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23497
JED MARGOLIN
1981 EMPIRE ROAD
RENO, NV 89521-7430

CONFIRMATION NO. 5221
FILING RECEIPT



Date Mailed: 09/19/2017

Receipt is acknowledged of this provisional patent application. It will not be examined for patentability and will become abandoned not later than twelve months after its filing date. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections

Inventor(s) Jed Margolin, VC Highlands, NV;

Applicant(s) Jed Margolin, VC Highlands, NV;

Power of Attorney: None

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

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

Projected Publication Date: None, application is not eligible for pre-grant publication

Non-Publication Request: No

Early Publication Request: No

** SMALL ENTITY **

Title

Directed Energy Weapon Using a Plurality of Lasers

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

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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UNITED STATES PROVISIONAL APPLICATION FOR PATENT
FOR

DIRECTED ENERGY WEAPON USING A PLURALITY OF LASERS

INVENTOR: JED MARGOLIN

DIRECTED ENERGY WEAPON USING A PLURALITY OF LASERS

BACKGROUND OF THE INVENTION - Field of Invention

[001] This invention relates to the field of directed energy weapons and, in particular, to the use of lasers as a directed energy weapon.

BACKGROUND OF THE INVENTION – Prior Art

[002] A directed energy weapon using a laser at or near sea level has the problem that when the laser power is high enough to be useful the laser energy ionizes the atmosphere and defocuses the beam. This appears to be one of the reasons that the mega-watt class chemical oxygen-iodine laser (Coil) used by the now-canceled Airborne Laser was not used in a ground installation. A ground installation would have avoided the expense and space constraints of the 747 aircraft and, as a speed-of-light system, would have been more reliable than the THAAD kinetic-kill system.

[003] The use of a laser for long distances in atmosphere requires that the beam be corrected for atmospheric turbulence. An example of a such an adaptive optics system is the system developed for the Airborne Laser. (See *Ref. 1: Atmospheric Compensation and Tracking Using Active Illumination* by Charles Higgs, Herbert T. Barclay, Daniel V. Murphy, and Charles A. Primmerman; Volume 11, Number 1, 1998 Lincoln Laboratory Journal.)

OBJECTIVES AND ADVANTAGES

[004] In a world where rogue nations such as North Korea and Iran are developing long-range missiles with nuclear weapons payloads there is a need to have a laser-based directed energy weapon that can send its

destructive energy at or near sea level without ionizing the atmosphere thereby defocusing the laser beam. With the present invention a ground installation can destroy or disable incoming aircraft and missiles. The system can also be deployed in an aircraft or an orbiting satellite to destroy or disable missiles either during their pre-launch phase, launch phase, or during their descent. The system deployed in an aircraft or an orbiting satellite can also destroy or disable ground targets. The system can also be used to produce an Electromagnetic Pulse (EMP) at the target.

[005] There is also a problem in destroying or disabling the small consumer drones that have become popular (and a problem). The term “drone” originally meant a remote-controlled aircraft usually used for target practice. Many of these drones were obsolete aircraft outfitted with a remote control system. As the technology evolved into systems that could be used for reconnaissance and then for armed strikes the term evolved into Remotely Piloted Vehicle (RPV), Remotely Operated Aircraft (ROA), and Unmanned Aerial Vehicle (UAV). Now it is back to “drones” again and they do not even have to be remotely operated other than by setting the GPS coordinates of their destination.

Hobbyists are flying drones near airports jeopardizing the safety of aircraft. See *Ref. 2* from the Washington Post: **FAA records detail hundreds of close calls between airplanes and drones.**

Hobbyists flying their drones to capture photos or video of fires have caused firefighting efforts to slow down or even stop. See *Ref. 3*.

Consumer drones are also being used to invade people’s privacy. See *Ref. 4* from the Santa Clara High Technology Law Journal, Volume 33 Issue 2 Article 3, 1-3-2017, **Drones and Privacy in the Golden State** by Brandon Gonzalez:

The Federal Aviation Administration (FAA) has signaled that it does not intend to regulate issues unrelated to drone flight and safety. Therefore, issues such as privacy will be left to the states to regulate. As a result, lawmakers in California have scurried to find a legislative solution for the protection of its citizens’ privacy from this potentially invasive technology. Currently, California’s legal landscape is insufficient to meet the potential threat of drone technology as it pertains to personal privacy because drone technology could not have been anticipated when many of California’s traditional privacy protections came of age in the 1960s and 1970s.

Whatever laws California and other states may pass to protect people’s privacy from drones, enforcing them will be another matter. It will be like enforcing the Telephone Solicitation Law. It essentially won’t happen.

Besides, laws are for honest people. And while there do not appear to be instances of domestic terrorists using drones it is only a matter of time before they do.

The only real solution to dealing with miscreant drones is to destroy or disable them. The USAF would like the authority to do just that. See **Ref 6: USAF Wants Authority To Down Drones After F-22 Near Miss**; Lara Seligman; *Aerospace Daily & Defense Report*; July 12, 2017.

[006] While consumer drones operate at a low altitude where they are sometimes within range of a good civilian firearm a shot that misses will continue on its ballistic trajectory and come down in a civilian area where it can cause death or injury to civilians or damage to civilian property.

A high power laser that misses will continue on where it could do damage. However, a shot from the ground is less likely to cause damage to people and objects on the ground. The primary danger is to piloted aircraft in the air. Also, the amount of laser power needed to blind or damage the sensors used in consumer drones is much less than the power needed to destroy or disable a real aircraft or a missile.

SUMMARY OF THE INVENTION

[007] In a first preferred embodiment a plurality of lasers are arranged in a circle where the power of each laser is below the atmospheric ionization threshold and where each laser is aimed to converge on a target using its own 2-axis mirror. An example of such a system uses 36 100kw lasers to produce a 3.6 Megawatt laser system. The system is mounted on a platform base that allows the elevation and azimuth of the laser system to be aimed at the target. A thermal imager can be used to provide the fine adjustment of the lasers since the point of convergence will ionize the atmosphere producing a very high temperature. As such it can be considered an adaptive optics system that corrects for atmospheric turbulence without requiring a separate guide laser. The point of convergence does not have to be on the target itself. For example, ionizing the atmosphere in the path of the target will create an atmospheric disturbance that may disrupt the aerodynamics of the target, especially a small target like a consumer drone.

When the system is operated in continuous mode (or in long bursts) the laser power will destroy or disable the target. When the system is used to produce a short high intensity pulse at or near the target the rapid ionization of the atmosphere will produce an electromagnetic pulse (EMP). This is done by either pulsing the lasers or by having the lasers rapidly converge to produce a pulse with a fast risetime. The pulse can be relatively short making it possible to operate the system at a low duty cycle. This allows the system to use a temporary energy

storage system such as a capacitor bank or flywheel energy storage to reduce the demands on the system power source. This mode also reduces the cooling requirements for the lasers. When aimed at a ground target the EMP will penetrate the ground to disable a buried facility that has not been properly hardened against an EMP.

[008] In a second preferred embodiment the plurality of lasers are arranged in a line instead of a circle as in the first embodiment. Other arrangements of the lasers are possible as well.

[009] In a third preferred embodiment the first embodiment is augmented to reduce the chance that the laser strike will hit a friendly either directly or as the laser beams continue on their way after missing the target. This augmentation uses the GPS coordinates of the laser array and the GPS coordinates of all aircraft in the vicinity including consumer drones (friendly or not). When a friendly aircraft or drone is in the path of the proposed laser strike then the shot must not be taken. At the speeds of friendly aircraft and unfriendly consumer drones it will not be long before another targeting solution will present itself. In addition the Digital Terrain Elevation Database can be used so that shots will not be taken if the laser strike will hit terrain. This is useful in areas that are surrounded by mountains. This can also be augmented in areas with buildings or other structures by adding the buildings and other structures to the database. This also makes it possible to use the laser weapon that is not located directly on the ground. Because of the possibility of mountain terrain it is not sufficient that the laser array be at an altitude that is lower than the target's altitude.

[010] In a fourth preferred embodiment the second embodiment is augmented as in the third embodiment.

[011] There is also the problem of detecting and locating consumer drones. Since the FAA (when authorized by Congress) can mandate safety standards for consumer drones it can require that consumer drones be equipped with a system similar to the current ADS-B system. However, it cannot be the same ADS-B system as it is currently constituted since the large number of consumer drones could overwhelm the system with the sheer number of transmissions.

Therefore it is proposed that a Drone ADS-B system use a different frequency and further, that the data rate be substantially increased to improve the accuracy of the system for verifying Drone ADS-B transmissions taught, for example, in U.S. Patent 9,465,104 **ADS-B Radar** by the current Applicant. (*Ref. 5*). This will make it easier for drones to detect and locate other drones as well as aircraft.

[012] To improve the chances of detecting a rogue consumer drone, infrared thermal imaging can be used to detect and locate drones at night. To detect and locate drones when the Sun is shining consumer drones can be mandated to have a minimum UV reflectivity so they can be detected and located with UV imaging. The UV reflectivity can occur simply because of the UV reflectivity of the materials used in the drone or a UV reflecting coating can be added. There may be times during daylight when the Sun is obscured by clouds so that drones can be detected and located by infrared thermal imaging during those times.

BRIEF DESCRIPTION OF THE DRAWINGS

[013] Figure 1A is a general illustration showing the side view of a laser module consisting of a laser, a mirror, and a 2-axis mirror positioner.

[014] Figure 1B is a general illustration showing the top view of a laser module and the mirror. The mirror positioner is below the mirror and is not shown.

[015] Figure 2A is a general illustration showing the top view of a laser platform containing four laser modules arranged in a circle.

[016] Figure 2B is a general illustration showing the laser platform in Figure 2A on a base to provide azimuth and elevation control of the laser platform.

[017] Figure 3 is a general illustration showing the system in Figure 2A with a thermal imager.

[018] Figure 4A is a general illustration showing the top view of a laser platform containing four laser modules and a thermal imager arranged in a line.

[019] Figure 4B is a general illustration showing the laser platform in Figure 4A on a base to provide azimuth and elevation control of the laser platform.

[020] Figure 5A is a general illustration showing the Laser Module Controller for the Laser Module.

[021] Figure 5B is a general illustration showing a plurality of Laser Module Controllers under the control of the Master Controller.

DETAILED DESCRIPTION

[022] In the following description, numerous specific details are set forth to provide a thorough understanding of the invention. However, it is understood that the invention may be practiced without these specific details. In other instances well-known circuits, structures, and techniques have not been shown in detail in order not to obscure the invention.

[023] The first embodiment uses a plurality of lasers arranged in a circle where the power of each laser is below the atmospheric ionization threshold and where each laser is aimed to converge on a target using its own 2-axis mirror. Figure 1A is a side view showing Laser Module 101 consisting of Laser 102, Mirror 104, and 2-Axis Mirror Positioner 105. This produces the aimable Laser Beam 103. Figure 1B shows a top view of Laser Module 101. The 2-Axis Mirror Positioner is mostly behind Mirror 104 and for clarity is not shown. Laser Beam 103 is coming out of the page.

Figure 2A shows four Laser Modules (Laser Modules 202, 203, 204, and 205) mounted on Laser Platform 201 arranged in a circle in a top view. For clarity only four Laser Modules are being used here.

Figure 2B shows Laser Platform 201 mounted on Azimuth-Elevation Mount 206. This allows the array of Laser Modules (Laser Array) to point at Target 207. The mirrors in the Laser Modules (202, 203, 204, and 205) cause the laser beams to converge on Target 207.

Figure 3 shows the addition of Thermal Imager 302 to the system producing Laser Platform 301. Thermal Imager 302 is used to provide the fine adjustment of the lasers since the point of convergence will ionize the atmosphere producing a very high temperature. It also allows for the correct for atmospheric turbulence.

[024] The second embodiment uses a plurality of lasers arranged in a line where the power of each laser is below the atmospheric ionization threshold and where each laser is aimed to converge on a target using its own 2-axis mirror. Figure 4 shows four Laser Modules (Laser Modules 402, 403, 404, and 405) mounted on Laser Platform 401 arranged in a line in a top view. For clarity only four Laser Modules are being used here. Also shown is Thermal Imager 406 for providing the fine adjustment of the lasers as well as for allowing for corrections for atmospheric turbulence.

Figure 4B shows Laser Platform 401 mounted on Azimuth-Elevation Mount 406. This allows the array of Laser Modules (Laser Array) to point at Target 207. The mirrors in the Laser Modules (402, 403, 404, and 405) cause the laser beams to converge on Target 207. Figure 4B also shows Thermal Imager 406 in the system which is

used to provide the fine adjustment of the lasers since the point of convergence will ionize the atmosphere producing a very high temperature. It also allows for the correct for atmospheric turbulence. Thermal Imager 406 can be omitted for some uses such as when the system is to be used for short distances only and when system calibration can be relied upon not to drift.

[025] In Figure 5A each Laser Module 101 has associated with it Laser Module Controller 501. Laser Module Controller 501 contains a Laser Power Supply and Controller for Laser 102 and a Controller for 2-Axis Positioner for 2-Axis Mirror Positioner 105.

[026] Figure 5B is the complete operating system for the first embodiment. Laser Module Controller 502 controls Laser Module 202, Laser Module Controller 503 controls Laser Module 203, Laser Module Controller 504 controls Laser Module 204, and Laser Module Controller 505 controls Laser Module 205. All are under the control of Master Controller 506. Master Controller 506 also controls Azimuth-Elevation Controller 512.

Master Controller 506 receives inputs from Drone ADS-B 511 system, standard ADS-B 510 system, the Digital Terrain Elevation Database 509, GPS 508 system, Thermal Imager 302, and Command Inputs 507. Command Inputs 507 include commands such as pointing at the target and firing the lasers. The lasers can be fired with a long duty cycle to destroy the target and/or a short pulse to create an EMP at or near the target. It is expected that Command Inputs 507 will be issued by a human operator either directly or indirectly such as when there are a plurality of Directed Energy Weapons using a Plurality of Lasers in a defense grid.

The second embodiment which uses a plurality of lasers arranged in a line instead of a circle uses a control system substantially the same as in Figure 5B.

[027] While preferred embodiments of the present invention have been shown, it is to be expressly understood that modifications and changes may be made thereto.

ABSTRACT OF THE DISCLOSURE

A directed energy weapon using a laser at or near sea level has the problem that when the laser power is high enough to be useful the laser energy ionizes the atmosphere and defocuses the beam. The solution to this problem is to use a plurality of lasers preferably arranged either in a circle or in a line where the power of each laser is below the atmospheric ionization threshold and where the lasers are aimed to converge on the target. As an alternative the lasers can be configured to produce a short high intensity ionization pulse to produce an electromagnetic pulse at or near the target.

References

Ref. 1: **Atmospheric Compensation and Tracking Using Active Illumination** by Charles Higgs, Herbert T. Barclay, Daniel V. Murphy, and Charles A. Primmerman; Volume 11, Number 1, 1998 Lincoln Laboratory Journal: www.ll.mit.edu/publications/journal/pdf/vol11_no1/11_atmosphericcomp.pdf .

Ref. 2: **FAA records detail hundreds of close calls between airplanes and drones**; Craig Whitlock; Washington Post, August 20, 2015.

https://www.washingtonpost.com/world/national-security/faa-records-detail-hundreds-of-close-calls-between-airplanes-and-drones/2015/08/20/5ef812ac-4737-11e5-846d-02792f854297_story.html?utm_term=.d756d9825851

Ref. 3: **Hobbyists flying their drones to capture photos or video of fires have caused firefighting efforts to slow down or even stop.** From: ABC15(TV) Phoenix, Az.

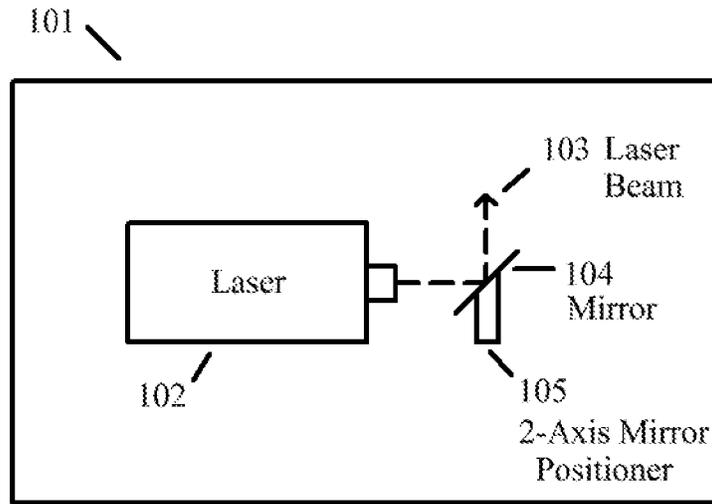
<http://www.abc15.com/news/region-central-southern-az/other/drones-causing-problems-battling-pinal-fire>

Ref. 4: Santa Clara High Technology Law Journal, Volume 33 Issue 2 Article 3, 1-3-2017, **Drones and Privacy in the Golden State** by Brandon Gonzalez: <http://digitalcommons.law.scu.edu/chtj/vol33/iss2/3/>

Ref. 5: U.S. Patent 9,465,104 **ADS-B Radar** issued October 11, 2016 to Margolin

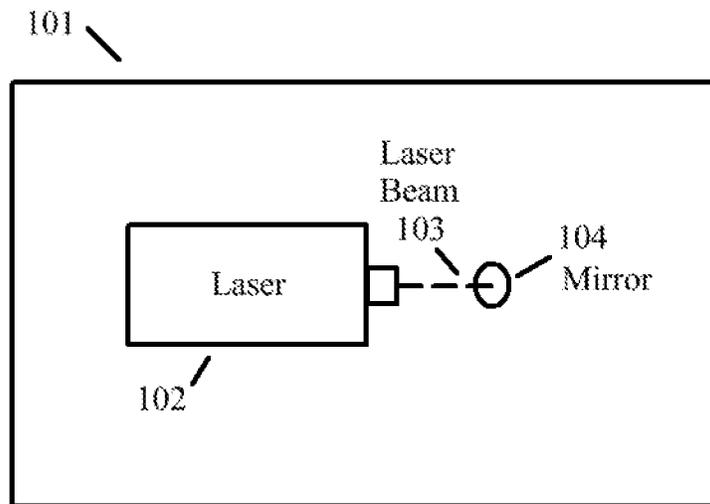
Ref. 6: **USAF Wants Authority To Down Drones After F-22 Near Miss**, Lara Seligman; *Aerospace Daily & Defense Report*; July 12, 2017.

Ref. 7: **Hunting For Heat - Infrared low-observability in theory and practice**; Daniel Katz, *Aviation Week & Space Technology*; July 10-23, 2017.



Laser Module - Side View of Laser, Mirror, and Mirror Positioner

Fig. 1A



Laser Module - Top View of Laser, Mirror, and Mirror Positioner

Fig. 1B

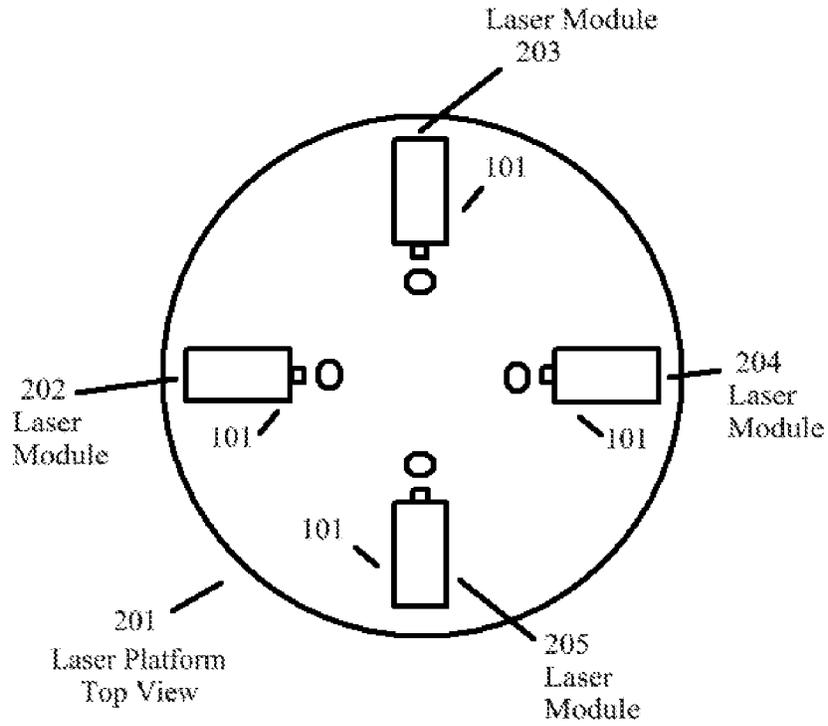


Fig. 2A

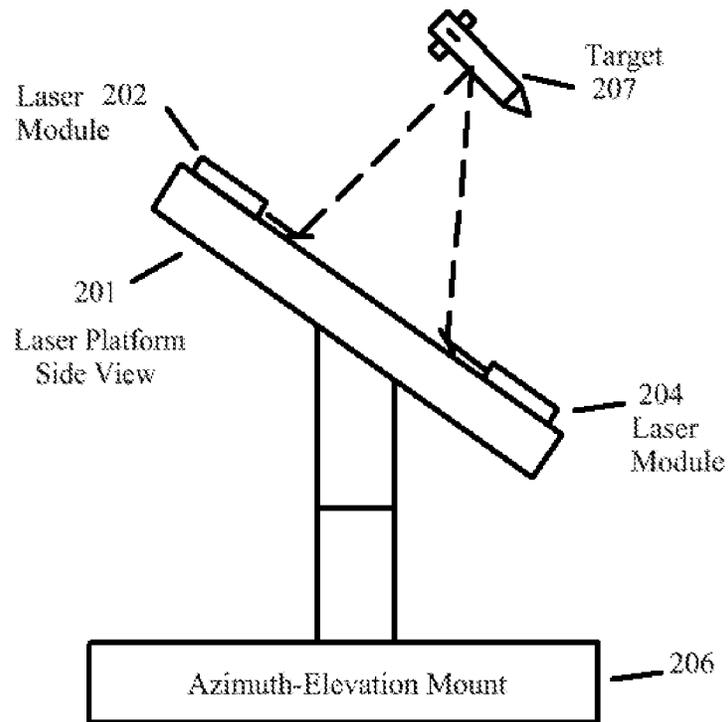


Fig. 2B

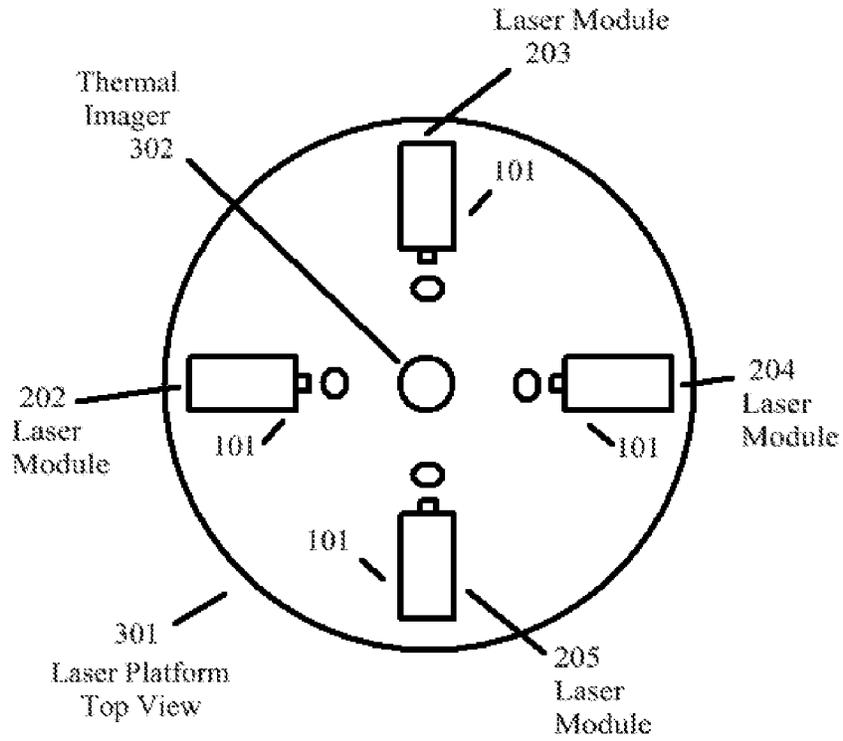


Fig. 3

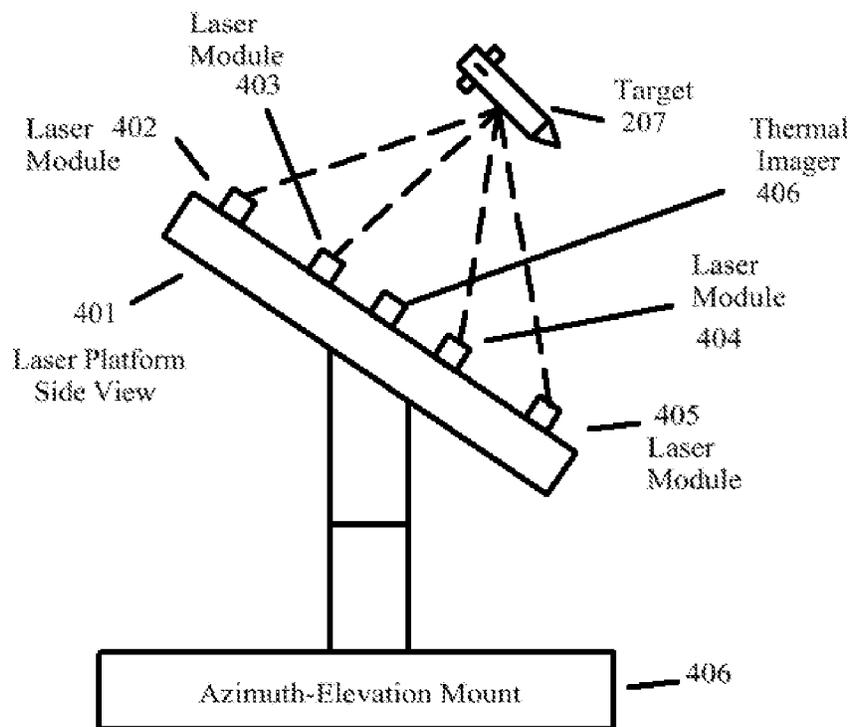
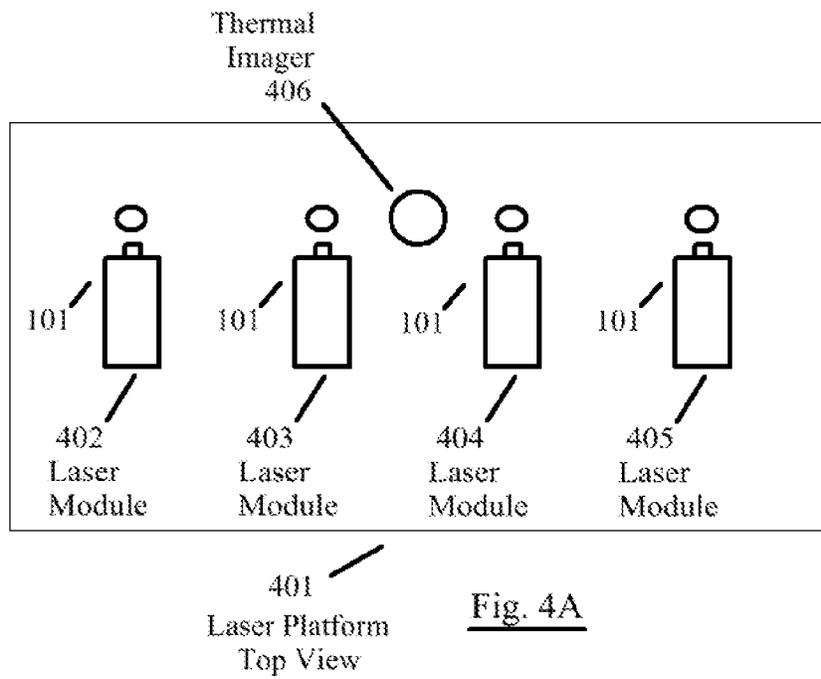


Fig. 4B

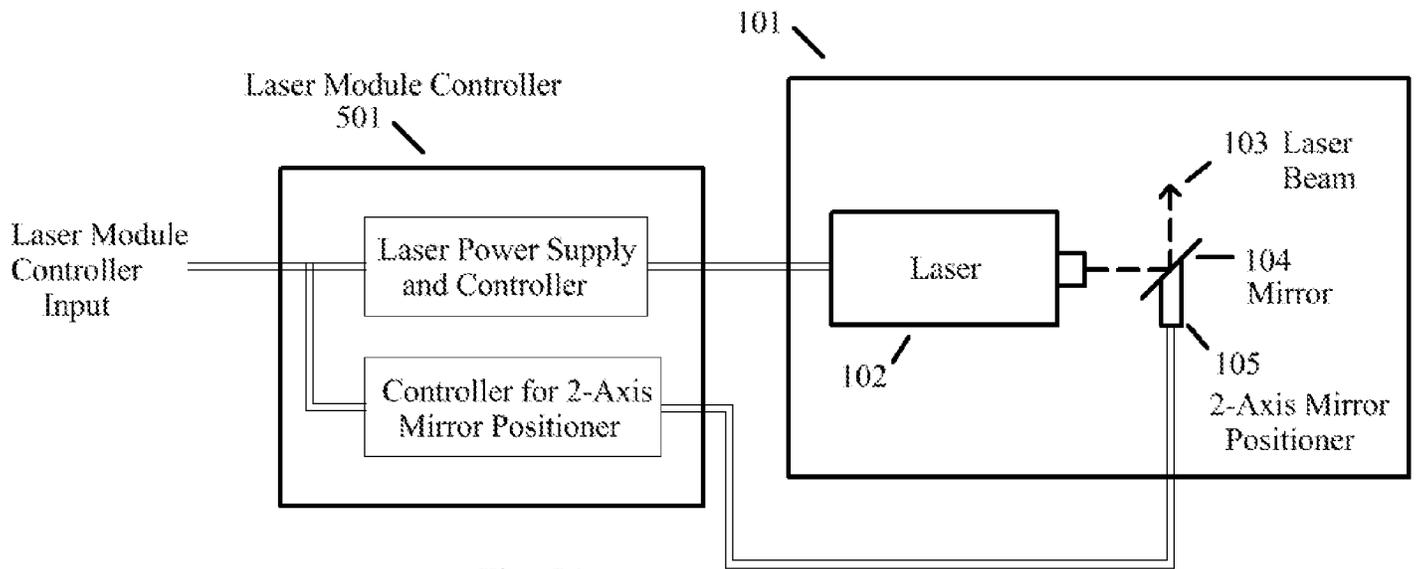


Fig. 5A

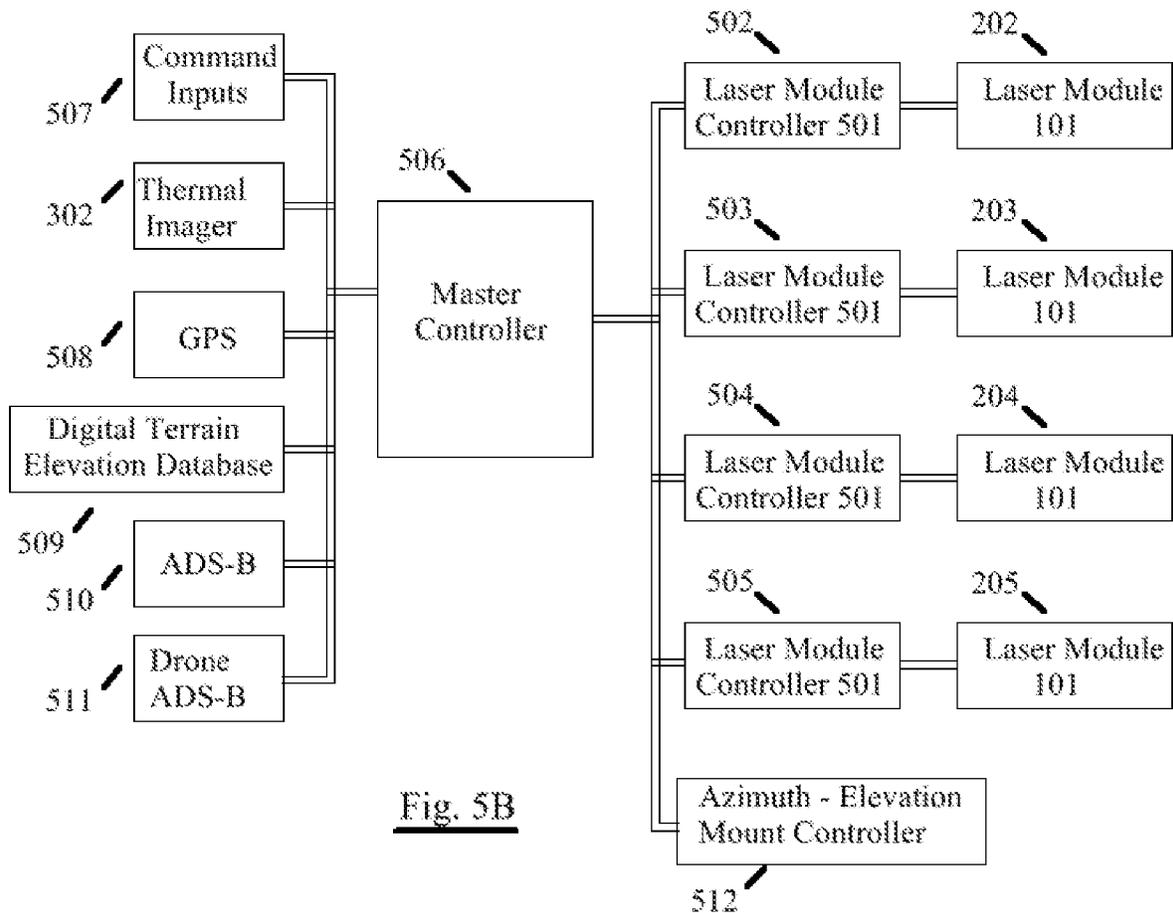


Fig. 5B

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PROVISIONAL APPLICATION FOR PATENT COVER SHEET – Page 2 of 2

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Yes, the invention was made under a contract with an agency of the U.S. Government. The name of the U.S. Government agency and Government contract number are: _____

WARNING:

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

SIGNATURE /Jed Margolin/ DATE 09/01/2017

TYPED OR PRINTED NAME Jed Margolin REGISTRATION NO. _____
(if appropriate)

TELEPHONE 775-847-7845 DOCKET NUMBER _____

Privacy Act Statement

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

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

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

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

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	
		Application Number	
Title of Invention	Directed Energy Weapon Using a Plurality of Lasers		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

Secrecy Order 37 CFR 5.2:

<input type="checkbox"/>	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
--------------------------	---

Inventor Information:

Inventor	1				<input type="button" value="Remove"/>	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
Mr. <input type="button" value="v"/>	Jed		Margolin	<input type="button" value="v"/>		
Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service						
City	MC Highlands	State/Province	NV	Country of Residence	US	
Mailing Address of Inventor:						
Address 1	1981 Empire Rd					
Address 2						
City	Reno	State/Province	NV			
Postal Code	89521-7430	Country i	US			
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button.						<input type="button" value="Add"/>

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
<input type="checkbox"/> An Address is being provided for the correspondence information of this application.			
Customer Number	23497		
Email Address	jm@margolin.com		<input type="button" value="Add Email"/> <input type="button" value="Remove Email"/>

Application Information:

Title of the Invention	Directed Energy Weapon Using a Plurality of Lasers		
Attorney Docket Number		Small Entity Status Claimed	<input checked="" type="checkbox"/>
Application Type	Provisional <input type="button" value="v"/>		
Subject Matter	Utility <input type="button" value="v"/>		
Total Number of Drawing Sheets (if any)	5	Suggested Figure for Publication (if any)	2B

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

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	
	Application Number	
Title of Invention	Directed Energy Weapon Using a Plurality of Lasers	

Filing By Reference:

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

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

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

Publication Information:

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

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

Representative Information:

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

Please Select One:	<input checked="" type="radio"/> Customer Number	US Patent Practitioner	<input type="radio"/> Limited Recognition (37 CFR 11.9)
Customer Number	23497		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	<input type="text"/>	<input type="button" value="Remove"/>
Application Number	Continuity Type	Prior Application Number
<input type="text"/>	<input type="text"/>	Filing or 371(c) Date (YYYY-MM-DD)
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.		<input type="button" value="Add"/>

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

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	
	Application Number	
Title of Invention	Directed Energy Weapon Using a Plurality of Lasers	

Foreign Priority Information:

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

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

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

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

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

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	
	Application Number	
Title of Invention	Directed Energy Weapon Using a Plurality of Lasers	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

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

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	
	Application Number	
Title of Invention	Directed Energy Weapon Using a Plurality of Lasers	

Applicant Information:

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

Applicant	1	<input type="button" value="Remove"/>		
<p>If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.</p>				
<input type="button" value="Clear"/>				
Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor		
Person to whom the inventor is obligated to assign.		Person who shows sufficient proprietary interest		
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:				
<div style="border: 1px solid black; height: 20px; width: 100%;"></div>				
Name of the Deceased or Legally Incapacitated Inventor: <input style="width: 90%;" type="text"/>				
If the Applicant is an Organization check here. <input type="checkbox"/>				
Prefix	Given Name	Middle Name	Family Name	Suffix
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Mailing Address Information For Applicant:				
Address 1	<input type="text"/>			
Address 2	<input type="text"/>			
City	<input type="text"/>	State/Province	<input type="text"/>	
Country	<input type="text"/>	Postal Code	<input type="text"/>	
Phone Number	<input type="text"/>	Fax Number	<input type="text"/>	
Email Address	<input type="text"/>			
Additional Applicant Data may be generated within this form by selecting the Add button.				<input type="button" value="Add"/>

Assignee Information including Non-Applicant Assignee Information:

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

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

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	
	Application Number	
Title of Invention	Directed Energy Weapon Using a Plurality of Lasers	

Assignee	1
-----------------	---

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

Remove

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

Prefix	Given Name	Middle Name	Family Name	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1				
Address 2				
City		State/Province		
Country ⁱ		Postal Code		
Phone Number		Fax Number		
Email Address				

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

Add

Signature:

Remove

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). However, if this Application Data Sheet is submitted with the **INITIAL** filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Jed Margolin/		Date (YYYY-MM-DD)	2017-09-01
First Name	Jed	Last Name	Margolin	Registration Number

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

Add

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

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	
	Application Number	
Title of Invention	Directed Energy Weapon Using a Plurality of Lasers	

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

Privacy Act Statement

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

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

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

Electronic Patent Application Fee Transmittal

Application Number:				
Filing Date:				
Title of Invention:	Directed Energy Weapon Using a Plurality of Lasers			
First Named Inventor/Applicant Name:	Jed Margolin			
Filer:	Jed Margolin			
Attorney Docket Number:				
Filed as Small Entity				
Filing Fees for Provisional				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
PROVISIONAL APPLICATION FILING FEE	2005	1	130	130
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				130

Electronic Acknowledgement Receipt

EFS ID:	30252195
Application Number:	62553280
International Application Number:	
Confirmation Number:	5221
Title of Invention:	Directed Energy Weapon Using a Plurality of Lasers
First Named Inventor/Applicant Name:	Jed Margolin
Customer Number:	23497
Filer:	Jed Margolin
Filer Authorized By:	
Attorney Docket Number:	
Receipt Date:	01-SEP-2017
Filing Date:	
Time Stamp:	13:05:43
Application Type:	Provisional

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$130
RAM confirmation Number	090517INTEFSW13083100
Deposit Account	
Authorized User	

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

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Specification	jm_laser_pap_spec.pdf	62314	no	8
			31fa4e87d875869ecfe93956d002f0b502871821		
Warnings:					
Information:					
2	Drawings-only black and white line drawings	jm_laser_pap_figs.pdf	112158	no	5
			9e542fa6a952265530394581763abd3f7240db88		
Warnings:					
Information:					
3	Provisional Cover Sheet (SB16)	jm_laser_pap_sb0016_cover.pdf	299662	no	3
			e5700b59a4f23cb9971dc29afdd7516dbd05b6da		
Warnings:					
This is not a USPTO supplied Provisional Cover Sheet SB16 form.					
Information:					
4	Application Data Sheet	jm_laser_pap_aia0014.pdf	1822697	no	8
			ca4046ac649808401cd9601927920b68f9058da4		
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	29509	no	2
			4b1ee2d84680eab7c709eb44bddcd678a04ed29b		
Warnings:					
Information:					
Total Files Size (in bytes):			2326340		

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

New Applications Under 35 U.S.C. 111

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

National Stage of an International Application under 35 U.S.C. 371

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

New International Application Filed with the USPTO as a Receiving Office

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