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問 1 .

Claim 1

An energy dispersive X-ray detector that irradiates a sample with an electron beam, an x-ray, or the like, detects a characteristic X-ray generated from a surface of the sample, and conducts elemental analysis, the energy dispersive X-ray detector comprising:

a female threaded cylindrical element holder that stores a semiconductor x-ray detection element; and

a male threaded finger body that stores a substrate including a first-stage FET for amplifying a signal from the semiconductor x-ray detection element, the finger body including a cooling mechanism,

wherein the element holder and the finger body are fastened to each other via the female thread and the male thread such that the semiconductor x-ray detection element is fixed.

Claim 2

The energy dispersive X-ray detector according to claim 1, wherein

the element holder that stores the semiconductor x-ray detection element is made of metal material with a large coefficient of thermal expansion, and

the finger body that stores the substrate including the first-stage FET is, however, made of metal material with a smaller coefficient of thermal expansion than the element holder.

Claim 3

The energy dispersive X-ray detector according to claim 1, wherein

the element holder has a slit-like opening that allows high-voltage wiring to pass through the element holder, the high-voltage wiring supplying voltage to an electrode of the semiconductor x-ray detection element.

問 2 .

Examples of conventional typical image compression methods include JPEG that is standardized by the ISO. JPEG is known as a method that uses a discrete cosine transform and provides good coded images and decoded images when a relatively large number of encoding bits are allocated. However, when decreasing the number of

encoding bits to some extent or less, block boundary artefacts clearly appear and deterioration subjectively seems to be show up.

On the other hand, in recent years, methods that use a so-called filter bank including high-pass filters and low-pass filters to divide an image into a plurality of bands and conduct encoding for each of the bands have been actively researched. Among such methods, encoding using wavelet transform is considered as leading one of new technologies that serve as alternatives to the DCT, since the encoding using wavelet transform does not have the disadvantage of showing distinct block boundary artefacts due to high compression, unlike the DCT.

For example, JPEG 200 that is internationally standardized in January, 2001 adopts a combination of the wavelet transform and high-efficiency entropy coding. This enables larger improvement in coding efficiency than JPEG.

問 3 .

Specifically, the electronic paper device 26 is a conventionally-known self-writing type electronic paper device capable of displaying an image of predetermined information on an image display unit while voltage is applied, and keeping displaying the image while electric power is not supplied. In a state where the voltage is not applied, under the control of the microcontroller 23, via the driver to pixel electrodes forming a matrix in the image display unit, negatively (-) charged white particles are accumulated on the back side of the image display unit, and positively (+) charged black particles remain on the front side of the image display unit. When the image display unit is seen from the front side, the image display unit seems to be painted black. Subsequently, when the driver operates on the basis of electronic data output from the microcontroller 23 to invert the polarities of the pixel electrodes in a necessary part of the matrix in accordance with information to be displayed as an image, the positional relation between the white particles and the black particles are switched appropriately. Therefore, the image of the information is displayed on the image display unit by using contrast between the white particles and the black particles. In addition, the electronic paper device 26 is capable of keeping displaying the image even while electric power is not supplied, in other words, while the voltage is not applied via the driver to the pixel electrodes forming the matrix in the image display unit.