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H. ARNI ET AL

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TELEVISION RECEIVING APPARATUS

Filed Feb. 12, 1938

Fig. 1

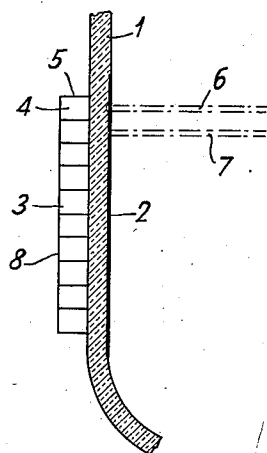


Fig. 2

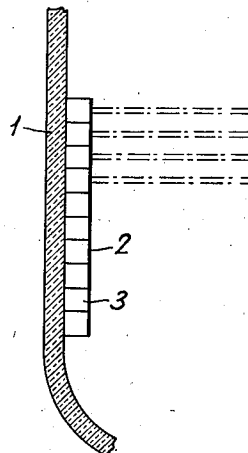
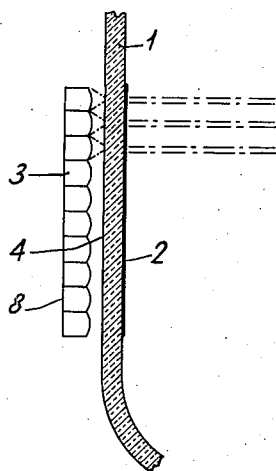


Fig. 3



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TELEVISION RECEIVING APPARATUS

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4 Claims. (Cl. 178—7.3)

The invention relates to a method through which an improvement in the quality of television images is to be attained.

A television apparatus consists at the transmitter side essentially of an image dissecting apparatus, an amplifier, and an ultra-short wave transmitter. The receiver usually contains an ultra-short wave receiver, amplifier, and image reconstructing apparatus. The analyzing of the picture at the transmitter is carried out in lines and the picture to be analyzed may be projected upon a diaphragm through which the light flux assigned to the element of the image to be transmitted respectively is passed. A Nipkow disc with circular perforations through which the various elements of the image can act successively along lines upon the photoelectric cell may be used for this purpose. Image analyzers are also known in which the image is projected upon a photocell table whereby a cell is assigned to each element of the image. Special switching elements for rapid switching are used to connect the individual cells successively to the image signal amplifier.

At the receiver, the reconstruction of the image is obtained in general by means of cathode ray tubes (Braun tubes) having a fluorescent screen on which the fluorescent spot moves along lines in accordance with the brightness of the picture lines at the transmitter.

Hitherto it was believed that the quality of the television images could be improved solely by a more refined dissection of the image, i. e. if instead of using for instance 180 image lines for analyzing the image, 240 lines or 360 lines or even a greater number of image lines are employed for dissecting the image. This has the disadvantage that the frequency band involved is considerably increased entailing again difficulties as regards transmission. Another suggestion was to improve the quality of the image by means of the so-called line skip method or interlacing.

In accordance with the invention, however, a substantial improvement in the quality of television images is attained in a much simpler way, in that care is taken to provide an extremely correct construction of the picture line. In fact, it was found that images having the same number of lines reveal an entirely different quality which depends on whether or not the lines are correctly constructed. Thus, for instance, an image of 180 lines with a correct set of lines is of a better quality than an image of 360 lines in which the lines have bright or dark intermediate

lines. According to the invention, the construction of the line of the television image is carried out with such accuracy that the lines adjoin each other without intermediate spaces such that a uniformly illuminated area practically no longer reveals any structure when viewed from a sufficiently short distance; namely, such that two adjacent lines can be viewed at an angle of viewing that is greater than the critical angle of the analyzing property. Through such a line construction a quality of the image is obtained, without requiring an increase in the number of lines, that is essentially more favorable than if 360 image lines are used in place of 180 lines.

The accurate adjoining of the individual image lines can be achieved by optical and/or electrical means. Preferably, the fluorescent screen has arranged directly in front thereof optical means, for instance line screens, or Venetian blinds by which the beam of light emanating from the fluorescent spot is widened out such that no interspaces exist between the individual lines of the image. When using a line screen, care is to be taken that the individual screen elements are disposed in front of the fluorescent screen at such a distance, and that the cathode ray tube is so controlled that a line structure is no longer recognizable on the line screen. By dimensioning the fluorescent screen accordingly, it can be accomplished that an image element influences only one screen element.

It will be of advantage to employ line screens formed of Venetian blinds which may consist for instance of very thin Celluloid plates covered with silver. The line screens may also be built into the cathode ray tube proper.

Furthermore, there exists the possibility by means of a purely electrical influencing of the cathode ray, for instance through a corresponding shape of the image impulses, to attain a line structure in which interspaces between the individual lines are avoided at least for the places of the image having average brightness. A luminous spot may also be used which becomes larger at a greater intensity so that only an area having a certain intensity but no line structure can be obtained. In this case a controllable light stop will be provided by means of which the effective width of the line can be maintained constant.

My invention will best be understood by reference to the drawing, in which

Fig. 1 is an embodiment of my invention,

Fig. 2 is another embodiment of my invention, and

Fig. 3 is still a further embodiment of my invention.

Fig. 1 shows a part of a fluorescent screen of a cathode ray tube, wherein item 1 is the glass wall of the tube, and item 2 represents the actual fluorescent layer. There is disposed directly in front of the glass wall 1 a shield 3 of the line screen type consisting of small Celluloid plates 4 whose sides 5 are mirror surfaces, and which act as Venetian blinds. The fluorescent spot scans the individual image lines 6 and 7 on the fluorescent screen 2, and the beam of light emanating from these lines will be so enlarged by the Venetian blinds 4 that at the surface 8 which is preferably frosted an image appears having practically no longer a line structure. The line screen like shield 3 may as shown in Fig. 2, also be arranged between the fluorescent screen 2 and the glass wall 1.

Fig. 3 again shows a part of a fluorescent screen whereby the glass wall is item 1 and the fluorescent screen represented in 2. The fluorescent screen has a line screen for instance formed of glass placed in front thereof. In this case the individual lines of the screen are so dimensioned or have such a distance from the fluorescent screen that an image appears at 8 in

which the individual lines adjoin without inter-spaces.

What is claimed is:

1. An optical image reproducing system comprising means for linearly reproducing an optical image on a plane screen member, a series of plane strip members of elemental width positioned immediately adjacent said screen member and mounted substantially at right angles thereto, the plane faces of said latter members forming a reflecting surface, and a second screen positioned at the ends of said reflecting members remote from the first screen member.

2. Apparatus in accordance with claim 1 wherein said plane members are comprised of Celluloid.

3. Apparatus in accordance with claim 1 wherein said reflecting members are spaced apart a distance greater than the width of a line of the linearly reconstructed optical image.

4. Apparatus in accordance with claim 1, wherein said plane strip members of elemental widths are comprised of a solid cellulose product.

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