506511007 02/18/2021

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 Stylesheet Version v1.2 EPAS ID: PAT6557783

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
ELIZABETH T. KUNKEE	02/03/2021
DAH-WEIH DUAN	01/27/2021
DINO FERIZOVIC	01/27/2021
CHUNBO ZHANG	02/08/2021
GRETA S. TSAI	02/04/2021
MING-JONG SHIAU	01/27/2021
DANIEL R. SCHERRER	01/27/2021
MARTIN E. RODEN	01/27/2021

RECEIVING PARTY DATA

Name:	NORTHROP GRUMMAN SYSTEMS CORPORATION
Street Address:	2980 FAIRVIEW PARK DRIVE
City:	FALLS CHURCH
State/Country:	VIRGINIA
Postal Code:	22042-4511

PROPERTY NUMBERS Total: 1

Property Type	Number
Application Number:	16860642

CORRESPONDENCE DATA

Fax Number: (630)286-7611

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: 630-286-7600 **Email:** mail@mfgip.com

Correspondent Name: MCCRACKEN & GILLEN LLC Address Line 1: 1315 WEST 22ND STREET

Address Line 2: SUITE 225

Address Line 4: OAK BROOK, ILLINOIS 60523

ATTORNEY DOCKET NUMBER:	C0588/011562-0030/US/NPV
NAME OF SUBMITTER:	GARY R. GILLEN
SIGNATURE:	/Gary R. Gillen/

PATENT 506511007 REEL: 055330 FRAME: 0835

DATE SIGNED: 02/18/2021 **Total Attachments: 24** source=011562-0030USNPV 1 Kunkee Signed Assignment#page1.tif source=011562-0030USNPV 1 Kunkee Signed Assignment#page2.tif source=011562-0030USNPV 1 Kunkee Signed Assignment#page3.tif source=011562-0030USNPV 2 Duan Signed Assignment#page1.tif source=011562-0030USNPV 2 Duan Signed Assignment#page2.tif source=011562-0030USNPV 2 Duan Signed Assignment#page3.tif source=011562-0030USNPV 3 Ferizovic Signed Assignment#page1.tif source=011562-0030USNPV_3_Ferizovic_Signed_Assignment#page2.tif source=011562-0030USNPV_3_Ferizovic_Signed_Assignment#page3.tif source=011562-0030USNPV_4_Zhang_Signed_Assignment#page1.tif source=011562-0030USNPV 4 Zhang Signed Assignment#page2.tif source=011562-0030USNPV_4_Zhang_Signed_Assignment#page3.tif source=011562-0030USNPV 5 Tsai Signed Assignment#page1.tif source=011562-0030USNPV 5 Tsai Signed Assignment#page2.tif source=011562-0030USNPV 5 Tsai Signed Assignment#page3.tif source=011562-0030USNPV_6_Shiau_Signed_Assignment#page1.tif source=011562-0030USNPV 6 Shiau Signed Assignment#page2.tif source=011562-0030USNPV 6 Shiau Signed Assignment#page3.tif source=011562-0030USNPV 7 Scherrer Signed Assignment#page1.tif source=011562-0030USNPV_7_Scherrer_Signed_Assignment#page2.tif source=011562-0030USNPV 7 Scherrer Signed Assignment#page3.tif source=011567-0030USNPV 8 Roden Signed Assignment#page1.tif source=011567-0030USNPV 8 Roden Signed Assignment#page2.tif source=011567-0030USNPV 8 Roden Signed Assignment#page3.tif

WHEREAS, I, Elizabeth T. Kunkee together with Dah-Weih Duan, Dino Ferizovic, Chunbo Zhang, Greta S. Tsai, Ming-Jong Shiau, Daniel R. Scherrer, and Martin E. Roden hereinafter referred to as Assignor, have jointly invented certain new and useful improvements in FILTER WITH AN ENCLOSURE HAVING A MICROMACHINED INTERIOR USING SEMICONDUCTOR FABRICATION described in an application for United States Letters Patent, executed by me on the date as stated below;

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 continuationsin-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

the expense of Assignee, its successors, legal representatives and assigns. The undersigned has executed and delivered this instrument this 3 day of 2021, and has executed the referenced patent application on the day of 1969-19 2021. Elizabeth T. Kunhee 2-3-2021
Elizabeth T. Kunhee The undersigned has executed and delivered this instrument this ______ day of ______, 2021, and has executed the referenced patent application on the ______day of ______, 2021. Dah-Weih Duan The undersigned has executed and delivered this instrument this ______ day of ______, 2021, and has executed the referenced patent application on the Dino Ferizovic The undersigned has executed and delivered this instrument this ______ day of _______, 2021, and has executed the referenced patent application on the ______ day of _______, 2021. Chunbo Zhang The undersigned has executed and delivered this instrument this ______ day of ______, 2021, and has executed the referenced patent application on the ______ day of _______, 2021.

Greta S. Tsai

applications, and to make all rightful paths 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

	has executed and delivered this instrument this	
day of	_, 2021, and has executed the referenced patent appli, 2021.	cation on th
Ming-Jong Shia	U	
	has executed and delivered this instrument this, 2021, and has executed the referenced patent appli, 2021.	
Daniel R. Schen	rer	

WHEREAS, I, Elizabeth T. Kunkee together with Dah-Weih Duan, Dino Ferizovic, Chunbo Zhang, Greta S. Tsai, Ming-Jong Shiau, Daniel R. Scherrer, and Martin E. Roden hereinafter referred to as Assignor, have jointly invented certain new and useful improvements in FILTER WITH AN ENCLOSURE HAVING A MICROMACHINED INTERIOR USING SEMICONDUCTOR FABRICATION described in an application for United States Letters Patent, executed by me on the date as stated below;

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 continuationsin-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

rights herein conveyed to the expense of Assignee	or said improvements in all countries without further compensation, but , its successors, legal representatives and assigns.
	as executed and delivered this instrument this day of 2021, and has executed the referenced patent application on the, 2021.
Elizabeth T. Kun	kee
The undersigned I Johnary 2744 day of Dah-Weih Duan	nas executed and delivered this instrument this 274 day of 2021, and has executed the referenced patent application on the 2021.
The undersigned day of	has executed and delivered this instrument this day of, 2021, and has executed the referenced patent application on the, 2021.
Dino Ferizovic	
The undersigned	has executed and delivered this instrument this day of 2021, and has executed the referenced patent application on the, 2021.
Chunbo Zhang	
The undersignedday of	has executed and delivered this instrument this day of
Greta S. Tsai	

	nas executed and delivered this instrument this	day o
day of	_ 2021, and has executed the referenced patent app, 2021.	ilication on ti
Ming-Jong Shiat	3	
	nas executed and delivered this instrument this , 2021, and has executed the referenced patent app	day c
day of		
Daniel R. Scherr	et.	
The undersigned h	as executed and delivered this instrument this	day c
	, 2021, and has executed the referenced patent app , 2021.	lication on t

WHEREAS, I, Elizabeth T. Kunkee together with Dah-Weih Duan, Dino Ferizovic, Chunbo Zhang, Greta S. Tsai, Ming-Jong Shiau, Daniel R. Scherrer, and Martin E. Roden hereinafter referred to as Assignor, have jointly invented certain new and useful improvements in FILTER WITH AN ENCLOSURE HAVING A MICROMACHINED INTERIOR USING SEMICONDUCTOR FABRICATION described in an application for United States Letters Patent, executed by me on the date as stated below;

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 continuationsin-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

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. The undersigned has executed and delivered this instrument this _____ day of ______, 2021, and has executed the referenced patent application on the _____ day of ______, 2021. Elizabeth T. Kunkee The undersigned has executed and delivered this instrument this _____ day of ______, 2021, and has executed the referenced patent application on the ______, 2021. Dah-Weih Duan Dino Ferizovic The undersigned has executed and delivered this instrument this ______ day of ______, 2021, and has executed the referenced patent application on the _____ day of ______, 2021. , 2021. Chunbo Zhang The undersigned has executed and delivered this instrument this ______ day of ______, 2021, and has executed the referenced patent application on the _____ day of ______, 2021.

Greta S. Tsai

applications; and to make all rightful oaths or declarations and generally do everything possible to

	has executed and delivered this instrument this	day o
day of	, 2021, and has executed the referenced patent app , 2021.	lication on t
Ming-Jong Shia	au	
	has executed and delivered this instrument this, 2021, and has executed the referenced patent app, 2021.	day o lication on t
	rrer	
Daniel R. Schei		

WHEREAS, I, Elizabeth T. Kunkee together with Dah-Weih Duan, Dino Ferizovic, Chunbo Zhang, Greta S. Tsai, Ming-Jong Shiau, Daniel R. Scherrer, and Martin E. Roden hereinafter referred to as Assignor, have jointly invented certain new and useful improvements in FILTER WITH AN ENCLOSURE HAVING A MICROMACHINED INTERIOR USING SEMICONDUCTOR FABRICATION described in an application for United States Letters Patent, executed by me on the date as stated below;

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 continuationsin-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

rights herein conveyed for said improvements in all countries without further compensation, but at the expense of Assignee, its successors, legal representatives and assigns. The undersigned has executed and delivered this instrument this _____ day of _____, 2020, and has executed the referenced patent application on the day of ______, 2020. Elizabeth T. Kunkee The undersigned has executed and delivered this instrument this _____ day of _____, 2020, and has executed the referenced patent application on the ______, 2020. Dah-Weih Duan The undersigned has executed and delivered this instrument this _____ day of ______, 2020, and has executed the referenced patent application on the day of ______, 2020. Dino Ferizovic The undersigned has executed and delivered this instrument this 8th day of February, 2021, and has executed the referenced patent application on the 4th day of February, 2021. The undersigned has executed and delivered this instrument this ______ day of _____, 2020, and has executed the referenced patent application on the day of ______, 2020.

Greta S. Tsai

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

	as executed and delivered this instrument this	aay c
day of	, 2020, and has executed the referenced patent appl	ication on t
Ming-Jong Shiau		
-	as executed and delivered this instrument this	day
day of	, 2020	
Daniel R. Scherre	er	
Damei N. Conene		
The undersigned ha	as executed and delivered this instrument this	day o

WHEREAS, I, Elizabeth T. Kunkee together with Dah-Weih Duan, Dino Ferizovic, Chunbo Zhang, Greta S. Tsai, Ming-Jong Shiau, Daniel R. Scherrer, and Martin E. Roden hereinafter referred to as Assignor, have jointly invented certain new and useful improvements in FILTER WITH AN ENCLOSURE HAVING A MICROMACHINED INTERIOR USING SEMICONDUCTOR FABRICATION described in an application for United States Letters Patent, executed by me on the date as stated below;

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 continuationsin-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

the expense of Assignee, its successors, legal representatives and assigns. The undersigned has executed and delivered this instrument this ______, 2021, and has executed the referenced patent application on the Elizabeth T. Kunkee The undersigned has executed and delivered this instrument this _____, 2021, and has executed the referenced patent application on the day of ______, 2021. Dah-Weih Duan The undersigned has executed and delivered this instrument this _____ day of ______, 2021, and has executed the referenced patent application on the day of ______, 2021. Dino Ferizovic The undersigned has executed and delivered this instrument this _____ day of ______, 2021, and has executed the referenced patent application on the day of ______, 2021. Chunbo Zhang The undersigned has executed and delivered this instrument this 4th day of February, 2021, and has executed the referenced patent application on the 4th day of February, 2021.

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

	nas executed and delivered this instrument this	day o
day of	_ 2021, and has executed the referenced patent app, 2021.	ilication on ti
Ming-Jong Shiat	3	
	nas executed and delivered this instrument this , 2021, and has executed the referenced patent app	day c
day of		
Daniel R. Scherr	et.	
The undersigned h	as executed and delivered this instrument this	day c
	, 2021, and has executed the referenced patent app , 2021.	lication on t

WHEREAS, I, Elizabeth T. Kunkee together with Dah-Welh Duan, Dino Ferizovic, Chunbo Zhang, Greta S. Tsai, Ming-Jong Shiau, Daniel R. Scherrer, and Martin E. Roden hereinafter referred to as Assignor, have jointly invented certain new and useful improvements in FILTER WITH AN ENCLOSURE HAVING A MICROMACHINED INTERIOR USING SEMICONDUCTOR FABRICATION described in an application for United States Letters Patent, executed by me on the date as stated below;

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 continuationsin-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.

day of	, ZUZ 1, SNG NS:	s executed the refere , 2021.	suceo baseus abb	OCENOR (
Elizabeth T. Ki	ınkee			
The undersigned	i has executed an , 2021, and has	ed delivered this instr s executed the refere , 2021.	ument this enced patent app	ds &cation (
	rs.			
		ed delivered this instr s executed the refere , 2021.		
Dino Ferizovic				
The undersigned	i has executed an 2021, and has	ed delivered this instr s executed the refere , 2021.	ument this _ enced patent app	di Sication (
Chunbo Zhang	§			
The undersigned	i has executed an , 2021, and has	ed delivered this instr s executed the refere , 2021.	ument this _ enced patent app	di lication (

The undersigned has ex	t1, and has executed the referenced	patent application on t
Standay of Towns	t1, and has executed the referenced exq	
	- A \	
Ming-Jong Shlau	t Shraw	
Ming-Jong Shlau	4	***
The undersigned has ex	ecuted and delivered this instrument	this day o
, 202	1, and has executed the referenced (patent application on t
day of	, 2021.	
day of	1, and has executed the referenced , 2021.	
day of	, 2021.	
day of	, 2021.	ac.
day of Daniel R. Scherrer	, 2021.	xx-
	, 2021.	
Daniel R. Scherrer		ne.
Daniel R. Scherrer The undersigned has ex	tecuted and delivered this instrument	this day c
Daniel R. Scherrer The undersigned has ex , 202	recuted and delivered this instrument	this day c
Daniel R. Scherrer The undersigned has ex , 202	tecuted and delivered this instrument	this day c
Daniel R. Scherrer The undersigned has ex , 202	recuted and delivered this instrument	this day c
Daniel R. Scherrer The undersigned has ex , 202	recuted and delivered this instrument	this day c

WHEREAS, I, Elizabeth T. Kunkee together with Dah-Weih Duan, Dino Ferizovic, Chunbo Zhang, Greta S. Tsai, Ming-Jong Shiau, Daniel R. Schemer, and Martin E. Roden hereinafter referred to as Assignor, have jointly invented certain new and useful improvements in FILTER WITH AN ENCLOSURE HAVING A MICROMACHINED INTERIOR USING SEMICONDUCTOR FABRICATION described in an application for United States Letters Patent, executed by me on the date as stated below;

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 continuationsin-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.

day of		s executed the refere , 2021.	uceo baseus abbuc:	±88218 €
Elizabeth T. Ki	ınkee			
The undersigned	i has executed ar , 2021, and ha	nd delivered this instrus s executed the refere , 2021.	ument this nced patent applic:	di ation (
Dah-Weih Dus	its			
		nd deliwered this instrus s executed the refere , 202%		
Dino Ferizovic				
The undersigned	i has executed ar , 2021, and ha	nd delivered this instrus s executed the refere 	ıment this nced patent applic:	di etion (
Chunbo Zhang	\$			
The undersigned	i has executed ar , 2021, and ha	nd delivered this instrus s executed the refere 2021.	ument this nced patent applic:	d: etion (

C0588/011562-0030/US/NPV

	nas executed and delivered th _, 2021, and has executed the 2021	is instrument this	day of lication on the
Ming-Jong Shie	u		
37 day of	has executed and delivered the 2021, and has executed the Tanasta 2021.	6 teletaticed baterii abb	7 day of dication on the
Daniel R. Sche	DR SL		
The undersigned	has executed and delivered t _, 2021, and has executed th 2021.	his instrument this e referenced patent app	day of day of the
Martin E. Rodi	n		

WHEREAS, I, Elizabeth T. Kunkee together with Dah-Weih Duan, Dino Ferizovic, Chunbo Zhang, Greta S. Tsai, Ming-Jong Shiau, Daniel R. Scherrer, and Martin E. Roden hereinafter referred to as Assignor, have jointly invented certain new and useful improvements in FILTER WITH AN ENCLOSURE HAVING A MICROMACHINED INTERIOR USING SEMICONDUCTOR FABRICATION described in an application for United States Letters Patent, executed by me on the date as stated below;

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 continuationsin-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.

The undersigned has executed and delivered this instrument this day of

The undersigned has executed and delivered this instrument this	day of	, 2021, and has executed the referenced patent application, 2021.	
The undersigned has executed and delivered this instrument this			
	Elizabeth T. K	inkee	
Dah-Weih Duan The undersigned has executed and delivered this instrument this day, 2021, and has executed the referenced patent application or, 2021. Dino Ferizovic The undersigned has executed and delivered this instrument this day	The undersigned	has executed and delivered this instrument this, 2021, and has executed the referenced patent applications.	day o
The undersigned has executed and delivered this instrument this day, 2021, and has executed the referenced patent application or day of, 2021. Dino Ferizovic The undersigned has executed and delivered this instrument this day	day of	, 2021.	
, 2021, and has executed the referenced patent application or, 2021. Dino Ferizovic The undersigned has executed and delivered this instrument this	Dah-Weih Du	n	
Dino Ferizovic The undersigned has executed and delivered this instrument this day	The undersigned	has executed and delivered this instrument this, 2021, and has executed the referenced patent applications.	day ation on
The undersigned has executed and delivered this instrument this day	day of	, 2021.	
The undersigned has executed and delivered this instrument this day, 2021, and has executed the referenced patent application or day of, 2021.	Dino Ferizovio	·	
day 01, 2021.	The undersigned	has executed and delivered this instrument this, 2021, and has executed the referenced patent applications.	day ation on
	day of		
Chunbo Zhang	Chunbo Zhan		
The undersigned has executed and delivered this instrument this day, 2021, and has executed the referenced patent application or day of, 2021.	The undersigned	has executed and delivered this instrument this, 2021, and has executed the referenced patent application, 2021.	day ation on
	Greta S. Tsai		

	ed has execut	ted and delivere	ed this instrument	t this	day of
day of	, 2021, at	, 2021.	d the referenced	paterit applicatio	in on the
Ming-Jong S	hiau				
	, 2021, aı	nd has executed	ed this instrument of the referenced		
day of		, 2021.			
	· · · · · · · · · · · · · · · · · · ·				
Daniel R. Sc	herrer				
Daniel R. Sc	herrer				
The undersign	ed has execut	ted and delivere	ed this instrument	t this 27th	day of

RECORDED: 02/18/2021