FIGS. 7A, 7B, 7D, and 7E, respectively. For a specific example, suppose the classifier values for horizontal, vertical, diag1, and diag2 were 32, 20, 18, and 25, respectively. Because the horizontal classifier 32 exceeds the threshold of 24, the pixel is not classified as "flat." So then the minimum value 18 being the diag1 classifier determines that the preferred direction for interpolation is diag1. Using the predictor kernel weights for the diag1 direction (FIG. 7D), the predicted luminance value V33 would be:

$$V_{33} = \left(\begin{array}{ccccc} & & 1^*A_{14} + & & \\ & 2^*A_{23} + & & 1^*A_{25} + & \\ 2^*A_{32} + & 2^*A_{33} + & 2^*A_{34} + & & \\ 1^*A_{41} + & & 2^*A_{43} + & & \\ & 1^*A_{52} & & & \end{array} \right) \Big/ 14$$

The operation of correction block **44** will now be discussed. The luminance correction term for a pixel depends on its classification and the computed blurred luminance values. A pixel classified as "flat" has a zero luminance correction. The other correction terms are determined as follows:

horz: $C=(-B_{31}+2^*B_{33}-B_{35})$

vert: $C=(-B_{13}+2^*B_{33}-B_{53})$

diag1: $C=(-B_{15}+2^*B_{33}-B_{51})$

diag2: $C=(-B_{11}+2^*B_{33}-B_{55})$

Whichever correction term (C) is used, it is then multiplied by a constant such as 3/8 and substituted into the following function:

$$\text{correction} = \begin{cases} \text{Max}(\text{Min}(0, x+6), -54) & \text{if } x < 0 \\ \text{Min}(\text{Max}(0, x-6), 54) & \text{if } 0 \le x \end{cases}$$

where

$x=C^*(3/8)$.

Referring to FIG. **8**B, the color filter array filters used are cyan (C), magenta (M), yellow (Y), and green (G). Luminance (V) can be defined equivalently in two ways, one using C and Y, the other using M and G. The equations are:

$V=(Y+C)/2$

and

$V=(M+G)/2$

The two chrominance values Ca and Cb are defined as:

$Ca=(Y-C)/2$

and

$Cb=(M-G)/2$

From these equations it can be determined that:

$Ca = Y - V \quad Cb = M - V$

$Ca = V - C \quad Cb = V - G$

FIG. **3**B which shows in detail the chrominance values block **34** shown in FIG. **2**. Where parts correspond to FIG. **3**A, the same numerals will be used. The color filter array data is applied to a partial block **52** which also receives luminance values as shown in FIG. **2**. The purpose of the partial block is to provide a computation which provides chroma values that are completed by the complete block **54**. The complete block **54** also receives an input from the classification block **48**.

Because the luminance interpolation has already been completed, each pixel location has an interpolated luminance value in addition to its original CFA color value (C, M, Y, or G). The pixels having Y or C can now use the interpolated luminance V in one of the above equations to compute Ca in the partial block **52**. Similarly, the pixels having M or G can use the interpolated luminance V to compute Cb in the partial block **52**. Thus, each pixel now has an interpolated luminance value and one interpolated chrominance value. This input is applied to the complete block **54**.

Since the M and G pixels form 2×2 sub-blocks, as do the Y and C pixels (see FIG. **8**B), the chrominance values Ca and Cb are computed on these same sub-blocks. That means that following the array shown in FIG. **8**B, the known Ca and Cb values, computed in partial block **52**, are arranged as follows:

Cb	*Cb*	*Ca*	*Ca*	*Cb*	*Cb*
Cb	*Cb*	*Ca*	*Ca*	*Cb*	*Cb*
Ca	*Ca*	*Cb*	*Cb*	*Ca*	*Ca*
Ca	*Ca*	*Cb*	*Cb*	*Ca*	*Ca*
Cb	*Cb*	*Ca*	*Ca*	*Cb*	*Cb*
Cb	*Cb*	*Ca*	*Ca*	*Cb*	*Cb*

Referring to FIG. **9**, which illustrates the operation of the complete block **54**, the upper left 5×5 block of this. array of chrominance values is shown. The center pixel already has an interpolated value for Cb and needs to get an interpolated value for Ca. Any pixel needing a value of Ca has a neighbor to the left (one or two steps away), a neighbor to the right (one or two steps away), a neighbor above (one or two steps away), a neighbor below (one or two steps away), and two neighbors touching on opposite comers (either top left and bottom right, or top right and bottom left) and all having an interpolated value for Ca. If the pixel was originally classified as flat or horizontal, the two values in the horizontal direction (at the right and left neighbors) are averaged and become the interpolated value for Ca. If the pixel was classified as vertical, then the values of Ca above and below are averaged to become the interpolated value for Ca. If the pixel was classified either as diag1 or diag2, the two values from opposite corners are averaged to become the interpolated value for Ca.

For example, if the center pixel (FIG. **9**) were classified flat or horizontal the interpolation equation would be:

$Ca_{33}=(Ca_{32}+Ca_{35})/2$

If the center pixel were classified as vertical the interpolation equation would be:

$Ca_{33}=(Ca_{23}+Ca_{53})/2$

If the center pixel were classified as diag1 or diag2 the interpolation equation would be:

$Ca_{33}=(Ca_{24}+Ca_{42})/2$