

## PATENT ASSIGNMENT

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SUBMISSION TYPE:	NEW ASSIGNMENT																						
NATURE OF CONVEYANCE:	ASSIGNMENT																						
CONVEYING PARTY DATA																							
<table border="1"> <thead> <tr> <th>Name</th> <th>Execution Date</th> </tr> </thead> <tbody> <tr> <td>PAVEL BORODULIN</td> <td>03/25/2013</td> </tr> <tr> <td>NABIL ABDEL-MEGUID EL-HINNAWY</td> <td>03/22/2013</td> </tr> <tr> <td>ROBERT MILES YOUNG</td> <td>03/22/2013</td> </tr> <tr> <td>ROBERT S. HOWELL</td> <td>03/22/2013</td> </tr> <tr> <td>JOHN S. MASON JR.</td> <td>03/22/2013</td> </tr> <tr> <td>BRIAN PAUL WAGNER</td> <td>03/22/2013</td> </tr> <tr> <td>MATTHEW RUSSELL KING</td> <td>03/22/2013</td> </tr> <tr> <td>EVAN B. JONES</td> <td>03/22/2013</td> </tr> <tr> <td>MICHAEL J. LEE</td> <td>03/26/2013</td> </tr> <tr> <td>MARC EISENZWEIG SHERWIN</td> <td>03/25/2013</td> </tr> </tbody> </table>		Name	Execution Date	PAVEL BORODULIN	03/25/2013	NABIL ABDEL-MEGUID EL-HINNAWY	03/22/2013	ROBERT MILES YOUNG	03/22/2013	ROBERT S. HOWELL	03/22/2013	JOHN S. MASON JR.	03/22/2013	BRIAN PAUL WAGNER	03/22/2013	MATTHEW RUSSELL KING	03/22/2013	EVAN B. JONES	03/22/2013	MICHAEL J. LEE	03/26/2013	MARC EISENZWEIG SHERWIN	03/25/2013
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<table border="1"> <tr> <td>Name:</td> <td>NORTHROP GRUMMAN SYSTEMS CORPORATION</td> </tr> <tr> <td>Street Address:</td> <td>2980 FAIRVIEW PARK DRIVE</td> </tr> <tr> <td>City:</td> <td>FALLS CHURCH</td> </tr> <tr> <td>State/Country:</td> <td>VIRGINIA</td> </tr> <tr> <td>Postal Code:</td> <td>22042-4511</td> </tr> </table>		Name:	NORTHROP GRUMMAN SYSTEMS CORPORATION	Street Address:	2980 FAIRVIEW PARK DRIVE	City:	FALLS CHURCH	State/Country:	VIRGINIA	Postal Code:	22042-4511												
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CORRESPONDENCE DATA																							
Fax Number:	2166214072																						
<i>Correspondence will be sent via US Mail when the fax attempt is unsuccessful.</i>																							
Phone:	216-621-2234																						
Email:	lpringle@tarolli.com																						
Correspondent Name:	Christopher P. Harris																						
Address Line 1:	Tarolli, Sundheim, Covell & Tummino LLP																						

OP \$40.00 13828351

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Address Line 4: Cleveland, OHIO 44114

ATTORNEY DOCKET NUMBER: NG(ES)022098 US PRI

NAME OF SUBMITTER: Christopher P. Harris

Signature: /Christopher P Harris/

Date: 06/18/2013

**Total Attachments: 6**

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# ASSIGNMENT

WHEREAS, I, Pavel Borodulin, together with Nabil Abdel-Meguid El-Hinnawy, Robert Miles Young, Robert S. Howell, John S. Mason, Jr., Brian Paul Wagner, Matthew Russell King, Evan B. Jones, Michael J. Lee and Marc Eisenzweig Sherwin, hereinafter referred to as Assignor have jointly invented certain new and useful improvements in A PHASE CHANGE MATERIAL SWITCH AND METHOD OF MAKING THE SAME, for which application for Letters Patent of the United States has been filed on 14 March 2013 under Serial No. 13/828351;

WHEREAS, Northrop Grumman Systems Corporation, a Delaware corporation, having its principal place of business at 2980 Fairview Park Drive, Falls Church, VA 22042-4511, United States of America, hereinafter referred to as Assignee, is desirous of acquiring the entire right, title and interest in, to and under said improvements and said application:

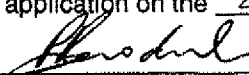
NOW, THEREFORE, in consideration of Assignor's obligations to Northrop Grumman Systems Corporation, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Assignor has sold, assigned, transferred and set over, and by these presents does hereby sell, assign, transfer and set over, unto Assignee, its successors, legal representatives and assigns, Assignor's entire right, title and interest in, to and under said improvements, and said application and all divisions, renewals, continuations, and continuations-in-part thereof, and all United States Letters patent that may be granted thereon and all reissues and extensions thereof, and all applications for Letters Patent that may hereafter be filed for said improvements in any country or countries foreign to the United States, including the full right to claim for any such application the priority benefits of the International Convention for the Protection of Industrial Property and other priority-conferring treaties, and all Letters Patent that may be granted for said improvements in any country or countries foreign to the United States and all extensions, divisions, continuations, continuations-in-part, renewals and reissues thereof; and Assignor hereby authorizes and requests the Commissioner of Patents and Trademarks of the United States, and any official of any country or countries foreign to the United States, whose duty it is to issue patents on applications as aforesaid, to issue all Letters Patent for said improvements to said Assignee, its successors, legal representatives and assigns, in accordance with the terms of this instrument;

Assignor hereby acknowledges that at the time of making the improvements herein identified, Assignor was under an obligation to assign to Assignee, Assignor's entire right, title and interest in, to and under said improvements;

Assignor hereby covenants that Assignor has full right to convey the interest herein assigned, and that Assignor has not executed, and will not execute, any agreement in conflict herewith and that Assignee, Northrop Grumman Systems Corporation, its successors, assigns and other legal representatives shall have the right to hold and enjoy for its and their own use and benefit, to the end of the term or terms for which such Letters Patent shall or may be granted, reissued or extended as fully and completely as the same right could have been held and enjoyed by Assignor had this Assignment not been made.

Assignor hereby further covenants and agrees to communicate to Assignee, its successors, legal representatives and assigns, any and all facts known to Assignor respecting said improvements; to promptly provide Assignee with all documents relating to said improvements, said invention, and said Letters Patent as may be known or accessible to Assignor; to testify as to the same in any interference or litigation or other legal proceedings related thereto; to sign all lawful papers, execute all extensions, continuations, continuations-in-part, divisional and reissue applications; and to make all rightful oaths or declarations and generally do everything possible to aid Assignee, its successors, legal representatives and assigns in obtaining and enforcing all the rights herein conveyed for said improvements in all countries without further compensation, but at the expense of Assignee, its successors, legal representatives and assigns.

IN WITNESS WHEREOF, the undersigned has executed and delivered this instrument this 25<sup>th</sup> day of March, 2013, and has executed the referenced patent application on the 25<sup>th</sup> day of March, 2013.

  
PAVEL BORODULIN

STATE OF MARYLAND)

COUNTY OF Anne Arundel<sup>SS</sup>

On March 25, 2013 before me, Mary J. Stanley, personally appeared PAVEL BORODULIN, proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to this instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument to be the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of Maryland that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Mary J. Stanley



IN WITNESS WHEREOF, the undersigned has executed and delivered this instrument this 22 day of March, 2013, and has executed the referenced patent application on the 22 day of March, 2013.

NABIL ABDEL-MEGUID EL-HINNAWY

STATE OF MARYLAND)

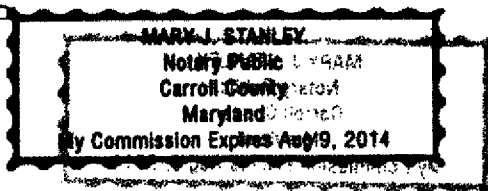
COUNTY OF Anne Arundel<sup>SS</sup>

On March 22, 2013 before me, Mary J. Stanley, personally appeared NABIL ABDEL-MEGUID EL-HINNAWY, proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to this instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument to be the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of Maryland that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Mary J. Stanley  
Notary's Signature



(SEAL)

IN WITNESS WHEREOF, the undersigned has executed and delivered this instrument this 22 day of March, 2013, and has executed the referenced patent application on the 22 day of March, 2013.

ROBERT MILES YOUNG

STATE OF MARYLAND)

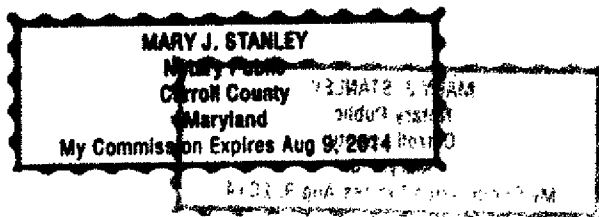
COUNTY OF Anne Arundel<sup>SS</sup>

On March 22, 2013 before me, Mary J. Stanley, personally appeared ROBERT MILES YOUNG, proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to this instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument to be the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of Maryland that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Mary J. Stanley  
Notary's Signature



(SEAL)

IN WITNESS WHEREOF, the undersigned has executed and delivered this instrument this 22<sup>nd</sup> day of March, 2013, and has executed the referenced patent application on the 22<sup>nd</sup> day of March, 2013.

Robert S. Howell  
ROBERT S. HOWELL

STATE OF MARYLAND)

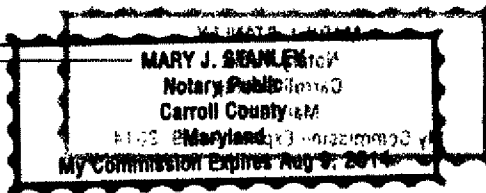
COUNTY OF Anne Arundel <sup>SS</sup>

On March 22, 2013 before me, Mary J. Stanley, personally appeared ROBERT S. HOWELL, proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to this instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument to be the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of Maryland that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Mary J. Stanley  
Notary's Signature



(SEAL)

IN WITNESS WHEREOF, the undersigned has executed and delivered this instrument this 22 day of MARCH, 2013, and has executed the referenced patent application on the 22 day of MARCH, 2013.

John S. Mason, Jr.  
JOHN S. MASON, JR.

STATE OF MARYLAND)

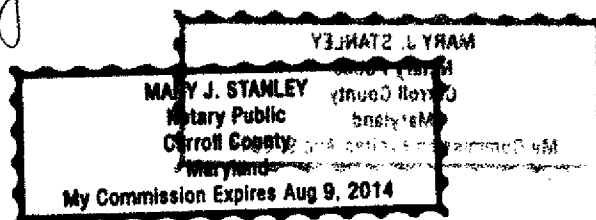
COUNTY OF Anne Arundel <sup>SS</sup>

On March 22, 2013 before me, Mary J. Stanley, personally appeared JOHN S. MASON, JR., proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to this instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument to be the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of Maryland that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Mary J. Stanley  
Notary's Signature



(SEAL)

IN WITNESS WHEREOF, the undersigned has executed and delivered this instrument this 22 day of March, 2013, and has executed the referenced patent application on the 22 day of March, 2013.

Brian Paul Wagner  
BRIAN PAUL WAGNER

STATE OF MARYLAND)

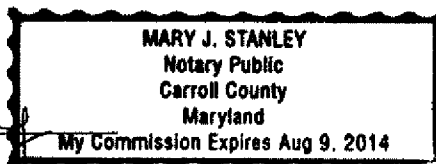
COUNTY OF Anne Arundel<sup>SS</sup>

On March 22, 2013 before me, Mary J. Stanley, personally appeared BRIAN PAUL WAGNER, proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to this instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument to be the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of Maryland that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Mary J. Stanley  
Notary's Signature



(SEAL)

IN WITNESS WHEREOF, the undersigned has executed and delivered this instrument this 22nd day of March, 2013, and has executed the referenced patent application on the 22 day of March, 2013.

Matthew Russell King  
MATTHEW RUSSELL KING

STATE OF MARYLAND)

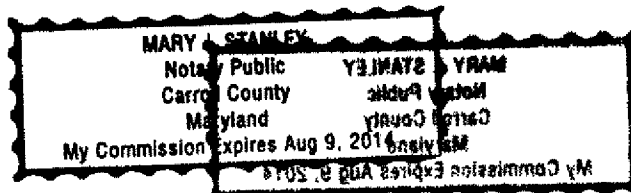
COUNTY OF Anne Arundel<sup>SS</sup>

On March 22, 2013 before me, Mary J. Stanley, personally appeared MATTHEW RUSSELL KING, proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to this instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument to be the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

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WITNESS my hand and official seal.

Mary J. Stanley  
Notary's Signature



(SEAL)

IN WITNESS WHEREOF, the undersigned has executed and delivered this instrument this 22<sup>nd</sup> day of March, 2013, and has executed the referenced patent application on the 22<sup>nd</sup> day of March, 2013.

EB Jones  
EVAN B. JONES

STATE OF MARYLAND)

COUNTY OF Anne Arundel<sup>SS</sup>

On March 22, 2013 before me, Mary J. Stanley, personally appeared EVAN B. JONES, proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to this instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument to be the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of Maryland that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Mary J. Stanley  
Notary's Signature



(SEAL)

IN WITNESS WHEREOF, the undersigned has executed and delivered this instrument this 26<sup>th</sup> day of March, 2013, and has executed the referenced patent application on the 26<sup>th</sup> day of March, 2013.

M. J. Lee  
MICHAEL J. LEE

STATE OF MARYLAND)

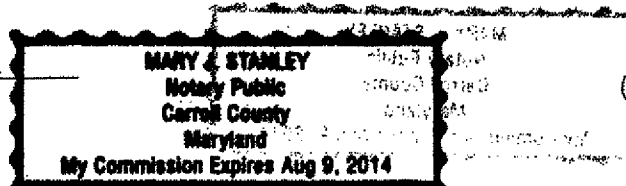
COUNTY OF Anne Arundel<sup>SS</sup>

On March 26, 2013 before me, Mary J. Stanley, personally appeared MICHAEL J. LEE, proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to this instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument to be the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

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WITNESS my hand and official seal.

Mary J. Stanley  
Notary's Signature



(SEAL)

IN WITNESS WHEREOF, the undersigned has executed and delivered this instrument this 25<sup>th</sup> day of March, 2013, and has executed the referenced patent application on the 25 day of March, 2013.

M. E. Sherwin  
MARC EISENZWEIG SHERWIN

STATE OF MARYLAND)

COUNTY OF Anne Arundel<sup>SS</sup>

On March 25, 2013 before me, Mary J. Stanley, personally appeared MARC EISENZWEIG SHERWIN, proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to this instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument to be the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

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WITNESS my hand and official seal.

Mary J. Stanley  
Notary's Signature

(SEAL)

