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(54) System, method and apparatus for protecting objects, individuals and entities.

(57) System, method and apparatus for protecting objets, individuals and entities, such as human beings, livestock and things, and in particular for protecting children at play. The system comprises a central station (20) and one or more mobile and portable subsidiary stations (10), each subsidiary station providing sustained transmission of energy waves and said central station comprising a receiver means (21, 22) having adjustable input sensitivity (23) and an alarm device (27) signalling insufficient input at the receiver means from said transmitted energy waves. Apparatus to be attached to a subject under surveillance may be embodied in a trinket sized package or as a labeling means.

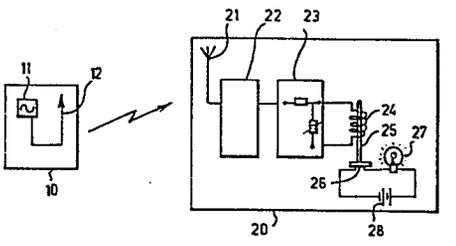

FIG. 1

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Field of the Invention

The invention relates in general to a system, a method and an apparatus, for protecting objects, individuals and entities, such as human beings, live-stock and things, comprising transmitter means for sustained wireless transmission of energy waves.

Background of the Invention

Protection systems, methods and apparatus of a type known in the art comprise a label to be attached to the object of surveillance and a transmitter means generating a magnetic field at any exit port of an area under surveillance, said label carrying a device interacting with the local field caused by the transmitter means at an exit port, thus enabling an alarm device at said exit port. Only an object not having a label attached to it may leave said area freely, that is without raising an alarm signal.

A further protection system, method and apparatus of a type known in the art fully covers the area under surveillance with electromagnetic radiation beamed across said area, and signals the presence of moving and/or stationary objects in that area indiscriminately with respect to their identity.

It is thus an object of the invention to provide a system, method

and apparatus for protection, whereby the protected subject is unhampered as to its movements within the area under surveillance or when exiting said area.

A further objective of the invention is to provide a system, method and apparatus to effect in an unobtrusive way discrimination of protected subjects in the area under surveillance.

Brief summary of the Invention

The invention relates to a wireless system for protecting objects, individuals and entities, such as human beings, live-stock and things.

According to the invention the said wireless protection system comprises a central station including wireless receiver means, and at least one mobile and portable subsidiary wireless transmission comprising a wireless transmitter means for transmitting signal energy, said wireless receiver means being adapted for sensing said transmitted signal energy and having a threshold means for rejecting any sensed signal at an energy level below an adjustable threshold level, a trigger means to be enabled by signal energy above threshold level and an alarm device to be activated by said trigger means.

The invention is advantageous in that its implementation requires only little space, both at the transmitter end and at the receiver end. Its application is in particular satisfactory when providing a child at play with a subsidiary station means and its guardian with a central station means.

Brief description of the drawings

The invention will be illustrated by way of example only in the following description of two embodiments.

Fig. 1 in the accompanying drawing is a schematic diagram of a first embodiment according to the invention.

Fig. 2 is a schematic diagram of a further embodiment according to the invention.

Fig. 3 is a schematic diagram of a modification of the embodiment according to the invention shown in Fig. 1.

In fig. 1 a transmitter means generally indicated with the reference numeral 10 comprises a generating device 11 and an antenna device 12 being interconnected to have a sustained transmission of electromagnetic energy waves carrying such energy and such information as to enable identification, e.g. by transmitting continuous waves at one specific frequency. An on/off switching means (not shown) is comprised in said generating device 11 for activating same from an energy source (not shown). Said transmitter means 10 thus is self-contained and is comprised in a portable means, such as a trinket or a label, which can be attached to any carrier to be protected.

A receiving station or central station generally indicated in the one figure with reference numeral 20 comprises a receiving antenna 21, a detecting and discriminating stage 22 to be tuned to the energy waves transmitted by transmitter means 10, a threshold adjustment means 23 comprising a variable potentiometer means, a relay coil 24 and a relay armature 25 under control of said coil 24 and adapted to close an interrupter 26 in a circuit further comprising an alarm device 27 and an energy supply means 28 to feed said alarm device. An electrical current output of threshold means 23 of sufficient intensity will thus cause the armature 25

to interrupt the alarm device circuit.

Threshold adjustment means 23, relay coil 24 and relay armature 25 make up a threshold and trigger means in receiver means 20, and having an adjustable threshold level.

As a result alarm device 27 will be actuated when insufficiently receiving signal wave energy from transmitter means 10, that is below a level set in threshold adjustment means 23. When and if transmitter means 10 is away from receiver means 20 beyond a predetermined distance, the alarm device 27 will be actuated. Such a predetermined distance can be selected by adjustment of the level adjustment means 23.

Fig. 2 shows a further embodiment of the wireless protection system according to the invention. In a subsidiary wireless station 30 a transmitter 32 is under control of a coder 31. In a central wireless station 40 a receiver 41 is arranged to receive coded signal energy from the transmitter 32. Decoding of the received signal energy in the receiver 41 produces by means of a pulse generator 42 sync pulses. The generated sync pulses are applied to an adjustable time delay means 44 and to one of two inputs of an AND gating means 47. The time delay means is adjusted to represent a time period in accordance with time lapsed in propagation of signal energy from transmitter to receiver if and when the transmitter is at a predetermined distance from the receiver. The selected adjustment starts from a zero setting representing synchronization between sync pulses and clock pulses from a clock 45 during an initiating time interval under control of a timing means 46 causing a normally open switch 51 to close and connect the delay means output to clock 45 during said initiating time interval.

Clock 45 is operating at the same rate as the sync pulses generated in pulse generator 42. The clock pulses are applied to the further input of AND-gating means 47. The clock pulses will reach an accumulating device 48 only if they appear at AND-gating means 47 in synchronisation with the sync pulses.

Clock pulses being accumulated in accumulating device 48 will enable an alarm device 49.

Thus at the point of time that the subsidiary station 30 being carried by an object under surveillance, arrives in a position at the predetermined distance from the central station 40, alarm device 49 in central station 40 will be activated. This means that the object under surveillance gets out of reach or is endangered.

In this embodiment the setting of the number of clock pulses to be accumulated in accumulating device 48 for enabling alarm device 49 is operative as a threshold level.

Optionally central station comprises a signal wave energy transmitting means and secundary station comprises a receiving means adapted to receive the thus transmitted signal wave energy. Fig. 3 shows a modification of a protection system embodiment according to Fig. 1. Central station 60 comprises a transmitter means 61 arranged to transmit pulse wise signal wave energy at predetermined time intervals. A receiver 51 at secundary station 50 is arranged to receive signal wave energy pulses transmitted by central station transmitter 61. The arrangement of receiver 51 is generally identical to the arrangement of the receiving means shown in Fig. 1 as included in central station 20. The embodiment shown in Fig. 3 is different in that alarm device 27 is used to enable transmitter 52 to transmit signal wave energy for a

restricted period of time, preferably comprising two pulses as transmitted by central station 60. The arrangement of receiver 62 comprised in central station 60 also is identical to the arrangement of the receiving means shown in Fig. 1.

Failure to receive signal wave energy at a level above threshold from transmitter 52 in receiver 62 will cause operation of the alarm device in central station 60.

In the above the preferred embodiments have been described using electromagnetic waves to interconnect central station (receiver means) and subsidiary station (transmitter means).

Use of infra red light wave energy or ultrasound wave energy is envisaged to provide such interconnection, primarily to avoid of interference.

Also a central station may be equipped with alarm devices which are each being responsive to one of a plurality of subsidiary stations respectively to keep track of a plurality of individuals or entities to be protected. A central station comprising a receiver means and an alarm device may be conveniently comprised in a portable and self-contained package for versatile utilization.

CLAIMS:

1. System for protecting objects, individuals and entities, such as human beings, live-stock and things, comprising a central station including wireless receiver means, and at least one mobile and portable subsidiary wireless transmission station for transmitting signal energy, said receiver means being adapted for sensing said transmitted signal energy and having a threshold means for rejecting any sensed signal at an energy level below an adjustable threshold level, a trigger means to be enabled by signal energy above threshold level and an alarm device to be activated by said trigger means.

2. Wireless protection system according to claim 1, characterized in that said central station receiver means comprises a decoding means deriving sync signal energy from received signal energy a clock means delivering clock pulses at the transmission rate of the said sync signals and comprising a synchronizing device, an initiating device for temporarily connecting sync signal energy output to said synchronizing device and comprising an adjustable time delay means for sync signal energy said threshold means comprising an AND gating means having an input for said clock pulses and an input for said sync signal energy, and said trigger means comprising an accumulating device for receiving clock pulses from said AND gating means.

3. Wireless protection system according to claim 1, characterized in that said central station comprises a central wireless transmitter means and a said subsidiary station comprises a receiver and trigger means to be enabled by said central wireless transmitter means and activating said signal energy transmitting wireless transmitter, said receiver and trigger means having an adjustable input sensitivity means.

4. Wireless protection system according to claim 1 or claim 2, characterized in that the said wireless transmitter means and receiver means each are adapted for sustained transmission of h.f. electromagnetic wave energy.

5. Wireless protection system according to claim 1 or claim 2, characterized in that the said wireless transmitter means and receiver means each are adapted for sustained transmission of infra red wave energy.

6. Wireless protection system according to claim 1 or claim 2, characterized in that the said wireless transmitter means and receiver means each are adapted for sustained transmission of ultrasonic wave energy.

7. A method for protecting individuals and entities, such as human beings, live-stock and things, comprising the steps of attaching a signal energy transmitter means to said individual or entity and adjusting a threshold level means in a central signal energy receiver means thus selecting a range wherein protection is provided.

8. An apparatus for protecting an individual or an entity, such as human beings, live-stock and things, comprising a mobile and portable wireless transmitter means being self-contained and

operable through an on/off switching means and being packaged as a trinket or being trinket-sized.

9. An apparatus for protecting an individual or an entity, such as human beings, live-stock and things, comprising a mobile and portable wireless transmitter means being self-contained and operable through an on/off switching means and being packaged in a labeling device.

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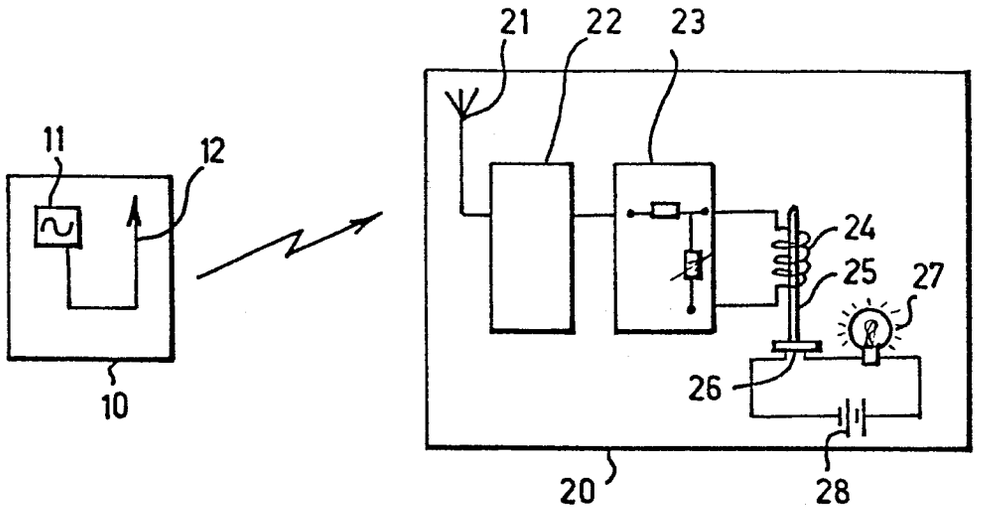

FIG. 1

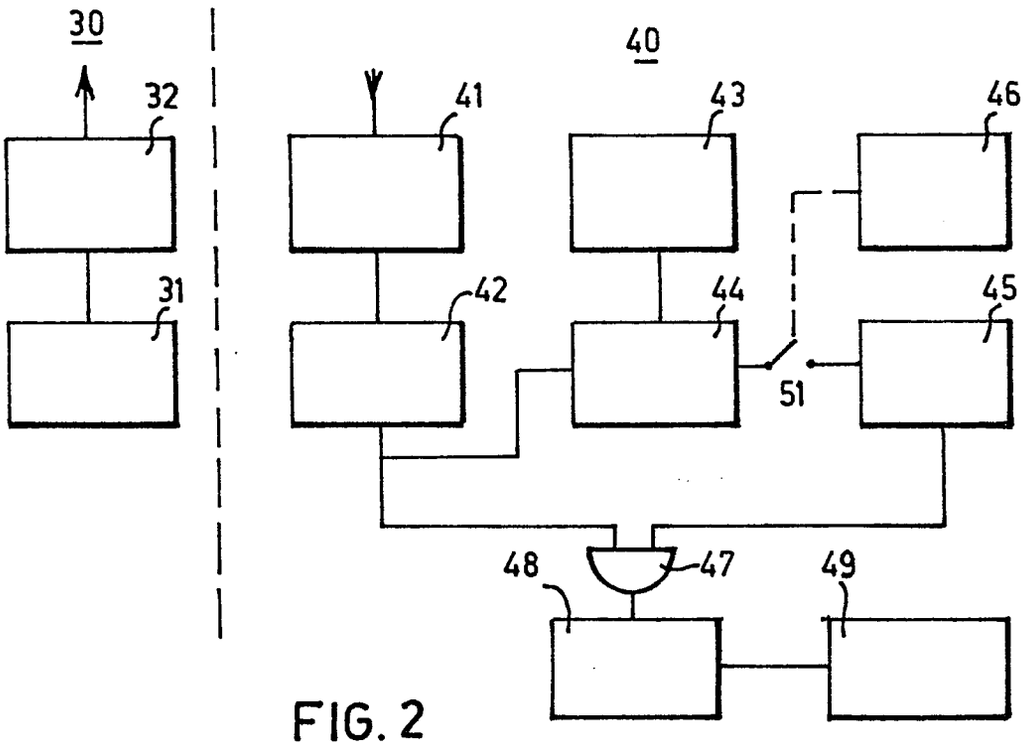

FIG. 2

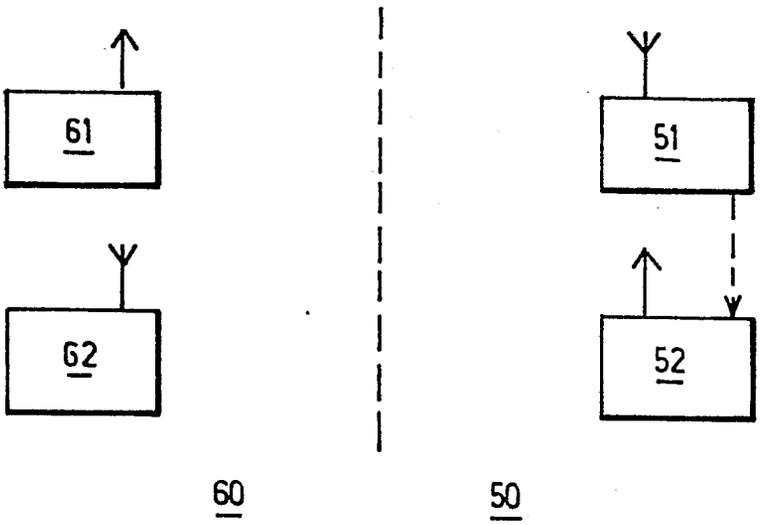

FIG. 3

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EUROPEAN SEARCH REPORT

0093463
Application number

EP 83200508.6

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
X	CH - A - 615 522 (HOLZER) * Totality * --	1,4,5,6,7,8,9	G 08 B 21/00
X	DE - A1 - 2 455 259 (LÖBNAU-MÄDER) * Totality * --	1,4,7,8,9	
A	DE - A1 -2 837 014 (OLYMPIA WERKE AG) * Totality, especially claim 4 * --	2	
A	CH - A5 - 589 335 (AB INSTITUT FOR INNOVATIONSTECHNIK) * Totality, especially column 2, line 59 - column 3, line 30 * ----	3	

TECHNICAL FIELDS SEARCHED (Int. Cl. ³)

G 08 B
G 01 S

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	11-07-1983	FRANZ

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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