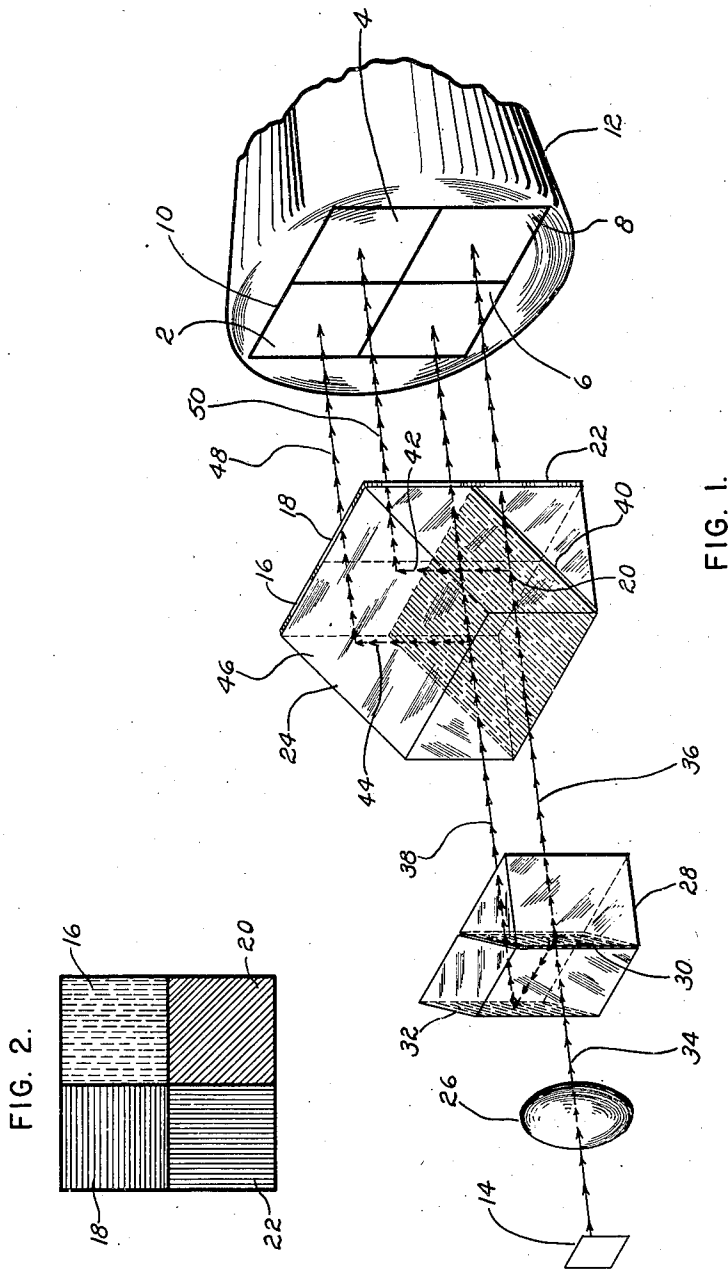


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COLOR TELEVISION

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COLOR TELEVISION

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1 Claim. (Cl. 178—5.2)

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This invention relates to devices for color separation for television transmission and reception.

An object of the invention is to provide a device and system for color separation for television transmission and reception which makes use of optical separation of colors.

Another object of the invention is to provide means for color separation for television transmission and reception in which the original image is optically formed into four differently colored images thrown onto the pick-up tube screen simultaneously for transmission by the usual television apparatus and then are optically re-combined into the form and color of the original image.

A further object of the invention is to provide an optical color separation system for television transmission and reception which is simple in construction, relatively inexpensive to manufacture, and effective in operation.

Other objects and advantages of the invention will become apparent from the following description of a preferred embodiment thereof, as illustrated in the accompanying drawings, and in which:

Figure 1 is a perspective view of the optical elements according to the invention, shown in relation to a cathode ray tube for television purposes.

Figure 2 is a face view of the color filter side of the larger prism shown in Figure 1, showing the color break-down.

This system of color television makes use of optically separated colors instead of, as in the prior art, mechanically separated colors such as are obtained by driving a drum or disc in the transmitting equipment in synchronism with a motor-driven disc or drum in the receiving equipment. Therefore, the problem of synchronism of color-separated images is entirely eliminated according to my invention.

To do this, I use a system for simultaneously producing four images 2, 4, 6, and 8 on the mosaic 10 of a television iconoscope or orthicon pick-up tube 12 from a single scene indicated generally at 14, each of the four images having been passed through one of four different color filters 16, 18, 20 and 22 on prism 24, thus separating the original scene 14 into its basic colors for transmission of the scene by suitable television apparatus connected to the tube 12, and not shown in the drawings.

The four separate images 2, 4, 6, and 8 are scanned by the pick-up tube 12 as one frame and transmitted in any usual manner well known

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in the art over any television equipment and circuits without requiring any further electrical or mechanical change in the transmitting equipment.

This is accomplished by passing the subject image 14 through a suitable focusing lens 26, thence into a first light-dividing prism 28 which consists of a partial reflecting mirror surface 30 and a total reflecting surface 32. The partial reflecting surface 30 divides the light represented generally by ray 34 equally, one-half passing through the prism along the path indicated by line 36 and continuing into the second light-dividing prism 24. The other half of the light from ray 34 is reflected at right angles to its original path to total reflector 32, where it is again reflected 90°, bringing it into parallelism with its original path and along the path indicated by ray 38 into prism 24.

In prism 24, the two beams 36 and 38 are each divided again equally by partial reflecting surface 40, one-half of each of the two beams 36 and 38 continuing on through the surface 40, and two of the color filters 20 and 22 to the mosaic 10 on tube 12 to register images at 6 and 8. The other two halves are reflected at right angles upward along paths indicated by 42 and 44 to total reflecting surface 46, where they are again reflected at right angles along paths 48 and 50 parallel to their original directions, and through filters 16 and 18 to register images 2 and 4 on the tube mosaic 10. The four colors used in filters 16, 18, 20 and 22 are such that when superimposed or added together will produce white light. Ordinarily, there is no spacing between prisms 28 and 24 and between prism 24 and mosaic 10 on tube 12, the spacing being shown only for clarity of illustration.

In the receiving and reproducing equipment, the cathode ray-receiving tube will register the four images on the screen of the tube as one frame. Each image will be viewed or projected through its proper color filter, the image then passing back through the same kind of optical system as is illustrated for the transmitting station, the images combining into one composite scene and being viewed or seen in the natural color of the original scene.

Although I have described a preferred embodiment of my invention in specific terms, it is to be understood that various changes may be made in size, shape, materials and arrangement without departing from the spirit and scope of the invention as claimed.

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I claim:
Color television transmitting apparatus comprising a television pick-up tube having a mosaic screen, a lens spaced from said screen for focusing an image of a scene to be televised, a first prism for forming said images into two identical side-by-side images disposed between said lens and said screen and adjacent said lens, a second prism disposed between said first prism and said screen for receiving light from said first prism and forming said two side-by-side images into two pairs of identical side-by-side images of the same scene, and filter means interposed between said second prism and said screen for filtering

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from each of said four images all but one predetermined color.

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