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(12) **EX PARTE REEXAMINATION CERTIFICATE** (8822nd)

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Banyard et al.

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(54) **LIQUID FOR PRODUCING MARKER VAPOR, A METHOD OF PRODUCING MARKER VAPOR AND A METHOD OF INSPECTION WITH MARKER VAPOR**

(52) **U.S. CL.** **250/302; 73/40; 73/40.7; 73/592**

(58) **Field of Classification Search** **250/302**
See application file for complete search history.

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(56) **References Cited**

To view the complete listing of prior art documents cited during the proceeding for Reexamination Control Number 90/011,544, please refer to the USPTO's public Patent Application Information Retrieval (PAIR) system under the Display References tab.

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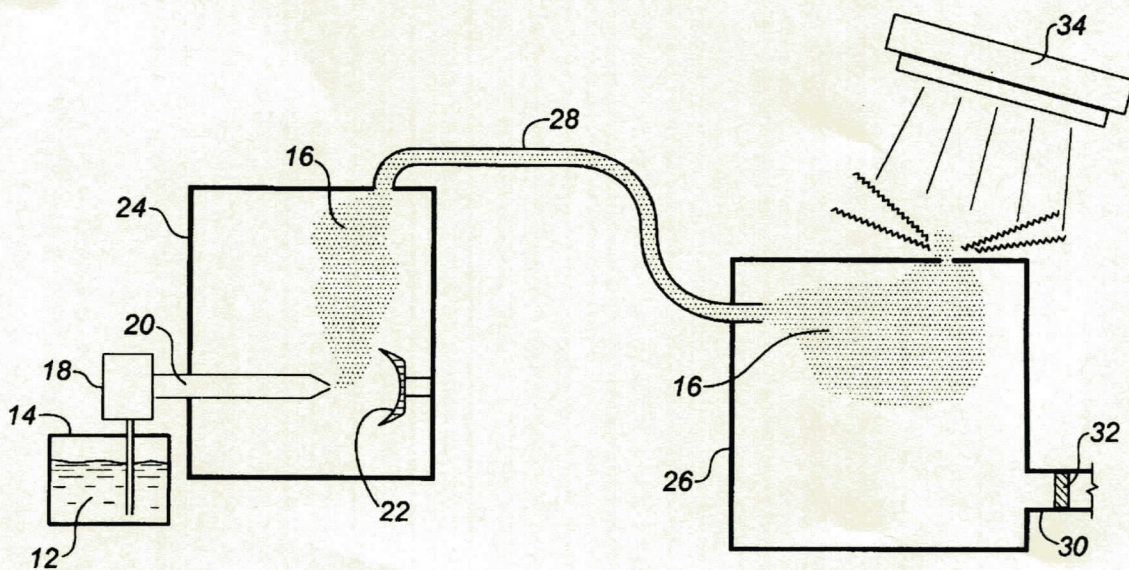
Reexamination Certificate for:

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(57) **ABSTRACT**

A liquid for producing a marker vapor includes a fluorescent substance in solution in a carrier liquid. The fluorescent substance has a first vaporization temperature range at which the fluorescent substance vaporizes. The carrier liquid has a second vaporization temperature range at which the carrier liquid vaporizes. The second vaporization temperature range overlaps the first vaporization range. The liquid is vaporized and directed into a body being inspected. Leaks then become visible when the body is inspected using radiation of a wavelength that causes the fluorescent substance to fluoresce.

(51) **Int. Cl.**
G01M 3/00 (2006.01)
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**EX PARTE
REEXAMINATION CERTIFICATE
ISSUED UNDER 35 U.S.C. 307**

THE PATENT IS HEREBY AMENDED AS
INDICATED BELOW.

Matter enclosed in heavy brackets [] appeared in the patent, but has been deleted and is no longer a part of the patent; matter printed in italics indicates additions made to the patent.

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 4 is cancelled.

Claims 1, 5 and 10 are determined to be patentable as amended.

Claims 2, 3, 6-9 and 11-16, dependent on an amended claim, are determined to be patentable.

New claims 17 and 18 are added and determined to be patentable.

1. A liquid for producing a marker vapour, comprising:

a fluorescent substance in solution in a carrier liquid, *wherein the carrier liquid is one of oil and glycerin*, the fluorescent substance having a first vapourization temperature range at which the fluorescent substance vapourizes and the carrier liquid having a second vapourization temperature range at which the carrier liquid vapourizes and the second vapourization temperature range overlapping the first vapourization range.

5. A method of producing a marker vapour *and for detecting a leak in a container*, comprising the steps of:

providing a fluorescent marker liquid consisting of a fluorescent substance in solution in a carrier liquid, the

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fluorescent substance having a first vapourization temperature range at which the fluorescent substance vapourizes and the carrier liquid having a second vapourization temperature range at which the carrier liquid vapourizes, the second vapourization temperature range overlapping the first vapourization range; **[and]**

vapourizing the fluorescent marker liquid at a temperature that is within both the first vapourization temperature range and the second vapourization temperature range, thereby forming a vapour **[that is visible when exposed to radiation of suitable wavelength]** ;

directing the vapour under pressure into the container so that the vapour exits the leak therein whereby at least some of the vapour changes back to a liquid for depositing the fluorescent substance at the site of the leak; and

inspecting the exterior of the container under radiation of suitable wavelength to cause the fluorescent substance deposited by the liquid to fluoresce and thereby indicate the location of the leak.

10. A method of inspection with marker vapour, comprising the steps of:

providing a fluorescent marker liquid consisting of a carrier liquid containing a fluorescent substance; vapourizing the marker liquid to produce a marker vapour;

directing the marker vapour *under pressure* into a pressure container being inspected for pressure leaks *such that the marker vapour exits a leak whereby at least some of the vapour changes back to a liquid for depositing the fluorescent substance at the site of the leak; and*

inspecting an exterior of the pressure container under radiation of suitable wavelength to cause the fluorescent substance *deposited by the liquid* to fluoresce *and thereby indicate the location of the leak.*

17. *The method as defined in claim 5, wherein the fluorescent marker liquid is one of oil, glycerin and a solvent.*

18. *The method as defined in claim 10, wherein the fluorescent marker liquid is one of oil, glycerin and a solvent.*

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