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(STEREOSCOPIC VIDEO CAPTURING DEVICE AND DUAL RECEIVER WITH A THREE DIMENSIONAL VIEWER)

ANTECEDENTS OF THE INVENTION

Currently we have a television system of images which is transmitted through different means that we already know, such as cables, optic fiber or electromagnetic radiation waves in a preestablished frequency band from a central basis or a television station. Depending on the means of transmission, the television channel and its allocated frequency is received into a television device through cable or electromagnetic waves.

Up to this date, a television program is created focusing the television camera in some scene, converting the light into electronic video signals, combined with the audio and are transmitted as we mentioned.

Currently the television cameras have three basic parts, which are a sole optic system in order to capture images, a collector device which translates the image into electronic video signals and a codifier in order to be able to transmit the signal.

The result of this process of capture-codification-transmission-reception-decodification and presentation of images has been used experimentally since 1952 and practically worldwide, since the 40's years in black and white, and in the 50's years a great step was carried out for the obtention of the television in Color.

This video and audio transmission is know up to this date as Television (transmitted by electromagnetic signal, by satellite, micro-waves or cable) and derives from the composition of the words Tele-vision (Remote vision).

Up to this date, this transmission is the most used as communication means worldwide.

This image is a flat image which has only tow planes due to its monoscopic origin, in other words, it derives from a sole lens in the camera which horizontally and vertically swipes an area of sensors, covering only one perspective area equivalent to observe with only one open eye, thus losing some characteristics of dimension, such as depth or distance between one object and another in the same plane. Such allow us to obtain a sensation of flat observation.

Thinking in carrying out a radical change in the form in which the television signals have been transmitted up to this date, I thought to develop a series of new devices which allow to emulate the stereoscopic vision, unique characteristic which the human being has up to this date.

The development of the technology which I propose, is completely different to all that has been developed until now, since it does not deceive the human eye nor uses polarization lenses, and by means of this development it can be obtained a television system in three dimension which includes taking images, their processing, codification, transmission, reception and decodification, same development which I like to protect by means of this patent application, since

until now nobody in the world has offered a television transmission in three dimension by means of this innovative technology, which practically is going to change the way human beings communicate with each other.

DESCRIPTION OF THE INVENTION

Currently the capture system of video images is carried out in a tape of monoscopic camera (1), which has only one lens and the electronic generation of the codified signals of each image at the time of being transmitted, received and decoded in a typical television system, gives us a monoscopic appreciation, in other words, in two horizontal and vertical planes, noticing the depth of the objects which are presented in the image.

This invention and development of the new technology which I propose, allows to send a decode television signals in three dimension and has the following figures and diagrams in blocks:

Figure 1. Diagrams in blocks of the invention in general.

Figure 2. Monoscopic video camera.

Figure 3. Stereoscopic video camera.

Figure 4. Presents us three perspectives of vision: Monoscopic left and right and stereoscopic perspective.

Figure 5. Diagram of stereoscopic camera.

Figure 6. Diagram of flux of the process of codification, amplification, transmission by two different frequencies.

Figure 7. Receiver with antenna and decoder of the two channels dual signal.

Figure 8. Diagram of composition of the viewfinder of stereoscopic images.

Figure 9. Diagram of stereoscopic decoder-receiver.

In regards to said figures, the invention has three basic parts: the stereoscopic camera (2), the signal decoder-receiver (7) and the stereoscopic viewfinder (6), and it requires a conventional television signal transmission system.

The stereoscopic camera (2) takes the image and it is transmitted by any means until it meets the decoder receiver (7) which presents the image in the viewfinder in stereoscopic form (6) giving immediately the sensation of three dimension (figure 1).

DETAILED FUNCTIONING

Using the stereoscopic camera which takes the video image simultaneously from two lenses and two collectors that keep a distance between them equivalent to the average distance between the two centers of the human being's pupils, thus ensuring that tow images which are taken in the same moment are to be obtained (figure 5).

These images, are not collected, processed and codified independently for each left and right channel using the methods and technology already known (figure 5).

Both signals are processed and can be recorded in two coordinated recording systems of analogical or digital type or, they can be transmitted in real time by means of two typical transmission systems in any channel or available means (figure 6).

Using the infrastructure which exists up to this date, such as codification, amplification, transmission and modulation systems, the process obtained in the stereoscopic camera is carried out. This signal is sent by two frequencies of different transmission, such as conventional television channels, individually but simultaneously, for example, channel 5 and channel 7 or channel 11 and channel 13 sending one signal per each one (figure 6).

The dual decoder (7) has two integrated tuners, one for each visual channel (left and right), Each one receives the signal of one antenna transmission channel (10), for example channel 5 and channel 7 and are received and decoded separately and sent each one to a screen in the viewfinder, in other words, left and right signal (11) and (figure 9).

The viewfinder (6) is formed by the liquid crystal screens or of active pixels with magnification and both screens are located in the viewfinder, one for each left and right visualization channel (8 and9), in such a way that when locating the viewfinder it presents with a liquid crystal screen or of active pixels per

each one (figure 8), the image in the front part of each eye, these screens are similar to the screens that the compact video recorder cameras currently use. Likewise, it has an audio system which decodes the involving signal stereo type which is currently used in televisions and domestic equipments (figure 9).

For the viewfinder and the decoder feed, it has a system based in Ion-Lithium long lasting batteries in order to feed all thecircuits (figures 8 and 9).

Once coordinating the simultaneous transmission in stereoscopic-video, and once it is received by the decoder (figure 9) and presented in the viewfinder (figure 8), the human brain carries out the same function of superposition of the left and right images (3 and 4), like if the user were seeing directly what it is happening in a distance of kilometers with his/her own eyes.

This effect of three dimension is observed when our brain decodes a signal deriving from tow independent sources (each source is an eye) allowing to obtain a differential perspective angle which allow us to notice the depth or distance to which the objects that we are looking at are located. This stereoscopic vision (5) results from the superposition or combination of the images that each eye receives in the brain.

The filed invention differs totally from the systems that have been developed until now, since the existing three dimension transmission techniques, as well as the polarized imaged that have been used, require excluding polarization

lenses by means of micas or lenses, and also, they use the transmission method of two perspective at high speed, taken in independent cameras with polarized lenses, in order to deceive the visualization process of the human being and such causes an effect of indisposition, head ache and tiredness; on the other hand, the invention that I have carried out presents continued images in simultaneous real time for each eye without carrying out a deceive process to the brain and therefore, it does not represent symtomatologic consequences.

It also differs from the virtual reality digitalized image generated by computer which finally is a generated simulation and it is not real information of images.

The most interesting is that this new integral technology can provide to us an effect which not only corresponds to the observation, but also it will allow to us to notice the depth of the things which are being transmitted and such experimentally generates an effect of physical presence in the original place of filing, and as I mentioned, even being in a distance of kilometers.

This result or realistic presence effect has not been provided by any technology up to this moment, and the advantages and applications that can be obtained directly from this technology are huge, and mentioning some of them, we can carry out remotely surgeries in three dimension, drive remotely, observe a football game from the distance, transmit a live program in three

dimension, record commercials in three dimension, in order to obtain the exact characteristics of a product and transmit it though this technology, attend to a travel or maintain a videoconference and notice all the details that a volume in the space grants to us.

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CLAIMS

1.- A method for producing, transmitting and receiving three-dimension video images of a scene, the method using conventional transmission channels, wherein the method comprises the step of:

(a) producing two independent video images taken from different view angles;

(b) encoding the data corresponding to the video images;

(c) transmitting the encoded data from both video signals by independent and different video channels;

(d) receiving and decoding the transmitted video data; and

(e) independently and simultaneously displaying video images on two displays of a viewer.

2.- A method for producing, transmitting and receiving three-dimension video images as per claim 1, further characterized in that the difference in the view angle corresponds to the average distance between the pupils of the human eyes.

3.- A method for transmitting and receiving three-dimension video images as per claim 1, further characterized in that displaying the images in three dimensions is carried out by independent projections of each channel on the left and right displays of the viewer, not requiring an external monitor.

4.- A device for producing, transmitting, and receiving three-dimension video images of a scene, by using conventional video transmission channels, comprising a stereoscopic camera, a signal decoder-receiver, and a stereoscopic viewer; characterized in that the stereoscopic camera comprises two parallel lenses that simultaneously receive two signals, encoding means for encoding the received signals as two video signals; a dual decoder-receiver that is adapted to simultaneously process the two video signals; a viewer having two liquid crystal or active pixel displays that independently receive the two video signals.

5.- A device for producing, transmitting, and receiving three-dimension video images of a scene as per claim 4, further characterized in that the lenses of the stereoscopic camera are separated apart from each other by a distance that correspond to the average distance between the pupils of the human eyes.

6.- A device for producing, transmitting, and receiving three-dimension video images of a scene as per claim 4, further characterized in that the dual receiver-decoder is adapted to process two simultaneous signals being received by two independent video channels, transmitting them to the viewer, which in turn is adapted to independently project them on the displays.

7.- A device for producing, transmitting, and receiving three-dimension video images of a scene as per claim 4, further characterized in that the viewer is adapted to respectively project the information carried by an independent channel on a corresponding display, that is, a left channel on a left display, and a right channel on a right display.

8.- A device for producing, transmitting, and receiving three-dimension video images of a scene as per claim 4, further characterized in that the viewer is adapted to project on the display, in real time, the complete information of the video signals.