the type rare earth - Co, Ni]
   1/045 . . . . [Alloys based on refractory metals]
   1/0458 . . . . [Alloys based on titanium, zirconium, hafnium]
   1/0466 . . . . [Alloys based on noble metals]
   1/0475 . . . . [Impregnated alloys]
   1/0483 . . . . [Alloys based on the low melting point metals Zn, Pb, Sn, Cd, In or Ga]
   1/0491 . . . . [comprising intermetallic compounds (C22C 1/0441 takes precedence)]
   1/05 . . . . Mixtures of metal powder with non-metallic powder (C22C 1/08, C22C 47/00, C22C 49/00 take precedence)
   1/051 . . . . [Making hard metals based on borides, carbides, nitrides, oxides or silicides; Preparation of the powder mixture used as the starting material]
Alloys based on non-metals: 

- Alloys containing non-metals (C22C 1/05, C22C 47/00, C22C 49/00) take precedence.
- Alloys containing non-metals (C22C 1/05, C22C 47/00, C22C 49/00) take precedence.

Other processes:

- Casting porous metals into porous preform (C22C 47/02). Alloys containing non-metals (C22C 1/05, C22C 47/00, C22C 49/00) take precedence.
- Casting porous metals into porous preform (C22C 47/02). Alloys containing non-metals (C22C 1/05, C22C 47/00, C22C 49/00) take precedence.

Alloys based on nickel or cobalt:

- with aluminium as the next major constituent.
- with tin as the next major constituent.
- with zinc as the next major constituent.
- with manganese as the next major constituent.
- with nickel or cobalt as the next major constituent.
- with lead as the next major constituent.
- with silicon as the next major constituent.

Alloys based on lead:

- with an alkali or an alkaline earth metal as the next major constituent.
- with tin as the next major constituent.
- with antimony or bismuth as the next major constituent.

Alloys based on mercury:

- with lead as the next major constituent.

Alloys based on copper:

- with tin as the next major constituent.

Alloys based on tin:

- with antimony or bismuth as the next major constituent.

Alloys based on titanium:

- with antimony or bismuth as the next major constituent.

Alloys based on zirconium:

- with copper as the next major constituent.

Alloys based on zirconium:

- with copper as the next major constituent.

Alloys based on zinc:

- with copper as the next major constituent.

Alloys based on nickel or cobalt:

- with copper as the next major constituent.

Alloys based on nickel or cobalt:

- with copper as the next major constituent.

Alloys based on a platinum group metal:

- with copper as the next major constituent.

Alloys based on a platinum group metal:

- with copper as the next major constituent.

Alloys based on noble metals:

- with copper as the next major constituent.

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Alloys based on noble metals:

- with copper as the next major constituent.
Non-ferrous alloys, i.e. alloys based essentially on metals other than iron

Alloys based on carbides, oxides, nitrides, borides or silicides, e.g. carbides, nitrides, borides or silicides as the main non-metallic constituents

23/00 Alloys based on magnesium

23/02 . with aluminium as the next major constituent
23/04 . with zinc or cadmium as the next major constituent
23/06 . with a rare earth metal as the next major constituent

24/00 Alloys based on an alkali or an alkaline earth metal

25/00 Alloys based on beryllium

26/00 Alloys containing diamond (or cubic or wurtzitic boron nitride, fullerenes or carbon nanotubes)

27/00 Alloys based on rhenium or a refractory metal not mentioned in groups C22C 14/00 or C22C 16/00

28/00 Alloys based on a metal not provided for in groups C22C 5/00 - C22C 27/00

29/00 Alloys based on carbides, oxides, nitrides, borides, or silicides, e.g. cermets, or other metal compounds, e.g. oxynitrides, sulfides (C22C 26/00 takes precedence)

30/00 Alloys containing less than 50% by weight of each constituent

32/00 Non-ferrous alloys containing at least 5% by weight but less than 50% by weight of oxides, carbides, borides, nitrides, silicides or other metal compounds, e.g. oxynitrides, sulfides whether added as such or formed in situ

NOTE

This group comprises also dispersion hardened alloys with less than 5% of dispersed compounds

Ferrous alloys, i.e. alloys based on iron (alloys containing radioactive material C22C 43/00; amorphous alloys C22C 45/00; alloys containing fibres or filaments C22C 47/00, C22C 49/00; heat treatment thereof C21D)

33/00 Making ferrous alloys
Ferrous alloys, i.e. alloys based on iron

- [making amorphous alloys]
- [compositions used for making ferrous alloys]
- by powder metallurgy (working metallic powder B22F)

- Using a mixture of prealloyed powders or a master alloy (mixtures of metal powder in general B22F 1/0003)
- comprising P or a phosphorus compound
- comprising S or a sulfur compound
- comprising other non-metallic compounds or more than 5% of graphite
- [Starting from compounds, e.g. oxides (manufacture of articles starting from powder comprising reducible metal compounds in general B22F 3/001)]
- using the impregnating technique (impregnating articles in general B22F 3/26)
- [having an intermetallic of the REM-Fe type which is not magnetic]
- [characterised by the range of the alloying elements]
- [the maximum content of each alloying element not exceeding 5%]
- [with only C, Mn, Si, P, S. As as alloying elements, e.g. carbon steel]
- [with at least one alloying element having a minimum content above 5%]
- [with Cr, Co, or Ni having a minimum content higher than 5%]
- [with more than 5% preformed carbides, nitrides or borides]

- by melting
- using master alloys
- Making cast-iron alloys
- including procedures for adding magnesium
- by fluidised injection

Master alloys for iron or steel

35/00

35/005 [based on iron, e.g. ferro-alloys]

Note: In the absence of an indication to the contrary, in groups C22C 37/00 - C22C 38/00 an alloy is classified in the last appropriate place that provides for one of the alloying components.

37/00 Cast-iron alloys

37/04 containing spheroidal graphite
37/06 containing chromium
37/08 with nickel
37/10 containing aluminium or silicon

38/00 Ferrous alloys, e.g. steel alloys (cast-iron alloys C22C 37/00)

38/001 containing N
38/002 containing In, Mg, or other elements not provided for in one single group C22C 38/001 - C22C 38/60
38/004 containing rare earths, i.e. Sc, Y, Lanthanides
38/005 containing carbon steels, i.e. having a carbon content of less than 0,01%
38/007 containing silver
38/008 containing tin
38/02 containing silicon
38/04 containing manganese
38/06 containing aluminium

38/08 containing nickel (C22C 38/105 takes precedence)
38/10 containing cobalt
38/105 containing Co and Ni
38/12 containing tungsten, tantalum, molybdenum, vanadium, or niobium
38/14 containing titanium or zirconium
38/16 containing copper
38/18 containing chromium
38/20 with copper
38/22 with molybdenum or tungsten
38/24 with vanadium
38/26 with niobium or tantalum
38/28 with titanium or zirconium
38/30 with cobalt
38/32 with boron
38/34 with more than 1,5% by weight of silicon
38/36 with more than 1,7% by weight of carbon
38/38 with more than 1,5% by weight of manganese
38/40 with nickel
38/42 with copper
38/44 with molybdenum or tungsten
38/46 with vanadium
38/48 with niobium or tantalum
38/50 with titanium or zirconium
38/52 with cobalt
38/54 with boron
38/56 with more than 1,7% by weight of carbon
38/58 with more than 1,5% by weight of manganese
38/60 containing lead, selenium, tellurium, or antimony, or more than 0,04% by weight of sulfur

43/00 Alloys containing radioactive materials

45/00 Amorphous alloys

45/001 [with Cu as the major constituent]
45/003 [with one or more of the noble metals as major constituent]
45/005 [with Mg as the major constituent]
45/006 [with Cr as the major constituent]
45/008 [with Fe, Co or Ni as the major constituent (C22C 45/02, C22C 45/04 take precedence)]
45/02 with iron as the major constituent
45/04 with nickel or cobalt as the major constituent
45/06 with beryllium as the major constituent
45/08 with aluminium as the major constituent
45/10 with molybdenum, tungsten, niobium, tantalum, titanium, or zirconium [or Hf] as the major constituent

Alloys containing fibres or filaments

WARNING

The subgroups of C22C 47/00 and C22C 49/00 might be incomplete as some of the patent documents classified C22C 47/00, C22C 47/16 and C22C 49/00 might need reclassification to one or more subgroups or to C22C 47/02 and subgroups

47/00 Making alloys containing metallic or non-metallic fibres or filaments

2047/005 [Working of filaments or rods into fibre reinforced metal by mechanical deformation]
47/02 Pretreatment of the fibres or filaments
Alloys containing fibres or filaments

47/025  .  .  [Aligning or orienting the fibres]

WARNING
Not complete, see also C22C 47/02

47/04  .  .  by coating, e.g. with a protective or activated covering

47/06  .  .  by forming the fibres or filaments into a preformed structure, e.g. using a temporary binder to form a mat-like element

47/062  .  .  [from wires or filaments only]

WARNING
Groups C22C 47/062, C22C 47/064, C22C 47/066 and C22C 47/068 are not complete, see also C22C 47/02 or C22C 47/06

47/064  .  .  .  .  [Winding wires]
47/066  .  .  .  .  [Weaving wires]
47/068  .  .  .  .  [Aligning wires]

47/08  .  by contacting the fibres or filaments with molten metal, e.g. by infiltrating the fibres or filaments placed in a mould { (C22C 47/16 takes precedence) }

47/10  .  .  Infiltration in the presence of a reactive atmosphere; Reactive infiltration

47/12  .  .  Infiltration or casting under mechanical pressure

47/14  .  .  by powder metallurgy, i.e. by processing mixtures of metal powder and fibres or filaments

47/16  .  by thermal spraying of the metal, e.g. plasma spraying { (atomising molten metal comprising fibres see also C22C 1/1042) }

47/18  .  .  using a preformed structure of fibres or filaments

47/20  .  by subjecting to pressure and heat an assembly comprising at least one metal layer or sheet and one layer of fibres or filaments

2047/205  .  .  [placing wires inside grooves of a metal layer]

49/00  Alloys containing metallic or non-metallic fibres or filaments

49/02  .  .  characterised by the matrix material

49/04  .  .  Light metals

49/06  .  .  .  Aluminium

49/08  .  .  Iron group metals

49/10  .  .  Refractory metals

49/11  .  .  .  Titanium

49/12  .  .  .  Intermetallic matrix material

49/14  .  .  characterised by the fibres or filaments

2200/00  Crystalline structure

2200/02  .  Amorphous

2200/04  .  Nanocrystalline

2200/06  .  Quasicrystalline

Non-ferrous alloys, i.e. alloys based essentially on metals other than iron (master alloys for iron and steel C22C 35/00; alloys containing radioactive material C22C 43/00; amorphous alloys C22C 45/00; alloys containing fibres or filaments C22C 47/00, C22C 49/00)

2202/00  Physical properties

2202/02  .  Magnetic

2202/04  .  Hydrogen absorbing