

F27B

Furnaces, Kilns, Ovens or Retorts in general; Open Sintering or like Apparatus

Definition statement

This subclass/group covers:

Furnaces in general, kilns, ovens, retorts or furnaces for open sintering.

References relevant to classification in this subclass

This subclass/group does not cover:

Specially adapted for bakery ovens	A21B
Specially adapted for glass melting furnaces	C03B
Specially adapted for coke or gas-making apparatus	C10B , C10J
Specially adapted for apparatus for cracking hydrocarbons	C10G
Specially adapted for blast furnaces	C21B
Specially adapted for converters for making steel	C21C
Specially adapted for furnaces for heat treating metal	C21D
Furnaces for electro-slag or arc re-melting of metals	C22B 9/00
Enamelling ovens	C23D

Informative references

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

Combustion apparatus	F23G
Heat exchanger	F28D

Electric heating	H05B
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Special rules of classification within this subclass

Indexing Codes should be used as additional information or in case an EC symbol is given and more detailed Indexing Codes are existing, these more detailed Indexing Codes should also be given.

F27B 1/00

Shaft or like vertical or substantially vertical furnaces (for preheating, burning, calcining or cooling lime, magnesia or dolomite C04B2/12)

References relevant to classification in this group

This subclass/group does not cover:

Blast furnaces	C21B 5/00 ; C21B 11/02 ; C21B 7/00
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Informative references

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

Preheating, burning, calcining or cooling lime, magnesia or dolomite	C04B 2/12
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F27B 1/14

Arrangements of linings (linings in general F27D1/00)

Informative references

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

Linings in general	F27D 1/00
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F27B 1/16

Arrangements of tuyeres

References relevant to classification in this group

This subclass/group does not cover:

Tuyeres for blast furnaces	C21B 7/16
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F27B 1/20

Arrangements of devices for charging

References relevant to classification in this group

This subclass/group does not cover:

Bell and hopper arrangement for blast furnaces and appliances for distributing the burden	C21B 7/18 ; C21B 7/20
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Informative references

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

Charging for furnaces in details	F27D 3/00
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F27B 1/21

Arrangements of devices for discharging

References relevant to classification in this group

This subclass/group does not cover:

Discharging devices for blast furnaces	C21B 7/14
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Informative references

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

Discharging for furnaces in details	F27D 3/00
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F27B 1/22

Arrangements of heat-exchange apparatus (heat-exchangers in general F28C, F28D)

Informative references

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

Heat-exchanger in general	F28C 3/10 ; F28D 1/00 - F28D 21/0015
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F27B 1/24

Cooling arrangements

References relevant to classification in this group

This subclass/group does not cover:

Cooling devices for blast furnaces	C21B 7/10
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Informative references

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

Cooling of furnaces or of charges therein in details	F27D 9/00
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F27B 1/26

Arrangements of controlling devices

Informative references

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

Controlling devices for furnaces in details	F27D 19/00
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F27B 1/28

Arrangements of monitoring devices, of indicators or of alarms

Informative references

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

Monitoring devices for furnaces in details	F27D 21/00
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F27B 3/00

Hearth-type furnaces, e.g. of reverberatory type (F27B9/00, F27B11/00, F27B13/00, F27B14/00, F27B15/00, F27B21/00 take precedence); Tank furnaces

References relevant to classification in this group

This subclass/group does not cover:

Furnaces for general processes of refining metals	C22B 9/00
Converters for making steel	C21C 5/28
Manufacturing of steel in electric furnaces	C21C 5/52

F27B 3/04

of multiple-hearth type; of multiple-chamber type;
Combinations of hearth-type furnaces

References relevant to classification in this group

This subclass/group does not cover:

Manufacture of steel in electrically heated multi-chamber furnace, a combination of electric furnaces or an electric furnace arranged for associated working with a non electric furnace	C21C 5/5252
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Informative references

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

Linings in general	F27D 1/00
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F27B 3/08

heated electrically, with or without any other source of heat

Informative references

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

Electric heating elements or systems for furnaces in details	F27D 99/0006
Heated by electric discharge in details	F27D 11/08

F27B 3/14

Arrangement of linings

Informative references

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

Linings in general	F27D 1/00
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F27B 3/16

Walls and roofs

Informative references

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

Roofs and crowns in details	F27D 1/02
Linings and walls in details	F27D 1/00

F27B 3/18

Arrangement of devices for charging

References relevant to classification in this group

This subclass/group does not cover:

Charging of electric furnaces	C21C 5/527
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Informative references

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

Devices for charging in details	F27D 3/00
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F27B 3/19

Arrangement of devices for discharging

Informative references

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

Devices for discharging in details	F27D 3/00
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F27B 3/20

Arrangement of heating devices

References relevant to classification in this group

This subclass/group does not cover:

Burners in electric arc furnaces	C21C 5/5217
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Informative references

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

Heating elements or systems in details	F27D 99/0001
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Burners	F27B 3/205
Electric heating	H05B

F27B 3/22

Arrangement of air or gas supply devices

References relevant to classification in this group

This subclass/group does not cover:

Injectors for electric arc furnaces	C21C 5/5217
Lances or injectors for converters	C21C 5/4606

Informative references

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

Introducing a fluid jet or current into the charge in details	F27D 3/16
Oxygen blowing	F27B 3/225

F27B 3/24

Cooling arrangements

Informative references

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

Cooling of furnaces or charges therein in details	F27D 9/00
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F27B 3/26

Arrangements of heat-exchange apparatus

Informative references

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

Heat-exchange apparatus	F28D 17/00
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F27B 3/28

Arrangements ofr controlling, monitoring, alarm or the like devices

Informative references

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

Controlling devices for furnaces in details	F27D 19/00
Monitoring devices for furnaces in details	F21D 21/00

F27B 5/00

Muffle furnaces; Retort furnaces; Other furnaces in which the charge is held completely isolated (F27B9/00 takes precedence)

References relevant to classification in this group

This subclass/group does not cover:

Furnaces through which the charge is moved mechanically	F27B 9/00
Furnaces for heat treatment	C21D 9/00
Muffle furnaces	C21D 9/006

F27B 5/04

adapted for treating the charge in vacuum or special atmosphere

References relevant to classification in this group

This subclass/group does not cover:

Heat treatment in controlled atmosphere	C21D 1/74
Furnaces for heat treatment	C21D 9/00

Informative references

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

Forming, maintaining or circulating atmosphere in heating chambers in details	F27D 7/00
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F27B 5/08

Arrangement of linings

Informative references

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

Linings in general	F27D 1/00
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F27B 5/12

Arrangement of devices for charging

References relevant to classification in this group

This subclass/group does not cover:

Charging for metallic articles for heat treatment	C21D 9/0018
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Informative references

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

Charging devices for furnaces in details	F27D 3/00
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F27B 5/13

Arrangement of devices for discharging

References relevant to classification in this group

This subclass/group does not cover:

Discharging for metallic articles for heat treatment	C21D 9/0018
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Informative references

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

Discharging devices for furnaces in details	F27D 3/00
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F27B 5/14

Arrangement of heating devices

References relevant to classification in this group

This subclass/group does not cover:

Methods of heating during heat treatment	C21D 1/34
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Informative references

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

Heating elements or systems in details	F27D 99/0001
Arrangement of elements for electric heating in or on furnaces in details	F27D 11/00

F27B 5/16

Arrangement of air or gas supply devices

References relevant to classification in this group

This subclass/group does not cover:

Methods of heat treatment in inert gas	C21D 1/74
Rotary-drum furnaces	F27B 7/04

Informative references

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

Supplying steam, vapour, gases or liquids in heating chambers	F27D 7/02
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F27B 5/18

Arrangements for controlling, monitoring, alarm or the like devices

References relevant to classification in this group

This subclass/group does not cover:

Process control of heat treatment	C21D 11/00
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Informative references

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

Controlling devices for furnaces in details	F27D 19/00
Monitoring devices for furnaces in details	F21D 21/00

F27B 7/00

Rotary-drum furnaces, i.e. horizontal or slightly inclined

References relevant to classification in this group

This subclass/group does not cover:

Rotary retorts	C10B 1/10
Destructive distillation of solid carbonaceous material with indirect heating in rotary ovens or retorts	C10B 47/30
Making pig iron in rotary kilns	C21B 11/06
Making spongy iron or liquid steel, by direct processes in rotary furnaces	C21B 13/08
Rotary furnaces for heat treatment	C21D 9/0031

Informative references

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

Burning or melting of hydraulic cements	C04B 7/44 C04B 7/43
Incineration of waste in rotating drum	F23G 5/20

F27B 7/06

Adapted for treating the charge in vacuum or special atmosphere

References relevant to classification in this group

This subclass/group does not cover:

Heat treatment in controlled atmosphere	C21D 1/74
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Informative references

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

Forming or maintaining special atmospheres or vacuum in heating chambers in details	F27D 7/06
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F27B 7/20

Details, accessories or equipment peculiar to rotary-drum furnaces

Informative references

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

Burning or melting of hydraulic cements	C04B 7/44 C04B 7/43
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F27B 7/24

Seals between rotary and stationary parts

Informative references

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

Seals for furnaces in details	F27D 99/0073
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F27B 7/28

Arrangements of linings

Informative references

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

Linings for furnaces in details	F27D 1/0003
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F27B 7/30

Arrangements of partitions

Informative references

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

Partitions for furnaces in details	F27D 99/007
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F27B 7/32

Arrangements of devices for charging

Informative references

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

Devices for charging for furnaces in details	F27D 3/00
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F27B 7/33

Arrangements of devices for discharging

Informative references

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

Devices for charging of furnaces in details	F27D 3/00
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F27B 7/38

Arrangements of cooling devices

Definition statement

This subclass/group covers:

Arrangements of cooling devices

Informative references

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

Cooling of furnaces or charges therein in details	F27D 9/00
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F27B 7/40

Planetary coolers

Definition statement

This subclass/group covers:

Planetary coolers

Informative references

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

Cooling of furnaces or charges therein in details	F27D 9/00
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F27B 7/42

Arrangements of controlling, monitoring, alarm or the like devices

Informative references

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

Controlling devices for furnaces in details	F27D 19/00
Monitoring devices for furnaces in details	F21D 21/00

F27B 9/00

Furnaces through which the charge is moved mechanically, e.g. of tunnel type (F27B7/14 takes precedence); Similar furnaces in which the charge moves by gravity

Definition statement

This subclass/group covers:

Furnaces through which the charge is moved mechanically, e.g. tunnel furnaces; Similar furnaces in which the charge moves by gravity

References relevant to classification in this group

This subclass/group does not cover:

Rotary-drum furnaces with means for agitating or moving the charge	F27B 7/14
Furnaces for heat treatment	C21D 9/00

F27B 9/04

Adapted for treating the charge in vacuum or special atmosphere

References relevant to classification in this group

This subclass/group does not cover:

Method of heat treatment in inert gas	C21D 1/74
Continuous furnace for wire with a controlled atmosphere	C21D 9/561

Informative references

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

Forming or maintaining special atmospheres or vacuum in heating chambers in details	F27D 7/06
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F27B 9/06

heated without contact between combustion gases and charge; electrically heated

References relevant to classification in this group

This subclass/group does not cover:

Method of heating during heat treatment	C21D 1/34
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Informative references

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

Heating elements or systems in details	F27D 99/0001
Arrangement of elements for electric heating in or on furnaces in details	F27D 11/00-F27D 11/12

F27B 9/14

characterised by the path of the charge during treatment;
characterised by the means by which the charge is moved during treatment (F27B9/28 takes precedence; travelling or movable supports or containers for the charge F27D3/12)

References relevant to classification in this group

This subclass/group does not cover:

Furnaces for heat treatment through which the charge is moved in horizontal path; up or down	C21D 9/0056 ; C21D 9/005
Furnaces through which the charge is moved mechanically, for treating continuous lengths of work	F27B 9/28

Informative references

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

Travelling or movable supports or containers for the charge; Furnace cars	F27D 3/12 ; F27D 3/12A
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F27B 9/24

being carried by a conveyer [N: transport by conveyers in general B65G]

References relevant to classification in this group

This subclass/group does not cover:

Rolls in heat treating furnaces	C21D 9/0012
Rolls in continuous heat treating furnaces	C21D 9/563

Informative references

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

Transport by conveyors in general	B65G/[CpcRefSymbol=00]
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F27B 9/26

on or in trucks, sleds, or containers

Informative references

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

Travelling or movable supports or containers for the charge; Furnace cars	F27D 3/12 ; F27D 3/12A
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F27B 9/34

Arrangement of linings

Informative references

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

Linings for furnaces in details	F27D 1/0003
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F27B 9/36

Arrangement of heating devices

References relevant to classification in this group

This subclass/group does not cover:

Heating metal strips	C21D 9/567 ; C21D 9/58 ; C21D 9/60 ; C21D 9/62
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Informative references

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

Heating elements or system for furnaces in details	F27D 99/0001
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F27B 9/38

Arrangement of devices for charging

References relevant to classification in this group

This subclass/group does not cover:

Charging metallic articles in heat treatment furnaces	C21D 9/0018
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Informative references

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

Devices for charging of furnaces in details	F27D 3/00
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F27B 9/40

Arrangements of controlling or monitoring devices

References relevant to classification in this group

This subclass/group does not cover:

Discharging metallic articles in heat treatment furnaces	C21D 9/0018
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Informative references

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

Devices for discharging of furnaces in details	F27D 3/00
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F27B 9/42

Arrangement of controlling, monitoring, alarm or like devices

Definition statement

This subclass/group covers:

Arrangement of controlling or monitoring devices

References relevant to classification in this group

This subclass/group does not cover:

Process control for heat treatment	C21D 11/00
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Informative references

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

Controlling devices for furnaces in details	F27D 19/00
Monitoring devices for furnaces in details	F21D 21/00

F27B 11/00

Bell-type furnaces (for treating metal strips or wire C21D9/663)

References relevant to classification in this group

This subclass/group does not cover:

Bell-type furnaces for treating metal strips or wire	C21D 9/663
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F27B 13/00

Furnaces with both stationary charge and progression of heating, e.g. of ring type, of type in which segmental kiln moves over stationary charge

F27B 13/10

Arrangement of linings

Informative references

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

Linings for furnaces in details	F27D 1/0003
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F27B 13/12

Arrangement of heating devices

Informative references

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

Heating elements or systems in details; especially burners	F27D 99/0001 ; F27D 99/0033
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F27B 13/14

Arrangement of controlling, monitoring or alarm or like devices

Informative references

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

Controlling devices for furnaces in details	F27D 19/00
Monitoring devices for furnaces in details	F21D 21/00

F27B 14/00

Crucible or pot furnaces

Informative references

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

Single crystal growth	C30B
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F27B 14/04

adapted for treating the charge in vacuum or special atmosphere

Informative references

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

Forming, maintaining or circulating atmosphere in heating chambers in details	F27D 7/00 ; F27D 7/02 ; F27D 7/06
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F27B 14/06

heated electrically, e.g. induction crucible furnaces with or without any other source of heat (F27B14/04 takes precedence)

Informative references

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

Electric heating elements or systems	F27D 99/0033
Electric heating elements in general	H05B

F27B 14/10

Crucibles

Informative references

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

Crucibles for single crystal growth	C30B 13/14
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F27B 14/12

Covers therefor

Informative references

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

Covers for furnaces in details	F27D 1/18 ; F27D 1/1808
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F27B 14/14

Arrangements of heating devices

Informative references

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

Heating elements or systems for furnaces in details	F27D 99/0001 ; F27D 99/0033 ; F27D 99/0035
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F27B 14/20

Arrangements of controlling, monitoring, alarm or the like devices

Informative references

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

Controlling devices for furnaces in details	F27D 19/00
Monitoring devices for furnaces in details	F21D 21/00

F27B 15/00

Fluidised-bed furnaces; Other furnaces using or treating

finely-divided materials in dispersion [N: (apparatus in general for carrying out chemical or physical processes in a fluidised bed reactor B01J8/24 to B01J8/44)]

Definition statement

This subclass/group covers:

Fluidised-bed furnaces; Other furnaces using or treating finely-divided materials in dispersion.

References relevant to classification in this group

This subclass/group does not cover:

Making spongy iron or liquid steel, by direct processes in fluidised bed furnaces or apparatus containing a dispersion of the material	C21B 13/0033
Heating metallic strips in fluidized beds	C21D 9/567

Informative references

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

General apparatuses for carrying out chemical or physical processes in a fluidised-bed reactor	B01J 8/24-B01J 8/44
Heat exchange apparatus using fluidized bed	F28D 13/00

F27B 15/06

Arrangements of linings

Informative references

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

Linings for furnaces in details	F27D 1/0003
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F27B 15/08

Arrangements of devices for charging

Informative references

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

Devices for charging of furnaces in details	F27D 3/00
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F27B 15/09

Arrangements of devices for discharging

Informative references

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

Devices for discharging of furnaces in details	F27D 3/00
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F27B 15/18

Arrangements of controlling devices

Informative references

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

Controlling devices for furnaces in details	F27D 19/00
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F27B 15/20

Arrangements of monitoring, of indicators, of alarm devices

Informative references

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

Monitoring devices for furnaces in details	F27D 21/00
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F27B 17/00

**Furnaces of a kind not covered by any preceding group
(structural combinations of furnaces F27B19/02)**

Definition statement

This subclass/group covers:

Furnaces of a kind not covered by any preceding group;

open field furnaces for burning bricks;

chamber-type furnaces, also adapted for treating semiconductor wafers;

furnaces, where the floor consists of the support carrying the charge, e.g. car type furnaces;

furnaces for burning bricks or pottery;

References relevant to classification in this group

This subclass/group does not cover:

Furnaces coilers	C21D 9/68
Furnace for ingots	C21D 9/70

Informative references

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

Apparatuses for treating semiconductors/wafers	H01L 21/67
Furnaces through which the charge is moved mechanically	F27B 9/02

F27B 17/02

especially designed for laboratory use

Definition statement

This subclass/group covers:

Furnaces especially designed for laboratory use.

Furnaces for dental work-pieces

Informative references

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

Devices for soldering, casting, moulding or melting dental prostheses	A61C 13/20
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F27B 19/00

Combinations of furnaces of kinds not covered by a single preceding main group

F27B 21/00

Open or uncovered sintering apparatus; Other heat-treatment apparatus or like construction