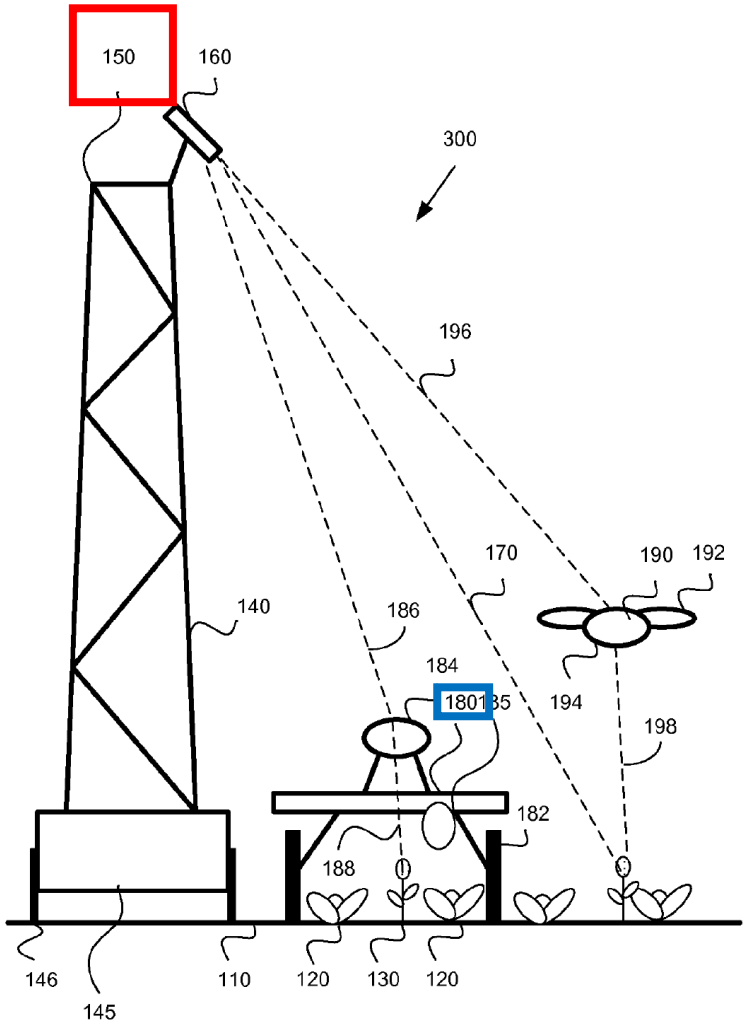
'547 Claim Language	**'752 Claim Language**	**Prior Art Disclosure – US Pat. Publ. No. 2016/0205918 ("Chan")**
[1.pre] "1. A targeting system for autonomous weed eradication comprising:"	[1.pre] "1. A targeting system for autonomous weed eradication comprising:"	Chan discloses the claimed "target system for autonomous weed eradication." As disclosed by Chan: A "plant material targeting apparatus" includes a "light source platform" and a "light redirector platform." The light source platform can transmit a laser that can be used to eradicate weeds and the light redirector platform redirects the laser to the appropriate weed for eradication. Figure 3 of Chan (below) discloses a mobile light source platform 150 and a mobile light redirector platform 180:

FIG. 3


150
160
300
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170
190
192
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120

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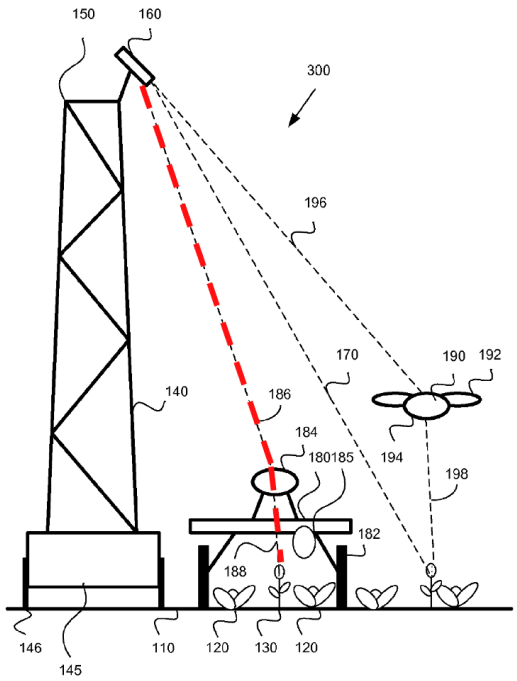
		Fig. 3 (showing light source platform 150 and a mobile light redirector platform 180). As also shown above in Figure 3 of Chan, the light source platform 150 includes a light source 160 (e.g., laser) that emits a laser 186 to a light redirector 184 on the light redirector platform. The light redirector redirects the laser to weeds for eradication. FIG. 3  Fig. 3 (showing laser beam path for weed eradication). "A plant material targeting apparatus includes a light source platform and a light source coupled to the light source platform. The light source is configured to provide a high-intensity light. The apparatus also includes a light transmitter coupled to the light source. The light transmitter is configured to transmit the

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		high-intensity light to a light redirector. In addition, the apparatus includes a light redirection platform separate from the light source platform. The light redirector is coupled to the light redirection platform. The light redirector is configured to receive the high-intensity light from the light transmitter and redirect the high-intensity light toward a plant material target to damage the plant material target." Abstract. "In an embodiment, vehicles, such as unmanned vehicles (e.g., unmanned aircraft vehicles (UAVs) or unmanned ground vehicles, such as wheeled or tracked vehicles, stilted walking vehicles, ground-scurrying vehicles, etc.), robots, and/or other light-weight transportable systems, are used in combination with a light source, to attack individual weeds. In some embodiments, the vehicles, in combination with the light source, are configured to specifically attack portions of weeds, such as the weeds' seedpods." [0025]. "Turning to FIG. 3, a plant material targeting apparatus 300 is illustrated according to one embodiment. Apparatus 300 is similar to apparatus 100 and may include, in various embodiments, components similar to those described above with respect to apparatus 100. In one embodiment, light source platform structure 140 is used to support platform 150 holding high-intensity light source 160 (e.g., laser source). Structure 140 includes vehicle 145 with wheels 146 to allow platform 150 to be moved either within or outside of crop field 110. For example, light source platform 150 may be a mobile platform, such as a ground-based mobile platform. In other embodiments, light source platform 150 may be an airborne mobile platform. In some embodiments, light source platform 150 is self-propelled while in other embodiments, light source platform 150 is towed, for example, by a tractor. In some embodiments, light source platform 150 is located within or outside of crop field 110." [0044]. Chan also teaches that its "plant material targeting apparatus" includes a "control system" for controlling the functionality of the targeting apparatus. An embodiment of the "control system" (500) and its components is shown in Figure 5 of Chan below:

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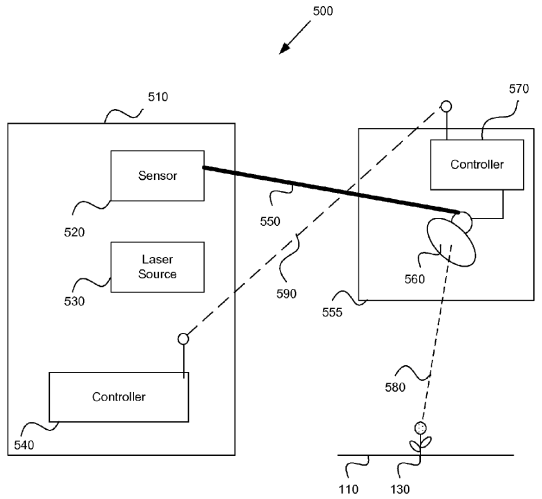
		FIG. 5  Fig. 5. “Turning to FIG. 5, a block diagram of control system 500 for a plant material targeting apparatus is illustrated, according to one embodiment. Control system 500 includes high-intensity light control system 510, which may include sensor 520, high-intensity light source 530, memory 535, and high-intensity light controller 540. Control system 500 may also include redirector control system 555, which may include beam director 560 and redirector controller 570. Sensor 520 may be configured to distinguish plant material targets 130 from desired plant material and to identify the location of plant material targets (e.g., weed 130).” [0051]. “Control system 510, via sensor 520, may be configured to provide information 550 representative of the location of plant material target (e.g., weed 130) to beam director 560. Additionally or alternatively, high-intensity light controller 540 may be configured to provide control signal 590 to redirector controller 570 to cause redirection of beam 580 to plant material target 130. In one embodiment, sensor 520 includes a

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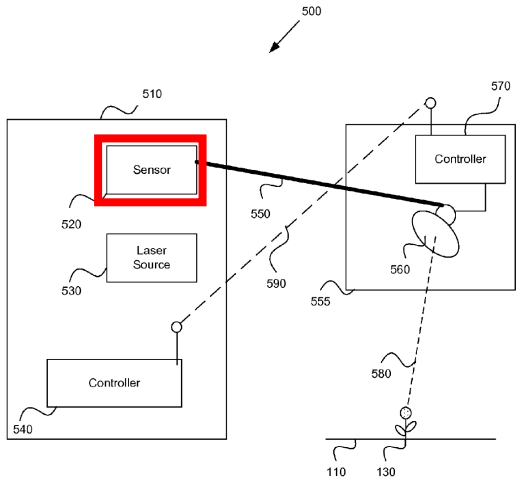
		camera. In another embodiment, sensor 520 includes a camera and an image recognition system. In a further embodiment, sensor 520 includes a spectral filter of a multicolor camera." [0053]. The "control system" and its components and functionalities are discussed further below.
[1.a] "a first camera configured to image a surface"	[1.a] "a first camera configured to image a surface"	Chan discloses a "sensor," which is the claimed "first camera" in the asserted claims. As disclosed by Chan: Chan teaches that the "sensor" in its "control system" can be a camera that is used to provide information regarding the location of weeds (in so doing, the camera images the surface): FIG. 5  Fig. 5 (showing sensor 520). "For example, plant material targets 130 (e.g., weed seedpods) may be identified by performing various image processing techniques, such as image recognition, spectrometry, among others, on information captured by sensor 520." [0052]. "Control system 510, via sensor 520, may be configured to provide information 550 representative of the location of plant material target (e.g., weed 130) to beam director 560. Additionally or alternatively, high-

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		intensity light controller 540 may be configured to provide control signal 590 to redirector controller 570 to cause redirection of beam 580 to plant material target 130. In one embodiment, sensor 520 includes a camera. In another embodiment, sensor 520 includes a camera and an image recognition system. In a further embodiment, sensor 520 includes a spectral filter of a multicolor camera." [0053]. "Sensor 520 may be configured to distinguish plant material targets 130 from desired plant material and to identify the location of plant material targets (e.g., weed 130)." [0051].
[1.b] "an emitter configured to emit a beam toward the surface"	[1.b] "an emitter configured to emit a beam toward the surface; and"	Chan discloses a "light source," which is the claimed "emitter" in the asserted claims. As disclosed by Chan: Figure 3 of Chan discloses a "light source 160" that emits a laser beam for eradicating weeds on the surface.

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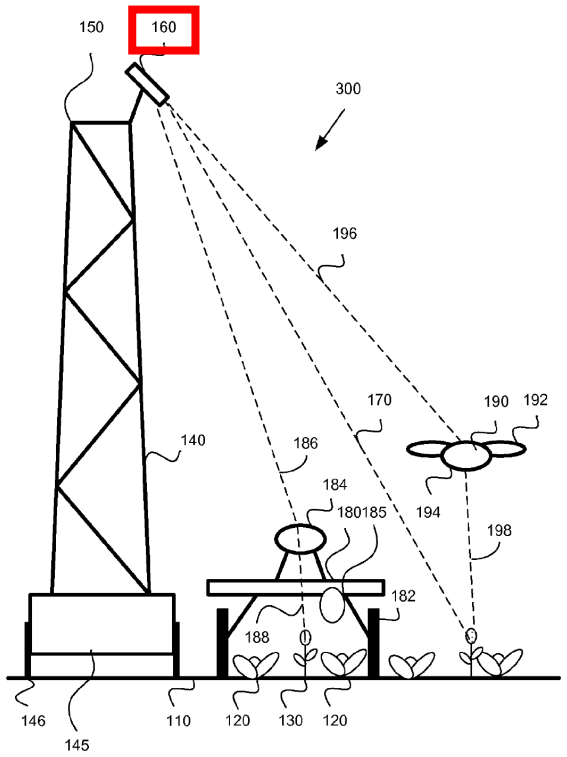
		FIG. 3  Fig. 3 (showing sensor light source 160). As also shown in Figure 5, the light source emits a light beam 186 (i.e., laser) that is sent to light redirector 184, which redirects the laser (redirected laser shown by 188 above) to eradicate weeds. This path is shown below by the red dashed line:

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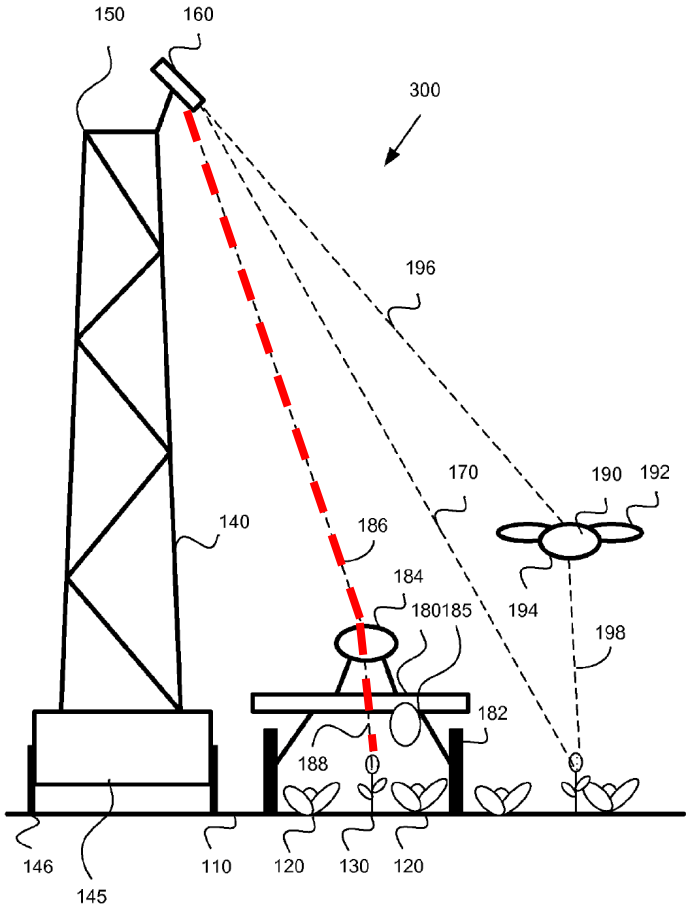
		FIG. 3 

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		Fig. 3 (showing laser beam path for weed eradication). "Turning to FIG. 3, a plant material targeting apparatus 300 is illustrated according to one embodiment. Apparatus 300 is similar to apparatus 100 and may include, in various embodiments, components similar to those described above with respect to apparatus 100. In one embodiment, light source platform structure 140 is used to support platform 150 holding high-intensity light source 160 (e.g., laser source). Structure 140 includes vehicle 145 with wheels 146 to allow platform 150 to be moved either within or outside of crop field 110. For example, light source platform 150 may be a mobile platform, such as a ground-based mobile platform. In other embodiments, light source platform 150 may be an airborne mobile platform. In some embodiments, light source platform 150 is self-propelled while in other embodiments, light source platform 150 is towed, for example, by a tractor. In some embodiments, light source platform 150 is located within or outside of crop field 110." [0044]. "In some embodiments, apparatus 300 includes light redirector 184 coupled to ground-based light redirection platform 180, which may be fixed or mobile. For example, light source 160 (e.g., laser source) may be configured to provide light beam 186 (e.g., laser beam) to ground-based light redirector 184 to redirect beam 188 onto the plant material target (e.g., weed 130)." "For the sake of clarity and brevity, various embodiments are described herein with respect to high-intensity light sources and high-intensity light beams. However, the high-intensity light sources may include various types of light sources. The high-intensity light source may be configured to emit at least one of visible light, infrared light, and ultraviolet light. In some embodiments, even longer wavelengths of electromagnetic radiation (e.g. microwave, millimeter or submillimeter radiation) which can be transmitted through the air and reflected and focused by suitable quasi-optical elements may be used in place of UV, visible, and/or infrared light. The high-intensity light source may include a laser or a laser array. The laser or laser array may include a diode laser, a carbon dioxide (CO2) laser, a fiber laser, a diode-pumped solid state (DPSS) laser, or other types of lasers. In some embodiments, the light source includes a quasi-optical source (e.g., a source configured to produce waves having a frequency of between 0.3 and 3 terahertz and a wavelength of between 1 mm and 1 μm). In some embodiments, the light source includes optics, such as a beam expander, for transmitting the light beam to the redirector platform." [0030]. "In some embodiments, high-intensity light source 160 (e.g., laser source) may include a high-intensity light generating device and a high-intensity light delivery device (e.g., a light transmitter). The generating device and the delivery device may be encompassed in a common light source device, or they may be

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		discrete components. For example, in some embodiments, the generating device may at least partially include a fiber optic cable and/or may be positioned off of light source platform 150.” [0035]. “For example, in an embodiment, high-intensity light source 160 includes a laser ….” [0039].
[1.c] “an actuator configured to direct an optical path of the beam; and”		As discussed above, Chan discloses a light source that emits a light beam (i.e., laser) that is sent to a light redirector, which redirects the laser to eradicate weeds:

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		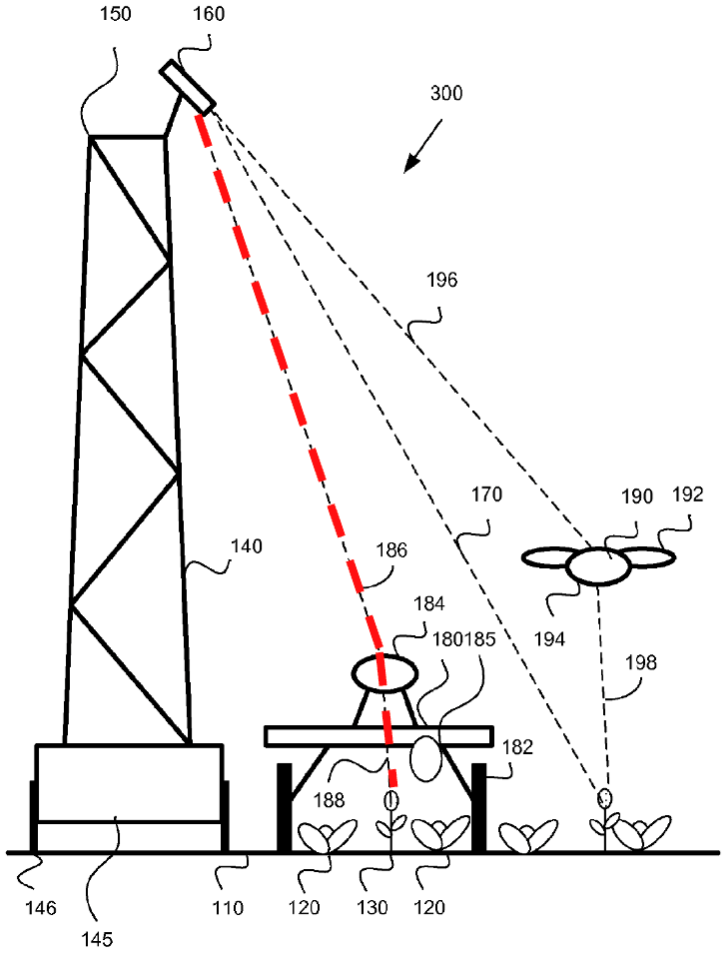 Fig. 3 (showing laser beam path).

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		The targeting apparatus in Chan would include an actuator(s) to properly align the light source and the light redirector such that the laser is correctly directed to weeds for eradication. In other words, there would need to be an actuator to move and adjust the light redirector. As taught by Chan: "In some embodiments, apparatus 300 includes light redirector 184 coupled to ground-based light redirection platform 180, which may be fixed or mobile. For example, light source 160 (e.g., laser source) may be configured to provide light beam 186 (e.g., laser beam) to ground-based light redirector 184 to redirect beam 188 onto the plant material target (e.g., weed 130)." [0045]. "In one embodiment, light redirector 184 includes a single positionable mirror. In another embodiment, light redirector 184 includes a mirror train including multiple positionable mirrors. For example, in one embodiment, the mirror train includes a first mirror that is positionable such that the first mirror faces light source 140. Light beam 186 may bounce off of the first mirror and off of a second mirror of the mirror train, such that light beam 186 is in a fixed position relative to light source platform 150. The mirror train may further include a third mirror positionable to direct the fixed beam to a target. In another embodiment, light redirector 184 includes optics, such as lenses and/or mirrors (e.g., curved mirrors), to modify light beam 186. For example, optics may be used to capture light beam 186 and reduce or expand a diameter of light beam 186 before light beam 186 enters light redirector 184. In various embodiments, optics are used to focus light beam 186 to a small diameter to concentrate the energy of light beam 186 to a small target." [0032]. "In some embodiments, light redirection platform 180 includes a wheeled or tracked vehicle (e.g., a tractor or a truck), a legged vehicle, a pedestal-walking vehicle, a cable-carried vehicle, etc." [0033]. "Additionally or alternatively, high-intensity light controller 540 may be configured to provide control signal 590 to redirector controller 570 to cause redirection of beam 580 to plant material target 130." [0053]. "Further yet, the apparatus includes a means for redirecting the high-intensity light toward the plant material target based on the control signal." [0006].
[1.d] "a computing system in communication with the first camera and the emitter, the computing system capable of performing operations comprising:"	[1.c] "a computing system in communication with the first camera and the emitter, the computing system capable of performing operations comprising:"	Chan discloses a "control system," which is the claimed "computing system" in the asserted claims. As shown in Figure 5 of Chan, the "control system 500" includes a "light control system 510" (that controls the light source platform and the components contained therein) and "a redirector control system 555" (that controls the redirection platform and the components contained therein):

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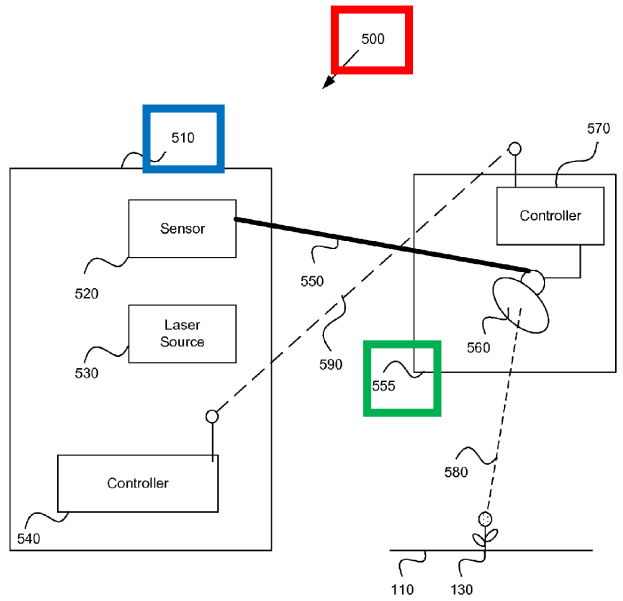
		FIG. 5  As also shown above, the light control system 510 includes a sensor 520 (which can include a camera), a laser source 530, and a controller 540, and the redirector control system 555 includes a beam director 560 and controller 570 that controls the redirection of the laser onto a weed (shown above by the dashed line 580). "Turning to FIG. 5, a block diagram of control system 500 for a plant material targeting apparatus is illustrated, according to one embodiment. Control system 500 includes high-intensity light control system 510, which may include sensor 520, high-intensity light source 530, memory 535, and high-intensity light controller 540. Control system 500 may also include redirector control system 555, which may include beam director 560 and redirector controller 570. Sensor 520 may be configured to distinguish plant

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		material targets 130 from desired plant material and to identify the location of plant material targets (e.g., weed 130)." [0051]. "In some embodiments, control system 500 memory 535 includes data relating to characteristics of one or more plants. Control system 500 may be configured to distinguish plant material target 130 from a predetermined plant material based on stored plant characteristics data. For example, plant material targets 130 (e.g., weed seedpods) may be identified by performing various image processing techniques, such as image recognition, spectrometry, among others, on information captured by sensor 520." [0052]. "Control system 510, via sensor 520, may be configured to provide information 550 representative of the location of plant material target (e.g., weed 130) to beam director 560. Additionally or alternatively, high-intensity light controller 540 may be configured to provide control signal 590 to redirector controller 570 to cause redirection of beam 580 to plant material target 130. In one embodiment, sensor 520 includes a camera. In another embodiment, sensor 520 includes a camera and an image recognition system. In a further embodiment, sensor 520 includes a spectral filter of a multicolor camera." [0053].
[1.e] "receiving, from the first camera, a first image of the surface, the first image comprising a weed on the surface"	[1.d] "receiving, from the first camera, an image of the surface, the image comprising a weed on the surface"	Chan discloses that its "sensor" can be a camera that provides images of the surface (which includes weeds) that are received by the "control system." As disclosed by Chan:

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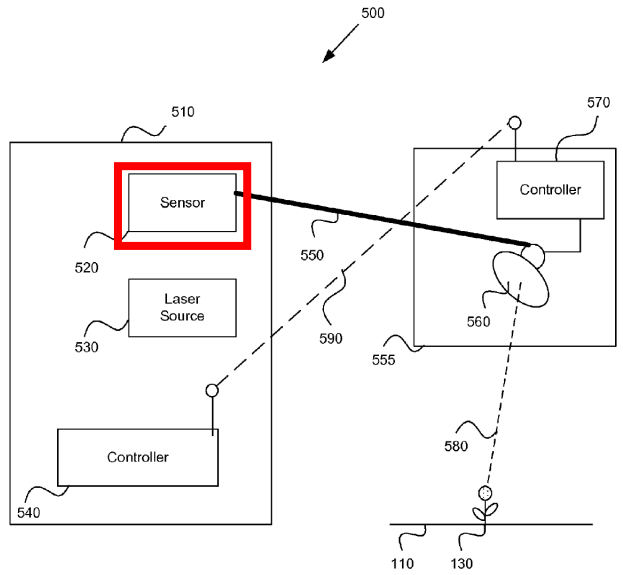
		FIG. 5  Fig. 5 (showing sensor 520 within light control system 510). "For example, plant material targets 130 (e.g., weed seedpods) may be identified by performing various image processing techniques, such as image recognition, spectrometry, among others, on information captured by sensor 520." [0052]. "Control system 510, via sensor 520, may be configured to provide information 550 representative of the location of plant material target (e.g., weed 130) to beam director 560. Additionally or alternatively, high-intensity light controller 540 may be configured to provide control signal 590 to redirector controller 570 to cause redirection of beam 580 to plant material target 130. In one embodiment, sensor 520 includes a camera. In another embodiment, sensor 520 includes a camera and an image recognition system. In a further embodiment, sensor 520 includes a spectral filter of a multicolor camera." [0053].

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[1.f] "identifying a region in the first image that includes the weed"	[1.e] "identifying a region in the image that includes the weed"	Chan discloses that the image that is received from the camera is analyzed by the control system to identify weeds. As disclosed by Chan: "Control system 500 may be configured to distinguish plant material target 130 from a predetermined plant material based on stored plant characteristics data. For example, plant material targets 130 (e.g., weed seedpods) may be identified by performing various image processing techniques, such as image recognition, spectrometry, among others, on information captured by sensor 520." [0052]. "Control system 510, via sensor 520, may be configured to provide information 550 representative of the location of plant material target (e.g., weed 130) to beam director 560. Additionally or alternatively, high-intensity light controller 540 may be configured to provide control signal 590 to redirector controller 570 to cause redirection of beam 580 to plant material target 130. In one embodiment, sensor 520 includes a camera. In another embodiment, sensor 520 includes a camera and an image recognition system. In a further embodiment, sensor 520 includes a spectral filter of a multicolor camera." [0053]. "At 702, the location of a plant material target (e.g., weed 130) is identified. For example, the location of plant material targets 130 (e.g., weed seedpods) may be identified by performing various image processing techniques, such as image recognition, spectrometry, among others, on information captured by a sensor (e.g., sensor 520 of FIG. 5)."

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		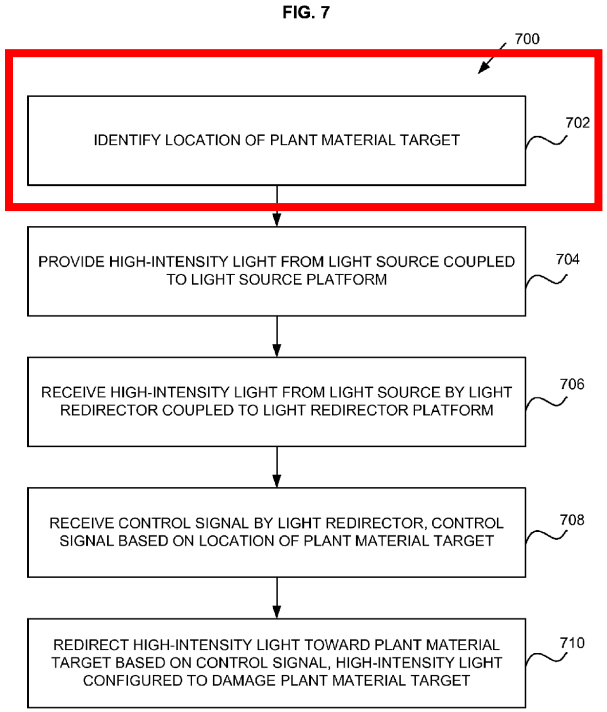 Fig. 7 (showing step 702 – "identify location of plant material target" (i.e., weed). *See also*: "In some embodiments, source/director 610 identifies specific parts of plant material target 130 by image recognition, by spectrometry, or by other techniques." [0055]. "For example, the damage amount may be determined by performing various image processing techniques, such as image recognition, spectrometry, among others, on information captured by a sensor (e.g., sensor 520 of FIG. 5)." [0063].
[1.g] "determining a target location of the weed on the	[1.f] "determining a target location of the weed based	Chan discloses that its "control system" determines a weed's target location based on images providing by the camera. As disclosed by Chan:

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surface based on the identified region in the first image”	on the identified region in the image”	“In some embodiments, control system 500 memory 535 includes data relating to characteristics of one or more plants. Control system 500 may be configured to distinguish plant material target 130 from a predetermined plant material based on stored plant characteristics data. For example, plant material targets 130 (e.g., weed seedpods) may be identified by performing various image processing techniques, such as image recognition, spectrometry, among others, on information captured by sensor 520.” [0052]. “In some embodiments, control system 500 is configured for a high intensity mode and a low intensity mode. For example, control system 500 may be configured to use the low intensity mode to determine and store the location of a multiplicity of plant material targets 130 and to use the high intensity mode to aim and fire the high-intensity laser at the stored locations of plant material targets 130.” [0054]. “Control system 510, via sensor 520, may be configured to provide information 550 representative of the location of plant material target (e.g., weed 130) to beam director 560. Additionally or alternatively, high-intensity light controller 540 may be configured to provide control signal 590 to redirector controller 570 to cause redirection of beam 580 to plant material target 130. In one embodiment, sensor 520 includes a camera. In another embodiment, sensor 520 includes a camera and an image recognition system. In a further embodiment, sensor 520 includes a spectral filter of a multicolor camera.” [0053]. As described in paragraph [0053] of Chan: (1) The sensor 520 (which includes a camera) in the light control system 510 provides weed location information 550 to the beam director 560 in the redirector control system 555. (2) The controller 540 sends a control signal 590 to the controller 570 to readjust the beam director 560 and redirect the laser beam to eradicate a weed.

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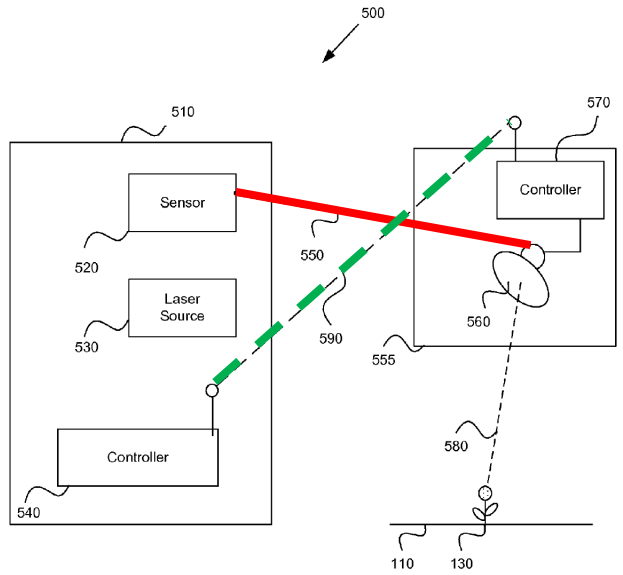
		FIG. 5  Fig 5. (showing location information 550 and control signal 590). By providing weed location information to the redirector control system 555, the light control system 510 would also need to determine the target location of the weed. *See also*: "In some embodiments, the plant material targeting mode is used for identification (e.g., via remote sensing, imaging, spectrometry, etc.) of weed 130. For example, the plant material targeting mode may be used to determine and store the location (e.g., in memory) of a plurality of plant material targets 130 and to use the plant material damaging mode in accordance with the stored locations of the plant material targets 130." [0039].

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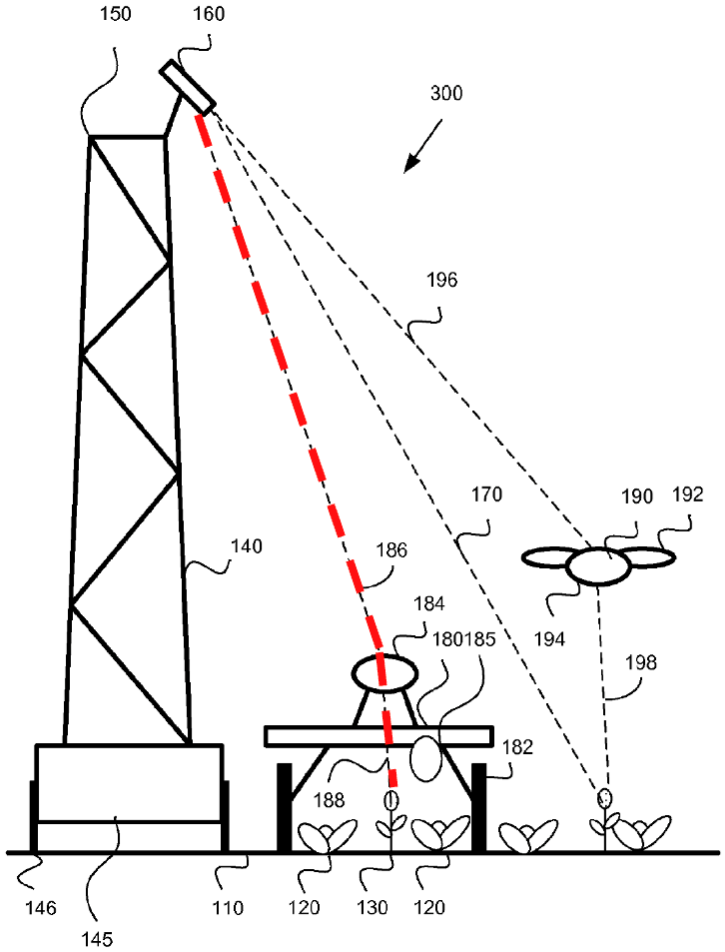
[1.h] “aligning the optical path of the beam based on the target location of the weed by adjusting a position of the actuator”	[1.g] “aligning an optical path of the beam based on the target location of the weed, and”	As discussed above, Chan discloses a light source that emits a light beam (i.e., laser) that is sent to a light redirector, which redirects the laser to eradicate weeds:  Fig. 3 (showing laser beam path).

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		The targeting apparatus in Chan would require an actuator(s) to properly align the light source and the light redirector such that the optical path of the laser is correctly directed to weeds for eradication. As taught by Chan: “In some embodiments, apparatus 300 includes light redirector 184 coupled to ground-based light redirection platform 180, which may be fixed or mobile. For example, light source 160 (e.g., laser source) may be configured to provide light beam 186 (e.g., laser beam) to ground-based light redirector 184 to redirect beam 188 onto the plant material target (e.g., weed 130).” [0045]. “In one embodiment, light redirector 184 includes a single positionable mirror. In another embodiment, light redirector 184 includes a mirror train including multiple positionable mirrors. For example, in one embodiment, the mirror train includes a first mirror that is positionable such that the first mirror faces light source 140. Light beam 186 may bounce off of the first mirror and off of a second mirror of the mirror train, such that light beam 186 is in a fixed position relative to light source platform 150. The mirror train may further include a third mirror positionable to direct the fixed beam to a target. In another embodiment, light redirector 184 includes optics, such as lenses and/or mirrors (e.g., curved mirrors), to modify light beam 186. For example, optics may be used to capture light beam 186 and reduce or expand a diameter of light beam 186 before light beam 186 enters light redirector 184. In various embodiments, optics are used to focus light beam 186 to a small diameter to concentrate the energy of light beam 186 to a small target.” [0032]. “In some embodiments, light redirection platform 180 includes a wheeled or tracked vehicle (e.g., a tractor or a truck), a legged vehicle, a pedestal-walking vehicle, a cable-carried vehicle, etc.” [0033]. “Further yet, the apparatus includes a means for redirecting the high-intensity light toward the plant material target based on the control signal.” [0006]. Moreover, light redirector is adjusted based on the control signal it receives that contains location information for the weed. “\In some embodiments, control system 500 memory 535 includes data relating to characteristics of one or more plants. Control system 500 may be configured to distinguish plant material target 130 from a predetermined plant material based on stored plant characteristics data. For example, plant material targets 130 (e.g., weed seedpods) may be identified by performing various image processing techniques, such as image recognition, spectrometry, among others, on information captured by sensor 520.” [0052]. “In some embodiments, control system 500 is configured for a high intensity mode and a low intensity mode. For example, control system 500 may be configured to use the low intensity mode to determine and

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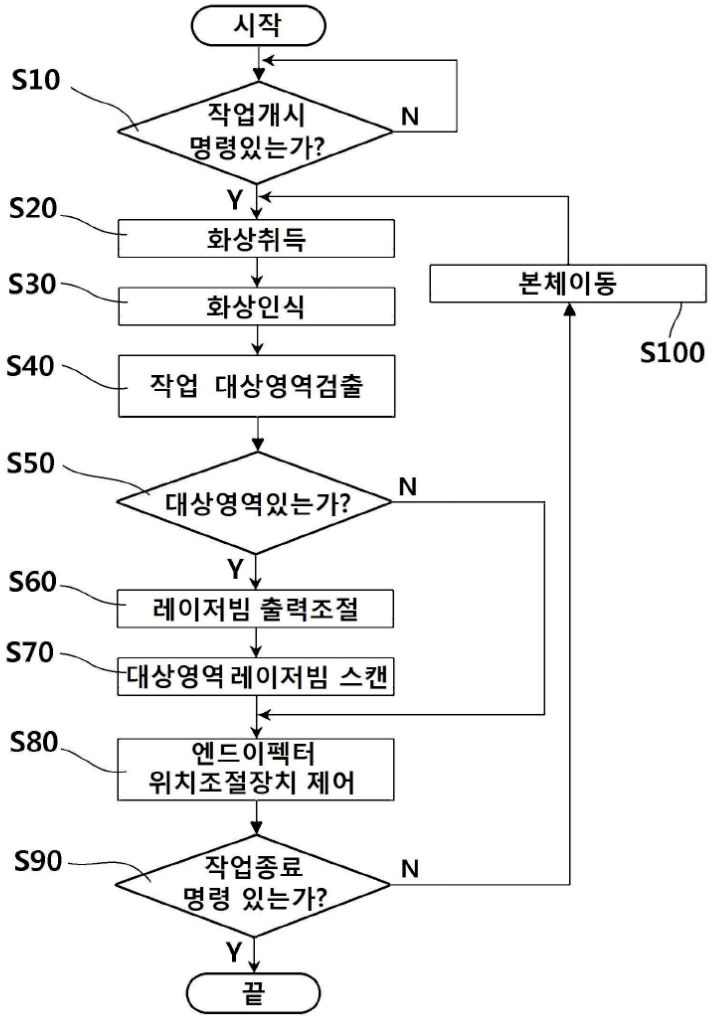
		store the location of a multiplicity of plant material targets 130 and to use the high intensity mode to aim and fire the high-intensity laser at the stored locations of plant material targets 130." [0054]. "Control system 510, via sensor 520, may be configured to provide information 550 representative of the location of plant material target (e.g., weed 130) to beam director 560. Additionally or alternatively, high-intensity light controller 540 may be configured to provide control signal 590 to redirector controller 570 to cause redirection of beam 580 to plant material target 130. In one embodiment, sensor 520 includes a camera. In another embodiment, sensor 520 includes a camera and an image recognition system. In a further embodiment, sensor 520 includes a spectral filter of a multicolor camera." [0053].
[1.i] "correcting the target location based on a motion of the first camera relative to the surface"		Chan discloses that corrections can be made relative to the movement between the light source platform and light redirection platform. Chan at [0033] ("In some embodiments, light source platform 150 and light redirection platform 180 are configured for relative motion therebetween."). It appears that Chan does not expressly disclose corrections "relative to the surface." But, including such functionality to Chan would have been obvious to a person of ordinary skill in the art. First, other prior art discloses such functionality. For example, KR20150124305 ("Hee") discloses a "calibration unit" that corrects the target location relative to the surface. The agricultural robot in Hee first captures images of weeds, which are sent to the image acquisition unit." Then the "image recognition unit" identifies the area of the weed, followed by the "target area detection unit" detecting the target work area for eradication. The main body of the agricultural robot is moving relative to the surface, which causes the motion of the camera to be in the same direction. Thus, the correction that is based off this movement would be "based on a motion of the first camera relative to the surface." Hee further discloses: "The target area detection unit 930 for detecting the work target area 258 from the calculated information, the camera 220 coordinates and the laser beam scanner 210 coordinates are calibrated, and the target area detection unit 930 is calibrated. One embodiment of the present invention, such as a <u>calibration unit 940 for providing correction information</u>, the laser beam scanner 210 and the moving device 980." Hee at [0047].

도면11


시작
S10
작업개시
명령있는가?
N
Y
S20
화상취득
S30
화상인식
S40
작업 대상영역검출
S50
대상영역있는가?
N
Y
S60
레이저빔 출력조절
S70
대상영역 레이저빔 스캔
S80
엔드이펙터
위치조절장치 제어
S90
작업종료
명령 있는가?
N
Y
끝
본체이동
S100

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		Hee at Fig. 11 (flowchart; English translation of specific steps shown below). "In the next step S60, the power is adjusted to the laser beam intensity suitable for the task. Preferably, in this step, the laser beam may be scanned at a low intensity prior to the actual scanning operation to correct the position value for the work target region 258 in advance." Hee at [0067-0068]. Second, a person of ordinary skill in the art would have been motivated and found it obvious to apply Hee's calibration unit teachings to Chan because a person of ordinary skill in the art would have recognized that doing so would improve Chan's system by providing greater accuracy when targeting weeds. Third, a person of ordinary skill in the art would have found it obvious to apply Hee's calibration unit teachings to Chan because it would have been the predictable result obtained in combining the different elements of the prior art and the predictable result obtained in applying a known technique to a known device, method, or product ready for improvements. Indeed, a person of ordinary skill in the art would have had the skill to modify Chan's system with the functionality provided by Hee's calibration unit.
[1.j] "causing the emitter to emit the beam toward the weed when at least part of the optical path is aligned with the target location of the weed, and"	[1.h] "causing the emitter to emit the beam toward the weed when at least part of the optical path is aligned with the target location of the weed"	As discussed above, Chan discloses a light source that emits a light beam (i.e., laser) that is sent to a light redirector, which redirects the laser to eradicate weeds. This process involves adjusting the light redirector to align the optical path of the laser with the weed. As disclosed by Chan:

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		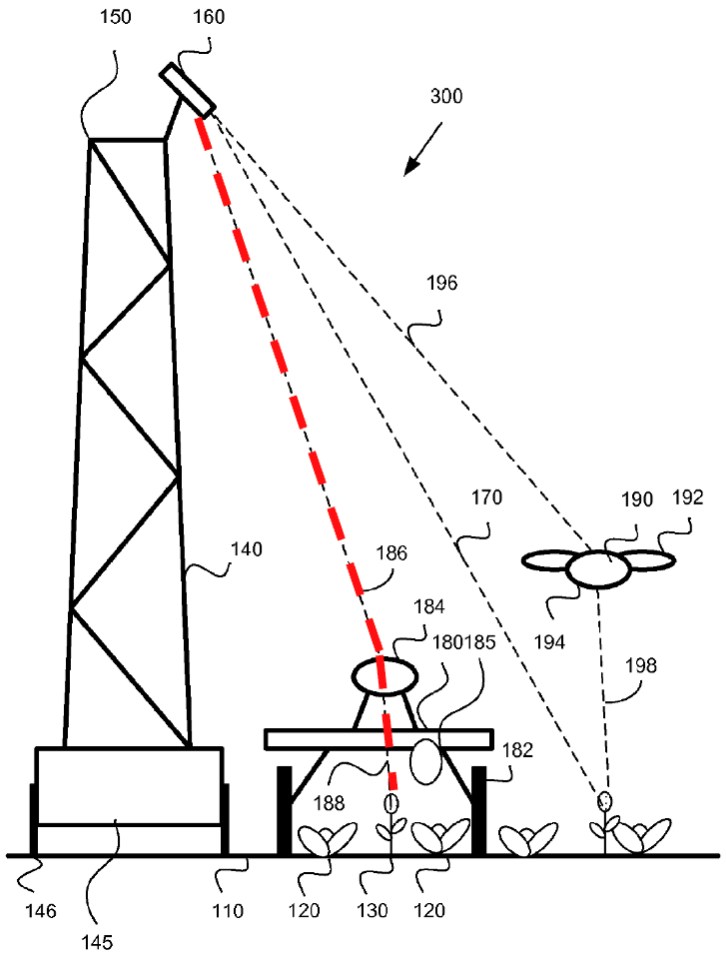 Fig. 3 (showing laser beam path). "In some embodiments, apparatus 300 includes light redirector 184 coupled to ground-based light redirection platform 180, which may be fixed or mobile. For example, light source 160 (e.g., laser source)

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		may be configured to provide light beam 186 (e.g., laser beam) to ground-based light redirector 184 to redirect beam 188 onto the plant material target (e.g., weed 130).” [0045]. “Additionally or alternatively, high-intensity light controller 540 may be configured to provide control signal 590 to redirector controller 570 to cause redirection of beam 580 to plant material target 130.” [0053]. “Further yet, the apparatus includes a means for redirecting the high-intensity light toward the plant material target based on the control signal.” [0006].

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		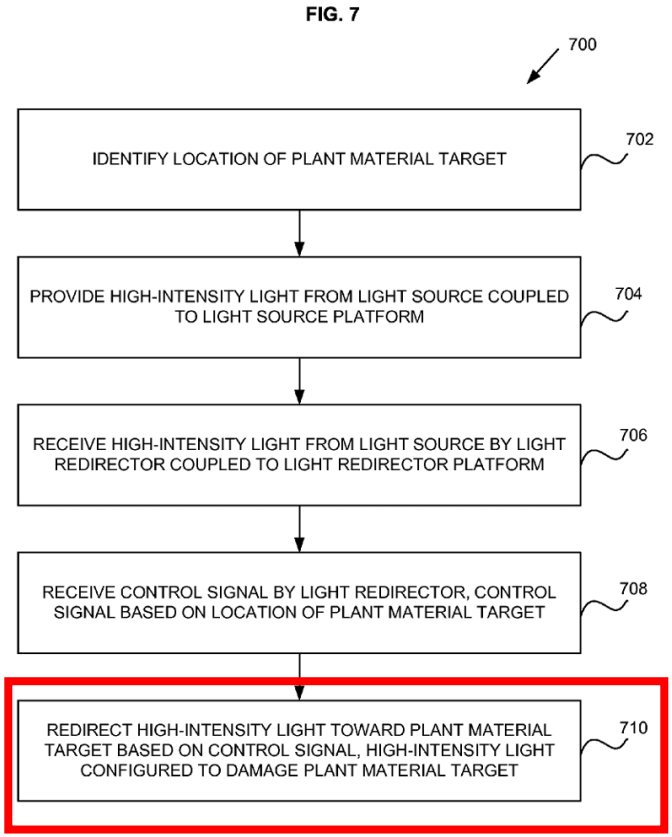 Fig. 7 (showing step 710 wherein laser is redirected to eradicate a weed). "At 710, the high-intensity light is redirected toward the plant material target based on the control signal. The high-intensity light is configured to damage the plant material target. For example, in an embodiment, the redirector 184 is configured to aim the high-intensity light (e.g., light beam 188) at the plant material target (e.g., weed 130) to damage the plant material target." [0071].
[1.k] "causing the emitter to deactivate the beam after a		As discussed above, Chan discloses a light source that emits a light beam (i.e., laser) that is sent to a light redirector, which redirects the laser to eradicate weeds. Chan also teaches that when the laser is instructed

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length of time sufficient to damage or kill the weed.”		to destroy multiple targets (i.e., weeds), it deactivates the laser after a sufficient time has passed to damage/kill a first weed, before activating the laser again to damage/kill a second weed. As disclosed by Chan: In Figure 8 of Chan below, (1) step 804 determines whether sufficient time has elapsed to damage/kill the first weed; (2) if yes, step 808 deactivates the beam; (3) step 810 identifies the second weed for eradication; and (4) step 812 readjusts the optical path of the laser to the second weed and activates the laser to damage/kill the second weed.

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		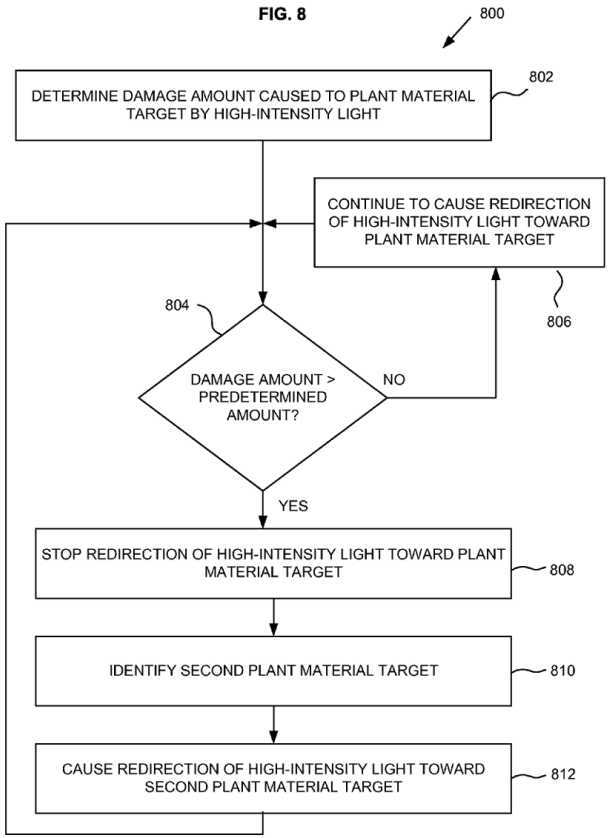 Fig. 8. “If at 804 it is determined that the damage amount does not exceed a predetermined amount, the method continues to 806. At 806, high-intensity light is continued to be redirected toward the plant material target.” [0065].

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		"At 808, redirection of high-intensity light toward the plant material target is stopped. In some embodiments, this is effected by stopping the transmission of light from high-intensity light source 160." [0066]. "At 810, a second plant material target is identified. For example, the second plant material targets may be identified using the same techniques as those used to identify the first plant material target." [0067]. "At 812, the high-intensity light is redirected toward the second plant material target. In some embodiments, high-intensity light source 160 is configured to again provide light beam 188 to redirector 184, and redirector 184 is configured to redirect the light beam 188 toward the plant material target." [0068]. *See also*: "The control system may also control a shutter or optical switch to turn light beam 186, 196 on and off." [0036].
	[1.i] "wherein emitting the beam towards the weed kills or damages the weed."	As discussed above, Chan discloses a light source that emits a light beam (i.e., laser) that is sent to a light redirector, which redirects the laser to eradicate weeds. As disclosed by Chan:

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		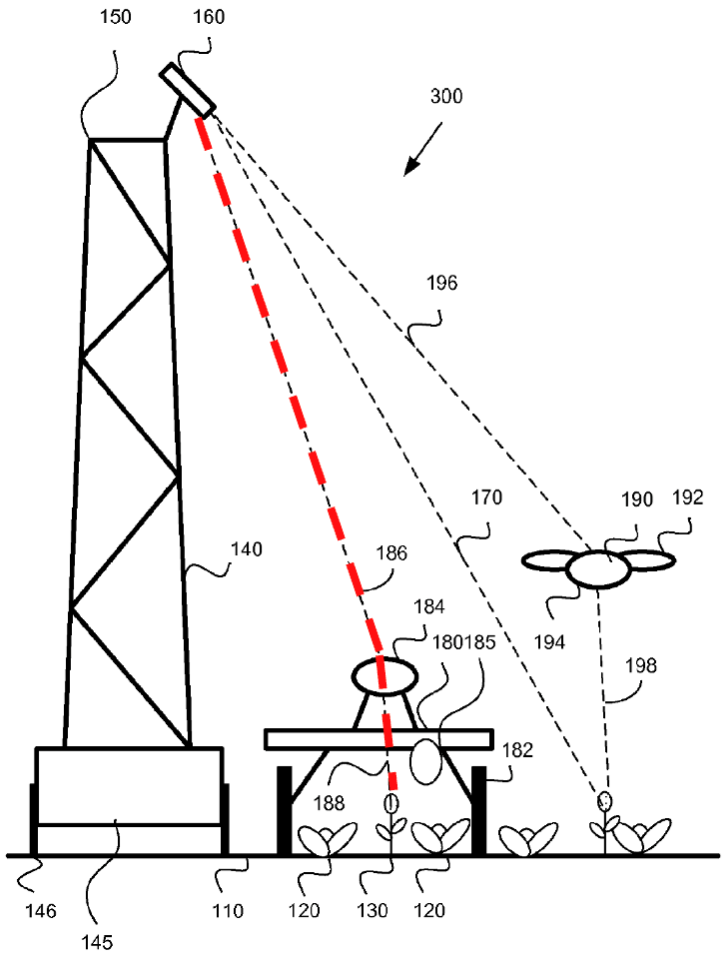 Fig. 3 (showing laser beam path). "In some embodiments, apparatus 300 includes light redirector 184 coupled to ground-based light redirection platform 180, which may be fixed or mobile. For example, light source 160 (e.g., laser source)

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		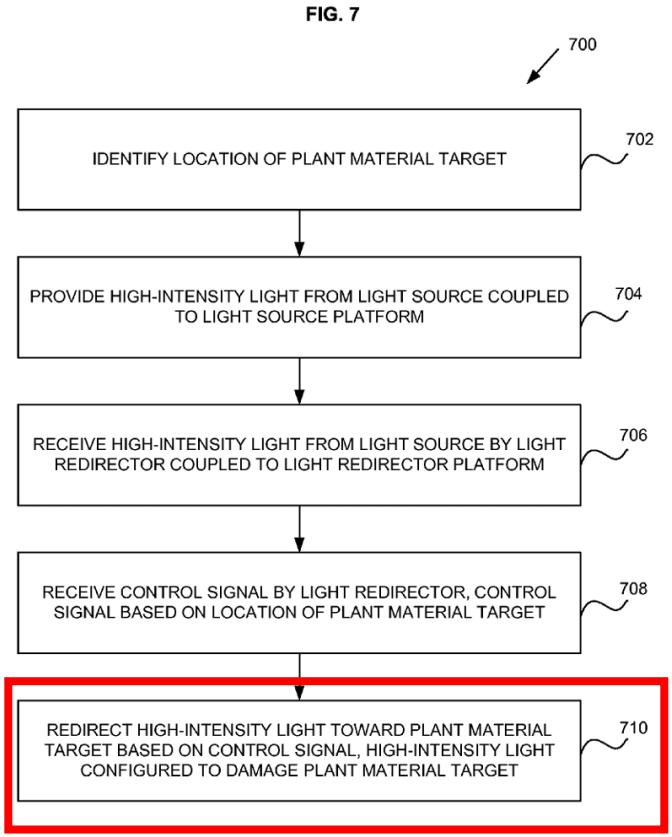 Fig. 7 (showing step 710 wherein laser is redirected to eradicate a weed). "At 710, the high-intensity light is redirected toward the plant material target based on the control signal. The high-intensity light is configured to damage the plant material target. For example, in an embodiment, the redirector 184 is configured to aim the high-intensity light (e.g., light beam 188) at the plant material target (e.g., weed 130) to damage the plant material target." [0071].