★★★ ＜第26回知的財産翻訳検定試験【第14回和文英訳】＞ ★★★
≪１級課題 -電気・電子工学-≫

【問 1】

[Claim 1]

An energy dispersion type X-ray detection device that irradiates a sample with an electron beam, an X-ray, or the like and detects a characteristic X-ray generated from a sample surface to conduct elemental analysis, comprising:

an element holder that houses a semiconductor X-ray detection element and has a female screw having a cylindrical shape; and

a finger body that houses a substrate with an initial-stage FET for amplifying a signal from the semiconductor X-ray detection element, the finger body having a cooling mechanism and being provided with a male screw, wherein

the element holder and the finger body are configured to be fastened using the female screw and the male screw to fix the semiconductor X-ray detection element.

[Claim 2]

The energy dispersion type X-ray detection device according to claim 1, wherein the element holder that houses the semiconductor X-ray detection element is made of a metal material having a large thermal expansion coefficient, while the finger body that houses the substrate with the initial-stage FET is made of a metal material having a smaller thermal expansion coefficient compared to the element holder.

[Claim 3]

The energy dispersion type X-ray detection device according to claim 1, wherein a slit-like opening is provided in the element holder such that a high voltage wiring for supplying voltage to an electrode of the semiconductor X-ray detection element may pass through the element

holder.

【問 2】

Conventional and typical image compression methods include JPEG method, which is standardized by ISO. It is known that this method uses discrete cosine transform, and assigning comparatively large number of encoding bits will lead to provide good encoded images and good decoded images. However, decreasing the number of encoding bits to a certain degree will lead to noticeable block distortion, and deterioration subjectively becomes conspicuous.

In contrast, research and development is recently becoming active for methods for dividing an image into plural bands, using a filter having a high-pass filter and a low-pass filter in a combined manner, and performing encoding for each band. This filter is called a filter bank. Among them, wavelet transform coding is thought to be promising as a new technique that may replace DCT, because, compared to DCT, it does not have any deficit of noticeable block distortion in a high compression rate.

For example, JPEG 2000, for which international standardization was completed in January, 2001, employs a method in which the wavelet transform is combined with highly-efficient entropy encoding. This has achieved a great improvement in encoding efficiency compared to JPEG.

【問 3】

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In more detail, the electronic paper device 26 is a well-known self-writing type which may display predetermined information in an image on an image display section in a voltage application state and hold it in a no power supply state. In a state where no voltage is applied by the microcomputer 23 via the driver to each of the pixel electrodes which form a matrix in the image display section, negatively (-) charged white particles accumulate on the back side of the image display section, while positively (+) charged black particles remain on the front side. The image display section is thus in a black colored state when it is viewed from the front side. The driver operates based on electronic data output from the microcomputer 23.

When the driver inverts the polarity of the pixel electrodes in a required portion of the matrix in response to the information to be displayed in an image, the positional relationship between the white particles and the black particles is changed as appropriate. The image display section thus displays information in an image based on the contrast of the white particles and the black particles. In addition, the electronic paper device 26 may hold the image displaying state as it is even in a no power supply state in which no voltage is applied via the driver to each of the pixel electrodes forming the matrix in the image display section.

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