

1	PROCESSES OF HEATING OR HEATER OPERATION	24	..Modulating or stabilizing pressure or temperature
2	..Including apparatus purging, cleaning or accretion preventing	25	..Providing pulsed or periodically reversed atmosphere
3	..Including repairing, converting or assembling apparatus	26	..By mode of admission of treating or protecting fluid
4	..Including apparatus heat-up, cool-down or protection	27	..Including the flowing or circulating of particulate heat carrier
5	..Including preparing or arranging work for heating	28	..Of operating a furnace utilizing a heat storage mass
6	..Stacking or aligning objects	29	..Of heating a fluid
7	..Forming a permeable layer or sheet	30	..Utilizing a heat storage mass
8	..Continuous strip, strand or web passed longitudinally through heating zone	31	..Heating of or by wall or radiant surface
9	..Treating an article, container, batch or body as a unit	32	WITH INDICATOR, ILLUMINATOR OR INSPECTION MEANS
10	..Localized treating or shielding of work area	33	ARTICLE OR TEMPLATE FOLLOWER POSITIONS HEATING ELEMENT RELATIVE TO ARTICLE
11	..Moving unit through or within treating zone during treating	34	HAVING OPERATING OR CONTROLLING DEVICE RESPONDING TO PRESENCE OF DISCRETE WORK UNIT OR REMOVABLE UNIT HOLDER
12	..Modulating, varying or augmenting heat supply during heat-up period	35	FRANGIBLE OR FUSIBLE SAFETY RELIEF OR SHUTDOWN MEANS
13	..Including melting, vaporizing, sintering, expanding comminuting, or classifying work material	36	HAVING CONDITION RESPONSIVE CONTROL
14	..Including passing, treating or conveying gas into or through particulate work	37	..Analyzer or composition sensor of work, work atmosphere or exhaust gas
15	..Including maintenance of fluidized bed	38	..Control of or response to apparatus protecting fluid or means
16	..Including a dust control or particle separation step	39	..Of selection or load balancing of furnace exhaust heated regenerators
17	..Including modulation of flow rate of gas or treated material	40	..Of hot blast stove (i.e., of Cowper stove)
18	..Subjecting work to diverse treatments or graduated temperatures	41	..Of purger, purge period, scavenger or cleaner
19	..Controlling flame position or work atmosphere	42	..Of protective work shield, cooler or atmosphere; or of heat applicator position
20	..Providing flame or high luminosity	43	..Of discharging, or stopping the heating of a unit or batch on sensed completion of heating
21	..Including recycling work atmosphere	44	..With cool-down timer or means
22	..Establishing strata, layer or curtain	45	..Of or by means sensing or controlling work movement, quantity or position
23	..Establishing or maintaining composition of atmosphere bathing work	46	..Condition responsive shutdown requiring reset

47	.Of or by pressure of fluid work or work chamber atmosphere	68	.Separator discharges gas to work zone
48	.Of cooling, dilution, withdrawal, bypass or circulation of work chamber atmosphere	69	.With means passing separated solid to heating zone
49	.Of or by heat generation or transmission	70	.At regenerator or recuperator (e.g., slag pocket, etc.)
50	WITH PROTECTOR, CLEANER OR SUPPORT FOR CONDITION SENSOR	71	..With separated solid discharge structure
51	HAVING TIMING, PROGRAMMING OR CYCLING CONTROL MEANS	72	WITH MEANS DILUTING, PURIFYING OR BURNING EXHAUST GASES
52	.Of handling or treatment of discrete work batch or unit	73	COMBUSTION PRODUCTS, FLUE OR GENERATOR AND WORK CHAMBER MOUNTED FOR RELATIVE MOVEMENT FOR ACCESS
53	..And of furnace closure or heating element operator	74	WITH DRIP, LEAKAGE, BREAKAGE OR SOIL COLLECTING STRUCTURE
54	WITH INTERLOCKED, INTERCONNECTED OR MULTIWAY CONTROLLER ALTERNATING FLOW OF HEATED AND HEATING FLUID	75	WITH CLEANING MEANS FOR APPARATUS
55	WITH CONCURRENT CONTROL OR INTER- CONTROL OF DIVERSE OPERABLE ELEMENTS	76	WITH APPARATUS REPAIR OR ASSEMBLY MEANS
56	.Door or baffle movement correlated with work movement or placement	77	WITH WORK COOLING STRUCTURE
57	.Heating gas supply, removal or recirculation correlated with work or door movement or placement	78	.Combustion feed air cools exiting work by contact
58	WITH HEATING GAS CONVEYING, AGITATING, SCATTERING OR DISINTEGRATION OF WORK (E.G., FLUIDIZED BED, ETC.)	79	..Contact at discharge end section of shaft furnace
59	ADVANCING STRUCTURE FLEXING, LOOPING OR COILING SHEET, WEB OR STRAND	80	..Work manipulated in cooling zone
60	.Internally heated roll	81	.Work holder having selectively usable heating and cooling structure
61	WITH LUMP BREAKER OR CLASSIFIER FOR PARTICULATE WORK MATERIAL	82	.Entering and leaving work exchange heat
62	GEOGRAPHIC OR STRUCTURAL INSTALLATION	83	.Work heat removed through heat transmitting wall
63	.Installed on internal combustion engine element	84	..Combustion feed material cools wall
64	HAVING FLUID CURTAIN AT CHAMBER PORT OR WORK PATH	85	.Cooling liquid contacts work
65	WITH HEAT SHIELD, OR ESCAPING GAS COLLECTOR AT FURNACE CHAMBER ACCESS AREA	86	WITH MEANS RECEIVING WORK FROM WORK HEATING ZONE DISCHARGE MEANS
66	WITH CONDENSER OR ABSORBER FOR WORK CHAMBER VAPOR	87	WITH MEANS SUPPLYING WORK TO WORK FEEDER
67	WITH MEANS SEPARATING SOLID PARTICLES OR SLAG FROM WORK CHAMBER GAS	88	WITH WHEEL, HANDLE, OR SKID-TYPE SUPPORT FOR HEATER ASSEMBLY
		89	CONVERTIBLE
		90	BOILER AND WORK HEATING FURNACE, POT OR OVEN
		91	.Having means utilizing generated steam in heating work
		92	COMBINED
		93	HAVING WORK HEATING CHAMBER AND OPEN ACCESS WORK SUPPORTING AND HEATING AND HEATING STRUCTURE OUTSIDE OF CHAMBER
		94	DISPARATE HEAT SOURCES OR FUELS

95	SHAFT TYPE	117	.Having work or work atmosphere feed or discharge structure
96	..Having combustion products generated in or fed to shaft	118	.Having structure agitating or controlling the motion of the charge
97	..Having flow controller restraining solid and passing melt	119	.Having brick-type lining
98	..Having agitator or movably mounted baffle for shaft or shaft outlet	120	WORK CHAMBER HAVING HEATING MEANS
99	..Having vertically spaced gas supply ports	121	.Having means by which work is progressed or moved mechanically
100	..Having distinct fume outlet and work inlet	122	..Having manipulating means arranging, orienting, segregating or topically heating individual unit
101	..Having distinct combustion products generator chamber	123	...Handler outside of chamber supports unit partially within and partially outside of furnace chamber
102	.Having heat emitting tube or flue within or traversing shaft chamber	124	...Having structure rotating, reorienting, or inverting unit during heating
103	TUMBLER-TYPE ROTARY - DRUM FURNACE	125	...Vertical stack or mutually supporting units having thrust means
104	..Having support for engaging heated surface of domestic stove	126	...Thrust means advances row or stack of units
105	..Having combustion products generated in or fed to drum	127	...Having structure for removing skid marks
106	..Including plural, distinct serially connected work chambers	128	..Plural distinct chambers
107	..And having externally heated drum surface or indirect heating flue	129	...Work moved to drop between shelf or trough-type chambers
108	..Work advancing type (e.g., steady flow of work)	130	...Combustion products generated in or fed to chamber
109	...Axially spaced feed to drum of combustion or reaction material	131	....Annular shelves and rotary pusher on central vertical axis
110	...Structure providing different rates of heating or work movement along axis	132	...Heated shelf or trough
111	...Counterflow of work and combustion products	133	..Having combustion products generated in or fed to work chamber
112	..Externally heated drum or associated heating element heats work by conduction or radiation	134	..Vibrating or jarring-type work advancer
113	..And having distinct atmosphere supply or removal structure	135	..Traveling heat emitter carries or stirs work
114	..Heat emitter is tube within the drum chamber or the drum wall	136	..Combustion products generated in or fed to chamber
115	..Having flexible, cooled, or air curtain seal between rotary and stationary parts	137	...Movable chamber floor section carried by external guide or axle
116	..Having protective cooling structure	138	....Rotary section
		139	...Plough, rake, screw, or stirrer means
		140	....Moved by endless carrier

141	...Rotatably mounted work carrier (e.g., Ferris wheel type, etc.)	169	...Through perforated partition
142	...Horizontal shelf on vertical axis	170	...Having branch connection to common flue
143	...Having means forming work path from inlet to outlet	171	...Diverse atmospheres (e.g., directly and indirectly heated, etc.)
144	...Having structure circulating work atmosphere along or across path	172	...Fed with combustion products from a common generator
145	....Distinct blowers or blower discharge ports along path	173	..Having protective cooling means for combustion material feed structure
146	...Plural burners longitudinal spaced in path	174	..Including noncommunicating combustion products flue
147	....Radiant type	175	..Radiant-type burner in or on wall (e.g., surface combustion, etc.)
148	...Baffle, heat radiator, or heating flue in chamber along path	176	..Having exhaust return passage or recirculating fan or jet
149	...Combustion material supply ports spaced along path	177	..Chamber exhaust transfers heat with chamber wall
150	...Spaced combustion products exhaust ports	178	..Work chamber or its wall heats chamber feed
151	..Stirrer in externally heated tank	179	..Work chamber exhaust heats chamber feed
152	..Having distinct atmosphere supply, removal or recirculation structure	180	...By regenerative-type heat exchanger
153	..Work or work carrier slides on heated chamber wall or floor	181	....Spaced alternating or successive chamber exhausts feed plural regenerators
154	..Screw-type pusher	182	....Regenerators heat fuel
155	..Chamber heated by multiple combustion products flues	183	..For annular article (e.g., wheel rim, etc.)
156	..Crucible or pot heating furnace	184	..Article inserted type
157	..Having tilting arrangement	185	..Dividing baffle or screen in cabinet forms upper work and lower burner chambers
158	..Pot stand forms annular combustion material admission zone	186	..Distinct combustion chamber feeds work chamber
159	..Combustion products heat work by contact	187	...Having additional feed means diluting combustion products
160	..Furnace or work holder of furnace mounted for tilting discharge	188	..Work chamber indirectly heating by common wall or connecting flue
161	..Having separator of flow director for melted work	189	...Having pump or jet means forcing air into combustion chamber
162	..Having shelf, rack, tray or chamber on guide or pivot	190	...Distinct vertically spaced combustion products feed openings to work chamber
163	..Plural structurally related work chambers	191	...Plural distinct combustion chambers feed single work chamber
164	...Connected for serial flow of combustion products	192	...Multiple perforate wall, floor or roof for combustion feed or exit
165	....Having serially connected regenerator		
166	....Chambers spatially separated		
167	....Having temporary partition		
168	....Through perforated floor		

193	..Spaced exhaust ports from work chamber	219	HEAT GENERATOR HEATS GAS OR LIQUID MATERIAL IN A FLOW STRUCTURE
194	..Baffle, shield, heat absorber, work support or flow directing means in work chamber	220	.With pump for the material driven by energy from the heat generator
195	..Hearth-type or tank-type furnace	221	.With means utilizing the heated material for heating work
196	..Spaced fuel or air feeds to work chamber	222	.Material heated by mixing with combustion products of generator
197	.Having particulate or liquid heat transfer medium in work chamber	223	..Having means for indirectly exchanging heat between combustion products and material
198	.Means supplying a protective or treating agent other than or additional to air	224	INSERTED EMITTER TYPE OF HOLLOW ARTICLE INTERIOR HEATER
199	.Having work atmosphere recirculating means	225	HEAT APPLICATOR HAVING STRUCTURE FOR MOUNTING IT ON OR AROUND OBJECT TO BE HEATED
200	.Work chamber having gaseous material supply or removal structure	226	HAVING MASK, BAFFLE OR CONDUCTOR CONCENTRATING HEAT ON OR PROTECTING SECTION OF ARTICLE
201	..Air flow-through type	227	HEAT GENERATOR WITH AN ASSOCIATED WORK SUPPORT OR HEAT DELIVERY STRUCTURE
202	...Having means heating work by radiation or conduction	228	.Internally heated roll
203	...Pump for atmosphere	229	.Movably mounted heat emitter traverses work during heating
204	...Having a movable drawer or separable tray	230	.Means moving or guiding work relative to heat emitter during heating
205	..Having pump, jet or valve means establishing chamber pressure distinct from ambient	231	.Article engaging and retaining support fixes position of article relative to heat emitter
206	.Interior bell forms muffle	232	.Horizontal, planar, openwork, work support above burner
207	.Plural structurally related work heating chambers	233	HEATING APPARATUS ELEMENT HAVING PROTECTIVE COOLING STRUCTURE
208	..Chambers are movably or removably mounted retorts	234	.Work skid or rail structure
209	.Heating tube, element, or flue traverses work space	235	.Conveyor, chute or work agitator element
210	.Externally heated, liquid holding type of work container	236	..Roll
211	..Mounted for pouring discharge	237	.Door, cover, door frame or rim of cover
212	.Tortuous, branched or baffled heating flue means within or along chamber wall	238	.Wall, floor or roof element
213	..Having distinct burner units	239	WORK FEEDING, AGITATING, DISCHARGING OR CONVEYING SUBCOMBINATION
214	HEAT GENERATING MEANS HEATS HEAT STORAGE MASS OF SOLID MATERIAL	240	.Having support for engaging surface of domestic stove
215	.Mass is solid fluent heat carrier (e.g., pebbles, etc.)	241	.Removable furnace bottom section or kiln cart
216	.Interconnected separately encased masses		
217	.Dividing wall in casing forms combustion and heat storage chambers		
218	..Annular divider forms concentric chambers		

- 242 .Having closure or seal for work
feeder's entrance passage
- 243 .Outside conveyor track
paralleled by chamber wall
slot for conveyor arm
- 244 .Seal at chamber wall for
conveyor arm or shaft
- 245 .Having distinct heat shield,
conductor, director or
expansion relief structure
- 246 .Roll-type conveyor element
- 247 **HEATING OR HEAT RETAINING WORK
CHAMBER STRUCTURE**
- 248 .Protected, lined or reinforced
melt holding section
- 249 .Including baffle wall, work
shield, or work support
element
- 250 .Door, cover or port
- 251 .Having expansion relieving or
absorbing means
- 252 .Masonry with metallic casing or
support
- 253 **ACCESSORY MEANS FOR HOLDING,
SHIELDING OR SUPPORTING WORK
WITHIN FURNACE**
- 254.1 .Fluid tight metallic heat
transferring box, shield or
hood
- 254.2 ..Bell-type hood or support for
such hood
- 258 .Support structure for heat
treating ceramics (e.g.,
saggars, etc.)
- 259 ..Point or line contact support
- 260 .For annular work (e.g., coil
separator, etc.)
- 261 .Openwork tray, basket, or grid
structure for heat treating
metal
- 262 .Crucible
- 263 ..Having dispensing opening or
spout
- 264 ..Lined, layered or coated
- 265 ..Of particular material
- 266 **MISCELLANEOUS**

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