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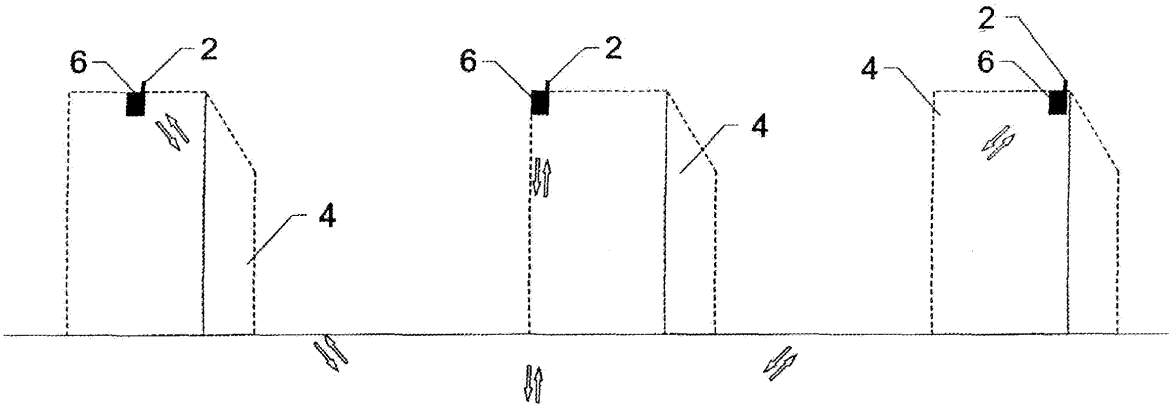
(54) Wireless system applied to a color-based, grain sorting electronic machine

(57) This patent application refers to a new method to use wireless technology applied to color-based, grain sorting electronic machines. It comprises a wireless transmission system (1) installed and configured in a color-based, grain sorting electronic machine (4), with a stationary module for monitoring and adjustment (6) provided with wireless stationary transmitting/receiving devices (2), to communicate with a portable mobile control and processing unit (3) with wireless transmitter (5).



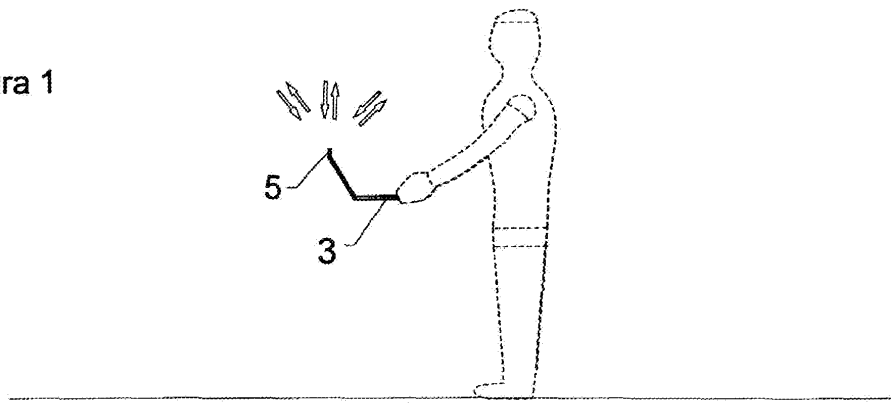


Figura 1

EP 2 233 218 A1

Description

[0001] This patent application relates to a new method to use wireless technology applied to a color-based, grain sorting electronic machine.

[0002] It consists of allowing the direct communication between the main control unit and the monitored machines through man/machine interface, that is, nobody needs to stay at the main control unit to make the change controls. Just by using the identification I.P. for each machine as an access port and, through a notebook, a palm top, a cell phone or another communication piece of equipment, one can carry out the change, adjust the time, select the speed, particle sizing, hue, defective grain disposal, among other types of controls by exclusively using the wireless system applied to a color-based, grain sorting electronic machine.

[0003] This technology will be developed and commercialized by the industries that manufacture grain sorting electronic machines and it will be used by the agro-industrial fields of storage, selection and packaging of the most varied types of grains.

[0004] In the current state-of-the-art, the use of wires and cables for the connection and communication among the terminals is still required, that is, the CPU of the grain sorting electronic machine with main control unit is in charge of monitoring the machines, the selection and classification process of granular products such as rice, coffee, peas, lentil, maize, wheat, soybean and a variable range of several particle and granular products; these operations are carried out by color-based, grain sorting electronic machines that comprise five operation stages, which are: feeding hopper, electromagnetic vibrator with vibratory chute (doser), conveyor chute, electronic optical reading sensors and ejecting valve.

[0005] In this case, the whole monitoring process is still carried out by two or more persons in order to follow up the process as well as the equipment adjustment. In the state-of-the-art, wireless technology can link electronic terminals, usually computers, by means of radio waves, not requiring connection cables among them. Due to the creation of this new technology, several patents have been developed in the most varied industrial fields and they have been used to launch new products in the market.

[0006] We can mention an example from the electro-electronic field, the Brazilian Utility Model MU8501696-9, a WIRELESS DEVICED CONNECTED TO A COMPUTER TO REMOTELY CONTROL THE KEYBOARD AND MOUSE FUNCTIONS, which is distinguished by an electronic device (2) that allows the remote control of a computer mouse or keyboard by means of a remote control set (1) through radio frequency (3); the device comprises a radio frequency receiver (2) that is connected to the personal computer (5) through the conventional communication ports of the computer (4).

[0007] Another example is the Brazilian Utility Model "MU8502998-0 - WIRELESS REMOTE DRIVE. This patent of wireless remote drive Utility Model will make the implementation of automation and assets security systems easier, not requiring many infrastructure items to connect the equipment. Based on Figure 01, we have a portable, either mobile or stationary TX drive (1) and a receiver (RX drive (11), in which the TX drive (1) sends a coded radio frequency signal (3) to RX receiver (11) that will actuate the circuit (8) in charge of actuating the desired piece of equipment through the contact outputs of the relay (9), such as: motors, motor-pumps, lights, alarms, sirens, electric gates, among others".

[0008] We can highlight that in the prior devices the dosers are used in several ways: however, in none of the prior devices this technology to monitor the process through wireless transmission systems has been found in color-based, grain sorting electronic machines.

[0009] The monitoring of grain dosers can be carried out in the piece of equipment itself by using the wireless technology, not requiring wires or cables but communication through radio waves. Using this technology applied to color-based, grain sorting electronic machines we will offer many advantages in relation to prior processes, thus avoiding several inconveniences and expressively reducing the number of professionals required to monitor an entire production line of color-based, grain sorting electronic machines.

[0010] This application aims to settle and solve at a time the current inconveniences such as low productivity, end product not complying with the required standards, excessive trips to change the controls in the main unit, to mention some; in order to search for efficient solutions, by joining together the known wireless technology for color-based, grain sorting electronic machines, and to solve the previously mentioned problems, the author has conceived a new remote monitoring, adjustment and control system for production tines through a control unit that, through wireless communication devices, allows one operator using just a notebook, a palm top, a cell phone or another communication piece of equipment to monitor, adjust and change the controls of the grain selection process carried out by an electronic sorting machine; through the innovative use of the wireless system on a sorting machine it becomes more practical and efficient expressively reducing labor cost and the number of professionals required for the monitoring.

[0011] Another positive aspect is that all the information is taken by wireless data transmission technology, that is, wireless technology that allows the connection among different points not requiring telephone, coaxial or optical cables.

[0012] The system according to this patent application, can be better understood through the description of the attached figures that, along with the detailed numerical references below, will be easily understood.

[0013] The attached drawing shows an organization chart of the system that, along with the detailed numerical references below, will be easily understood. Nevertheless, its configuration must not be restrained as to the

dimension and material occasionally used in its industrial production.

Figure 1 - represents an organization chart of the remote monitoring, adjustment and control system in a production line by means of a sole unit control through wireless communication devices applied to color-based, grain sorting electronic machines.
Figure 2 - represents a merely explanatory image.

[0014] This invention is characterized by a wireless transmission system (1) installed and configured in a color-based, grain sorting electronic machine (4), whose adjustment and monitoring stationary module (6) is provided with wireless receiving/transmitting devices (2) that transmit, receive and process data for instantaneous adjustment, sent by the processing unit, control and portable mobile control (3) with a wireless transmitter (5), taken by the operator to any place within the plant to adjust or send controls to the transmitting/receiving device (2), in an individual way for each monitoring and adjustment module (6), thus allowing the precise adjustment to each color-based, grain sorting electronic machine (4) in an individual way and "in-loco" or remotely.

Claims

1. Wireless system applied to a color-based, grain sorting electrocin machine, **characterized by** a wireless transmission system (1), installed and configured in a color-based, grain sorting electronic machine (4), with a stationary module for monitoring and adjustment (6) provided with wireless stationary transmitting/receiving devices (2), to communicate with a portable mobile control and processing unit (3) with wireless transmitter (5) to the transmitting/receiving device (2) of monitoring and adjustment module (6).

2. Wireless system applied to a color-based, grain sorting electronic machine, according to claim 1, **characterized by** a portable mobile control (3) with wireless mobile transmitters (5).

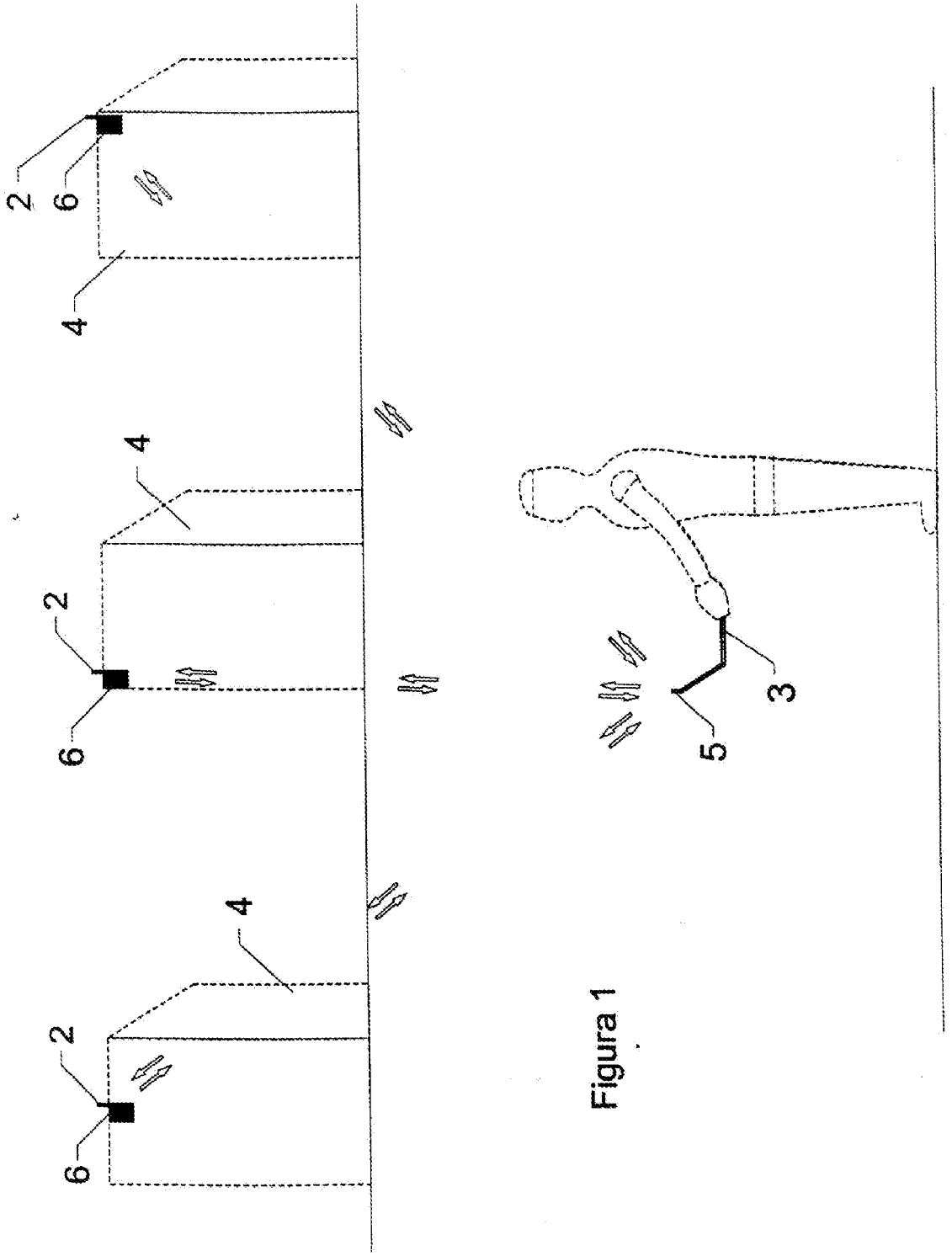


Figura 1

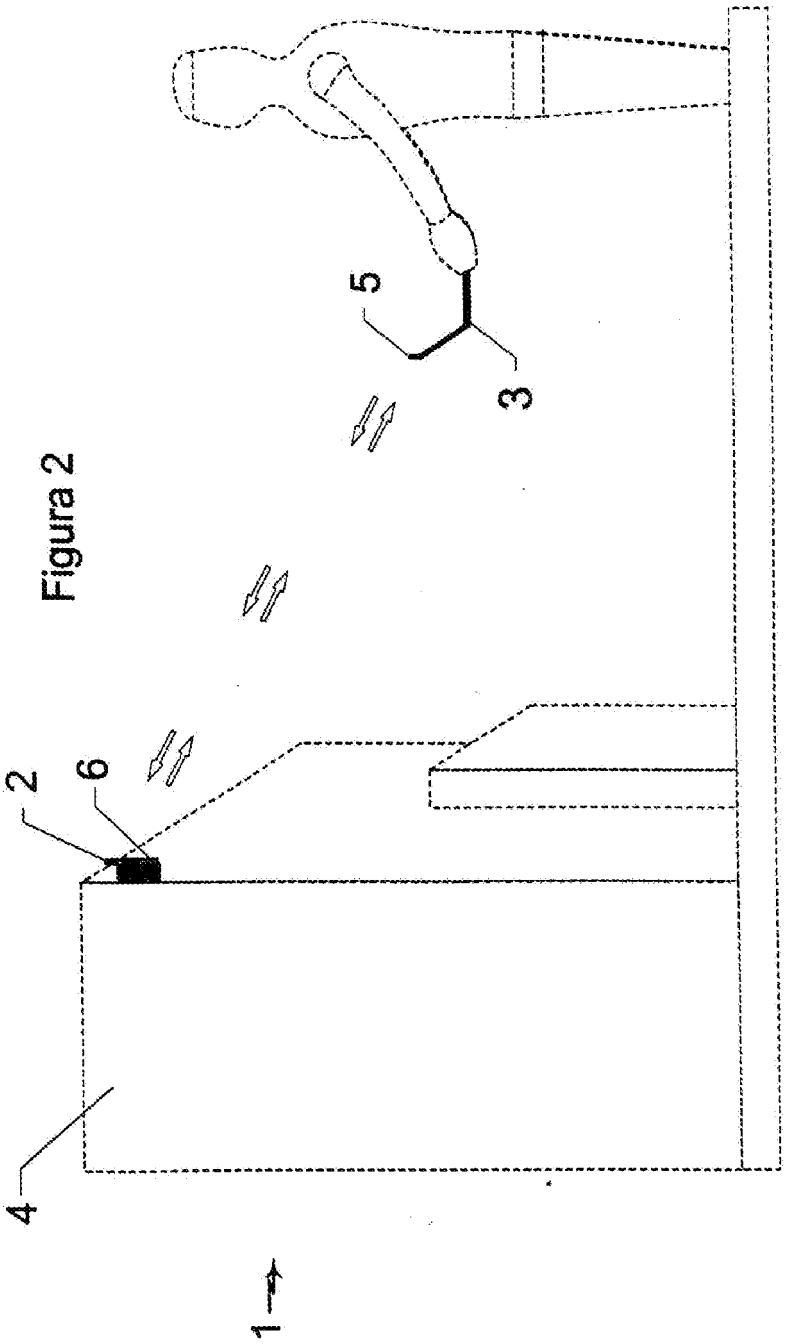


Figura 2

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EUROPEAN SEARCH REPORT

Application Number
EP 09 16 6355

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2005/090961 A1 (BONK MARK [US] ET AL) 28 April 2005 (2005-04-28) * paragraph [0002] - paragraph [0003] * * paragraph [0031] * * paragraph [0037] * * paragraph [0076] * -----	1,2	INV. B07C5/342
A	WO 2008/015615 A2 (LOUIS PADNOS IRON AND METAL CO [US]; RUSSCHER DAVID L [US]; HERWEYER R) 7 February 2008 (2008-02-07) * page 6, line 2 - line 4 * -----	1,2	

TECHNICAL FIELDS SEARCHED (IPC)

B07C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	15 June 2010	Wich, Roland

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 09 16 6355

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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15-06-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005090961 A1	28-04-2005	NONE	
WO 2008015615 A2	07-02-2008	US 2008029445 A1	07-02-2008

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82