FORM PTO-1618A
Expires 06/30/99
OMB 0651-0027

12-22-2000

U.S. Department of Commerce
Patent and Trademark Office
TRADEMARK

Re: 12.11.00

101560113

RECORDATION FORM COVER SHEET
TRADEMARKS ONLY

TO: The Commissioner of Patents and Trademarks: Please record the attached original document(s) or copy(ies).

Submission Type

- [ ] New
- [x] Resubmission (Non-Recordation) Document ID # 101463205
- [ ] Correction of PTO Error Reel # ____ Frame # ____
- [ ] Corrective Document Reel # ____ Frame # ____

Conveyance Type

- [ ] Assignment
- [ ] License
- [ ] Security Agreement
- [ ] Nunc Pro Tunc Assignment
- [ ] Merger
- Effective Date Month Day Year: 08/10/2000
- [ ] Change of Name
- [x] Other: Release of Security Interest

Conveying Party

- [ ] Mark if additional names of conveying parties attached

Name: FIRST UNION NATIONAL BANK

Execution Date Month Day Year: 08/10/2000

Formerly:

- [ ] Individual
- [ ] General Partnership
- [ ] Limited Partnership
- [ ] Corporation
- [ ] Association
- [x] Other: National Banking Association
- [ ] Citizenship/State of Incorporation/Organization:

Receiving Party

- [ ] Mark if additional names of receiving parties attached

Name: VERIDIAN ERIM INTERNATIONAL, INC.

DBA/AKA/TA:

Composed of:

Address (line 1): 3300 Plymouth Road

Address (line 2):

Address (line 3): Ann Arbor (City) Michigan (State/Country) 48105 (Zip Code)

- [ ] Individual
- [ ] General Partnership
- [ ] Limited Partnership
- [ ] If document to be recorded is an assignment and the receiving party is not domiciled in the United States, an appointment of a domestic representative should be attached. *(Designation must be a separate document from Assignment.)*
- [x] Corporation
- [ ] Association
- [ ] Other:
- [x] Citizenship/State of Incorporation/Organization: Michigan

FOR OFFICE USE ONLY

Mail documents to be recorded with required cover sheet(s) information to:
Commissioner of Patents and Trademarks, Box Assignments , Washington, D.C. 20231

Domestic Representative Name and Address

Enter for the first Receiving Party only.

Name

Address (line 1)

Address (line 2)

Address (line 3)

Address (line 4)

Correspondent Name and Address

Area Code and Telephone Number 616-752-2000

Name: Warner Norcross & Judd LLP

Address (line 1): Intellectual Property Practice Group

Address (line 2): 900 Old Kent Building

Address (line 3): 111 Lyon Street, N.W.

Address (line 4): Grand Rapids, Michigan 49503-2487

Pages

Enter the total number of pages of the attached conveyance document including any attachments. # 6

Trademark Application Number(s) or Registration Number(s)

☐ Mark if additional numbers attached

Enter either the Trademark Application Number or the Registration Number (DO NOT ENTER BOTH numbers for the same property).

Trademark Application Number(s)			Registration Number(s)		
75/679,507	75/679,508	75/679,509			
75/541,999	75/679,510	75/679,506			
75/679,505	75/679,511				

Number of Properties

Enter the total number of properties involved. # 8

Fee Amount

Fee Amount for Properties Listed (37 CFR 3.41): $ 215.00

Charge underpayment to:

Method of Payment: Enclosed ☐ Deposit Account ☒

Deposit Account

Fee previously submitted

(Enter for payment by deposit account or if additional fees can be charged to the account.)

Deposit Account Number: # 23 0457

Authorization to charge additional fees: Yes ☒ No ☐

Statement and Signature

To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document. Charges to deposit account are authorized, as indicated herein.

Charles E. Burpee
Name of Person Signing

Charles E. Burpee
Signature

December 6, 2000
Date Signed

FORM PTO-1618A
Expires 06/30/99
OMB 0651-0027

09-19-2000

101463205

U.S. Department of Commerce
Patent and Trademark Office
TRADEMARK

8-21-00

RECORDATION FORM COVER SHEET
TRADEMARKS ONLY

TO: The Commissioner of Patents and Trademarks: Please record the attached original document(s) or copy(ies).

Submission Type

[X] New

[ ] Resubmission (Non-Recordation)
Document ID #

[ ] Correction of PTO Error
Reel # Frame #

[ ] Corrective Document
Reel # Frame #

Conveyance Type

[ ] Assignment [ ] License

[ ] Security Agreement [ ] Nunc Pro Tunc Assignment

[ ] Merger

Effective Date
Month Day Year
Undated

[ ] Change of Name

[X] Other Release of Security Interest

Conveying Party

[ ] Mark if additional names of conveying parties attached

Name: First Union National Bank

Execution Date
Month Day Year
Undated

Formerly:

[ ] Individual [ ] General Partnership [ ] Limited Partnership [ ] Corporation [ ] Association

[X] Other National Banking Association

[ ] Citizenship/State of Incorporation/Organization

Receiving Party

[ ] Mark if additional names of receiving parties attached

Name: Veridian ERIM International, Inc.

DBA/AKA/TA:

Composed of:

Address (line 1): 3300 Plymouth Road

Address (line 2):

Address (line 3): Ann Arbor (City) Michigan (State/Country) 48105 (Zip Code)

[ ] Individual [ ] General Partnership [ ] Limited Partnership

[X] Corporation [ ] Association

[ ] Other

[ ] If document to be recorded is an assignment and the receiving party is not domiciled in the United States, an appointment of a domestic representative should be attached. *(Designation must be a separate document from Assignment.)*

[ ] Citizenship/State of Incorporation/Organization

FOR OFFICE USE ONLY

09/20/2000 GTON11 00000022 75679507

01 FC:481 40.00 OP
02 FC:482 175.00 OP

Mail documents to be recorded with required cover sheet(s) information to:
Commissioner of Patents and Trademarks, Box Assignments , Washington, D.C. 20231

Domestic Representative Name and Address

Enter for the first Receiving Party only.

Name

Address (line 1)

Address (line 2)

Address (line 3)

Address (line 4)

Correspondent Name and Address

Area Code and Telephone Number 616-752-2000

Name: Warner Norcross & Judd LLP

Address (line 1): Intellectual Property Practice Group

Address (line 2): 900 Old Kent Building

Address (line 3): 111 Lyon Street, N.W.

Address (line 4): Grand Rapids, Michigan 49503-2489

Pages

Enter the total number of pages of the attached conveyance document including any attachments. # 6

Trademark Application Number(s) or Registration Number(s)

☐ Mark if additional numbers attached

Enter either the Trademark Application Number or the Registration Number (DO NOT ENTER BOTH numbers for the same property).

Trademark Application Number(s)			Registration Number(s)		
75/679,507	75/679,508	75/679,509			
75/541,999	75/679,510	75/679,506			
75/679,505	75/679,511				

Number of Properties

Enter the total number of properties involved. # 8

Fee Amount

Fee Amount for Properties Listed (37 CFR 3.41): $ 215.00

Method of Payment: Enclosed [x] Deposit Account [ ]

Deposit Account

(Enter for payment by deposit account or if additional fees can be charged to the account.)

Deposit Account Number: # 23 0457

Authorization to charge additional fees: Yes [x] No [ ]

Statement and Signature

To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document. Charges to deposit account are authorized, as indicated herein.

Charles E. Burpee — Name of Person Signing

Charles E. Burpee — Signature

August 16, 2000 — Date Signed

This FINANCING STATEMENT is presented for filing pursuant to the Michigan Uniform Commercial Code. (Please Type All Information)

FOR FILING OFFICER (Date, Time, Number, and Filing Officer)

DO NOT WRITE IN THIS SPACE

1. Debtor(s) (Last Name First, if individual) & Address(es)

Veridian ERIM International, Inc.
3300 Plymouth Road
Ann Arbor, Michigan 48105

Soc. Security S/Tax ID #
38-3341513

2. Secured Party(ies) & Address(es)

See Schedule A

Secured Party #

4. No. of Add'l Sheets
1

5. State Account No.

3. MAIL ACKNOWLEDGEMENT COPY TO:

David L. Morrow, Esq.
Dickinson Wright PLLC
500 Woodward Avenue
Suite 4000
Detroit, Michigan 48226

6. THIS STATEMENT REFERS TO THE ORIGINAL FINANCING STATEMENT BEARING THE FOLLOWING:

Sec. of State File Number 06803C

Reg. of Deeds File Number _____

Liber _____ Page _____

7. [ ] AMENDMENT - The Financing Statement bearing the file number(s) shown in Item 6 is amended as set forth in Item 13 below.

8. [ ] ASSIGNMENT - All of Secured Party's right under the Financing Statement bearing the file number shown in Item 6 has been assigned to the assignee whose name and address appears in Item 13 below.

9. [ ] PARTIAL ASSIGNMENT - A portion of the Secured Party's right under the Financing Statement bearing the file number shown in Item 6 to the property described in Item 13 has been assigned to the assignee whose name and address appears in Item 13.

10. [ ] CONTINUATION - The original Financing Statement bearing the file number shown in Item 6 is still effective. A CONTINUATION CANNOT BE FILED MORE THAN SIX MONTHS PRIOR TO EXPIRATION DATE.

11. [x] PARTIAL RELEASE - The Secured Party(ies) release(s) the following collateral described in Item 13 below from the original Financing Statement bearing the file number as shown in Item 6.

12. [ ] TERMINATION - The Secured Party(ies) of record no longer claim(s) a security interest under the Financing Statement bearing the file number shown in Item 6.

13. Secured Party hereby releases all assets of the HoloVision Products Group business, including without limitation the patents and trademarks listed on Schedule B attached hereto.

File with Michigan Department of State

FIRST UNION NATIONAL BANK, as Agent

X _____
Signature(s) of Debtor(s)

X _____
Signature(s) of Secured Party(ies) or Assignee(s) of Record

X _____
Signature(s) of Debtor(s)

X _____
Signature(s) of Secured Party(ies) or Assignee(s) of Record

IF YOU WISH THE ACKNOWLEDGEMENT COPY TO BE MAILED TO AN ADDRESS OTHER THAN THE SECURED PARTY SHOWN IN ITEM 2, PROVIDE COMPLETE MAILING INFORMATION IN ITEM 3.

FILING OFFICER COPY

Schedule A

Secured Party and address:

First Union National Bank, as Administrative Agent under the Revolving Credit Agreement dated as of September 7, 1999 among the Debtor, Secured Party, as Agent and the lenders party thereto, as it may be amended, modified or restated from time to time
1970 Chain Bridge Road
VA1942
McLean, VA 22102-4099

TRADEMARKS

Application No.	Mark	Goods	Filing Date
75/679,507	FormAce	Computer-based systems for non-contact three-dimensional measurement.	04/12/99
75/679,508	HoloAce	Computer-based systems for non-contact three-dimensional measurement.	04/12/99
75/679,509	HoloGage	Computer-based systems for non-contact three-dimensional measurement.	04/12/99
75/541,999	HoloMapper	Computer-based systems for non-contact three-dimensional measurement.	08/24/98
75/679,510	HoloVision	Holographical metrology instruments, computers and computer software, all sold together as a unit, for making non-contact three-dimensional measurements of objects and creating graphic representations of those measured objects.	04/12/99
75/679,506	MicroAce	Computer-based systems for non-contact three-dimensional measurement.	04/12/99
75/679,505	SurfAce	Holographic metrology instruments, computers and computer software, all sold together as a unit, for making non-contact three-dimensional measurements of objects and creating graphic representations of those measured objects.	04/12/99
75/679,511	VolumAce	Computer-based systems for non-contact three-dimensional measurement.	04/12/99

PATENTS

Patent No.	Inventors	Title	Abstract	Expiration Date
5,627,363	Paxman, R. and Marron, J.	System and Method for Three-Dimensional Imaging of Opaque Objects Using Frequency Diversity and Opacity Constraint	A system and method for creating a three-dimensional image of an opaque object utilizes frequency diverse coherent illumination in combination with an opacity constraint in performing three-dimensional phase retrieval and/or profile retrieval. An opaque object is one which exhibits only surface scattering and no volume scattering over volumes that extend beyond the desired range resolution. The system and method require only Fourier intensity information to create a three-dimensional image which avoids the difficulties associated with prior art systems and methods requiring phase information to produce similar images. Furthermore, the system and method of the present invention do not require imaging optics, precise alignment of optical components, or precise phase stability of the coherent illumination source.	02/16/15
5,777,742	Marron, J.	System and Method for Holographic Imaging with Discernible Image of an Object	A system and method for three-dimensional imaging utilize a lens to perform a two-dimensional Fourier transform of an interference pattern while focusing the pattern on a two-dimensional detector array which is positioned in the image plane of the lens. This allows immediate previewing of the imaged object for proper positioning. Coherent energy beams are utilized to create a series of interference patterns, or image-plane holograms, each at a different frequency of the source energy beams. Furthermore, at each frequency, the relative phase between an object and a reference energy beam is varied to capture the complex values associated with the interference patterns. After capturing and storing the various interference patterns, a computer performs a one-dimensional Fourier transform, or other simplified processing to generate the three-dimensional image of the object. The image resolution extends to the micron range making this system and method easily adaptable to a variety of three-dimensional inspection applications.	07/07/15
5,880,841	Marron, J. and Gleichman, K.	Method and Apparatus for Three-Dimensional Imaging Using Laser Illumination Interferometry	A method for determining a range dimension of an object utilizing multiple wavelength interferometry to form an image of the object includes developing a discernible two-dimensional image from an interference pattern at selected points for each of a number of wavelengths, collecting complex values from the interference pattern and developing a phase value from the complex value, and determining a phase correction vector based on a difference between measured phase values and an ideal phase value associated with one or more reference points. The phase correction vector is used to correct each of the selected points. A one-dimensional Fourier transform is performed on the corrected values to yield a range profile for each selected point. A peak value is then determined from the range profile to determine the range dimension. The peak value may be determined based on a simple maximum, oversampling in selected areas prior to performing the Fourier transform, or using curve-fitting techniques. The phase correction vector minimizes phase errors due to various causes such as insufficient knowledge of the laser frequencies, or which occur when optical path lengths of the object and	09/08/17

			reference beams are not matched, to provide a computationally efficient method of improving accuracy in the range dimension.	
5,907,404	Marron, J. and Gleichman, K.	Multiple Wavelength Image Plane Interferometry	A system for interferometric inspection of an object includes a number of improvements to reduce spurious reflections and provide precision measurement of large objects. A neutral density filter of absorptive glass is used as an attenuator to reduce undesirable reflections which may otherwise result in detector saturation. A wedge-shaped beam splitter having at least one anti-reflective surface is also utilized to reduce unwanted reflections. The system uses multiple wavelength interferometry to provide range information for an object. Additional improvements in precision may be provided by using a wavelength calibration device such as an etalon, a wavemeter, or a reference cell having relatively narrow transmission peaks, to improve the accuracy in determining the laser wavelengths. The wavelength information may be used to more precisely determine range values for the object. The various improvements in precision and accuracy facilitate use of differing optical path lengths for the reference beam so that overall system size and complexity is reduced.	09/08/17
5,926,277	Marron, J. and Gleichman, K.	Method and Apparatus for Three-Dimensional Imaging Using Laser Illumination Interferometry	A method for determining a range dimension of an object utilizing multiple wavelength interferometry to form an image of the object includes developing a discernible two-dimensional image from an interference pattern at selected points for each of a number of wavelengths, collecting complex values from the interference pattern and developing a phase value from the complex value, and determining a phase correction vector based on a difference between measured phase values and an ideal phase value associated with one or more reference points. The phase correction vector is used to correct each of the selected points. A one-dimensional Fourier transform is performed on the corrected values to yield a range profile for each selected point. A peak value is then determined from the range profile to determine the range dimension. The peak value may be determined based on a simple maximum, oversampling in selected areas prior to performing the Fourier transform, or using curve-fitting techniques. The phase correction vector minimizes phase errors due to various causes such as insufficient knowledge of the laser frequencies, or which occur when optical path lengths of the object and reference beams are not matched, to provide a computationally efficient method of improving accuracy in the range dimension.	11/25/18

2000-509018 Japanese Application	Marron, J.	System and Method for Holographic Imaging with Discernible Image of an Object	A system and method for three-dimensional imaging utilize a lens to perform a two-dimensional Fourier transform of an interference pattern while focusing the pattern on a two-dimensional detector array which is positioned in the image plane of the lens. This allows immediate previewing of the imaged object for proper positioning. Coherent energy beams are utilized to create a series of interference patterns, or image-plane holograms, each at a different frequency of the source energy beams. Furthermore, at each frequency, the relative phase between an object and a reference energy beam is varied to capture the complex values associated with the interference patterns. After capturing and storing the various interference patterns, a computer performs a one-dimensional Fourier transform, or other simplified processing to generate the three-dimensional image of the object. The image resolution extends to the micron range making this system and method easily adaptable to a variety of three-dimensional inspection applications.	
97939753.6 European Application	Marron, J.	System and Method for Holographic Imaging with Discernible Image of an Object	A system and method for three-dimensional imaging utilize a lens to perform a two-dimensional Fourier transform of an interference pattern while focusing the pattern on a two-dimensional detector array which is positioned in the image plane of the lens. This allows immediate previewing of the imaged object for proper positioning. Coherent energy beams are utilized to create a series of interference patterns, or image-plane holograms, each at a different frequency of the source energy beams. Furthermore, at each frequency, the relative phase between an object and a reference energy beam is varied to capture the complex values associated with the interference patterns. After capturing and storing the various interference patterns, a computer performs a one-dimensional Fourier transform, or other simplified processing to generate the three-dimensional image of the object. The image resolution extends to the micron range making this system and method easily adaptable to a variety of three-dimensional inspection applications.	

Michigan Department of State
UCC Section
PO Box 30197
Lansing MI 48909-7697

R06477

INFORMATION OR COPY REQUEST

Account No. W050

DEBTORS	REQUESTING PARTY
Name: Veridian ERIM International, Inc.	Name: Warner Norcross & Judd LLP
Address: 3300 Plymouth Road, ann Arbor MI 48105	Attn: Kimberly A. Johnson
Name:	Street Address: 900 Old Kent Building - 111 Lyon Street, N.W.
Address: A99946721	City: Grand Rapids State: MI Zip Code: 49503-2487

INFORMATION GIVEN IS EXACTLY AS REQUESTED

Information Request ☐ Furnish certificate showing whether there is on file as of the date shown below, any presently effective financing statement and tax lien naming the above debtors and any assignment thereof. Provide information on each statement filed. The undersigned agrees to pay the sum of $3.00 for each name requested.

Copy Request ☒ Furnish date stamped copy of attached document. Secretary of State File No. 06803C.

FURNISH FILING INFORMATION DATED: From _____ to _____

Date of Request _____ Signature of Requesting Party _____

FILE NO.	DATE AND HOUR FILED	NAME AND ADDRESS OF SECURED PARTIES
06803C		First Union National Bank, 1970 Chain Bridge Road VA 1942, McLean VA 22102-4099
Specific copy		
		N MD0S 768352 1 11/27/2000 2001 95016 12016 1032 $4.00 UCC NEW YEAR

FOR OFFICE USE ONLY

FEES

Special _____

Form _____

Regular NOV 30 2000

Total _____

Amt. Paid _____

CERTIFICATE

The Undersigned Filing Officer Certifies that the above is a record of all presently effective financing statements, tax liens and assignments which name the above debtors and which are on file as of: _____ 19__.

The attached photo copies are true copies of the requested financing statements, tax liens and assignments on file.

NOV 22 2000

Date

Signature of Filing Officer

UCC-11 (11/81)
As required by P.A. Act 174 of 1964

AA

This FINANCING STATEMENT is presented for filing pursuant to the Michigan Uniform Commercial Code. (Please Type All Information)

FOR FILING OFFICER (Date, Time, Number, and Filing Officer)

DO NOT WRITE IN THIS SPACE

REC'D U. C. C. UNIT
08/10/00 9:00 AM
SECRETARY OF STATE
LANSING MI D683238

N 2000 95018 12016 1032
UCC NEW YEAR

1. Debtor(s) (Last Name First, if Individual) & Address(es)

Veridian ERIM International, Inc.
3300 Plymouth Road
Ann Arbor, Michigan 48105

Soc. Security S/Tax ID #
38-3341513

2. Secured Party(ies) & Address(es)

See Schedule A

Secured Party #

4. No. of Add'l Sheets: 4

5. State Account No.

3. MAIL ACKNOWLEDGEMENT COPY TO:

David L. Morrow, Esq.
Dickinson Wright PLLC
500 Woodward Avenue
Suite 4000
Detroit, Michigan 48226

6. THIS STATEMENT REFERS TO THE ORIGINAL FINANCING STATEMENT BEARING THE FOLLOWING:

Sec. of State File Number 06803C

Reg. of Deeds File Number _____

Liber _____ Page _____

D791036-5

7. [ ] AMENDMENT - The Financing Statement bearing the file number(s) shown in Item 6 is amended as set forth in Item 13 below.

8. [ ] ASSIGNMENT - All of Secured Party's right under the Financing Statement bearing the file number shown in Item 6 has been assigned to the assignee whose name and address appears in Item 13 below.

9. [ ] PARTIAL ASSIGNMENT - A portion of the Secured Party's right under the Financing Statement bearing the file number shown in Item 6 to the property described in Item 13 has been assigned to the assignee whose name and address appears in Item 13.

10. [ ] CONTINUATION - The original Financing Statement bearing the file number shown in Item 6 is still effective. A CONTINUATION CANNOT BE FILED MORE THAN SIX MONTHS PRIOR TO EXPIRATION DATE.

11. [X] PARTIAL RELEASE - The Secured Party(ies) release(s) the following collateral described in Item 13 below from the original Financing Statement bearing the file number as shown in Item 6.

12. [ ] TERMINATION - The Secured Party(ies) of record no longer claim(s) a security interest under the Financing Statement bearing the file number shown in Item 6.

13. Secured Party hereby releases all assets of the HoloVision Products Group business, including without limitation the patents and trademarks listed on Schedule B attached hereto.

File with Michigan Department of State

FIRST UNION NATIONAL BANK, as Agent

X _____
Signature(s) of Debtor(s)

X _____
Signature(s) of Secured Party(ies) or Assignee(s) of Record

X _____
Signature(s) of Debtor(s)

X _____
Signature(s) of Secured Party(ies) or Assignee(s) of Record

IF YOU WISH THE ACKNOWLEDGEMENT COPY TO BE MAILED TO AN ADDRESS OTHER THAN THE SECURED PARTY SHOWN IN ITEM 2, PROVIDE COMPLETE MAILING INFORMATION IN ITEM 3.

FILING OFFICER COPY

H43415

A99996271

D683238

Schedule A

Secured Party and address:

First Union National Bank, as Administrative Agent under the Revolving Credit Agreement dated as of September 7, 1999 among the Debtor, Secured Party, as Agent and the lenders party thereto, as it may be amended, modified or restated from time to time
1970 Chain Bridge Road
VA1942
McLean, VA 22102-4099

D683238

SCHEDULE B

PATENTS

Patent No.	Inventors	Title	Description	Expiration Date
5,627,363	Paxman, R. and Marron, J.	System and Method for Three-Dimensional Imaging of Opaque Objects	A system and method for creating a three-dimensional image of an opaque object utilize frequency diverse coherent illumination in combination with an opacity constraint in performing three-dimensional phase retrieval and/or profile retrieval. An opaque object is on which exhibits only surface scattering and no volume scattering over volumes that extend beyond the desired range resolution. The system and method require only Fourier intensity information to create a three-dimensional image which avoids the difficulties associated with prior art systems and methods requiring phase information to produce similar images. Furthermore, the system and method of the present invention do not require imaging optics, precise alignment of optical components, or precise phase stability of the coherent illumination source.	02/16/15
5,777,742	Marron, J.	System and Method for Interferometric Imaging with Discernible Image of an Object	A system and method for three-dimensional image utilize a lens to perform a two-dimensional Fourier transform of an interference pattern while focusing the pattern on a two-dimensional detector array which is positioned in the image plane of the lens. This allows immediate previewing of the imaged object for proper positioning. Coherent energy beams are utilized to create a series of interference patterns, or image-plane holograms, each at a different frequency of the source energy beams. Furthermore, at each frequency, the relative phase between an object and a refer ence energy beam is varied to capture the complex values associated with the interference patterns. After capturing and storing the various interference patterns, a computer performs a one-dimensional Fourier transform, or other simplified processing to generate the three-dimensional image of the object. The image resolution extends to the micron range making this system and method easily adaptable to a variety of three-dimensional inspection applications.	07/07/15
5,880,841	Marron, J. and Gleichman, K.	Method and Apparatus for Three-Dimensional Imaging Using Laser Illumination Interferometry	A method for determining a range dimension of an object utilizing multiple wavelength interferometry to form an image of the object includes developing a discernible two-dimensional image from an interference pattern at selected points for each of a number of wavelengths, collecting complex values from the interference pattern and developing a phase value from the complex value, and determining a phase correction vector based on a difference between measured phase values and an ideal phase value associated with one or more reference points. The phase correction vector is used to correct each of the selected points. A one-dimensional Fourier transform is performed on the corrected values to yield a range profile for each selected point. A peak value is then determined from the range profile to determine the range dimension. The peak value may be determined based on a simple maximum, oversampling in selected areas prior to performing the Fourier transform, or using curve-fitting techniques. The phase correction vector minimizes phase errors due to various causes such as insufficient knowledge	09/08/17

D683238

			of the laser frequencies, or which occur when optical path lengths of the object and reference beams are not matched, to provide a computationally efficient method of improving accuracy in the range dimension.	
5,907,404	Marron, J.	Multiple Wavelength Image Plane Interferometry	A system for interferometric inspection of an object includes a number of improvements to reduce spurious reflections and provide precision measurement of large objects. A neutral density filter of absorptive glass is used as an attenuator to reduce undesirable reflections which may otherwise result in detector saturation. A wedge-shaped beam splitter having at least one anti-reflective surface is also utilized to reduce unwanted reflections. The system uses multiple wavelength interferometry to provide range information for an object. Additional improvements in precision may be provided by using a wavelength calibration device such as an etalon, a wavemeter, or a reference cell having relatively narrow transmission peaks, to improve the accuracy in determining the laser wavelengths. The wavelength information may be used to more precisely determine range values for the object. The various improvements in precision and accuracy facilitate use of differing optical path lengths for the reference beam so that overall system size and complexity is reduced.	09/08/17
5,926,277	Marron, J. and Gleichman, K.	Method and Apparatus for Three-Dimensional Imaging Using Laser Illumination Interferometry	A method for determining a range dimension of an object utilizing multiple wavelength interferometry to form an image of the object includes developing a discernible two-dimensional image from an interference pattern at selected points for each of a number of wavelengths, collecting complex values from the interference pattern and developing a phase value from the complex value, and determining a phase correction vector based on a difference between measured phase values and an ideal phase value associated with one or more reference points. The phase correction vector is used to correct each of the selected points. A one-dimensional Fourier transform is performed on the corrected values to yield a range profile for each selected point. A peak value is then determined from the range profile to determine the range dimension. The peak value may be determined based on a simple maximum, oversampling in selected areas prior to performing the Fourier transform, or using curve-fitting techniques. The phase correction vector minimizes phase errors due to various causes such as insufficient knowledge of the laser frequencies, or which occur when optical path lengths of the object and reference beams are not match, to provide a computationally efficient method of improving accuracy in the range dimension.	11/25/18
2000-50901 Japan Application	Marron, J.	System and Method for Interferometric Imaging	A system and method for three-dimensional image utilize a lens to perform a two-dimensional Fourier transform of an interference pattern while focusing the pattern on a two-dimensional detector array which is positioned in the image plane of the lens. This allows immediate previewing of the imaged object for proper positioning. Coherent energy beams are utilized to create a series of interference patterns, or image-plane holograms, each at a different frequency of the source energy beams. Furthermore, at each frequency, the relative phase between an object and a reference energy beam is varied to capture the complex values associated with the interference patterns. After capturing and storing the various interference patterns, a computer performs a one-dimensional Fourier transform, or other simplified processing to generate the three-dimensional image of the object. The image resolution extends to the micron range making this system and method	

D683238

			easily adaptable to a variety of three-dimensional inspection applications.
97939753.6 -2205/ 1010042 European Application	Marron, J.	System and Method for Interferometric Imaging	A system and method for three-dimensional image utilize a lens to perform a two-dimensional Fourier transform of an interference pattern while focusing the pattern on a two-dimensional detector array which is positioned in the image plane of the lens. This allows immediate previewing of the imaged object for proper positioning. Coherent energy beams are utilized to create a series of interference patterns, or image-plane holograms, each at a different frequency of the source energy beams. Furthermore, at each frequency, the relative phase between an object and a reference energy beam is varied to capture the complex values associated with the interference patterns. After capturing and storing the various interference patterns, a computer performs a one-dimensional Fourier transform, or other simplified processing to generate the three-dimensional image of the object. The image resolution extends to the micron range making this system and method easily adaptable to a variety of three-dimensional inspection applications.

TRADEMARKS

Application No.	Mark	Goods	Filing Date
75/679,507	FormAce	Computer-based systems for non-contact three-dimensional measurement.	04/12/99
75/679,508	HoloAce	Computer-based systems for non-contact three-dimensional measurement.	04/12/99
75/679,509	HoloGage	Computer-based systems for non-contact three-dimensional measurement.	04/12/99
75/541,999	HoloMapper	Computer-based systems for non-contact three-dimensional measurement.	08/24/98
75/679,510	HoloVision	Holographical metrology instruments, computers and computer software, all sold together as a unit, for making non-contact three-dimensional measurements of objects and creating graphic representations of those measured objects.	04/12/99
75/679,506	MicroAce	Computer-based systems for non-contact three-dimensional measurement.	04/12/99
75/679,505	SurfAce	Holographic metrology instruments, computer and computer software, all sold together as a unit, for making non-contact three-dimensional measurements of objects and creating graphic representations of those measured objects.	04/12/99
75/679,511	VolumAce	Computer-based systems for non-contact three-dimensional measurement.	04/12/99