

# CPC COOPERATIVE PATENT CLASSIFICATION

## Y GENERAL TAGGING OF NEW TECHNOLOGICAL DEVELOPMENTS; GENERAL TAGGING OF CROSS-SECTIONAL TECHNOLOGIES SPANNING OVER SEVERAL SECTIONS OF THE IPC; TECHNICAL SUBJECTS COVERED BY FORMER USPC CROSS-REFERENCE ART COLLECTIONS [XRACs] AND DIGESTS

(NOTES omitted)

## Y02 TECHNOLOGIES OR APPLICATIONS FOR MITIGATION OR ADAPTATION AGAINST CLIMATE CHANGE

(NOTES omitted)

## Y02B CLIMATE CHANGE MITIGATION TECHNOLOGIES RELATED TO BUILDINGS, e.g. HOUSING, HOUSE APPLIANCES OR RELATED END-USER APPLICATIONS

<b>10/00</b>	<b>Integration of renewable energy sources in buildings</b>	20/30	• Semiconductor lamps, e.g. solid state lamps [SSL] light emitting diodes [LED] or organic LED [OLED]
10/10	• Photovoltaic [PV]		
10/12	• • Roof systems for PV cells	20/32	• • Electroluminescent panels
10/14	• • PV hubs	20/34	• • Inorganic LEDs
10/20	• Solar thermal	20/341	• • • Specially adapted circuits
10/22	• • Evacuated solar collectors	20/342	• • • • for driving the LEDs directly from an AC voltage source, e.g. with only passive components
10/24	• • Air conditioning or refrigeration systems		
10/30	• Wind power		
10/40	• Geothermal heat-pumps	20/343	• • • • Linear regulators
10/50	• Hydropower in dwellings	20/345	• • • • • configured as a current source
10/70	• Hybrid systems	20/346	• • • • Switching regulators
10/72	• • Uninterruptible or back-up power supplies integrating renewable energies	20/347	• • • • • configured as a current source
		20/348	• • • • Resonant bridges
		20/36	• • Organic LEDs, i.e. OLEDs for general illumination
<b>20/00</b>	<b>Energy efficient lighting technologies</b>		
20/10	• Energy saving technologies for incandescent lamps	20/38	• • Constructional details
20/12	• • Halogen lamps	20/383	• • • Adaptation to Edison sockets
20/125	• • • High voltage halogen lamps	20/386	• • • Retrofitting in tubes
20/14	• • Specially adapted circuits	20/40	• Control techniques providing energy savings
20/142	• • • for resonant dimming, e.g. by means of high frequency resonant bridges	20/42	• • based on timing means or schedule
20/144	• • • for pulse modulation dimming	20/44	• • based on detection of the user
20/146	• • • for phase control dimming	20/445	• • • Controlling the access to premises
20/148	• • • • for reverse phase control dimming	20/46	• • based on detection of the illumination level
20/16	• Gas discharge lamps, e.g. fluorescent lamps, high intensity discharge lamps [HID] or molecular radiators	20/48	• • Smart controllers
20/18	• • Low pressure and fluorescent lamps	20/70	• Used in particular applications
20/181	• • • Fluorescent powders	20/72	• • in street lighting
20/183	• • • Specially adapted circuits		
20/185	• • • • Self-resonant bridges	<b>30/00</b>	<b>Energy efficient heating, ventilation or air conditioning [HVAC]</b>
20/186	• • • • Controlled bridges	30/08	• relating to domestic heating, space heating, domestic hot water heating [DHW] or supply systems
20/188	• • • • • with dedicated cathode heating circuitry	30/10	• • using boilers
20/19	• • Mechanical details of compact fluorescent lamps	30/102	• • • Condensing boilers
20/20	• • High pressure [UHP] or high intensity discharge lamps [HID]	30/104	• • • • Moistening the combustion air with condensate from the combustion gases
20/202	• • • Specially adapted circuits	30/106	• • • • Removing condensate from the heater
20/204	• • • • Details of the starting circuit	30/108	• • • Modular boilers, i.e. connecting different sections within a boiler or cascading multiple boilers
20/206	• • • • • for hot restarting		
20/208	• • • • providing detection and prevention of anomalous lamp operating conditions	30/12	• • Hot water central heating systems using heat pumps
20/22	• • Other discharge lamps		

30/125	. . . combined with the use of heat accumulated in storage masses	30/765	. . . of refrigeration machines, plants or systems, including combined heating and refrigeration systems or heat-pumps
30/13	. . Hot air central heating systems using heat pumps	30/767	. . . of air distribution systems
30/14	. . Central heating systems having more than one heat source	30/78	. . Ventilation adapted to air quality
30/16	. . Central heating systems using steam or condensate extracted or exhausted from steam engine plants	30/80	. Ultrasonic humidifiers
30/17	. . District heating	30/90	. Passive houses; Double facade technology
30/18	. . Domestic hot-water supply systems using recuperated or waste heat	30/92	. . with air flow into the conditioned premises or facilities
30/20	. . Heat consumers, i.e. devices to provide the end-user with heat	30/94	. . Improving the thermodynamic properties of the premises or facilities
30/22	. . . Low temperature radiators, i.e. convectors, radiators or a mixture of both with increased heat-exchange surface being suitable for systems working with a low temperature heat transfer medium	<b>40/00</b>	<b>Technologies aiming at improving the efficiency of home appliances</b>
30/24	. . . ceiling, wall or underfloor heating arrangements for being used in combination with water central heating system	40/10	. relating to domestic cooking
30/26	. . . Radiant panels electrically heated	40/12	. . Induction cooking in kitchen stoves
30/28	. . . Direct fired air heaters, i.e. the air being in direct contact with the exhaust gases of the burner	40/123	. . . Control circuit or coil power supply
30/50	. Systems profiting of external or internal conditions	40/126	. . . Coil arrangements
30/52	. . Heat recovery pumps, i.e. heat pump based systems or units able to transfer the thermal energy from one area of the premises or part of the facilities to a different one, improving the overall efficiency	40/14	. . Microwave ovens
30/54	. . Free-cooling systems	40/143	. . . Control circuit or magnetron power supply
30/542	. . . Air based, e.g. mixed outside air and recirculation systems	40/146	. . . Load impedance matching, e.g. by acting upon phase or frequency
30/545	. . . Cooling using dew point control and direct humidifiers	40/16	. . Improved cooking stoves
30/547	. . . Using energy from the ground by air circulation, e.g. "Canadian well"	40/163	. . . Fuel efficient biomass cooking stoves
30/56	. . Heat recovery units	40/166	. . . Fuel efficient gas cooking stoves
30/563	. . . Air to air	40/18	. . Solar cooking stoves or furnaces
30/566	. . . Water to water	40/30	. relating to refrigerators or freezers
30/60	. Other technologies for heating or cooling	40/32	. . Motor speed control of compressors or fans
30/62	. . Absorption based systems	40/34	. . Thermal insulation
30/625	. . . combined with heat or power generation [CHP], e.g. trigeneration	40/40	. relating to dish washers
30/64	. . Adsorption based systems	40/42	. . Motor speed control of pumps
30/66	. . Magnetic cooling	40/44	. . Heat recovery, e.g. of washing water
30/70	. Efficient control or regulation technologies ( <a href="#">empty, see subgroups</a> )	40/46	. . Optimisation of water quantity, e.g. of hot water
30/72	. . Electric or electronic refrigerant flow control	40/50	. Relating to washing machines
30/74	. . Technologies based on motor control	40/52	. . Motor speed control of drum or pumps
30/741	. . . Speed regulation of the compressor	40/54	. . Heat recovery, e.g. of washing water
30/743	. . . Speed control of condenser or evaporator fans, e.g. for controlling the pressure of the condenser	40/56	. . Optimisation of water quantity
30/745	. . . Speed regulation of pumps in flow control systems	40/58	. . Solar heating
30/746	. . . Speed regulation of fans in flow control systems	40/70	. relating to laundry dryers
30/748	. . . Speed regulation of fans and pumps in cooling towers	40/72	. . Motor speed control of drum or fans
30/76	. . Centralised control	40/74	. . Solar heating
30/762	. . . of heating or domestic hot water [DHW] systems	40/80	. relating to vacuum cleaners
		40/82	. . Motor speed or motor power consumption control
		40/84	. . Motor overheating or overloading prevention
		40/90	. Energy efficient batteries, ultracapacitors, supercapacitors or double-layer capacitors charging or discharging systems or methods specially adapted for portable applications
		<b>50/00</b>	<b>Energy efficient technologies in elevators, escalators and moving walkways</b>
		50/10	. in elevators
		50/12	. . Energy saving technologies
		50/122	. . . by adapted call allocation
		50/125	. . . by adapting the motion profile
		50/127	. . . by control of auxiliary devices
		50/14	. . Energy recuperation technologies
		50/142	. . . with electrical storage
		50/144	. . . with mechanical storage
		50/146	. . . with pressure storage
		50/148	. . . by delivering current to the grid for hydraulic elevators
		50/20	. in escalators and moving walkways

- 50/22 . . Energy saving technologies
- 50/225 . . . by adapting the motion profile
- 50/24 . . Energy recuperation technologies
- 70/00 Technologies for an efficient end-user side electric power management and consumption**
- 70/10 . Technologies improving the efficiency by using switched-mode power supplies [SMPS], i.e. efficient power electronics conversion
- 70/12 . . Power factor correction technologies for power supplies
- 70/123 . . . Passive technologies
- 70/126 . . . Active technologies
- 70/14 . . Reduction of losses in power supplies
- 70/1408 . . . Low frequency active rectification, i.e. from a low frequency AC grid or generator
- 70/1416 . . . Converters benefiting from a resonance, e.g. resonant or quasi-resonant converters
- 70/1425 . . . . in non-galvanically isolated DC/DC converters
- 70/1433 . . . . in galvanically isolated DC/DC converters
- 70/1441 . . . . in DC/AC or AC/DC converters
- 70/145 . . . . in AC/AC converters
- 70/1458 . . . Synchronous rectification
- 70/1466 . . . . in non-galvanically isolated DC/DC converters
- 70/1475 . . . . in galvanically isolated DC/DC converters
- 70/1483 . . . by using wide band gap based power semiconductors, i.e. power converters integrating silicon carbide [SiC], gallium nitride [GaN], gallium arsenide [GaAs] or diamond power switches
- 70/1491 . . . Other technologies for reduction of losses, e.g. non-dissipative snubbers, diode reverse recovery losses minimisation, zero voltage switching [ZVS], zero current switching [ZCS] or soft switching converters
- 70/16 . . Efficient standby or energy saving modes, e.g. detecting absence of load or auto-off
- 70/30 . Systems integrating technologies related to power network operation and communication or information technologies for improving the carbon footprint of the management of residential or tertiary loads, i.e. smart grids as climate change mitigation technology in the buildings sector, including also the last stages of power distribution and the control, monitoring or operating management systems at local level ([smart grids supporting the management or operation of end-user stationary applications in general, e.g. with no associated climate change mitigation effect Y04S 20/00](#))
- 70/32 . . End-user application control systems
- 70/3208 . . . characterised by the aim of the control
- 70/3216 . . . . General power management systems
- 70/3225 . . . . Demand response systems, e.g. load shedding, peak shaving
- 70/3233 . . . . The system entering an energy saving mode, i.e. sleep, low-power or standby modes
- 70/3241 . . . . Domotics or building automation systems
- 70/325 . . . . . involving home automation communication networks
- 70/3258 . . . characterised by the end-user application
- 70/3266 . . . . The end-user application being or involving home appliances
- 70/3275 . . . . . The home appliances being or involving heating ventilating or air conditioning [HVAC] units
- 70/3283 . . . . . The system involving the remote operation of lamps or lighting equipment
- 70/3291 . . . . . The end-user application involving uninterruptible power supply [UPS] systems or standby or emergency generators ([for uninterruptible power supply systems or standby or emergency generators in the last power distribution stages Y04S 20/12](#))
- 70/34 . . Smart metering supporting the carbon neutral operation of end-user applications in buildings
- 70/343 . . . Systems which determine the environmental impact of user behavior
- 70/346 . . . Systems which monitor the performance of renewable electricity generating systems, e.g. of solar panels
- 80/00 Architectural or constructional elements improving the thermal performance of buildings**
- 80/10 . Insulation
- 80/12 . . Slab shaped vacuum insulation
- 80/14 . . Slab shaped aerogel insulation
- 80/20 . Windows or doors
- 80/22 . . Glazing
- 80/24 . . . Vacuum glazing
- 80/26 . . . Other special glazing, e.g. aerogel
- 80/28 . . Wooden or plastic frames with extra insulation
- 80/30 . Roofs
- 80/32 . . Roof garden systems
- 80/34 . . Roof coverings with high solar reflectance
- 80/40 . Floors specially adapted for storing heat or cold
- 80/50 . Light dependent control systems for sun shading
- 90/00 Enabling technologies or technologies with a potential or indirect contribution to GHG emissions mitigation**
- 90/10 . Applications of fuel cells in buildings
- 90/12 . . Cogeneration of electricity with other electric generators
- 90/14 . . Emergency, uninterruptible or back-up power supplies integrating fuel cells
- 90/16 . . Cogeneration or combined heat and power generation, e.g. for domestic hot water
- 90/18 . . Fuel cells specially adapted to portable applications, e.g. mobile phone, laptop
- 90/20 . Systems integrating technologies related to power network operation and communication or information technologies mediating in the improvement of the carbon footprint of the management of residential or tertiary loads, i.e. smart grids as enabling technology in buildings sector ([smart grids supporting the management or operation of end-user stationary applications in general, or like technologies with no associated climate change mitigation effect Y04S 20/00](#))
- 90/22 . . Systems characterised by the monitored, controlled or operated end-user elements or equipments

- 90/222 . . . the elements or equipments being or involving energy storage units, uninterruptible power supply [UPS] systems or standby or emergency generators involved in the last power distribution stages ([energy storage units involved in power generation, transmission or distribution Y04S 10/14; uninterruptible power supply systems or standby or emergency generators as end-user application Y04S 20/248](#))
- 90/224 . . . the elements or equipments being or involving protection elements, switches, relays or circuit breakers
- 90/226 . . . the elements or equipments being or involving power plugs, sockets, adapters or power strips
- 90/228 . . . the element or elements being a direct current power network, grid or distribution line
- 90/24 . . Smart metering mediating in the carbon neutral operation of end-user applications in buildings
- 90/241 . . . Systems characterised by remote reading
- 90/242 . . . . from a fixed location
- 90/243 . . . . from a mobile location
- 90/244 . . . . the remote reading system including mechanisms for turning on/off the supply
- 90/245 . . . Displaying of usage with respect to time, e.g. monitoring evolution of usage, relating usage to weather conditions
- 90/246 . . . Utility meters which are networked together, e.g. within a single building
- 90/247 . . . Retrofitting of installed meters
- 90/248 . . . Systems oriented to metering of generated energy or power
- 90/26 . . Communication technology specific aspects
- 90/2607 . . . characterised by data transport means between the monitoring, controlling or managing units and the monitored, controlled or operated electrical equipment
- 90/2615 . . . . using the power network as support for the transmission
- 90/2623 . . . . . using pulsed signals
- 90/263 . . . . . using modification of a parameter of the network power signal
- 90/2638 . . . . using a wired telecommunication network or a data transmission bus
- 90/2646 . . . . using phone lines
- 90/2653 . . . . using wireless data transmission
- 90/2661 . . . . . By means of mobile telephony
- 90/2669 . . . . involving the use of Internet protocol
- 90/2676 . . . Communication technology specific aspects
- 90/2684 . . . . using dedicated transmission supports
- 90/2692 . . . . using the power network as support for the transmission