EUROPEAN PATENT OFFICE
U.S. PATENT AND TRADEMARK OFFICE

CPC NOTICE OF CHANGES 1645

DATE: AUGUST 1, 2024

PROJECT DP12355

The following classification changes will be effected by this Notice of Changes:

Action	**Subclass**	**Group(s)**
DEFINITIONS:		
Definitions Modified:	G06T	5/00, 5/10, 5/20, 5/30, 5/40, 5/50, 5/60, 5/70, 5/73, 5/75, 5/77, 5/80, 5/90, 5/92, 5/94

No other subclasses/groups are impacted by this Notice of Changes.

This Notice of Changes includes the following *[Check the ones included]:*

1. CLASSIFICATION SCHEME CHANGES
   - ☐ A. New, Modified or Deleted Group(s)
   - ☐ B. New, Modified or Deleted Warning(s)
   - ☐ C. New, Modified or Deleted Note(s)
   - ☐ D. New, Modified or Deleted Guidance Heading(s)
2. DEFINITIONS
   - ☒ A. New or Modified Definitions (Full definition template)
   - ☐ B. Modified or Deleted Definitions (Definitions Quick Fix)
3. ☐ REVISION CONCORDANCE LIST (RCL)
4. ☐ CHANGES TO THE CPC-TO-IPC CONCORDANCE LIST (CICL)
5. ☐ CHANGES TO THE CROSS-REFERENCE LIST (CRL)

2. A. DEFINITIONS (modified)

G06T 5/00

Replace: The existing Definition statement text with the following updated text.

Definition statement

This place covers:

Image enhancement or restoration:

- using non-spatial domain filtering;
- using local operators;
- using morphological operators, i.e. erosion or dilatation;
- using histogram techniques;
- using two or more images, e.g. averaging or subtraction;
- using machine learning, e.g. neural networks;
- Denoising; Smoothing;
- Deblurring; Sharpening;
- Unsharp masking;
- Retouching; Inpainting; Scratch removal;
- Geometric correction;
- Dynamic range modification of images or parts thereof.

Replace: The existing Relationships text with the following updated text.

Relationships with other classification places

Group G06T 5/00 is the function place for image enhancement or restoration. Image enhancement or restoration specially adapted for a particular application is classified in the relevant application field, e.g. in subclasses G06V or H04N.

References

Insert: The following new Application-oriented references section.

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Circuitry for compensating brightness variation in the scene in cameras or camera modules comprising electronic image sensors	H04N 23/70
Camera processing pipelines in cameras or camera modules comprising electronic image sensors	H04N 23/80
Noise processing, e.g. detecting, correcting, reducing or removing noise in circuitry of solid-state image sensors [SSIS]	H04N 25/60

Delete: The following three references from the Informative references table.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Circuitry for compensating brightness variation in the scene in cameras or camera modules comprising electronic image sensors	H04N 23/70
Camera processing pipelines in cameras or camera modules comprising electronic image sensors	H04N 23/80
Noise processing, e.g. detecting, correcting, reducing or removing noise in circuitry of solid-state image sensors [SSIS]	H04N 25/60

Insert: A semicolon at the end of the first bullet statement so that the Special rules section appears as follows.

Special rules of classification

This group focuses on image processing algorithms. Although such algorithms sometimes need to consider characteristics of the underlying image acquisition apparatus, inventions to the image acquisition apparatus per se are outside the scope of this group.

Whenever possible, additional information should be classified using one or more of the indexing codes from the ranges of G06T 2200/00 (see definitions re. G06T) or G06T 2207/00 (see definitions re. G06T 2207/00).

The classification symbol G06T 5/00 should be allocated to documents concerning:

- Interactive / multiple choice image processing, e.g. choosing outputs from multiple enhancement algorithms;
- Image restoration based on properties or models of the human vision system [HVS]

Replace: The existing Synonyms and Keywords table with the following updated table.

Synonyms and Keywords

In patent documents, the following abbreviations are often used:

HDR	high dynamic range
HDRI	high dynamic range imaging
HMM	hidden Markov model
PSF	point spread function
SDR	standard dynamic range

G06T 5/10

Replace: The existing Definition statement text with the following updated text. The image should remain as is.

Definition statement

This place covers:

All transform domain-based enhancement methods, e.g. using:

- Fourier transform, discrete Fourier transform [DFT] or fast Fourier transform [FFT];
- Hadamard transform;
- Discrete cosine transform [DCT];
- Wavelet transform, discrete wavelet transform [DWT].

Illustrative example of subject matter classified in this place:

G06T 5/20

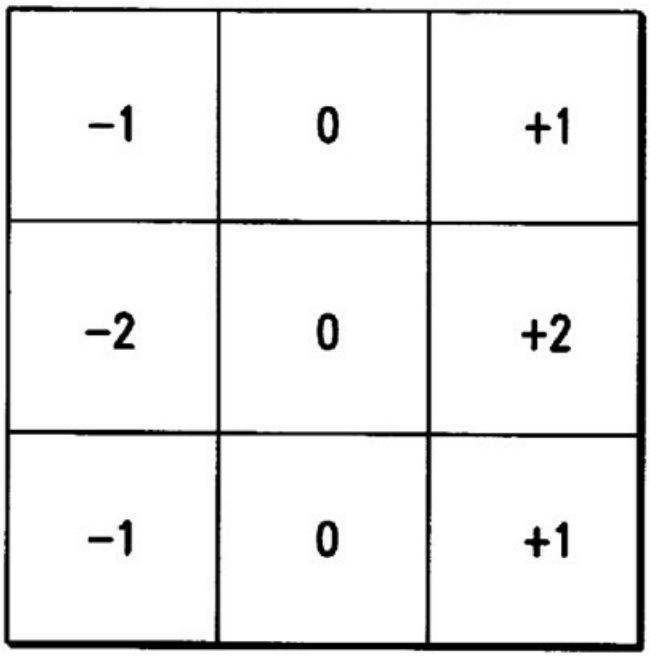
Replace: The existing Definition statement text and image with the following updated text and image.

Definition statement

This place covers:

- Convolution with a mask or kernel in the spatial domain;
- High-pass filter, low-pass filter;
- Gauss filter, Laplace filter;
- Averaging filter, mean filter, blurring filter;
- Differential filters (e.g. Sobel operator);
- Median filter;
- Bilateral filter;
- Minimum, maximum or and rank filtering;
- Wiener filter;
- Phase-locked loops, detectors, mixers;
- Recursive filter;
- Distance transforms;
- Local image processing architectures.

Illustrative example of subject matter classified in this place:



G06T 5/30

Replace: The existing Definition statement text with the following updated text. The images should remain as they are.

Definition statement

This place covers:

All morphology-based operations for image enhancement, e.g. using:

- Thickening, thinning;
- Opening, closing;
- Erosion, dilation;
- Structuring elements;
- Skeletons;
- Geodesic transforms.

Illustrative examples of subject matter classified in this place:

G06T 5/40

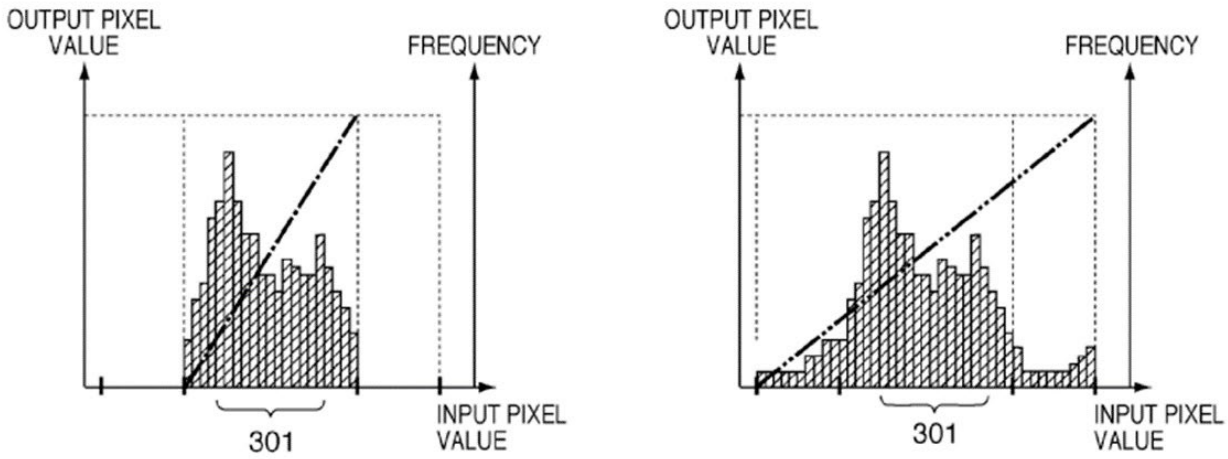
Replace: The existing Definition statement text and image with the following updated text and image.

Definition statement

This place covers:

All histogram-based image enhancement methods.

Illustrative example of subject matter classified in this place:



References

Replace: The existing text in the following reference with the following updated text.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Dynamic range modification of images or parts thereof	G06T 5/90

G06T 5/50

Replace: The existing Definition statement text with the following updated text. The image should remain as is.

Definition statement

This place covers:

- Image averaging;
- Image fusion, image merging;
- Image subtraction;
- Enhanced final image by combining multiple, e.g. degraded, images, while maintaining the same number of pixels (for increased number of pixels: see G06T 3/40);
- Full-field focus from multiple of depth-of-field images, e.g. from confocal microscopy;
- Processing of synthetic aperture radar [SAR] images;
- Energy subtraction;
- Bright field, dark field processing;
- Angiography image processing;
- High dynamic range [HDR] image processing;
- Multispectral image processing;
- Computational photography, e.g. coded aperture imaging.

Illustrative example of subject matter classified in this place:

G06T 5/60

Replace: The existing Definition statement text with the following updated text. The image should remain as is.

Definition statement

This place covers:

All machine learning-based image enhancement methods, e.g. using:

- artificial neural networks [ANN], convolutional neural networks [CNN], generative adversarial networks [GAN] or deep learning;
- decision trees;
- support-vector machines;
- regression analysis;
- Bayesian networks;
- Gaussian processes;
- genetic algorithms.

Illustrative example of subject matter classified in this place:

G06T 5/70

Replace: The existing Definition statement text and image with the following updated text, deleting the image.

Definition statement

This place covers:

- Removing noise from images;
- Temporal denoising, spatio-temporal noise filtering;
- Removing pattern noise from images;
- Image smoothing;
- Image blurring, adding motion blur to images, adding blur to images;
- Edge-adaptive smoothing;
- Smoothing of depth map in stereo or range images;
- Antialiasing by image filtering;
- Denoising or smoothing using singular value decomposition [SVD].

G06T 5/73

Replace: The existing Definition statement text and images with the following updated text and images.

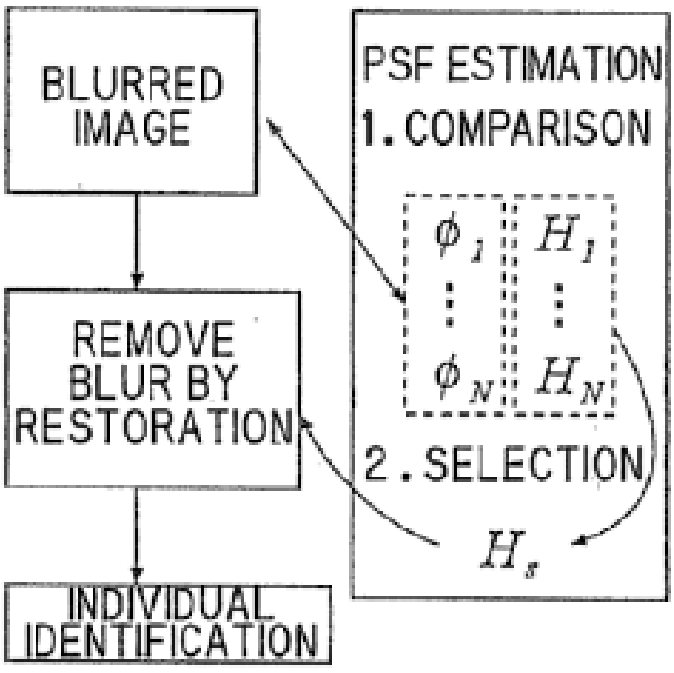
Definition statement

This place covers:

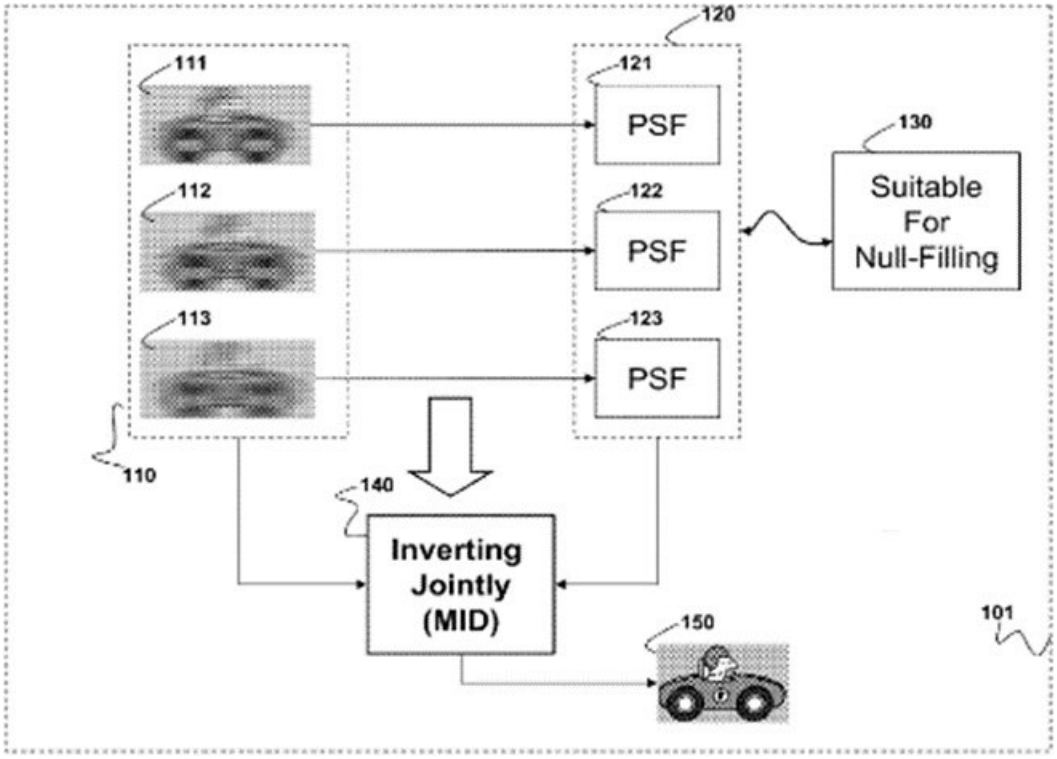
- Deblurring;
- Removing motion blur from images;
- Point-spread function [PSF] model of blurring;
- Deconvolution;
- Modulation transfer function [MTF];
- Sharpening, crispening;
- Edge enhancement, edge boosting.

Illustrative examples of subject matter classified in this place:

1.



2.



G06T 5/75

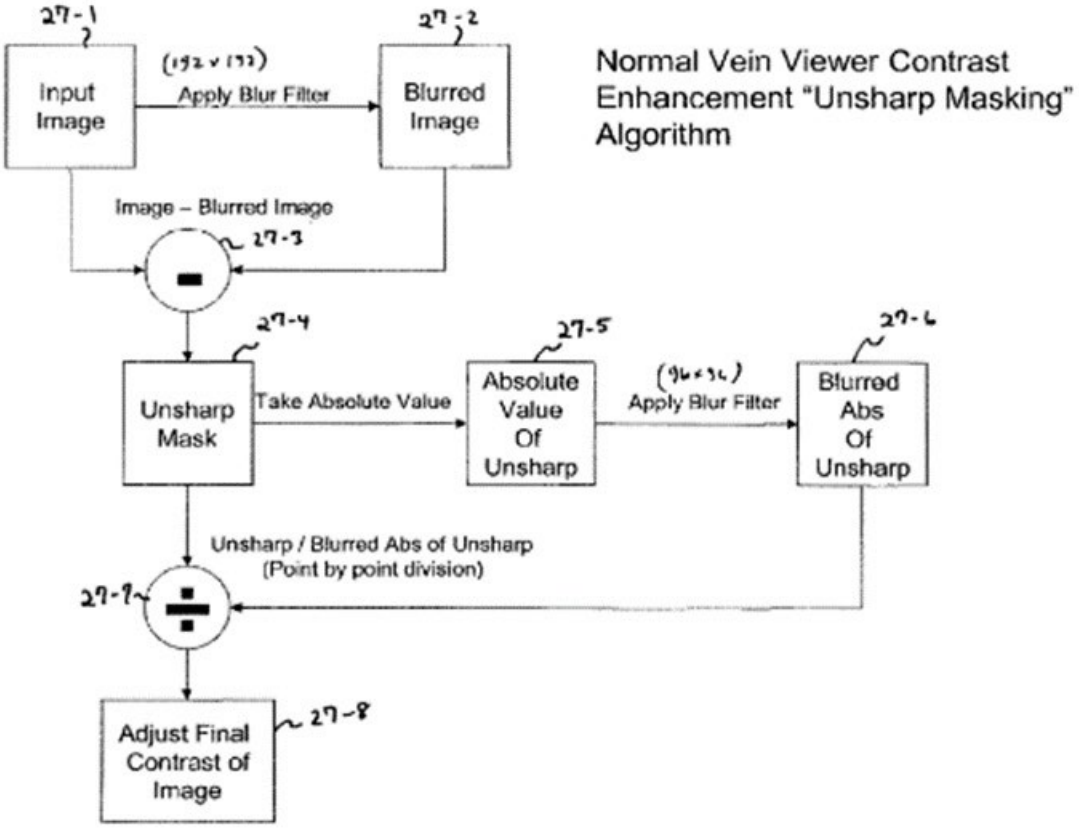
Replace: The existing Definition statement text and image with the following updated text and image.

Definition statement

This place covers:

- Unsharp masking;
- Adding or subtracting a processed version of an image to or from the image.

Illustrative example of subject matter classified in this place:



G06T 5/77

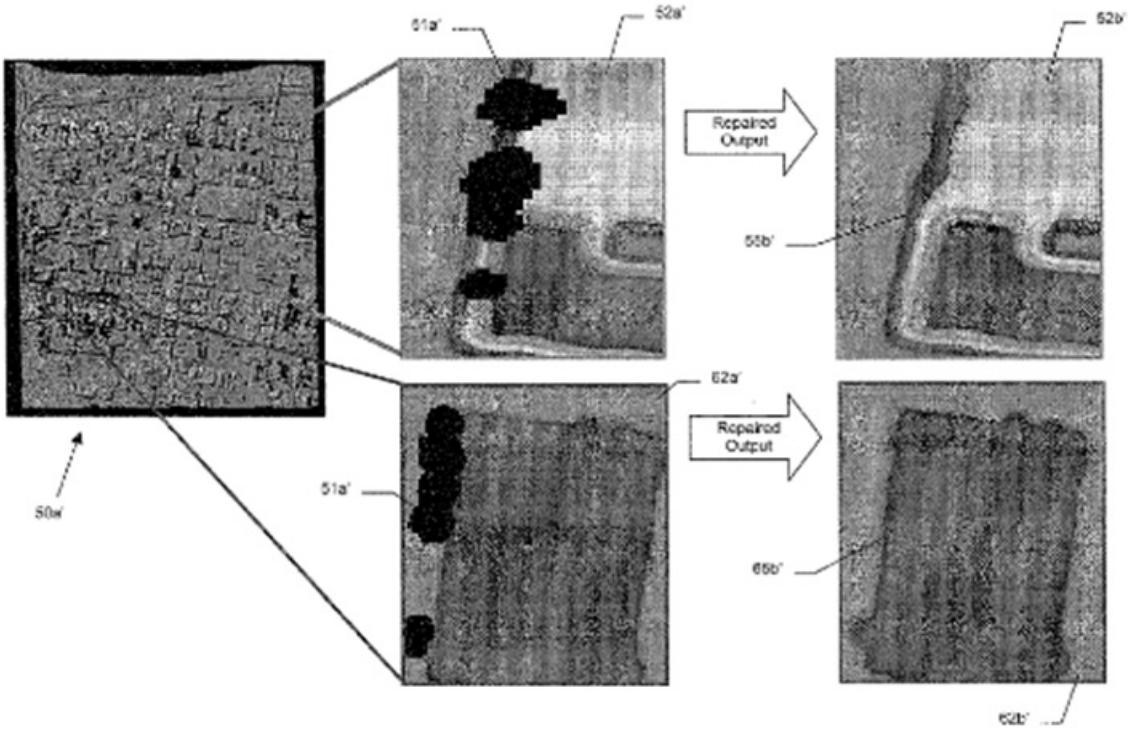
Replace: The existing Definition statement text and image with the following updated text and image.

Definition statement

This place covers:

- Concealing defective pixels in images;
- Scratch removal;
- Inpainting by image filtering or by replacing patches within an image using a generated image or texture patch, or a patch retrieved from another source, e.g. image databases or the internet;
- Correcting red-eye defects.

Illustrative example of subject matter classified in this place:



References

Replace: The existing Informative references table with the following updated table.

Informative references

Attention is drawn to the following places, which may be of interest for search:

Segmentation or edge detection in image analysis	G06T 7/10
Analysis of geometric attributes in image analysis	G06T 7/60
Determining position or orientation of objects or cameras in image analysis	G06T 7/70
Determination of colour characteristics in image analysis	G06T 7/90
Texture generation as such	G06T11/001
Recognition of eye characteristics	G06V 40/18

Modification of content of picture, e.g. retouching	H04N 1/40093
Retouching colour images adapted to be used in scanners, printers, photocopying machines, displays or similar devices	H04N1/62
Red-eye correction adapted to be used in scanners, printers, photocopying machines, displays or similar devices	H04N1/624

G06T 5/80

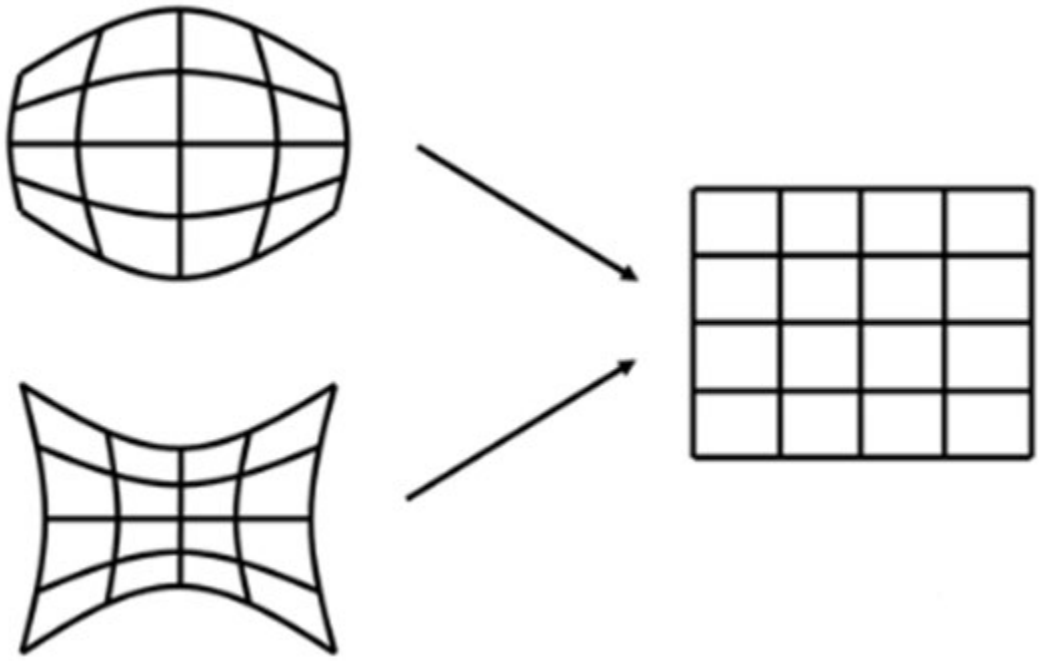
Replace: The existing Definition statement text and image with the following updated text and image.

Definition statement

This place covers:

- Correcting lens distortions or aberrations;
- Correcting pincushion, barrel, trapezoidal or fish-eye distortions;
- Calibrating parameters of lens distortion;
- Reference grids, coordinate mapping.

Illustrative example of subject matter classified in this place:



G06T 5/90

Replace: The existing Definition statement text and images with the following updated text and images.

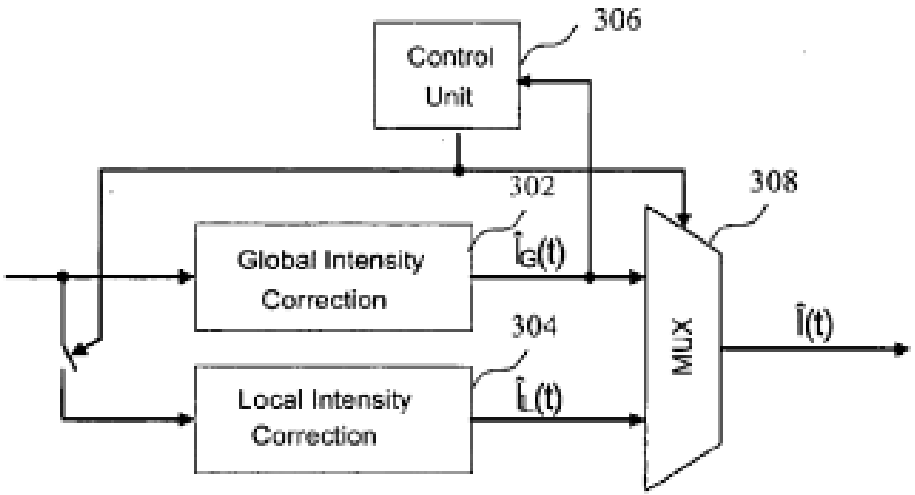
Definition statement

This place covers:

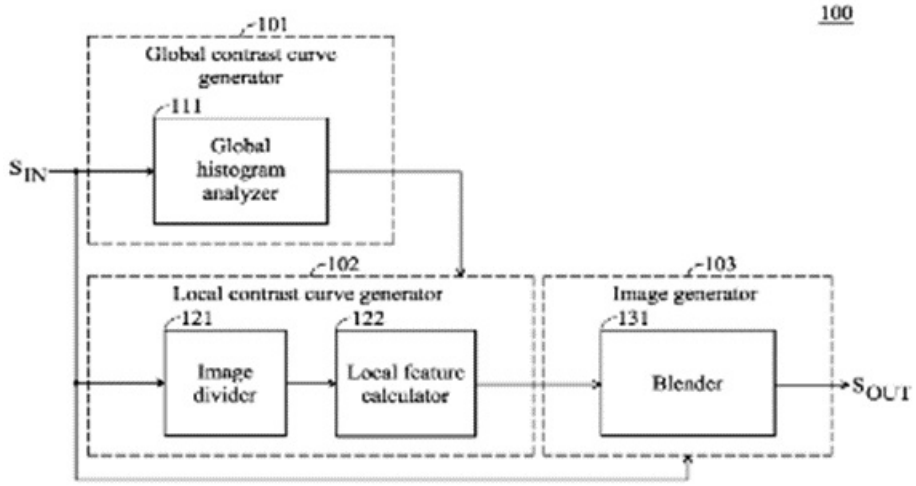
Contrast enhancement based on a combination of local and global properties.

Illustrative examples of subject matter classified in this place:

1.



2.



Insert: The following new reference in the Application-oriented references table.

Application-oriented references

Examples of places where the subject matter of this place is covered when specially adapted, used for a particular purpose, or incorporated in a larger system:

Control of the dynamic range in Circuitry of solid-state image sensors [SSIS]	H04N 25/57

G06T 5/92

Replace: The existing Definition statement text with the following updated text. The image should remain as is.

Definition statement

This place covers:

- Global contrast enhancement or tone mapping to increase the dynamic range of an image, based on properties of the whole image, e.g. global statistics or histograms;
- Contrast stretching, brightness equalisation;
- Gamma and gradation correction in general;
- Tone mapping for high dynamic range [HDR] imaging;
- Intensity mapping, e.g. using lookup tables [LUT].

Illustrative example of subject matter classified in this place:

G06T 5/94

Replace: The existing Definition statement text with the following updated text. The images should remain as they are.

Definition statement

This place covers:

- Local contrast enhancement, e.g. locally adaptive filtering;
- Retinex processing.

Illustrative examples of subject matter classified in this place: