

H02J

CIRCUIT ARRANGEMENTS OR SYSTEMS FOR SUPPLYING OR DISTRIBUTING ELECTRIC POWER; SYSTEMS FOR STORING ELECTRIC ENERGY

Definition statement

This place covers:

- ac and/or dc supplying systems
- ac and/or dc distribution networks
- circuit arrangements for battery supplies, including charging or control thereof, or co-ordinated supply from two or more sources of any kind
- circuit arrangement providing remote indication and control of a network switch
- systems for supplying or distributing electric power by electromagnetic waves

References

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Electrical networks for vessels	B63J
Electrical networks for aircrafts	B64D
Power supply circuits for apparatus for measuring X-radiation, gamma radiation, corpuscular radiation or cosmic radiation	G01T 1/175
Electric power supply circuits specially adapted for use in electronic time-pieces with no moving parts	G04G 19/00
For digital computers	G06F 1/26
For discharge tubes	H01J 37/248

Informative references

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

Steam turbines	F01K
Gas turbines	F02C
Wind power generation	F03D
Photovoltaic elements	H01L 31/00
Fuel cells	H01M 8/00
Boards, substations or switching arrangements	H02B
Electric protections	H02H
Circuits or apparatus for the conversion of electric power, arrangements for control or regulation of such circuits or apparatus	H02M
Control or regulation of electric motors, electric generators or dynamo-electric converters	H02P
Solar power generation	H02S
Control of high-frequency power	H03L

Additional use of power line or power network for transmission of information	H04B
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Special rules of classification

Claimed devices, systems, and methods always have to be classified. If there is additional information disclosed, then indexing codes for the additional information must be allocated.

If a breakdown indexing code of the subclass [H02J](#) (only for additional information) is given, it must always be accompanied by a main trunk symbol under [H02J](#), for invention or additional information.

Glossary of terms

In this place, the following terms or expressions are used with the meaning indicated:

Wireless energy transfer	non-conductive energy transfer, even if conductors can be used for implementing the separated sending and receiving units
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H02J 1/00

Circuit arrangements for dc mains or dc distribution networks

References

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Electric propulsion with power supplied within the vehicle	B60L 50/00
Electric circuits specially adapted for vehicles	B60R 16/00
Power supplies for memories	G05G
Power supply, e.g. DC power supply, for computers	G06F 1/26
Fuel cells	H01M 8/00
Power supplies for dc lamps	H05B 47/00

Informative references

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

Load protection by tripping of the load for dc systems	H02H
DC/DC power converters	H02M 3/00
AC/DC or DC/AC power converters	H02M 7/00

H02J 1/02

Arrangements for reducing harmonics or ripples

References

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Arrangements for reducing harmonics or ripples in converters	H02M 1/14
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H02J 1/10

Parallel operation of dc sources

Definition statement

This place covers:

Circuit arrangements, systems and methods for the parallel connection of DC sources. Parallel operation must be interpreted as the operational characteristics allowing that the parallel-connected sources supply the load, for instance, how to share the load among the different sources, or how to sequentially switch different power sources on.

References

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Parallel operation of dc sources involving batteries	H02J 7/34
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H02J 1/102

{being switching converters ([H02J 1/108](#), [H02J 1/12](#) take precedence)}

Definition statement

This place covers:

Parallel operation of DC sources, where the sources are switched mode power supplies (SMPS), i.e. power electronic converters with a DC output.

References

Limiting references

This place does not cover:

Parallel operation of dc sources using diodes blocking reverse current flow	H02J 1/108
Parallel operation of dc generators with converters, e.g. with mercury-arc rectifier	H02J 1/12

Informative references

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

Conversion of dc power input into dc power output without intermediate conversion into ac by static converters using semiconductor devices as final control devices for a single load	H02M 3/158
Single converters with a plurality of output stages connected in parallel	H02M 3/285

H02J 1/108

{using diodes blocking reverse current flow ([H02J 1/12](#) takes precedence)}

References**Limiting references**

This place does not cover:

Parallel operation of dc generators with converters, e.g. with mercury-arc rectifier	H02J 1/12
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H02J 1/14**Balancing the load in a network****Definition statement**

This place covers:

Balancing the load in a DC distribution network, either by avoiding overloading one section of the network, or by load shedding

Relationships with other classification places

Group [H02J 1/14](#), in practice, relates for load shedding. Load balancing by buffering is classified in group [H02J 7/34](#).

References**Application-oriented references**

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Balancing the load in a network by batteries	H02J 7/34
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H02J 3/00**Circuit arrangements for ac mains or ac distribution networks****Definition statement**

This place covers:

- Arrangements for selectively connecting the load to one among a plurality of power lines or power sources
- Arrangements for reducing harmonics or ripples

Definition statement

- Arrangements using a single network for simultaneous distribution of power at different frequencies; using a single network for simultaneous distribution of ac power and of dc power
- Arrangements for connecting networks of the same frequency but supplied from different sources
- Constant-current supply systems
- Arrangements for adjusting, eliminating, or compensating reactive power in networks
- Arrangements for preventing or reducing oscillations of power in networks
- Arrangements for eliminating or reducing asymmetry in polyphase networks
- Arrangements for balancing of the load in a network by storage of energy
- Arrangements for transfer of electric power between networks of substantially different frequency
- Arrangements for transfer of electric power between ac networks via a high-tension dc link
- Arrangements for parallelly feeding a single network by two or more generators, converters or transformers

References

Informative references

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

Wind turbines	F03D 9/00
Computer systems for trading	G06Q 30/00
Systems, methods for trading (electricity/gas/water)	G06Q 50/06
Details of switches for load protection	H01H
Photovoltaic panel	H01L 31/00
Mechanical details of connectors	H01R
Electromechanical details	H02B
Load protection by tripping of the load for ac systems	H02H
Harmonic reduction application for converters	H02M 1/12
Details of converters for reactive power compensation and ac power generation from dc sources	H02M 7/48
Details of converters for HVDC	H02M 7/7575
Preventing/reducing oscillation with a single generator	H02P 9/00

H02J 3/005

{Arrangements for selectively connecting the load to one among a plurality of power lines or power sources (for providing uninterruptable power supply [H02J 9/00](#))}

References

Limiting references

This place does not cover:

Arrangements for providing uninterruptable power supply	H02J 9/00
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H02J 3/01

Arrangements for reducing harmonics or ripples

References

Informative references

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

Arrangements for reducing harmonics or ripples in converters	H02M 1/12
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H02J 3/06

Controlling transfer of power between connected networks; Controlling sharing of load between connected networks

References

Informative references

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

Arrangements for feeding a single network by two or more generators, converters or transformers in parallel	H02J 3/38
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H02J 3/12

for adjusting voltage in ac networks by changing a characteristic of the network load

References

Informative references

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

Voltage regulation	G05F 1/10
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H02J 3/18

Arrangements for adjusting, eliminating or compensating reactive power in networks (for adjustment of voltage [H02J 3/16](#))

Relationships with other classification places

In group [H02H 9/08](#), the coil is not used for any reactive power compensation, but for limiting earth fault currents.

References

Limiting references

This place does not cover:

Arrangements for adjusting voltage in ac networks by changing a characteristic of the network load by adjustment of reactive power	H02J 3/16
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Informative references

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

Use of Petersen coils	H02H 9/08
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H02J 3/1842

{wherein at least one reactive element is actively controlled by a bridge converter, e.g. active filters}

References**Informative references**

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

if the bridge combines both series and shunt compensators	H02J 3/1814
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H02J 3/24

Arrangements for preventing or reducing oscillations of power in networks (by control effected upon a single generator [H02P 9/00](#))

Definition statement

This place covers:

Circuit arrangements, devices and methods for preventing, avoiding or correcting oscillations of voltage, current or power in an AC power network

References**Limiting references**

This place does not cover:

Arrangements for preventing or reducing oscillations of power in networks by control effected upon a single generator	H02P 9/00
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H02J 3/32

using batteries with converting means

References**Informative references**

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

Vehicle-to-grid [V2G] arrangements	B60L 55/00
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H02J 3/34

Arrangements for transfer of electric power between networks of substantially different frequency

References

Informative references

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

Frequency converters	H02M 5/00
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H02J 3/38

Arrangements for parallely feeding a single network by two or more generators, converters or transformers

References

Informative references

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

Vehicle-to-grid [V2G] arrangements	B60L 55/00
Parallel connections of DC/AC converters not for feeding a network, but a local load	H02M 7/493

H02J 4/00

Circuit arrangements for mains or distribution networks not specified as ac or dc

Definition statement

This place covers:

Circuit arrangements for mains or distribution networks containing both ac and dc (for instance, for planes) or for (rarely) networks whose nature (AC or DC) is not specified

H02J 5/00

Circuit arrangements for transfer of electric power between ac networks and dc networks ([H02J 3/36](#) takes precedence)

Definition statement

This place covers:

Circuit arrangements, systems and methods for supplying a DC load from an AC power source. Only general purpose circuits (not application-oriented/driven) are classified here.

References

Limiting references

This place does not cover:

Arrangements for transfer of electric power between ac networks via a high-tension dc link	H02J 3/36
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Informative references

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

Circuit arrangements for dc mains or dc distribution networks	H02J 1/00
Details for sending and receiving coils	H01F
Ac/dc or dc/ac converters	H02M 7/00

Special rules of classification

A system used for feeding an ac distribution network from the output of DC power source like fuel cells, solar panels belongs to [H02J 3/38](#) and not to [H02J 5/00](#), even if a DC to AC transfer is involved.

H02J 5/005

{with inductive power transfer (for charging [H02J 7/025](#))}

Definition statement

This place covers:

Circuit arrangements for transfer of electric power between ac networks and dc networks by inductive transfer, i.e. the sending coil being part of the source and the receiving coil being part of the load and coupling is in the near field region.

References

Informative references

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

Transmission involving transformers	H02J 3/00
Transmission by means of electromagnetic waves, e.g. microwave, RF, and far-field inductive coupling. In practice, long distance wireless transmission	H02J 50/00
Near-field transmission systems, e.g. inductive loop type	H04B 5/00

Special rules of classification

[H02J 5/005](#) should be allocated even, if the power source is not ac mains or if it is not better specified. For example, if the power source is a fuel cell, [H02J 5/005](#) has to be allocated, and additionally **H02J2001/004**

With regard to wireless power transfer vs wireless battery charging; any document with relevant technical features about near-field inductive power transfer, should come here. If it is involved in battery charging, then double classification under [H02J 7/025](#) must be considered.

H02J 7/00

Circuit arrangements for charging or depolarising batteries or for supplying loads from batteries

Definition statement

This place covers:

Circuit arrangements for charging batteries. Rarely, general-purpose discharging, battery management, e.g. sequentially discharging batteries, or load-supplying, e.g. when they are not too concerned by the characteristics of the load.

References

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Charging stations or on-board charging equipment for electrically-propelled vehicles	B60L 53/00
Details of telephone stands	H04M

Informative references

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

Electrical circuits for vehicles	B60R
Vehicle starting circuits	F02D
Methods for charging or discharging secondary cells	H01M 10/44
Mechanical details of battery charger alternators	H02K
DC/DC power converters	H02M 3/00
AC/DC or DC/AC power converters	H02M 7/00
Perpetuum mobile	H02N
Control of alternators	H02P 9/00

Special rules of classification

If the document deals with the controlled charging of a capacitor, e.g. a supercapacitor, it is mandatory to assign a combination of the symbol [H02J 7/345](#) and CPC symbols, which would apply, if the capacitor was replaced with a battery.

H02J 7/0027

{Stations for charging mobile units, e.g. of electric vehicles, of mobile telephones ([H02J 7/0021](#), [H02J 7/0026](#) take precedence)}

Definition statement

This place covers:

Battery charging characterized by a physical or electrical arrangement allowing the simultaneous charge of a plurality, i.e. two or more, of mobile units, e.g. mobile phones, machine-tools or electric/hybrid vehicles.

References

Limiting references

This place does not cover:

Monitoring or indicating circuits	H02J 7/0021
Safety or protection circuits, e.g. overcharge/discharge disconnection	H02J 7/0026
Details of stations for charging electric vehicles, e.g. vehicle recognition or identification, billing or payment, charging columns for electric vehicles, automatic adjustment of relative position, vehicle to grid (V2G) arrangements.	B60L 53/00

H02J 7/0077

{the charge cycle being terminated in response to electric parameters
(H02J7/0093 takes precedence)}

Definition statement

This place covers:

- Controlling charge in response to current
- Controlling charge in response to voltage
- Controlling charge in response to both current and voltage

References

Limiting references

This place does not cover:

Regulation of charging current or voltage with introduction of pulses during the charging process	H02J7/0093
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Synonyms and Keywords

In the definition [H02J 7/0077](#) and subgroups the word "terminated" has to be interpreted as "controlled"

H02J 7/025

{using non-contact coupling, e.g. inductive, capacitive}

Definition statement

This place covers:

Non-contact coupling, i.e. the sending coil or the first capacitor plate being part of the supplying source and the receiving coil or the second capacitor plate being part of the energy receiving circuit and coupling is in the near field region.

References

Informative references

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

Near-field transmission systems, e.g. inductive loop type	H04B 5/00
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Special rules of classification

The classification symbol [H02J 7/025](#) should be given even if the charging source is not ac mains or if it is unspecified. For example, if the charging source is a photovoltaic cell, classification is made in [H02J 7/35](#) and additionally in [H02J 7/025](#). Features regarding wireless power transfer itself are classified under [H02J 50/00](#).

H02J 7/34

Parallel operation in networks using both storage and other dc sources, e.g. providing buffering ([H02J 7/14](#) takes precedence)

Definition statement

This place covers:

Battery charging where power comes from one or more different DC power sources, e.g. charging from solar arrays. It may further involve the supply of a load and the resulting modes of operation (battery charging, battery supplying the load).

References

Limiting references

This place does not cover:

Arrangements for charging batteries from dynamo-electric generators driven at varying speed, e.g. on vehicle	H02J 7/14
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H02J 9/00

Circuit arrangements for emergency or stand-by power supply, e.g. for emergency lighting

Definition statement

This place covers:

Power sources acting when the main source fails, i.e. uninterruptible (on-line and off-line) power supplies [UPS] and back-up power supplies

Power supplies able to operate in a "standby" mode (low power or sleep modes).

References

Informative references

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

With provision for charging standby battery	H02J 7/00
UPS for computers	G06F 1/00
UPS for communication stations	H04M
Details of lamp	H05B 47/00

Special rules of classification

The following Indexing Codes are to be used for classifying additional information:

H02J 9/007	power saving operation when no load is present
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H02J 9/063	common neutral
H02J 9/067	using a single transformer with multiple primaries (one for each ac energy source) and a secondary for the loads
H02J 9/068	electronic means for switching from one power supply to another, avoiding parallel connection

H02J 9/02

in which an auxiliary distribution system and its associated lamps are brought into service

Definition statement

This place covers:

Emergency light systems integrated typically by a back-up power source, a set of lamps and a dedicated auxiliary distribution system powering the lamps from the back-up power source

References

Informative references

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

A lamp not being an emergency lamp, but a lamp which is normally fed by the mains and during contingency by a battery, even if no dc/ac converters are not involved	H02J 9/065
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H02J 9/061

{for DC powered loads}

Definition statement

This place covers:

Emergency, back-up or standby power supplies integrating power electronic converters for the different power conversions within the units: e.g. rectifiers, battery chargers, voltage regulators.

H02J 11/00

Circuit arrangements for providing service supply to auxiliaries of stations in which electric power is generated, distributed or converted

References

Informative references

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

Emergency or standby power supply arrangements	H02J 9/00
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H02J 13/00

Circuit arrangements for providing remote indication of network conditions, e.g. an instantaneous record of the open or closed condition of each circuitbreaker in the network; Circuit arrangements for providing remote control of switching means in a power distribution network, e.g. switching in and out of current consumers by using a pulse code signal carried by the network

Definition statement

This place covers:

[H02J 13/00](#) covers operation-related documents, i.e. there must be at least switching on/off or generator or load (or information of such an event) or any other similar action (i.e. sending settings of an inverter connecting a photovoltaic array to the power network).

It also covers specific monitoring of power networks (tailored to such application).

Concerning smart grids, documents where the relevant features concern electrical engineering and not ICT technologies, are classified here.

References

Informative references

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

Electricity meters involved (in particular smart meters)	G01D 4/00
Measuring of electric variables	G01R
Power strips with locally controlled on/off capability for computers	G06F 1/266
Data processing systems or methods adapted for electricity supply	G06Q 50/06
Transmission systems for measured values or control signals	G08C
Details of switches	H01H
Circuits for indication of single switches	H01H 9/167
Power strips with locally controlled on/off capability	H01R 13/66
Power line carrier	H04B 3/54
Transmission of digital information	H04L
Telecontrol or telemetry systems	H04Q 9/00
Wireless communication	H04W

H02J 15/00

Systems for storing electric energy (mechanical systems therefor [F01-F04](#); in chemical form [H01M](#))

Definition statement

This place covers:

Energy storage systems having either relevant power management issues, or having (or be ready/able for) an interaction with the (AC or DC) power network (but with focus on the storage system). The subject-matter stays normally at system level (there are other CPC technical fields dealing with the

Definition statement

specific storage technologies). Under this approach, the group has two subdivisions according to two different technologies:

- Systems for storing electric energy in the form of hydraulic energy
- Systems for storing electric energy in the form of pneumatic energy

References

Limiting references

This place does not cover:

Mechanical systems therefor	F01 - F04
Systems for storing electric energy in chemical form	H01M

Informative references

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

Balancing the load in a network by storage of energy	H02J 3/28
Hydrogen production by electrolyses of water	C25B 1/04
Storage heaters	F24H 7/00
Heat storage	F28D 20/00
Capacitors	H01G
Flywheels for dynamo-electric machines	H02K 7/02

H02J 50/00

Circuit arrangements or systems for wireless supply or distribution of electric power

Definition statement

This place covers:

Functional and operational aspects of systems for the wireless supply or distribution of electric power, regardless of the type of wireless power transmission used.

Circuit arrangements for the wireless supply or distribution of electric power.

In this main group, wireless supply or distribution of electric power involves both of the following steps:

- (1) conversion of electrical energy from a power source for transfer by wireless transmission;
- (2) reception of the wirelessly transmitted energy and re-conversion into electrical energy for distribution or delivery to an electrical load.

References

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Inductive energy transfer between a charging station and an electric vehicle	B60L 53/12
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Synonyms and Keywords

In patent documents, the following abbreviations are often used:

WPT	Wireless Power Transfer
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In patent documents, the following words/expressions are often used as synonyms:

- "cordless power transfer" or "wireless power transmission" or "wireless energy transmission" or "wireless power transfer" or "contactless power transfer"

H02J 50/05

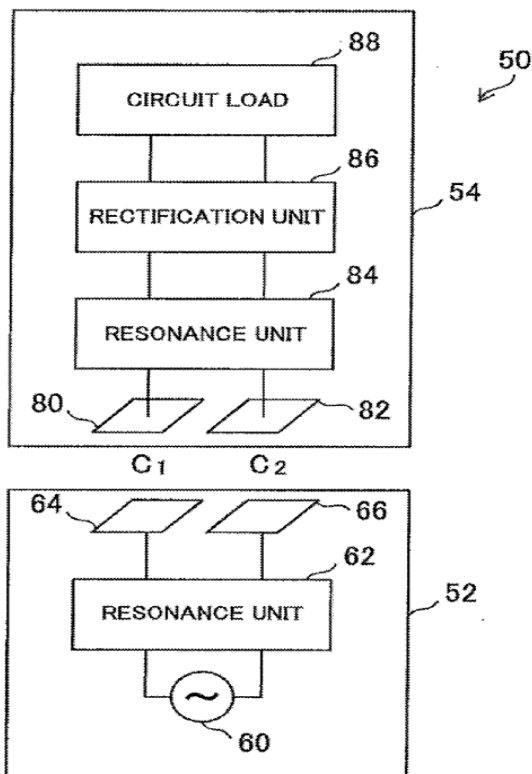
using capacitive coupling

Definition statement

This place covers:

Circuit arrangements or systems for wireless supply or distribution of electric power using capacitive coupling between the plates of at least two capacitive elements, the plates being located in separate units involved in contactless power transmission.

The figure below is an illustrative example which falls within the scope of this subgroup. In the figure, the pairs of plates 64 and 80, and 66 and 82 create two capacitive elements C1 and C2 through which power is transferred from a power transmitter 52 to a power receiver 54.



References

Informative references

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

Capacitors; Capacitors, rectifiers, detectors, switching devices, light-sensitive or temperature-sensitive devices of the electrolytic type	H01G
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H02J 50/10

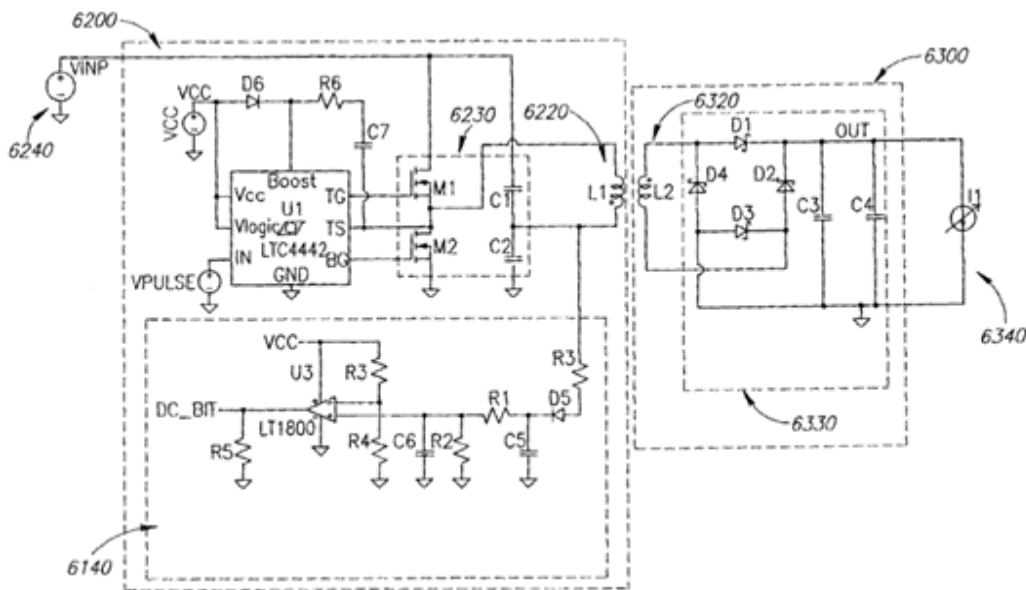
using inductive coupling

Definition statement

This place covers:

Circuit arrangements or systems for wireless supply or distribution of electric power using inductive coupling, i.e. electromagnetic interaction between two or more inductive coils, at least one coil being located in a unit separate from the others, the units being involved in contactless power transmission.

The figure below is an illustrative example which falls within the scope of this subgroup.



References

Informative references

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

Magnets; inductances; transformers	H01F
Adaptations of transformers or inductances for inductive coupling	H01F 38/14
Conversion of dc power input into dc power output	H02M 3/00
Conversion of ac power input into ac power output	H02M 5/00
Conversion of ac power input into dc power output; conversion of dc power input into ac power output	H02M 7/00
Induction heating	H05B 6/02

H02J 50/12

of the resonant type

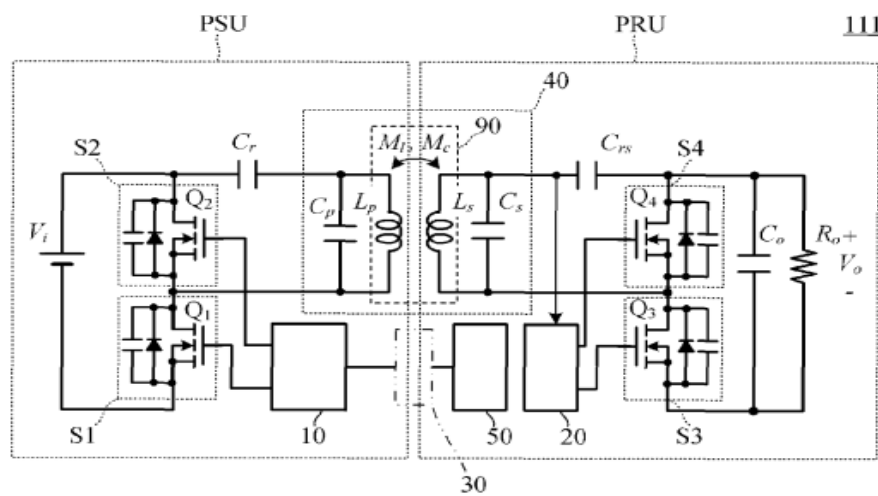
Definition statement

This place covers:

Circuit arrangements or systems for wireless supply or distribution of electric power using inductive coupling of the resonant type, i.e. in which at least one coil forms part of a resonant circuit.

In the illustrative example, resonant circuits Cr-Cp-Lp and Crs-Cs-Ls constitute a resonant circuit 40 which has a specific resonant frequency f_r at which the total impedance of the resonant circuit 40 is minimized so that transmission efficiency of electric power between the power emitter circuit in PSU and power receiver circuit in PRU is increased.

FIG. 1



References

Informative references

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

Magnets; inductances; transformers	H01F
Converters	H02M
Resonant circuits, resonators	H03H
Tuning resonant circuits	H03J

H02J 50/15

using ultrasonic waves

References

Informative references

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

Non-electric signal transmission systems using acoustic waves	G08C 23/02
Transmission systems employing ultrasonic waves	H04B 11/00

H02J 50/20

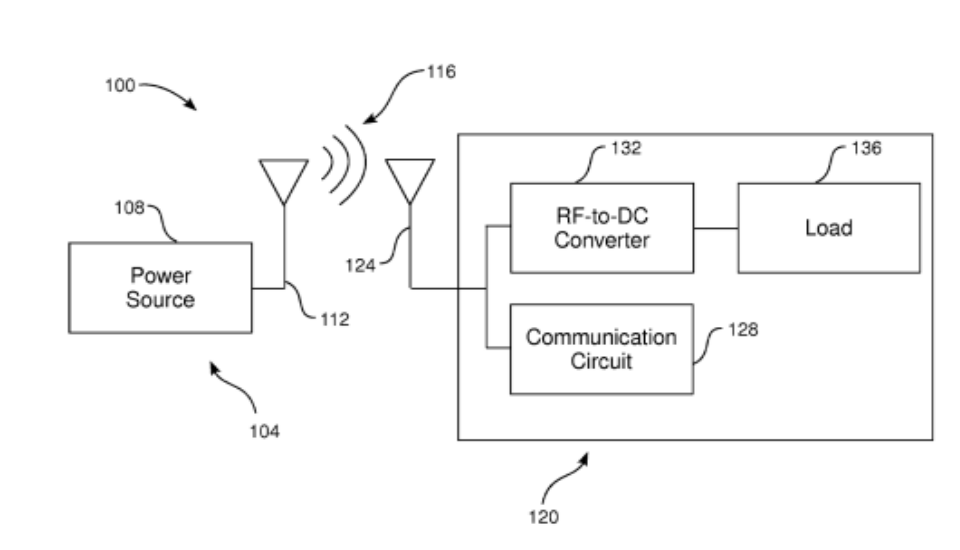
using microwaves or radio frequency waves

Definition statement

This place covers:

Circuit arrangements or systems for wireless supply or distribution of electric power using microwaves or radio frequency waves.

The figure below exemplifies the subject-matter to be classified in this subgroup. Power generated in power source 108 is converted into radiofrequency and transmitted by antenna 112 in transmitter 104 to antenna 124 in receiver 120, and used to power load 136.



References

Informative references

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

Radiofrequency identification	G06K
Aerials	H01Q
Radio transmission systems	H04B 7/00

H02J 50/23

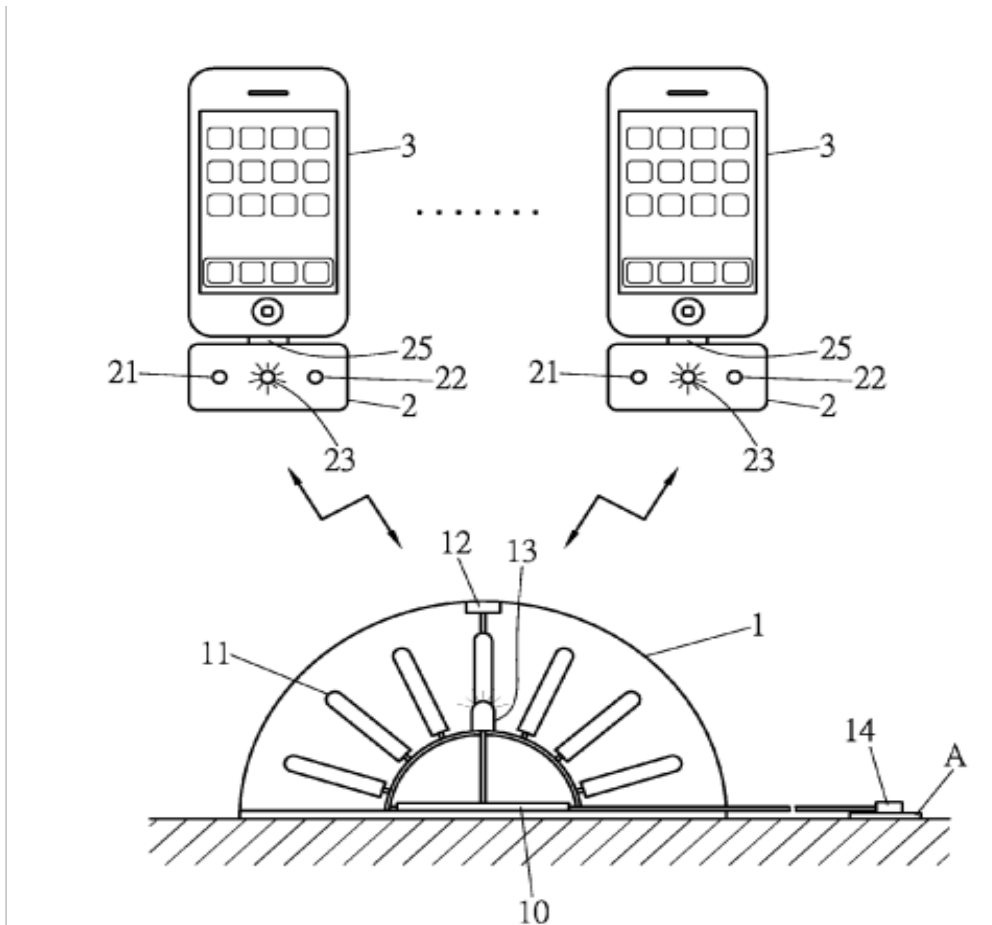
characterised by the type of transmitting antennas, e.g. directional array antennas or Yagi antennas

Definition statement

This place covers:

Circuit arrangements or systems for wireless supply or distribution of electric power using microwaves or radio frequency waves, characterised by the type of transmitting antennas, e.g. directional array antennas or Yagi antennas

The figure below is an illustrative example relevant for this subgroup. The directional antenna 11 of the transmitting station 1 sends power to the receiver 21 of the charging device 2.



References

Informative references

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

Types of antennas, structural details or features of antennas, special arrangements of antennas	H01Q
Radio transmission systems	H04B 7/00

H02J 50/27

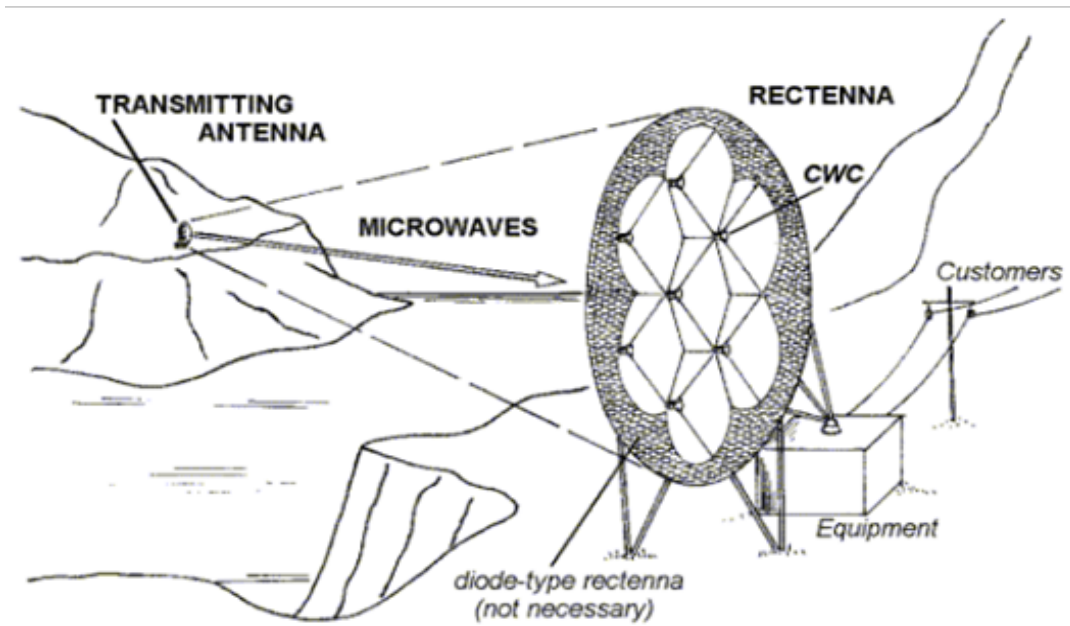
characterised by the type of receiving antennas, e.g. rectennas

Definition statement

This place covers:

Circuit arrangements or systems for wireless supply or distribution of electric power using microwaves or radio frequency waves characterised by the type of receiving antennas, e.g. rectennas.

The figure below is an illustrative example relevant for this subgroup.



References

Informative references

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

Types of antennas, structural details or features of antennas, special arrangements of antennas	H01Q
Radio transmission systems	H04B 7/00

H02J 50/30

using light, e.g. lasers

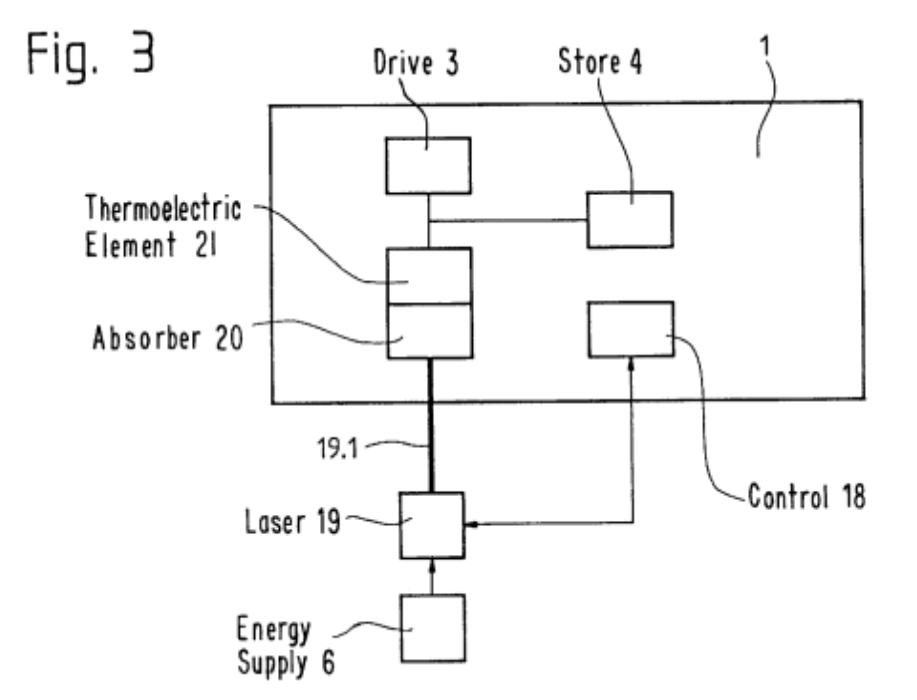
Definition statement

This place covers:

Circuit arrangements or systems for wireless supply or distribution of electric power using light, e.g. lasers

The figure below is an illustrative example for this subgroup. A laser 19.1 emitted by laser unit 19 heats absorber 20 and heat is converted into electrical energy by thermoelectric element 21.

Fig. 3



References

Informative references

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

Non-electric transmission systems using light waves	G08C 23/04
Lasers	H01S 3/00
Transmission systems employing infrared, visible or ultraviolet light	H04B 10/00

H02J 50/40

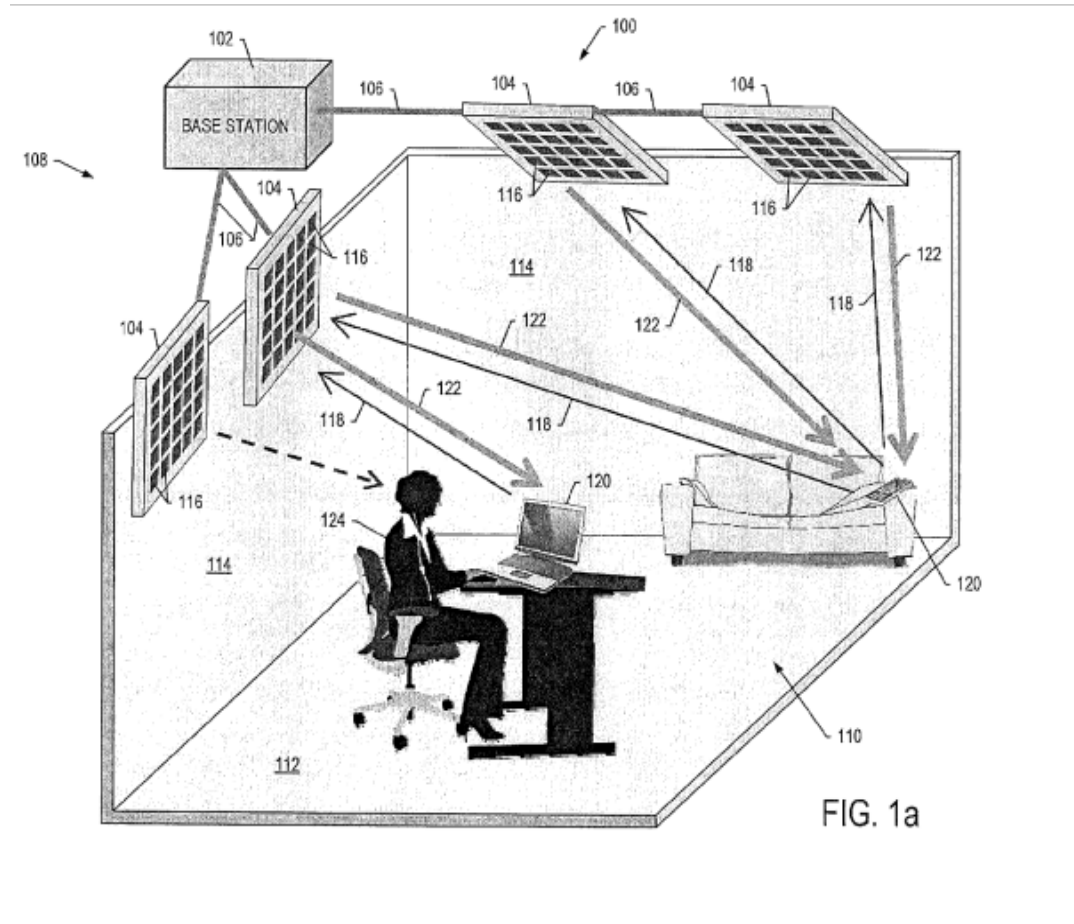
using two or more transmitting or receiving devices ([H02J 50/50](#) takes precedence)

Definition statement

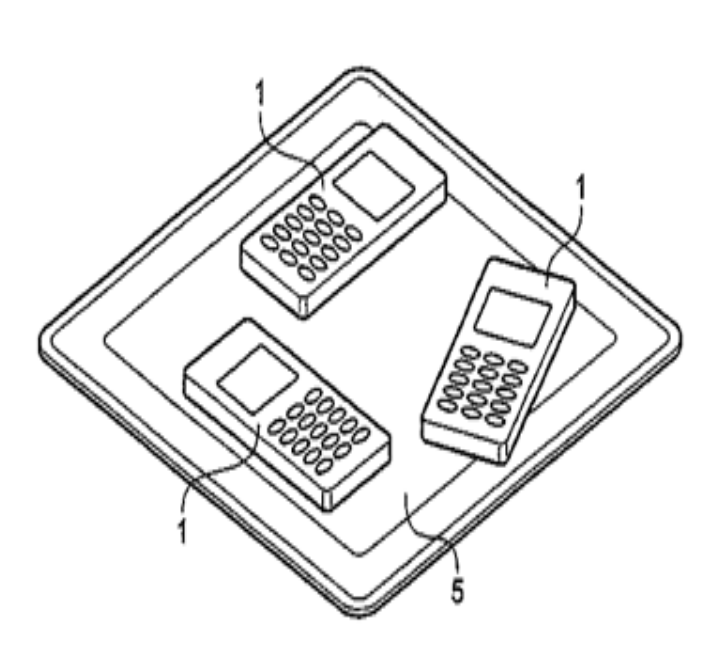
This place covers:

Circuit arrangements or systems for wireless supply or distribution of electric power involving two or more transmitting or receiving devices.

The figure below is also an illustrative example for this subgroup. In the figure, the several transmitting devices transmit electric power to several receiving devices simultaneously.



The figure below is also an illustrative example of this subgroup with two or more receiving devices involved. In the figure, the transmitting device transmits electric power to several receiving devices 1 simultaneously



References

Limiting references

This place does not cover:

using additional energy repeaters between transmitting devices and receiving devices	H02J 50/50
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Informative references

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

Radio transmission diversity systems using a plurality of spaced independent aerials	H04B 7/04
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H02J 50/50

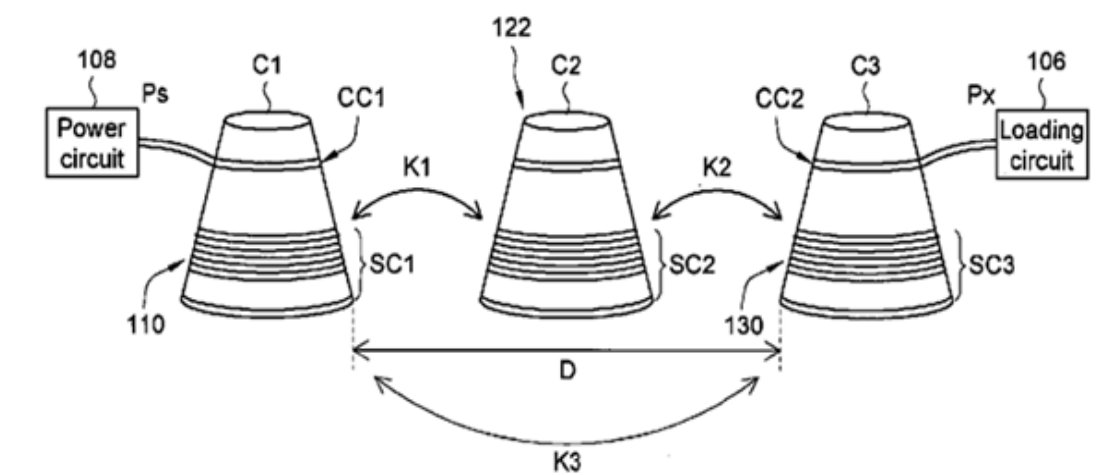
using additional energy repeaters between transmitting devices and receiving devices

Definition statement

This place covers:

Circuit arrangements or systems for wireless supply or distribution of electric power using additional energy repeaters between transmitting devices and receiving devices. The repeater(s) must be physically located between the transmitting devices the receiving devices, and must be separate from them.

The figure below is an example falling within the scope of this subgroup. In the figure, the repeater C2 repeats electric power transmission between the transmitting device C1 and the receiving device C3.



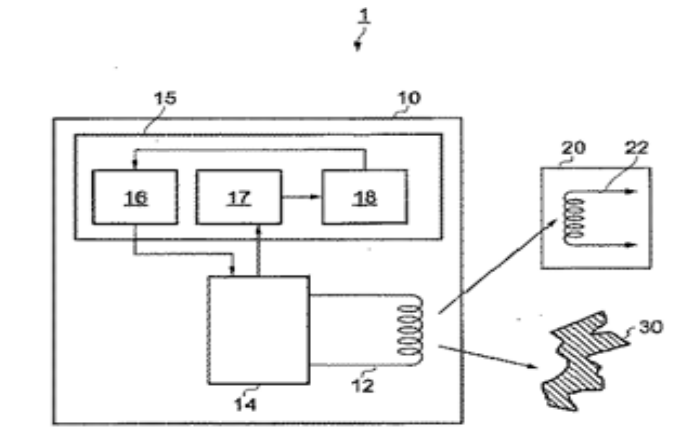
H02J 50/60

responsive to the presence of foreign objects, e.g. detection of living beings

Definition statement

This place covers:

The figure below is an illustrative example for this subgroup. In the figure, the transmitting device 10 detects the presence of the foreign object 30.



Relationships with other classification places

Mechanical aspects related to mechanical removing of foreign object are classified in the relevant field of technology.

References

Informative references

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

Detection of object presence using reflection of radio waves	G01S 13/04
Detection of object presence using reflection of acoustic waves	G01S 15/04
Electric or magnetic detection of objects	G01V 3/08 ; G01V 3/15
Optical detection of objects	G01V 8/10

H02J 50/70

involving the reduction of electric, magnetic or electromagnetic leakage fields

References

Informative references

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

Details of transformers or inductances - special means for preventing or reducing unwanted electric or magnetic effects, e.g. leakage fields	H01F 27/34
Devices for absorbing waves radiated from an aerial	H01Q 17/00
Suppression or limitation of noise or interference	H04B 15/02
Screening of apparatus or components against electric or magnetic fields	H05K 9/00

H02J 50/80

involving the exchange of data, concerning supply or distribution of electric power, between transmitting devices and receiving devices

References

Informative references

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

IC cards	G06K 19/07
Transmitting signals characterised by the use of a wireless electrical link	G08C 17/00
Non-electric signal transmission systems	G08C 23/00
Responders; (passive) Transponders	H04B 1/59
Near-field transmission systems, e.g. inductive loop type	H04B 5/00
Transmission systems employing electromagnetic waves other than radio-waves	H04B 10/00

H02J 50/90

involving detection or optimisation of position, e.g. alignment

Definition statement

This place covers:

Circuit arrangements or systems for wireless supply or distribution of electric power electrically detecting and/or optimising the relative position between emitters, receivers and repeaters, aiming to increase the efficiency of the wireless power transmission, wherein active parts of these circuit arrangements or systems, e.g. coils or antennas, are involved in the detection and/or optimising of the position.

References

Informative references

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

Detection of object position using reflection of radio waves	G01S 13/06
Detection of object position using reflection or reradiation of electromagnetic waves other than radio waves	G01S 17/06
Control of position of vehicles, e.g. automatic pilot	G05D 1/00
Position control	G05D 3/00