

Practitioner's Docket No. 1945/A27

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Roderick Swift, Andrew Tybinkowski

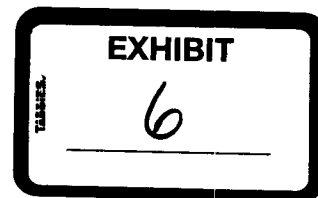
Application No.: 10/229,993

Group No.: 2882

Filed: 08/28/2002

Examiner: Church, Craig E

For: Mobile X-Ray Inspection System for Large Objects



Mail Stop Amendment

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

AMENDMENT TRANSMITTAL

1. Transmitted herewith is an amendment for this application.

STATUS

2. Applicant is a small entity.

EXTENSION OF TERM

3. The proceedings herein are for a patent application and the provisions of 37 C.F.R. 1.136 apply. Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition for extension of time.

CERTIFICATION UNDER 37 C.F.R. §§ 1.8(a) and 1.10*

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Express Mail certification is optional.)

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37 C.F.R. § 1.8(a)

[X] with sufficient postage as first class mail.

37 C.F.R. § 1.10*

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TRANSMISSION

[X] facsimile transmitted to examiner Church, (571) 273-2488.

A handwritten signature in black ink, appearing to read "S. J. Petuchowski". Below the signature is a horizontal line.

Signature

Samuel J. Petuchowski

(type or print name of person certifying)

Date: September 21, 2005

* Only the date of filing (§ 1.6) will be the date used in a patent term adjustment calculation, although the date on any certificate of mailing or transmission under § 1.8 continues to be taken into account in determining timeliness. See § 1.703(f). Consider "Express Mail Post Office to Addressee" (§ 1.10) or facsimile transmission (§ 1.6(d)) for the reply to be accorded the earliest possible filing date for patent term adjustment calculations.

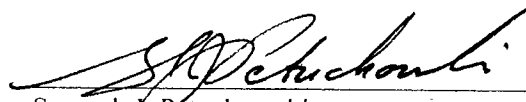
FEE FOR CLAIMS

4. The fee for claims (37 C.F.R. 1.16(b)-(d)) has been calculated as shown below:

	(Col. 1)	(Col. 2)	(Col. 3)	SMALL ENTITY			
	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NO. PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE	ADDIT. FEE		
TOTAL	14	— 20	= 0	x \$ 25.00	= \$		0.00
INDEP.	4	— 4	= 0	x \$ 100.00	= \$		0.00
FIRST PRESENTATION OF MULTIPLE DEP. CLAIM				+ \$ 0.00	= \$		0.00
				TOTAL ADDIT. FEE	\$		0.00

No additional fee for claims is required.

Date: September 21, 2005



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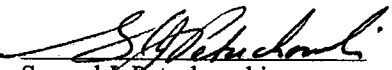
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Swift et al. Atty Dkt: 1945/A27
Serial No: 10/229,993 Art Unit: 2882
Date Filed: 08-28-2002 Examiner: C. Church

Invention: Mobile X-Ray Inspection System for Large Objects

CERTIFICATE OF MAILING

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Samuel J. Petuchowski

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RESPONSE TO OFFICE ACTION OF SEPTEMBER 12, 2005

In response to the office action dated September 12, 2005, Applicants provide the following response.

A Listing of Claims begins on page 2 of this paper.

Remarks begin on page 5 of this paper.

Listing of Claims

Please amend claims 8, 11 and 14 to read as indicated below. The following listing of claims replaces all prior versions, and listings, of claims in the application:

1. **(original)** A device, for inspecting a cargo container with penetrating radiation, the device comprising:
 - a. a bed that is reversibly moveable along a direction having a horizontal component;
 - b. a source of penetrating radiation, mounted on the bed for providing a beam having a central axis, the central axis being predominantly horizontal;
 - c. a motorized drive for moving the bed in the first direction;
 - d. at least one scatter detector mounted on the bed, each scatter detector having a signal output;so that, as the bed is moved forward and backward along the direction, the beam is caused to traverse the cargo container as the bed is moved and each scatter detector provides a signal for characterizing the cargo container and any contents of the cargo container.
2. **(original)** A device according to claim 1, wherein the a source of penetrating radiation is characterized by a source axis adjustable over a range of angles about the horizontal.
3. **(original)** A device according to claim 1, further including a remotely operated actuator for setting a desired x-ray beam angle.
4. **(original)** A device according to claim 1, further including an interlock for disabling the source of penetrating radiation unless the bed is in motion.
5. **(original)** A device according to claim 1, wherein the scatter detector is a backscatter detector.
6. **(original)** A device according to claim 1, wherein the beam is a pencil beam scanned repeatedly about an axis orthogonal to the source axis.

7. **(original)** A method for producing an x-ray scatter image of a cargo container, the method comprising:
- a. providing a device having:
 - (i) a bed reversibly moveable along a horizontal direction;
 - (ii) a source of penetrating radiation, mounted on the bed, for providing a beam characterized by an adjustable beam axis;
 - (iii) a motorized drive for moving the bed in the first direction; and
 - (iv) at least one scatter detector mounted on the bed and having a signal output;
 - b. using the motorized drive to move the device past the cargo container so as to cause any contents of the cargo container to be scanned by the beam; and
 - c. processing the signal from the signal output of the scatter detector as the bed is moved forward and backward along the horizontal direction to form an image of the contents of the cargo container.
8. **(currently amended)** A device, for inspecting a cargo container with penetrating radiation, the device comprising:
- a. a self-propelled vehicle moveable along a direction having a horizontal component;
 - b. a source of penetrating radiation, coupled to the self-propelled vehicle ~~bed~~ for providing a beam having a central axis, the central axis being predominantly horizontal;
 - c. a beam stop for absorbing the beam of penetrating radiation after traversal of the object; and
 - d. at least one scatter detector mounted on the self-propelled vehicle ~~bed~~, each scatter detector having a signal output;
- so that, as the self-propelled vehicle ~~bed~~ is moved along the direction, the beam is caused to traverse the cargo container as the self-propelled vehicle ~~bed~~ is moved and each scatter detector provides a signal for characterizing the cargo container and any contents of the cargo container.
9. **(previously presented)** A device according to claim 8, wherein the source of penetrating radiation is characterized by a source axis adjustable over a range of angles about the horizontal.

10. **(previously presented)** A device according to claim 8, further including a remotely operated actuator for setting a desired x-ray beam angle.
11. **(currently amended)** A device according to claim 8, further including an interlock for disabling the source of penetrating radiation unless the self-propelled vehicle bed is in motion.
12. **(previously presented)** A device according to claim 8, wherein the scatter detector is a backscatter detector.
13. **(previously presented)** A device according to claim 8, wherein the beam is a pencil beam scanned repeatedly about an axis orthogonal to the source axis.
14. **(currently amended)** A method for producing an x-ray scatter image of a cargo container, the method comprising:
 - a. providing a device having:
 - i. a self-propelled vehicle bed reversibly moveable along a horizontal direction;
 - ii. a source of penetrating radiation, coupled to ~~mounted on~~ the self-propelled vehicle bed, for providing a beam characterized by an adjustable beam axis;
 - iii. a motorized drive for moving the self-propelled vehicle bed in the first direction; and
 - iv. at least one scatter detector mounted on the self-propelled vehicle bed and having a signal output;
 - b. using the motorized drive to move the device past the cargo container so as to cause any contents of the cargo container to be scanned by the beam; and
 - c. processing the signal from the signal output of the scatter detector as the self-propelled vehicle bed is moved forward and backward along the horizontal direction to form an image of the contents of the cargo container.

REMARKS

Amendments to claims 8, 11, and 14 are submitted, after careful review of the pending claims, solely for the sake of linguistic consistency, so that claims 9-14 correspond to original claims 2-7 in a fully consistent manner, the intention of which was enunciated in Applicants' Preliminary Amendment of August 29, 2002.

Claims 1-14 are currently pending in the Application, having been withdrawn from issue, at Applicants' request, for consideration of additional references. All claims currently stand rejected as unpatentable (under 35 U.S.C. § 103(a)) over the combination of a product (the AS&E Model 101 Van) predating October 19, 1994 (and described as background in US Army Contract DAAB10-95-C-0001) together with the Lawrence article (IDS reference BD) of July, 1994.

In order to clarify the patentability of the pending claims over the newly cited art, a description of the AS&E Model 101 Van, which remains in production and is currently designated the Model 101Z Van, is attached hereto for the Examiner's convenience. The 101 Van is not close prior art because it is a fixed-site system, with the van serving merely to tote the x-ray apparatus to the deployment site. Moreover, the 101 Van was already amply described in US Patent No. 5,313,511 (Annis), and various other references of record in the case, and thus any further description is cumulative.

The AS&E Model 101 Van, while aptly named in that it is an x-ray backscatter system carried around in a van, is, in substance, no different from fixed backscatter systems that were well-known before Applicants' proposal to develop a system to inspect objects (such as cargo containers or trucks) that are too large to be inspected by any fixed system. AS&E designates its family of fixed-site package inspection systems as Model 101.

The 101 Van remains stationary while inspecting small packages and other cargo. In contrast, every claim pending in the current application is directed to a device or method for inspecting *while the inspection system is itself in motion*. Pending Claim 1 makes this distinction clear. The claimed device includes a "bed that is reversibly moveable . . ." and a "motorized drive for moving the bed in the first direction." In use, the "bed is moved forwards and backward along the direction" to cause the radiation beam "to traverse the cargo container as the bed is moved" Similarly, the second independent claim, claim 8, requires that "as the self-propelled vehicle is moved . . . , the beam is caused to traverse the cargo container."

The third independent claim, method claim 14, similarly requires “. . . using the motorized drive to move the device past the cargo container so as to cause any contents of the cargo container to be scanned by the beam. . . .”

Embodiments of the present invention provide solutions to a host of problems that are particular to this technological context. A salient problem addressed by embodiments of the present invention, the solution to which is nowhere suggested before the present invention, is presented as one example: the problem of registering the horizontal motion of the scanning source with respect to the scanned object as against the horizontal axis of the resulting image. This is a non-trivial problem, addressed, in one embodiment described in the ‘929 Patent, currently in reissue examination, by a slow-speed drive mechanism, for example.

Another major problem is that of preventing stray radiation from impinging on personnel, since, in the instant invention, the beam points outwardly from the truck which contains the source. Both of these novel considerations are introduced, for example, in the paragraph beginning in col. 6, line 31, of US Patent No. 6,252,929, of which the instant case is a re-issue application. Correspondingly, pending Claim 8 and its dependent claims require a “beam stop” not required, taught or suggested by the 101 Van.

The Model 101 family of fixed parcel inspection systems, including the Model 101 Van, nowhere incorporates, nor suggests, any solution to the unique problems of a system that conducts x-ray inspection while in motion, neither does the Lawrence paper suggest any.

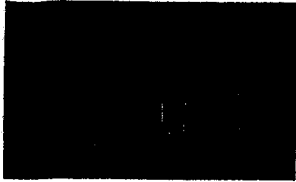
On the basis of the present record, all claims, as discussed above, or as dependent therefrom, are deemed to be allowable, and allowance of the pending claims, are respectfully requested.

Respectfully submitted,



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AMERICAN SCIENCE AND ENGINEERING, INC.
WHEN YOU CAN'T AFFORD TO COMPROMISE.

MODEL 101ZVAN

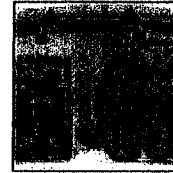
MOBILE INSPECTION SYSTEM SCANS PACKAGES UP TO 89cm
WIDE BY 104cm HIGH (35" x 41")

ANOTHER AS&E ADVANTAGE

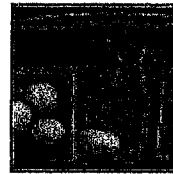
Housed in a common delivery van - mobile and inconspicuous, allowing for surprise inspections.

Combined technologies - simultaneous Transmission and Z® Backscatter X-ray imaging - providing the most information to the operator about the object under examination

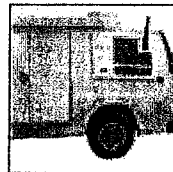
Proprietary Z Backscatter technology to provide photo-like images that highlight organic threats and contraband, expediting analysis while reducing operator fatigue



Transmission X-ray



Z Backscatter X-ray



Surprise Inspections

The U.S. Department of Homeland Security knows the AS&E Advantage. In September 2003 they ordered 19 101ZVans for a variety of homeland defense applications, including force protection, port and border security, and counterterrorism.

Specs at-a-Glance

Image Analysis Features

The 101ZVan combines AS&E's patented Z Backscatter technology with traditional Transmission X-rays. The system is engineered to be mobile and totally self-contained.

Designed for mobility and ease of use, the Model 101ZVan is an inspection unit that fits within a standard van. The totally integrated system requires a single operator, and allows for surprise inspections whenever a security threat or trade fraud is suspected.

Model 101ZVan can operate on its own auxiliary power unit or on local ground power, and can process up to 1,500 parcels per hour. The operator's console is equipped with various system controls and separate displays for transmission and backscatter images. The console is mounted on an arm that extends outside the vehicle during operation and stows inside the vehicle for ease of transport and storage.

Model 101ZVan Specs at-a-Glance

Tunnel Opening

Length: Unlimited

Standard Width: 89 cm (35")

Height: 104 cm (41")

Overall Dimensions

Length: 556 cm (219")

Width: 203 cm (80")

Height: 231 cm (91")

Weight: +/- 3900 kg (8600 lbs)

Conveyor

Auto-stop, auto-return and continuous mode allows one-person operation

Width: 71 cm (28") 32"

Height: 101.6 cm (40")

Capacity: 136 kg (300 lbs)

Health & Safety

Complies with applicable federal health and safety regulations:

Center for Devices and Radiological Health Standards for Cabinet X-ray Systems (21 CFR subchapter J section 1020.40)

U.S. Federal Aviation Administration Use of X-ray Systems (14 CFR part 108.17 and 129.26)

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Image Analysis Features

Density Expand: Density Expand allows the operator to adjust the contrast of the displayed image, thus enhancing differences in objects that may initially appear similar. (System is also equipped with **Density Expand Lock**, to maintain density setting for successive scans.)

Edge Enhancement: Edge Enhancement is a computer-based algorithm used to accentuate the edges of objects in the X-ray image, helping the operator to recognize anomalies faster and more readily.

Example: Sharpens and enhances thin wires associated with explosives.

Penetration: Penetration of 24 mm is provided. Extra penetration is available as an option.

Reverse Video: Reverse Video allows operators to enhance X-ray images by reversing polarity of white and black contrast.

Zoom: Zoom provides 2X and 4X magnification options with joystick control to roam continuously through full field of view. (System is also equipped with **Zoom Lock**.)

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The Commissioner for Patents has received from Bromberg & Sunstein LLP the following re:

Inventor:	Swift et al.	Docket No.:	1945/A27
Title:	Mobile X-Ray Inspection System for Large Objects	Art Unit:	2882
		Examiner	C.Church
Serial/Patent No.:	10/229,993	Date:	September 21, 2005
Filing/Issue Date:	August 28, 2002	Express Mail No.:	

Documents:

- | | |
|--|--|
| ☐ New Application Transmittal | ☒ Amendment Transmittal |
| ☐ Provisional Application Cover Sheet | ☐ Amendment (Preliminary) |
| ☐ Description- pages | ☒ Response |
| ☐ Claims- pages | ☐ IDS & References |
| ☐ Abstract | ☐ Petition for month extension |
| ☐ Application Data Sheet | ☐ Issue Fee Transmittal & Form PTOL-85b |
| ☐ Request and Certification under 35 USC 122(b)(2)(B)(i) | ☐ Payment of Maintenance Fee |
| ☐ sheets of drawings | ☐ Assignment/Recordation Form Cover Sheet |
| ☐ ☐ formal ☐ informal | ☐ Check in the amount of \$ |
| ☐ Declaration & Power of Attorney | ☐ Completion of Filing Requirements |
| ☐ ☐ executed ☐ unexecuted | ☐ Transmittal of Formal Drawings |
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FROM Samuel J. Petuchowski  PAGES 13 (INCLUDING THIS SHEET)

PHONE DATE 9/21/2005

RE Reissue Application for Swift et al.
Serial No. 10/229,993, Filed 8/28/02

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COMMENTS

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