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SIGNATURE of Applicant for Patent

Signature	Fatih M. Ozluturk	Date	10/18/12
Name	Fatih M. Ozluturk	Telephone	516 603 8383
Title and Company			

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Application Number:	
Filing Date:	
Title of Invention:	METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES
First Named Inventor/Applicant Name:	Fatih M. Ozluturk
Filer:	Thomas A Mattioli/Angel Wolf
Attorney Docket Number:	OZL-PT001.13

Filed as Small Entity

Filing Fees for Track I Prioritized Examination - Nonprovisional Application under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	70	70
Utility Search Fee	2111	1	300	300
Utility Examination Fee	2311	1	360	360
Request for Prioritized Examination	2817	1	2000	2000
Pages:				
Claims:				
Independent Claims in Excess of 3	2201	1	210	210
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Publ. Fee- Early, Voluntary, or Normal	1504	1	0	0
PROCESSING FEE, EXCEPT PROV. APPLS.	2830	1	70	70
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
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Electronic Acknowledgement Receipt

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Application Number:	14690818
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Title of Invention:	METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES
First Named Inventor/Applicant Name:	Fatih M. Ozluturk
Customer Number:	3624
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		OZL_PT001_13_Application_20150420.PDF	178174 46d2e713ef9fdef44e809f9fd8d3eabc73eb08a0	yes	26
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Specification		1	21	
	Claims		22	25	
	Abstract		26	26	
Warnings:					
Information:					
2	TrackOne Request	OZL_PT001_13_TrackOneRequest_20150420.PDF	148619 26464c49a2a2a5c222a1c9e131e06d51e50fb2e6	no	2
Warnings:					
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3	Application Data Sheet	OZL_PT001_13_ADS_20150420.PDF	1561578 1df4fa00c6abd276405e1ddca2080dd7998e664e	no	7
Warnings:					
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4	Drawings-only black and white line drawings	OZL_PT001_13_Drawings_20150420.PDF	225570 b152082410172c486da491874876c785548bd5ce	no	9
Warnings:					
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5	Oath or Declaration filed	OZL_PT001_13_Declaration.PDF	1259548 2eea273442b79cdb4a8f4304f42f02648e75e1f1	no	1
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6	Power of Attorney	OZL_PT001_13_POA_Transmittal_20150420.PDF	208729 0fe726ff95d2d1a421c72ab9df713fcda4f2a178	no	1

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7	Power of Attorney	OZL_PT001_13_POA_20150420.PDF	187133 ffea9f505bbc28aa2fa11dd8d2b200993491514e	no	2
Warnings:					
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8	Fee Worksheet (SB06)	fee-info.pdf	42159 d8977dfa5665cc74a301c101971a590b99ec7dc4	no	2
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METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of U.S. Patent Application No. 14/532,654, filed on November 4, 2014, which is a continuation of U.S. Patent Application No. 13/442,370, filed on April 9, 2012, which issued as U.S. Patent No. 8,922,663 on December 30, 2014, which is a continuation of U.S. Patent Application Serial No. 12/274,032, filed on November 19, 2008, which issued as U.S. Patent No. 8,154,607 on April 10, 2012, which is a continuation of U.S. Patent Application Serial No. 11/089,081, filed on March 24, 2005, which issued as U.S. Patent No. 8,331,723 on December 11, 2012, which claims the benefit of U.S. Provisional Application Serial No. 60/556,230, filed on March 25, 2004, the contents of each of which are incorporated by reference herein.

FIELD OF INVENTION

[0002] The present invention generally relates to digital image processing. More specifically, this invention relates to processing of digitized image data in order to correct for image distortion caused by relative motion between the imaging device and the subject at the time of image capture, or by optical distortion from other sources.

BACKGROUND

[0003] When capturing images, as with a camera, it is desirable to capture images without unwanted distortion. In general, sources of unwanted distortion can be characterized as equipment errors and user errors. Examples of common equipment errors include inadequate or flawed optical equipment, and undesirable characteristics of the film or other recording media. Using equipment and media of a quality that is suitable for a particular photograph can help mitigate the problems

associated with the equipment and the recording medium, but in spite of this, image distortion due to equipment errors can still appear.

[0004] Another source of image distortion is user error. Examples of common user errors include poor image processing, and relative motion between the imaging device and the subject of the image. For example, one common problem that significantly degrades the quality of a photograph is the blur that results from camera movement (i.e. shaking) at the time the photograph is taken. This can be difficult to avoid, especially when a slow shutter speed is used, such as in low light conditions, or when a large depth of field is needed and the lens aperture is small. Similarly, if the subject being photographed is moving, use of a slow shutter speed can also result in image blur.

[0005] There are currently many image processing techniques that are used to improve the quality, or "correctness," of a photograph. These techniques are applied to the image either at the time it is captured by a camera, or later when it is post-processed. This is true for both traditional "hardcopy" photographs that are chemically recorded on film, and for digital photographs that are captured as digital data, for example using a charged couple device (CCD) or a CMOS sensor. Also, hardcopy photographs can be scanned and converted into digital data, and are thereby able to benefit from the same digital signal processing techniques as digital photographs.

[0006] Commonly used post-processing techniques for digitally correcting blurred images typically involve techniques that seek to increase the sharpness or contrast of the image. This can give the mistaken impression that the blur is remedied. However, in reality, this process causes loss of data from the original image, and also alters the nature of the photograph. Thus, current techniques for increasing the sharpness of an image do not really "correct" the blur that results from relative motion between a camera and a subject being photographed. In fact, the data loss from increasing the sharpness can result in a less accurate image than the original. Therefore, a different method that actually corrects the blur is

desirable.

[0007] In the prior art, electro-mechanical devices for correcting image blur due to camera motion are built into some high quality lenses, variously called "image stabilization", "vibration reduction", or similar names by camera/lens manufacturers. These devices seek to compensate for the camera/lens movement by moving one or more of the lens elements; hence countering the effect of the motion. Adding such a device to a lens typically makes the lens much more expensive, heavier and less sturdy, and can also compromise image quality.

[0008] Accordingly, it is desirable to have a technique that corrects for distortion in photographs without adding excessively to the price, robustness or weight of a camera or other imaging device, or adversely affecting image quality.

SUMMARY

[0009] The present invention processes image data in order to correct an image for distortion caused by imager movement or by movement of the subject being imaged. In another embodiment, the present invention can prevent image distortion due to motion of the imaging device or subject at relatively slow shutter speeds, resulting in a substantially undistorted image.

[0010] In another embodiment, the present invention measures relative motion between the imaging device and the subject by using sensors that detect the motion. When an image is initially captured, the effect of relative motion between the imaging device and the subject is that it transforms the "true image" into a blurred image, according to a 2-dimensional transfer function defined by the motion. The invention determines a transfer function that represents the motion and corrects the blur.

[0011] In yet another embodiment, the transfer function is estimated using blind detection techniques. The transfer function is then inverted, and the inverted function is implemented in an image correcting filter that essentially reverses the blurring effect of the motion on the image. The image is processed through the

filter, wherein blur due to the motion is reversed, and the true image is recovered.

[0012] In yet another embodiment, the invention uses the transfer function to combine consecutive images taken at a fast shutter speed to avoid blur due to motion between camera and subject that could result from using a slow shutter speed. In still another embodiment, the image sensor is moved to counter camera motion while the image is being captured.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] Figure 1 is a portion of memory having memory locations wherein elements of a recorded image are stored.

[0014] Figure 2 is a portion of memory having memory locations wherein elements of a deconvolution filter are stored.

[0015] Figure 3 is a portion of memory having memory locations wherein the recorded image is stored for calculating the next value of a corrected image.

[0016] Figure 4 is a functional block diagram of a system for correcting an image for distortion using a transfer function representing the distortion, wherein the transfer function is derived from measurements of the motion that caused the distortion.

[0017] Figure 5 is a functional block diagram of a system for correcting an image for distortion using a transfer function representing the distortion, wherein the transfer function is derived using blind estimation techniques.

[0018] Figure 6 shows a unit for iterative calculation of the corrective filter coefficients and estimation of the correct image data.

[0019] Figure 7 illustrates support regions of an image $r(n,m)$ and of a transfer function $h(n,m)$, and the transfer function $h(n,m)$ being applied to different parts of the image $r(n,m)$.

[0020] Figure 8 shows a unit for blind deconvolution to calculate the correct image data.

[0021] Figure 9 is an image of an object being captured on an image sensor

wherein pixel values represent points of the image.

[0022] Figure 10 illustrates the effect of moving an imager while capturing an image, resulting in multiple copies of the image being recorded over each other, causing blur.

[0023] Figure 11 illustrates combining images taken at fast shutter speeds to result in the equivalent of a final image taken at a slower shutter speed, but with reduced blur.

[0024] Figure 12 illustrates image blur correction where an image sensor is moved to compensate for imager movement.

[0025] Figure 13 is an example of an image distorted by movement of the imager when the image was captured.

[0026] Figure 14 is represents the image of Figure 13 corrected according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0027] The present invention will be described with reference to the figures wherein like numerals represent like elements throughout. Although the invention is explained hereinafter as a method of correcting for image distortion due to the shaking of a camera when a picture is taken, similar distortions can also be caused by other types of imaging equipment and by imperfections in photo processing equipment, movement of the subject being photographed, and other sources. The present invention can be applied to correct for these types of distortions as well. Additionally, although reference is made throughout the specification to a camera as the exemplary imaging device, the present invention is not limited to such a device. As aforementioned, the teachings of the present invention may be applied to any type of imaging device, as well as image post-processing techniques.

[0028] Capturing and recording a photograph, for example by a camera, involves gathering the light reflected or emanating from a subject, passing it through an optical system, such as a series of lenses, and directing it onto a light

sensitive recording medium. A typical recording medium in traditional analog photography is a film that is coated with light sensitive material. During processing of the exposed film, the image is fixed and recorded. In digital cameras, the recording medium is typically a dense arrangement of light sensors, such as a Charge-Coupled Device (CCD) or a CMOS sensor.

[0029] The recording medium continuously captures the impression of the light that falls upon it as long as the camera shutter is open. Therefore, if the camera and the subject are moving with respect to each other (such as in the case when the user is unsteady and is shaking the camera, or when the subject is moving), the recorded image becomes blurred. To reduce this effect, a fast shutter speed can be used, thereby reducing the amount of motion occurring while the shutter is open. However, this reduces the amount of light from the subject captured on the recording medium, which can adversely affect image quality. In addition, increasing the shutter speed beyond a certain point is not always practical. Therefore, undesired motion blur occurs in many pictures taken by both amateur and professional photographers.

[0030] The nature of the blur is that the light reflected from a reference point on the subject does not fall on a single point on the recording medium, but rather it 'travels' across the recording medium. Thus a spread-out, or smudged, representation of the reference point is recorded.

[0031] Generally, all points of the subject move together, and the optics of the camera and the recording medium also move together. For example, in the case of a photograph of a moving car, wherein an image of the car is blurred due to uniform motion of all parts of the car. In other words, the image falling on the recording medium 'travels' uniformly across the recording medium, and all points of the subject blur in the same manner.

[0032] The nature of the blur resulting from uniform relative motion can be expressed mathematically. In a 2-dimensional space with discrete coordinate indices *'n'* and *'m'*, the undistorted image of the subject can be represented by

s(n,m), and a transfer function *h(n,m)* can be used to represent the blur. Note that *h(n,m)* describes the way the image 'travels' on the recording medium while it is captured. The resulting image that is recorded, *r(n,m)*, is given by:

$$r(n,m) = s(n,m) ** h(n,m)\,; \qquad \text{Equation (1)}$$

where ** represents 2-dimensional convolution. The mathematical operation of convolution is well known to those skilled in the art and describes the operation:

$$r(n,m) = \sum_{i=-\infty}^{\infty} \sum_{j=-\infty}^{\infty} h(i,j) s(n-i, m-j)\,. \qquad \text{Equation (2)}$$

[0033] In the sum operations in Equation (2), the summation limits are infinite. In practice, the summations are not infinite, since the support region of the transfer function is finite. In other words, the region where the function is non-zero is limited by the time the camera shutter is open and the amount of motion. Therefore, the summation is calculated for only the indices of the transfer function where the function itself is non-zero, for example, from $i = -N \ldots N$ and $j = -M \ldots M$.

[0034] If the transfer function *h(n,m)* is known, or its estimate is available, the blur that it represents can be "undone" or compensated for in a processor or in a computer program, and a corrected image can be obtained, as follows. Represent the "reverse" of the transfer function *h(n,m)* as $h^{-1}(n,m)$ such that:

$$h(n,m) ** h^{-1}(n,m) = \delta(n,m)\,; \qquad \text{Equation (3)}$$

where $\delta(n,m)$ is the 2-dimensional Dirac delta function, which is:

$$\delta(n,m) = \begin{cases} 1 \text{ if } n = m = 0 \\ 0 \text{ otherwise} \end{cases}. \qquad \text{Equation (4)}$$

[0035] The delta function has the property that when convolved with another function, it does not change the nature of that function. Therefore, once $h(n,m)$ and hence $h^{-1}(n,m)$ are known, an image $r(n,m)$ can be put through a correcting filter, called a "deconvolution filter", which implements the inverse transfer function $w(n,m) = h^{-1}(n,m)$ and undoes the effect of blur. Then:

$$\begin{aligned} r(n,m)**w(n,m) &= r(n,m)**h^{-1}(n,m) \\ &= s(n,m)**h(n,m)**h^{-1}(n,m) \\ &= s(n,m)**\delta(n,m) \\ &= s(n,m); \end{aligned} \qquad \text{Equation (5)}$$

and the correct image data $s(n,m)$ is recovered.

[0036] The deconvolution filter in this example is such that:

$$\sum_{i=-N}^{N}\sum_{j=-M}^{M} w(i,j)h(n-i,m-j) = \begin{cases} 1 & \text{if } n=m=0 \\ 0 & \text{otherwise} \end{cases}. \qquad \text{Equation (6)}$$

Because of the property that the deconvolution operation forces the output of the convolution to be zero for all but one index, this method is called the "zero-forcing algorithm". The zero-forcing algorithm itself is but one method that can be used, but there are others possible also, such as the least mean-square algorithm described in more detail below.

[0037] In order to define a deconvolution filter, the transfer function $h(n,m)$ representing the relative motion between the imager and the subject must be derived from measuring the motion, or alternatively by using blind estimation techniques. The inverse function $h^{-1}(n,m)$ must then be calculated and incorporated in a filter to recover a corrected image $s(n,m)$. It is possible to determine $h(n,m)$ using sensors that detect motion, and record it at the time the image is captured.

[0038] One embodiment of the present invention includes one or more motion sensors, attached to or included within the imager body, the lens, or otherwise configured to sense any motion of the imager while an image is being captured, and to record this information. Such sensors are currently commercially available which are able to capture movement in a single dimension, and progress is being made to improve their accuracy, cost, and characteristics. To capture motion in two dimensions, two sensors may be used, each capable of detecting motion in a single direction. Alternatively, a sensor able to detect motion in more than one dimension can be used.

[0039] The convolution in Equation (5) can be performed using memory elements, by performing an element-by-element multiplication and summation over the support region of the transfer function. The recorded image is stored, at least temporarily, in memory elements forming a matrix of values such as shown in Figure 1. Similarly, the deconvolution filter $w(n,m)$ is stored in another memory location as shown in Figure 2. The deconvolution operation is then performed by multiplying the values in the appropriate memory locations on an element-by-element basis, such as multiplying $r(n,m)$ and $w(0,0)$; $r(n-1,m)$ and $w(1,0)$, and so on, and summing them all up.

[0040] Element-by-element multiplication and summing results in the convolution:

$$y(n,m) = \sum_{i=-N}^{N} \sum_{j=-M}^{M} w(i,j) r(n-i, m-j). \qquad \text{Equation (7)}$$

To calculate the next element, $y(n+1,m)$ for example, the deconvolution filter $w(n,m)$ multiplies the shifted memory locations, such as shown in Figure 3, followed by the summation. Note that the memory locations do not need to be shifted in practice; rather, the pointers indicating the memory locations would move. In Figure 1 and Figure 3 portions of $r(n,m)$ are shown that would be included in the element-by-

element multiplication and summation, and this portion is the same size as $w(n,m)$. However, it should be understood that $r(n,m)$, that is the whole image, is typically much larger than the support region of $w(n,m)$. To determine value of the convolution for different points, an appropriate portion of $r(n,m)$ would be included in the calculations.

[0041] The filter defined by Equation (5) is ideal in the sense that it reconstructs the corrected image from the blurred image with no data loss. A first embodiment calculates the inverse of $h(n,m)$ where $h(n,m)$ is known. As explained above, by making use of motion detecting devices, such as accelerometers, the motion of the imager (such as a camera and/or the associated lens) can be recorded while the picture is being captured, and the motion defines the transfer function describing this motion.

[0042] A functional block diagram of this embodiment in accordance with the present invention is illustrated in Figure 4, wherein a method 40 for correcting image distortion is shown. An image $r(n,m)$ from camera optics is captured by an imager (step 41) and recorded in memory (step 42). Simultaneously, motion sensors detect and record camera motion (step 43) that occurs while the shutter of the camera is open. The transfer function representing the motion $h(n,m)$ is derived (step 44), and the inverse transfer function $h^{-1}(n,m)$ is determined (step 46). The inverse transfer function is applied in a corrective filter (step 48) to the image, which outputs a corrected image $s(n,m)$ (step 49).

[0043] In this and other embodiments that make use of motion sensors to represent the imager's movement, derivation of the transfer function from motion information (step 44) takes into account the configuration of the imager and the lens also. For an imager that is a digital camera, for example, the focal length of the lens factors into the way the motion of the imager affects the final image. Therefore the configuration of the imager is part of the derivation of $h(n,m)$. This is important especially for imagers with varying configurations, such as digital cameras with interchangeable lenses.

[0044] In this first embodiment of the invention, an iterative procedure is used to compute the inverse transfer function from *h(n,m)*. The approximate inverse transfer function at iteration k is denoted as $\hat{h}_k^{-1}(n,m)$. At this iteration, output of the deconvolution filter is:

$$\begin{aligned} y_k(n,m) &= \hat{h}_k^{-1}(n,m) ** r(n,m) \\ &= \sum_i \sum_j \hat{h}_k^{-1}(i,j) r(n-i, m-j). \end{aligned} \qquad \text{Equation (8)}$$

[0045] The filter output can be written as the sum of the ideal term and the estimation noise as:

$$\begin{aligned} y_k(n,m) &= h^{-1}(n,m) ** r(n,m) + \left(\hat{h}_k^{-1}(n,m) - h^{-1}(n,m)\right) ** r(n,m) \\ &= s(n,m) + v_k(n,m); \end{aligned} \qquad \text{Equation (9)}$$

where *v(n,m)* is the estimation noise which is desirable to eliminate. An initial estimate of the correct image can be written as:

$$\hat{s}_k(n,m) = \hat{h}_k^{-1}(n,m) ** r(n,m). \qquad \text{Equation (10)}$$

[0046] However, this estimate can in general be iteratively improved. There are a number of currently known techniques described in estimation theory to achieve this. A preferable option is the Least Mean-Square (LMS) algorithm. A block diagram of a calculation unit 60 which implements this method is shown in Figure 6.

[0047] As an initial state, $\hat{h}^{-1}{}_0(n,m)$ is set to equal $\mu r(n,m)$. Then, the following steps are iteratively repeated:

[0048] Step 1, an estimate of the correct image is calculated in a first 2-dimensional finite impulse response (2D FIR) filter 62:

$$\hat{s}_k(n,m) = \hat{h}_k^{-1}(n,m) ** r(n,m).$$

[0049] Step 2, a received signal based on the estimated correct image is calculated in a second 2D FIR filter 64:

$$\tilde{r}_k(n,m) = \hat{s}_k(n,m) ** h(n,m);$$

and the estimation error is calculated using an adder 66:

$$e_k(n,m) = r_k(n,m) - \tilde{r}_k(n,m).$$

[0050] Step 3, the inverse transfer function coefficients are then updated in the LMS algorithm unit 68:

$$\hat{h}_{k+1}^{-1}(n,m) = \hat{h}_k^{-1}(n,m) + \mu r(n,m) e_k(n,m);$$

where μ is the step-size parameter.

[0051] These steps are repeated until the estimation error becomes small enough to be acceptable; which value can be predetermined or may be set by a user. As the iterative algorithm converges, the estimated inverse transfer function approaches the correct inverse transfer function $h^{-1}(n,m)$. The inverse transfer function coefficients are the coefficients of the deconvolution filter, and the estimate $\hat{s}(n,m)$ converges to $s(n,m)$, the correct image, at the same time.

[0052] This process can be repeated for the entire image, but it is less complex, and therefore preferable, to find the inverse filter first over a single transfer function support region, then apply it to the entire image $r(n,m)$.

[0053] While the above Steps 1-3 are being repeated, a different portion of the recorded image $r(n,m)$ can be used in each iteration. As in Figure 7, it should be noted that the recorded image $r(n,m)$ typically has a much larger support region than the transfer function $h(n,m)$ that represents the camera motion. Therefore, the above steps are preferably performed over a support region of $h(n,m)$, and not over the entire image $r(n,m)$, for each iteration.

[0054] Although the present invention has been explained with reference to the LMS algorithm, this is by way of example and not by way of limitation. It should be clear to those skilled in the art that there are other iterative algorithms

beside the LMS algorithm that can be used to achieve acceptable results, and also that there are equivalent frequency domain derivations of these algorithms. For example, it is possible to write Equation (1) in frequency domain as:

$$R(\omega_1,\omega_2) = S(\omega_1,\omega_2)H(\omega_1,\omega_2); \qquad \text{Equation (11)}$$

where $R(\omega_1,\omega_2)$, $S(\omega_1,\omega_2)$, and $H(\omega_1,\omega_2)$ are the frequency domain representations (Fourier Transforms) of the captured image, the correct image, and the transfer function, respectively, and therefore:

$$S(\omega_1,\omega_2) = \frac{R(\omega_1,\omega_2)}{H(\omega_1,\omega_2)}. \qquad \text{Equation (12)}$$

[0055] To obtain *s(n,m)* one would calculate $S(\omega_1,\omega_2)$ as above and take the Inverse Fourier Transform, which should be known to those skilled in the art. However, this method does not always lead to well behaved solutions, especially when numerical precision is limited.

[0056] In a second embodiment of the present invention, *h(n,m)* is not known. This second embodiment uses so-called blind deconvolution, whereby the transfer function *h(n,m)* is estimated using signal processing techniques. A functional block diagram of this embodiment is illustrated in Figure 5, wherein a method 50 for correcting image distortion according to this embodiment is shown. An image *r(n,m)* from the optics from a camera is captured (step 51) and recorded in memory (step 52). Unlike the first embodiment, there are no motion sensors to detect and record camera motion that occurs while the shutter of the camera is open. Instead, the transfer function representing the motion *h(n,m)* is derived using blind estimation techniques (step 54), and the inverse transfer function $h^{-1}(n,m)$ is determined (step 56). The inverse transfer function is applied in a corrective filter to the image (step 58), which outputs a corrected image *s(n,m)* (step 59).

[0057] Blind equalization techniques are used to obtain the deconvolution filter coefficients. This is also an iterative LMS algorithm, similar to that used in the first embodiment. In this second embodiment, an iterative procedure is also used to compute an approximate deconvolution filter, and the approximation is improved at each iteration until it substantially converges to the ideal solution. As aforementioned with respect to the first embodiment, the level of convergence may be predetermined or may be set by a user. The approximate deconvolution filter is denoted at iteration k as $\hat{w}_k(n,m)$. At this iteration, the output of the deconvolution filter is:

$$\begin{aligned} y_k(n,m) &= \hat{w}_k(n,m) ** r(n,m) \\ &= \sum\sum \hat{w}_k(i,j) r(n-i, m-j); \end{aligned} \qquad \text{Equation (13)}$$

[0058] The filter output can be written as the sum of the ideal term and the estimation noise as:

$$\begin{aligned} y_k(n,m) &= w(n,m) ** r(n,m) + \left[\hat{w}_k(n,m) - w(n,m)\right] ** r(n,m) \\ &= s(n,m) + v_k(n,m); \end{aligned} \qquad \text{Equation (14)}$$

where $v(n,m)$ is the estimation noise, which is desirable to eliminate. An initial estimate of the correct image can be written as:

$$\hat{s}_k(n,m) = \hat{w}_k(n,m) ** r(n,m). \qquad \text{Equation (15)}$$

[0059] However, this estimate can be iteratively improved. There are a number of currently known techniques described in estimation theory to achieve this. A preferable option is the LMS algorithm. A block diagram of a calculation unit 80 which implements this method is shown in Figure 8.

[0060] As an initial state, $\hat{h}^{-1}{}_0(n,m)$ is set equal to $\mu r(n,m)$. Then, the following steps are iteratively repeated:

[0061] Step 1, an estimate of the correct image is calculated in a first 2D FIR filter 82:

$$\hat{s}_k(n,m) = \hat{h}_k^{-1}(n,m) ** r(n,m).$$

[0062] Step 2, a received signal based on the estimated correct image is calculated in a non-linear estimator 84:

$$\tilde{r}_k(n,m) = g\left(\hat{s}_k(n,m)\right);$$

and the estimation error is calculated using an adder 86:

$$e_k(n,m) = r_k(n,m) - \tilde{r}_k(n,m).$$

[0063] Step 3, the inverse transfer function coefficients are then updated in the LMS algorithm unit 88:

$$\hat{h}_{k+1}^{-1}(n,m) = \hat{h}_k^{-1}(n,m) + \mu r(n,m) e_k(n,m),$$

where μ is the step-size parameter.

[0064] The function *g(.)* calculated in step 2 is a non-linear function chosen to yield a Bayes estimate of the image data. Since this function is not central to the present invention and is well known to those of skill in the art, it will not be described in detail hereinafter.

[0065] There are known blind detection algorithms for calculating *s(n,m)* by looking at higher order statistics of the image data *r(n,m)*. A group of algorithms under this category are called Bussgang algorithms. There are also variations called Sato algorithms, and Godard algorithms. Another class of blind estimation algorithms use spectral properties (polyspectra) of the image data to deduce information about *h(n,m)*. Any appropriate blind estimation algorithm can be used to determine *h(n,m)*, and to construct a correcting filter.

[0066] The first two embodiments of the present invention described hereinbefore correct blur in an image based on determining a transfer function that represents the motion of an imager while an image is being captured, and then

correcting for the blur by making use of the "inverse" transfer function. One method determines the transfer function at the time the photograph is being captured by using devices that can detect camera motion directly. The other method generates a transfer function after the image is captured by using blind estimation techniques. Both methods then post-process the digital image to correct for blur. In both cases, the captured image is originally blurred by motion, and the blur is then removed.

[0067] In accordance with a third embodiment of the present invention the blurring of an image is prevented as it's being captured, as described below. When an imager is moved while an image is being captured, multiple copies of the same image are, in effect, recorded over each other. For example, when an image is captured digitally it is represented as pixel values in the sensor points of the image sensor. This is pictorially represented in Figure 9, in which the imager (for example, a camera and its associated lens) are not shown in order to simplify the depiction.

[0068] If the imager is shaken or moved while the image is being captured, the situation is equivalent to copies of the same image being captured multiple times in an overlapping fashion with an offset. The result is a blurred image. This is particularly true if the shutter speed is relatively slow compared to the motion of the camera. This is graphically illustrated in Figure 10.

[0069] When the shutter speed is sufficiently fast compared to the motion of the imager, blur does not occur or is very limited because the displacement of the imager is not large enough to cause the light reflected from a point on the image to fall onto more than one point on the image sensor. This third embodiment of the invention takes advantage of the ability of an imager to record multiple images using fast shutter speeds. When an image is being captured using a setting of a relatively slow shutter speed, the imager actually operates at a higher shutter speed (for instance at the fastest shutter speed at which the imager is designed to operate), and captures multiple images "back to back." For example, if the photograph is being taken with a shutter speed setting of 1/125 sec and the fastest shutter speed of the camera is 1/1000 sec, the camera actually captures 8

consecutive images, each taken with a shutter speed setting of 1/1000 sec. Then, the camera combines the images into a single image by aligning them such that each pixel corresponding to the same image point in each image is combined pixel-by-pixel into one pixel value by adding pixel values, averaging them, or using any other appropriate operation to combine them. The multiple images can all be stored and aligned once all of them are captured, or alternatively, each image can be aligned and combined with the first image in "real time" without the need to store all images individually. The blur of the resulting image is substantially reduced, as depicted in Figure 11.

[0070] The quality of an image can be measured in terms of signal-to-noise power ratio (SNR). When a fast shutter speed is used, the SNR of the image is degraded because the image sensor operates less effectively when the amount of light falling on it is reduced. However, since multiple images are being added, this degradation is overcome. Indeed, an SNR improvement can be expected using this embodiment, because the image data is being added coherently while the noise is being added non-coherently. This phenomenon is the basis for such concepts as maximal ratio combining (MRC).

[0071] To determine how to align the pixel values, a device that can detect motion, such as an accelerometer or other motion sensor, is attached to or incorporated within the imager, and it records the motion of the imager while the photograph is being taken. The detected motion indicates how much the imager moved while each of the series of images was captured, each image having been captured back-to-back with a high shutter speed as explained in the example above. The imager moves each of the images in the series by an amount which is preferably measured in pixels, in the direction opposite the motion of the imager that occurred during the interval between the capture of the first image and each respective image in the series. Thus, the shift of each image is compensated for, and the correct pixels are aligned in each of the images. This is illustrated in Figure 11. The combined image will not be blurred since there is no spilling of image points

into more than one pixel in the combined final image.

[0072] As an alternative to the third embodiment, the reference point for aligning the higher speed images is not the imager location, but the subject itself. In other words, higher shutter speed images can be aligned and combined such that a designated subject in a field of view is clear and sharp whereas other parts of the image may be blurred. For example, a moving subject such as a car in motion can be the designated subject. If high shutter speed images are combined such that the points of the image of the moving car are aligned, the image of the car will be clear and sharp, while the background is blurred. As a way to align a designated subject, such as the car in this example, pattern recognition and segmentation algorithms may be used that are well known to those skilled in the art, and defined in current literature. Alternatively, a tracking signal that is transmitted from the subject can be used to convey its position. Alternatively, the user can indicate, such as by an indicator in a viewfinder, which object in the field of view is the designated subject to be kept blur-free.

[0073] A fourth embodiment of the invention compensates for movement of the imager or the subject by adjusting the position of the image sensor during image capture, according to the inverse of the transfer function describing the imager or subject motion, or both. This embodiment is illustrated in Figure 12. This embodiment is preferably used in digital cameras wherein the image sensor 108 is a relatively small component and can be moved independently of the camera, but can also be used with film. Accordingly, this embodiment makes use of motion sensors, and detects the movement of the camera and/or the subject while the image is being captured. The signals from the motion sensors are used to control devices that adjust the position of the image sensor. In Figure 12, horizontal motion sensor 102 and vertical motion sensor 104 measure movement of the camera while its shutter (not shown) is open and an image is being captured. The motion information is conveyed to a controller 106, which determines and sends signals to devices 110a, 110b, 110c, and 110d, which adjust the position of the image sensor 108. The

control mechanism is such that the devices 110a-d, for example electromagnets or servos, move the image sensor 108 in the opposite direction of the camera motion to prevent motion blur. Additional sensors (not shown) can be used to detect motion of the subject, and the control mechanism configured to correct for that motion as well.

[0074] Figure 13 shows an example of a photographic image that is blurred due to user movement of the imager while taking the picture. Figure 14 shows the same image, corrected according to the present invention. The invention substantially recovers the correct image from the blurred image.

[0075] Those skilled in the art will recognize that all embodiments of the invention are applicable to digitized images which are blurred by uniform motion, regardless of the source of the image or the source of the motion blur. It is applicable to digital images blurred due to motion of the imager, of the subject, or both. In some cases, it is also applicable to images captured on film and then scanned into digital files. In the latter case, however, motion sensor information typically may not be available, and therefore only the blind estimation embodiment can be used. Also, where appropriate, the different embodiments of the invention can be combined. For example, the superposition embodiment can be used to avoid most blur, and the correcting filter using blind estimation embodiment can then be applied to correct the combined image for any remaining blur.

[0076] In describing the invention, no distinction has been made between an imager that captures images one at a time, such as a digital camera, and one that captures sequence of images, such as digital or analog video recorders. A digital video recorder or similar device operates substantially the same way as a digital camera, with the addition of video compression techniques to reduce the amount of image data being stored, and various filtering operations used to improve image quality. The invention is also applicable to digital and analog video capture and processing, being applied to each image in the sequence of images, and can be used in conjunction with compression and other filtering.

[0077] The implementation of the apparatus that performs the restoration of

the images to their correct form can be done as part of the imager capturing the image, or it can be done as a post-process. When done as part of the imager, the image correcting apparatus can be implemented in an integrated circuit, or in software to run on a processor, or a combination of the two. When done as a post process, a preferred embodiment is that the image data is input into a post processing device such as a computer, and the blind estimation algorithm is performed by a computer program. In this embodiment, the implementation could be a dedicated computer program, or an add-on function to an existing computer program.

[0078] Where a computer program performs the image restoration, a blind estimation algorithm can be executed by the program to calculate the estimated transfer function $h(n,m)$. Alternatively, motion information can be recorded by the camera at the time the image is captured, and can be downloaded into the program to be used as an input to calculate $h(n,m)$. In either case, the program then derives the correcting filter and applies the filter to correct the image.

[0079] It should also be noted that if there are multiple blurred objects in an image, and the blur is caused by the objects moving in different directions, the image of each object will be blurred differently, each blurred object having a different transfer function describing its motion. The present invention can allow the user to individually select independently blurred parts of the image and individually correct only the selected parts, or alternatively, to correct a selected part of the image at the expense of the rest of the image, resulting in a blur-corrected subject and a blurred background.

[0080] When increased accuracy is needed in obtaining $h(n,m)$, those skilled in the art will recognize that, in some cases, the motion information from sensors can be used to calculate $h(n,m)$, and an estimate of $h(n,m)$ can also be calculated by blind estimation and the two transfer functions can be advantageously combined for more accurate results.

[0081] There are other signal processing algorithms and digital filters which

can be applied to digital images in order to improve their color saturation, reduce noise, adjust contrast and sharpness, etc. These can be incorporated as part of an imager, such as a digital camera, or as part of a post-processing application, such as a photo editing software running on a computer. It should be clear to those skilled in the art that those techniques can be applied in addition to the distortion correction of this invention.

* * *

CLAIMS

What is claimed is:

1. A method for use in a device that includes a memory and a processor, comprising:

storing, at a memory, a plurality of sequential videos;

detecting, by a processor, a main subject in each of the plurality of videos, wherein the main subject is the same in the sequential videos;

aligning, by the processor, each of the videos such that the main subject is placed at a same location in sequential videos; and

combining, by the processor, the aligned videos to obtain a final video.

2. The method of claim 1, wherein the plurality of sequential videos are captured consecutively.

3. The method of claim 1, wherein the detecting the main subject is performed using a pattern recognition technique.

4. The method of claim 1, wherein the detecting the main subject is performed using an image segmentation technique.

5. The method of claim 1, wherein the detecting the location of the main subject is performed based on input from a user.

6. A computing device, comprising:

a memory configured to store a plurality of sequential videos;

a processor configured:

to detect a main subject in each of the videos, wherein the main subject is the same in the sequential videos;

to align each of the videos such that the main subject is placed at a same location in each of the sequential videos; and

to combine the aligned videos to obtain a final video.

7. The computing device of claim 6, wherein the videos are captured consecutively.

8. The computing device of claim 6, wherein the processor is configured to detect the main subject using a pattern recognition technique.

9. The computing device of claim 6, wherein the processor is configured to detect the main subject using an image segmentation technique.

10. The computing device of claim 6, wherein the processor is configured to detect the main subject based on input from a user.

11. A method for use in a device that includes a memory and a processor, comprising:

storing, at a memory, a plurality of sequential images, wherein the images are part of a plurality of sequential videos;

detecting, by a processor, a main subject in each of the plurality of images, wherein the main subject is the same in the sequential images;

aligning, by the processor, each of the images such that the main subject is placed at a same location in sequential images; and

combining, by the processor, the aligned images to obtain a final video.

12. The method of claim 11, wherein the plurality of sequential videos are captured consecutively.

13. The method of claim 11, wherein the detecting the main subject is performed using a pattern recognition technique.

14. The method of claim 11, wherein the detecting the main subject is performed using an image segmentation technique.

15. The method of claim 11, wherein the detecting the location of the main subject is performed based on input from a user.

16. A computing device, comprising:

a memory configured to store a plurality of sequential images, wherein the sequential images are part of a plurality of sequential videos;

a processor configured:

to detect a main subject in each of the images, wherein the main subject is the same in the sequential images;

to align each of the images such that the main subject is placed at a same location in each of the sequential images; and

to combine the aligned images to obtain a final video.

17. The computing device of claim 16, wherein the videos are captured consecutively.

18. The computing device of claim 16, wherein the processor is configured to detect the main subject using a pattern recognition technique.

19. The computing device of claim 16, wherein the processor is configured to detect the main subject using an image segmentation technique.

20. The computing device of claim 16, wherein the processor is configured to detect the main subject based on input from a user.

ABSTRACT

Signal processing techniques are applied to digital image data to remove the distortion caused by motion of the camera, or the movement of the subject being photographed, or defective optics, or optical distortion from other sources. When the image is captured, the effect of relative motion between the camera and the subject is that it transforms the true image into a blurred image according to a 2-dimensional transfer function. The 2-dimensional transfer function representing the motion is derived using blind estimation techniques or by using information from sensors that detect the motion. The transfer function is inverted and used to define a corrective filter. The filter is applied to the image and the blur due to the motion is removed, restoring the correct image. Another embodiment uses the transfer function to avoid blur by combining multiple consecutive images taken at a fast shutter speed.

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Application Number	Not Yet Known
Filing Date	April 20, 2015
First Named Inventor	Fatih M. Ozluturk
Title	METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES
Art Unit	Not Yet Known
Examiner Name	Not Yet Known
Attorney Docket Number	OZL-PT001.13

SIGNATURE of Applicant or Patent Practitioner

Signature	/Thomas A. Mattioli/	Date	April 20, 2015
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Registration Number	56,773		

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications.

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CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION UNDER 37 CFR 1.102(e) (Page 1 of 1)

First Named Inventor:	Fatih M. Ozluturk	Nonprovisional Application Number (if known):	OZL-PT001.13
Title of Invention:	METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES		

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.

1. The processing fee set forth in 37 CFR 1.17(i)(1) and the prioritized examination fee set forth in 37 CFR 1.17(c) have been filed with the request. The publication fee requirement is met because that fee, set forth in 37 CFR 1.18(d), is currently $0. The basic filing fee, search fee, and examination fee are filed with the request or have been already been paid. I understand that any required excess claims fees or application size fee must be paid for the application.

2. I understand that the application may not contain, or be amended to contain, more than four independent claims, more than thirty total claims, or any multiple dependent claims, and that any request for an extension of time will cause an outstanding Track I request to be dismissed.

3. The applicable box is checked below:

I. ☑ Original Application (Track One) - Prioritized Examination under § 1.102(e)(1)

i. (a) The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a). This certification and request is being filed with the utility application via EFS-Web.

---OR---

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ii. An executed inventor's oath or declaration under 37 CFR 1.63 or 37 CFR 1.64 for each inventor, **or** the application data sheet meeting the conditions specified in 37 CFR 1.53(f)(3)(i) is filed with the application.

II. ☐ Request for Continued Examination - Prioritized Examination under § 1.102(e)(2)

i. A request for continued examination has been filed with, or prior to, this form.
ii. If the application is a utility application, this certification and request is being filed via EFS-Web.
iii. The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371.
iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination.
v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).

Signature /Thomas A. Mattioli/	Date April 20, 2015
Name (Print/Typed) Thomas A. Mattioli	Practitioner Registration Number 56,773

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	OZL-PT001.13
	Application Number	
Title of Invention	METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Fatih	M.	Ozluturk	

Residence Information (Select One) ◉ US Residency ◯ Non US Residency ◯ Active US Military Service

City	Port Washington	State/Province	NY	Country of Residence i	US

Mailing Address of Inventor:

Address 1	5 Hilldale Lane		
Address 2			
City	Sands Point	State/Province	NY
Postal Code	11050	Country i	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	03624		
Email Address	eoffice@vklaw.com	Add Email	Remove Email

Application Information:

Title of the Invention	METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES		
Attorney Docket Number	OZL-PT001.13	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	9	Suggested Figure for Publication (if any)	4

Filing By Reference :

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	OZL-PT001.13
	Application Number	
Title of Invention	METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES	

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	03624		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the application number blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation of	14532654	2014-11-04

Prior Application Status	Patented		Remove		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14532654	Continuation of	13442370	2012-04-09	8922663	2014-12-30

Prior Application Status	Patented		Remove

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	OZL-PT001.13
	Application Number	
Title of Invention	METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES	

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13442370	Continuation of	12274032	2008-11-19	8154607	2012-04-10
Prior Application Status	Patented			Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12274032	Continuation of	11089081	2005-03-24	8331723	2012-12-11
Prior Application Status	Expired			Remove	

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
11089081	Claims benefit of provisional	60556230	2004-03-25

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX) [i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country [i]	Filing Date (YYYY-MM-DD)	Access Code [i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	OZL-PT001.13
	Application Number	
Title of Invention	METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES	

Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◯ Assignee	◯ Legal Representative under 35 U.S.C. 117	◯ Joint Inventor
◯ Person to whom the inventor is obligated to assign.	◯ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	OZL-PT001.13
	Application Number	
Title of Invention	METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES	

Mailing Address Information:			
Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not subsitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication . An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:			
Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	OZL-PT001.13
	Application Number	
Title of Invention	METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES	

Signature:

Remove

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications					
Signature	/Thomas A. Mattioli/			Date (YYYY-MM-DD)	2015-04-20
First Name	Thomas A.	Last Name	Mattioli	Registration Number	56773
Additional Signature may be generated within this form by selecting the Add button.					Add

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

r(n+N,m+M)	. . .		*r(n,m+M)*		. . .	*r(n-N,m+M)*
			. . .			
			r(n,m+1)			
r(n+N,m)	. . .	*r(n+1,m)*	***r(n,m)***	*r(n-1,m)*	. . .	*r(n-N,m)*
			r(n,m-1)			
			. . .			
r(n+N,m)	. . .		*r(n,m-M)*		. . .	*r(n-N,m-M)*

Figure 1

w(N,M)	. . .		*w(0,M)*		. . .	*w(-N,M)*
			. . .			
			w(0,1)			
w(N,0)	. . .	*w(1,0)*	***w(0,0)***	*w(-1,0)*	. . .	*w(-N,0)*
			w(0,-1)			
			. . .			
w(N,0)	. . .		*w(0,-M)*		. . .	*w(-N,-M)*

Figure 2

r(n+N+1,m+M)	. . .		*r(n+1,m+M)*		. . .	*r(n-N+1,m+M)*
			. . .			
			r(n+1,m+1)			
r(n+N+1,m)	. . .	*r(n+2,m)*	***r(n+1,m)***	*r(n,m)*	. . .	*r(n-N+1,m)*
			r(n+1,m-1)			
			. . .			
r(n+N+1,m)	. . .		*r(n+1,m-M)*		. . .	*r(n-N+1,m-M)*

Figure 3

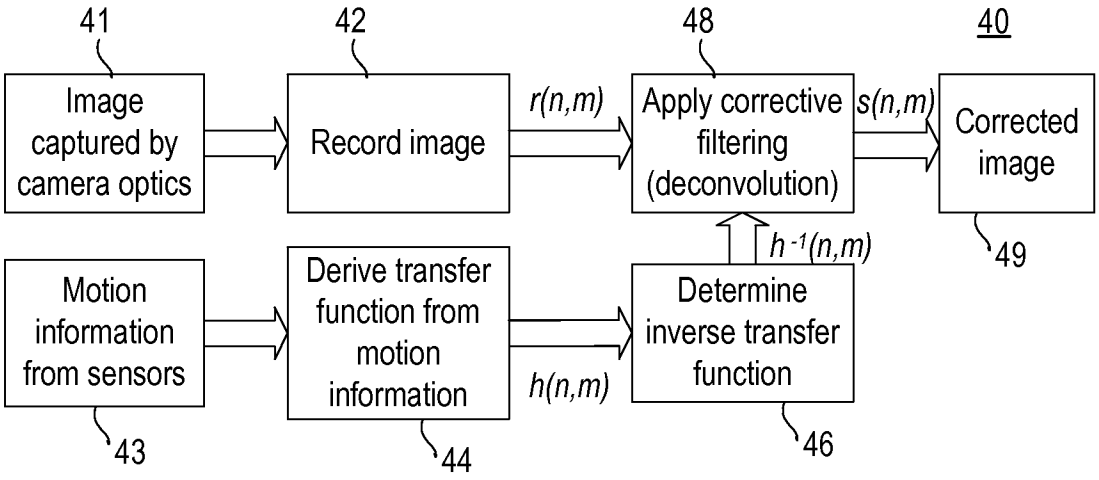

Figure 4

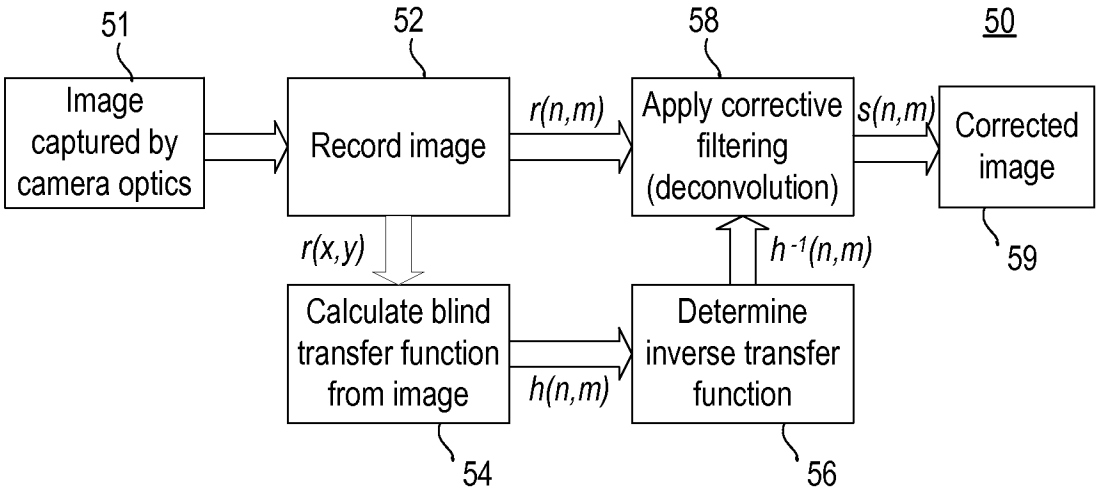

Figure 5

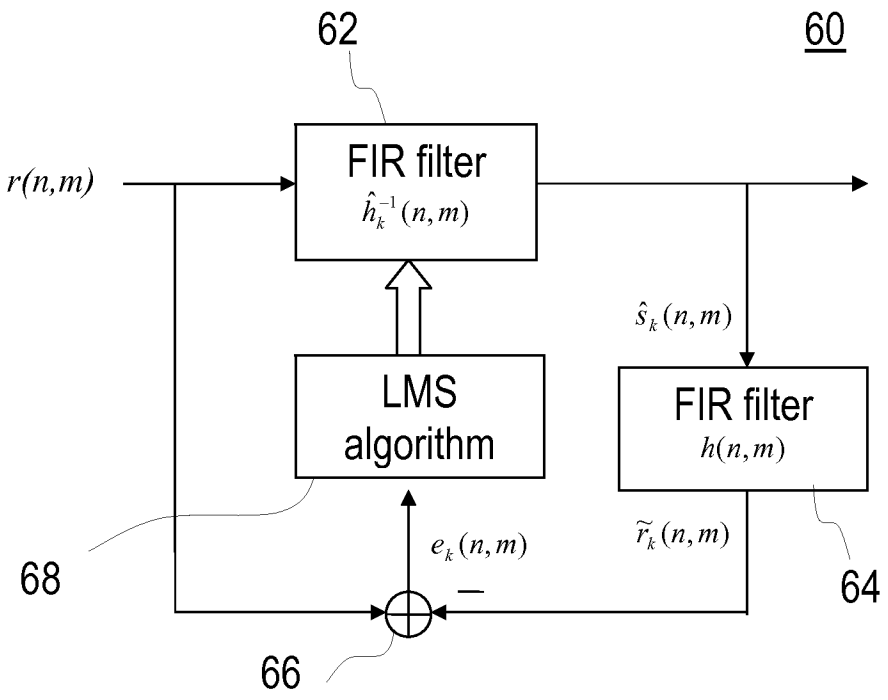

Figure 6

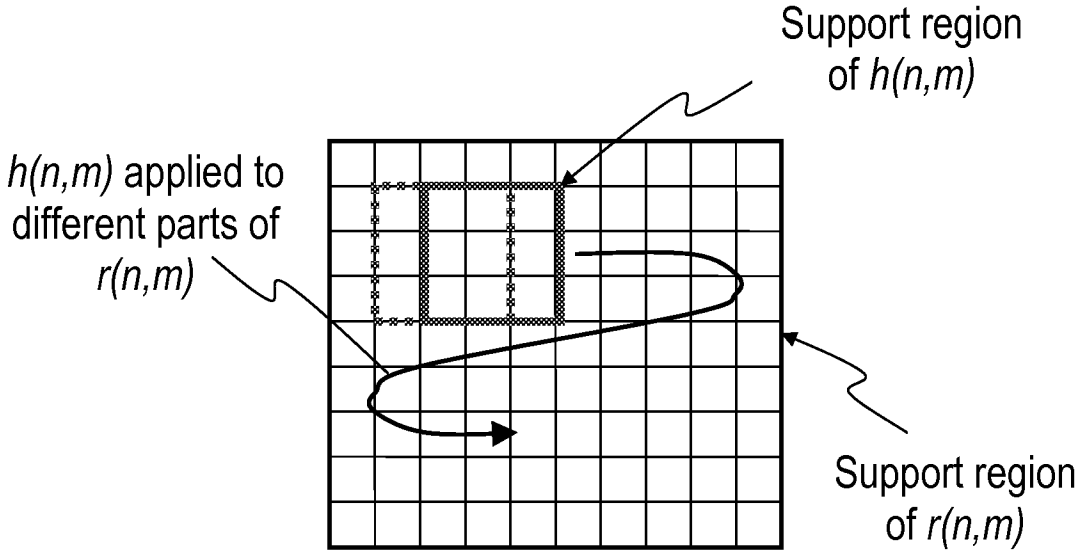

Figure 7

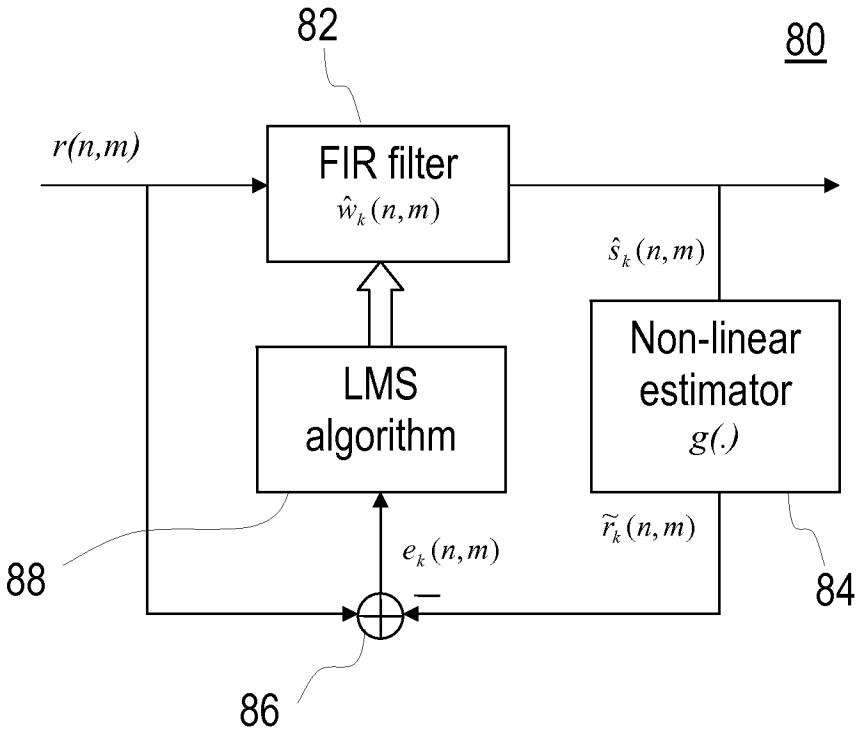
82
80
r(n,m)
FIR filter
$\hat{w}_k(n,m)$
$\hat{s}_k(n,m)$
Non-linear
estimator
g(.)
LMS
algorithm
$\tilde{r}_k(n,m)$
$e_k(n,m)$
88
84
86

Figure 8

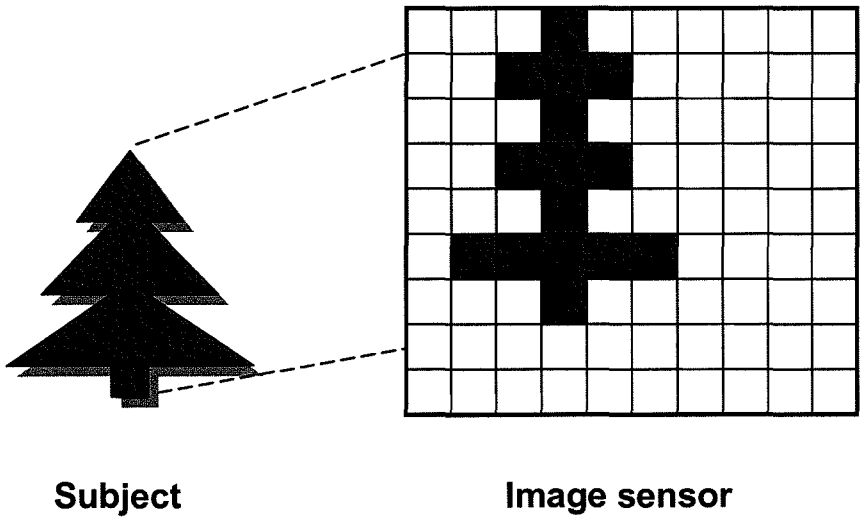

Figure 9

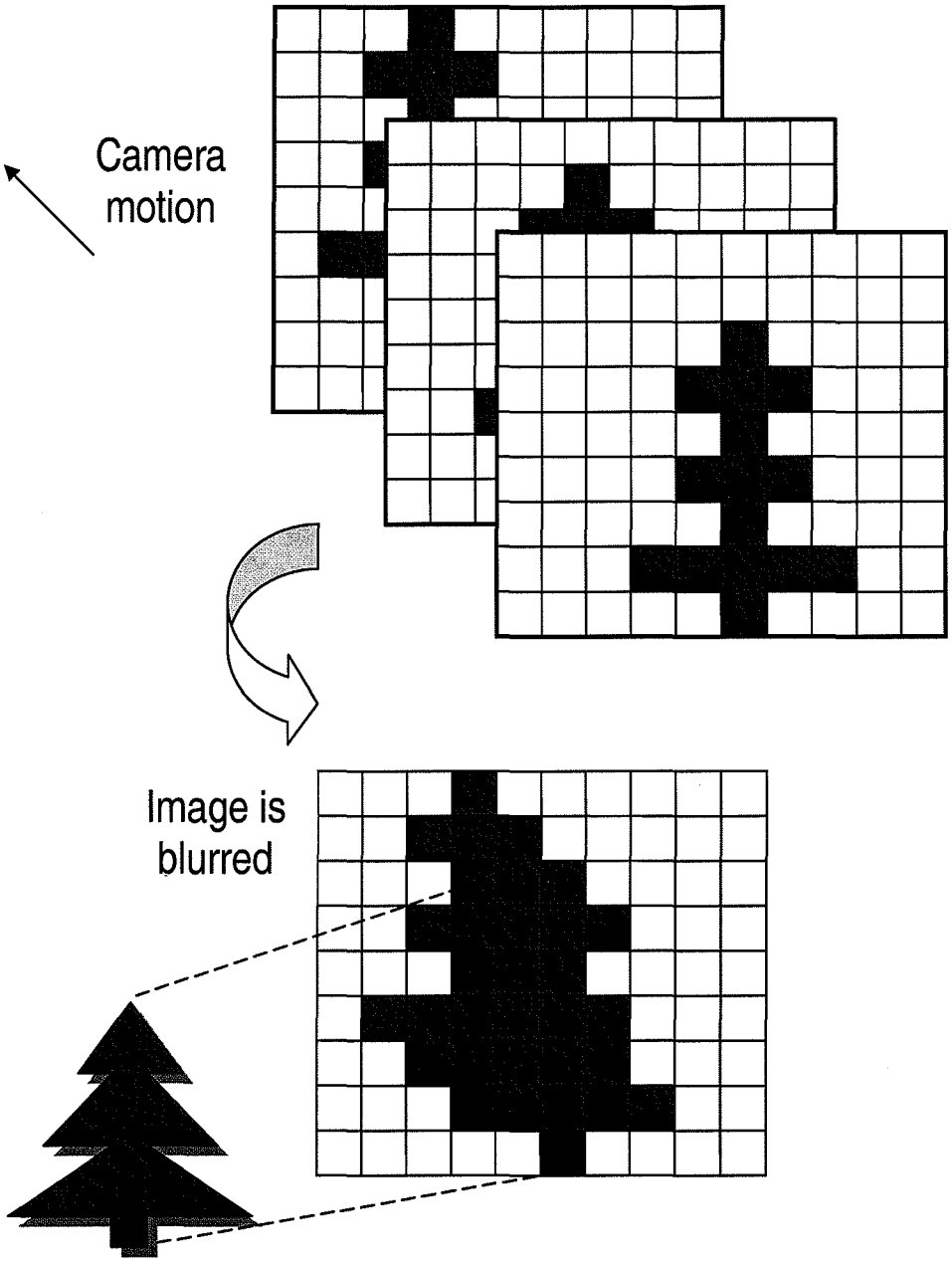

Figure 10

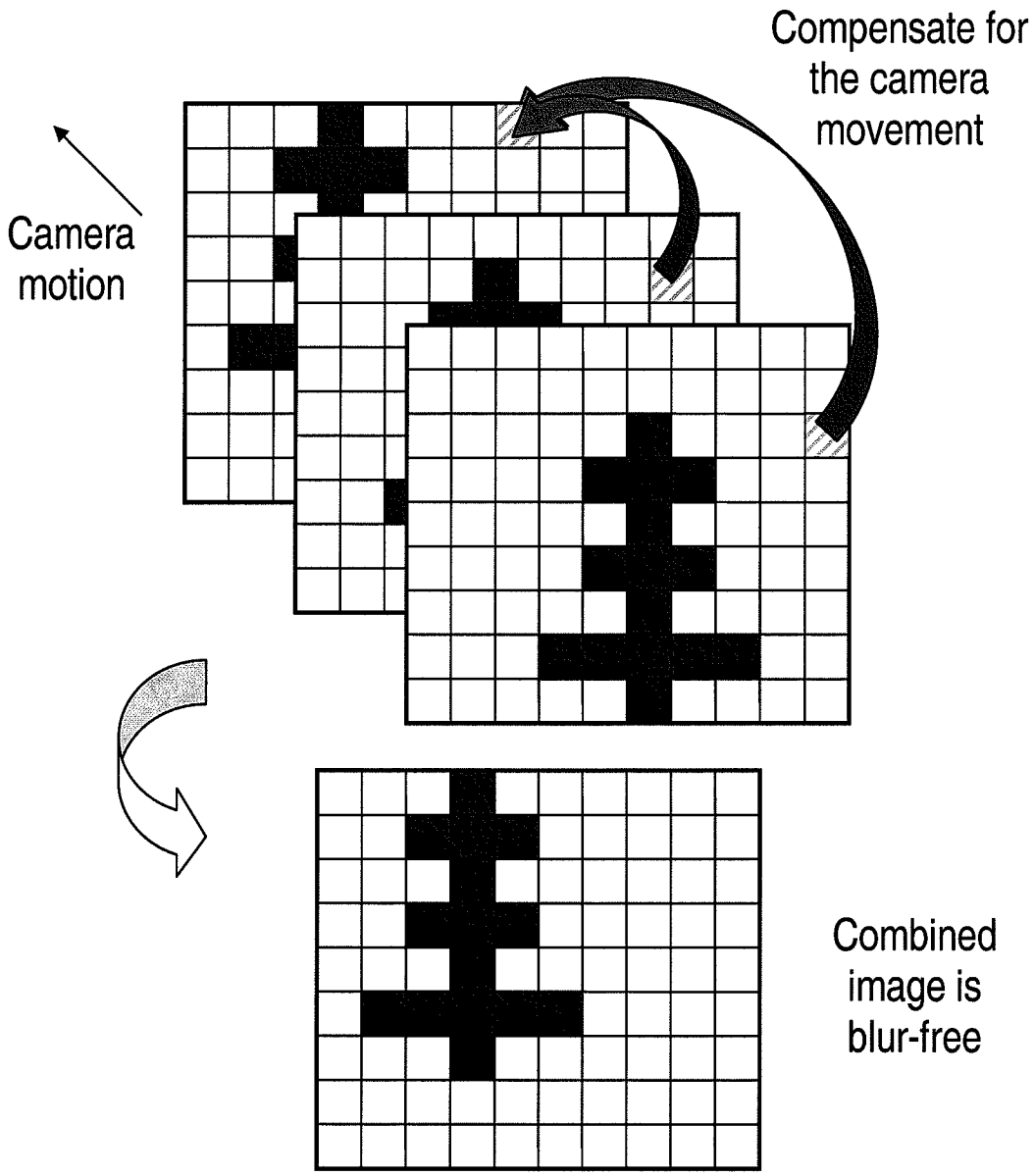
Compensate for the camera movement
Camera motion
Combined image is blur-free

Figure 11

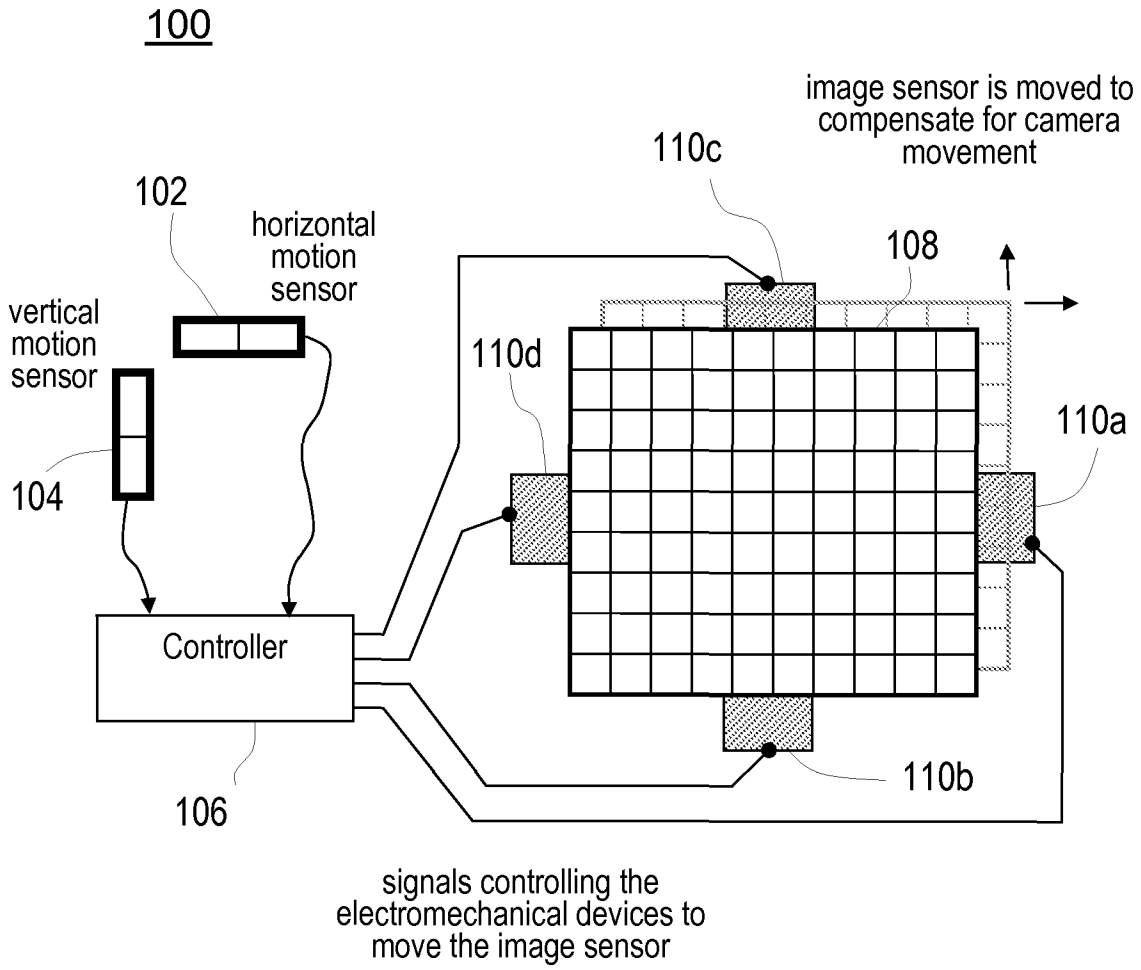
100
image sensor is moved to compensate for camera movement
110c
102
horizontal motion sensor
108
vertical motion sensor
110d
110a
104
Controller
110b
106
signals controlling the electromechanical devices to move the image sensor

Figure 12

Figure 13

Figure 14

PTO/AIA/01 (06-12)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR DUE TO MOTION OF SUBJECT OR IMAGING DEVICE

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

▩ United States application or PCT international application number 14/532,654 filed on November 5, 2014.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Fatih M. Ozluturk Date (Optional) :

Signature: Fatih M Ozluturk

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number
14/690,818

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	20 minus 20 =	*	x 40 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	4 minus 3 =	* 1	x 210 =	210			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	940		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
AMENDMENT A	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
AMENDMENT A	Application Size Fee (37 CFR 1.16(s))									
AMENDMENT A	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)	OR	RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
AMENDMENT B	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
AMENDMENT B	Application Size Fee (37 CFR 1.16(s))									
AMENDMENT B	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
14/690,818	04/20/2015	2852	940	OZL-PT001.13	20	4

CONFIRMATION NO. 8235

3624
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

FILING RECEIPT

OC000000074901656

Date Mailed: 05/05/2015

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Fatih M. Ozluturk, Port Washington, NY;

Applicant(s)

Fatih M. Ozluturk, Port Washington, NY;

Power of Attorney: The patent practitioners associated with Customer Number 03624

Domestic Priority data as claimed by applicant

This application is a CON of 14/532,654 11/04/2014 PAT 9013587
which is a CON of 13/442,370 04/09/2012 PAT 8922663
which is a CON of 12/274,032 11/19/2008 PAT 8154607
which is a CON of 11/089,081 03/24/2005 PAT 8331723
which claims benefit of 60/556,230 03/25/2004

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 04/29/2015
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/690,818**
Projected Publication Date: Perfected

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES

Preliminary Class

396

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

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For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number
14/690,818

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	20 minus 20 =	*	x 40 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	4 minus 3 =	* 1	x 210 =	210			
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MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	940		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
AMENDMENT A	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
AMENDMENT A	Application Size Fee (37 CFR 1.16(s))									
AMENDMENT A	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)	OR	RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
AMENDMENT B	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
AMENDMENT B	Application Size Fee (37 CFR 1.16(s))									
AMENDMENT B	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
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www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
14/690,818	04/20/2015	2852	940	OZL-PT001.13	20	4

CONFIRMATION NO. 8235

FILING RECEIPT

3624
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

OC000000074901656

Date Mailed: 05/12/2015

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Inventor(s)

Fatih M. Ozluturk, Port Washington, NY;

Applicant(s)

Fatih M. Ozluturk, Port Washington, NY;

Power of Attorney: The patent practitioners associated with Customer Number 03624

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which is a CON of 13/442,370 04/09/2012 PAT 8922663
which is a CON of 12/274,032 11/19/2008 PAT 8154607
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If Required, Foreign Filing License Granted: 04/29/2015
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/690,818**
Projected Publication Date: 08/20/2015

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES

Preliminary Class

396

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

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The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

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VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA PA 19103

MAILED
JUN 16 2015
OFFICE OF PETITIONS

Doc Code: TRACK1.GRANT

Decision Granting Request for Prioritized Examination (Track I or After RCE)	Application No.: 14/690,818

1. THE REQUEST FILED April 20, 2015 IS **GRANTED.**

The above-identified application has met the requirements for prioritized examination

A. ☒ for an original nonprovisional application (Track I).
B. ☐ for an application undergoing continued examination (RCE).

2. **The above-identified application will undergo prioritized examination.** The application will be accorded special status throughout its entire course of prosecution until one of the following occurs:

A. filing a **petition for extension of time** to extend the time period for filing a reply;
B. filing an **amendment to amend the application to contain more than four independent claims, more than thirty total claims**, or a multiple dependent claim;
C. filing a **request for continued examination**;
D. filing a notice of appeal;
E. filing a request for suspension of action;
F. mailing of a notice of allowance;
G. mailing of a final Office action;
H. completion of examination as defined in 37 CFR 41.102; or
I. abandonment of the application.

Telephone inquiries with regard to this decision should be directed to Brian W. Brown at 571-272-5338.

/Brian W. Brown/
[*Signature*]

Petitions Examiner, Office of Petitions
(Title)

U.S. Patent and Trademark Office
PTO-2298 (Rev. 02-2012)

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United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/690,818	04/20/2015	Fatih M. Ozluturk	OZL-PT001.13	8235

3624 7590 06/29/2015
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

EXAMINER
HO, TUAN V

ART UNIT	PAPER NUMBER
2661	

NOTIFICATION DATE	DELIVERY MODE
06/29/2015	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

eoffice@volpe-koenig.com

Office Action Summary	Application No. 14/690,818	Applicant(s) OZLUTURK, FATIH M.	
	Examiner TUAN HO	Art Unit 2661	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 4/20/15.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) 1-20 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) 1-20 is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on 4/20/15 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

1. The present application is being examined under the pre-AIA first to invent provisions.

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the claims at issue are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the reference application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO internet Web site contains terminal disclaimer forms which may be used. Please visit http://www.uspto.gov/forms/. The filing date of the application will determine what form should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to http://www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

Claims 1-20 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-30 of U.S. Patent No. 9,013,587. Although the claims at issue are not identical, they are not patentably distinct from each other because claims 1-20 are obvious variants and encompassed by claims 1-30 of Patent'587.

US Patent 9,013,587 B2	Application 14/690,818
1. A method comprising: displaying an image in a viewfinder; designating, by a processor, a main subject in the image in the viewfinder; capturing a plurality of photographic images in a recording medium, wherein the plurality of photographic images include the designated main subject; and combining the plurality of photographic images to generate a corrected image, wherein the combining includes determining, for each image point in the main subject of the corrected image, a pixel value based on pixel values in the plurality of photographic images at the image point. 2. The method of claim 1, wherein designating the main subject is based on	1. A method for use in a device that includes a memory and a processor, comprising: storing, at a memory, a plurality of sequential videos; detecting, by a processor, a main subject in each of the plurality of videos, wherein the main subject is the same in the sequential videos; aligning, by the processor, each of the videos such that the main subject is placed at a same location in sequential videos; and combining, by the processor, the aligned videos to obtain a final video. 2. The method of claim 1, wherein the plurality of sequential videos are captured consecutively.

image segmentation or pattern recognition techniques. 3. The method of claim 1, further comprising indicating the designated main subject in the viewfinder.	3. The method of claim 1, wherein the detecting the main subject is performed using a pattern recognition technique.
4. The method of claim 1, wherein the combining includes shifting the plurality of photographic images such that the designated main subject is aligned in a same location in each of the plurality of photographic images. 5. The method of claim 1, wherein the combining comprises determining pixel values for only a portion of the main subject. 6. The method of claim 1, wherein combining the plurality of photographic images to generate a corrected image is performed by combining sequential images.	5. The method of claim 1, wherein the detecting the location of the main subject is performed based on input from a user.
7. The method of claim 1, wherein the combining further comprises determining, for each image point not in the main subject of the corrected image, a pixel value based on pixel values in the plurality of photographic images at the image point.	4. The method of claim 1, wherein the detecting the main subject is performed using an image segmentation technique.
8. A method comprising: displaying an image in a viewfinder; receiving user input, by the viewfinder, designating a main subject in the image; capturing a plurality of photographic images at a recording medium, wherein	Claims 1, 2, 3, 5, and 4.

the plurality of photographic images include the designated main subject; and combining, by a processor, the plurality of photographic images to generate a corrected image, wherein the combining includes determining, for each image point in the main subject of the corrected image, a pixel value based on pixel values in the plurality of photographic images at the image point. 9. The method of claim 8, wherein the viewfinder receives the user input based on a selection of an indicator in the viewfinder. 10. The method of claim 8, wherein the processor indicates the main subject by an indicator in the viewfinder based on the received user input. 11. The method of claim 8, wherein the combining comprises shifting the plurality of images such that the main subject is aligned in a same location in the plurality of images. 12. The method of claim 8, wherein the combining comprises determining pixel values for only a portion of the main subject. 13. The method of claim 8, wherein combining the plurality of photographic images to generate a corrected image is performed by combining sequential images. 14. The method of claim 8, wherein the combining further comprises determining, for each image point not in the main subject of the corrected image, a pixel value based on pixel values in the plurality of photographic	

images at each said image point.	
15. An apparatus comprising: a viewfinder configured to display an image; a processor configured to designate a main subject in the image in the viewfinder; a recording medium configured to capture a plurality of photographic images, wherein the plurality of images includes the designated main subject; and a processor configured to combine the plurality of photographic images to generate a corrected image, wherein the processor determines, for each image point in the main subject of the corrected image, a pixel value for the image point based on pixel values in the plurality of photographic images at the image point.	Claims 1, 2, 3, 5 and 4
16. The apparatus of claim 15, wherein the processor is configured to designate the main subject using image segmentation or pattern recognition techniques.	
17. The apparatus of claim 15, wherein the processor is further configured to indicate the main subject by an indicator in the viewfinder.	
18. The apparatus of claim 15, wherein the processor is configured to designate more than one designated main subject in the plurality of photographic images.	
19. The apparatus of claim 15, wherein the processor is configured to shift the plurality of photographic images such that the main subject is aligned in a same location in the plurality of photographic images.	

20. The apparatus of claim 15, wherein the combined plurality of photographic images determines pixel values for only a portion of the main subject. 21. The apparatus of claim 15, wherein the combined plurality of photographic images are sequential images. 22. The apparatus of claim 15, wherein the processor is further configured to determine, for each image point not in the main subject of the corrected image, a pixel value based on pixel values in the plurality of photographic images at the image point.	
23. Apparatus including a viewfinder configured to display an image; a processor configured to receive user input that designates a main subject in the image in the viewfinder; a recording medium configured to capture a plurality of photographic images, wherein the plurality of photographic images includes the designated main subject; and the processor further configured to combine the plurality of photographic images to generate a corrected image, wherein processor determines for each image point in the main subject of the corrected image, a pixel value based on pixel values in the plurality of photographic images at the image point. 24. The apparatus of claim 23 wherein viewfinder is further configured to receive an indicator designating the main subject and transmit the user input to the processor.	Claims 1, 3, 5 and 4

25. The apparatus of claim 23, wherein processor is further configured to indicate the main subject by an indicator in the viewfinder. 26. The apparatus of claim 23, wherein the processor is configured to receive user inputs that designate more than one designated main subject in the plurality of photographic images. 27. The apparatus of claim 23, wherein the processor is configured to shift the plurality of photographic images such that the main subject is aligned in a same location in the plurality of photographic images. 28. The apparatus of claim 23, wherein the combined plurality of photographic images determines pixel values for only a portion of the main subject. 29. The apparatus of claim 23, wherein the combined plurality of photographic images are sequential images. 30. The apparatus of claim 23, wherein the processor is further configured to determine, for each image point not in the main subject of the corrected image, a pixel value based on pixel values in the plurality of photographic images at the image point.	

Claims 6-10, 11-15 and 16-20 correspond to claims 1-5 and analyzed the same as previously discussed with respect to claims 1-5.

3. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4-7, 9-12, 14-17 and 19-20 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Kino et al (US 5,889,553).

With regard to claim 1, Kino et al discloses in Figs. 1-9, an image pickup apparatus that comprises the method for use in a device that includes a memory and a processor (memories 6a and 6B, col. 5, line 17 and processing part 7, col. 5, line 18), comprising: storing, at a memory, a plurality of sequential videos (video signals, col. 5, line 15); detecting, by a processor (processing part 7), a main subject in each of the plurality of videos (a main subject is aimed by a user when vide images are taken), wherein the main subject is the same in the sequential videos (video signals are taken in sequence, col. 5, lines 35-37, col. 6, lines 46-64); aligning, by the processor, each of the videos such that the main subject is placed at a same location in sequential videos; and combining, by the processor, the aligned videos to obtain a final video (higer resolution video signals are obtained, col. 6, lines 46+).

With regard to claim 2, Kino et al discloses in Figs. 1-7, an image pickup apparatus that comprises the plurality of sequential videos are captured consecutively (video signals ae captured consecutively, col. 5, lines 35+).

With regard to claim 4, Kino et al discloses in Figs. 1-7, an image pickup apparatus that comprises the detecting the main subject is performed using an image segmentation technique (pixel shift, col. 6, lines 35+).

With regard to claim 5, Kino et al discloses in Figs. 1-7, an image pickup apparatus that comprises the detecting the location of the main subject is performed based on input from a user (a user uses a monitor or view finder when the user aims a subject).

Claims 6-7, 9-10, 11-12, 14-15 and 16-17, 19-20 correspond to claims 1-2 and 4-5 and are analyzed the same as previously discussed with respect to claims 1-2 and 4-5.

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Liu et al (US 8,228,400) discloses a sequence of images is combined in an integration process.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan Ho whose telephone number is (571) 272-7365. The examiner can normally be reached on Mon-Fri 7:00AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571) 272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tuan V Ho/

Primary Examiner, Art Unit 2622

Notice of References Cited	Application/Control No. 14/690,818	Applicant(s)/Patent Under Reexamination OZLUTURK, FATIH M.	
	Examiner TUAN HO	Art Unit 2661	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,889,553	03-1999	Kino et al.	348/218.1
*	B	US-8,228,400	07-2012	Liu et al.	348/239
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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BIB DATA SHEET

CONFIRMATION NO. 8235

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
14/690,818	04/20/2015 **RULE**	348	2661	OZL-PT001.13

APPLICANTS

INVENTORS

Fatih M. Ozluturk, Port Washington, NY;

**** CONTINUING DATA ***************************

This application is a CON of 14/532,654 11/04/2014 PAT 9013587
which is a CON of 13/442,370 04/09/2012 PAT 8922663
which is a CON of 12/274,032 11/19/2008 PAT 8154607
which is a CON of 11/089,081 03/24/2005 PAT 8331723
which claims benefit of 60/556,230 03/25/2004

**** FOREIGN APPLICATIONS ****************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **** ** SMALL ENTITY **
04/29/2015

Foreign Priority claimed	☐ Yes ☑ No	☐ Met after Allowance	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
35 USC 119(a-d) conditions met	☐ Yes ☑ No		NY	9	20	4
Verified and Acknowledged	/TUAN V HO/ Examiner's Signature	Initials				

ADDRESS

VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103
UNITED STATES

TITLE

METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES

FILING FEE RECEIVED		
940	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14690818	OZLUTURK, FATIH M.
	Examiner	**Art Unit**
	TUAN HO	2661

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	06/23/2015								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
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	16	✓								
	17	✓								
	18	✓								
	19	✓								
	20	✓								

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	5321	348/208.99-208.13.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/06/23 15:15
L2	3697	H04N5/23287.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/06/23 15:15
L3	8005	L1 or L2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/06/23 15:15
L4	243	L3 and (subject and align$4 and location and combin$5)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/06/23 15:15
L5	5	"9013587".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/06/23 15:15
L6	1496	Fatih near3 ozluturk	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/06/23 15:16
L8	63	L6 and (subject and align$4 and location and combin$5)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/06/23 15:17
L9	63	L6 and (subject and align$4 and location and combin$5 and memory)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/06/23 15:18

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L10	0	"L6" and (subject and align$4 and location and combin$5 and memory).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2015/06/23 15:19

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	5321	348/208.99-208.13.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/06/23 09:44
L2	3697	H04N5/23287.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/06/23 09:45
L3	8005	1 or 2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/06/23 09:46
L4	243	3 and (subject and align$4 and location and combin$5)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2015/06/23 09:47

EAST Search History (Interference)

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14690818	OZLUTURK, FATIH M.
	Examiner	**Art Unit**
	TUAN HO	2661

CPC- SEARCHED

Symbol	Date	Examiner
H04N 5/23287	6/23/15	TH

CPC COMBINATION SETS - SEARCHED

Symbol	Date	Examiner

US CLASSIFICATION SEARCHED

Class	Subclass	Date	Examiner
348	208.99-208.13	6/23/15	TH

SEARCH NOTES

Search Notes	Date	Examiner
EAST and Inventorship Search	6/23/15	TH

INTERFERENCE SEARCH

US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	Search Histroy	6/23/15	TH

Notice of References Cited	Application/Control No. 14/690,818	Applicant(s)/Patent Under Reexamination OZLUTURK, FATIH M.	
	Examiner TUAN HO	Art Unit 2661	Page 1 of 1

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	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

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	N					
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	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

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	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14/690,818
	Filing Date	April 20, 2015
	First Named Inventor	Fatih M. Ozluturk
	Art Unit	2661
	Examiner Name	Tuan V. Ho
	Attorney Docket Number	OZL-PT001.13

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
		4,612,575	09/1986	Ishman et al.			
		4,646,274	02/1987	Martinez			
		4,890,160	12/1989	Thomas			
		5,060,074	10/1991	Kinugasa et al.			
		5,125,041	06/1992	Kimura et al.			
		5,170,255	12/1992	Yamada et al.			
		5,189,518	02/1993	Nishida			
		5,193,124	03/1993	Subbarao			
		5,262,867	11/1993	Kojima			
		5,264,846	11/1993	Oikawa			
		5,291,300	03/1994	Ueda			
		5,365,603	11/1994	Karmann			
		5,510,831	04/1996	Mayhew			
		5,596,366	01/1997	Takashima et al.			
		5,627,543	05/1997	Moreira			
		5,649,032	07/1997	Burt et al.			
		5,652,918	07/1997	Usui			
		5,666,158	09/1997	Sekine et al.			
		5,684,887	11/1997	Lee et al.			
		5,706,402	01/1998	Bell			
		5,706,416	01/1998	Mann et al.			
		5,712,474	01/1998	Naneda			
		5,729,290	03/1998	Tokumitsu et al.			
		5,734,739	03/1998	Sheehan et al.			
		5,771,403	06/1998	Imada			
		5,867,213	02/1999	Ouchi			
		5,889,553	03/1999	Kino et al.			
		5,963,675	10/1999	Van der Wal et al.			
		5,982,421	11/1999	Inou et al.			

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EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
		6,067,367	05/2000	Nakajima et al.			
		6,079,862	06/2000	Kawashima et al.			
		6,097,854	08/2000	Szeliski et al.			
		6,101,238	08/2000	Murthy et al.			
		6,124,864	09/2000	Madden et all.			
		6,166,384	12/2000	Dentinger et al.[1]			
		6,166,853	12/2000	Sapia et al.			
		6,195,460	02/2001	Kobayashi et al.			
		6,198,283	03/2001	Foo et al.			
		6,208,765	03/2001	Bergen			
		6,249,616	06/2001	Hashimoto			
		6,278,460	08/2001	Myers et al.			
		6,292,593	09/2001	Nako et al.			
		6,342,918	01/2002	Inou et al.			
		6,349,114	02/2002	Mory			
		6,353,689	03/2002	Kanamaru et al.			
		6,353,823	06/2003	Shimada et al.			
		6,466,262	10/2002	Miyatake et al.[2]			
		6,470,100	10/2002	Horiuchi et al.			
		6,512,807	01/2003	Pohlman et al.			
		6,583,823	06/2003	Shimada et al.			
		6,687,458	02/2004	Masuda			
		6,745,066	06/2004	Lin et al.			
		6,757,434	06/2004	Miled et al.			
		6,759,979	07/2004	Vashisth et al.			
		6,781,623	08/2004	Thomas			
		6,909,914	06/2005	Pedrizzetti et al.			
		6,930,708	08/2005	Sato et al.			

1 Corresponds to EP 1004983 and JP 2000-207538
2 Corresponds to EP 0884897

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	Attorney Docket Number	OZL-PT001.13

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
		6,993,157	01/2006	Oue et al.			
		6,993,204	02/2006	Yahil et al.			
		7,024,050	04/2006	Kondo et al.			
		7,162,102	01/2007	Cahill et al.			
		7,286,164	10/2007	Shinohara et al.			
		7,298,923	11/2007	Zhang et al.			
		7,352,389	04/2008	Uenaka			
		7,397,500	07/2008	Yost et al.			
		7,483,056	01/2009	Shinohara et al.			
		7,489,760	02/2009	Hemmendorff			
		7,561,186	07/2009	Poon			
		7,693,563	04/2010	Suresh et al.			
		7,710,460	05/2010	Stavely et al.			
		7,961,323	06/2011	Tibbetts			
		8,228,400	07/2012	Liu et al.			
		8,259,184	09/2012	Murashima et al.			
		8,798,388	08/2014	Atanassov et al.			
		2001/0028798	10/2001	Manowitz et al.			
		2001/0045989	11/2001	Onuki			
		2002/0094200	07/2002	Yamaguchi			
		2002/0110268	08/2002	Brinker et al.			
		2002/0159651	10/2002	Tener et al.			
		2003/0067544	04/2003	Wada			
		2003/0076408	04/2003	Dutta			
		2003/0113035	06/2003	Cahill et al.			
		2003/0118227	06/2003	Winsor et al.			
		2003/0174899	09/2003	Kondo et al.			
		2004/0008872	01/2004	Goldberg et al.			
		2004/0091158	05/2004	Miled et al.			
		2004/0100561	05/2004	Shinohara et al.			

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14/690,818
	Filing Date	April 20, 2015
	First Named Inventor	Fatih M. Ozluturk
	Art Unit	2661
	Examiner Name	Tuan V. Ho
	Attorney Docket Number	OZL-PT001.13

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
		2004/0170327	09/2004	Kim et al.			
		2004/0218055	11/2004	Yost et al.			
		2005/0078881	04/2005	Xu et al.			
		2005/0140793	06/2005	Kojima et al.			
		2005/0157180	07/2005	Takahashi et al.			
		2005/0213850	09/2005	Zhang et al.			
		2005/0231603	10/2005	Poon			
		2005/0286388	12/2005	Ayres et al.			
		2006/0177145	08/2006	Lee et al.			
		2006/0257051	11/2006	Zavadsky et al.			
		2006/0280249	12/2006	Poon			
		2007/0025503	02/2007	Hemmendorff			
		2007/0031004	02/2007	Matsui et al.			
		2007/0086675	04/2007	Chinen et al.			
		2007/0236573	10/2007	Alon et al.			
		2007/0263914	11/2007	Tibbetts			
		2008/0123996	05/2008	Zavadsky et al.			
		2015/0103190	04/2015	Corcoran et al.			

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES	TRANSLATION NO
		1004983	05/2000	EP				
		11-024122	01/1999	JP				
		2000-207538	07/2000	JP				
		2004-056581	02/2004	JP				
		2004-104652	04/2004	JP				

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14/690,818
	Filing Date	April 20, 2015
	First Named Inventor	Fatih M. Ozluturk
	Art Unit	2661
	Examiner Name	Tuan V. Ho
	Attorney Docket Number	OZL-PT001.13

OTHER DOCUMENTS		
EXAMINER INITIAL		DESCRIPTION (Including Author, Title, Date, Pertinent Pages, Etc.)
		Banham, et al., Digital Image Restoration, IEEE Signal Processing Magazine, March 1997, Pgs. 24-41.
		Biemond et al., "Iterative Methods for Image Deblurring," Proceedings of the IEEE, May 1990, vol 78, no. 5.
		Kundur, et al., Blind Image Deconvolution, IEEE Signal Processing Magazine, May 1996, Pgs. 43-64.
		Yitzhaky, et al., Comparison of Direct Blind Deconvolution Methods for Motion-Blurred Images, Applied Optics, Vol 38, No. 20, July 1999, Pgs. 4325-4332.

Electronic Patent Application Fee Transmittal

Application Number:	14690818
Filing Date:	20-Apr-2015
Title of Invention:	METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES
First Named Inventor/Applicant Name:	Fatih M. Ozluturk
Filer:	Thomas A Mattioli/Carey Kulp
Attorney Docket Number:	OZL-PT001.13

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt

EFS ID:	23060232
Application Number:	14690818
International Application Number:	
Confirmation Number:	8235
Title of Invention:	METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES
First Named Inventor/Applicant Name:	Fatih M. Ozluturk
Customer Number:	3624
Filer:	Thomas A Mattioli/Angel Wolf
Filer Authorized By:	Thomas A Mattioli
Attorney Docket Number:	OZL-PT001.13
Receipt Date:	29-JUL-2015
Filing Date:	20-APR-2015
Time Stamp:	16:28:06
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$180
RAM confirmation Number	3087
Deposit Account	220493
Authorized User	MATTIOLI, THOMAS A

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	IDS.pdf	62143 ed3be5d0dd9915a4148877a56de2c2a0421844a7	no	3
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	MasterList.pdf	94850 ed12a61034edc41425cb1497921a48a617d50434	no	5
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	Fee Worksheet (SB06)	fee-info.pdf	30996 f48374f37d8713ef6b8d03166c3b5a879f46e6fd	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	187989		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the **PATENT APPLICATION** of:	
Fatih M. Ozluturk	
Application No.: 14/690,818	Our File: OZL-PT001.13
Confirmation No.: 8235	Date: July 29, 2015
Filed: April 20, 2015	
For: METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES	
Group: 2661	
Examiner: Tuan V. Ho	

INFORMATION DISCLOSURE STATEMENT

Mail Stop Amendment (via EFS)
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Madam:

Further to Applicant's Duty of Disclosure pursuant to 37 C.F.R. §1.56, Applicant wishes to bring to the Examiner's attention the material cited on the enclosed Information Disclosure Statement Form. Applicant believes that all references cited on the enclosed Information Disclosure Statement have been cited in either a Form PTO-1449, Form SB-08(a) or Form PTO-892 in one or more of the Applications noted in the next two paragraphs.

This Application is a continuation of U.S. Patent Application No. U.S. Patent Application No. 14/532,654, filed November 4, 2014, which issued April 21, 2015 as U.S. Patent No. 9,013,587, which is a continuation of U.S. Patent Application No. 13/442,370, filed April 9, 2012, which issued December 30, 2014 as U.S. Patent No. 8,922,663, which is a continuation of U.S. Patent Application No. 12/274,032, filed November 19, 2008, which issued April 10, 2012 as U.S. Patent No. 8,154,607, which is a continuation of U.S. Patent Application No. 11/089,081, filed March 24, 2005, which issued December 11, 2012 as U.S. Patent No. 8,331,723, which claims priority from Provisional Application No. 60/556,230, which was filed March 25, 2004.

Applicant would like to bring the following Applications to the Examiner's attention: U.S. Patent Application No. 14/586,297, filed December 30, 2014; U.S. Patent Application No. 13/653,144, filed October 16, 2012, which issued April 7, 2015 as U.S. Patent No. 9,001,221; U.S. Patent Application No. 14/584,891, which was filed December 29, 2014; U.S. Patent Application No. 14/679,551, which was filed April 6, 2015; U.S. Patent Application No. 14/690,818, which was filed April 20, 2015; U.S. Patent Application No. 12/274,057, filed November 19, 2008, which issued January 14, 2014 as U.S. Patent No. 8,630,484; U.S. Patent Application No. 12/274,074, filed November 19, 2008, which issued November 22, 2011 as U.S. Patent No. 8,064,719; U.S. Patent Application No. 12/274,084, which was filed

November 19, 2008; and U.S. Patent Application No. 12/274,096, filed November 19, 2008, which issued November 22, 2011 as U.S. Patent No. 8,064,720.

Pursuant to 37 C.F.R. §1.98(d) copies of documents cited in the parent application are not enclosed, but copies will be provided upon request.

This Information Disclosure Statement is being filed with the fee required by 37 C.F.R. § 1.17(p).

It is respectfully requested that the Examiner consider these documents and return an initialed copy of the Information Disclosure Statement Form indicating consideration of the cited materials.

Respectfully submitted,

Fatih M. Ozluturk

By /Thomas A. Mattioli/
Thomas A. Mattioli
Registration No. 56,773
(215) 568-6400

Volpe and Koenig, P.C.
United Plaza
30 South 17th Street
Philadelphia, PA 19103

TAM/PCK
Enclosure

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/690,818	04/20/2015	Fatih M. Ozluturk	OZL-PT001.13

CONFIRMATION NO. 8235

PUBLICATION NOTICE

OC000000076990259

3624
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

Title:METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES

Publication No.US-2015-0237258-A1
Publication Date:08/20/2015

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the **PATENT APPLICATION** of:	
Fatih M. Ozluturk	
Application No.: 14/690,818	
Confirmation No.: 8235	Our File: OZL-PT001.13
Filed: April 20, 2015	Date: November 30, 2015
For: METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES	
Group: 2661	
Examiner: Tuan V. Ho	

RESPONSE PURSUANT TO 37 C.F.R. §1.111

Mail Stop Amendment (via EFS)
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir/Madam:

This Response is being filed in response to the Non-Final Office Action dated June 29, 2015 and is submitted in conjunction with an appropriate petition for extension of time.

Please amend the application without prejudice or disclaimer as follows:

Amendments to the Claims:

This listing of the claims will replace all prior versions of the claims in the application:

1. (Currently Amended) A method for use in a device that includes a lens, an image sensor, a viewfinder, a memory, one or more motion sensors, and a processor, comprising:

capturing by the image sensor a video and storing the video in the[[,]] ~~at a~~ memory~~, a plurality of sequential videos~~;

while capturing the video, detecting by one or more motion sensors a motion information representing the motion of the device, and storing the motion information in the memory;

~~detecting, by a processor, a main subject in each of the plurality of videos, wherein the main subject is the same in the sequential videos;~~

~~aligning~~ calculating, by the processor, a correcting filter to counteract the motion of the device based in part on the motion information; ~~each of the videos such that the main subject is placed at a same location in sequential videos; and~~

~~combining~~ modifying the video, by the processor, ~~the aligned videos~~ according to the correcting filter to obtain a final video; and

displaying the final video in the viewfinder.

2-5. (Canceled).

6. (Currently Amended) A computing device, comprising:

a camera including a lens and an image sensor configured to capture a video;

one or more motion sensors configured to record a motion information

representing motion of the device while the video is being captured;

a memory configured to store ~~a plurality of sequential videos~~ the video and to store the motion information;

a processor configured:

to calculate a correcting filter to counteract motion of the device based in part on the motion information; and

~~to detect a main subject in each of the videos, wherein the main subject is the same in the sequential videos;~~

to ~~align each of the videos~~ modify the video according to the correcting filter to generate a corrected video such that ~~the main subject is placed at a same location in each of the sequential videos~~ motion of the device is counteracted in the corrected video; and

~~to combine the aligned videos to obtain a final video~~

a viewfinder configured to display the corrected video.

7-10. (Canceled).

11. (Currently Amended) A method for use in a device that includes a lens, an image sensor, a viewfinder, a memory, one or more motion sensors, and a processor, comprising:

~~storing, at a memory~~ capturing by the image sensor, a plurality of sequential images, wherein the images ~~are~~ form part of a video, and storing the sequential images in the memory ~~plurality of sequential videos~~;

while capturing the images, detecting by one or more motion sensors a motion information representing the motion of the device, and storing the motion information in the memory;

~~detecting, by a processor, a main subject in each of the plurality of images, wherein the main subject is the same in the sequential images;~~

~~aligning~~ calculating, by the processor, a correcting filter for each of the images ~~such that the main subject is placed at a same location~~ to counteract the motion of the device in sequential images; ~~and~~

~~combining~~ modifying the sequential images, by the processor, ~~the aligned images~~ according to the correcting filter to obtain a final video; and

displaying the final video in the viewfinder.

12-15. (Canceled).

16. (Currently Amended) A computing device, comprising:

[[A]] a camera including a lens and an image sensor configured to capture ~~memory configured to store~~ a plurality of sequential images, wherein the sequential images ~~are~~ form part of a video ~~plurality of sequential videos~~;

one or more motion sensors configured to record a motion information representing the motion of the device while the images are being captured;

a memory configured to store the images and to store the motion information; and

a processor configured:

to calculate a correcting filter to counteract motion of the device in sequential images based in part on the motion information;

~~to detect a main subject in each of the images, wherein the main subject is the same in the sequential images;~~

~~to align~~ to modify each of the images ~~such that the main subject is placed at a same location~~ to generate a corrected image according to the correcting filter to counteract the motion of the device in each of the sequential images; ~~and~~

to combine the ~~aligned~~ corrected images to obtain a final video; and

a viewfinder configured to display the final video.

17-20. (Canceled).

21. (New) The method of claim 1, wherein the video captured by the image sensor is a plurality of sequential videos.

22. (New) The method of claim 1, wherein the motion information is stored synchronously with the storing of the video.

23. (New) The method of claim 1, wherein the calculating a correcting filter to counteract the motion of the device is based in part on the focal distance of the lens or the zoom level.

24. (New) The method of claim 1, wherein the device receives user input at the viewfinder, and the modifying the video to obtain a final video is based in part on the user input.

25. (New) The computing device of claim 6, wherein the video captured by the camera is a plurality of sequential videos.

26. (New) The computing device of claim 6, wherein the motion information is stored synchronously with the storing of the video.

27. (New) The computing device of claim 6, wherein the calculating a correcting filter to counteract the motion of the device is based in part on the focal distance of the lens or the zoom level.

28. (New) The computing device of claim 6, wherein the device receives user input at the viewfinder, and the modifying the video to obtain a final video is based in part on the user input.

29. (New) The method of claim 11, wherein the sequential images captured by the image sensor form part of a plurality of sequential videos.

30. (New) The method of claim 11, wherein the motion information is stored synchronously with the storing of the sequential images.

31. (New) The method of claim 11, wherein the calculating a correcting filter to counteract the motion of the device is based in part on the focal distance of the lens or the zoom level.

32. (New) The method of claim 11, wherein the device receives user input at the viewfinder, and the modifying the sequential images to obtain a final video is based in part on the user input.

33. (New) The computing device of claim 16, wherein the sequential images captured by the camera form part of a plurality of sequential videos.

34. (New) The computing device of claim 16, wherein the motion information is stored synchronously with the storing of the sequential images.

35. (New) The computing device of claim 16, wherein the calculating a correcting filter to counteract the motion of the device is based in part on the focal distance of the lens or the zoom level.

36. (New) The computing device of claim 16, wherein the device receives user input at a viewfinder, and the modifying the sequential images to obtain a final video is based in part on the user input.

Amendments to the Specification:

Please amend the title to:

~~METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES~~ METHOD AND APPARATUS TO CORRECT DIGITAL VIDEO TO COUNTERACT EFFECT OF CAMERA SHAKE

Please substitute the Abstract with the following new Abstract:

ABSTRACT

The effect of camera shake in digital video is corrected using signal processing techniques. The digital video is a sequence of digital images. When the sequence of digital images are being captured, movement of the imaging device causes the images to shift on the image sensor of the imaging device and affects the quality of the eventual video. Movement of the imaging device is detected while the video is being captured, and a motion information representing the motion is recorded. A processor determines a correcting filter based on the motion information and user input. The processor modifies the sequence of images captured according to the correcting filter and obtains a final corrected video. Corrected video is displayed in a viewfinder.

REMARKS/ARGUMENTS

After the foregoing Amendment, claims 1, 6, 11, 16 and 21-36 are currently pending in this application. Claims 2-5, 7-10, 12-15 and 17-20 are canceled. Claims 1, 6, 11 and 16 are amended. New claims 21-36 are added. In the specification, a new Abstract and Title are submitted herewith.

Request for an Interview

If any of the claims submitted herewith will be rejected by the Examiner, the Applicant respectfully requests a telephonic interview.

Double Patenting Rejection

Claims 1-20 are rejected under the judicially created doctrine of nonstatutory double patenting as being unpatentable over claims 1-30 of U.S. Patent No. 9,013,587. The Applicant is willing to submit a Terminal Disclaimer should the Examiner find the claims to be otherwise allowable.

Claim Rejections - 35 U.S.C. §102(b)

Claims 1, 2, 4-7, 9-12, 14-17 and 19-20 are rejected under §35 USC 102(b) as being anticipated by U.S. Patent No. 5,889,553 to Kino et al (hereinafter "Kino").

Kino discloses an image pickup apparatus that includes an image pickup element for photoelectrically converting an optical image formed on an image

pickup plane via an image pickup optical system and outputting a picked-up image signal.

Applicant's amended independent claim 1, on the other hand recites in part:

> capturing by the image sensor a video and storing the video in the memory;
> while capturing the video, detecting by one or more motion sensors a motion information representing the motion of the device, and storing the motion information in the memory;
> calculating, by the processor, a correcting filter to counteract the motion of the device based in part on the motion information;
> modifying the video, by the processor, according to the correcting filter to obtain a final video; and
> displaying the final video in the viewfinder,

which is not disclosed, taught or suggested in the Kino reference. Accordingly, amended independent claim 1 is patentable over the Kino reference.

Amended independent claims 6, 11 and 16, although not identical, include subject matter similar to patentable amended independent claim 1. They are therefore patentable for at least the same reasons as patentable amended independent claim 1.

Claims 2, 4-5, 7, 9-10, 12, 14-15, 17 and 19-20 are canceled in the present reply.

Based on the arguments presented above, withdrawal of the 35 USC §102(b) rejection of claims 1, 6, 11 and 16 is respectfully requested.

Conclusion

If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, or that a telephonic interview will help to materially advance the prosecution of this application, the Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

In view of the foregoing, Applicant respectfully submits that the present application is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,

Fatih M. Ozluturk

By /Todd A. Norton/
Todd A. Norton
Registration No. 48,636

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30 South 17th Street
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Facsimile: (215) 568-6499

TAN/TAM/amw

Electronic Patent Application Fee Transmittal

Application Number:	14690818
Filing Date:	20-Apr-2015
Title of Invention:	METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES
First Named Inventor/Applicant Name:	Fatih M. Ozluturk
Filer:	Todd A. Norton/Angel Wolf
Attorney Docket Number:	OZL-PT001.13

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 2 months with $0 paid	2252	1	300	300
Miscellaneous:				
			Total in USD ($)	**300**

Electronic Acknowledgement Receipt

EFS ID:	24213606
Application Number:	14690818
International Application Number:	
Confirmation Number:	8235
Title of Invention:	METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES
First Named Inventor/Applicant Name:	Fatih M. Ozluturk
Customer Number:	3624
Filer:	Todd A. Norton/Angel Wolf
Filer Authorized By:	Todd A. Norton
Attorney Docket Number:	OZL-PT001.13
Receipt Date:	30-NOV-2015
Filing Date:	20-APR-2015
Time Stamp:	16:56:15
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$300
RAM confirmation Number	4843
Deposit Account	220493
Authorized User	NORTON, TODD A.

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Extension of Time	OZL-PT001_13_Extension_of_Time_20151130.PDF	163575 c02d9d4a67b5ad5917b4869f9e5277f75e0603ea	no	2
Warnings:					
Information:					
2		OZL-PT001_13_Reply_20151130.PDF	90207 590dc1a74babaecdbf7dc66b1ff5d0f8bf605fea	yes	12

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Claims	2	7
Specification	8	8
Abstract	9	9
Applicant Arguments/Remarks Made in an Amendment	10	12

Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	31132 d5e6750ce05bde196a439a4b0b76b78f076108d5	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	284914		

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/AIA/22 (03-13)
Approved for use through 7/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)

Docket Number (Optional): OZL-PT001.13

Application Number: 14/690,818

Filed: April 20, 2015

For: METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES

Art Unit: 2661

Examiner: Tuan V. Ho

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

		Fee	Small Entity Fee	Micro Entity Fee	
☐	One month (37 CFR 1.17(a)(1))	$200	$100	$50	$
☑	Two months (37 CFR 1.17(a)(2))	$600	$300	$150	$ 300.00
☐	Three months (37 CFR 1.17(a)(3))	$1,400	$700	$350	$
☐	Four months (37 CFR 1.17(a)(4))	$2,200	$1,100	$550	$
☐	Five months (37 CFR 1.17(a)(5))	$3,000	$1,500	$750	$

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ A check in the amount of the fee is enclosed.

☑ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☑ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 220493.

☑ Payment made via EFS-Web.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant.

☑ attorney or agent of record. Registration number 48,636.

☐ attorney or agent acting under 37 CFR 1.34. Registration number _____.

/Todd A. Norton/
Signature

November 30, 2015
Date

Todd A. Norton
Typed or printed name

215-568-6400
Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☑ * Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Doc Code: DIST.E.FILE Document Description: Electronic Terminal Disclaimer - Filed	PTO/SB/26 U.S. Patent and Trademark Office Department of Commerce

Electronic Petition Request	**TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT**
Application Number	14690818
Filing Date	20-Apr-2015
First Named Inventor	Fatih Ozluturk
Attorney Docket Number	OZL-PT001.13
Title of Invention	METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES

☒ Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action

☒ This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.

Owner	Percent Interest
Fatih M. Ozluturk	100%

The owner(s) with percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent number(s)

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as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:
- expires for failure to pay a maintenance fee;
- is held unenforceable;
- is found invalid by a court of competent jurisdiction;
- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
- has all claims canceled by a reexamination certificate;
- is reissued; or
- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

◉ Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.

○ I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.

Applicant claims the following fee status:

◉ Small Entity

○ Micro Entity

○ Regular Undiscounted

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES

I certify, in accordance with 37 CFR 1.4(d)(4) that I am:

◉ An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application

Registration Number 56773

○ A sole inventor

○ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application

○ A joint inventor; all of whom are signing this request

Signature	/Thomas A. Mattioli/
Name	Thomas A. Mattioli

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

Electronic Patent Application Fee Transmittal

Application Number:	14690818
Filing Date:	20-Apr-2015
Title of Invention:	METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES
First Named Inventor/Applicant Name:	Fatih M. Ozluturk
Filer:	Thomas A Mattioli/Angel Wolf
Attorney Docket Number:	OZL-PT001.13

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Statutory or Terminal Disclaimer	2814	1	160	160
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**160**

Doc Code: DISQ.E.FILE
Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 14690818

Filing Date: 20-Apr-2015

Applicant/Patent under Reexamination: Ozluturk et al.

Electronic Terminal Disclaimer filed on January 27, 2016

☒ APPROVED

This patent is subject to a terminal disclaimer

☐ DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

U.S. Patent and Trademark Office

Electronic Acknowledgement Receipt

EFS ID:	24734916
Application Number:	14690818
International Application Number:	
Confirmation Number:	8235
Title of Invention:	METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES
First Named Inventor/Applicant Name:	Fatih M. Ozluturk
Customer Number:	3624
Filer:	Thomas A Mattioli/Angel Wolf
Filer Authorized By:	Thomas A Mattioli
Attorney Docket Number:	OZL-PT001.13
Receipt Date:	27-JAN-2016
Filing Date:	20-APR-2015
Time Stamp:	14:42:38
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$160
RAM confirmation Number	967
Deposit Account	220493
Authorized User	MATTIOLI, THOMAS A

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 CFR 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 CFR 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Electronic Terminal Disclaimer-Filed	eTerminal-Disclaimer.pdf	33421 417b20be3188f3c82d1d9b06073e10a86bd fd91a	no	2
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30934 b78495496b0004723fe13db1de09419700e b1c13	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	64355		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

3624 7590 02/04/2016
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

EXAMINER
HO, TUAN V

ART UNIT	PAPER NUMBER
2661	

DATE MAILED: 02/04/2016

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/690,818	04/20/2015	Fatih M. Ozluturk	OZL-PT001.13	8235

TITLE OF INVENTION: METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	05/04/2016

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

3624 7590 02/04/2016
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/690,818	04/20/2015	Fatih M. Ozluturk	OZL-PT001.13	8235

TITLE OF INVENTION: METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	05/04/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
HO, TUAN V	2661	348-208700

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
❑ Issue Fee
❑ Publication Fee (No small entity discount permitted)
❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
❑ A check is enclosed.
❑ Payment by credit card. Form PTO-2038 is attached.
❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/690,818	04/20/2015	Fatih M. Ozluturk	OZL-PT001.13	8235

3624 7590 02/04/2016
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

EXAMINER
HO, TUAN V

ART UNIT	PAPER NUMBER
2661	

DATE MAILED: 02/04/2016

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 14/690,818	Applicant(s) OZLUTURK, FATIH M.	
	Examiner TUAN HO	Art Unit 2661	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *papers filed on 1/27/16*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1, 6, 11, 16, 21-36 (renumbered as 1-20)*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/TUAN HO/
Primary Examiner, Art Unit 2661

1. The present application is being examined under the pre-AIA first to invent provisions.

2. TD filed on 1/27/16 has been approved.

3. Claims 1, 6, 11, 16 and 21-36 are allowed.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan Ho whose telephone number is (571) 272-7365. The examiner can normally be reached on Mon-Fri 7:00AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571) 272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tuan V Ho/

Primary Examiner, Art Unit 2622

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14690818	OZLUTURK, FATIH M.
	Examiner	**Art Unit**
	TUAN HO	2661

CPC- SEARCHED

Symbol	Date	Examiner
H04N 5/23287	6/23/15	TH
H04N5/23287, 5/232, 5/23267	1/28/16	TH
G06T 5/00, 5/002	1/28/16	TH

CPC COMBINATION SETS - SEARCHED

Symbol	Date	Examiner

US CLASSIFICATION SEARCHED

Class	Subclass	Date	Examiner
348	208.99-208.13	6/23/15	TH
	Updated	1/28/16	TH

SEARCH NOTES

Search Notes	Date	Examiner
EAST and Inventorship Search	6/23/15	TH

INTERFERENCE SEARCH

US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	Search Histroy	6/23/15	TH

	/TUAN HO/ Primary Examiner, Art Unit 2661

UNITED STATES PATENT AND TRADEMARK OFFICE

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BIB DATA SHEET

CONFIRMATION NO. 8235

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
14/690,818	04/20/2015 **RULE**	348	2661	OZL-PT001.13

APPLICANTS

INVENTORS

Fatih M. Ozluturk, Port Washington, NY;

**** CONTINUING DATA ***************************

This application is a CON of 14/532,654 11/04/2014 PAT 9013587
which is a CON of 13/442,370 04/09/2012 PAT 8922663
which is a CON of 12/274,032 11/19/2008 PAT 8154607
which is a CON of 11/089,081 03/24/2005 PAT 8331723
which claims benefit of 60/556,230 03/25/2004

**** FOREIGN APPLICATIONS ****************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **** ** SMALL ENTITY **
04/29/2015

Foreign Priority claimed	☐ Yes ☑ No		STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
35 USC 119(a-d) conditions met	☐ Yes ☑ No	☐ Met after Allowance				
Verified and Acknowledged	/TUAN V HO/ Examiner's Signature	Initials	NY	9	20	4

ADDRESS

VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103
UNITED STATES

TITLE

METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES

FILING FEE RECEIVED		
940	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14/690,818
	Filing Date	April 20, 2015
	First Named Inventor	Fatih M. Ozluturk
	Art Unit	2661
	Examiner Name	Tuan V. Ho
	Attorney Docket Number	OZL-PT001.13

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
		4,612,575	09/1986	Ishman et al.			
		4,646,274	02/1987	Martinez			
		4,890,160	12/1989	Thomas			
		5,060,074	10/1991	Kinugasa et al.			
		5,125,041	06/1992	Kimura et al.			
		5,170,255	12/1992	Yamada et al.			
		5,189,518	02/1993	Nishida			
		5,193,124	03/1993	Subbarao			
		5,262,867	11/1993	Kojima			
		5,264,846	11/1993	Oikawa			
		5,291,300	03/1994	Ueda			
		5,365,603	11/1994	Karmann			
		5,510,831	04/1996	Mayhew			
		5,596,366	01/1997	Takashima et al.			
		5,627,543	05/1997	Moreira			
		5,649,032	07/1997	Burt et al.			
		5,652,918	07/1997	Usui			
		5,666,158	09/1997	Sekine et al.			
		5,684,887	11/1997	Lee et al.			
		5,706,402	01/1998	Bell			
		5,706,416	01/1998	Mann et al.			
		5,712,474	01/1998	Naneda			
		5,729,290	03/1998	Tokumitsu et al.			
		5,734,739	03/1998	Sheehan et al.			
		5,771,403	06/1998	Imada			
		5,867,213	02/1999	Ouchi			
		5,889,553	03/1999	Kino et al.			
		5,963,675	10/1999	Van der Wal et al.			
		5,982,421	11/1999	Inou et al.			

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.H./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Attorney Docket Number	OZL-PT001.13

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
		6,067,367	05/2000	Nakajima et al.			
		6,079,862	06/2000	Kawashima et al.			
		6,097,854	08/2000	Szeliski et al.			
		6,101,238	08/2000	Murthy et al.			
		6,124,864	09/2000	Madden et all.			
		6,166,384	12/2000	Dentinger et al.[1]			
		6,166,853	12/2000	Sapia et al.			
		6,195,460	02/2001	Kobayashi et al.			
		6,198,283	03/2001	Foo et al.			
		6,208,765	03/2001	Bergen			
		6,249,616	06/2001	Hashimoto			
		6,278,460	08/2001	Myers et al.			
		6,292,593	09/2001	Nako et al.			
		6,342,918	01/2002	Inou et al.			
		6,349,114	02/2002	Mory			
		6,353,689	03/2002	Kanamaru et al.			
		6,353,823	06/2003	Shimada et al.			
		6,466,262	10/2002	Miyatake et al.[2]			
		6,470,100	10/2002	Horiuchi et al.			
		6,512,807	01/2003	Pohlman et al.			
		6,583,823	06/2003	Shimada et al.			
		6,687,458	02/2004	Masuda			
		6,745,066	06/2004	Lin et al.			
		6,757,434	06/2004	Miled et al.			
		6,759,979	07/2004	Vashisth et al.			
		6,781,623	08/2004	Thomas			
		6,909,914	06/2005	Pedrizzetti et al.			
		6,930,708	08/2005	Sato et al.			

1 Corresponds to EP 1004983 and JP 2000-207538
2 Corresponds to EP 0884897

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.H./

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	Examiner Name	Tuan V. Ho
	Attorney Docket Number	OZL-PT001.13

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
		6,993,157	01/2006	Oue et al.			
		6,993,204	02/2006	Yahil et al.			
		7,024,050	04/2006	Kondo et al.			
		7,162,102	01/2007	Cahill et al.			
		7,286,164	10/2007	Shinohara et al.			
		7,298,923	11/2007	Zhang et al.			
		7,352,389	04/2008	Uenaka			
		7,397,500	07/2008	Yost et al.			
		7,483,056	01/2009	Shinohara et al.			
		7,489,760	02/2009	Hemmendorff			
		7,561,186	07/2009	Poon			
		7,693,563	04/2010	Suresh et al.			
		7,710,460	05/2010	Stavely et al.			
		7,961,323	06/2011	Tibbetts			
		8,228,400	07/2012	Liu et al.			
		8,259,184	09/2012	Murashima et al.			
		8,798,388	08/2014	Atanassov et al.			
		2001/0028798	10/2001	Manowitz et al.			
		2001/0045989	11/2001	Onuki			
		2002/0094200	07/2002	Yamaguchi			
		2002/0110268	08/2002	Brinker et al.			
		2002/0159651	10/2002	Tener et al.			
		2003/0067544	04/2003	Wada			
		2003/0076408	04/2003	Dutta			
		2003/0113035	06/2003	Cahill et al.			
		2003/0118227	06/2003	Winsor et al.			
		2003/0174899	09/2003	Kondo et al.			
		2004/0008872	01/2004	Goldberg et al.			
		2004/0091158	05/2004	Miled et al.			
		2004/0100561	05/2004	Shinohara et al.			

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.H./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Attorney Docket Number	OZL-PT001.13

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
		2004/0170327	09/2004	Kim et al.			
		2004/0218055	11/2004	Yost et al.			
		2005/0078881	04/2005	Xu et al.			
		2005/0140793	06/2005	Kojima et al.			
		2005/0157180	07/2005	Takahashi et al.			
		2005/0213850	09/2005	Zhang et al.			
		2005/0231603	10/2005	Poon			
		2005/0286388	12/2005	Ayres et al.			
		2006/0177145	08/2006	Lee et al.			
		2006/0257051	11/2006	Zavadsky et al.			
		2006/0280249	12/2006	Poon			
		2007/0025503	02/2007	Hemmendorff			
		2007/0031004	02/2007	Matsui et al.			
		2007/0086675	04/2007	Chinen et al.			
		2007/0236573	10/2007	Alon et al.			
		2007/0263914	11/2007	Tibbetts			
		2008/0123996	05/2008	Zavadsky et al.			
		2015/0103190	04/2015	Corcoran et al.			

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES	TRANSLATION NO
		1004983	05/2000	EP				
		11-024122	01/1999	JP				
		2000-207538	07/2000	JP				
		2004-056581	02/2004	JP				
		2004-104652	04/2004	JP				

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.H./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Filing Date	April 20, 2015
	First Named Inventor	Fatih M. Ozluturk
	Art Unit	2661
	Examiner Name	Tuan V. Ho
	Attorney Docket Number	OZL-PT001.13

OTHER DOCUMENTS		
EXAMINER INITIAL		DESCRIPTION (Including Author, Title, Date, Pertinent Pages, Etc.)
		Banham, et al., Digital Image Restoration, IEEE Signal Processing Magazine, March 1997, Pgs. 24-41.
		Biemond et al., "Iterative Methods for Image Deblurring," Proceedings of the IEEE, May 1990, vol 78, no. 5.
		Kundur, et al., Blind Image Deconvolution, IEEE Signal Processing Magazine, May 1996, Pgs. 43-64.
		Yitzhaky, et al., Comparison of Direct Blind Deconvolution Methods for Motion-Blurred Images, Applied Optics, Vol 38, No. 20, July 1999, Pgs. 4325-4332.

/Tuan Ho/ (12/17/2015)

/Tuan Ho/ (12/17/2015)

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.H./

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14690818	OZLUTURK, FATIH M.
	Examiner	**Art Unit**
	TUAN HO	2661

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☒ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	06/23/2015	01/28/2016							
	1	✓	=							
	2	✓	-							
	3	✓	-							
	4	✓	-							
	5	✓	-							
	6	✓	=							
	7	✓	-							
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	34		=							
	35		=							
	36		=							

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	2	"20150237258"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/01/28 07:20
L4	41500	H04N5/23287,232,23267.cpc. or G06T5/00,002.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/01/28 07:23
L5	12	4 and (image and sensor and lens and memory and (motion same sensor) and (correct$5 same filter) and (motion same device) and counteract$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/01/28 07:26
L6	315739	348/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/01/28 07:28
L7	345094	4 or 6	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/01/28 07:28

L8	23	7 and (image and sensor and lens and memory and (motion same sensor) and (correct$5 same filter) and (motion same device) and counteract$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/01/28 07:29
S30	482770	H04N5/2621.cpc. or G06T5/20.cpc. or G06T5/001.cpc. or 348/$.ccls. or 382/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/01/12 13:34
S31	184794	382/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/01/22 08:02
S32	1295	S31 and (tran near3 phuoc)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/01/22 08:02
S33	1032	S32 and pixel	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/01/22 08:03
S34	34	S33 and (sub adj pixel)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/01/22 08:03
S35	0	"5351309".pn. and (color same filter)	US-PGPUB; USPAT;	OR	ON	2016/01/22 08:10

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S36	99	S33 and ((color same filter) same (photodiode or pixel))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/01/22 08:11
S37	12	S31 and ((color adj filters) same (single near4 (pixel or photodiode)) same (sub adj pixel))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/01/22 08:21

EAST Search History (Interference)

<This search history is empty>

1/28/2016 7:29:52 AM
C:\Users\tho\Documents\EAST\Workspaces\NWE2014SEP.wsp

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14690818	OZLUTURK, FATIH M.
	Examiner	**Art Unit**
	TUAN HO	2661

CPC						
Symbol					**Type**	**Version**
H04N		5	/	23267	F	2013-01-01
G06T		5	/	002	I	2013-01-01

CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 20	
/TUAN HO/ Primary Examiner.Art Unit 2661 (Primary Examiner)	01/28/2016 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 4

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14690818	OZLUTURK, FATIH M.
	Examiner	**Art Unit**
	TUAN HO	2661

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION	
CLASS	SUBCLASS	CLAIMED	NON-CLAIMED
348	208.6	H 0 4 N 5 / 23287	

CROSS REFERENCE(S)					
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 20	
/TUAN HO/ Primary Examiner.Art Unit 2661 (Primary Examiner)	01/28/2016 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 4

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	Examiner	**Art Unit**
	TUAN HO	2661

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 20	
/TUAN HO/ Primary Examiner.Art Unit 2661 (Primary Examiner)	01/28/2016 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 4

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
14/690,818	04/20/2015	2661	940	OZL-PT001.13	20	4

CONFIRMATION NO. 8235

CORRECTED FILING RECEIPT

OC000000080427314

3624
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET, 18th Floor
PHILADELPHIA, PA 19103

Date Mailed: 02/09/2016

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Fatih M. Ozluturk, Port Washington, NY;

Applicant(s)

Fatih M. Ozluturk, Port Washington, NY;

Power of Attorney: The patent practitioners associated with Customer Number 03624

Domestic Priority data as claimed by applicant

This application is a CON of 14/532,654 11/04/2014 PAT 9013587
which is a CON of 13/442,370 04/09/2012 PAT 8922663
which is a CON of 12/274,032 11/19/2008 PAT 8154607
which is a CON of 11/089,081 03/24/2005 PAT 8331723
which claims benefit of 60/556,230 03/25/2004

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: No

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 04/29/2015

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/690,818**

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

METHOD AND APPARATUS TO CORRECT DIGITAL VIDEO TO COUNTERACT EFFECT OF CAMERA SHAKE

Preliminary Class

348

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

3624 7590 02/04/2016
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

	(Depositor's name)
SUBMITTED VIA EFS	(Signature)
	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/690,818	04/20/2015	Fatih M. Ozluturk	OZL-PT001.13	8235

TITLE OF INVENTION: METHOD AND APPARATUS TO CORRECT DIGITAL IMAGE BLUR BY COMBINING MULTIPLE IMAGES

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	05/04/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
HO, TUAN V	2661	348-208700

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Volpe and Koenig, P.C.
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

☒ Issue Fee

☒ Publication Fee (No small entity discount permitted)

☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

☐ A check is enclosed.

☒ Payment by credit card. ~~Form PTO-2038 is attached.~~

☒ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 220493 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

☐ Applicant asserting small entity status. See 37 CFR 1.27

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

☐ Applicant changing to regular undiscounted fee status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Thomas A. Mattioli/ Date April 8, 2016

Typed or printed name Thomas A. Mattioli Registration No. 56,773

Electronic Patent Application Fee Transmittal

Application Number:	14690818
Filing Date:	20-Apr-2015
Title of Invention:	METHOD AND APPARATUS TO CORRECT DIGITAL VIDEO TO COUNTERACT EFFECT OF CAMERA SHAKE
First Named Inventor/Applicant Name:	Fatih M. Ozluturk
Filer:	Thomas A Mattioli/Angel Wolf
Attorney Docket Number:	OZL-PT001.13

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Utility Appl Issue Fee	2501	1	480	480
Publ. Fee- Early, Voluntary, or Normal	1504	1	0	0
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**480**

Electronic Acknowledgement Receipt

EFS ID:	25439712
Application Number:	14690818
International Application Number:	
Confirmation Number:	8235
Title of Invention:	METHOD AND APPARATUS TO CORRECT DIGITAL VIDEO TO COUNTERACT EFFECT OF CAMERA SHAKE
First Named Inventor/Applicant Name:	Fatih M. Ozluturk
Customer Number:	3624
Filer:	Thomas A Mattioli
Filer Authorized By:	
Attorney Docket Number:	OZL-PT001.13
Receipt Date:	08-APR-2016
Filing Date:	20-APR-2015
Time Stamp:	15:57:42
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$480
RAM confirmation Number	2433
Deposit Account	220493
Authorized User	MATTIOLI, THOMAS A

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 CFR 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 CFR 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	OZL-PT001_13_Issue_Fee_EFS.PDF	113058 4449399940790b440103e54eab5849dcb6b2fe7a	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	32554 be7152aaca419df1030aedd3bdd74fe5038fad93	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	145612		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14/690,818
	Filing Date	April 20, 2015
	First Named Inventor	Fatih M. Ozluturk
	Art Unit	2661
	Examiner Name	Tuan V. Ho
	Attorney Docket Number	OZL-PT001.13

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
		6,067,367	05/2000	Nakajima et al.			
		6,079,862	06/2000	Kawashima et al.			
		6,097,854	08/2000	Szeliski et al.			
		6,101,238	08/2000	Murthy et al.			
		6,124,864	09/2000	Madden et all.			
		6,166,384	12/2000	Dentinger et al.[1]			
		6,166,853	12/2000	Sapia et al.			
		6,195,460	02/2001	Kobayashi et al.			
		6,198,283	03/2001	Foo et al.			
		6,208,765	03/2001	Bergen			
		6,249,616	06/2001	Hashimoto			
		6,278,460	08/2001	Myers et al.			
		6,292,593	09/2001	Nako et al.			
		6,342,918	01/2002	Inou et al.			
		6,349,114	02/2002	Mory			
		6,353,689	03/2002	Kanamaru et al.			
Change(s) applied to document, /J.M./ 2/11/2016		6,583,823 ~~6,353,823~~	06/2003	Shimada et al.			
		6,466,262	10/2002	Miyatake et al.[2]			
		6,470,100	10/2002	Horiuchi et al.			
		6,512,807	01/2003	Pohlman et al.			
		6,583,823	06/2003	Shimada et al.			
		6,687,458	02/2004	Masuda			
		6,745,066	06/2004	Lin et al.			
		6,757,434	06/2004	Miled et al.			
		6,759,979	07/2004	Vashisth et al.			
		6,781,623	08/2004	Thomas			
		6,909,914	06/2005	Pedrizzetti et al.			
		6,930,708	08/2005	Sato et al.			

1 Corresponds to EP 1004983 and JP 2000-207538
2 Corresponds to EP 0884897

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /T.H./

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/690,818	05/10/2016	9338356	OZL-PT001.13	8235

3624 7590 04/20/2016

VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET, 18th Floor
PHILADELPHIA, PA 19103

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Fatih M. Ozluturk, Port Washington, NY;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT4004311

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
FATIH M OZLUTURK	08/10/2016

RECEIVING PARTY DATA

Name:	CLEAR IMAGING RESEARCH, LLC
Street Address:	5 HILLDALE LN
City:	SANDS POINT
State/Country:	NEW YORK
Postal Code:	11050

PROPERTY NUMBERS Total: 3

Property Type	Number
Patent Number:	9392175
Patent Number:	9338356
Patent Number:	9294674

CORRESPONDENCE DATA

Fax Number:

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

Email: fozluturk@gmail.com
Correspondent Name: FATIH M OZLUTURK
Address Line 1: 5 HILLDALE LN
Address Line 4: SANDS POINT, NEW YORK 11050

NAME OF SUBMITTER:	FATIH M OZLUTURK
SIGNATURE:	/FatihOzluturk/
DATE SIGNED:	08/12/2016
	This document serves as an Oath/Declaration (37 CFR 1.63).

Total Attachments: 1
source=674 356 175 assignment#page1.tif

ASSIGNMENT OF PATENT RIGHTS

Fatih Ozluturk ("Assignor") is owner of the following U.S. Patents (the "Patents"):

Patent No	Date	Title
9,392,175	July 12, 2016	Method and apparatus for using motion information and image data to correct blurred images
9,338,356	May 10, 2016	Method and apparatus to correct digital video to counteract effect of camera shake
9,294,674	March 22, 2016	Method and apparatus to correct digital image blur due to motion of subject or imaging device

Clear Imaging Research, LLC, a Limited Liability Company registered in Delaware, with offices in 5 Hilldale Ln, Sands Point, NY ("Assignee") desires to acquire rights in and to the Patent.

Therefore, for valuable consideration, the receipt of which is acknowledged, Assignor sells, assigns and transfers his entire right, title and interest in the Patents to Assignee. The right, title and interest conveyed in this Assignment is to be held and enjoyed by Assignee and Assignee's successors, legal representatives and assigns, to the full end of the term for which the Patent is granted, as fully and exclusively as it would have been held and enjoyed by Assignor had this assignment not been made.

Date: 8/10/2016

Fatih Ozluturk

On this 10th day of Aug 2016, before me, Lynn J. Moessner, the undersigned Notary Public, personally appeared Fatih Ozluturk, proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument, and acknowledged to me that he executed the same. Witness my hand and official seal in New York County of Nassau on the date set forth in this certificate.

Notary Public

LYNN J MOESSNER
Notary Public, State of New York
No. 01M04970982
Qualified in Nassau County
My Commission Expires 8/20/2018

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT6663561

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
FATIH OZLUTURK	04/19/2021
OZLUTURK & CO, LLC	04/19/2021
CLEAR IMAGING, LLC	04/19/2021

RECEIVING PARTY DATA

Name:	CLEAR IMAGING RESEARCH, LLC
Street Address:	5 HILLDALE LANE
City:	SANDS POINT
State/Country:	NEW YORK
Postal Code:	11050

PROPERTY NUMBERS Total: 30

Property Type	Number
Application Number:	60556230
Patent Number:	8331723
Patent Number:	8064719
Patent Number:	8064720
Patent Number:	8154607
Patent Number:	8630484
Patent Number:	9294674
Patent Number:	8922663
Patent Number:	9001221
Patent Number:	9013587
Patent Number:	9167162
Patent Number:	9154699
Patent Number:	9392175
Patent Number:	9338356
Patent Number:	9826159
Patent Number:	9774785
Patent Number:	9800787
Patent Number:	9800788

Property Type	Number
Patent Number:	9860450
Patent Number:	10171740
Application Number:	15790430
Patent Number:	10341566
Patent Number:	10389944
Patent Number:	10382689
Patent Number:	10721405
Application Number:	16538066
Patent Number:	10880483
Application Number:	16933557
Application Number:	17066882
PCT Number:	WO2005093654

CORRESPONDENCE DATA

Fax Number:

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.

Phone: 516 603 8383

Email: fatih@clear-imaging.com

Correspondent Name: FATIH M OZLUTURK

Address Line 1: 5 HILLDALE LN

Address Line 4: SANDS POINT, NEW YORK 11050

NAME OF SUBMITTER:	FATIH OZLUTURK
SIGNATURE:	/FatihOzluturk/
DATE SIGNED:	04/19/2021
	This document serves as an Oath/Declaration (37 CFR 1.63).

Total Attachments: 3

source=CIR Re-assignment#page1.tif

source=CIR Re-assignment#page2.tif

source=CIR Re-assignment#page3.tif

ASSIGNMENT OF PATENT RIGHTS

I, Fatih Ozluturk ("Assignor"), have assigned my right, title and interest in the inventions, patents, and patent applications listed in Exhibit A, as well as, any reissues, continuations, continuation-in-parts, divisionals, substitute applications, re-examinations claiming the benefit of any patent or patent application listed in Exhibit A ("Patents"), for the entire life of Patents, including the right to sue for past, current, or future patent infringement, to Clear Imaging Research, LLC with offices in 5 Hilldale Lane, Sands Point, NY ("Assignee").

To the extent that any clarification is sought or necessary, for any reason, I ("Assignor") on behalf of myself in my personal capacity, and as the Principal and Owner of any legal entity that I own, control, and/or manage as of this date and any time in the past (including but not limited to Clear Imaging LLC), for valuable consideration, the receipt of which I acknowledge, hereby sell, assign and transfer the entire right, title and interest in the inventions, patents, and patent applications listed in Exhibit A, as well as, any reissues, continuations, continuation-in-parts, divisionals, substitute applications, re-examinations claiming the benefit of any patent or patent application listed in Exhibit A ("Patents"), for the entire life of Patents, including the right to sue for past, current, or future patent infringement, to Clear Imaging Research, LLC with offices in 5 Hilldale Lane, Sands Point, NY ("Assignee"). For the avoidance of doubt, this assignment includes all rights to sue and collect for past damages.

For the avoidance of doubt, there remains no rights, past, current, or future, related or associated with Patents that remain outside the Assignee. For the avoidance of doubt, no rights to sue or collect for past damages remain outside the Assignee. The right, title and interest conveyed in this Assignment is to be held and enjoyed by Assignee and Assignee's successors, legal representatives and assigns, to the full end of the term of Patents past, current, and future, is granted, as fully and exclusively as it would have been held and enjoyed by Assignor had this assignment not been made.

Date: 4/19/21

Assignor

On this 19th day of April, before me, Lynn J Moessner, the undersigned Notary Public, personally appeared Fatih Ozluturk, proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument, and acknowledged to me that he executed the same. Witness my hand and official seal in Port Washington County of Nassau on the date set forth in this certificate.

Notary Public

LYNN J MOESSNER
Notary Public, State of New York
No. 01M04979852
Qualified in Nassau County
My Commission Expires 6/20/2022

EXHIBIT A

The Patents include the patents and patent applications listed below, as well as, any reissues, continuations, continuation-in-parts, divisionals, substitute applications, re-examinations claiming the benefit of any patent or patent application listed below.

Patent Number	Publication Number	Application Number	Title
		US60/556230	Processing to restore photographs affected due to camera shake or moving subject
US8331723		US11/089081	Method and apparatus to correct digital image blur due to motion of subject or imaging device
US8064719		US12/274074	Method and apparatus to correct digital image blur due to motion of subject or imaging device
US8064720		US12/274096	Method and apparatus to correct digital image blur due to motion of subject or imaging device
US8154607		US12/274032	Method and apparatus to correct digital image blur due to motion of subject or imaging device
US8630484		US12/274057	Method and apparatus to correct digital image blur due to motion of subject or imaging device
US9294674		US12/274084	Method and apparatus to correct digital image blur due to motion of subject or imaging device
US8922663		US13/442370	Method and apparatus to correct digital image blur due to motion of subject or imaging device
US9001221		US13/653144	Method and apparatus for using motion information and image data to correct blurred images
US9013587		US14/532654	Method and apparatus to correct digital image blur by combining multiple images
US9167162		US14/584891	Method and apparatus to correct digital image blur due to motion of subject or imaging device by adjusting image sensor
US9154699		US14/586297	Method and apparatus to correct blur in all or part of a digital image by combining plurality of images
US9392175		US14/679551	Method and apparatus for using motion information and image data to correct blurred images
US9338356		US14/690818	Method and apparatus to correct digital video to counteract effect of camera shake
US9826159		US14/861731	Method and apparatus for implementing a digital graduated filter for an imaging apparatus
US9774785		US14/875204	Method and apparatus to correct blur in all or part of a digital image by combining plurality of images
US9800787		US15/149481	Method and apparatus to correct digital video to counteract effect of camera shake
US9800788		US15/207057	Method and apparatus for using motion information and image data to correct blurred images
US9860450		US15/431332	Method and apparatus to correct digital video to counteract effect of camera shake
US10171740		US15/714558	Method and apparatus to correct blur in all or part of a digital image by combining plurality of

			images
	US20180048822	US15/790430	Method and apparatus for using motion information and image data to correct blurred images
US10341566		US15/811171	Method and apparatus for implementing a digital graduated filter for an imaging apparatus
US10389944		US15/858339	Method and apparatus to correct blur in all or part of an image
US10382689		US16/233914	Method and apparatus for capturing stabilized video in an imaging device
US10721405		US16/459157	Method and apparatus for implementing a digital graduated filter for an imaging apparatus
	US20190364213	US16/538066	Method and apparatus for capturing stabilized video in an imaging device
US10880483		US16/544426	Method and apparatus to correct blur in all or part of an image
	US20200351445	US16/933557	Method and apparatus for implementing a digital graduated filter for an imaging apparatus
	US20210044752	US17/066882	Method and apparatus to correct blur in all or part of an image
	WO2005093654	US2005009766W	Method and apparatus to correct digital image blur due to motion of subject or imaging device

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY.DOCKET NO./TITLE	REQUEST ID
14/690,818	04/20/2015	Fatih M. Ozluturk	OZL-PT001.13	141429

Acknowledgement of Loss of Entitlement to Entity Status Discount

The entity status change request below filed through Private PAIR on 06/17/2021 has been accepted.

CERTIFICATIONS:

Change of Entity Status:

X Applicant changing to regular undiscounted fee status.
NOTE: Checking this box will be taken to be notification of loss of entitlement to small or micro entity status, as applicable.

This portion must be completed by the signatory or signatories making the entity status change in accordance with 37 CFR 1.4(d)(4).

Signature:	/Thomas A. Mattioli/
Name:	Thomas A. Mattioli
Registration Number:	56773