FORM PTO-1619A Expires 06/30/99 OMB 0651-0027

06-27-2002



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Name (line 2)						
Receiving Party Mark if addition	al names of receiving parties attached					
Name (line 1) RAYTHEON COMPANY	If document to be recorded is an assignment and the receiving party is not					
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Name Colin M. Raufer. Reg. No. 40.781						
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> **PATENT REEL: 013016 FRAME: 0718**

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FORM PTO-1619B Expires 06/30/99 OMB 0651-0027	Page 2		U.S. Department of Commerce Patent and Trademark Office PATENT
Correspondent Name and Address	Area Code and Telephone	Number (310) 6	47-3214
Name Patent Records Administration	on		
Address (line 1) RAYTHEON COMPANY			
Address (line 2) Bldg. E1, M.S. E150			
Address (line 3) P.O. Box 902			
Address (line 4) El Segundo, California 9024	5		
Pages Enter the total number of pag including any attachments.	es of the attached conveya	nce document	# 3
Application Number(s) or Patent Num	per(s)	Mark if additiona	I numbers attached
Enter either the Patent Application Number or the Pa	tent Number (DO NOT ENTER BC	TH numbers for the s	ame property).
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If this document is being filed together with a <u>new</u> Patent signed by the first named executing inventor.	Application, enter the date the particular	tent application was	Month Day Year
Patent Cooperation Treaty (PCT)			no=[
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Fee Amount fo	r Properties Listed (37 CFI	₹ 3.41): \$ 40.00	
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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.

**Deposit Account Number:** 

Colin M. Raufer, Reg. No. 40,781

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Name of Person Signing

Signature

Authorization to charge additional fees:

(out

June 14, 2002

No

Date

# 50-0616

Yes

X

Enter additional Conveying Parties  Name (line 1) Alexander A. Betin  Name (line 2) Execution  Name (line 2) Execution  Name (line 2) Execution  Name (line 2) Execution  Name (line 2) Indicate the following parties attached Enter additional Receiving Party(ies)  Name (line 1) If document is an assign receiving parties attached Enter additional Receiving Party (ies)  Name (line 2) Indicate the following parties attached Enter additional Receiving Party (ies)  Name (line 2) If document is an assign receiving parties attached and the following parties attached Enter additional Receiving Party (ies)  Name (line 2) If document is attached and the following parties attached Enter additional Receiving Party (ies)  Name (line 2) If document is an assign receiving parties attached Enter additional Receiving Party (ies)  Name (line 2) If document is an assign receiving parties attached Enter additional Receiving Party (ies)  Name (line 2) If document is an assign receiving parties attached Enter additional Receiving Party (ies)  Name (line 2) If document is an assign receiving parties attached Indicate the Indicate	FORM PTO-16 Expires 06/30/99 OMB 0651-0027	RECO	CONTIN	FORM COVER IUATION IS ONLY	SHEET		U.S. Department of Commerce Patent and Trademark Office PATENT
Name (line 1) Alexander A. Betin  Name (line 2) Execut Month  Name (line 1) Execut Month  Name (line 2) If document is an assign receiving parties attached must be a sea document in States, an a of a domes is attached. Must be a sea document in States, an a of a domes is attached. Must be a sea document in States, an a sea document in St	• -		Mark if a	additional names of co	onveying parties	attached	Execution Date
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Address (line 2)  Address (line 2)  Address (line 2)  Address (line 3)  City  State/Country  Zip Code  Name (line 1)  Name (line 2)  Name (line 2)	ter additional R	• , ,		Mark if addition	al names of rece	iving part	If document to be recard is an assignment and the receiving party is not
Address (line 1)  Address (line 2)  Address (line 3)  City  State/Country  Zip Code  Name (line 1)  If document is an assign receiving particular of the control of the con	Name (line 2)						domiciled in the United States, an appointment
Address (line 2)  Address (line 3)  City  State/Country  Zip Code  Name (line 1)  If document is an assign receiving part domiciled in States, an approximately approximat	Address (line 1)		4				of a domestic representative is attached. (Designation must be a separate document from
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Address (line 1) attached. (L							States, an appointment of a domestic representative is attached. (Designation mus be a separate document from

Address (line 2)

Address (line 3)

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Application Number(s) or Patent Number(s)

Patent Application Number(s)

**PATENT REEL: 013016 FRAME: 0720** 

Zip Code

Patent Number(s)

State/Country

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Mark if additional numbers attached

## Raytheon

#### **ASSIGNMENT**

Page 1 of 3 PD-02W042

WHEREAS, I, as below named sole inventor (if only one name is listed below) or joint inventor (if plural names are listed below) of the city and state as stated below next to my name, have invented a(an) LASER COOLING APPARATUS AND METHOD for which application for Letters Patent of the United States has been executed by me on or before this day, or (if the following is completed) filed on \_\_\_\_\_\_\_, as Serial No.\_\_\_\_\_\_; and

WHEREAS, RAYTHEON COMPANY, (hereinafter referred to as Raytheon), a Delaware Corporation, having its principal place of business in Lexington, Massachusetts, is desirous of acquiring the entire and exclusive right, title and interest in, to and under said invention, said application and any and all Letters Patent that may be granted therefor in the United States and throughout the world;

NOW, THEREFORE, in consideration of the obligations voluntarily assumed by me and set forth in an invention agreement between me and my employer, effective the date as stated below next to my name, and other good and valuable consideration, receipt of which is hereby acknowledged, I do hereby sell, assign and transfer to RAYTHEON, its successors, assigns or other legal representatives, the entire and exclusive right, title and interest in and to said invention invented by me, to said application and any and all applications which are continuations, continuations-in-part, divisions or substitutes of said application and any and all Letters Patent that may be granted therefor in the United States and throughout the world on any of said applications and to any and all reexaminations, reissues, renewals or extensions of said Letters Patent in the United States and throughout the world for the full term or terms for which said Letters patent may be granted in the United States and throughout the world; authorize and request The Commissioner of Patents and Trademarks of the United States and all foreign countries to issue all such Letters Patent to said RAYTHEON, its successors, assigns or other legal representatives; covenant that no assignment, sale, agreement, transfer or encumbrance has been, or will be, made or entered into which would conflict with this assignment, sale and transfer; and agree to communicate to RAYTHEON, its successors, assigns or other legal representatives, upon request and at no cost or expense to me, any facts known by me respecting said invention, do all lawful acts, including the execution and delivery of all papers and proper oaths and giving of testimony that is deemed necessary or desirable by RAYTHEON, its successors, assigns or other legal representatives with regard to said invention for protecting, obtaining, maintaining and enforcing any and all of said Letters Patent in the United States and throughout the world for said invention and for perfecting, affirming, recording and maintaining the title of RAYTHEON, its successors, assigns or other legal representatives, and generally cooperate to the fullest extent in all matters pertaining to said invention, and any and all of said Letters Patent and the title thereto in RAYTHEON, its successors, assigns or other legal representatives.

> PATENT REEL: 013016 FRAME: 0721

# Raytheon

ASSIGNMENT Page 2 of 3 PD-02W042

IN WITNESS WHEREOF, I have executed this instrument.

JOSEPHW. STONE

Los Angeles County My Comm. Expires Feb 23, 2008

FULL NAME OF SOLE OR JOINT INVENTOR	INVENTOR'S SIGNATURE	DATE
ROBERT W. BYREN	/hh	6/14/02
RESIDENCE (CITY AND STATE)		INVENTION AGREEMENT DATE
MANHATTAN BEACH, CA		September 5, 1979
STATE OF CALIFORNIA	) ) SS:	
COUNTY OF FOR ANGELES	)	
On JUNE 14 2002 before	re me, SSEPH W. Sto	WE
On June 14, 2002 before a Notary Public in and for said State, pers	sonally appeared <u>&amp; BENT W.</u>	Byeen
•	,	/
		o to be the person(of where
☐ personally known to me or ☐ proved to name(¿) is/ace subscribed to the within ins	strument and acknowledged to me that he	/s <b>hr</b> e/th <b>s</b> y executed the same
in his/her/their authorized capacity(ise), and the entity upon behalf of which the person(	nd that by his/loer/their signature(戶) on the	instrument the person(s), or
the entity upon behalf of which the person	acted, executed the institution.	
WITNESS my hange and state all Commission # 1344231		
Notary Public - California Los Angeles County	<i>=</i> 200	a ma
My Comm. Expires Feb 23, 20	Notary Public	sig. Wount
	Lavery and a sound tupe	DATE
FULL NAME OF SOLE OR JOINT INVENTOR	INVENTOR'S SIGNATURE	DATE
WILLIAM S. GRIFFIN	INVENTOR'S SIGNATURE William & Briffin	14 June. 2002
	William & Briffin	14 June, 2012 INVENTION AGREEMENT DATE
WILLIAM S. GRIFFIN	INVENTOR'S SIGNATURE William & Briffin	14 June. 2002
WILLIAM S. GRIFFIN  RESIDENCE (CITY AND STATE)  MANHATTAN BEACH, CA	William & Briffin	14 June, 2012 INVENTION AGREEMENT DATE
WILLIAM S. GRIFFIN RESIDENCE (CITY AND STATE)	William & Briffin	14 June, 2012 INVENTION AGREEMENT DATE
WILLIAM S. GRIFFIN  RESIDENCE (CITY AND STATE)  MANHATTAN BEACH, CA  STATE OF	INVENTOR'S SIGNATURE William & Briffin  ) SS:	14 June, 2012 INVENTION AGREEMENT DATE
WILLIAM S. GRIFFIN  RESIDENCE (CITY AND STATE)  MANHATTAN BEACH, CA  STATE OF	William & Briffin  Ss:	Invention agreement date April 11, 1977
WILLIAM S. GRIFFIN  RESIDENCE (CITY AND STATE)  MANHATTAN BEACH, CA  STATE OF	William & Briffin  SS:  Te me, Sosepe W. Stones	Invention agreement date April 11, 1977
WILLIAM S. GRIFFIN  RESIDENCE (CITY AND STATE)  MANHATTAN BEACH, CA  STATE OF	William & Briffin  SS:  Te me, Sosepe W. Stones	Invention agreement date April 11, 1977
WILLIAM S. GRIFFIN  RESIDENCE (CITY AND STATE)  MANHATTAN BEACH, CA  STATE OF	William & Briffin  SS:  Te me, Sosepe W. Stones	Invention agreement date April 11, 1977
WILLIAM S. GRIFFIN  RESIDENCE (CITY AND STATE)  MANHATTAN BEACH, CA  STATE OF	William & Briffin  ) SS:  The me, SosePol W. Stones  Sonally appeared WILLIAM S. Of the control of the basis of satisfactory evidence.	Invention agreement date April 11, 1977  Set to be the person(*Fwhose
WILLIAM S. GRIFFIN  RESIDENCE (CITY AND STATE)  MANHATTAN BEACH, CA  STATE OF	William & Briffin  ) SS:  The me, SSEPA W. Stones  Sonally appeared WILLAM S. Of the strument and acknowledged to me that he	INVENTION AGREEMENT DATE April 11, 1977  Set to be the person (**) whose /she/they executed the same
WILLIAM S. GRIFFIN  RESIDENCE (CITY AND STATE)  MANHATTAN BEACH, CA  STATE OF	william & briffin  ) SS:  Te me, SSEPA W. Stones  sonally appeared WLLAM S.  o me on the basis of satisfactory evidence strument and acknowledged to me that he and that by his/har/their signature(s) on the	INVENTION AGREEMENT DATE April 11, 1977  Set to be the person (**) whose /she/they executed the same
WILLIAM S. GRIFFIN  RESIDENCE (CITY AND STATE)  MANHATTAN BEACH, CA  STATE OF	william & Briffin  SS:  The me, SSEPI W. Stones  Sonally appeared WLLAM S.  To me on the basis of satisfactory evidence of the strument and acknowledged to me that he and that by his/hear signature(a) on the condition of the strument.	INVENTION AGREEMENT DATE April 11, 1977  Set to be the person (**) whose /she/they executed the same

Notary Public

**PATENT** 

**REEL: 013016 FRAME: 0722** 

Raytheon
ASSIGNMENT
Page 3 of 3
PD-02W042

IN WITNESS WHEREOF, I have executed this instrument.

FULL NAME OF SOLE OR JOINT INVENTOR	INVENTOR'S SIGNATURE		DATE		
ALEXANDER A. BETIN	be-		6/14/02		
RESIDENCE (CITY AND STATE)		INVENTIO	N AGREEMENT DATE		
MANHATTAN BEACH, CA		June 28,	1999		
STATE OF					
personally known to me or proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/thee executed the same in his/her/their authorized capacity(iss), and that by his/her/their signature(s) on the instrument the person(s) acted, executed the instrument.					

WITNESS my hand and official seal.

**RECORDED: 06/14/2002** 

JOSEPHW. STONE
Commission # 1344231
Notary Public - California
Los Angeles County
My Comm. Expires Feb 23, 2006

Notary Public

PATENT REEL: 013016 FRAME: 0723

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