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(11) **EP 1 577 440 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
07.12.2005 Bulletin 2005/49

(51) Int Cl.7: **E01B 35/00, B61K 9/08**

(43) Date of publication A2:
21.09.2005 Bulletin 2005/38

(21) Application number: **05251576.4**

(22) Date of filing: **16.03.2005**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR**
Designated Extension States:
AL BA HR LV MK YU

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(30) Priority: **17.03.2004 GB 0405914**

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(54) **Measurement apparatus**

(57) Measurement apparatus 20, in particular for measuring structures alongside railway tracks, comprises a vehicle 22 preferably in the form of a portable trolley movable relative to a structure to be measured, structure illumination means 24 for illuminating a region of the structure to be measured, and image capturing means 26 for capturing an image of the region of the structure illuminated by the structure illumination means 24. An illumination arrangement for inspecting a structure is also disclosed.

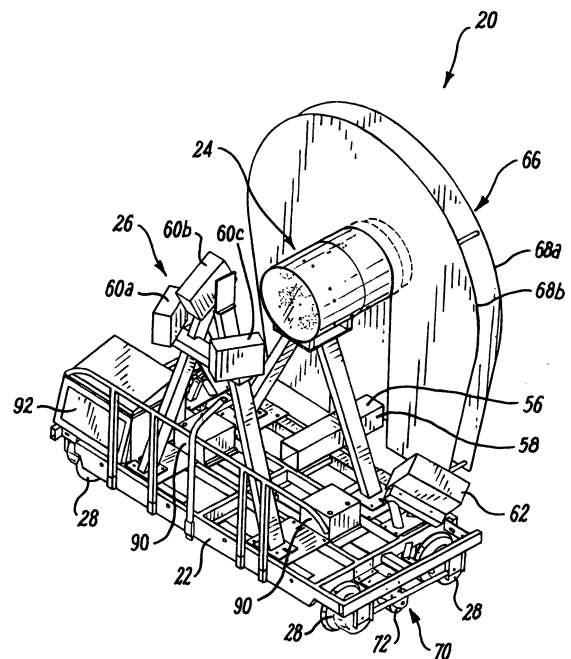


Fig. 1

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 6 356 299 B1 (TROSINO MICHAEL ET AL) 12 March 2002 (2002-03-12) * column 3, line 43 - column 4, line 8; claim 10; figure 1 *	1,5,7,8, 17,18, 20,21	E01B35/00 B61K9/08
A	-----	19	
X	US 4 065 856 A (WATERS ET AL) 3 January 1978 (1978-01-03) * column 3, lines 11-62; claims 1,3,4; figures 4,5,7,14 *	1,5,20	
A	-----	7-9,13	
P,X	US 2004/263624 A1 (NEJIKOVSKY BORIS ET AL) 30 December 2004 (2004-12-30) * claim 1; figures 1,2 *	1,5,8, 17,20	
A	DE 42 38 034 C1 (SARTORI, MICHAEL, DIPL.-ING., 79102 FREIBURG, DE) 31 March 1994 (1994-03-31) * column 7, lines 19-50; claims 1,11,13; figures 1-5 *	1,2,5,7, 9,20	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A	DE 198 01 311 A1 (GSG KNAPE GLEISSANIERUNG GMBH, 85737 ISMANING, DE) 6 May 1999 (1999-05-06) * column 9, lines 5-41; figure 1 *	1,5,19	E01B B61K G01B G01C B61L
A	US 4 179 216 A (RIESSBERGER, KLAUS ET AL) 18 December 1979 (1979-12-18) * abstract; figures 1,2 *	1,5	

-The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 27 June 2005	Examiner Fernandez, E
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

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EPO FORM 1503 03.82 (P04C01)



CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):

- No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

- As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

- Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

- None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-24



The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-24

Measurement apparatus comprising

- a) a vehicle movable relative to a structure to be measured,
- b) illumination means for illuminating a region of the structure, and
- c) image capturing means for capturing an image of the illuminated region of the structure,
- d) wherein the structure illumination means and the image capturing means are removably mounted on the vehicle.

Claims 2-24 are referred back to claim 1.

2. claims: 25-30

An illumination arrangement for inspecting a structure, comprising

- a) a light source and
- b) a deflector,
- c) the light source presenting a limited width of light beam to the deflector, and
- d) the deflector deflecting the light beam to present a wider arc of light to the structure for inspection.

Claims 26-30 are referred back to claim 25.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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27-06-2005

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6356299	B1	12-03-2002	US 6064428 A	16-05-2000
US 4065856	A	03-01-1978	NONE	
US 2004263624	A1	30-12-2004	NONE	
DE 4238034	C1	31-03-1994	AU 5461494 A	08-06-1994
			DE 4395721 D2	23-11-1995
			WO 9411705 A1	26-05-1994
			EP 0668988 A1	30-08-1995
DE 19801311	A1	06-05-1999	NONE	
US 4179216	A	18-12-1979	AT 353487 B	12-11-1979
			AU 516969 B2	02-07-1981
			AU 3650978 A	29-11-1979
			CA 1077158 A1	06-05-1980
			CH 630854 A5	15-07-1982
			CS 226175 B2	19-03-1984
			DD 136538 A5	11-07-1979
			DE 2818531 A1	14-12-1978
			FR 2393270 A1	29-12-1978
			GB 1583737 A	04-02-1981
			HU 178677 B	28-06-1982
			IT 1095842 B	17-08-1985
			JP 53149058 A	26-12-1978
			PL 207177 A1	12-02-1979